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Measuring the Economic Wellbeing of Australia's Regions

Staff paper
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Introduction

This paper brings together the results of three BITRE research projects covering key aspects of regional economic wellbeing—income, wealth and the cost of living. These three projects adopt quite different methodological approaches, but all seek to improve data availability and understanding of economic conditions in Australia's regions. The paper provides an overview of the adopted methodologies in these studies. The main focus is on exploring the relationship between income, wealth and the cost of living, with a view to providing a more integrated assessment of economic wellbeing in Australia's regions.

The paper begins with an introduction to regional boundaries and the geographic distribution of population within Australia. This is followed by a discussion of the role of BITRE in providing research, analysis and statistics relevant to the issues facing Australia's regions. The three regional information projects are outlined and the concept of economic wellbeing is discussed. The empirical relationship between BITRE's regional income and wealth estimates is analysed in some depth. Finally, attention is turned to how spatial differences in the cost of living impact on assessments of regional economic wellbeing.

Australia's regions

Australia has a federal system of government. The Commonwealth of Australia was created in 1901 by the federation of six British colonies. The six Australian states are New South Wales (NSW), Victoria (VIC), Queensland (QLD), Western Australia (WA), South Australia (SA) and Tasmania (TAS). The Northern Territory (NT) and the Australian Capital Territory (ACT) are self governing territories.

Local government areas (LGAs) are proclaimed by state and territory governments. As of July 2007, there were 667 LGAs. LGAs do not cover all of Australia's land mass. The main areas not covered are the ACT, much of the NT and northern SA. LGAs vary enormously in both area and population size. The Brisbane City Council LGA has a population of over one million, but there are ten LGAs with populations under 200. Box 1 provides an overview of the spatial distribution of Australia's population.

Regions can be defined by legislated boundaries (e.g. LGAs), by a sense of economic and social interdependence, or by natural environments and landscapes. In Australia, there is demand for small area data based on a range of spatial classifications, including LGAs, electorates, statistical local areas (SLAs), urban centres, suburbs and river catchments.

BITRE's standard approach has been to make data available at the SLA scale, subject to reliability considerations. The SLA is the base spatial unit within the main Australian Standard Geographical Classification (ASGC) structure, and it is the smallest spatial unit available between censuses (ABS 2007). SLAs can be readily aggregated to LGAs and a range of other spatial units. As of 2007, there were 1426 SLAs, covering all of Australia's land mass without gaps or overlaps.

Where incorporated local government bodies exist, SLAs are based on LGA boundaries. Unincorporated SLAs are defined for all other areas. Because LGAs vary widely in their population size, a single LGA is often disaggregated into a number of SLAs as illustrated in Figure 1. For example, the Brisbane LGA has been split into 158 SLAs, based on suburbs. Nevertheless, substantial size differences remain.

Figure 1   SLA and LGA boundaries in Sydney region
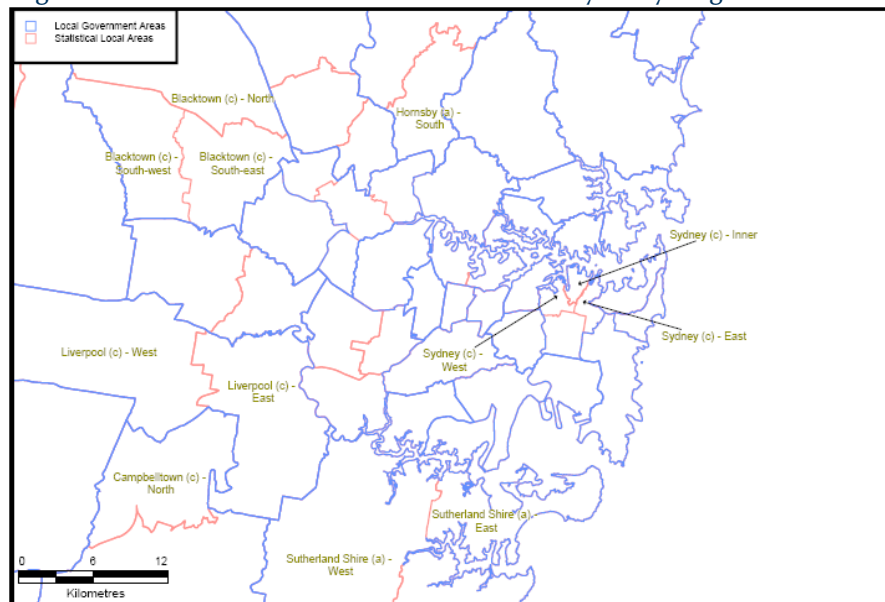
Source: 2006 ABS ASGC boundaries (ABS 2007).

Box 1: Geography of Australia's population

Australia's population was just over 21 million as of June 2007.

This population is spread across 7.7 million km² of land mass. The population density averages just 2.7 persons per km², but exceeds 6000 persons per km² in some inner suburbs of Sydney and Melbourne.

Australia has five cities with a population over one million: the state capitals of Sydney (4.3 million as of June 2007), Melbourne (3.8 million), Brisbane (1.9 million), Perth (1.6 million) and Adelaide (1.2 million).

The population is highly urbanised. Three quarters of the population live in urban areas with a population of 100 000 or more.

Around 85 per cent of the population lives within 50 kilometres of the coast. Population is concentrated along the eastern and southeastern coastlines and in the southwest corner.

Remote and very remote areas account for 86 per cent of the nation's land mass, 2.3 per cent of its population and 24 per cent of the Indigenous population.

Figure 2 Population distribution, June 2006 [a]

(a) Estimated resident population.
Source: Australian Demographic Statistics (3101.0).
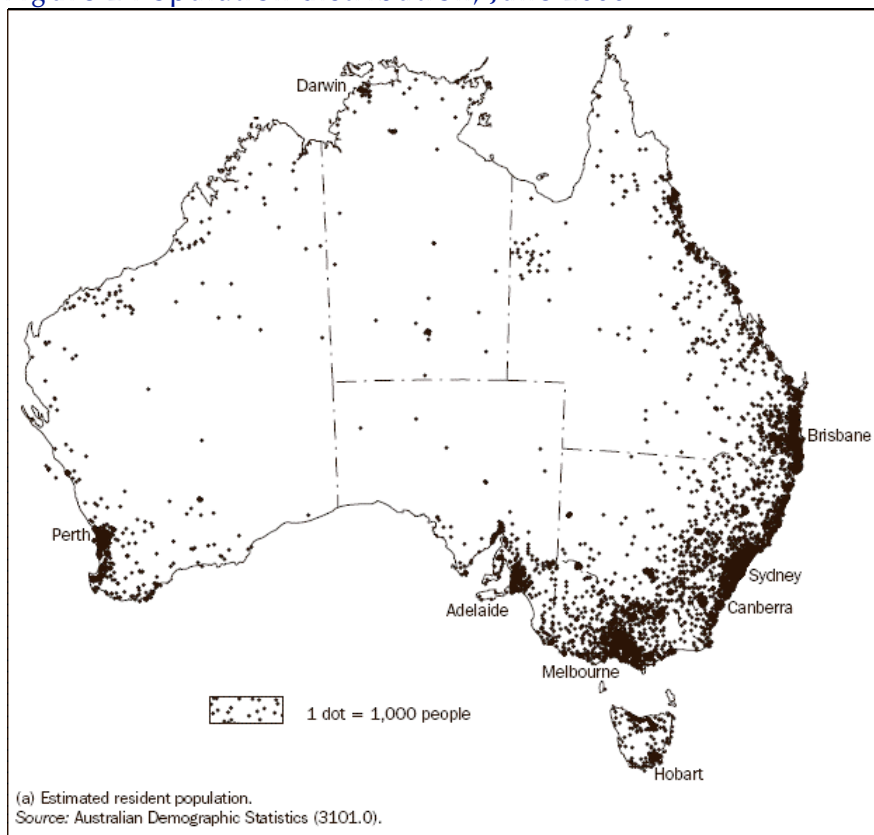
Sources: BITRE 2008a, ABS 2008a, ABS 2008b, ABS 2008c, ABS 2004.

Role of BITRE

The Bureau of Infrastructure, Transport and Regional Economics (BITRE) provides economic analysis, research and statistics on infrastructure, transport and regional issues to inform both Australian Government policy development and wider community understanding.

The Bureau of Transport Economics was established in 1970, with its initial role being to gather and analyse information about the transport industry. Since 2002, this role has extended to analysis of trends and issues relating to Australia's regions. BITRE employs around 60 staff comprising economists, statisticians, social researchers, policy analysts and business and publications specialists. All BITRE publications are freely available from <www.bitre.gov.au>.

