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**Publication details:**

Working Paper No. 135  
SPRC Discussion Paper  
0733421598 (ISBN)  
1447-8978 (ISSN)

**Publication Date:**

2004

**DOI:**

<https://doi.org/10.26190/unsworks/267>

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# **ACCOUNTING FOR HOUSING COSTS IN REGIONAL INCOME COMPARISONS**

By Peter Siminski and Peter Saunders

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SPRC Discussion Paper No. 135

*August 2004*

Published by  
The Social Policy Research Centre  
University of New South Wales  
Sydney NSW 2052  
Australia  
© SPRC 2004

ISSN: 1447-8978  
ISBN: 0 7334 2159 8

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This paper is part of a broader project on household inequality and living standards involving the Social Policy Research Centre (SPRC) and the Australian Bureau of Statistics (ABS) under Australian Research Council SPIRT grant No. C00106830. The authors acknowledge the suggestions and extensive discussions with Bruce Bradbury (SPRC), Leon Pietsch, Bob McColl, Jan Gatenby and Jenny Harber (ABS), which contributed greatly to this paper, and the comments made by delegates of the 2003 Australian Social Policy Conference. The views expressed in the paper are those of the authors.

## **Abstract**

This paper discusses a series of methodological issues that arise when assessing regional differences in the propensity of households to be relatively poor, focusing specifically on whether it is better to base such comparisons on measures of income that are defined before or after deducting housing costs. It is argued on conceptual grounds relating to the factors that give rise to regional differences in housing costs, that an after-housing costs measure of income is preferable for some, but not all, regional analyses. It is also demonstrated that differences in housing costs are not always offset by differences in transport costs and, in fact, transport costs are higher on average in major cities than in the balance of Australia. Regional income comparisons of income both before and after housing costs are presented derived from unit record data from the latest (1998-99) Household Expenditure Survey and from the 2001 Census. Despite differences in data coverage and definition, the patterns are not sensitive to the data source used, both sources indicating that while the percentage of people in low-income (bottom quintile) households is lower in major urban locations than in the rest of Australia, these differences are much smaller when account is taken of housing costs. These results contradict other studies that show a large gap in regional living standards in Australia.

## **1 Introduction**

The main purpose of the paper is to discuss methodological issues in assessing geographical differences in the propensity of households to be relatively poor, and to make a broad assessment of such geographical differences. An issue of particular significance in this context is the way in which differences in housing costs between regions should be incorporated into the analysis. The use of disposable income to measure the standard of living will yield different results to that obtained by measuring income after housing costs – both on average, and in relation to the distribution of income between different social groups. It is argued that the latter is a useful alternative indicator of comparative living standards, though both measures have their limitations.

It has been argued that a measure of income that includes imputed rent is preferable to cash income for most distributional analyses of living standards, particularly in a country like Australia where the rate of home ownership is high. The inclusion of imputed rent highlights inequalities by housing tenure or life cycle phase that can be obscured if the standard disposable income measure is used. But the addition of imputed rent does nothing to solve the problem of housing price differences in regional analyses of living standards. Regional analyses of living standards will always be problematic, especially without acceptable spatial price indices. But we question whether such indices are appropriate in the realm of housing, and also assess whether higher housing costs are offset by lower transport costs at a regional level. Our results remain subject to uncorrected price differences, but we believe that the extent of this problem is reduced through the process we have undertaken.

The paper is organised as follows: Section 2 contains a discussion of the conceptual issues associated with allowing for housing costs when comparing living standards. The data and methods utilised are the discussed in Section 3. Section 4 provides our results, which compare regional differences in the incidence of low-income households based on income measured both before and after housing costs. The main conclusions are briefly summarised in Section 5.

## **2 The Case for Examining Income After Housing Costs**

Despite the interest in the topic among policy makers and politicians, there have been relatively few attempts to analyse regional differences in household income in Australia. One recent study confirmed the widespread perception of a growing regional divide by concluding that there is a ‘large and growing gap between the incomes of those Australians living in capital cities and those living in the rest of Australia’ (Lloyd, Harding and Hellwig, 2001). The authors acknowledge that lack of data prevented them from taking account of regional price differences, even though such price differences can be significant particularly in relation to housing (see for example King, 1995).

Another recent study by Bray (2001) shows that the proportion of households that have ‘lower income’<sup>1</sup> is much higher in areas outside of capital cities, but he too does not consider differences in prices or housing costs. Harding and Szukalska (2000)

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<sup>1</sup> He defines lower income as being in the bottom 43.2 per cent of the income distribution.

compare poverty rates between capital cities and the rest of Australia, before and after housing costs. Their results indicate that the difference in poverty rates between capital cities and the rest of Australia changes little between the before and after housing costs measures, a finding that is very different to that produced by Siminski and Norris (2003) (although the data and methods used are not strictly comparable).

