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Author/Contributor:

Bradbury, Bruce

Publication details:

Working Paper No. 73
SPRC Discussion Paper
0733415040 (ISBN)
1447-8978 (ISSN)

Publication Date:

1996

DOI:

<https://doi.org/10.26190/unsworks/205>

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ARE THE LOW INCOME SELF-EMPLOYED POOR?

by Bruce Bradbury

SPRC Discussion Paper No. 73
December 1996

ISSN 1037 2741
ISBN 7334 1504 0

Revised version of a paper presented at the 25th Annual Conference of Economists, ANU, Canberra, 22-26 September 1996. Initial research from which this paper has been developed was funded by the Department of Social Security as part of the commissioned research program for the Social Policy Research Centre. The author thanks Tony Eardley for comments, but takes full responsibility for the views expressed in this paper.

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The series is indebted to Diana Encel for her continuing editorial contribution.

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Tony Eardley
Editor

Abstract

Poverty measurement in Australia has typically excluded the self-employed because of concerns about a weak relationship between their measured incomes and their living standards. At the same time, however, families containing self-employed individuals receive substantial income support. Is this support well targeted?

This paper compares the living standards of low-income self-employed families with low-income employee families using data from the ABS *1993-94 Household Expenditure Survey*. The use of expenditure data for the measurement of living standards poses particular methodological problems, for which some new solutions are proposed. The provisional conclusions of the paper are that: average incomes are a poor indicator of the average living standards of the self-employed; poverty is greater among self-employed families; but, because of the weak association between income and expenditure for the self-employed, the average living standards of low-income self-employed are higher than employee families.

1 Introduction

In Australia, the conventional approach to measuring poverty and the distribution of living standards has been to use information on family incomes. However, it is generally recognised that this approach is unlikely to provide accurate estimates of either the average level, or the distribution of, the living standards of families with self-employed members. Many studies of poverty, for example, deliberately exclude the self-employed because of a perception that their standard of living is higher than their low recorded incomes would suggest.

The difficulty of measuring self-employment incomes stems from the lack of clear distinction between the business of ‘sole traders’ and their household consumption (see Covick, 1984, for more discussion). The greater complexity of business arrangements compared to those of wage and salary earners may also provide the self-employed with additional opportunities to define their incomes so as to minimise taxation. Moreover, this complexity means that the self-employed often have only a vague idea of their current income, with comprehensive records only available for past years.

Given these difficulties, how can we examine the living standards of self-employed families? Are the low-income self-employed as poor as other low-income groups? How many poor self-employed are there? The goal of this paper is to address these questions using alternative indicators of household living standards based on expenditure.

These questions are not just of academic interest. After the decline in farm employment in the post-war years, self-employment has been slowly expanding again, and the increasing use of ‘dependent contractors’ is likely to see this accelerate.¹ At the same time, the self-

1 See VandenHeuvel and Wooden (1994, 1995) for discussion of dependent contractor trends, and Eardley and Bradbury (forthcoming) for a broader discussion of self-employment trends. The latter also point to a significant growth over the last decade of the number of people running limited liability companies. Whilst the owners of these companies are grouped with employees in this current paper, many of the questions about the measurement of the living standards of the self-employed apply equally to them.

employed and their families have become eligible for an increasing number of income support programs.

In 1990, for example, Australian income units with a head or spouse working in their own business received a total of around \$1b per annum in social security transfers.² About 57 per cent of this was in the form of family transfers (Family Allowance and Family Allowance Supplement). The remainder comprised payments such as Unemployment Benefit, usually paid to the not-employed spouse. For all these payments, family income is an important indicator used in the targeting of assistance to those families with greatest needs. The recent introduction of new payments such as Parenting Allowance, where family incomes and assets play an even greater role in the assessment of entitlement, is likely to see an expanded role for income transfers to the self-employed.

Given the increasing prevalence of dependent subcontractors and informal evidence of real poverty among many self-employed families, the poverty alleviation goals of these programs will not be served if the self-employed are excluded from them. However, there is real doubt that existing targeting policies based upon incomes are as effective for the self-employed as for employees. Since income support payments typically have much higher effective marginal tax rates than exist in the tax system, the policy imperative for accurate measurement of self-employment incomes is even stronger for income support than for taxation policy.

A precondition for the development of policy refinements in this area, however, is an understanding of the level and distribution of the living standards of self-employed families. For income support policies (and many other policies) the most relevant aspect of living standards is that

2 Eardley and Bradbury (forthcoming) (original source ABS 1990 Income Distribution Survey). This total includes company directors. Income units comprise single people, married (including de facto) couples, sole parents with dependent children, or couples with dependent children. Adult children (not in full-time education or aged over 20) are defined as separate income units (hence this estimate only includes a small fraction of the Austudy payments paid to the adult children of self-employed parents).

of family consumption, with people being defined as poor if their family has a particularly low level of consumption relative to their needs.

Section 2 of the paper begins with a simple comparison of the income and expenditure data collected by the ABS in the *1993-94 Household Expenditure Survey*. The result observed by previous researchers is confirmed: the relationship between the two is clearly weaker for the self-employed than for employee families. Nonetheless, using the conventional measure of household expenditure as an index, the living standards of the low-income self-employed are only slightly higher than low-income employees.