BITRE's regional research team comprises eight staff who investigate social and economic conditions in different parts of Australia. Current projects include investigations of the drivers of Tasmania's economic growth, recent regional trends in industry employment and the distribution of income support recipients throughout Australia.

The primary role of BITRE's regional research team is research and analysis—not the production of regional statistics. Australia's official statistical agency is the Australian Bureau of Statistics (ABS). The ABS produces a wide range of statistics for states and territories, and a more limited range of statistics for regions.

Nearly all ABS surveys disaggregate results by state and territory. For example, the ABS publishes estimates of Gross State Product (GSP) on an annual basis. However, the demand for 'regional statistics' in Australia typically relates to a small area scale, such as LGAs. The primary source for such small area data is the ABS' five yearly *Census of Population and Housing*. Outside of the census, small area data sources with nationwide coverage are limited. The ABS updates regional population estimates annually and a range of administrative datasets provide small area data (e.g. taxation statistics, social security payments, house prices). Regional data is also available for selected industries, such as agriculture, tourism and construction. However, there are no official sub-state estimates of Gross Regional Product (GRP).

There is strong demand from Australian policy makers and regional stakeholders for improved regional information. This led to the team's initial focus on making existing regional information more readily accessible, such as through the *About Australia's Regions* booklet or the *Industry Structure* and *Education, skills and qualifications* databases and analytical reports (BITRE 2008a, BTRE 2003, BTRE 2004). More recently, BITRE has focused on creating new sources of information about regional social and economic conditions, including:

- o Construction of a 25 year time-series of regional economic growth and average income from administrative data held by the Australian Tax Office (BTRE 2005, BITRE 2008b);

- o Use of small area estimation techniques to estimate household wealth for Australia's regions (BITRE forthcoming); and

- o Collection of prices of more than 400 goods and services in 131 locations around Australia (BITRE 2008c).

These three projects are discussed in greater detail below.

Three small area data projects

This section outlines and contrasts three recent BITRE projects which have developed small area data on income, wealth and the cost of living using very different methodologies. The first is reliant on manipulation of administrative data, the second involves the application of small area estimation techniques and the third involves extensive fieldwork.

Taxable Income

BITRE first released its *Taxable Income Database* in 2005 (BTRE 2005). The time-series commenced in 1980–81 for all LGAs and in 1990–91 for all SLAs. The most recent update extends the time-series to 2004–05 (BITRE 2008b). Regional boundaries are based on the 2001 Australian Standard Geographical Classification and all monetary values are adjusted for inflation using the Consumer Price Index. This database has been very well used by policymakers and regions seeking information on regional economic trends.

This time-series dataset was constructed by BITRE from Australian Tax Office (ATO) data on tax returns from individual taxpayers, as published in the ATO's annual *Taxation Statistics* report. The ATO publishes taxation statistics at the postcode scale. Postcodes are not spatial units, and were designed by Australia Post to facilitate mail delivery.

BITRE's *Taxable Income Database* includes three main indicators:

- o Number of taxable individuals (NTI)—the number of individuals who reside in the region who submitted a tax return and for whom tax needed to be paid.

- o Aggregate real taxable income (ARTI)—the sum of taxable income across all individual taxpayers who reside in the region. BITRE argues that, in the absence of measures of GRP in Australia, ARTI provides a useful indicator of changes in regional economic activity at the sub-state level.

- o Real income per taxpayer (RIPT)—equals ARTI divided by NTI for a region. RIPT is a measure of individual economic wellbeing, which captures how much income, on average, individual

taxpayers receive. People who did not submit a tax return or had income below the tax free threshold are excluded. The implication is that RIPT will overstate actual average incomes, particularly for regions where a low proportion of the population is employed.

Development of consistent regional time-series from this administrative data source involved extensive data manipulation by BITRE. Some of the steps are outlined below:

- o Tracking down hardcopy ATO and Australia Post reports from the 1980s proved a challenge, and the data was then scanned and checked.

- o Published estimates of total taxable income were heavily rounded in some years. Generally BITRE was able to develop more precise estimates using information elsewhere in the publication.

- o The ATO suppresses estimates for postcodes with small populations and the way they do this has changed over time. In order for BITRE to convert postcode data to the SLA scale, estimates needed to be produced for these missing postcodes. This was done using ATO's published electorate data, estimates for the postcode in surrounding years where available, trends in neighbouring postcodes and ABS census population counts.

- o BITRE used population weighted concordances developed by ABS for each year since 1980–81 to convert postcode data to the LGA and SLA scales. BITRE modified these concordances so that valid ATO data was not discarded for postcodes which have been officially discontinued but continued to be used by taxpayers or for postcodes corresponding to post office boxes, shopping/business centres, hospitals and universities.

BITRE's *Taxable Income Database* contains time-series data for all Australian SLAs, but the database has several limitations for measuring average incomes in a region:

- o The database only incorporates income reported by individual taxpayers—the income of partnerships, trusts and companies in a region is excluded.

- o The scope is restricted to individuals who submitted a tax return and for whom income (net of allowable deductions, credits and rebates) exceeded the tax free threshold. A significant number of low income earners, such as pensioners and other income support recipients, are not required to lodge a tax return. In 2001, about 52 per cent of the Australian population lodged a tax return, and 81 per cent of them were taxable (BTRE 2005).

- o Income may be concealed from the ATO. However, the data is collected under a legislative framework that involves penalties for inaccurate reporting, and documentary evidence is required.

The ATO income data is therefore likely to be more accurate than other means of collecting income data, such as the census.

o Concordances assume that the phenomenon of interest is distributed uniformly across a postcode's population. Where a postcode is split across more than one SLA, and there are no other contributing postcodes, the RIPT value will be the same for each of those SLAs. RIPT data will generally be more meaningful for larger and more aggregated areas, which contain significant populations and multiple postcodes.

o ATO releases the data with a considerable lag. For example, the 2005–06 data was released in March 2008.

Many of these limitations stem from the nature of the underlying ATO data as an administrative dataset, which was not designed for statistical purposes. Many government agencies hold administrative datasets which have considerable potential to inform regional issues (ABS 2005a). Unfortunately, regional information from these datasets can be difficult to access and where data has been released, regional information has often been suppressed. Nevertheless, administrative datasets have the potential to substantially improve the availability of regional statistics for Australia.

BITRE Household Wealth Database

Interest in wealth information has risen recently in Australia, due to very strong growth in house prices and the release of the first comprehensive surveys of the nation's household wealth. BITRE's *Household Wealth Database* will make new estimates of regional wealth available, providing a snapshot of regional differences in average household wealth, and its principal components, as of 2003–04. It is accompanied by an information paper which describes the methodology, analyses spatial differences in wealth, and investigates the links between wealth and other aspects of economic wellbeing.

The database contains wealth estimates for the 1135 in-scope Australian SLAs with more than 500 households. As with most ABS household surveys, very remote areas and discrete Indigenous communities are out of scope. Such areas represent less than 1 per cent of the Australian population.

The primary objective of BITRE's household wealth study is to develop and analyse new measures of wealth for Australia's regions. The 2003–04 ABS *Survey of Income and Housing* provides reliable measures of household wealth and its components for fourteen aggregate regions (i.e. the two Territories, the six remaining capital cities and the six state balances). BITRE has used these as its benchmark estimates. Small area estimation techniques have then been used to integrate this benchmark data with a range of small area data sources to produce detailed regional estimates of household wealth. Specifically, the adopted method was

Broad Area Ratio Estimation with auxiliary data (ABS 2006). The small area data sources included:

- o Valuer General's data on house sale prices, provided by Australian Property Monitors (APM);

- o ATO *Taxation Statistics* data on interest income, dividend imputation credits, rental income and Higher Education Contribution Scheme (HECS) debt;

- o ABS' *Census of Population and Housing* data on home ownership, dwelling type, vehicle ownership, mortgage repayments, self employment and industry; and

- o Information published by ABS on average superannuation and annuity income, average non-farm business income and average farm net worth in a region.

ABS (2006, p79) notes that while 'more sophisticated models may give some improvements in quality, in practice it is the basics such as realistic choice of small area geography, adequate sample size and the quality and statistical relevance of the auxiliary data that will have the greatest bearing on the final quality of the small area estimates'. Each of these 'basics' is considered below.

- o The quality of estimates is highly dependent on the availability of small area auxiliary data which is closely related to the target variable. BITRE has access to good quality wealth specific auxiliary data for the major components of household wealth—these components contribute 91 per cent of net worth. Only for owner occupied property assets and agricultural business assets does the auxiliary data relate directly to the average value of the asset in each small area. Most of the auxiliary data relates to either the income or repayment flows generated by the asset or liability or to ownership of the asset or liability.