In the absence of regional price indices, is there a better approach to the use of cash income when comparing relative living standards, and are such indices in any case appropriate for adjusting for differences in regional housing prices? Much of the literature in this area assumes that price indices are appropriate in the case of housing in the same way as all other goods and services. In the US, for example, Citro and Michael (1995, pp. 182-201) discuss the issue of adjustments to the poverty threshold on the basis of price differentials by geographical area, in the context of measuring poverty. Among the numerous issues that arise are whether the adjustment should be made on the basis of a fixed (national) bundle of goods and services or a regionally specific bundle. Should the bundle be based on an average household's consumption bundle (such as the CPI bundle), or on a low-income household's consumption bundle? Since any such an index would assume uniformity within a given region, how large or small should each region under consideration be? After reviewing the issues, Citro and Michael conclude that a bundle of goods and services that is typical of a low-income household and fixed across regions should be priced in different geographical areas, and income should be adjusted accordingly.<sup>2</sup>

One issue that has been somewhat neglected by such research is the specific nature of housing within the consumption bundle. A washing machine purchased in the country is the same commodity as an identical washing machine purchased in the city since both provide identical services, so comparing their prices is a sensible exercise when considering their contribution to living standards. Housing, however, cannot be assumed to be a homogenous commodity across regions in this sense. Even if the dwellings themselves are physically identical, their location makes them fundamentally different commodities, rather than the same commodity at a different price.<sup>3</sup>

### **Why housing costs vary**

Housing costs are generally much higher in major cities than in regional and rural areas. Consider two families that receive equal cash incomes and rent similar dwellings, but in different locations. One family lives in a major city, and the other lives in a regional town. The rent that the first family pays is most likely to be considerably above that of the second family. Therefore, although the two families have equal resources (cash income) available for (total) consumption, the first family

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<sup>2</sup> In the spirit of this approach, it would be possible to develop an index for Australia's regions using the bundle of goods and services established by the SPRC's budget standards research (Saunders et al., 1998). Saunders (1998) makes a start in this direction, but the data that are necessary to make comprehensive regional price adjustments do not presently exist. Even if they did exist, they would be limited to available geographical classifications with assumed internal homogeneity, and in any case, the issue of comparability between regions should not be reduced to simple price disparities.

<sup>3</sup> For related reasons, the literature on cross-country income comparisons acknowledges difficulties in accounting for housing in the construction of Purchasing Power Parities (PPPs), referring to housing as 'comparison resistant goods' (Castles, 1997, p. 28).

will have fewer resources available for non-housing consumption. Under the cash income measure, the two families are assumed to have the same economic standard of living, since they have the same resources available for (total) consumption. And since the imputed rent approach does not affect renting households, it will lead to the same conclusion.<sup>4</sup>

It is reasonably uncontroversial to assume that the rent differential reflects the relative locational benefits of the dwellings. However, the additional assumption implicit in the cash and imputed rent approaches is that these locational benefits reflect differences in direct utility value. An alternative approach, set out below, is to assume that the high rental prices in major cities partly result from the potential for city-dwellers to access better jobs and thus earn higher incomes. This alternative approach has major implications for regional income distribution analysis, as we will demonstrate.

An important question to address in this context is why the housing market values the dwelling in the city at a higher price. There are two possible reasons for this: Firstly, it is possible that people prefer to live in cities more than in the country, for reasons of accessibility to shopping, leisure facilities, or to other people. If this was the entire reason for the price differentials, then there would be less need to make price adjustments between regions on the basis of housing. Housing could be seen as consumption expenditure, and the choice of a location of residence would reflect consumption preferences.<sup>5</sup>

An alternate explanation for the city-country differential in house prices is to consider the geographical location of paid work, and wage differentials between regions. Remuneration of paid work is generally higher in urban areas than in regional or remote areas, and the choice of where to live is also constrained by where jobs are available. It is reasonable to assume initially that people would consider both their potential income capacity and their housing costs when assessing where to live.<sup>6</sup> The difference between the price of an apartment in the city and an identical apartment in the country can then be considered to reflect the expense associated with earning a higher income in the city. Under this reasoning, it would make sense for regional comparisons of income to be made net of the 'premium' in housing costs that result from gaining access to a stronger labour market.

In the language of National Accounting frameworks such as SNA93, this implies regarding this premium as 'intermediate consumption', purchased only as an input into the production process, rather than 'final consumption', from which utility is directly derived (UNSD, 2001).<sup>7</sup> Such an approach implies adjusting the definition of

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<sup>4</sup> One could also consider a similar example, using two home purchaser households. Using the imputed rent method, the family living in the city often has a higher total income, even though it has fewer resources available for non-housing consumption.

<sup>5</sup> Price adjustments should still, however, be made if one assumes a lack of mobility between regions on the part of households.