Section 3 examines expenditure patterns more closely. Is there any evidence that the consumption of business-provided goods is responsible for a lower level of expenditure among the self-employed? Using a simple linear Engel curve model, some evidence for this is found - particularly in the case of transport expenditures.

Section 4 then goes on to use expenditure data more directly in the measurement of poverty. The key methodological issue considered is the influence of 'shopping variability'. If people do not go shopping in the survey period they will be recorded as having a low expenditure level, irrespective of their consumption level. In this part of the paper, a new index based upon a factor analysis methodology is introduced. This index gives greater weight to those expenditure components which have the strongest relationship with an underlying 'permanent consumption'. This weighted expenditure variable is then employed in a logistic regression, predicting the relative poverty level of self-employed compared to employee households. Whilst these results are not final, they suggest a higher level of poverty among self-employed households.

Section 5 then revisits the simple analysis of Section 2. The weighted expenditure variable suggests a higher relative living standard level for the low-income self-employed than was found in Section 2.

Section 6 then considers the income and expenditure patterns of Additional Family Payment recipients in 1993-94. The self-employed do have higher consumption levels, which might be considered a failure of

targeting. But the difference might also be considered small given the difficulties of income measurement facing policy-makers. The main conclusions of the paper are summarised in Section 7.

2 Incomes and Expenditures: A First Look

There are several reasons why income as usually measured by tax authorities or in household surveys might be a poorer indicator of living standards for the self-employed than for other groups in society. These stem primarily from the fact that, for the self-employed, there is often no clear distinction between the activities of the enterprise and consumption within the household. This makes household and individual incomes intrinsically difficult to define and measure. In particular, there are several means whereby the self-employed and other people working in their own business can reduce their personal taxable income in ways which are not available to employees. These include: the accumulation of savings within the enterprise, the personal consumption of goods owned by the enterprise, being able to deduct some non-consumption expenses from income in a way that is denied to employees (e.g. travel to work costs), and a greater flexibility to arrange the financial affairs of the enterprise so as to minimise tax liability.

Several researchers compare measured incomes with indicators of household consumption (for a review see Eardley and Corden, 1996). Pissarides and Weber (1989) and Baker (1993) undertake an analysis using UK food expenditure whilst Bradbury et al. (1988) do this for housing expenditures in Australia. If, at a given level of income, the self-employed spend more than employee families, this suggests that self-employment income is under-recorded or they have access to other resources (such as savings) which are not available to employees. Given the relationship between incomes and expenditure for employees, it is then possible to work backwards to estimate the extent of under-estimation of self-employment income.

The main conclusion of these studies is that income is a significantly poorer predictor of expenditures for the self-employed, and that if the relationship between 'true' income and expenditure for employee

households is assumed to hold for self-employed households, then the latter's income must be under-recorded by a significant amount. This has implications both for estimates of average living standards and for the measurement of poverty among the self-employed.

Some information on average incomes and expenditures for Australian self-employed families are shown in Table 1, which shows data collected by the ABS in the *1993-94 Household Expenditure Survey* (HES). In order to restrict attention to a reasonably homogeneous population, the table shows incomes and expenditures for single income unit married (including de facto) couple households, with either the head or spouse working full time, and with no household members aged 65 or over.³ Households are described as 'self-employed' if either the head or spouse was self-employed and working full time. Otherwise they are defined as employees. Self-employment includes those in partnerships and 'small employers', but does not include self-employed using limited liability company or trust structures, nor does it include those whose main job was wage and salary, but who were also running a business.

Some discrepancies between incomes and expenditures are evident in this table. Whilst the self-employed do have lower average expenditures, with their mean expenditure being only 84 per cent of employee households, their income is lower still at only 70 per cent. If we use the employee expenditure/income ratio as a simple yardstick, we can obtain a simple estimate for the under-recording of self-employment income. The mean income of employee households is three per cent higher than their expenditure. A three per cent increase in self-employment expenditure yields a 'true' income of \$670pw, which is 20 per cent higher than their recorded average income. The same calculation based upon medians yields a 28 per cent increase.

Part of this difference stems from the fact that, in the HES, incomes for different income sources are collected for different periods. In particular, wage and salary incomes are based on current usual wages, whilst self-

3 Any households receiving social security payments (except family payments) are also excluded.

Table 1: Average Incomes^(a) and Expenditures^(a) for Working Couples: 1993-94

		Self- employed (\$/week)	Employee (\$/week)	Ratio (SE/Emp)
All Households (100%)				
Net income	Mean	557	799	0.70
	Median	518	747	0.69
Total expenditure	Mean	648	773	0.84
	Median	611	687	0.89
Sample size		491	2,324	
Population estimate		402,176	1,709,140	
Households with net income < \$500 pw (22%)				
Net income	Mean	221	410	0.54
	Median	326	433	0.75
Total expenditure	Mean	577	548	1.05
	Median	526	511	1.03
Sample size		226	340	
Households with net income < \$400 pw (10%)				
Net income	Mean	130	307	0.42
	Median	243	358	0.68
Total expenditure	Mean	580	571	1.02
	Median	498	482	1.03
Sample size		153	93	

Note: a) Income, (current) expenditure and weights as defined by ABS.

