

# Consumption and the Within-household Income Distribution: Outcomes from an Australian “Natural Experiment”

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***Abstract:** Does the within-household distribution of income influence household consumption patterns? In one attempt to answer this question, Lundberg, Pollak and Wales (1997) exploited the ‘natural experiment’ of a change in family benefits in the UK. They found that the within-household income distribution did have a significant impact on expenditure. This paper exploits a similar natural experiment in Australia. During the 1990s, unemployment benefits for unemployed married couples changed from being paid almost entirely to husbands, to being paid primarily to wives. Using household expenditure data it is found that, although the changes in the within-household income distribution were large, the changes in expenditure patterns were small and not in the expected direction. The data do not, therefore, provide support for the hypothesis that women’s control over household expenditure was increased. The paper concludes with a discussion of the possible reasons for this. (JEL J10, J12, I38)*

## 1 Introduction

It is now generally accepted that households do not necessarily pool their income when making consumption decisions. This result has important implications for the understanding of household consumption and labour supply behaviour and also for policies that seek to increase the living standards of particular population groups (such as children). Nonetheless, the extent of non-pooling and, more specifically, the ability of policy instruments to influence within-household consumption patterns, is only poorly understood. This is because exogenous variation in household income sources (or other factors influencing the within-household distribution) is rarely observed. Instead, variation in household income receipt is usually associated with variation in associated prices or preferences, which also influence consumption behaviour.

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This paper is based on research funded by the Australian Department of Family and Community Services. The author would like to thank Bob Pollak, Shelly Lundberg, Paul Frijters, Saba Waseem, Trish Hill, Denise Thompson, seminar participants and officers of the Department of Family and Community Services for their comments on previous versions. However, the views expressed here are those of the author alone.

This paper utilises the “natural experiment” of a substantial change in income support policy in Australia during the 1990s. Over this period, income support payments to working age married-couple families shifted from being paid almost entirely to the male head, to a situation where more than half the income support was paid to the female head. This paper examines the impact of these changes on the expenditure behaviour of married couple households. The analysis of the paper is thus similar to that of Lundberg, Pollak and Wales (1997) (hereafter LPW) who analysed changes in expenditure patterns in the UK associated with a similar change in the payment methods for child benefits.

However, the conclusions here are different. LPW observed a very substantial increase in the consumption of women’s and children’s clothing relative to men’s clothing when child benefit was transferred from “the wallet to the purse”. In Australia, however, this paper finds no significant relationship between a much larger income change and household expenditure patterns. Possible reasons for the Australian result include the population affected by the change, the magnitude of the policy change, and the different patterns of household financial management in the two countries.

The paper is organised as follows. In the next section some of the previous theoretical and empirical results in this area are introduced. Section 2 then summarises the relevant changes to Australian income support policy during the 1990s. The expenditure survey data used to examine consumption patterns is described in Section 3 and the estimation strategy in Section 4. Section 5 then provides estimates of the impact of the within-household income distribution separately for couples with and without children. Section 6 presents results for alternative specifications which utilise variations in income distribution across the different family types or are restricted to low-income households. Section 7 speculates on possible explanations for the results.

## 2 Background

Because married couples live together for extended periods, it is reasonable to assume that the allocation of resources within the household will be Pareto-optimal (i.e. efficient in the sense that it is not possible to make one person better off without making another worse off). This is the key assumption of the “collective” model of household decision-making, which has been central to the recent economic literature on this topic.

Following Browning and Chiappori (1998), we can represent this model using the following decision rule. We assume that a two-adult household chooses its consumption of private goods for adult A,  $\mathbf{q}^A$ , private goods for adult B,  $\mathbf{q}^B$ , private goods for children,  $\mathbf{q}^C$ , and household public goods,  $\mathbf{Q}$  so as to maximise.

$$\delta u^A(\mathbf{q}^A, \mathbf{q}^B, \mathbf{q}^C, \mathbf{Q}) + (1 - \delta) u^B(\mathbf{q}^A, \mathbf{q}^B, \mathbf{q}^C, \mathbf{Q})$$

subject to

$$\mathbf{p} \cdot (\mathbf{q}^A + \mathbf{q}^B + \mathbf{q}^C + \mathbf{Q}) = x$$

Any particular commodity may be represented in each of  $\mathbf{q}^A$ ,  $\mathbf{q}^B$ ,  $\mathbf{q}^C$ , and  $\mathbf{Q}$  depending upon the relative amount of individual and shared consumption for that commodity. Prices are represented by the vector  $\mathbf{p}$  and total expenditure by  $x$ . Both adults have preferences with respect to the consumption of the private goods for each person and the shared goods. The household consumption decisions, however, are based upon a weighted average of these preferences.

In general, the “distribution parameter”  $\delta$  may be a function of incomes, prices, and other factors that influence the balance of decision-making power within the household. However, the key structural feature of this model is that all these factors operate via this uni-dimensional parameter. This implies that the impact of different factors that influence decision-making should be proportional across commodities (Browning and Chiappori 1998), a pattern that can be empirically tested. In principle, this makes it possible both to test the plausibility of the model (all distribution factors should have proportional impacts) and to distinguish between factors that influence  $\delta$  and other factors associated with variations in preferences (these will not necessarily be proportional).

These testable criteria arise from the model assumptions of economically consistent preferences for each individual and Pareto efficiency in the within-household allocation. Nonetheless, there are many examples in the sociological literature on household financial decision-making that do not fit within this collective model. For example, if the income the mother received from one source (e.g. family allowance payments) was always directed towards a particular commodity (children’s consumption), but her income from other sources was pooled with other household income, this situation could only be consistent with the collective model under quite extreme preference structures. (E.g.  $u^{Mother}(\cdot)$  might only value child consumption, and  $\delta$  might only depend upon the income from family allowances). These sorts of allocation rules are not consistent with a Pareto efficient allocation between two people with economically consistent preferences. Instead, they must be rationalised with the use of other concepts such as bounded rationality and costly decision-making processes.

Note also that if the distribution parameter is fixed (or varies in association with variables that are not observed), then it is not possible to distinguish between household consumption patterns under the general collective model, and consumption patterns that might occur under the conventional ‘unitary’ model of household consumption (see Samuelson 1956). To identify a fixed

distribution parameter, additional assumptions are required. For example, it might be assumed that individuals only have preferences for their own consumption, and that these preferences also apply when they are living alone. If the consumption patterns of men and women are different enough, it may then be possible to identify the fixed distribution rule that applies in couples by observing whether couple consumption patterns are more like those of single men or women, while controlling for the price effects of joint consumption. See Bradbury (1997).

Nonetheless, from the perspective of policy that seeks to influence consumption behaviour or the intra-household allocation of resources, the key question is how the intra-household distribution of decision-making power varies in line with observable characteristics, and in particular, characteristics that can be influenced by policy decisions.

There is now a substantial body of research in both the sociological and economic disciplines addressing these empirical questions (see Waseem 2004 for a recent survey). The sociological research tends to focus on financial decision making processes<sup>1</sup>, and the economic literature on behavioural outcomes, particularly labour supply and consumption behaviour. As Waseem notes, though both sociologists and economists use the term “income pooling”, it means different things in the two literatures. For sociologists, income pooling is a method of financial management within the household. In the economic literature, the income-pooling hypothesis is that households behave as if their income was pooled (ie it does not matter which member receives the income). Though probably correlated, these two phenomena are not the same.

In the economic literature, studies examining consumption behaviour have mainly examined the way in which consumption patterns change as the wage income shares of husbands and wives vary. Papers using this approach include Bourguignon et al (1993), Browning and Chiappori (1998) and Phipps and Burton (1998).<sup>2</sup>

Lundberg, Pollak and Wales (1997) (LPW) are critical of these estimates. They argue that households with different ratios of husband to wife earnings are likely to face different prices and have different preferences. One explanation for the increase in expenditure on meals out, they argue, is that the shadow price of home produced food will be higher in households with higher wife wage rates (assuming that women are the main home-producers of meals).

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<sup>1</sup> The literature examining the allocation of housework between spouses is an exception. See Bittman et al (2003).

<sup>2</sup> Thomas (1990) uses variations in unearned income.

Such households will thus increase labour supply and purchase more meals rather than producing them at home.

However, the studies mentioned above restrict their attention to households where both husband and wife are working full-time. This argument of LPW is only relevant if within the full-time group there are variations in the hours, or perhaps more importantly, the intensity of labour market effort. While this is plausible, such factors are more difficult to evaluate. Phipps and Burton (1997) partly address this issue in their analysis by controlling for occupation.

Indeed, given the restriction to full-time workers, we can speculate that selection effects might lead to an observed bias in the opposite direction. Holding household income and preferences constant, higher female wage rates should lead to higher labour supply. If we therefore observe differences in wage rates between women with the same labour force participation and household income, this suggests that those women with lower wage rates have less preference for home production. Hence, we should expect to find that these women would prefer to purchase more meals outside the household – the opposite relationship to that observed.

Nonetheless, there are other, more commonplace, reasons why we might expect to find expenditure differences that are unrelated to the within-household allocation decision. In particular, if the costs of working increase with the wage rate, then this will appear as increased expenditures on the relevant items. Clothing is the most likely example, where it would seem quite plausible that higher paid jobs will require greater clothing expenditure.<sup>3</sup> More speculatively, this may also be relevant to expenditure on meals outside the household, where highly paid jobs might be associated with more expensive work-related meals (assuming these are paid by the worker rather than the employer).

In LPW's study, these identification problems are avoided by taking advantage of a "natural experiment" of changes in the patterns of UK family payments. In the late 1970s these payments changed from a tax deduction (mainly accruing to fathers) to a cash transfer, mainly paid to mothers. LPW examined patterns of household expenditure both before and after the policy change. They observed an increase in spending on women's and children's clothing relative to men's clothing. This change was quite substantial. For a two-child family, the policy change led to a £ 400 per annum redirection of income from husbands to wives.

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<sup>3</sup> Of course, much work-related clothing expenditure might be considered to have joint use as both an expenditure required to earn income and also as a consumption good. However, this joint consumption effectively reduces the price of clothing, which may also increase clothing expenditure and thus bias the results..

Holding expenditure on men's clothing constant, expenditure on children's clothing increased by around £ 52, or one-eighth of the change in income.<sup>4</sup>

In interpreting their results, LPW do not focus on family payment policy per se. Rather, they point to the general implications for intra-household income allocation, and the possible implications of the much larger income changes associated with married women's increased labour force participation. However, from the perspective of welfare and family policy, a straightforward interpretation of their results is of particular interest. Since the intention of such policies is often to increase the consumption level of particular household members (children in this case), it is important to know if making the payment to one family member rather than the other changes intra-household consumption patterns.

Indeed, an assumption that mothers will be more likely to direct income to child consumption than will fathers (or at least not less likely) was a major part of the justification for the UK policy change modelled by LPW, as well as for some of the changes in Australian income support policy that are considered in this paper. How much impact did these changes have?

### **3 The Australian changes to the within-household distribution of income support payments**

In Australia, social insurance and social assistance programs are all administered centrally and paid from general government revenue. At the start of the 1990s, there were four main categories of income transfer for people of working age, *pensions* for people with disabilities and for lone parents, *benefits* for the unemployed and people with short term illness, *family payments* paid to most families with children and *supplementary family payments* paid to low income families with children who were not receiving a pension or benefit. In married (or de facto) couples, pensions were paid both to the person with the disability and to their spouse (as a wife or carer pension). Supplements to the pension with respect to dependent children were paid to the disabled person. For beneficiary couples, however, the married rate of payment was paid to the primary income support recipient (usually the husband) as were the child supplements. Family payments and supplementary family payments were paid to the primary carer of the children (usually the mother).