- o All of the benchmark estimates of net worth per household are based on adequately sized samples of more than 350. The small area data sources are census and administrative collections so sample size is not a relevant issue.

- o A realistic choice of small area geography was made taking account of reliability issues. ABS (2005b) notes that if the variable of interest is a reasonably common characteristic of the population (e.g. more than 10 per cent) it may be able to be estimated at a reasonably fine level of geography such as for SLAs. Pretty much all households have some amount of wealth, and the key wealth components (e.g. homes, superannuation, bank accounts, shares) are all held by at least 30 per cent of households. It follows that household wealth estimates should be able to be developed at a reasonably fine level of geography. Ideally, wealth estimates would have been produced for all SLAs in Australia, but data reliability limited our capacity to produce quality estimates

for less populated SLAs. Wealth estimates have only been published for SLAs with more than 500 households.

The information paper includes an assessment of the quality of the small area estimates (BITRE forthcoming). Overall, the net worth estimates for SLAs with more than 500 households were assessed as being of good quality across a range of criteria. Of course, quality varies across wealth components. For example, the quality of the small area estimates is much higher for owner occupied property than for superannuation, due to the much greater relevance of the auxiliary data. Small area estimation techniques rely on a range of assumptions, which have the potential to introduce immeasurable bias. It is also well established that extremely rich households tend to be under-represented in surveys of household wealth (Headey, Marks and Wooden 2004).

Because the 2003–04 *Survey of Income and Housing* data was not released until April 2006 and the estimation process was time consuming, BITRE's estimates are being released with a considerable lag. Nevertheless, small area estimation proved to be a useful technique for producing new regional measures of household wealth, largely because a wide range of highly relevant small area auxiliary data was already available. This condition is less likely to be met for many other topics of interest. Regional information is suppressed from survey datasets in Australia for confidentiality reasons. This limits the potential for small area estimation and places greater reliance on the availability of highly relevant small area auxiliary data.

Small area estimation techniques would appear to have some potential for improving the availability of regional statistics in Australia. The potential would appear to be greatest for topics for which existing administrative and census data is available (e.g. income, health, education, unemployment, community services, demographics, crime).

Cost of Remoteness

There is limited understanding of how the cost of living varies from place to place in Australia. There has been no attempt to nationally measure spatial differences and previous studies have typically focused on the larger urban centres. The eight capital cities routinely have their prices sampled by the ABS for the Consumer Price Index, but it is designed to track the movement of prices over time, not to compare prices between cities (Waschka et al. 2003).

BITRE's study has three objectives:

o Measure differences in the cost of living across Australia;

o Understand the underlying drivers of cost difference;

o Observe and understand consumer behaviour in response to cost differences.

This paper focuses on the first of these objectives. The discussion which follows describes the approach used to measure differences in the cost of living of households across Australian locations.

BITRE collected data directly from 131 locations across Australia (see Figure 3). BITRE chose its survey locations to ensure a wide coverage of variables such as population, industry, income, distance from the capital city and distance from large regional centres. A number of very remote towns and discrete indigenous communities were selected. In the major cities, prices were recorded in a single area, with extremes such as very wealthy or disadvantaged areas avoided.

Figure 3   Locations sampled in the BITRE survey

Source: BITRE.
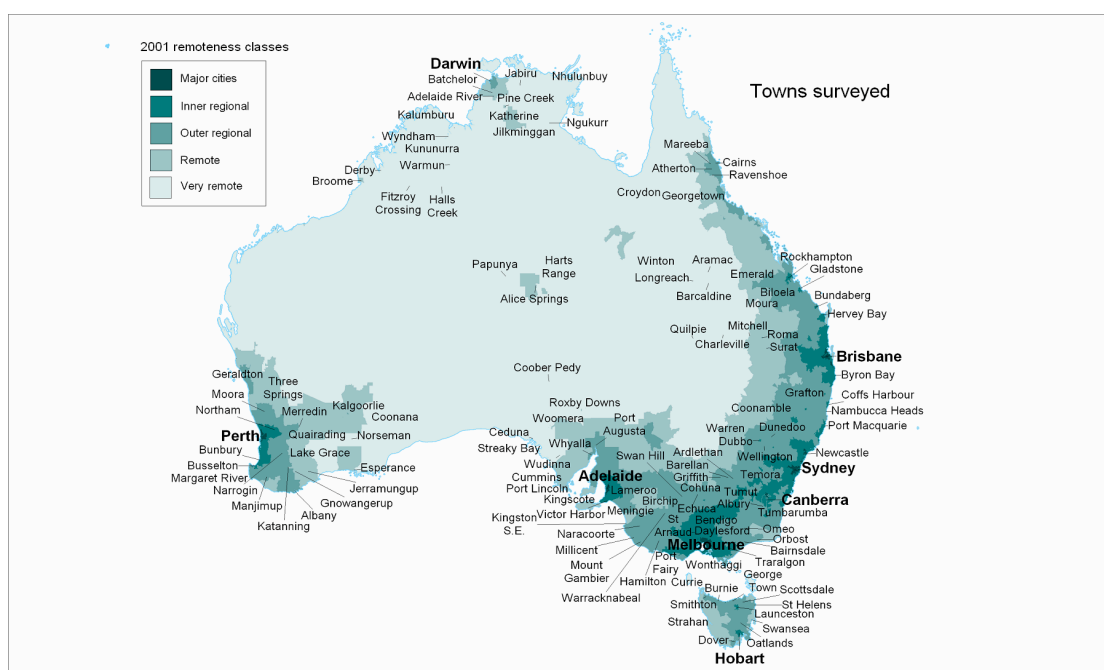
Commonly, the cost of living is measured by taking a basket of goods and services, and measuring its cost. It is desirable that the items priced reflect the range of goods and services accessed by a typical household and that the relative weight attached to each price reflects the relative expenditure on that (or similar) items. Limited availability of many goods and services makes this approach problematic for spatial analysis and so an approach based on categories of goods and services was developed.

The ABS' 2003–04 *Household Expenditure Survey* (HES) was used to design and weight the cost of living index. The HES groups items of expenditure in logical categories and has identified the average weekly amount spent on each. The national average expenditure mix was used as the basis for constructing an index applicable to all regions.

The collection approach was designed to enable the calculation of an index which covered all 13 major expenditure groups. These are: current housing costs (selected dwelling); domestic fuel and power; food and non-alcoholic beverages; alcoholic beverages; tobacco products; clothing and footwear; household furnishings and equipment; household services and operation; medical care and health expenses; transport; recreation; personal care; and miscellaneous goods and services. A list of items was developed which covered these 13 groups, and prices were collected for all available items in each location.

As the HES is not designed to weight a cost of living index, some adjustments to the weights were necessary. For instance, HES includes the interest paid on a mortgage (which averages A$46.26 a week across all households) and rent (A$46.60) as the two major components of current housing costs in its goods and services expenditure list. Repayments of mortgage principal are not included with goods and services expenditure, but treated separately, along with other capital housing costs.

For its cost of living index, BITRE replaced the mortgage interest category in the HES with one that would reflect the opportunity cost to owner occupiers of living in their own homes. In other words, the adjusted weight reflects the amount a homeowner could earn on their house if they were to rent it out. On this basis, the weighting was increased to A$102.05, making the current housing costs group a more significant part of the index.

Some HES subgroups were excluded from the index because a spatial comparison did not make sense (e.g. the cost of holidays). Others were given a uniform index of 100 across Australia because the price of items within them would typically not vary by location (e.g. interest rates on loans). These categories needed to be included in the index, because without them, the differences in costs between regions would be overstated.

After modifying the HES weights to enable a spatial comparison, the total of weights for the index came to A$868.52. Three groups together comprise 56 per cent of the total: current housing costs (23 per cent), food and non-alcoholic beverages (18 per cent) and transport (15 per cent). All 10 remaining groups account for less than 10 per cent each of the total.

Prices were collected throughout 2005 and 2006, but all prices were standardised to reflect price levels as of June 2006. Prices were collected by BITRE officers working in pairs on fieldtrips which typically lasted five days. For most locations, data was collected in a single day, but two days was allowed for capital cities which were used as benchmarks. The fieldwork involved interviews with school principals, health workers and regional representatives, as well as collection of prices from one or more supermarkets and a range of other retail outlets in each location. While some item specifications referred to specific brands, particularly

in the grocery group, others referred to a generic item (i.e. bath towel, plain men's t-shirt), in which case the cheapest item fulfilling the specification within a store was priced.

Following the collection process, the data was cleaned. This involved removing obvious price errors (i.e. $700 instead of $7.00), adjusting fruit and vegetable prices to a per kilogram basis and a range of other checks.