Source: ABS 1993-94 Household Expenditure Survey Unit Record File. .

employment incomes are based upon incomes for the most recent tax year for which the person has records. This can be up to two years previously. Business income is then converted to a weekly equivalent without any inflation adjustment.

In 1993-94, this lagged income data has only a minor impact. National accounts and labour force data on the gross operating surplus for unincorporated enterprises per self-employed person, suggest that average incomes in 1991-92 and 1992-93 were only three per cent lower

than in 1993-94. However for the previous HES, in 1988-89, this income lag has a very large impact, with incomes increasing by around 23 per cent over the corresponding period.

Whilst this points to the limitations of the survey data, income growth can also have important policy implications in periods of strong nominal income growth. This is because many social security payments (particularly family payments) are income tested on self-employment incomes, with incomes defined in a very similar manner to that in the HES.

The lag in income collection may also have implications for poverty measurement. For most households, financial market constraints will mean that current consumption will have a stronger correlation with current income than income in some prior period. This suggests that the lagged incomes of the self-employed may be of less use in predicting low consumption levels than are the more current incomes of employee households. On the other hand, the self-employed may have greater access to saving/dissaving instruments. This will imply both that prior period income may be as good as current period income, and that income for any single period will be a poorer indicator of consumption than for employee households.

The other two panels of Table 1 begin to address the question of the living standards of the low-income self-employed. Two very simple low-income thresholds are chosen, \$500 and \$400 per week, which distinguish 22 and 10 per cent of couples respectively (recall that all families have at least one full-time employed member). These thresholds are around the levels at which the higher rates of family assistance paid to families with children are withdrawn (the threshold varies with the number of children).

The first feature to note in Table 1 is the dramatic fall in the relative incomes of the self-employed in these sub-populations. This reflects the large number of self-employed families with very low incomes: much lower than their expenditures. For these very low income families, their incomes are clearly not a very good indicator of their living standards. At the same time as relative incomes fall as we move down the income

distribution, relative expenditures increase, so that low income self-employed families have slightly higher expenditure levels than low-income employee households.

However their average expenditures are only slightly higher, and the median expenditures of the self-employed⁴ do decline with income. Using these income thresholds and total expenditure as our poverty index, it does appear that, by and large, the low-income self-employed *are* (almost) as poor as low-income employee households. But is total household expenditure a good index of living standards for the self-employed? The next section explores this issue.

3 The Expenditure Patterns of the Self-employed: Living off the Business?

One reason why household expenditure might not be a good indicator of self-employment living standards is if the consumption of the household is financed directly by the business. In the ABS Household Expenditure Surveys, respondents are specifically asked to include the value of any in-kind goods received from the business, such as farm-grown food. This is then recorded as both household income and expenditure.

However for many commodities, the measurement approach in the HES is to ask respondents how much they paid and then whether any of that payment was met by a business. If so, the business contribution is subtracted, to derive the household expenditure contribution. For estimating household consumption, this makes sense if the expenditure by the business actually relates to non-consumption activities (e.g. expenditures on that part of the house actually used for running the business). However in many cases, the business will bear all or most of the expenditure for an item which contributes substantially to the household's consumption.

4 Mean expenditures for both employee and self-employed households are actually higher for the <\$400 group than for the <\$500 group. This is due to some households with negative expenditures in the \$400-\$500 range. However, the more robust median shows the expected decline.

Whilst these survey data on (possible) business contributions to household consumption have not been released by the ABS, it is possible to gain some insight into this issue by an examination of expenditure patterns. In particular, if it is assumed that the average tastes of the self-employed are the same as those of employee families, then a comparison of expenditure allocations can be used to point to possible areas where household expenditure will be a poor indicator of consumption for the self-employed.

The simplest⁵ way of doing this is to assume that the consumption x_{ij} of the i th commodity for the j th household can be modelled as

$$\begin{aligned} x_{ij} &= \alpha_i + \beta_i \sum_k x_{kj} + \delta'_i Z_j + e_{ij} \\ \text{with } \sum_i \alpha_i &= 0, \sum_i \beta_i = 1 \end{aligned} \quad (1)$$

and where Z is vector of observed ‘taste’ variables influencing consumption patterns. Here this includes: a variable indicating the presence of children, the number of children, variables for state of residence, the average age of head and spouse, and the square of this variable. Whilst equation (1) describes consumption, for the self-employed, we only observe expenditure $X_{ij} = x_{ij} - \gamma_i$ where γ_i is the contribution of the business to household consumption. Assuming this is zero for non-self-employed, and letting the variable $s_j=1$ for families with self-employed head or spouse, implies a model for observed expenditure of

$$\begin{aligned} X_{ij} &= \alpha_i + \varepsilon_i s_j + \beta_i \sum_k X_{kj} + \delta'_i Z_j + e_{ij} \\ \text{with } \sum_i \alpha_i &= 0, \sum_i \beta_i = 1, \sum_i \varepsilon_i = 0, \\ \text{and where } \varepsilon_i &= \beta_i \sum_k \gamma_k - \gamma_i \end{aligned} \quad (2)$$

5 A more sophisticated version of this model would consider substitution effects arising from the reduced price of commodities with business contributions, different patterns within different industries (data for this are not currently available), and random variations in γ_i (which could be identified via an increase in the regression error term for the self-employed).