In January 1993, Additional Family Payment (AFP) was introduced. This replaced the previous supplementary family payment program (Family Allowance Supplement) and also replaced the child supplements for pensioners and beneficiaries.

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<sup>4</sup> See also Ward-Batts (2000; 2003), who reanalyses the same data and also finds expenditure changes in other goods such as "men's tobacco".

AFP, however, was paid to the primary child carer. Changing the intra-household distribution of income was one explicit objective of this policy change.

“One major effect of these reforms is that the new family payment will direct a greater proportion of the family’s social security support to the person responsible for the day to day care of children, usually the mother ... Directing payments for children to the primary care giver is consistent with the Government’s Social Justice Strategy and the National Agenda for Women.” (*Social Security Legislation Amendment Bill, 2nd Reading, Senator Nick Bolkus, Australian Senate Hansard Record, 28 May 1992, page 2844*).

Just under two years later, in September 1994, Partner Allowance was introduced. This changed beneficiary payment arrangements so that they were now similar to those applying to pensioners. In an unemployed couple, for example, the husband now received half the married rate of payment as Unemployment Benefit, and the wife the other half via Partner Allowance. For couples with children, more than half the income support payments were now being paid to the mother, whereas two years earlier, almost all the payments had been paid to the father.

The motivation for this second change was not solely one of intra-household distribution. In particular, this individualisation of income support payments was followed by a number of changes in the second half of 1990s where entitlement was also individualised. From July 1995, younger<sup>5</sup> Partner Allowance recipients who did not have dependent children were required to apply for benefit in their own right (e.g. satisfy sickness or job search requirements) and no more grants of wife pension were made.

The objective of this study is to examine the changes in household consumption patterns associated with these within-household income distribution changes. Data from the 1988–89, 1993–94 and 1998–99 Household Expenditure Surveys are used.<sup>6</sup> The 1988–89 survey occurred prior to any of the policy changes described above, the 1993–94 survey after the changes to supplementary family payments, and the 1998–99 survey after the introduction of Partner Allowance.

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<sup>5</sup> Parenting Allowance was introduced for the primary carers of children, and Partner Allowance restricted to those who were aged over 40 in 1995 and who had no recent labour market experience.

<sup>6</sup> The surveys collect income and expenditure data for people interviewed during the respective financial year (July to June).

**Table 1****The impact of Australian income support policy changes in the 1990s on the intra-household income distribution among couples**

Income Support Category (Example Payment Names as of July 1995)	Usually Paid To...			Typical Maximum Payment for a Couple with 2 Children (July 1995, \$ per week)
	1988– 89	1993– 94	1998– 99	
1. Family Payments (Basic Family Payment)	Wife	Wife	Wife	\$ 22
2. Supplementary Family Payment for Low-Wage Workers and Self-Employed (Additional Family Payment - Workforce)	Wife	Wife	Wife	\$ 67
3. Child Supplement for Pensioner or Beneficiary (Additional Family Payment)	Husband	Wife	Wife	\$ 67
4. Benefit (Job Search Allowance, Newstart Allowance, Parenting Allowance, Partner Allowance)	Husband	Husband	Equal	\$ 272
5. Pension (Invalid Pension, Wife Pension)	Equal	Equal	Equal	\$ 272

The implications for the within-household distribution of different income sources in these three surveys are summarised in Table 1. The last column of the table shows the amount of these payments for a family with two children (aged under 13) in 1995.<sup>7</sup> A couple where the husband was unemployed (receiving Job Search Allowance) and the wife was receiving Parenting Payment received a total of \$ 361 per week in mid 1995 (the sum of payments 1, 3 and 4 in the table). Applying these rates to the three survey years, the table shows that in 1988–89 the wife would have received 6 percent of this income transfer, in 1993–94, 25 percent, and in 1998–99, 62 percent.<sup>8</sup> For pensioner couples, the change for this hypothetical family was much less, changing from 43 percent to 62 percent between 1988–89 and 1993–94 and then remaining at this level.

<sup>7</sup> Some families might also have received rent assistance.

<sup>8</sup> There were some relative increases in child-related payments over the period, which would thus accentuate the change described.

## 4 The Australian household expenditure survey

The Australian Household Expenditure Survey (HES) is a representative survey of Australian households conducted once every 5 years, with a sample size of between 6,900 to 8,400 households. Households in the smaller states have a higher probability of selection, and some remote areas are excluded from the survey scope.<sup>9</sup> The survey collects information on the current incomes of adult household members, as well as on household expenditure patterns. All incomes and expenditures in this paper are expressed in 1988–89 dollars per week except where noted. The official consumer price index is used as the deflator.

The focus here is on the consumption patterns of married couple families of workforce age. For comparison purposes, some information is also included on single person households and female lone parent households. Multi-family households are excluded, as are households where the male head is over 64 years of age, the female head is over 59, either person is self-employed or the household income is below \$ 100 per week (well below the minimum benefit income). Attention is restricted to the following types of households

- Married couple only households (married includes de facto relationships)
- Couples with children under 15<sup>10</sup>, and with no older children or other adults in the household
- Female lone parents with children under 15, and with no older children or other adults in the household
- Single person households

This paper does not consider the consumption patterns of more complicated households containing older children or multiple families.

### 4.1 Within-household income distribution trends

Table 2 summarises the trends in the within-household income distribution for these different household types over the 1988–89 to 1998–99 period. Households are disaggregated according to whether income transfers were the principal source of income. The married couples are further disaggregated

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<sup>9</sup> The results in this paper are based upon unweighted data and do not take account of the differential probability of selection or the clustering in the sample design.

<sup>10</sup> The under-15 restriction is used because this is the age threshold used to distinguish adult from children's clothing.

based on pension or benefit receipt. Total gross income is separated into income transfers received by males and by females, and other income received by males and females. Other income is primarily wage income. The small amount of income received by children is ignored.

In most of the table, there is little change in the within-household income distribution over the period. The family types where there is change are highlighted in bold. In general, the changes reflect the income support policy changes summarised in Table 1.

The largest changes to the within-household income distribution are found for couples with children receiving non-pension transfers. In these households, transfers paid to the mother increased from 13 percent of household gross income in 1988–89, to 36 percent in 1993–94 to 62 percent in 1998–99. For couples with children receiving pensions, the only policy change occurred between the first two surveys, with mother's transfer income share increasing from 48 to 57 percent of gross income.

For transfer-recipient couples without children, there were no changes to the within-household income distribution for those receiving pensions. For those receiving benefits, all transfers were paid to primary applicant in both 1988–89 and 1993–94. It appears that more women were the primary applicant in the latter year, with their share of transfer income increasing. The main policy change, however, was after 1993–94 when the payment was split between both spouses. By 1998–99, transfers were equally divided between both spouses.

## **4.2 Expenditure**

The Household Expenditure Surveys collects information on household expenditures using personal diaries and personal and household expenditure questionnaires. The diaries cover a two-week period, information on utility bills is collected on a last payment basis, and recall periods of up to a year are used for less frequently purchased items.

This paper examines expenditures on 23 different commodity groups. These are based on the standard Australian Bureau of Statistics (ABS) commodity groupings, with disaggregation of groupings where we might expect to find differences in consumption preferences of men and women. Some minor adjustments have been made to the ABS expenditure data, including the removal of some durable and negative expenditures; see the Appendix.

Table 2

## The within-household income distribution, 1988–89 to 1998–99

Household Type	Principal Source of Income	Year	Share of Gross Income (%)				Mean Disposable Income (1988-89\$)	Sample Size	shade	
			Male Transfers	Female Transfers	Male Other	Female Other				
Single Men	Transfers	1988-89	96	0	4	0	131	74	1	
		1993-94	94	0	6	0	145	122	1	
		1998-99	94	0	6	0	148	111	1	
	Other (eg wages)	1988-89	0	0	100	0	400	339	0	
		1993-94	0	0	100	0	425	363	0	
		1998-99	0	0	100	0	470	367	0	
Single Women	Transfers	1988-89	0	91	0	9	133	65	1	
		1993-94	0	93	0	7	142	118	1	
		1998-99	0	92	0	8	149	92	1	
	Other (eg wages)	1988-89	0	1	0	99	354	215	0	
		1993-94	0	0	0	100	393	245	0	
		1998-99	0	1	0	99	406	256	0	
Female Lone Parents	Transfers	1988-89	0	89	0	11	212	145	1	
		1993-94	0	86	0	14	251	190	1	
		1998-99	0	87	0	13	255	182	1	
	Other (eg wages)	1988-89	0	7	0	93	374	61	0	
		1993-94	0	12	0	88	420	81	0	
		1998-99	0	13	0	87	441	92	0	
Couples no Children	Transfers Receive Pension	1988-89	45	43	5	6	236	57	1	
		1993-94	49	42	4	5	242	71	1	
		1998-99	47	44	4	6	250	61	1	
	Transfers No Pension Income	1988-89	<b>71</b>	<b>10</b>	11	9	234	23	0	
		1993-94	<b>70</b>	<b>23</b>	2	5	227	59	0	
		1998-99	<b>47</b>	<b>46</b>	4	3	235	32	0	
	Other (eg wages)	1988-89	0	0	63	37	640	734	1	
		1993-94	1	0	61	38	678	937	1	
		1998-99	0	0	62	37	743	749	1	
	Couples with Children	Transfers Receive Pension	1988-89	<b>45</b>	<b>48</b>	5	2	291	21	0
			1993-94	<b>40</b>	<b>57</b>	2	2	290	26	0
			1998-99	<b>31</b>	<b>58</b>	6	5	329	30	0
Transfers No Pension Income		1988-89	<b>83</b>	<b>13</b>	2	1	274	85	1	
		1993-94	<b>57</b>	<b>36</b>	3	3	306	126	1	
		1998-99	<b>28</b>	<b>62</b>	7	3	306	65	1	
Other (eg wages)		1988-89	0	2	75	22	598	1,250	0	
		1993-94	0	3	73	24	638	1,210	0	
		1998-99	0	3	71	25	717	1,042	0	

**Notes:** Principal source of income is classified as “transfers” if transfers are greater than 50 percent of gross income. Couples with transfers as principal source of income are further disaggregated based on whether any pension income is received (mainly disability pension). The income shares are calculated as shares of aggregate income in the cells. Bold highlights cells where there is change in the within-household income distribution over time.

Source: Calculated from Australian Household Expenditure Surveys, Confidentialised Unit Record Files.

**Table 3****Mean budget shares (%) by family type**

	Single Men	Single Women	Female Lone Parents	Couples	Couples with Children
Housing	23.9	25.2	24.3	16.8	18.3
Fuel and power	3.5	3.9	4.5	3.0	3.3
Food at home	11.9	12.1	18.6	13.9	17.1
Food out	6.0	4.1	2.8	5.1	4.1
Alcohol	5.4	2.1	1.1	3.5	2.3
Tobacco	3.1	2.2	2.7	1.9	1.7
Children's clothing	0.1	0.2	1.7	0.2	1.3
Childcare	0.1	0.0	1.7	0.0	1.5
School fees	0.3	0.1	1.0	0.1	1.2
Pocket money	0.0	0.0	0.3	0.0	0.3
School lunch	0.0	0.0	0.3	0.0	0.1
Toys	0.1	0.2	0.6	0.2	0.6
Men's clothing	1.3	0.1	0.2	1.1	0.9
Women's clothing	0.1	2.9	1.7	2.1	1.3
Other clothing	0.7	1.4	1.4	1.4	1.5
Gambling	1.0	0.8	0.5	1.1	0.6
Furniture	4.6	5.6	4.8	7.2	5.9
Household goods and services	4.6	6.6	6.8	5.2	5.3
Medical	3.1	4.3	2.7	4.9	4.6
Transport	11.9	9.3	8.3	11.8	10.6
Recreation	10.9	10.0	7.7	11.6	9.8
Personal	0.9	2.6	2.0	2.0	1.7
Misc	6.6	6.3	4.5	7.1	6.1
Sum	100.0	100.0	100.0	100.0	100.0

Source: As for Table 2.