The location index was calculated using the minimum price per item in each area. While conceptually this does not take transaction costs into account, it was considered more robust than using an average of prices collected. Except for small towns, the data collected represented only a sample of stores in the location. An index calculated using average prices would be very dependent on which stores were sampled in a location and would give equal weight to all sampled stores, regardless of market share. The base value of the index (100) was set by averaging the minimum price per item across all capital cities. We are confident the lowest price was collected, and hence that the index and comparisons are sound.

The rising cost of living has been a high profile issue in Australia in recent times, and in January 2008 the Government asked the Australian Competition and Consumer Commission (ACCC) to inquire into the competitiveness of grocery prices. BITRE's submission to that inquiry (BITRE 2008c) provides a preliminary analysis of spatial differences in grocery prices and availability, a subset of its cost of remoteness dataset. BITRE's cost of remoteness project is continuing, and the first of several reports will be released later in 2008.

The most obvious limitation of this study is that it is restricted to a relatively small number of locations. However, this sample has proved sufficient to understand some of the key drivers of spatial differences in grocery prices in Australia (BITRE 2008c). The study provides a snapshot of spatial price differences in 2006, and so does not address current concerns about the rising cost of living.

Both the fieldwork and data processing stages of the project were very resource intensive. This form of data collection has a clear role in supporting one-off research projects such as BITRE's current investigation of the costs of remoteness, but is less practical for providing regular data updates across all regions. Data collection through fieldwork would appear to have limited potential to improve the availability of comparable regional statistics for all Australian regions. However, its potential is much greater when it comes to improving understanding of the socio-economic conditions, attitudes, behaviours and processes which prevail within regions, and providing a foundation for evidence based policy.

Comparing the three methods

The three projects described above highlight that there is no single preferred solution to filling regional information gaps in Australia. The selected methodology has varied based on the nature of the research question and whether relevant data sources already exist.

Table 1 compares some of the key features of these three projects. The individual projects should not be considered representative of all projects of their type. However, the comparison provides some insights into the relative strengths and weaknesses of the different methodologies for filling regional information gaps.

There are some commonalities. For all three projects, regional data has been published with a considerable lag, although the delay has been greatest for the small area estimation project. Quality concerns are also relevant across all of the projects. The projects differ in their reliance on existing data, their relative costs, their geographic coverage and whether they are suited to providing regularly updated information. The cost of remoteness study is more ambitious in scale than the other projects, and has cost perhaps three times as much.

Table 1   Relative strengths and limitations of the three BITRE projects

BITRE project	Key points
Taxable Income Database (administrative data)	* Substantial time lag after reference period the first time around, but moderate time lag for subsequent updates. * Conditional on availability of relevant administrative data at a small area scale. * The quality of regional estimates can be reduced by suppression of regional information or if concordances and other forms of estimation need to be used. * The validity of regional estimates may be an issue, depending on the scope and relevance of the administrative data source. * All geographic areas in Australia will be covered by most Australian Government administrative databases. * Very resource intensive the first time around, but subsequent updates required only a limited amount of resourcing. * Suitable for providing regularly updated information for all regions, but time-series subject to disruption if administrative definitions are changed.
Household Wealth Database (small area estimation)	* Substantial time lag after reference period. * Conditional on availability of relevant survey data and relevant small area auxiliary data. * The quality of regional estimates can be reduced by suppression of regional identifiers in surveys. * Estimates cannot be produced for very remote areas and discrete indigenous communities, which are out of scope for most Australian surveys. * The quality and validity of regional estimates is a key concern. * Moderately resource intensive.
Cost of remoteness study (primary data collection through fieldwork)	* Moderate time lag after reference period. * Not reliant on existing sources of data. * The quality and validity of regional estimates is dependent on the chosen methodology, instrument design and collection practices. * Information could only be gathered through fieldwork for a relatively small proportion of Australia's regions. * Information can be gathered for very remote locations and discrete indigenous communities. * Extremely resource intensive, in terms of staff time and travel costs. * Not well suited to providing regularly updated information for all regions.

Source: BITRE analysis.

Overall, the improved availability of spatial information from administrative datasets probably represents the most cost effective and realistic way of achieving substantial improvements in the availability of regional statistics for Australia. Small area estimation techniques have some potential to achieve this aim for topics where some relevant small area data already exists. Primary data collection through surveys and fieldwork has an important role to play in advancing knowledge through research into regional issues where there is little existing data.

Economic wellbeing

The economic wellbeing of households is a multidimensional concept. ABS (1995) argues that assessment of economic wellbeing involves bringing together information on a household's capacity to consume, its capacity to accumulate wealth and the value of the wealth held. According to The Canberra Group (2001), it is desirable that assessments of household economic wellbeing consider income, wealth and changes in wealth. A series of papers by Osberg (1985) and Osberg and Sharpe (2002, 2005) propose that national economic wellbeing has four major elements: per capita consumption flows, value of accumulated productive assets, poverty and inequality, and economic security.

Regional differences in the cost of living also affect the standard of living of households in different locations and are crucial to comparative assessments of economic wellbeing (Curran et al. 2008, Sorensen 2000).

This paper does not attempt to consider all aspects of household economic wellbeing for Australia's regions. Rather, it focuses on average incomes, average wealth and the cost of living. Future BITRE research will consider extending this paper's approach to incorporate information on economic security and the distribution of resources within regions.

Income and wealth

This section compares regional income and wealth, using the following two measures:

- o Income per taxpayer 2003–04 (*BITRE Taxable Income Database*);
- o Net worth per household 2003–04 (*BITRE Household Wealth Database*).

Ideally, both measures would be on a per household basis. However, no small area measure of average household income is available for 2003–04. The ABS' *Census of Population and Housing* collects income data in specified income ranges for individuals and ABS has used this data to develop small area estimates of median weekly household income for 2001 and 2006. The census based income measure has not been analysed in this paper, which focuses on comparing three BITRE

regional information projects. However, BITRE's forthcoming report on *Household Wealth* analyses the relationship between wealth and both the ABS and BITRE income measures. The conclusions are similar, except that the ABS income measure is somewhat less closely tied to wealth than the BITRE income measure.

The main factor limiting the comparability of the BITRE wealth and income measures is that one is on a 'per household' basis and the other is on a 'per taxpayer' basis. Thus, regional differences in the average number of taxpayers per household could potentially distort the comparison. Later in this section, an attempt will be made to control for this issue. However, the initial analysis will be based on the unadjusted BITRE wealth and income measures.

The analysis is undertaken at the SLA scale. Due to the unavailability of household wealth data, very remote SLAs, discrete indigenous communities and SLAs with less than 500 households have been excluded. There are 1135 remaining SLAs and these SLAs account for about 99 per cent of the Australian population.

Regional relationship between wealth and income

In 2003–04, income per taxpayer varied from a low of A$29 580 per year for the small Victorian town of Robinvale to a high of A$109 150 per year for the Mosman SLA on Sydney's north shore. The capital cities dominate the list of the highest income SLAs, particularly Sydney, Melbourne and Perth. The lowest income SLAs are often rural areas, although several outer Brisbane suburbs also have particularly low incomes.

In 2003–04, net worth per household ranged from a low of A$154 300 per household for Mount Morgan, a former gold mining town in Queensland, to a high of A$1.9 million in the Perth riverfront suburb of Peppermint Grove. The capital cities dominate the list of the wealthiest SLAs, particularly Sydney, Perth and Melbourne. The least wealthy SLAs are more diverse, and include outer suburbs of the capital cities, regional centres and small towns. Regional centres consistently have less wealth than their surrounding rural SLAs.

Wealth is positively correlated with income across SLAs, with a correlation coefficient of 0.64. Much of the strength of this relationship comes from the high income and high wealth SLAs. If the top wealth decile is excluded, the correlation drops to 0.26. Thus, when the wealthiest regions are taken out of the picture, the link between income and wealth is quite weak.

This pattern is illustrated by Figure 4, in which the SLAs are grouped into wealth deciles, and the median value of the income measure is plotted for each decile. Income rises very gradually across deciles one to nine, but the SLAs in the top wealth decile have markedly higher income than the SLAs in the other nine deciles.

The wealth estimates show greater variation at the SLA scale than do the income estimates. The coefficient of variation for wealth is 34 per cent, compared to 19 per cent for income.

When the wealth and income data are grouped into quintiles:
- o 31 per cent of SLAs are categorised in the same quintile for wealth and income;
- o 35 per cent of SLAs are categorised into adjacent quintiles; and
- o The wealth and income data are categorised to different and non-adjacent quintiles for the remaining 34 per cent of SLAs.