To identify the ‘business contributions’ γ_i , it is necessary to also assume that there is (at least) one commodity where γ_i is zero (or some known value).

Table 2 shows estimates of this model obtained from the 1993-94 Household Expenditure Survey. The population is the same as for Table 1 (though survey weights are not used). The expenditure variables are based upon the ABS broad expenditure groups with several groups which might have distinctive self-employment purchase patterns further disaggregated.⁶ In addition, actual gambling expenditure (part of ‘other recreation’) is replaced with an ‘expected gambling expenditure’ which removes gambling wins (negative expenditures) and uses them to deflate gambling losses (so that total net gambling expenditure across all households is unchanged).

The second column of Table 2 shows how the mean expenditure allocation of the self-employed differs from employee households (though recall that $\sum_i \varepsilon_i = 0$). The commodities with ε_i significantly different from zero are fuel, furniture, telephone, other transport, and non-durable recreation goods. Compared to comparable employee households, the self-employed spend more on the first three of these goods, and less on ‘other transport’ and non-durable recreation goods.

Column 3 of the table shows the estimate of total business contributions ($\sum_k \gamma_k$) obtained when each of the commodities in turn is assumed to have $\gamma_i = 0$. Where the self-employed spend less on the chosen reference good this total is negative. Clearly, the assumption of which commodities have no ‘self-employment bias’ makes a great difference to the estimate of the contributions to household consumption by businesses. The right hand side of Table 2 shows the estimates of ‘business contributions’ obtained when three alternative commodities are assumed to have no

6 Telephone and post is removed from household services and operation; vehicle purchase is separated from other transport costs; and purchase of caravans, trailers, boats and bicycles is moved from transport to ‘recreation (durables)’, which also includes expenditures on electronic goods, photographic equipment and musical instruments.

Table 2: Estimates of Business Purchases for Household Consumption

Commodity	β	ε	$\bar{\Sigma}$ when corresponding $\gamma = 0$		Alternative estimates of γ_i when specified $\gamma_i = 0$					
					Food		Clothing		Furniture	
			est.	t	est.	t	est.	t	est.	t
Housing	0.11	-5.7	-51	-1.3	8.6	1.4	8.0	1.3	12.3	2.4
Fuel	0.01	1.2	179	2.3	-1.0	-1.8	-1.1	-1.8	-0.8	-1.4
Food	0.08	2.1	26	0.8	0		-0.5	-0.1	2.6	0.7
Alcohol	0.02	0.2	11	0.1	0.3	0.2	0.2	0.1	0.8	0.6
Tobacco	0.00	0.0	-357	0.0	0.0	0.1	0.0	0.1	0.0	0.1
Clothing	0.09	1.8	21	0.5	0.5	0.1	0		3.4	0.7
Furniture	0.18	10.6	60	1.9	-5.9	-0.7	-6.9	-0.7	0	
Household operation	0.04	0.5	14	0.3	0.5	0.2	0.2	0.1	1.7	0.8
Telephone and post	0.01	1.8	285	2.7	-1.6	-2.4	-1.7	-2.3	-1.4	-2.1
Medical	0.02	1.8	85	1.2	-1.2	-0.8	-1.4	-0.8	-0.5	-0.3
Vehicle purchase	0.10	10.5	103	2.0	-7.8	-1.2	-8.4	-1.2	-4.4	-0.6
Other transport	0.07	-17.4	-261	-4.3	19.2	4.2	18.8	3.9	21.4	4.6
Recreation (durables)	0.03	1.2	42	0.4	-0.4	-0.2	-0.6	-0.2	0.5	0.2
Other recreation	0.14	-7.8	-57	-1.8	11.4	1.9	10.6	1.6	15.9	2.3
Personal care	0.01	-0.8	-69	-0.9	1.1	1.3	1.0	1.2	1.5	1.6
Miscellaneous	0.11	0.0	0	nc	3.0	nc	2.3	nc	6.7	nc

expenditure biases. These three commodities were chosen on the basis of the author's assumptions about which commodities were likely to have small biases, together with low standard errors for $\sum_k \gamma_k$ when these commodities had $\gamma_i = 0$.

The patterns using each of these three assumptions are quite similar. The commodity with the greatest level of apparent business expenditure on household consumption is 'other transport', which mainly comprises vehicle running costs (and some public transport expenditures). On average, the self-employed appear to be consuming about \$20 per week more than their expenditure would indicate. Other results in this table, however, point to the limitations of the model. For example, 'other recreation' has an apparent business contribution of \$10-\$16 per week.

This stems from a lower expenditure by the self-employed on a wide range of recreational expenditures such as sporting equipment, sporting club memberships etc. Rather than their business paying for these services, it is more likely that this stems from the reduced leisure time of the self-employed, or the geographical remoteness of self-employed farmers.⁷ The latter may also explain the higher expenditure on telephone and postal services by the self-employed. These relationships violate the assumption of ‘identical average preferences’ required by the model.