The mean values of the budget shares for the 23 commodities examined here are shown in Table 3 (separately for each family type), and the percentage of cases with zero expenditures on each commodity is shown in Table 15 in the Appendix. For some of the commodities the expenditure share is very small. Nonetheless, these are included as they are particularly relevant to child consumption. Child-related expenditures are naturally minimal for the family types without children, though not necessarily zero as they include purchases for people outside the household (e.g. gifts). As with most household expenditure surveys, comparisons with external aggregates suggest an under-reporting of alcohol, tobacco and gambling expenditures. See Bray (2001, 66) for a summary of Australian evidence on this.

## 5 Estimation strategy

Was the change in the within-household income distribution associated with any change in household expenditure patterns? Three estimation models for married couple households are used here. The first approach is to estimate an Engel curve for each commodity so that consumption is permitted to vary in line with the interactions described in Table 2. This model does not include income shares explicitly, but only the exogenous variables associated with the changes in income shares. This *reduced-form model* is

$$(1) \quad w_{ij} = \alpha_{i0} + \alpha_{i1}y93_j + \alpha_{i2}y98_j + \alpha_{i3}pen_j + \alpha_{i4}ben_j + \\ \beta_{i1}pen_j \cdot y93_j + \beta_{i2}pen_j \cdot y98_j + \beta_{i3}ben_j \cdot y93_j + \beta_{i4}ben_j \cdot y98_j \\ \gamma_{i1} \log(x_j) + \gamma_{i2} \log(x_j)^2 + \mathbf{z}'_j \boldsymbol{\phi}_i + e_{ij}$$

Where,

- $w_{ij}$  = the budget share of commodity  $i$  for household  $j$ ,
- $y93$  = 1 if the year is 1993-94,
- $y98$  = 1 if the year is 1998-99,
- $pen$  = 1 if the couple has transfers as their main source of income, and are receiving a pension,
- $ben$  = 1 if transfers are the principal source of income, but no pension is received (ie a benefit transfer is received),
- $x$  = total expenditure deflated by the consumer price index,
- $\mathbf{z}$  = vector of other exogenous variables,
- $e$  = error term (iid across people, SUR correlated across commodities)

With only three years of data (and no information available on regional price variation), it is not possible to estimate a full demand system. The year dummies capture the effect of inter-temporal price variation on demand, as well as other factors such as changes in preferences affecting the whole sample. The pension and benefit dummies allow for the fact that pensioner and beneficiary families may have lower long-term consumption levels than other low-income families.

The interaction terms between pension/benefit status and year mirror the changes in the within-household income distribution shown in Table 2. If the change in the within-household income distribution has an impact on demand patterns, then the  $\beta$  parameters should be non-zero for at least some commodities.

The exogenous ( $\mathbf{z}$ ) variables included in the regression are, mean age of husband and wife (minus 35), mean age squared, the age difference between husband and wife, the number of children and a set of labour force and durable ownership dummy variables: wife works part-time, wife works full-time,

husband works part-time, husband works full-time, household has no car, household has 2+ cars, housing tenure is private renter, housing tenure public renter. The latter variables control for possible non-separability between labour force status and durable ownership and commodity consumption. Because of space restrictions, estimates of  $\phi$  are not shown.

In the second, *direct model*, the share of transfer income received by men and women in each household is entered directly into the Engel curve estimation. This provides a more straightforward estimate of the relationship between the within-household income distribution and expenditure on particular commodities. However, this may lead to a biased estimate of the exogenous impact of the policy change if the within-household income distribution is associated with other unmeasured variables that also influence expenditure patterns.

The estimated model for this second approach is

$$(2) \quad w_{ij} = \alpha_{i0} + \alpha_{i1}y^{93}_j + \alpha_{i2}y^{98}_j + \beta_{i1}TransferShare_j + \beta_{i2}TransferShareDifference_j + \beta_{i3}MarketShareDifference_j + \gamma_{i1} \log(x_j) + \gamma_{i2} \log(x_j)^2 + \mathbf{z}'_j \phi_i + e_{ij}$$

with

$$TransferShare_j = (y_j^{FT} + y_j^{MT}) / y_j$$

$$TransferShareDifference_j = (y_j^{FT} - y_j^{MT}) / y_j$$

$$MarketShareDifference_j = (y_j^{FN} - y_j^{MN}) / y_j$$

and where  $y_j^{FT}$  is female income from transfers in household  $j$ ,  $y_j^{MT}$  is male transfer income,  $y_j^{FN}$  female non-transfer income,  $y_j^{MN}$  male non-transfer income and  $y_j$  total income ( $y_j = y_j^{FT} + y_j^{MT} + y_j^{FN} + y_j^{MN}$ ). The *TransferShare*, *TransferShareDifference*, and *MarketShareDifference* variables fully describe the four income shares shown in Table 2.<sup>11</sup>

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<sup>11</sup> That is,  
 $y_j^{FT} / y = (TransferShare + TransferShareDifference) / 2$ ,  
 $y_j^{MT} / y = (TransferShare - TransferShareDifference) / 2$ ,  
 $y_j^{FN} / y = (1 - TransferShare + MarketShareDifference) / 2$  and  
 $y_j^{MN} / y = (1 - TransferShare - MarketShareDifference) / 2$

The overall share of transfers in income (*TransferShare*) may influence consumption patterns because it is an indicator of longer-term incomes. If the *TransferShareDifference* and *MarketShareDifference* variables are significant, however, this suggests that the within-household income distribution has an influence on household consumption decisions.

It should be remembered, however, that the variation in *MarketShareDifference* is likely to reflect the influence of other unmeasured variables such as wage rates, which may have their own direct influence on consumption patterns. The impact of this variable thus needs to be assessed in the context of the issues discussed in Section 2.

Much of the variation in *TransferShareDifference* stems from the income support policy changes which can be considered exogenous to the household. Nonetheless, some variation may also arise from other decisions by the household, such as which spouse to nominate as the jobseeker when both spouses are unemployed (in 1988–89 and 1993–94).

The third, *instrumental model*, addresses this issue by instrumenting the *TransferShareDifference* variable using the interaction variables from the reduced-form model. This captures the change in *TransferShareDifference* that is associated with the policy changes, without including other sources of variation that may be correlated with the error term.<sup>12</sup>

The instrumental variables used include demographic, benefit, pension and time variables in interaction with the *TransferShare* variable. Demographic variables are included because the payment rates vary with family composition and housing tenure. If the share of transfer income received by the woman is denoted as  $\alpha$ , then

$$\begin{aligned} \text{TransferShareDifference} = & \alpha \times \text{TransferShare} - (1 - \alpha) \times \text{TransferShare} = \\ & 2\alpha \times \text{TransferShare} - \text{TransferShare} \end{aligned}$$

If  $\alpha$  is a linear function of the demographic, pension benefit and time variables, this suggests that suitable instruments for *TransferShareDifference* will be these variables in interaction with *TransferShare*.<sup>13</sup>

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<sup>12</sup> The instrumental variable technique replaces the *TransferShareDifference* variable in the regression with its predicted values from a first-stage regression in which *TransferShareDifference* is estimated as a function of the instrumental variables. The software used (SAS proc SYSLIN v8.2) estimates standard errors that take account of this two-stage process. The  $R^2$  for the first stage regression was 0.46 for couples, 0.61 for couples with children and between 0.85 and 0.89 for the estimates in Section 7 based on multiple family types.

<sup>13</sup> The instruments for total expenditure are also included, as the estimation software used requires that all instrumented variables be based on the same instruments.

Analytically, the instrumental model is the preferred model, as it most directly identifies the impact of the exogenous changes of the within-household income distribution on expenditure patterns. However, the use of instrumented variables brings a cost in terms of reduced precision, and so the other estimates are reported also.

As shown in the Appendix, for many commodities there are substantial numbers of households with no purchases during the data collection period (most commonly two weeks). Among couples with children, for example, 53 percent of households purchased no children's clothing – though this does not mean their children were naked! Keen (1986) shows that least squares estimation of expenditure levels is still consistent in the face of such purchasing infrequency, as long the endogeneity of total expenditure is modelled appropriately.<sup>14</sup> Low order polynomials of log disposable income and the remaining exogenous variables are thus used as instruments for  $\log(x)$  and  $\log(x)^2$ . All the regression results reported here are estimated with these instruments using 2SLS.<sup>15</sup>

More recent research has pointed to the potential bias that can arise when expenditures are modelled in budget share form (as here) and when instrumented variables enter in polynomial form (Lewbel 1996). The methods used here do not control for this. However, bias of the magnitude of that found by Lewbel (around 15 percent) would not change the conclusions. In the Appendix, results based on expenditures measured as shares of income rather than expenditure (and thus not subject to this potential bias) are presented. The results from this are very similar to the expenditure share results.

## 6 Results 1: Estimates based on expenditure variations within each family type

### 6.1 Single men and women

Since the hypothesis investigated is whether the within-household distribution gives either men or women more power in determining the household consumption, we begin by comparing the consumption patterns (and by implication, preferences) of men and women when they live alone. Estimates of the reduced-form model for single adult households are shown in Table 4. The

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<sup>14</sup> Modelling cases where the consumption of (as opposed to the expenditure on) a particular good is zero is more difficult and not attempted here. In the Australian context, this is likely to be particularly important for tobacco consumption.

<sup>15</sup> Because the explanatory variables are the same in every equation, this yields identical estimates to 3SLS. The cross-equation F tests are based on a 3SLS estimation (with the last equation omitted).

additional *female* variable identifies commodities where single women have different expenditure patterns to men.