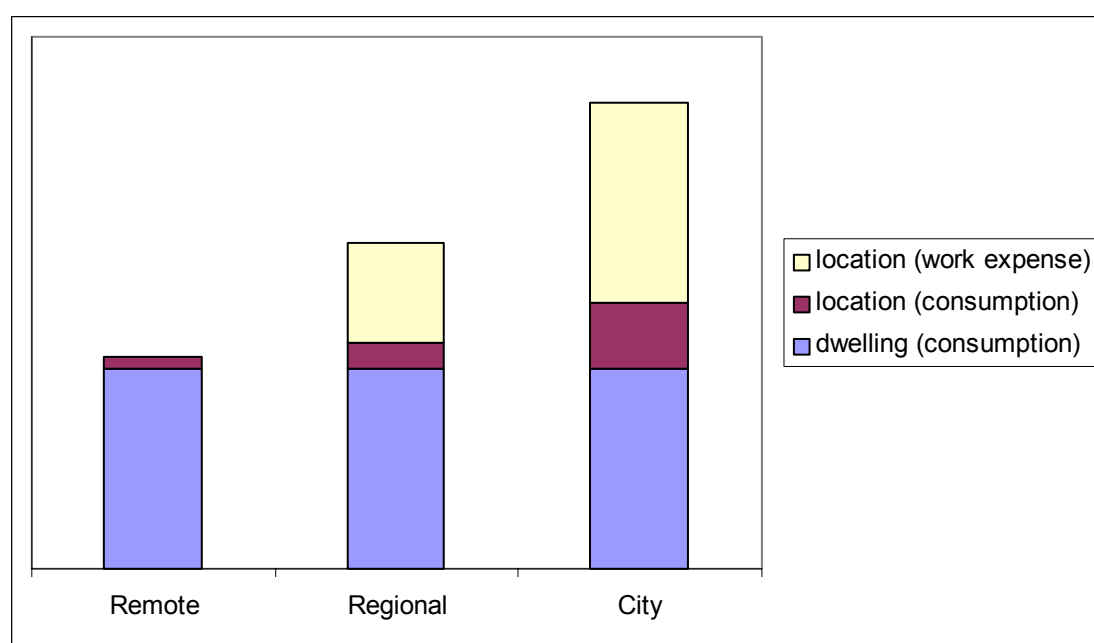
<sup>6</sup> This choice is constrained, since regional differences in earnings are partly driven by regional differences in industrial and occupational structure.

<sup>7</sup> SNA93 does not, however, recommend a process for accounting for intermediate consumption by employees (UNSD, 2001).

income to reflect regional differences in housing costs, whilst regarding housing in different regions to be different commodities. In contrast, the standard approach to housing price differences as described by Citro and Michael involves treating housing in different locations as the same commodity, purchased at different prices.

In order to adopt this framework, one would need to disaggregate each household's housing expenses into a 'work expense' component associated with location, and a (final) consumption component (consisting of the benefits of the physical dwelling itself and the consumption benefits of the location). A stylised example of how such components may differ geographically is shown in Figure 1, where three dwellings are considered. These are located in a remote, a regional, and a city area, respectively but are otherwise identical. The consumption value of the *dwelling* (in terms of the services it guarantees) is constant by definition across the three regions. The consumption value of the *location* is assumed to be higher in the city, while the 'work expense' component of the cost of housing is assumed to be strongly related to location, being much higher in the city than elsewhere, and zero in rural areas. Under the framework proposed here, the 'location (work expense)' component of housing consumption should be deducted from each household's income in order to make meaningful comparisons between regions.<sup>8</sup>

**Figure 1: Stylised Example of the Determinants of Regional Differences in Dwelling Rent**



<sup>8</sup> One complication that arises relates to the treatment of households with no one in the labour force. Since their housing costs are not a function of their current access to higher incomes, it could be argued that no adjustment should be made to their incomes (although their current income may reflect the income consequences of past location decisions). In practice, however, this may not be a crucial issue in Australia, since most such households are retirees, and since the majority of retirees are outright home-owners, their housing costs do not vary greatly by geographical location.

It might be possible to adopt the above framework comprehensively, utilising detailed housing and wage data, though this is beyond the scope of this paper. However, the framework points to an alternate (available) method, in which all three components of housing costs discussed above are subtracted from income. This would be a reasonable method to adopt on the assumptions that the ‘location (consumption)’ component is a small determinant of regional housing cost differences, and if the quality of dwellings is not systematically different between the regions under consideration. However, these are not trivial assumptions.

At the very least, the after housing costs method provides a useful complement to comparisons based on unadjusted (before housing costs) cash income. In comparing incomes between regions, the after housing costs approach ignores housing quality (which may vary between regions), while the cash income approach ignores house prices (which vary greatly between regions). The imputed rent method is based on the assumption that rental price differences are not influenced by access to places of employment. Thus, all three approaches have their limitations and a combination of them is preferable to relying on any one method.

These insights have emerged in recent income comparisons across countries – where the issue of housing costs is important because of differences in housing policies and in the form in which housing assistance is delivered. Thus, Ritakallio (2003) compares the after-housing costs measure with the before housing costs and imputed rent measures. He argues (p.89) that the former ‘most genuinely reflects the daily life situation when households are assessing the sufficiency or insufficiency of their disposable incomes’ and he thus prefers this measure to income before housing costs.