In addition, the apparent business contribution to housing costs probably does not reflect a direct contribution by the business to housing costs.⁸ Rather, it is more likely to be due to the greater housing wealth of the self-employed (see Table 6 below). Whilst this does not reflect a contribution from the business to household consumption, it does indicate that the relative housing consumption of the self-employed may not be accurately indicated by their relative housing expenditure. Table 2 suggests that, if measured on a comparable basis to employees, their average housing consumption may be some \$8-12 per week higher than indicated by their expenditure. However this result is statistically significant only when furniture is used as the reference variable.

Nonetheless, the results for transport expenditures suggest that the measure of total expenditure used in Table 1 is a poor indicator of average consumption levels of self-employed households. The simplest way to correct for this is to omit transport expenditures from the calculation of total expenditure for both self-employed and employee households. Such an adjustment is likely to provide a more appropriate indicator of the relative consumption level of the self-employed.

7 The regression model controls for state/territory, but no data on industry or location within state were released by the ABS. (Industry was collected in the questionnaire, but apparently not coded).

8 Whilst it is true that some business people may live in dwellings owned by their business (possibly with a low rental), this is more likely when a company or trust structure is used for the business. People working in their own limited liability company are not included as self-employed here.

4 Expenditure-based Measures of Poverty

Even with this adjustment, there are reasons for concern about the ability of expenditure data to describe the distribution of consumption across households. The main difficulty is the variability of expenditures over time. Much expenditure information in the Australian HES is collected using an expenditure diary over a two week period. Any commodity which has a longer life span than two weeks may be providing consumption services during the survey period, even when no purchases are made. Though commodities typically defined as consumer durables have expenditures collected over a longer period (three months or a year) this period is also short compared to the life span of these commodities. This variability is not a fundamental problem for the analysis of mean expenditure (or conditional means), though it does lead to a loss of precision. Poverty estimates, however, require estimates of the distribution of consumption. Households may have a very low recorded expenditure simply because they happened to not buy much during the survey period.⁹

The same problem can occur with income data. Higher rates of poverty have been found when income for shorter periods is used, in part due to some people who are 'between income sources' (e.g. Bradbury et al., 1988). For employee households, however, income is probably more stable than expenditures.

The variability of expenditures does not necessarily rule out comparisons of the distribution of total expenditure. If we assume the extent of 'shopping variability' to be the same in employee and self-employed households, then comparisons of the proportion of households below some given total expenditure threshold may still be informative. Unfortunately, if the degree of shopping variability is large this will obscure the observation of the underlying consumption patterns.

9 One implication of this is that stocks of household assets may be better indicators of current household consumption than expenditures. The only stock data available in the 1998-94 HES are the sale prices of dwellings. We do not use these here because of concerns that they may include the value of farm businesses.

To address this issue, this paper introduces a new method of constructing an expenditure-based index of consumption. This method uses recorded expenditure on a number of commodity groups as indicators of an underlying ‘true’ consumption variable and develops an alternative weighting of expenditure patterns which better reflects this true consumption level. The intuition behind this index is that items of expenditure which have less shopping variability and which have higher income elasticities should have a greater weight.

Another version of the linear Engel curve system introduced above is used to operationalise this concept. Assume that observed expenditure x_{ij} of the i th commodity for the j th household is given by

$$x_{ij} = \alpha_i + \beta_i y_j + \varepsilon_{ij} \quad (3)$$

where y_j is the unobserved ‘permanent consumption’ of the household. The error term ε_{ij} has mean zero and variance σ_i^2 and represents a combination of preference variations around this linear model, measurement error in x_{ij} , and shopping variability. Unlike the Engel curve model of the previous section, there is no constraint that actual expenditures should total y for each household, since in any period, shopping variability will mean that some households are spending more than their permanent consumption level, and other households are spending less. Hence the ε_{ij} are defined as independent across commodities and households.¹⁰

However, permanent consumption is defined so that an adding-up constraint does hold on average, with $E_j[\sum_i x_{ij}] = E_j[y_j]$, where E_j is the expectation over households. That is, the mean of the unobserved consumption is equal to the sum of the mean expenditures on each commodity. This implies $\sum_i \alpha_i = 0$ and $\sum_i \beta_i = 1$ as before.

The easiest way to estimate this model is to define standardised variables $x_{ij}^S = (x_{ij} - \bar{x}_i) / s_i$ and $y_j^S = (y_j - \bar{y}) / s_y$ (where s_i and s_y are the

10 This independence assumption could be relaxed to explore the importance of liquidity constraints on household purchase patterns. This is left for future work.

standard deviations of x_i and y respectively). Then, using the result that $\alpha_i = \bar{x}_i - \beta_i \bar{y}$ equation (3) can be written as

$$x_{ij}^s = b_i y_j^s + e_{ij} \quad (4)$$

where $b_i = \beta_i s_y / s_i$ and $e_{ij} \sim (0, \sigma_i^2 / s_i^2)$. This is the model of common factor analysis (with a single factor), and maximum likelihood estimates for b_i can be easily obtained. Whilst the latent variable y^s is conventionally assigned a unit variance, in this case the adding-up constraint $\sum_i \beta_i = 1$ can be used to define the standard deviation of permanent consumption as $s_y = \sum_i b_i s_i$.