Table 4

	Intercept	female	y93	y98	pen	pen.y93	pen.y98	ben	ben.y93	ben.y98	log(x)	log(x) <sup>2</sup>
Housing	<b>-162.6</b>	<u>1.1</u>	1.7	-0.6	1.1	<u>4.2</u>	<b>5.0</b>	<u>5.0</u>	0.0	4.4	<b>63.4</b>	<b>-5.5</b>
Fuel and power	<b>71.1</b>	<b>0.4</b>	0.2	<u>0.3</u>	-0.7	<b>0.9</b>	0.6	0.5	-0.2	-0.8	<b>-21.1</b>	<b>1.6</b>
Food at home	<u>72.8</u>	-0.3	-0.5	0.2	<b>3.0</b>	-0.3	<b>-4.0</b>	-1.5	2.0	0.4	-14.4	0.6
Food out	-20.5	<b>-1.8</b>	-0.3	<b>-0.8</b>	1.2	-0.2	-0.5	0.6	0.2	-0.1	5.1	-0.1
Alcohol	-34.5	<b>-3.2</b>	<b>-0.7</b>	<b>-0.9</b>	0.4	-1.0	-1.2	-0.3	0.8	0.3	12.7	-1.0
Tobacco	7.8	<b>-1.1</b>	0.4	<b>0.6</b>	0.4	-1.0	0.5	0.3	-0.1	-0.9	0.7	-0.3
Children's clothing	0.6	<b>0.1</b>	-0.1	0.0	0.1	<b>-0.3</b>	-0.2	-0.1	0.1	0.0	-0.1	0.0
Childcare	-1.7	<u>0.0</u>	0.0	<b>0.1</b>	0.1	0.0	0.0	0.0	0.0	-0.1	0.6	-0.1
School fees	12.1	<u>-0.2</u>	0.0	0.2	0.1	0.2	-0.1	0.2	0.5	-0.1	-4.9	0.5
Pocket money	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.0
School lunch	-0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Toys	0.0	<b>0.1</b>	0.0	0.0	0.0	-0.1	0.1	-0.2	0.0	0.2	0.0	0.0
Men's clothing	-4.6	<b>-1.1</b>	<b>-0.5</b>	<b>-0.8</b>	-0.7	0.6	0.7	<b>-1.4</b>	<b>1.2</b>	<u>1.1</u>	2.2	-0.2
Women's clothing	-33.3	<b>2.8</b>	0.0	<b>-0.5</b>	0.2	-0.5	-0.3	0.2	-0.5	0.4	10.8	-0.8
Other clothing	-21.5	<b>0.7</b>	0.1	-0.3	0.3	0.2	0.3	<b>1.5</b>	<b>-1.1</b>	-0.6	6.6	-0.5
Gambling	<b>-22.9</b>	<b>-0.3</b>	0.2	-0.1	0.0	-0.1	0.3	0.2	-0.2	0.1	<b>8.6</b>	<b>-0.8</b>
Furniture	55.0	<b>1.1</b>	-0.6	0.8	-1.2	0.6	0.3	-2.4	1.8	0.5	-15.9	1.3
Household goods and services	<b>52.8</b>	<b>1.8</b>	0.2	<b>1.2</b>	-1.2	0.7	<b>1.7</b>	<b>-2.6</b>	<b>1.7</b>	<u>1.5</u>	<b>-15.6</b>	<u>1.3</u>
Medical	17.3	<b>1.3</b>	-0.1	-0.1	<b>-2.6</b>	0.6	<b>1.6</b>	-0.4	-1.2	<u>-1.6</u>	-5.9	0.6
Transport	27.7	<b>-2.3</b>	<u>-1.0</u>	<b>-1.4</b>	-1.5	-0.8	-0.9	-0.8	-0.3	0.0	2.3	-0.8
Recreation	-33.9	<u>-0.9</u>	<u>1.2</u>	0.8	<b>4.4</b>	-2.4	-2.4	<u>4.2</u>	<u>-3.5</u>	-2.5	5.4	0.4
Personal	-15.7	<b>1.6</b>	0.1	0.1	0.2	0.0	-0.4	0.3	0.0	-0.3	5.6	-0.5
Misc	<b>133.1</b>	0.1	-0.3	1.1	<b>-3.5</b>	-1.5	-1.3	<b>-3.2</b>	<b>-1.2</b>	<b>-1.9</b>	<b>-45.7</b>	<b>4.1</b>
Sum	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Notes:** Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in **bold**. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

Women tend to spend a greater share of their budget than men on fuel and power (domestic electricity, gas and other heating fuels), children's clothing and toys (gifts for children outside the household, or possibly some children's clothing bought for adult use), women's and other clothing, furniture, household goods and services, medical expenditure and personal care. They tend to

spend less than men on food out, alcohol, tobacco, men's clothing, gambling, transport and recreation. Some of these differences are quite large. As Table 3 shows, the budget share of alcohol is twice as high for men as it is for women.

Interestingly, Table 4 shows that some of the interaction terms between pension and benefit receipt are significant for single adults, despite the lack of relevance of the within-household income distribution policy changes. It is possible that housing, fuel, household goods and services, and medical terms reflect changes in the nature of pensioner and beneficiary subsidies for housing, utilities, telephone and medical services. Nonetheless, of the 88 independent parameters in the set of interaction terms only 9 are significant at the 5 percent level, and the joint hypothesis that all interaction terms are zero cannot be rejected at the 10 percent level ( $F_{88,51634} = 1.17$  with asymptotic  $p = 0.14$ ).

## 6.2 Couples with children

Estimates of the parameter estimates for couples with children are shown in Table 5, Table 6 and Table 7 for the reduced form, direct share and instrumented models respectively. These results are summarised here focussing mainly on the instrumented model estimates (Table 7), while pointing to any differences in the other specifications. The estimates of the impact of the share of market income between spouses are discussed in Section 6.4 below.

In interpreting the estimates of *TransferShareDifference* parameter it is useful to note that a one-unit increase in *TransferShareDifference* corresponds to the largest increase in the female transfer income share shown in Table 2. This is for couples with children receiving non-pension transfers. The difference between female and male transfers as a share of gross income was  $-0.7$  in 1988–89 (13 percent to 83 percent) and  $0.34$  in 1998–99, an increase of  $1.04$ . (Some families receiving rent assistance may have experienced a larger change).

The joint hypothesis that all the *TransferShareDifference* parameters in Table 7 are zero is strongly rejected ( $F_{22,84370} = 2.14$ ,  $p = 0.002$ ). There is some evidence that (domestic) fuel and power expenditure increases with the share of female transfers in gross income (though not significant in the direct model). It is possible that this is due to changes in pensioner and beneficiary concessions. However, we should also recall the stronger female preference for fuel expenditure shown in Table 4.

Expenditure on home-consumed food decreases with the female transfer share.<sup>16</sup> This might be considered to be inconsistent with an increase in women's financial power and a traditional home production role (though note that Table 4 does not show any difference between single men and women). There is no significant impact on food expenditure outside the household.

Similarly, we find that expenditure on tobacco increases with the female transfer share. Table 5 shows this effect to be mainly among beneficiaries. This increase is despite the apparently weaker preferences for tobacco consumption among women shown in Table 4.

No change is found in expenditures on children's clothing. However, this is only a small share of the budget, and the estimate is imprecise. A 95 percent confidence interval for the impact of an increase of one unit in *TransferShareDifference* on the children's clothing budget share is approximately  $\pm 0.6$  percentage points. This can be compared with the mean budget share of 1.3 percent.

For both women's and men's clothing there is some evidence of an increase in expenditure, though the statistical significance varies across the three model specifications. For the instrumented model, the 95 percent confidence intervals for the effect of a one unit increase in *TransferShareDifference* on both men's and women's clothing are from 0.0 to 1.3 percent.

For household goods and services there is some evidence of an increase in budget share as the female transfer share increases (though significant only for the instrumented model). As noted above, this is one area where women have stronger consumption preferences than men.

### 6.3 Couples without children

Estimates for the three model specifications for couples without children are shown in Tables 8, 9 and 10. The couples without children group has a smaller sample size and experienced less of an income share change. For the instrumented model, we cannot reject the hypothesis that all the *TransferShareDifference* variables are zero ( $F_{22,59488} = 0.48$ ,  $p = 0.97$ ).

The income distribution changes shown in Table 1 and Table 2 suggest that the reduced-form model should have significant entries for the *ben.y98* variable and not for the other interaction variables. In this respect, the only significant change is a shift from food consumption at home to food consumption out of the home (Table 8) – which is inconsistent with the income distribution hy-

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<sup>16</sup> Table 5 shows that this effect is concentrated among beneficiaries. Among pensioners, the food at home share increases, though for this group the change in transfer share was smaller.

pothesis. However, this is not significant in the other models (where the sign on the food at home parameter is reversed).

Table 5

## Couples with children, reduced-form model

	Intercept	y93	y98	pen	pen.y93	pen.y98	ben	ben.y93	ben.y98	log(x)	log(x) <sup>2</sup>
Housing	-23.3	<b>-1.3</b>	-0.1	-1.7	0.7	-0.9	0.6	0.5	1.2	15.5	-1.3
Fuel and power	<b>60.5</b>	<b>0.3</b>	<u>0.2</u>	<u>-0.8</u>	<b>2.4</b>	0.0	<u>-0.5</u>	<b>0.6</b>	<u>0.6</u>	<b>-16.2</b>	<b>1.1</b>
Food at home	68.2	-0.2	<b>-0.6</b>	-0.9	-2.9	<b>4.4</b>	<u>1.6</u>	<b>-2.1</b>	<b>-3.1</b>	-8.8	0.1
Food out	6.5	<b>0.6</b>	<b>0.6</b>	0.0	-1.0	0.1	0.0	-0.1	-0.5	-2.7	0.4
Alcohol	-7.1	<b>-0.4</b>	<b>-0.4</b>	0.8	0.1	-1.3	0.8	-0.6	-0.9	2.9	-0.2
Tobacco	<b>72.4</b>	<b>0.2</b>	<b>0.5</b>	-0.6	0.6	0.3	-0.6	<b>1.1</b>	<u>1.0</u>	<b>-20.4</b>	<b>1.4</b>
Children's clothing	-6.7	<b>-0.3</b>	<b>-0.8</b>	-0.5	0.5	1.0	-0.1	0.1	-0.1	2.4	-0.2
Childcare	-22.1	<b>0.4</b>	<b>0.7</b>	<u>1.7</u>	0.0	-0.8	<u>1.0</u>	-0.8	0.2	4.4	-0.1
School fees	<b>99.5</b>	<u>0.2</u>	0.1	<b>-1.6</b>	0.0	1.3	-0.6	0.3	0.4	<b>-31.7</b>	<b>2.5</b>
Pocket money	-8.6	0.0	<b>-0.1</b>	0.3	<b>0.6</b>	0.2	0.2	-0.1	-0.1	2.9	-0.2
School lunch	1.8	<b>-0.1</b>	<b>-0.1</b>	0.0	0.0	0.1	0.1	0.0	-0.1	-0.4	0.0
Toys	2.6	<b>0.3</b>	<b>0.2</b>	0.2	0.2	-0.1	<u>-0.4</u>	0.3	0.0	-0.6	0.0
Men's clothing	<b>63.5</b>	<u>-0.2</u>	<b>-0.6</b>	-0.6	0.0	1.2	-0.3	0.0	0.6	<b>-20.7</b>	<b>1.7</b>
Women's clothing	24.9	<b>-0.3</b>	<b>-0.7</b>	-0.7	0.1	<b>1.6</b>	<u>-0.7</u>	0.2	0.3	-8.4	0.8
Other clothing	-8.1	<u>0.2</u>	<b>0.8</b>	0.1	0.6	0.5	0.3	0.2	0.3	2.0	-0.1
Gambling	-8.0	<u>0.1</u>	0.1	-0.1	-0.2	0.4	-0.2	0.1	-0.1	3.0	-0.3
Furniture	<u>111.5</u>	0.0	0.1	1.1	-1.4	-1.2	-1.0	0.1	-1.3	<u>-34.2</u>	<u>2.8</u>
Household goods and services	2.2	<b>0.3</b>	<b>0.4</b>	<u>1.4</u>	-0.1	-0.5	-0.1	<u>0.9</u>	0.8	1.0	-0.1
Medical	-24.5	0.2	<u>-0.3</u>	-1.1	0.4	-0.6	-0.9	-0.7	-0.4	9.0	-0.7
Transport	-89.6	<b>0.7</b>	0.5	-0.6	-1.1	-2.2	0.2	-0.7	-0.2	<u>35.8</u>	<b>-3.1</b>
Recreation	-81.6	0.3	0.0	<u>4.0</u>	-2.6	<u>-4.6</u>	0.2	1.0	0.6	22.4	-1.2
Personal	13.2	<u>-0.1</u>	<b>-0.2</b>	-0.2	0.1	0.4	-0.3	0.2	-0.2	-3.8	0.3
Misc	<b>-147.2</b>	<b>-0.7</b>	-0.2	-0.2	<u>3.3</u>	0.8	0.9	-0.5	0.7	<b>46.5</b>	<b>-3.5</b>
Sum	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