Figure 4   Median SLA value of income for each wealth decile, 2003–04
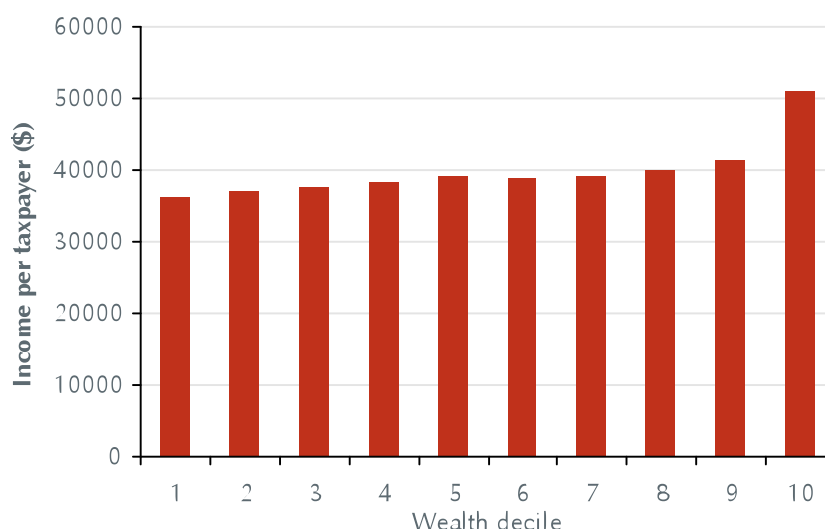
Notes: Excludes SLAs with fewer than 500 households, very remote SLAs and discrete indigenous communities. There are 1135 remaining SLAs.

Source: BITRE analysis based on BITRE *Household Wealth Database* and *Taxable Income Database*.

Thus, for roughly two thirds of the in-scope SLAs, the wealth and income rankings appear reasonably well aligned. Roughly half of all SLAs in the top wealth quintile are also categorised to the top income quintile. However, less than one-third of SLAs in the bottom wealth quintile are categorised to the bottom income quintile. The wealth and income data are more consistent in identifying particularly well off regions than in identifying relatively disadvantaged regions.

For 19 per cent of SLAs the gap between the wealth and income rankings exceeds 500 places. Wealth is ranked more than 500 places higher than income for 10 per cent of SLAs, and income is ranked more than 500 places higher than wealth for 9 per cent of SLAs. At face value, the wealth and income data appear to provide contradictory messages about the economic wellbeing of these SLAs.

Figures 5 and 6 map the relationship between wealth and income, focusing on regions in the highest and lowest quintiles.

- o **High income, high wealth** regions (blue) are largely concentrated in the major cities (particularly Sydney, Melbourne, Perth, Brisbane and Canberra). They are not visible on the national map, but generally have large populations. Figure 6 highlights a substantial number of high wealth, high income SLAs in Brisbane, particularly in the north western suburbs. Wingecarribee (NSW), Yarrowlumla Part A (which adjoins the ACT), some Gold Coast suburbs and several rural WA SLAs also have high wealth and high income.

Figure 5   Selected combinations of wealth and income, SLAs, Australia, 2003–04
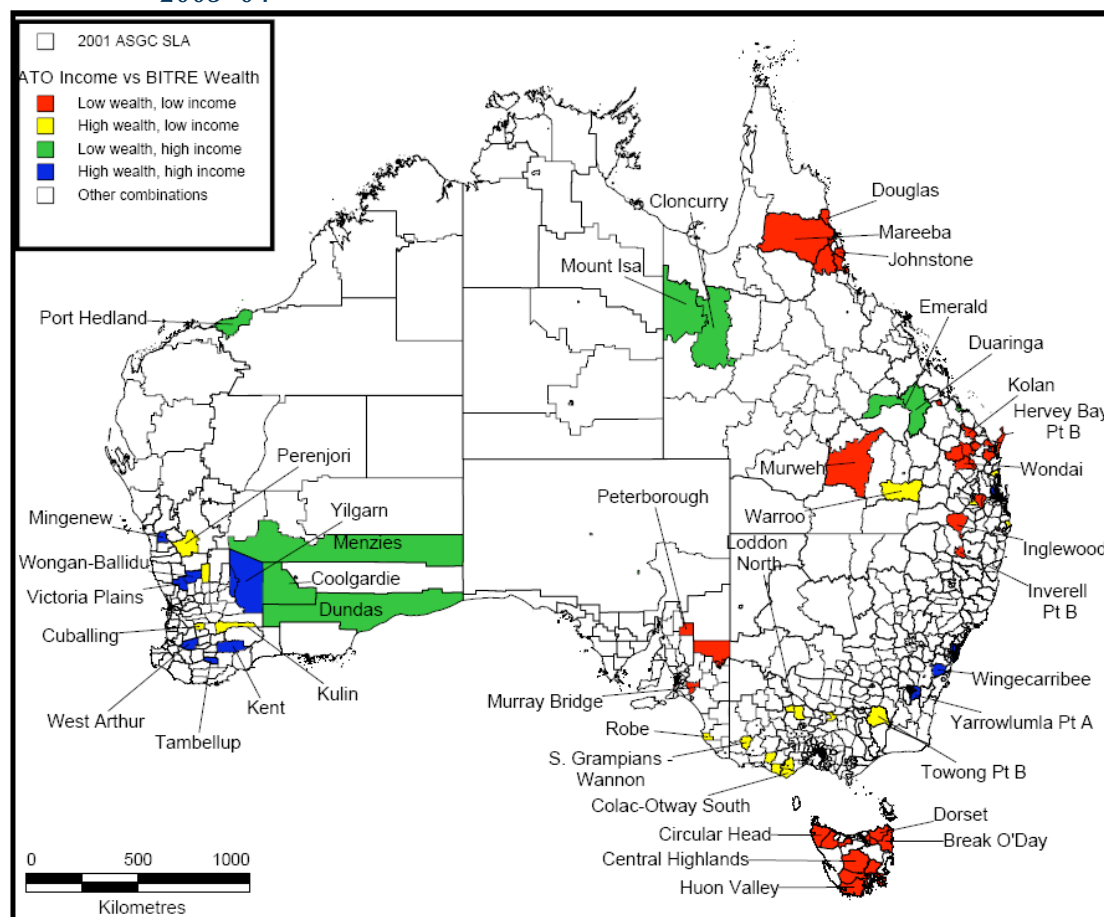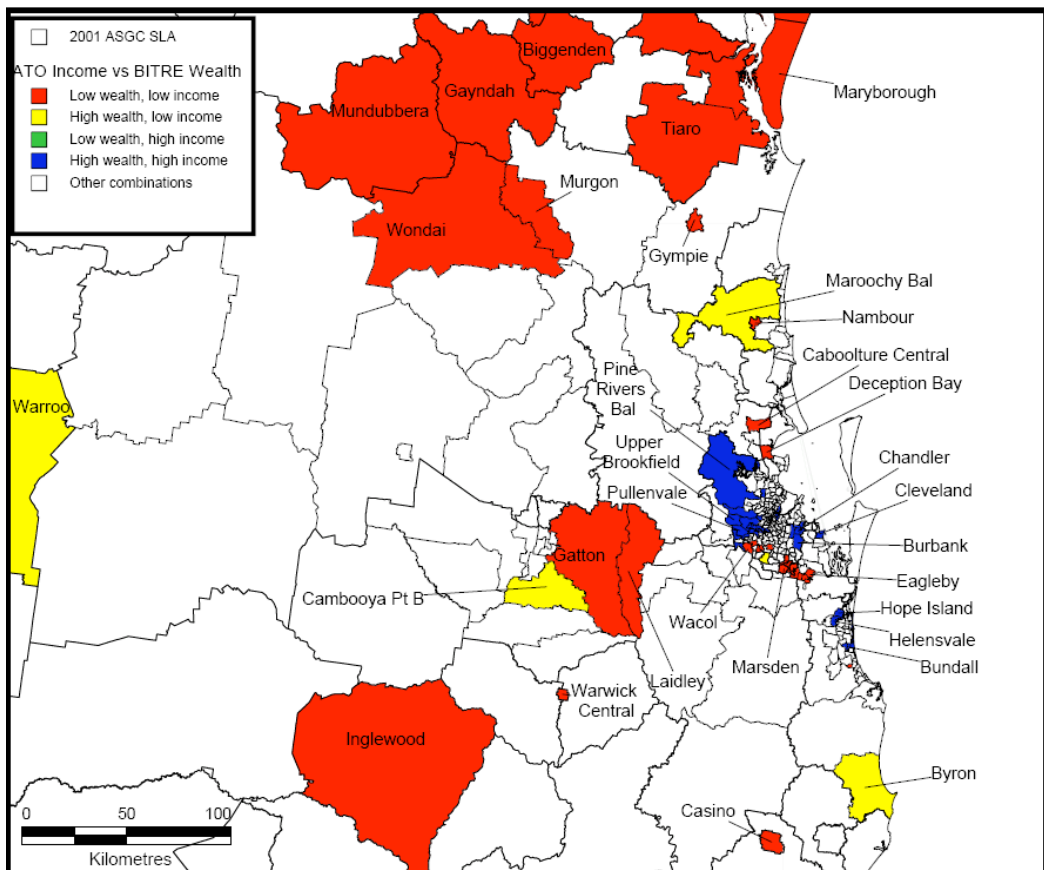

Notes: Based on 2001 ASGC boundaries. The analysis excludes very remote SLAs and discrete indigenous communities. If an SLA is in the top quintile for wealth (income) it is assessed as high wealth (income). SLAs in the bottom quintile are assessed as low wealth/income.