This type of model has been used by other researchers for the estimation of Engel curves without the simultaneity biases associated with the definition of total expenditure.¹¹ However, this is not the main purpose here. Rather, the key question is what this model can tell us about the distribution of permanent consumption. Whilst this is by definition unobservable, it is possible to estimate the linear combination of commodity expenditures which will have the highest correlation with the underlying total consumption. This is the (regression method) ‘factor score’ conventionally generated from factor analysis.¹² We can thus define a ‘weighted expenditure’ variable as

$$w_j = l_0 + \sum_i l_i x_{ij} \quad (5)$$

where the l_i are factor score weights normalised to ensure that w has the same mean and variance as permanent consumption. This ‘weighted expenditure’ gives more weight to those expenditures with a smaller error term and higher income elasticity.

11 For an application of this linear latent variable model (with other exogenous variables and panel data) see Aasness, Biørn and Skjerpen (1993). They do not utilise factor scores.

12 See Kim and Mueller (1978) for an introduction to factor analysis methods.

The estimated values for equation (3) are shown in Table 3. This is estimated for the same population and expenditure variables as for Table 2 but with expenditures on the two transport categories omitted.¹³

Table 3: Permanent Consumption Estimates^{(a)(b)}

Commodity	Mean	Standard deviation	α	β	Elasticity at mean	l
<i>l</i> ₀						83.07
Housing	111.2	97.0	52.8	0.090	0.53	0.26
Fuel	20.1	11.8	10.7	0.014	0.47	2.92
Food	136.6	64.4	33.1	0.160	0.76	1.63
Alcohol	18.5	25.5	5.7	0.020	0.69	0.80
Tobacco	9.3	17.9	12.9	-0.006	-0.39	-0.44
Clothing	42.8	73.6	-47.5	0.139	2.11	0.85
Furniture	54.8	131.2	-26.1	0.125	1.48	0.20
Household operation	27.7	40.8	-10.3	0.059	1.37	1.03
Telephone and post	14.9	13.5	9.1	0.009	0.39	1.28
Medical	35.0	31.1	8.4	0.041	0.76	1.21
Recreation (durables)	16.4	54.1	5.7	0.017	0.65	0.14
Other recreation	84.8	100.4	-34.4	0.184	1.41	0.59
Personal care	13.0	17.0	-3.2	0.025	1.24	2.55
Miscellaneous	62.8	102.0	-17.1	0.123	1.27	0.33
Total expenditure	648.0	354.7				
Permanent consumption	648.0	256.0				

Notes: a) Population and variables as for Table 2.
 b) The squared multiple correlation of weighted expenditure with permanent consumption = 0.68.

The last column of Table 3 shows the weights used to generate a weighted expenditure variable. Some goods, such as household fuel, receive a high weight because of their small error term (roughly proxied

¹³ Whilst the previous section estimated only 'business contributions' for non-capital transport expenditures, the same reasons for supposing business contributions to transport costs also apply to vehicle purchases. Moreover, vehicle purchase expenditures are extremely variable and preliminary analysis showed them to be given only a very small weight in the factor scores.

by the standard deviation score), other goods such as personal care have a higher weight because of their higher income elasticity.

Furniture and durable recreation goods have a low weight because of the ‘lumpy’ nature of purchases and hence the high amount of shopping variability. Tobacco has a negative weight because it is estimated to be an inferior good, implying that households with higher expenditures on tobacco are likely to have a lower level of permanent consumption.¹⁴

Interestingly, housing also has a low weight, despite the fact that most households have stable housing expenditure patterns. This is due to the weak relationship between housing expenditures and consumption. For home owners with substantial equity, monthly mortgage payments may have little relationship to the capital value, and hence imputed rental, of their dwelling. Table 3 is consistent with the view that it is housing wealth rather than housing expenditure that is most associated with high levels of consumption on other goods.

Finally, the standard deviation of the implied permanent consumption is significantly less than the standard deviation of actual total expenditure (excluding transport in both cases). The gap between these two measures of variability includes the effect of shopping variability, but also includes measurement error and variations of the true Engel curve from the linear form.

What does this weighted expenditure variable tell us about the extent of poverty among the self-employed compared to employee households? In income distribution studies, poverty is typically defined using a poverty threshold together with assumptions about how the needs of families differ with their composition. Rather than make assumptions about these elements of the poverty definition, the following procedure is used to describe the difference between employee and self-employed poverty status. Three consumption indicators are used: net income, total expenditure excluding transport, and the weighted expenditure defined above. For the combined population of employees and self-employed, the

14 These estimates differ from those of Table 2 because of the omission of the other independent variables and the use of a different error structure.

10th and 20th percentiles are calculated for each variable (unweighted data are used). A set of logistic regressions (six) are then estimated with the probability of being below one of these thresholds as the dependent variable, and self-employment status and the other variables used in the regression of Table 2 as independent variables.