Table 6

## Couples with children, direct model

	Intercept	y93	y98	Transfer Share	Transfer Share Difference	Market Share Difference	log(x)	log(x) <sup>2</sup>
Housing	-42.03	<b>-1.25</b>	0.05	1.60	-1.22	<b>-1.63</b>	21.10	-1.75
Fuel and power	<b>60.60</b>	<b>0.38</b>	<b>0.16</b>	-0.04	0.27	-0.13	<b>-16.25</b>	<b>1.12</b>
Food at home	69.38	-0.39	<u>-0.52</u>	-0.11	<b>-1.14</b>	0.22	-9.17	0.08
Food out	5.03	<b>0.55</b>	<b>0.53</b>	-0.31	0.20	0.16	-2.25	0.33
Alcohol	-3.53	<b>-0.46</b>	<b>-0.44</b>	0.03	-0.45	0.33	1.86	-0.15
Tobacco	<b>61.78</b>	<b>0.26</b>	<b>0.39</b>	<u>0.70</u>	<b>0.72</b>	0.23	<b>-17.28</b>	<b>1.20</b>
Children's clothing	-9.40	<b>-0.33</b>	<b>-0.78</b>	0.05	-0.18	-0.25	3.24	-0.26
Childcare	-16.85	<b>0.31</b>	<b>0.58</b>	0.62	0.14	<b>0.99</b>	2.72	0.02
School fees	<b>98.78</b>	<b>0.26</b>	0.22	<u>-0.82</u>	-0.01	-0.10	<b>-31.38</b>	<b>2.47</b>
Pocket money	-10.52	0.00	<b>-0.09</b>	<b>0.31</b>	0.08	-0.01	<u>3.41</u>	<u>-0.27</u>
School lunch	1.82	<b>-0.10</b>	<b>-0.11</b>	0.02	-0.04	0.01	-0.42	0.02
Toys	6.06	<b>0.29</b>	<b>0.18</b>	<u>-0.42</u>	0.12	0.12	-1.56	0.10
Men's clothing	<b>63.05</b>	<b>-0.22</b>	<b>-0.51</b>	0.09	0.16	-0.02	<b>-20.55</b>	<b>1.69</b>
Women's clothing	19.21	<b>-0.36</b>	<b>-0.67</b>	-0.16	<b>0.53</b>	0.05	-6.72	0.64
Other clothing	-12.73	<u>0.18</u>	<b>0.74</b>	<u>0.62</u>	0.05	<u>0.34</u>	3.35	-0.17
Gambling	-9.28	<b>0.09</b>	<u>0.08</u>	-0.12	-0.07	0.12	3.42	-0.29
Furniture	<u>123.35</u>	-0.01	0.04	-1.49	0.48	-0.42	<u>-37.68</u>	<u>3.04</u>
Household goods and services	-9.21	<b>0.33</b>	<b>0.30</b>	<b>1.26</b>	<u>0.51</u>	0.12	4.36	-0.33
Medical	-0.89	<u>0.26</u>	-0.19	<b>-2.58</b>	-0.40	-0.32	2.14	-0.19
Transport	-76.22	<b>0.62</b>	0.37	-0.76	0.42	0.61	<u>31.67</u>	<u>-2.82</u>
Recreation	-85.51	0.35	-0.03	0.84	0.02	-0.25	23.57	-1.32
Personal	14.35	-0.12	<b>-0.18</b>	-0.30	-0.03	<b>0.39</b>	-4.11	0.34
Misc	<b>-147.25</b>	<b>-0.65</b>	-0.12	0.99	-0.16	-0.55	<b>46.53</b>	<b>-3.50</b>
Sum	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

#### 6.4 The impact of market income shares

The models including the *MarketShareDifference* variable can also be used to assess the impact of market income shares on consumption patterns in a similar fashion to Phipps and Burton (1998). As noted above, this variable may be correlated with other unmeasured factors that influence consumption, and so its impact needs to be assessed cautiously.

Table 7

## Couples with children, instrumented model

	Intercept	y93	y98	Transfer Share	Transfer Share Difference	Market Share Difference	log(x)	log(x) <sup>2</sup>
Housing	-66.01	<b>-1.31</b>	-0.07	1.89	-0.30	<b>-1.65</b>	28.58	-2.32
Fuel and power	<b>60.41</b>	<b>0.37</b>	0.13	0.01	<b>0.51</b>	-0.15	<b>-16.22</b>	<b>1.12</b>
Food at home	49.31	-0.38	<u>-0.48</u>	-0.06	<b>-1.74</b>	0.24	-2.92	-0.40
Food out	6.60	<b>0.58</b>	<b>0.57</b>	-0.40	-0.09	0.17	-2.63	0.35
Alcohol	-15.50	<b>-0.46</b>	<b>-0.44</b>	0.07	-0.63	0.34	5.61	-0.44
Tobacco	<b>40.42</b>	<u>0.22</u>	<b>0.31</b>	<b>0.96</b>	<b>1.24</b>	0.18	<u>-10.68</u>	0.70
Children's clothing	-4.63	<b>-0.33</b>	<b>-0.79</b>	0.04	-0.06	-0.25	1.75	-0.14
Childcare	-1.12	<b>0.35</b>	<b>0.64</b>	0.42	-0.20	<b>1.01</b>	-2.09	0.38
School fees	<b>84.99</b>	<u>0.25</u>	0.20	<u>-0.71</u>	-0.16	-0.09	<b>-27.16</b>	<b>2.15</b>
Pocket money	<b>-14.20</b>	-0.01	<b>-0.10</b>	<b>0.34</b>	0.11	-0.01	<b>4.54</b>	<b>-0.36</b>
School lunch	1.93	<b>-0.11</b>	<b>-0.12</b>	0.02	-0.02	0.01	-0.46	0.02
Toys	4.30	<b>0.29</b>	<b>0.17</b>	<u>-0.39</u>	0.07	0.12	-1.07	0.07
Men's clothing	<b>62.00</b>	<b>-0.24</b>	<b>-0.56</b>	0.19	<b>0.64</b>	-0.03	<b>-20.28</b>	<b>1.68</b>
Women's clothing	15.67	<b>-0.37</b>	<b>-0.68</b>	-0.13	<u>0.61</u>	0.03	-5.60	0.55
Other clothing	-10.51	<u>0.17</u>	<b>0.73</b>	<u>0.64</u>	0.18	<u>0.34</u>	2.61	-0.11
Gambling	-6.35	<u>0.08</u>	0.07	-0.11	0.08	0.12	2.49	-0.22
Furniture	82.66	-0.02	0.04	-1.26	-0.05	-0.41	-25.06	2.07
Household goods and services	4.30	<b>0.31</b>	<u>0.26</u>	<b>1.26</b>	<b>1.11</b>	0.08	0.13	0.00
Medical	-15.17	0.25	-0.21	<b>-2.43</b>	-0.62	-0.30	6.38	-0.50
Transport	-81.67	<b>0.69</b>	0.52	-0.99	-0.86	0.62	<b>33.59</b>	<b>-2.99</b>
Recreation	-32.57	0.41	0.05	0.43	-0.08	-0.21	7.13	-0.06
Personal	<u>21.51</u>	<u>-0.13</u>	<b>-0.21</b>	-0.30	0.31	<b>0.38</b>	-6.35	<u>0.52</u>
Misc	<b>-86.37</b>	<b>-0.59</b>	-0.04	0.53	-0.03	-0.54	<b>27.71</b>	<b>-2.06</b>
Sum	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for *TransferShareDifference*,  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

For couples without children, we can reject the hypothesis that all the *MarketShareDifference* parameters are zero at the 10 percent, but not at the 5 percent level ( $F_{22, 59488} = 1.49$ ,  $p = 0.064$ ). For couples with children, this rejection is significant at the 5 percent level ( $F_{22, 84370} = 1.81$ ,  $p = 0.011$ ).

For couples with children we find a significant decrease in housing expenditure as the female share of market income increases, an increase in childcare expenditure and an increase in personal care expenditure (Table 7). The childcare effect was also found by Phipps and Burton.

For couples without children, the only significant relationships are found, paradoxically, among the child expenditure categories (Table 10). This may be because of some non-custodial parents in the sample.

Table 8

## Couples without children, reduced-form model

	Intercept	y93	y98	pen	pen.y93	pen.y98	ben	ben.y93	ben.y98	log(x)	log(x) <sup>2</sup>
Housing	-75.7	-0.7	0.0	1.5	-0.6	1.0	3.9	-1.2	-0.4	33.6	-3.0
Fuel and power	<b>55.6</b>	<b>0.3</b>	0.1	<b>0.9</b>	<b>-1.3</b>	<b>-0.9</b>	0.0	0.4	0.0	<b>-15.3</b>	<b>1.1</b>
Food at home	<b>161.9</b>	<u>-0.5</u>	0.4	0.8	<b>2.2</b>	0.2	1.2	-0.5	<b>-3.7</b>	<b>-40.5</b>	<u>2.6</u>
Food out	<b>205.7</b>	-0.1	0.0	<b>-2.5</b>	<b>2.0</b>	0.5	<b>-3.2</b>	<u>2.4</u>	<b>3.5</b>	<b>-68.1</b>	<b>5.7</b>
Alcohol	-5.2	<b>-0.6</b>	-0.3	-0.5	-0.2	0.8	-0.3	0.0	-1.2	3.1	-0.3
Tobacco	-52.1	0.2	0.3	<u>1.3</u>	-0.1	-0.5	1.4	0.6	-0.7	<u>19.6</u>	<u>-1.7</u>
Children's clothing	-3.3	<u>-0.1</u>	<b>-0.1</b>	-0.1	0.3	0.1	0.2	-0.1	-0.1	1.1	-0.1
Childcare	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0
School fees	<b>44.0</b>	0.0	-0.1	-0.4	0.2	0.2	-0.5	0.4	0.4	<b>-14.7</b>	<b>1.2</b>
Pocket money	<u>14.5</u>	0.0	<u>-0.1</u>	-0.1	0.1	0.1	-0.1	0.1	0.1	<u>-4.9</u>	<b>0.4</b>
School lunch	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Toys	2.8	0.0	0.0	-0.2	0.2	-0.1	-0.1	0.0	-0.1	-0.8	0.1
Men's clothing	-20.1	-0.1	<u>-0.3</u>	<b>1.3</b>	<b>-1.3</b>	-0.8	1.1	-0.7	-1.0	6.1	-0.4
Women's clothing	-26.6	<u>-0.4</u>	<b>-0.8</b>	0.1	0.6	0.8	1.1	0.3	-0.1	7.3	-0.4
Other clothing	<u>57.9</u>	-0.1	<b>-0.3</b>	<b>-1.1</b>	0.5	0.1	<b>-1.6</b>	1.1	1.2	<u>-18.9</u>	<b>1.6</b>
Gambling	<b>-48.3</b>	0.1	0.1	0.2	<b>0.9</b>	-0.4	0.0	0.5	-0.3	<b>16.7</b>	<b>-1.4</b>
Furniture	<b>-248.9</b>	-0.2	-0.7	2.4	-2.5	-0.7	2.2	-3.4	-0.6	<b>78.9</b>	<b>-5.9</b>
Household goods and services	<b>76.7</b>	<b>0.7</b>	<b>0.8</b>	-0.2	0.0	<b>1.8</b>	-0.6	0.4	1.1	<u>-21.5</u>	1.6
Medical	29.4	-0.1	0.0	<b>-2.8</b>	0.8	0.2	-1.8	0.4	0.1	-8.8	0.8
Transport	-99.7	0.5	0.0	0.3	<u>-2.9</u>	<b>-3.4</b>	-2.8	2.1	1.0	44.0	<u>-4.2</u>
Recreation	-21.3	<b>1.5</b>	0.3	0.9	-1.3	0.8	0.0	-1.3	-0.1	1.0	0.7
Personal	6.4	-0.1	<b>0.3</b>	0.1	0.4	-0.1	0.2	0.0	-0.3	-1.9	0.2
Misc	46.0	-0.2	0.5	-1.9	2.1	0.1	0.0	-1.4	1.0	<b>-15.8</b>	1.5
Sum	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