### **Travel costs**

Another factor contributing to variations in higher housing are transport costs. In this instance, the argument is that living in closer proximity to one’s place of work and to other social amenities will result in lower transport costs that will offset the higher housing costs associated with these locations. If there is truth in this, then it could be argued that an after-housing costs measure of income may not be appropriate when analysing regional income distribution. King (1996) – building on the argument that there is likely to be an inverse relationship between housing costs and transport costs proposed in an earlier paper (King, 1995, p. 70) - describes a simple model in which higher housing costs are partly the result of capitalised accessibility. In simple terms, people are prepared to pay more to live in locations that result in lower transport costs.

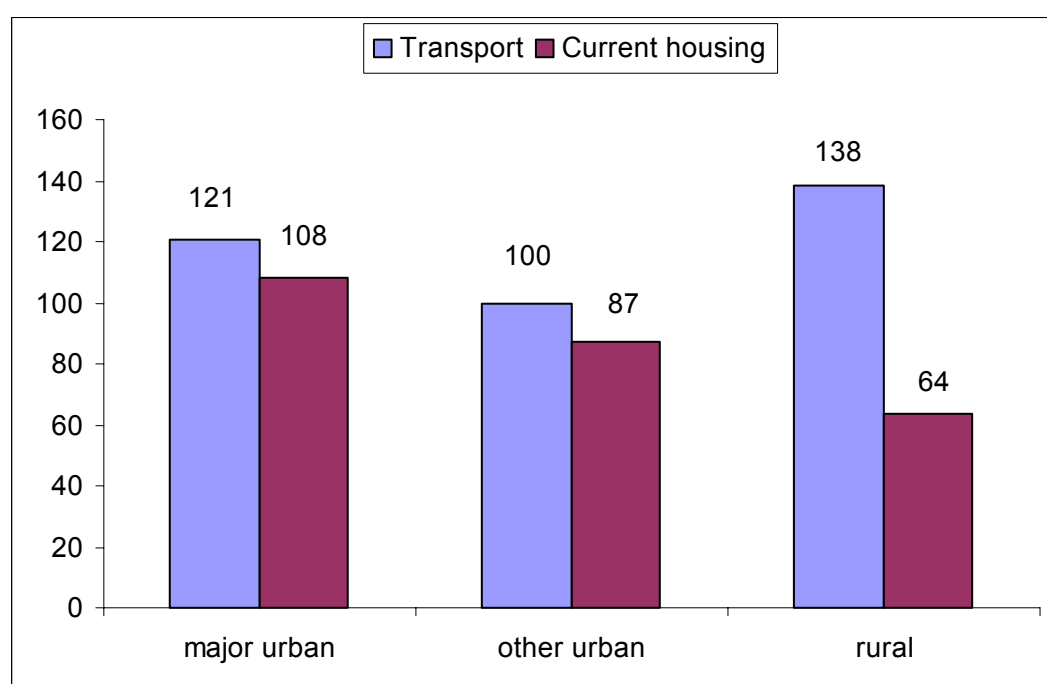
This argument is difficult to reject when one considers a household’s choice of place of residence. But this does not necessarily imply that such a relationship also applies at a geographically aggregated level, where the empirical evidence suggests a more complex relationship exists between housing costs and transport costs. King’s (1996) own analysis did not reveal any systematic relationship between housing costs and transport costs within capital cities, and we now present a brief summary of other such evidence, using data from two recent ABS surveys.

The *1998-99 Household Expenditure Survey* (HES) includes measures of expenditure on transport, but there is no distinction made between work-related and other transport expenditure. The *1997 Time Use Survey* (TUS), on the other hand, includes a measure of travel time that is specifically work-related. If one assumes that the proportion of travel expenses that are work-related is equal to the proportion of travel time that is

work-related, then the two datasets can be combined to derive an estimate of the amount spent on work-related travel.

Contrary to the hypothesis that higher housing costs are off-set by lower transport costs, the HES 98-99 data reveal that average weekly household expenditure on travel is actually slightly *higher* in major urban areas than in the balance of Australia (\$121 compared with \$113). At a slightly finer degree of disaggregation, rural households spend the most on transport (\$138), while households in other urban areas spend least (\$100). The difference between the two (\$38) is greater than the corresponding difference in average current housing costs in these two locations (\$23) (Figure 2). A similar pattern is observed when one limits the analysis to households with at least one employed person.<sup>9</sup>

**Figure 2: Mean Weekly Household Expenditure on Travel and Housing by Section of State (\$1998-99)**



Source: Calculated by ABS from ABS Household Expenditure Survey 1998-99; Main Unit Record File

The results shown in Figure 2 raise questions about whether or not the observed differences in transport expenditure are driven by price differences between regions, or by the quantity of travel consumption. What is the nature of this expenditure, is it equally based on necessities between regions, or is it perhaps more of a luxury for city dwellers? Are they a function of work-related travel or travel for other purposes?