The logistic regression parameter estimates for self-employment status are shown in Table 4. The first panel of the table shows results using net income as the poverty index. Self-employment status is highly significant as an indicator of poverty, at either the 10th percentile threshold of \$411 per week, or at the higher 20th percentile threshold. The last column shows the approximate increase in poverty when going from employee to self-employment status, holding demographic (and state of residence) variables constant. The increase is very large for the net income measure, though for large changes such as this the approximation is not very good.¹⁵

The expenditure measures show a much smaller increase in poverty with self-employment, but a statistically significant increase nonetheless. Using weighted expenditure as the index, the results suggest that whilst employees may have a 10 per cent poverty rate, the rate for the self-employed is approximately 16 per cent. Note, however, that this increase in poverty is much less for the weighted expenditure index than that obtained using the conventional unweighted expenditure.

Whilst these results do suggest that there is indeed significant poverty among the self-employed, some caveats are in order. First, the weighted expenditure variable is not perfectly correlated with the underlying ‘true’ permanent consumption variable. Some shopping variability and measurement error remains. However, shopping variability on its own should merely serve to dampen down any observed variations.

More pertinent to the current examination is that the estimates assume that shopping variability (and measurement error) are the same between

15 The approximation assumes that employees have a 10 or 20 per cent poverty rate (depending upon the threshold) and that the self-employed logistic regression parameter shows the increase in their log-odds of poverty.

Table 4: The Impact of Self-employment on the Probability of Expenditure Poverty

	Threshold (\$/wk)	Logistic regression parameter for self-employed	Standard error	Approx. increase in probability
Net Income				
10th percentile	411	2.29	0.14	0.42
20th percentile	499	1.66	0.11	0.37
Total Expenditure (excl. transport)				
10th percentile	329	0.97	0.14	0.13
20th percentile	404	0.60	0.12	0.11
Weighted Expenditure				
10th percentile	396	0.56	0.15	0.06
20th percentile	454	0.35	0.12	0.06

the self-employed and employee households. It is plausible that farmers in particular may shop less frequently than city dwellers, and may hence have a greater number of fortnights when they did not go shopping. Examination of the proportion of households with zero expenditures for various commodity groups shows only small differences between the self-employed and others, but this is not conclusive. Future research will examine these issues further, as well as drawing upon other data sets where it is possible to exclude farmers from the comparison.

5 Poverty Among the Low-income Self-employed: A Second Look

We now return to have a second look at indicators of living standards for the low-income self-employed. Table 5 replicates the results for total expenditure shown in Table 1, along the means and medians of the new expenditure variables introduced in the previous two sections.

Looking at the overall averages shown in the first panel of Table 5, the difference between employee and self-employed average consumption

Table 5: Alternative Average Expenditure Measures^(a) for Low-income Working Couples: 1993-94

		Self- employed (\$/week)	Employee (\$/week)	Ratio (SE/Emp)
All Households (100%)				
ABS definition	Mean	648	773	0.84
	Median	611	687	0.89
Excluding transport	Mean	567	657	0.86
	Median	527	576	0.91
Weighted expenditure	Mean	604	649	0.93
	Median	574	600	0.96
Households with net income < \$500 pw (22%)				
ABS definition	Mean	577	548	1.05
	Median	526	511	1.03
Excluding transport	Mean	498	459	1.08
	Median	446	417	1.07
Weighted expenditure	Mean	561	495	1.13
	Median	522	465	1.12
Households with net income < \$400 pw (10%)				
ABS definition	Mean	580	571	1.02
	Median	498	482	1.03
Excluding transport	Mean	497	451	1.10
	Median	426	358	1.19
Weighted expenditure	Mean	558	496	1.13
	Median	521	454	1.15
Households with equivalent net income < \$500 pw (16%)				
Equivalent weighted expenditure	Mean	618	537	1.15
	Median	556	503	1.11

Note: a) ABS weights used.

Source: ABS 1993-94 Household Expenditure Survey Unit Record File. Population as for Table 1.

patterns does shrink as we move from the ABS to the weighted expenditure measure. In other words, the self-employed spend almost as much as employee households on those commodities which have a stronger correlation with permanent consumption, though they spend less

on other commodities. Whilst their average consumption remains lower, their incomes appear to be very much lower than their true consumption level would suggest. That is, if we use the employee relationship between income and weighted expenditure to calculate comparable self-employed incomes, they are 34 per cent higher than the recorded average income (in Table 1).

The next three panels more directly address the question of whether the low-income self-employed are poor. As for the overall average, the use of the weighted expenditure variable implies a higher relative living standard for the self-employed. This is addressed most explicitly in the final panel where an equivalence scale is used in the definition of the poverty threshold and expenditure is measured on a per equivalent person basis.¹⁶ Depending upon the poverty threshold and average used, the low-income self-employed have average living standards some 11 to 15 per cent higher than the low-income employee households. Whilst this does not imply a high living standard, it does seem to be the case that the low-income self-employed are not as poor as low-income employee households.

There is no necessary conflict between this conclusion and the conclusion of the previous section that poverty was actually higher among self-employed families. Assuming that conclusion to be correct, this pattern simply implies that, whilst there may be extensive poverty among self-employed families, low income is not as good an indicator of their poverty as it is for employee households. In particular, there are some self-employed households which have incomes above the low income threshold, but have low consumption levels. This can arise because the income data are collected for a previous period, whilst the business (and hence household consumption) is currently not doing very well. Alternately, it might be due to self-employed households having higher saving rates than employees. In this latter case we might question whether the family should be described as poor.