Table 9

## Couples without children, direct model

	Intercept	y93	y98	Transfer Share	Transfer Share Difference	Market Share Difference	log(x)	log(x) <sup>2</sup>
Housing	-93.83	-0.81	-0.01	<b>3.29</b>	0.04	-0.29	39.20	-3.39
Fuel and power	<b>60.89</b>	<b>0.21</b>	0.00	0.23	<u>-0.42</u>	0.11	<b>-17.06</b>	<b>1.23</b>
Food at home	<b>157.96</b>	-0.38	0.24	1.29	0.37	-0.54	<b>-39.20</b>	<b>2.53</b>
Food out	<b>173.86</b>	0.14	0.18	<b>-1.51</b>	0.36	0.48	<b>-57.81</b>	<b>4.88</b>
Alcohol	9.31	<b>-0.61</b>	-0.31	-0.78	-0.13	0.09	-1.48	0.09
Tobacco	-35.93	<u>0.28</u>	0.26	<u>1.01</u>	-0.40	-0.35	14.51	-1.35
Children's clothing	-2.34	-0.07	<b>-0.10</b>	0.04	-0.01	0.06	0.84	-0.07
Childcare	0.57	0.00	0.00	0.01	0.00	-0.01	-0.21	0.02
School fees	<b>45.71</b>	0.03	-0.05	-0.29	0.05	<b>-0.28</b>	<b>-15.14</b>	<b>1.25</b>
Pocket money	9.58	-0.04	<u>-0.07</u>	0.02	-0.01	0.09	-3.38	0.30
School lunch	-0.08	0.00	0.00	0.00	0.00	<b>0.01</b>	0.03	0.00
Toys	1.69	-0.01	0.01	<u>-0.23</u>	0.05	<b>0.15</b>	-0.43	0.03
Men's clothing	15.87	-0.23	<b>-0.39</b>	0.21	0.21	0.01	-5.41	0.49
Women's clothing	-31.95	<u>-0.35</u>	<b>-0.81</b>	<u>1.09</u>	0.41	0.14	8.97	-0.57
Other clothing	46.62	-0.06	<u>-0.27</u>	<u>-0.73</u>	-0.16	-0.09	-15.29	<u>1.28</u>
Gambling	<b>-63.85</b>	<b>0.19</b>	0.05	0.43	<b>-0.67</b>	0.08	<b>21.59</b>	<b>-1.80</b>
Furniture	<u>-201.24</u>	-0.52	-0.69	0.62	-0.96	0.13	<u>63.44</u>	<u>-4.71</u>
Household goods and services	39.19	<b>0.69</b>	<b>0.98</b>	<u>0.95</u>	0.07	-0.03	-9.56	0.63
Medical	20.49	0.00	0.06	<b>-2.54</b>	0.14	-0.12	-5.78	0.51
Transport	-49.75	0.36	-0.22	<b>-2.98</b>	0.08	1.11	27.98	-2.86
Recreation	-24.15	<b>1.31</b>	0.36	0.24	-0.05	-0.99	1.93	0.64
Personal	4.23	-0.04	<b>0.29</b>	0.25	0.23	-0.02	-1.18	0.12
Misc	17.16	-0.12	0.48	-0.58	0.80	0.27	-6.57	0.77
Sum	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

Table 10

## Couples without children, instrumented model

	Intercept	y93	y98	Transfer Share	Transfer Share Difference	Market Share Difference	log(x)	log(x) <sup>2</sup>
Housing	-59.59	-0.75	0.04	<u>2.75</u>	0.46	-0.35	28.91	-2.63
Fuel and power	<b>73.00</b>	<b>0.22</b>	0.01	0.04	<u>-0.70</u>	0.10	<b>-20.90</b>	<b>1.53</b>
Food at home	<b>200.53</b>	-0.35	0.25	0.98	1.27	-0.57	<b>-52.71</b>	<b>3.59</b>
Food out	57.97	0.08	0.10	-0.23	0.67	0.48	<u>-20.88</u>	<b>1.97</b>
Alcohol	-11.03	<b>-0.62</b>	-0.33	-0.53	0.05	0.09	4.98	-0.42
Tobacco	-42.59	<u>0.27</u>	0.24	<b>1.16</b>	0.00	-0.34	<u>16.59</u>	<b>-1.51</b>
Children's clothing	-1.20	-0.07	<b>-0.10</b>	0.00	-0.09	0.06	0.49	-0.04
Childcare	0.44	0.00	0.00	0.01	-0.01	-0.01	-0.16	0.01
School fees	<b>31.99</b>	0.02	-0.07	-0.12	0.23	<b>-0.29</b>	<b>-10.76</b>	<b>0.90</b>
Pocket money	9.28	-0.03	<u>-0.07</u>	0.02	0.01	0.09	<u>-3.26</u>	<u>0.28</u>
School lunch	-0.13	0.00	0.00	0.00	0.00	<b>0.01</b>	0.05	0.00
Toys	3.64	-0.01	0.02	<b>-0.28</b>	-0.12	<b>0.15</b>	-1.05	0.08
Men's clothing	-7.27	-0.24	<b>-0.40</b>	0.45	0.33	0.00	2.01	-0.10
Women's clothing	-44.05	<u>-0.36</u>	<b>-0.81</b>	<u>1.14</u>	-0.26	0.15	12.74	-0.86
Other clothing	13.14	-0.08	<u>-0.26</u>	-0.54	-0.92	-0.10	-4.54	0.42
Gambling	<b>-54.79</b>	<b>0.20</b>	0.05	0.42	-0.22	0.10	<b>18.67</b>	<b>-1.56</b>
Furniture	-130.52	-0.48	-0.68	0.07	0.12	0.17	40.85	-2.92
Household goods and services	<b>65.48</b>	<b>0.72</b>	<b>0.99</b>	0.73	0.59	-0.04	<u>-17.86</u>	<u>1.28</u>
Medical	9.90	0.00	0.06	<b>-2.50</b>	-0.01	-0.13	-2.30	0.23
Transport	<b>-136.98</b>	0.27	-0.24	<b>-2.32</b>	-2.49	<u>1.15</u>	<b>55.32</b>	<b>-4.99</b>
Recreation	97.95	<b>1.38</b>	0.41	-0.92	0.65	-0.98	-37.03	<u>3.72</u>
Personal	4.16	-0.05	<b>0.30</b>	0.21	-0.11	-0.02	-1.20	0.13
Misc	20.66	-0.14	0.47	-0.55	0.56	0.29	-7.96	0.90
Sum	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for *TransferShareDifference*,  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. Parameter estimates for the demographic, labour force and wealth variables described in the text are not included in the table.

Source: As for Table 2.

## 7 Results 2: Alternative specifications

The identification of the transfer share effect in the results above is based on the variation in the transfer income share within each family type over time. The estimation populations include many families with no transfer income, with much of the identification of the other parameters of the system derived from

these families. This section tests the robustness of the results by undertaking a number of estimates across alternative populations which are both broader and narrower than those considered above. We also include estimates where expenditures are measured as shares of income rather than total expenditure.

The populations used for this sensitivity analysis, and the way in which they describe the variation in the transfer share difference, are summarised in Table 11. Population 2 is the same as the couples without children used for Table 10, and population 4 is the same as the couples with children population used to estimate Table 7. Populations 1 and 3 are the corresponding sub-populations of families where income support is the principal source of income.

Populations 5 and 6 also include lone parents. These households provide an additional reference point of a family type that has had no change in its transfer income share. Finally, populations 7 and 8 pool the family types with and without children. We do not estimate a model pooling these households with individual adults, as their expenditure patterns are likely to differ for other reasons, such as selection effects.

Estimates of the impact of the *TransferShareDifference* variable (for the instrumented model) across each of these populations are shown in Table 12. The regressions also include the following additional variables (where they are applicable to the relevant population).

- Dummy variables for family type (couples with children, couples without children, lone parents).
- Year dummies, log total expenditure, log total expenditure squared, *MarketShareDifference* and demographic variables as in the previous section.
- These variables in interaction with family type.

The instrumented variables are *TransferShareDifference*, and the expenditure variables in interaction with family type. (The disposable income instruments are also included in interaction with family type where relevant). Note that for those populations which contain more than one family type (5, 6, 7 and 8) the *TransferShareDifference* variable is not entered in interaction with family type. These models thus capture the effect of variation in the transfer share difference across family types without constraining the other parameters in the demand equations.

**Table 11****Estimation populations and sources of variation in the transfer income share**

<b>Population</b>	<b>Main Source of Identification of the Transfer Income Share Effect</b>	
<b>No Children</b>		
1	Couples, no children, principal income source is transfers	Different income shares for pensioners and non-pensioners prior to 1998-99.
2	Couples, no children	As for population 1, plus time trends in expenditure for non-income support recipients.
<b>With Children</b>		
3	Couples with children, principal source of income is transfers	As for population 1, plus a smaller change in income shares in the first time interval for pensioners.
4	Couples with children	As for population 3, plus time trends in expenditure for non-income support recipients.
5	Couples with children and lone parents, principal source of income is transfers	As for population 3, plus time trends in expenditure for lone parents.
6	Couples with children and lone parents	As for population 5, plus time trends in expenditure for non-income support recipients.
<b>Pooled</b>		
7	Couples with and without children and lone parents, principal source of income is transfers	As for populations 1 and 5
8	Couples with and without children and lone parents	As for populations 2 and 6

Table 12

## The impact of the transfer share difference across different populations

	Couple (Transfers) 1	Couple 2	Couple w. Children (Transfers ) 3	Couple with Children 4	Couple w. Children and Lone Par. (Transfers) 5	Couple with Children and Lone Parents 6	Couple w. and w/o Children, Lone Par (Transfers) 7	Couple with and w/o Children, Lone Parents 8
Housing	-2.36	0.46	-1.76	-0.30	-0.39	-0.06	-1.15	-0.10
Fuel and power	0.05	<u>-0.70</u>	0.67	<b>0.51</b>	0.75	<b>0.51</b>	0.64	0.25
Food at home	2.87	1.27	-1.52	<b>-1.74</b>	-0.34	<b>-1.87</b>	-0.01	<u>-1.18</u>
Food out	0.23	0.67	0.34	-0.09	-0.04	-0.11	0.10	0.18
Alcohol	-1.20	0.05	-0.29	-0.63	<b>-1.13</b>	<u>-0.70</u>	-0.79	-0.50
Tobacco	-0.31	0.00	1.09	<b>1.24</b>	0.70	<b>1.20</b>	0.38	<b>0.95</b>
Children's clothing	0.04	-0.09	-0.12	-0.06	0.08	-0.05	-0.04	-0.20
Childcare	-0.01	-0.01	0.22	-0.20	0.01	-0.28	0.07	-0.04
School fees	-0.02	0.23	0.26	-0.16	0.26	-0.15	0.22	0.00
Pocket money	0.03	0.01	0.14	0.11	-0.02	0.12	-0.01	0.09
School lunch	0.00	0.00	0.00	-0.02	0.05	-0.01	0.01	-0.03
Toys	-0.01	-0.12	0.41	0.07	0.32	0.08	0.25	0.08
Men's clothing	0.19	0.33	-0.40	<b>0.64</b>	-0.06	<u>0.57</u>	0.29	<u>0.50</u>
Women's clothing	-0.89	-0.26	-0.12	<u>0.61</u>	0.00	<u>0.63</u>	-0.19	0.44
Other clothing	0.02	-0.92	-0.62	0.18	0.02	0.22	0.08	0.12
Gambling	0.29	-0.22	-0.09	0.08	0.01	0.09	0.05	0.01
Furniture	0.19	0.12	-0.70	-0.05	-1.13	0.12	-0.48	0.20
Household goods and services	-0.23	0.59	1.27	<b>1.11</b>	0.15	<b>1.00</b>	0.11	<b>0.80</b>
Medical	0.27	-0.01	<b>1.59</b>	-0.62	0.49	-0.63	0.44	-0.50
Transport	-1.46	-2.49	-1.80	-0.86	-1.48	-0.74	-1.40	-1.05
Recreation	1.63	0.65	1.40	-0.08	0.86	-0.21	0.96	-0.11
Personal	-0.19	-0.11	0.40	0.31	0.26	0.29	0.10	0.13
Misc	0.86	0.56	-0.37	-0.03	0.64	-0.02	0.36	-0.04
Sum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p value of F test for all parameters = 0	na	0.970	0.460	<b>0.002</b>	0.740	<b>0.007</b>	0.900	0.130