Source: BITRE *Household Wealth Database* and BITRE *Taxable Income Database*.

o **Low income, low wealth** regions (red) are prominent in Tasmania, Adelaide, southwest Brisbane, Wide Bay-Burnett (QLD) and far north Queensland. Figure 6 reveals that regional centres such as Warwick, Gympie and Nambour do poorly in terms of both wealth and income. The low income low wealth regions are some of the more economically disadvantaged places in Australia, outside of discrete indigenous communities.

o **High income, low wealth** regions (green) are typically remote mining communities, such as Duaringa, Mount Isa, Roxby Downs, Coolgardie and Port Hedland. Some other SLAs with very young populations are characterised by high income and low wealth, such as City Remainder in Darwin (which contains a RAAF base) and the inner city Brisbane suburb of Fortitude Valley.

o   **Low income, high wealth** regions (yellow) are most commonly agriculturally based SLAs in regional WA and Victoria. Some coastal SLAs, such as Byron (NSW) and Robe (SA), are also characterised by low income and high wealth. Based on income statistics alone, these regions may be assessed as disadvantaged, but the wealth data suggests the average household has substantial wealth holdings that can be used to support consumption and maintain lifestyle.

Figure 6   Selected combinations of wealth and income, SLAs, southeast Queensland, 2003–04

Notes: Based on 2001 ASGC boundaries. If an SLA is in the top quintile for wealth (income) it is assessed as high wealth (income). SLAs in the bottom quintile are assessed as low wealth/income.

Source: BITRE *Household Wealth Database* and BITRE *Taxable Income Database*.

Figures 7 and 8 highlight regions for which the wealth and income data are least well aligned. Regions where the wealth ranking is markedly higher than the income ranking are in blue, while regions in which the income ranking is markedly higher than the wealth ranking are in red.

The following observations can be made about **regions in which the wealth data markedly outperforms the income data**:

- o They are predominantly located outside of the capital cities.

- o There is a tendency for these SLAs to have an older age structure, with a median age above the national median age of 35.

- o Many are rural areas in which a high proportion of households own a farm business and business assets are one of the largest contributors to net worth. For these SLAs, income is often low, and can fluctuate considerably from year to year. Farm income was generally low due to drought in 2003–04. Business assets are an illiquid form of asset and this has implications for assessing economic wellbeing. Nevertheless, households with substantial farm business assets generally have more options open to them if income suddenly falls, compared to households with limited assets (Alston and Kent 2004, DOTARS 2005).

- o Wealth also outperforms income for many coastal SLAs. These SLAs tend to have low or moderate business assets and a substantial proportion of wealth tied up in the owner occupied dwelling. Many have been identified as sea change communities by the National Sea Change Taskforce (2005, p2), which reports that:

    > 'more affluent sea changers realise high capital gains from city housing and "down size" in lifestyle destinations, where property prices are lower . . . This has been described as part of a broader trend to "downshift" by voluntarily reducing income and consumption levels'.

    To the extent that residents fit this mould, the low average incomes in these high wealth SLAs may reflect a deliberate choice to improve lifestyle by moving region and voluntary reducing income. The income data would then provide an overly negative picture of the region's economic wellbeing. Sorensen (2004 p19) notes that retirement and lifestyle areas can 'give the visual impression of being well-heeled even if studies of well-being suggest the opposite'—this apparent anomaly can be resolved by considering wealth as well as income.

The following observations can be made about **regions in which the income data markedly outperforms the wealth data:**

- o Most of the SLAs have a median age below the national median age of 35. Regions with a very youthful age profile would be expected to perform rather poorly in terms of wealth and better in terms of income. The difference may be large in those regions where young people are able to earn very high incomes.

- o Income tends to outperform wealth data for inner city suburbs in which most residents live in apartments or flats and home

ownership is low. Examples include Spring Hill (Brisbane), Adelaide city, Southbank-Docklands (Melbourne) and South Sydney.

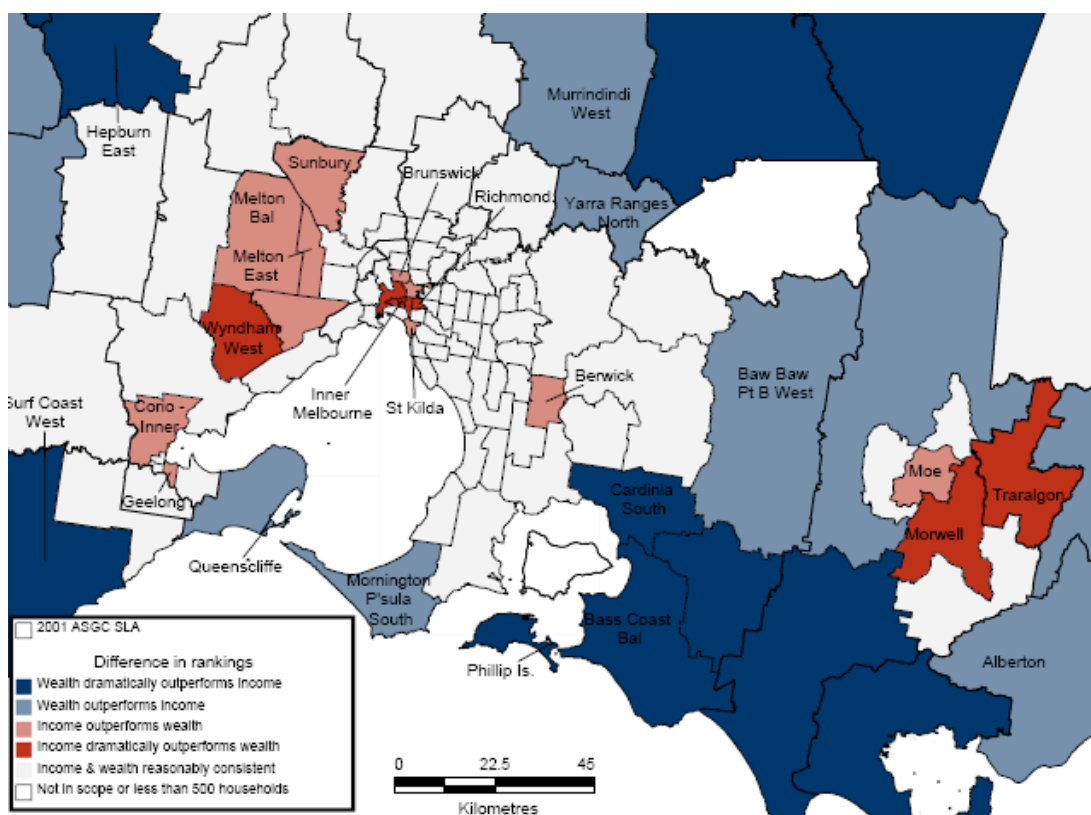**Figure 7   SLAs for which wealth and income rankings differ considerably, Australia, 2003–04**
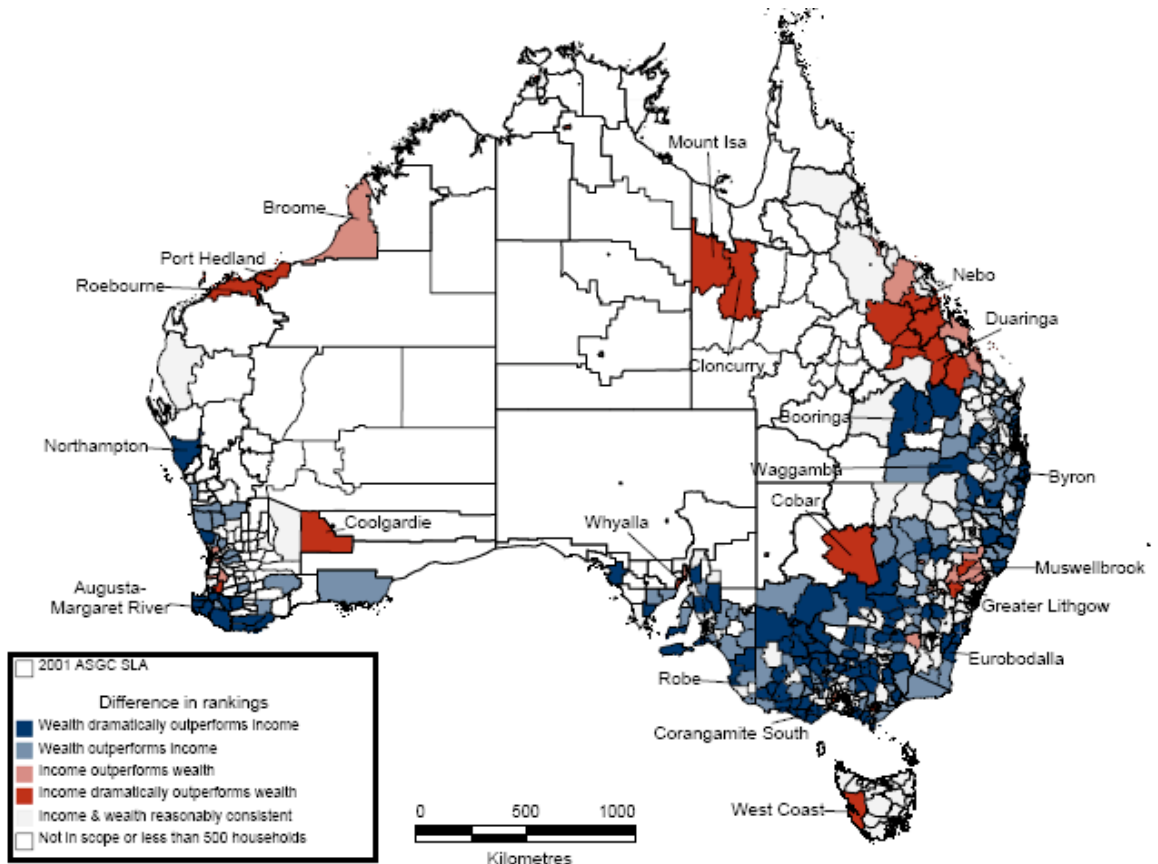
Notes: A difference in the wealth and income rankings of 500 or more places for a SLA is considered 'dramatic'. If the difference is less than 250 places, the SLA's wealth and income data are considered 'reasonably consistent'.
Based on 2001 ASGC boundaries. The analysis excludes SLAs with fewer than 500 households in 2003–04, very remote SLAs and discrete indigenous communities.