While it is difficult to answer these questions, data from the 1997 *Time Use Survey* (TUS 97) provides complementary evidence. Whilst time has a value in its own right, here we use the TUS 97 data to draw inferences about the monetary expenditure on

<sup>9</sup> One could also include imputed rent as a component of housing expenditure when comparing the appropriateness of the income after housing cost measure to the income plus imputed rent measure. Whilst we have not done that here, it would not change the general conclusion that the higher housing costs of major cities are not offset by lower transport costs, and that the higher housing costs of 'other urban' areas compared to rural areas would be offset by lower transport costs.

travel data as discussed above.<sup>10</sup> TUS 97 data reveal that average travel time per person is higher in major urban areas (75 minutes per day) than in other urban (63 minutes) or in rural areas (67 minutes).<sup>11, 12</sup> Average employment-related travel time is also higher in major cities (22 minutes) than in other urban (15 minutes) or rural areas (19 minutes). These results also hold when one considers only households that contain an employed person (Table 1).

The results in Table 1 thus suggest that the relatively high travel expenditure of people in major cities is a result of a higher 'volume' of travel, rather than other factors (for example a stronger preference for luxury vehicles or other more expensive forms of travel). Further, the majority of this difference in travel volume is work related. The results also suggest that the higher expenditure of rural households on travel shown in Figure 2 is a result of higher prices rather than a higher quantity of travel consumption. This may be a reflection of higher fuel prices, and/or higher costs of travel per unit of time on the open road compared to travel in more densely populated areas.

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<sup>10</sup> We acknowledge that ignoring the value of time can be perceived as a limitation in the analysis, but this is no different to ignoring the varying amounts of time that wage and salary earners work in order to earn their income. The inherent value of time can be seen as being beyond the scope of household income distribution analysis, although analysts such as Travers and Richardson (1993) have attempted to incorporate the value of time in their measure of full income. See also Apps (2002).

<sup>11</sup> The TUS 97 definition of travel time includes travel time associated with personal care, employment related activities, education activities, domestic activities, child care activities, purchasing goods and services, voluntary work and care activities, social and community interaction, recreation and leisure. Total travel time is equal to the sum of these nine forms of travel time. Employment related travel time is defined by ABS as: 'Travel associated with employment related activities, in motion or waiting. Travel to and from work, job interview etc. or from one to another work episode (different jobs). ... Waiting for trains, buses, taxis, private lifts etc. Walking from car park to the office' (ABS, 1998, p. 32). In analysing these data, episodes of time that included travel as either a primary or secondary activity were included as travel time. In calculating the results presented in this paper, diaries with more than 90 minutes of missing data (for a given day) were excluded.

<sup>12</sup> The TUS 97 confidentialised unit record file (CURF) groups major urban areas and capital cities together. However, the only capital city that is not a 'major urban' area is Darwin. Since Darwin contains less than 0.5 per cent of the population, this category is a good approximation to the major urban category (which is used in HES 98-99).

**Table 1: Mean Daily Travel Times by Section of State (Minutes)**

	<b>Employment related</b>	<b>Other</b>	<b>Total</b>
All Persons:			
Capital city/major urban	22	53	75
Other urban	15	49	63
Rural	19	48	67
Employed Persons:			
Capital city/major urban	35	50	86
Other urban	25	43	68
Rural	29	42	71

*Source:* Authors' calculations based on the ABS *Time Use Survey 1997*; Confidentialised Unit Record File.

These findings imply that, contrary to conventional wisdom, average expenditure on travel and the average time spent in travel are slightly *higher* in major urban areas than in the balance of Australia. It follows that the higher housing costs in urban areas are, overall, not offset by lower transport costs. However, the circumstances of households within major cities are not homogenous and there is spatial variation within cities. In relation to transport costs for example, there is evidence of such differences from the *Housing and Location Choice Survey* (HALCS). Not surprisingly, such data suggest that average travel times to work in Sydney and Melbourne increase with distance from the CBD (Burgess and Skeltys, 1992, 58). There is also a greater reliance on (expensive) car travel in fringe/outer areas of cities than in core/inner areas suggesting that work related travel in outer and fringe city areas exceeds that in inner city areas.

In the more detailed regional comparison, Figure 2 indicates that the difference in mean current housing costs (\$23 per week) between 'other urban' and 'rural' households is more than offset by differences in average travel expenditure (\$38 per week). This suggests that income after housing costs is probably less appropriate than cash disposable income as being the preferable measure in this case.

To conclude, there is spatial variation in transport costs both within major cities and within the rest of Australia. However, there is little difference in average transport costs between major cities and the balance of Australia. Therefore, it seems reasonable to put the issue of transport costs aside when making comparisons between major urban areas and the balance of Australia, suggesting that income after housing costs is a reasonable measure for this comparison. It is likely that income after housing costs is a better measure than cash income for most regional income comparisons, except those involving rural areas. At the very least, income after housing costs should be given more emphasis in regional analyses than is currently done.