Notes: Dependent variables are percentage of total expenditure. Estimated using 2SLS with instruments for *TransferShareDifference*, and family type times  $\log(x)$  and  $\log(x)^2$ . Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. See Table 16 in the Appendix for standard errors. (Transfers) denotes households whose principal source of income is income transfers. The estimates for columns 2 and 4 are identical to those in Table 10 and Table 7 respectively. See text for the other variables included in the regression.

Source: As for Table 2.

For the most part, the estimates here tell the same story as in the previous section. In part, of course, this is because the samples overlap. The F test that all parameters are zero is only rejected in populations 4 and 6. The associations

found for couples with children still apply when the sample is broadened to include lone parents, and (mostly) apply for the fully pooled population (last column). Restriction to transfer recipient households reduces the significance of terms, but generally does not substantially change the point estimates.

Focussing on estimates individually significant at the 5 percent level in any of the populations, we find that fuel and power expenditure increases, food at home decreases, alcohol decreases, tobacco increases, men's clothing increases, and household goods and services and medical expenses increase. (Only the fuel and power, food at home, tobacco and household goods and services effects are significant in more than one population). Compared to the estimates for single adults shown in Table 4, some of these appear consistent and some inconsistent with the income share hypothesis. The increases in fuel and power, decreases in alcohol, and increases in household goods and services and medical expenses are consistent with a greater female control over expenditure. The increase in tobacco expenditure and men's clothing is inconsistent, and the decrease in expenditure on food at home also appears inconsistent, even though this does not differ between single men and women.

The strongest support for the income share hypothesis is in population 5, income recipient lone parents and couples with children. For this group the alcohol parameter is significantly negative. Also, children's and men's clothing move in the expected direction though non-significantly (for all other populations the opposite applies). Tobacco expenditure and food at home still, however, change in the opposite to expected direction (though non-significantly).

Finally, in the Appendix, Table 17 shows estimates comparable to those in Table 12, but in this case with the expenditure shares calculated as shares of income, and income rather than expenditure included in the regression. The pattern of significant effects is very similar. In this case, however, the alcohol consumption effect described in the previous paragraph is smaller and not significant.

## 8 Discussion

Despite the very large changes in the within-household income distribution for some groups of income support recipients, changes in household consumption patterns were small. To the extent to which there were significant changes, some were in the direction the income share hypothesis might suggest, but others were in the opposite direction. For example, the increase in the female income share was associated with an increase in household tobacco consumption and a decrease in food at home expenditure.

These results are, of course, not definitive. There are known measurement problems in the data (e.g. alcohol and tobacco), and expenditure on many of the more interesting child-specific commodities is only measured imprecisely. For example, the estimated 95 percent confidence interval for the impact of a one unit change in *TransferShareDifference* on the children's clothing budget share is approximately  $\pm 0.6$  percentage points – which is about half the mean budget share (for the couples with children population).

However, the upper bound of this confidence interval is still an order of magnitude lower than the estimate found by LPW. They found that expenditure on children's clothing increased by about one-eighth of the income distributed from husbands to wives (holding men's clothing expenditure constant). A change of one unit in *TransferShareDifference* is equivalent to a shift of 50 percent of the household income between spouses and one-eighth of this is 6 percent. Since total income is approximately equal to total expenditure, this implies that we should have seen an increase in the budget share of around 6 percentage points. This calculation does not hold men's clothing constant, and it is not very plausible that the relationship would linearly extend to such a large change in the within-household income distribution. It does suggest, nonetheless, that the result found here is significantly different from the results found by LPW.

What explanations can be advanced for this lack of change in expenditure patterns? The Australian policy changes took place about 15 years after the UK changes. It is possible that there were changes in preferences occurring in the late 1970s in the UK that were not occurring in Australia in the early 1990s (or vice versa). LPW considered the growth of brand awareness in children's clothing as a possible explanation for their results,<sup>17</sup> although they rejected this explanation because of the close inter-temporal correlation between the policy and expenditure changes.

More likely explanations for the divergent results are differences between income payment mechanisms in the UK and in Australia, and in the nature of the household financial management practices in each country.

One important feature of Australian income support administration is that almost all income transfers are made by way of financial transfers to the bank accounts of recipients. If these accounts are in the joint names of husband and spouse, it is unlikely that a change of the name attached to the payment transfer will make much difference to expenditure patterns.

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<sup>17</sup> This is not relevant to the Australian results both because brand awareness was well established by the early 1990s, but also because the Australian results use control groups (higher income families and lone parent families), which did not experience an income share, change over this period.

Some evidence on these financial arrangements was collected as part of the evaluation of the policy changes considered here.<sup>18</sup> Foreman and Wilson (1996) reported the results of a January 1993 survey of married mothers with beneficiary husbands (i.e. undertaken prior to any of the policy changes). In 68 percent of cases, the wife already 'had access' to the bank account where the husband's primary income support payment was made. Although the precise definition of having access is not reported, this probably represents the use of a joint bank account. An even larger proportion (80%) of women described the decision-making process with respect to the income support payment as 'joint', and the remaining families were equally divided as to who made expenditure decisions. In 47 percent of cases, the mother had sole access to the account where the (much smaller) family payments were paid.

Chan and Wilson (1996) report results from a similar survey of Parenting Allowance Recipients undertaken in 1995–1996 (after all the policy changes described above). In this case, 68 percent of recipients reported that the Parenting Allowance (paid to the primary carer) was paid into a joint bank account.

Together, these survey results suggest that mothers reliant upon income support had substantial access to, and control of, the income support payments coming into the household even before the policy changes, and that pooling of financial resources continued to be common after the changes were implemented. This pooling of financial resources is consistent with other research on financial management in low-income families in Australia and elsewhere. In general, pooling or wife management of finances is more common in low rather than high-income households – though the sociological literature is clear in pointing out that management does not necessarily mean control (see Waseem 2004).

The greater preponderance of pooling management is often described as a response to the more stringent financial circumstances of low-income households, with the provision of basic needs leaving little room for consumption flexibility. Given that the UK results applied to all families whereas the Australian results applied only to low-income families, this is another possible explanation for the observed differences in behaviour.<sup>19</sup>

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<sup>18</sup> These surveys both focussed on mothers. No comparable data for couples without children was collected. We should also note that the two surveys had a low response rate, so the results described here should be considered as approximate. The use of joint bank accounts by income support recipients, however, mirrors the overall pattern in Australia. Glezer's review, for example, concludes that around 70 to 75 percent of Australian married couples have a joint bank account (Glezer 1995).

<sup>19</sup> Another difference is that many recipients of the Australian income transfers considered here may only be short-term recipients, and so their expenditure patterns may reflect consumption patterns established prior to the spell of income support. Analysis has been undertaken to test whether an income share effect is found among the long-term unemployed (>6 months). No

As well as being specific to low-income families, the Australian policy changes involved a much larger redistribution of income than the UK changes considered by LPW. It is conceivable that the redistribution in the UK families was too small to arouse anxiety about the change in established patterns of gender control over finances. In contrast, a large change, such as that in Australia, might prompt a re-organisation of household financial management so as to maintain the pre-existing pattern of household consumption.

This paradoxical switching model is consistent with recent research into the division of housework between husbands and wives. Bittman et al (2003)<sup>20</sup> find that Australian wives' hours of housework decrease as their share of the household's earnings increases up to 50 percent (holding hours of work and household income constant). This is consistent with intra-household bargaining theories. However, Bittman et al also find that the wife's housework is high when the wife has a *higher* income than her husband. They argue that this behaviour arises as a compensation for the "gender deviance" of the wife having a higher income than the husband. This deviance compensation appears stronger in Australia than in the US, which is consistent with the stronger gender typing of employment in Australia (Australian mothers are more likely to work part-time).

If the allocation of housework is responsive to such deviations from gender norms, then it is conceivable that a re-organisation of finances that leads to a "deviant" result will also prompt a behavioural compensation to restore gender norms. In this case, it may have been achieved via internal financial transfers or by the use of joint bank accounts.

Finally, it is important to be aware of the inherent limitations of 'natural experiments'. The word 'natural' refers to the fact that the treatment (in this case, the change in the within-household income distribution) is not imposed by the researcher, but instead occurs via some external process (policy change). Policy changes, however, don't appear out of nowhere. The policy changes in the UK and Australia clearly arose from more fundamental changes to gender relationships. Conceivably, the increasing social power of women could also influence the observed expenditure outcomes. However, it is hard to see how this would lead to a finding of no impact (as in Australia) and it is unlikely to have led to the timing coincidences found in the UK.

In the Australian context, another possible type of endogeneity is that the policy changes may have changed job search effort, and hence the likelihood that couples are receiving unemployment payments. For example, the reduction in

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significant effect was found, but this result is not very robust given the small sample size of this group.

<sup>20</sup> They also discuss other studies with similar results.

male income might encourage men in non-pooling households to increase their job search effort (but might have no effect on female job search effort). This would lead to the population of benefit recipients having a higher proportion of pooling households. Nonetheless, though this would attenuate the impact of income shares it would not be expected to introduce a bias in the opposite direction.

## 9 Concluding comments

The natural experiment considered here differed from the UK experience in three main respects. It took place in another time and place, was confined to low-income households and led to a much greater change in the within-household income distribution. Whereas LPW found a substantial change in consumption patterns as a result of the UK policy changes, this analysis found no major changes in expenditure patterns associated with the Australian changes.

All three of the key differences between the two studies are potential explanations for this result. The payment of income support in Australia by bank account transfers is particularly amenable to ensuring fungibility of income within the household; low-income households have less flexibility in their consumption patterns; and the large size of the Australian within-household redistribution may have prompted a reorganisation of household finances that restored the status quo.

Whatever the reason, the Australian experience of income support payment reform should remind us that, even though much household economic behaviour may be a result of bargaining processes within the household, it may not be easy for exogenous policy changes to influence the outcome of this bargaining. Paradoxically, it may be the case that small transfers paid to particular individuals with specifically advertised objectives and paid to particular individuals may be more effective in influencing consumption patterns than large-scale changes to the within-household distribution of income.