Source: BITRE *Household Wealth Database* and BITRE *Taxable Income Database*.

o   Many of the SLAs have a large mining industry (e.g. Port Hedland, Coolgardie, Roebourne, Collie and Kalgoorlie/Boulder in WA; Emerald, Duaringa, Peak Downs, Cloncurry and Mount Isa in QLD; and Roxby Downs in SA). Mining employs many young people at a relatively high wage, but the employees have not yet accumulated much wealth. Home ownership rates and property prices were typically quite low in 2003–04.

o   Income also outperforms wealth in several regional centres with a large manufacturing or electricity generation sector (e.g. Whyalla, Morwell, Geelong, Gladstone).

- o Figure 8 reveals that some urban fringe mortgage belt SLAs perform much more strongly in terms of income than wealth (e.g. Sunbury, Wyndham West and Berwick in Greater Melbourne).

- o Most SLAs in the three largest northern cities of Darwin (NT), Cairns (QLD) and Townsville (QLD) perform much more strongly in terms of income data than wealth data. Darwin and Townsville have a strong defence presence, while all three cities have relatively youthful populations.

Figure 8   SLAs for which wealth and income rankings differ considerably, Melbourne and surrounds, 2003–04

Notes: A difference in the wealth and income rankings of 500 or more places for a SLA is considered 'dramatic'. If the difference is less than 250 places, the SLA's wealth and income data are considered 'reasonably consistent'.
Based on 2001 ASGC boundaries. The analysis excludes SLAs with fewer than 500 households in 2003–04, very remote SLAs and discrete indigenous communities.
Source: BITRE *Household Wealth Database and* BITRE *Taxable Income Database.*

Controlling for 'taxpayers per household' and age structure

This section investigates the extent to which the observed differences in the income and wealth rankings for a region can be attributed to regional differences in age structure and the number of taxpayers per household.

The specific measures of wealth and income which form the basis of the preceding analysis are not entirely comparable. The 'per household' wealth measure may differ from the 'per taxpayer' income measure, not because of any underlying difference between income and wealth, but rather because the average number of taxpayers per household differs across regions. The average number of taxpayers per household typically lies between 0.6 and 1.9. It tends to be highest for outer suburban mortgage belt SLAs, in which both adults are generally engaged in the workforce, and lowest for regions which have either a very small average household size or low labour market engagement.

Wealth and income follow different patterns with respect to age. The youngest age groups have very low wealth but moderate to high incomes, while the oldest age groups have very low incomes combined with moderate to high wealth. The wealth and income data show less contrast for the 35 to 64 age groups (BITRE forthcoming). There are considerable differences in the age structure of regional populations and we would expect these differences in wealth and income across the lifecycle to be reflected in differences in the wealth and income performance of regions. Indeed, the earlier discussion of Figures 5 to 8 suggested regional differences in age structure have had such an effect.

Table 2 summarises how the SLA estimates of wealth and income vary with median age. Wealth tends to be lowest for SLAs with a median age of less than thirty, and rises across the age categories. In contrast, income is highest for SLAs with a median age of less than 30 and tends to decline across the age categories, although it is marginally higher for the 45 plus category than for the 40–44 category. This indicates we should expect contrasting wealth and income data for many of the SLAs which have a particularly youthful or a particularly old age structure.

Table 2   Income and wealth by median age category, SLAs, 2003–04

Median age	Number of SLAs	Net worth per household (A$'000) (median)	Income per taxpayer (A$) (median)
Less than 30	72	299	43 115
30–34	344	375	40 214
35–39	509	431	38 482
40–44	187	450	36 177
45 or more	23	476	36 527

Notes: Excludes SLAs with fewer than 500 households in 2003–04, very remote SLAs and discrete indigenous communities. There are 1135 remaining SLAs.

Source: BITRE analysis based on BITRE *Household Wealth Database*, BITRE *Taxable Income Database* and 2001 ABS' *Census of Population and Housing* place of usual residence data.

Regression analysis was used to investigate the extent to which a region's age structure and taxpayers per household ratio can explain differences in the wealth and income rankings. The dependent variable in the regression is the wealth rank less the income rank, where the SLA with the highest wealth (income) receives a ranking of one. When the dependent variable is positive, income outranks wealth. Table 3 presents the results.

The taxpayers per household variable could only explain a small proportion of variation. It was not statistically significant once age information was incorporated in the regression. The fact that income is measured on a 'per taxpayer' basis rather than a 'per household' basis makes little contribution to the difference in regional income and wealth rankings.

Table 3   Age and the taxpayer rate as explanators of the difference in wealth and income rankings for SLAs

Explanatory variables	Dependent variable = Wealth rank − Income rank		
	Taxpayer rate only	Taxpayer rate and median age	Taxpayer rate and age share variables
Constant	−496***	2002***	−1481**
Average taxpayers per household	432***	ns	ns
Median age	nr	−54***	nr
Population share aged 0–14	nr	nr	1582*
Population share aged 15–24	nr	nr	3166***
Population share aged 25–34	nr	nr	4584***
Population share aged 45–54	nr	nr	ns
Population share aged 55–64	nr	nr	−2257***
Population share aged 65+	nr	nr	ns
Adjusted R-squared	6.6%	35.6%	47.4%

Notes: Excludes SLAs with fewer than 500 households in 2003–04, very remote SLAs and discrete indigenous communities. There are 1135 remaining SLAs.

All age data relates to 2001. The 35–44 age category was omitted to avoid perfect multicollinearity.

nr=not relevant; ns=not significant at 10 per cent significance level; *= significant at 10 per cent level; **=significant at 5 per cent level; ***= significant at 1 per cent level.

Source: BITRE analysis based on BITRE *Household Wealth Database*, BITRE *Taxable Income Database* and 2001 ABS' *Census of Population and Housing* place of usual residence data.