### 3 Data and Methods

As already implied, the main data source used in the analysis is the ABS Household Expenditure Survey 1998-99 (HES 98-99), and we now report on these results.<sup>13</sup> We follow ‘international best practice’ by using equivalent (need-adjusted) disposable income (defined both before and after housing costs) as the preferable cash income measure for studies of household income distribution (Atkinson, Rainwater and Smeeding, 1995). The person is the unit of analysis, and it is assumed that income is shared fairly within the household, so we analyse the distribution of ‘person-weighted’ household income. We have used the full Henderson equivalence scales to adjust for variations in household need, since this scale explicitly differentiates between the equivalence adjustments required for cash disposable income, and for disposable income after housing costs (See Johnson, 1987; Saunders, 1994).

The choice of the appropriate measure of housing costs depends on the focus of the study and is limited by available data. Ideally, the measure should be defined in a way such that households of different tenure types are treated comparably. Rent payments are the only housing costs included in the HES data for renters. Since rent payments cover the landlord’s council rates, water rates, maintenance costs and building insurance, for consistency these should be therefore also be included in the housing costs of owner-occupiers, who directly incur such costs.

The question of whether or not to include the principal component of mortgage repayments as component of housing costs raises difficult issues. The argument against inclusion is that these costs can be considered as saving, and hence represent a voluntary choice on behalf of the owner-occupier to defer consumption. The argument for inclusion is that the resulting measure of income after housing is the better indicator of the level of income available for non-housing consumption. We prefer to include payments on the principal component for this reason.<sup>14</sup> Our preferred measure of expenditure on housing is thus the sum of current (direct) housing costs (consisting of rent, mortgage repayments – interest component, general rates, house and contents insurance, repairs and maintenance, loans for alterations and additions – interest component, and body corporate payments) and the principal component of mortgage repayments. This is the measure used in the results derived from the HES data.

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<sup>13</sup> There are some minor scope limitations of the HES data that may affect some of the results that follow. Households located in ‘remote and sparsely settled areas’ – defined as areas in which there were less than 0.06 dwellings per square kilometre - were out of scope and have been excluded from the analysis (ABS, 2000, p. 14). The supporting documentation for the Time Use Survey (which has the same limitation) suggests that some 175,000 people were out of scope on this basis (ABS, 1998, p. 10). The corresponding number of persons ruled out of scope from the HES 98-99 survey is likely to be similar. This represents less than one per cent of the total population. In reference to the main regional comparisons presented in this paper, the figure represents about 2.5 per cent of the population residing outside of major urban areas, or about seven per cent of people residing in rural locations.

<sup>14</sup> The latter measure is also clearly preferable when examining the implications for children, since the deferral of consumption is not a choice that they are likely to contribute to, and they are less likely than their parents to benefit from such saving when it is realised in the future. Bradbury and Jantti (1999, p. 6) make a similar point in arguing that the savings component of household income is not a contributor to children’s consumption.

Various tests were conducted to assess the sensitivity of the results to different treatment of the basic HES data, including the exclusion of households with nil or negative incomes, and the choice of housing cost variable. The sensitivity results, reported in Appendix A, did not make a statistically significant difference to the estimated patterns of low-income rates reported below.

The geographical classification used is the ABS Section of State (SOS) classification (ABS, 2002). SOS is defined only in census years, so we have applied the 1996 classification to the HES data. Each SOS category represents an aggregation of non-contiguous geographical areas of a particular urban/rural type. These categories are: major urban (urban areas with a population of 100,000 or over); other urban (urban areas with a population of between 1000 and 99,999 people); bounded locality (rural localities with populations of between 200 and 999 people); and rural balance (the remainder of the State/Territory). An additional category (migratory), which is composed of off-shore, shipping and migratory census collection districts (ABS, 2002, p 35) has been excluded altogether from the analysis.

## 4 Results

We have argued that income after housing costs measure provides the best measure for making standard of living comparisons between regions given existing data availability and limitations. We now present results using this measure, focusing initially on broad comparisons between major urban areas and the balance of Australia. Table 2 indicates that persons in major cities have higher mean incomes than persons living elsewhere in Australia, whether or not housing costs are deducted from income. On a before housing costs basis, mean equivalised disposable income is 16 per cent higher for persons in major cities, and although the difference is reduced using the after housing costs measure, it remains large at 12 per cent.