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## Appendix

The analysis in this paper is based on the confidentialised unit record files of the ABS Household Expenditure Surveys of 1988–89, 1993–94 and 1998–99. For more information on the surveys, see ABS Catalogue Number 6544.0.30.001. This appendix includes additional definitional detail.

**Table 13**

### Demographic and income variable definitions

Variable	Notes
Age	Mid-point of age ranges used
Pen	= 1 if the couple has transfers as their main source of income, and are receiving a pension. Transfers include all income from government benefits. Pensions are defined for both head and spouse as follows. 1988–98: $x03ap+x04ip+x05wp+x08va+x09sp+x10vp$ 1993–94: $i08vap+i03app+i05wpp+i04dsp+i10vpp+i30cpp$ 1998–99: $i08vap+i03app+i05wpp+i04dsp+i10vpp$ Household transfer and pension income is the sum of head and spouse income.
Ben	= 1 if transfers are the principal source of income, but no pension is received.
Number of children	Children under age 15. In 1998–99 there was more restrictive top-coding of the number of children in each age range. The total number of children has been adjusted upwards where the total number of people is greater than the recorded number of children plus the number of adults.

Table 13 includes information on the definition of some of the exogenous variables used in the regression. Where variables are not described, their definition follows the standard ABS convention. Heads and spouses are defined as the head and spouse of the first income unit in the household. In

1988–89 a small number of households had men coded in both these positions. These households are dropped from the analysis.

For expenditures, the starting point is the 13 category two-digit level classification of current expenditure used the ABS. Adjustments were then made to ensure comparability between years, remove some major durable expenditure items, remove some negative expenditures and identify some particular expenditure categories of interest. Details of the adjustments made are shown in Table 14. The proportion of households with zero expenditure on the relevant commodities are shown in Table 15.

Table 14

## Expenditure classification

Expenditure Variable	Notes: Terminology used is that for the 1998-99 survey unless noted. Items in italics are the ABS 2 digit expenditure categories.
Housing	<i>Current housing</i> . Excludes repayments of mortgage principal. A small number of cases have negative expenditures due to mortgage capital refunds being (inappropriately) deducted from current housing expenditure. Housing expenditure is set to zero for these households.
Fuel and power	<i>Domestic fuel and power</i>
Food at home	<i>Food and non alcoholic beverages</i> less <b>food out</b> and <b>school lunch</b>
Food out	Meals in restaurants, hotels, clubs, fast food and takeaway
Alcohol	<i>Alcoholic beverages</i>
Tobacco	<i>Tobacco products</i>
Children's clothing	Boy's clothing, girl's clothing, children's and infants hosiery, children's and infants footwear. Nappies and infant's clothing are <i>not</i> included because of changes in coding over time. Prior to 1998-99, disposable nappies were included in paper products (in <b>services</b> ) and cloth nappies were included in infant's clothing.
Childcare	Childcare services and preschool
School fees	Primary and secondary school fees and private education tuition fees
Pocket money	Pocket money or allowance. Information on the children's expenditure of this money is not collected
School lunch	School lunch money
Toys	Toys
Men's clothing	Men's clothing, men's hosiery and men's footwear
Women's clothing	Women's clothing, women's hosiery and women's footwear
Other clothing	Clothing and footwear, less <b>children's clothing</b> , <b>men's clothing</b> and <b>women's clothing</b> . Includes hats, accessories, materials, repairs and clothing insufficiently described. In 1998-99, nappies and infants clothing are included here. In the earlier years, disposable nappies are included in <b>services</b> .
Gambling	The ABS records gambling wins as negative expenditures. These have been set to zero here, and positive expenditures on each form of gambling deflated so as to maintain the same aggregate level of expenditure. In all three years, casino wins exceeded losses, so this variable has been set to zero. The reader is cautioned to regard this as reporting error!
Furniture	<i>Household furnishings and equipment</i>
Household goods and services	<i>Household services and operation</i> (includes cleaning and garden products, telephone services, other hired services etc) less <b>childcare</b> . Includes disposable nappies prior to 1998-99.
Medical	<i>Medical care and health expenses</i>
Transport	<i>Transport</i> less purchases of motor vehicles, motor cycles, caravans and trailers. A small number of cases with negative expenditure (due to unexplained negative vehicle servicing expenditures) are set to zero.
Recreation	<i>Recreation</i> less <b>toys</b> and purchases of boats.
Personal	<i>Personal care</i>
Misc	<i>Miscellaneous goods and services</i> less <b>school fees</b> and <b>pocket money</b> . As for housing, negative values have been set to zero for a small number of households with large car loan refunds.

**Table 15****Percentage of cases with zero expenditure by family type**

	Single Men	Single Women	Female Lone Parents	Couples	Couples with Children
Housing	4	2	2	1	1
Fuel and power	5	3	2	2	1
Food at home	1	1	0	0	0
Food out	16	16	17	8	5
Alcohol	32	49	65	27	34
Tobacco	60	67	52	63	62
Children's clothing	98	95	64	93	53
Childcare	99	100	69	100	66
School fees	95	99	44	98	42
Pocket money	98	99	79	98	77
School lunch	100	100	78	100	81
Toys	97	93	74	89	63
Men's clothing	81	93	90	73	72
Women's clothing	97	60	63	52	57
Other clothing	79	63	55	50	35
Gambling	57	60	62	37	43
Furniture	43	33	27	17	14
Household goods and services	5	2	1	0	0
Medical	27	16	25	6	6
Transport	7	6	6	1	1
Recreation	9	7	5	2	2
Personal	46	23	19	13	10
Misc	14	8	10	3	2

Source: As for Table 2.

Table 16

## Standard errors of estimates in Table 12

	Couple (Transfers) 1	Couple 2	Couple w. Children (Transfers ) 3	Couple with Children 4	Couple w. Children and Lone Par. (Transfers) 5	Couple with Children and Lone Parents 6	Couple w. and w/o Lone Par (Transfers) 7	Couple with and w/o Children, Lone Parents 8
Housing	2.47	2.34	2.32	1.35	1.67	1.38	1.34	1.17
Fuel and power	0.93	0.41	0.62	0.23	0.47	0.25	0.43	0.21
Food at home	2.34	1.30	1.82	0.75	1.39	0.79	1.12	0.66
Food out	1.09	1.05	0.58	0.46	0.41	0.44	0.41	0.43
Alcohol	1.50	1.00	0.74	0.41	0.48	0.39	0.49	0.40
Tobacco	1.29	0.77	0.93	0.36	0.69	0.38	0.60	0.35
Children's clothing	0.24	0.20	0.50	0.31	0.52	0.33	0.38	0.24
Childcare	0.01	0.02	0.49	0.47	0.47	0.47	0.33	0.32
School fees	0.03	0.29	0.36	0.39	0.33	0.38	0.23	0.28
Pocket money	0.02	0.17	0.37	0.10	0.21	0.11	0.15	0.09
School lunch	0.00	0.01	0.13	0.06	0.10	0.07	0.07	0.05
Toys	0.24	0.21	0.31	0.21	0.30	0.22	0.22	0.16
Men's clothing	0.82	0.67	0.37	0.32	0.20	0.30	0.26	0.29
Women's clothing	0.76	0.94	0.37	0.33	0.45	0.36	0.38	0.37
Other clothing	0.57	0.63	0.54	0.32	0.44	0.32	0.34	0.29
Gambling	0.63	0.43	0.26	0.13	0.20	0.14	0.22	0.16
Furniture	2.05	2.27	1.64	1.09	1.25	1.06	1.04	0.99
Household goods and services	1.06	0.79	0.92	0.43	0.74	0.44	0.59	0.38
Medical	1.21	1.01	0.65	0.50	0.52	0.49	0.49	0.45
Transport	2.10	1.89	1.86	0.99	1.18	0.97	1.00	0.87
Recreation	2.32	2.26	1.65	1.08	1.15	1.05	1.03	0.98
Personal	0.60	0.56	0.34	0.24	0.33	0.24	0.28	0.24
Misc	1.62	1.78	1.35	0.78	0.94	0.76	0.80	0.74

Source: As for Table 2.

Table 17

**The impact of the transfer share difference across different populations  
(expenditures as a share of income)**

	Couple (Transfers) 1	Couple 2	Couple w. Children (Transfers) 3	Couple with Children 4	Couple w. Children and Lone Par. (Transfers) 5	Couple with Children and Lone Parents 6	Couple w. and w/o Children, Lone Par (Transfers) 7	Couple with and w/o Children, Lone Parents 8
Housing	0.48	3.77	-3.48	-0.46	-1.67	-0.66	-0.59	0.70
Fuel and power	0.74	-0.31	<u>1.98</u>	<b>0.76</b>	<u>1.11</u>	<b>0.70</b>	<b>1.32</b>	<b>0.53</b>
Food at home	3.28	0.56	-4.09	-0.59	-2.24	-0.89	-0.79	-0.36
Food out	1.13	<b>2.81</b>	0.03	-0.17	-0.89	-0.22	-0.61	0.70
Alcohol	-0.82	0.16	0.66	-0.73	-0.73	<u>-0.80</u>	-0.70	-0.49
Tobacco	-0.27	-0.21	0.10	<b>1.63</b>	0.11	<b>1.51</b>	0.03	<b>1.19</b>
Children's clothing	0.02	-0.11	-0.50	-0.12	-0.23	-0.07	-0.25	-0.19
Childcare	-0.01	-0.01	0.81	-0.02	0.27	-0.21	0.31	0.05
School fees	-0.01	0.28	1.05	-0.64	<u>0.88</u>	-0.59	<u>0.66</u>	-0.25
Pocket money	0.06	0.04	0.70	0.14	0.21	0.14	0.20	0.12
School lunch	0.00	0.00	-0.10	-0.07	-0.09	-0.05	-0.07	-0.07
Toys	0.29	0.09	0.36	0.10	0.16	0.08	0.24	0.14
Men's clothing	1.06	0.87	-0.68	0.11	-0.14	0.02	0.34	0.24
Women's clothing	<u>-2.16</u>	-1.06	-0.75	0.62	0.10	0.67	-0.65	0.26
Other clothing	-0.45	<b>-1.36</b>	-0.48	0.23	0.46	0.31	0.09	0.12
Gambling	1.13	-0.39	-0.50	0.10	-0.20	0.10	-0.07	-0.02
Furniture	-0.02	0.81	0.54	0.33	-2.68	0.28	-1.45	0.66
Household goods and services	0.52	0.81	1.04	<b>1.70</b>	0.32	<b>1.51</b>	0.46	<b>1.31</b>
Medical	1.72	0.23	1.37	<u>-1.09</u>	-0.44	-1.02	-0.17	-0.72
Transport	2.59	-0.62	-4.89	-1.45	-3.51	-1.05	-0.59	-0.45
Recreation	1.75	2.84	3.39	0.54	0.59	0.20	0.53	0.72
Personal	-0.76	-0.47	0.45	0.42	0.23	0.40	-0.13	0.19
Misc	3.39	3.06	2.26	0.61	1.80	0.62	1.82	1.04
Saving (income- total expenditure)	-13.65	-11.82	0.72	-1.94	6.57	-0.98	0.08	-5.41
Sum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
p value of F test for all parameters = 0	na	0.610	0.580	<b>0.0003</b>	0.560	<b>0.008</b>	0.590	<b>0.040</b>

Notes: Dependent variables are percentage of total income. Estimated using 2SLS with instruments for *TransferShareDifference*. Parameter estimates significantly different from zero at the 5 percent (two tailed) level are shown in bold. Other estimates significantly different from zero at the 10 percent level are underlined. (Transfers) denotes households whose principal source of income is income transfers.

Source: As for Table 2.