16 The equivalence scale for both income and expenditure is simply $\sqrt{n}/2$, where n is the number of people in the household (equivalent income equals actual income in four person households).

6 Family Income Transfers and the Self-employed

What do these results imply for policies such as family payments paid by the Department of Social Security, designed to assist low income working families with dependent children?

In themselves the above results provide only a very partial guide to the targeting effectiveness of these payments. Whilst Family Payment uses an income measure as a primary targeting mechanism, and this income measure is quite similar to that collected in the ABS Household Expenditure Survey, the assessment of entitlement is more complicated than this. In particular, Family Payments are subject to an assets test which excludes many low-income self-employed families from receipt. Moreover, it may be the case that the self-employed in particular will find the act of applying for these payments to be particularly intrusive (and possibly stigmatising), and so they will exercise self-selection and only apply when they consider themselves to be in real need.¹⁷

Table 6 presents evidence on the living standards of self-employed and employee families receiving Additional Family Payment in 1993-94. This payment is not separately identified in the HES file, but can be inferred from information on the amount of combined Family Payment and Additional Family Payment (AFP) received by the household (with some approximations). The population of Table 6 is those couple households included in the previous tables, who were also apparently receiving \$15 per week or more AFP in 1993-94.

Whilst the sample size is small, the results of this table are broadly consistent with those of the previous section. The incomes of self-employed AFP families are much lower on average and this is reflected in their higher rates of payment per child. However, the average expenditures of the self-employed are generally higher. The only exception to this is the mean of total expenditure, where employees have a higher expenditure level. Further examination reveals this to be due to some outlier high expenditures on house purchase and transport costs:

17 Though DSS efforts to increase take-up will act against this.

Table 6: Living Standard Indicators for AFP Recipient Families: 1993-94

		Self- employed (\$/week)	Employee (\$/week)	Ratio (SE/Emp)
Sample Size		73	191	
Net income	Mean	271	608	0.45
	Median	368	550	0.67
Total expenditure (ABS)	Mean	600	641	0.94
	Median	598	543	1.10
Weighted expenditure	Mean	594	580	1.02
	Median	586	532	1.10
Equivalent weighted expenditure	Mean	554	530	1.05
	Median	542	493	1.10
AFP per child	Mean	34	28	1.21
Home owner or purchaser	%	67	55	1.22
Rent free	%	7	9	0.78

Source: ABS 1993-94 Household Expenditure Survey Unit Record File. Weighted estimates.

items which have a low (or zero) weight in the weighted expenditure variable. The most appropriate (and robust) measure for poverty purposes is probably the median of weighted expenditure, which is some 10 per cent higher for the self-employed.

In addition, self-employed households have a significantly higher rate of home-ownership, and hence a higher consumption of housing services than employee AFP recipients (and higher net wealth).¹⁸

7 Conclusions

This paper has examined the contribution of expenditure data to our understanding of the extent of poverty among self-employed families. Whilst expenditure does not equal consumption, and for many

¹⁸ The 1989-90 Income Distribution Survey shows an even greater disparity in home ownership rates (Eardley and Bradbury, 1996 forthcoming).

households expenditure is quite variable over time, it is possible to use this rich source of data to reach a better understanding of the distribution of living standards across the self-employed population.

The first conclusion reached in this paper is that average incomes are a very poor indicator of living standards for the self-employed. Using the new weighted expenditure variable developed here, the true consumption capability of the self-employed appears to be 34 per cent higher than implied by their incomes (only about three percentage points of this appears to be due to income recording lags).

This difference in consumption capability includes under-reporting of income by the self-employed, but also reflects any difference in saving rates between the self-employed and employee households. Some self-employed are undoubtedly 'living off the overdraft' and running their assets down in order to maintain this higher consumption level. Whilst this has to be financed in some fashion, and thus not count in the aggregate, it is possible that the build up of savings is undertaken when the person is not self-employed. For example, some people might save when they are employees, run down their assets as they try to start businesses, then return to employee status when their businesses collapse. Whatever the interpretation, the difference in expenditure levels does serve as an indicator of ability to finance consumption.

A second conclusion is that, in 1993-94, the incidence of low consumption was higher among self-employed families than among employee families. The main caveat to this conclusion is that this may be due to a lower shopping frequency among self-employed families (in particular farmers). On the other hand, the poor agricultural conditions of this period make this conclusion plausible.

A third, and apparently contradictory, conclusion is that the living standards of low-income self-employed families are higher, on average, than low-income employee households. This arises because of the weak link between income and expenditures for the self-employed. More self-employed than employees, for example, are recorded in the survey as having average incomes, but very low expenditure levels. This is

probably due in large part to the recording lags for self-employment income.

Finally, self-employed families receiving Additional Family Payment appear to have slightly higher living standards, and higher housing wealth levels, than employee families. The best estimate here is that the consumption level of self-employed families receiving AFP is about 10 per cent higher than that of employees. Whether alternative policies could improve this targeting is not considered here. Indeed some might consider the small difference in expenditure levels as a policy success, given the administrative difficulties of identifying needy self-employed.

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