**Table 2: Mean Income of Persons Before and After Housing Costs by Major Urban versus Balance of Australia (\$1998-99)**

	Major urban	Balance of Australia	Percentage difference
Equivalent disposable income before housing costs	840	722	16
Equivalent disposable income after housing costs	686	612	12

*Source:* Calculated by ABS from ABS *Household Expenditure Survey 1998-99*; Main Unit Record File

We now examine the distributional aspect by comparing the proportion of persons defined by region who fall within the lowest quintile (20 per cent) of the national distribution of each income measure.<sup>15</sup> The HES 98-99 data suggests that people living in major urban areas are much less likely to live in low-income households than people living elsewhere in Australia (17 per cent compared with 25 per cent).<sup>16</sup> When

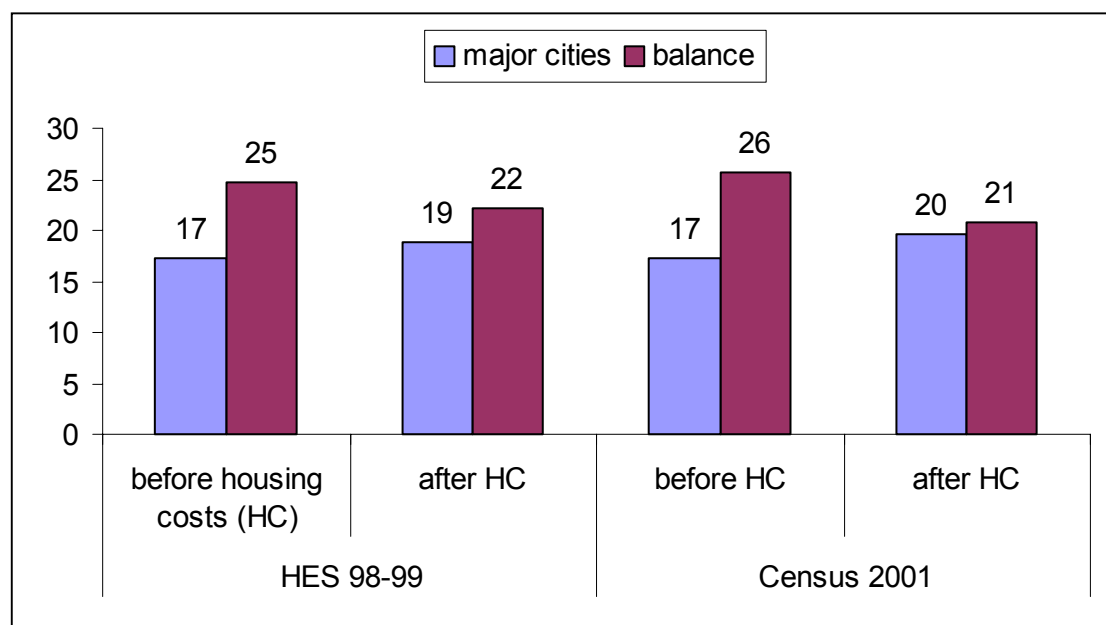
<sup>15</sup> The low-income rates are not poverty rates because they are defined using an arbitrary income benchmark rather than a poverty line.

<sup>16</sup> If there were no regional differences in the propensity to receive a low income, than these figures would, aside from any sampling error, be equal to 20 per cent in all regions, given how we have defined low-income.

income after housing costs is considered, the difference is much smaller (19 per cent compared with 22 per cent), although it is still statistically significant at the one per cent level. However, the proportion of people in low-income households is somewhat higher in the balance of Australia than in major cities using the after housing costs measure. These results are shown in Figure 3, along with those derived from corresponding data from the 2001 *Census of Population and Housing*. Using the Census data, the low-income rates before housing costs are 17 per cent and 26 per cent for major cities and the balance of Australia, respectively. When income is measured after housing costs, the difference narrows to just one percentage point (20 per cent for major cities and 21 per cent for the balance of Australia). Thus, whilst there are differences between the HES and Census data relating to geographical classification and to the measures of income and housing costs, the Census data provides further support to the findings derived from the HES data.<sup>17</sup>

There are still issues outstanding about whether or not the findings shown in Figure 3 are driven by housing price differences or by differences in tenure. As indicated in Table 3, there is very little difference in the housing tenure breakdown of the two distributions, the largest difference being the incidence of private renters, and even here the difference is not great - 22 per cent in major cities compared with 20 per cent elsewhere). Differences in regional patterns of housing tenure are therefore unlikely to have had much effect on the results shown in Figure 3.

**Figure 3: Percentages of People in Low-Income Households Before and After Housing Costs, by Major Urban versus Balance of Australia**



<sup>17</sup> See Siminski and Norris (2003) for details of the methods used to derive the Census results.

**Table 3: Persons by Housing Tenure and Section of State (percentages)**

	Owner	Purchaser	Renter- public	Renter- private	Other tenures	Total
Major urban	35.9	35.7	5.0	22.0	1.5	100.0
Balance	36.1	36.6	4.4	19.9	3.0	100.0

*Source:* Calculated by ABS from ABS *Household Expenditure Survey 1998-99*; Main Unit Record File

A second issue worthy of investigation is the maturity of mortgages amongst home purchasers. Amongst home purchasers in major urban areas, mean housing equity as a proportion of home value is 58 per cent. Amongst purchasers in the balance of Australia, the mean value is 55 per cent, and the difference between the two mean percentages is not statistically significant, indicating that there are no systematic differences between major urban areas and the balance of Australia in terms of mortgage maturity amongst home purchasers.

Table 4 compares the composition of the low-income population by the principal source of income. For most income sources, there is little difference between major urban areas and the balance of Australia in how the inclusion of housing costs affects the low-income rate. In major cities, for instance, 38 per cent of people in households with age and disability support payments as their main source of income fall into the low-income category, compared with 37 per cent in the balance of Australia. On an after housing costs basis, the low-income rates both decline to fourteen per cent.

The most interesting case shown in Table 4 is that of people in households with wages and salaries as their principal source of income. For this group, the before housing costs low-income rate is almost twice as high in the balance of Australia (9.7 per cent compared with 5.2 per cent). However, on an after housing costs basis, this difference is estimated to be less than 1 percentage point (11.2 per cent compared with 10.4 per cent) and is not statistically significant. Thus, despite earning higher incomes on average, people in working households in major cities are thus just as likely to be in the lowest income quintile as those living elsewhere, after housing costs have been deducted.

**Table 4: Percentages of People in Low-Income Households Before and After Housing Costs by Section of State and Principal Source of Income**

Region	Main source of income	Low income rate	Low income rate after housing costs
Major Urban	Wages and salaries	5.2	10.4
	Self employed	23.1	28.1
	Age and disability support payment	38.3	14.3
	All other govt. pensions & benefits	64.6	61.0
Balance	Wages and salaries	9.7	11.2
	Self employed	23.7	24.3
	Age and disability support payment	36.5	13.6
	All other govt pensions & benefits	68.3	61.8

*Source:* Calculated by ABS from ABS *Household Expenditure Survey 1998-99*; Main Unit Record File

## 5 Conclusions

This paper has argued that simple regional comparisons of low-income rates before taking account of housing) rates are, at best, of very limited value. Differences in prices, especially of the price of housing, are simply too significant to ignore. But making adjustments for regional housing prices by deflating incomes using a spatial price index may not be appropriate, since location is an important determinant of the price of housing.

We have also argued that a component of housing consumption is intermediate in nature, even if this is not recognised by the existing national accounting framework (or, for that matter, by the taxation system). The higher housing costs in major cities should perhaps be regarded primarily as a cost associated with earning the (typically) higher incomes that are characteristic of those who live in such cities. Therefore, in comparing the incomes of people or households between regions, a more appropriate measure of income would be net of housing cost differences. Furthermore, the available data indicate that the higher housing costs in major cities are not offset by lower transport costs. In contrast, people in rural areas have very high travel costs, which more than offset their low housing costs. Thus it seems that income after housing costs is preferable to cash income for some, but not all, regional income comparisons. At the very least, income after housing costs should be given more emphasis in regional analyses than is currently done.

The main empirical finding reported in this paper suggests that there is only a small difference between major cities and the rest of Australia in the percentage of people living in low-income households after housing costs, where low-income is defined as falling in the lowest quintile of the national income distribution. This contrasts with the large difference between major cities and the rest of Australia in the corresponding low-income rates before housing costs. Housing costs are thus again seen to have an important bearing on issues associated with the relative living standards of Australians living in different locations, and research must take account of this fact.

## Appendix A: Sensitivity Test Results

The low-income rates derived under the various alternate definitions referred to in the main text are shown in Table A.1. None of the differences between the chosen measures and alternate measures are statistically significant, implying that the results are not sensitive to how housing expenditure is defined, or to the inclusion or exclusion of households with negative or zero incomes.

**Table A.1 Low-income Rates by Section of State: Sensitivity tests (Percentages)**

	Major Urban	Balance
<b>Chosen measure</b>		
Equivalent disposable income (before housing)	17.3	24.7
<b>Alternate measures</b>		
Equivalent gross income (before housing)	17.1	25.0
Equivalent disposable income (before housing) excluding households with negative or zero income	17.3	24.6
<b>Chosen measure</b>		
Equivalent disposable income (after housing V1) <sup>a</sup>	18.8	22.1
<b>Alternate measures</b>		
Equivalent gross income (after housing V1) <sup>a</sup>	18.5	22.7
Equivalent disposable income (after housing V1) <sup>a</sup> excluding households with negative or zero income	18.7	22.2
Equivalent disposable income (after housing V2) <sup>a</sup>	18.5	22.6
Equivalent disposable income (after housing V3) <sup>a</sup>	18.8	22.1

*Notes:* Three alternate versions of housing expenditure are considered in these tests. Version 1 (V1), the preferred version, includes all current housing expenditure and the principal component of mortgage repayments. Version 2 (V2) includes all current housing expenditure. Version 3 (V3) includes expenditure on rent and mortgage repayments (corresponding to the measure of housing expenditure in the Census data).

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