In contrast, differences in the age structure of regional populations are very important in explaining differences in regional income and wealth rankings. Differences in median age explain more than one-third of the regional variation. The higher a region's median age, the more likely the wealth ranking will outperform the income ranking. Adding in a greater range of age related variables improves the model's explanatory power. Having a high proportion of people in the younger age groups makes it more likely the income ranking will outperform the wealth ranking for a region, while a high proportion of people in the 55–64 age group has the opposite effect. Regional differences in age structure are capable of explaining just under half of the observed regional variation.

This confirms the importance of regional differences in age structure in explaining differences in the wealth and income performance of a region. However, differences in age structure are certainly not the whole story. Other factors, such as property prices, migration flows, industry structure, business assets and saving propensities, also appear to

contribute to differences between wealth and income for Australia's regions.

Cost of living

This section examines the relationship between the cost of living, household wealth and income. The cost of living is important in the overall picture of economic wellbeing, as it effectively determines the buying power of a given income within that region. Curran et al. (2008, p2) note that 'unadjusted income-based measures inevitably yield misleading results by understating economic wellbeing in low-cost areas of the country and overstating economic wellbeing in high-cost areas'. This is an especially significant issue in Australia, where transport distances are often measured in thousands of kilometres. An important question to ask is whether consideration of the cost of living exacerbates or lessens regional differences in economic wellbeing.

The comparability of the cost of living index with wealth and income is limited because the datasets use different geographies. The cost of living indices are based on individual towns, while the wealth and income estimates are based on SLAs. Non-metropolitan SLAs vary greatly in size, and often contain multiple towns as well as rural areas.

Comparability is also limited by the timeframe. Both the wealth and income data are for 2003–04, while the cost of living indices are for June 2006. The following analysis makes the assumption that the spatial relativities of common goods and services prices in 2006 are a useful guide to the spatial relativities of prices in 2003–04.

Due to data limitations discussed below, the cost of living sample was reduced for the following comparisons with wealth and income. This had the effect of removing many of the smaller and more remote locations. Table 4 provides some summary statistics for the full cost of remoteness dataset and the samples used in the wealth and income analyses. As a cost of living index could not be calculated for all areas, these summary statistics are limited to a HES group for which collection items were always available: food and non-alcoholic beverages.

Table 4   Summary statistics for food index across samples

	All 131 locations in cost of living dataset	74 locations used for wealth and cost of living analysis	85 locations used for income and cost of living analysis
Mean	116.9	106.6	108.9
Minimum	91.3	91.3	91.3
Maximum	202.4	126.9	137.4
Coefficient of variation	15%	6%	8%

Source: BITRE analysis based on BITRE *Household Wealth Database*, *Taxable Income Database* and cost of remoteness dataset.

When the sample size is reduced, the mean, the maximum and the coefficient of variation decrease, while the minimum remains unchanged. The coefficient of variation for the reduced samples is around half that of the full dataset.

While many of the most remote locations have been excluded from this analysis, remoteness remains an important driver of the overall cost of living. For the sample of 85 locations, the cost of living index tends to increase with the distance from the nearest town of 5 000 or more people (correlation=0.63).

Cost of living and wealth

This section compares the cost of living index to the household wealth data, based on a sample of 74 SLAs. The sample was reduced from the original 131 locations through the removal of:

- o 36 locations for which household wealth estimates are not available (very remote and Indigenous communities and those with fewer than 500 households);

- o A further 15 towns that were not the largest within their SLA, to ensure the towns surveyed were representative of the SLA in which they were located; and

- o A further 6 towns which did not contain enough items to sufficiently cover the major HES groups (discussed below).

The cost of remoteness project was designed to examine differences in costs across Australia, particularly in remote places, many of which are small towns. A number of sampled locations had limited or no coverage of some of the 13 HES groups (e.g. no alcohol was available in 8 of the 131 locations). Only locations with sufficient coverage were used to create the overall cost of living indices. Without this coverage, the index would not be comparable between towns and would need to be adjusted to take travel costs for the consumer into account where goods or services were not available locally.

Consequently, it was not possible to create a cost of living index for some sampled towns. The adequacy of coverage was determined by a minimum number of price observations for each of the 13 groups, which varied between groups depending on their size. Some significant items were also considered mandatory within a group: house prices in current housing costs, petrol in transport and at least one electrical item in household furnishings and equipment.

The exclusion of areas which lacked coverage of the HES groups meant that smaller towns are not present in this sample. These towns tend to have higher indices for grocery prices (BITRE 2008c). Indices by category of expenditure (such as groceries) for the remaining locations will be available in the first of BITRE's upcoming cost of remoteness reports.

Table 5 provides some summary statistics for the wealth and cost of living data across the 74 SLAs. The wealth data displays much greater variation than the cost of living index. In this sample, the cost of living index ranges from 91.7 to 124.1. The lower the index value, the cheaper the cost of living.

**Table 5   Summary statistics for wealth and the cost of living index**

	Net worth per household 2003–04 (A$'000)	Cost of living index 2006
Mean	379.7	101.1
Minimum	202.1	91.7
Maximum	633.1	124.1
Coefficient of variation	24%	6%

Note: Based on a sample of 74 SLAs. Excludes very remote areas, discrete indigenous communities and SLAs with fewer than 500 households. Also excludes SLAs in which the sampled town for the cost of living data was not the largest and where there was insufficient coverage for a cost of living index.

Source: BITRE analysis based on BITRE *Household Wealth Database* and cost of remoteness dataset.

The cost of living index varied between 96.8 and 105.5 across Australia's capital cities. Australia's major population centres face relatively cheap prices for groceries and many other goods, but housing costs tend to be relatively high. The lowest cost of living is evident in the more accessible regional cities and towns, which benefit from low prices for groceries and other goods and services as well as relatively affordable housing. It is remote areas, such as mining towns, which have the highest cost of living, facing high prices for groceries and other goods, while housing costs are also very high in some remote locations. Several accessible and affluent coastal towns also have a high cost of living index.

Figure 9 illustrates the relationship between the cost of living index and wealth by SLA. There is a positive correlation of 0.35 between the wealth and cost of living data. Both the wealth estimates and cost of living indices have house price data as a component, which will influence this relationship. The correlation appears to be driven by the higher values in the data and falls to 0.23 when the SLA which has both the highest cost of living and the highest net worth is removed from the sample. Removing the three SLAs with the highest wealth does not reduce the correlation any further, nor does removing the three SLAs with the highest cost of living indices. However, removal of the seven SLAs with net worth over A$500 000 reduces the correlation substantially, to 0.13.

Thus, while there is a positive overall correlation between wealth and the cost of living index at the regional scale, the relationship is not particularly strong and is not robust across samples.

Figure 9   Relationship of cost of living index to wealth across SLAs
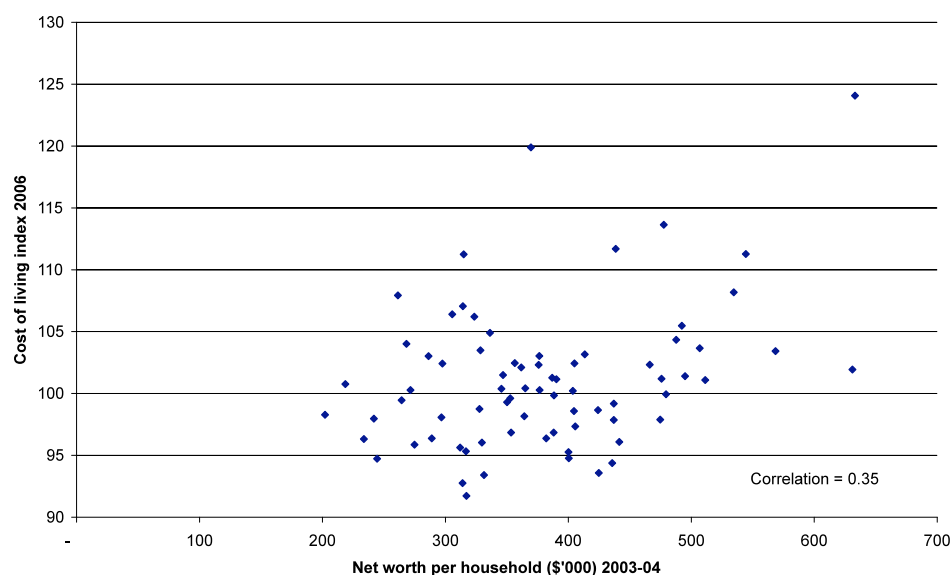
Notes: Based on a sample of 74 SLAs. Excludes very remote areas, discrete indigenous communities and SLAs with fewer than 500 households. Also excludes SLAs in which the sampled town for the cost of living data was not the largest and where there was insufficient coverage for a cost of living index.

Source: BITRE analysis based on BITRE *Household Wealth Database* and cost of remoteness dataset.

Cost of living and income

An exploration of the relationship between the cost of living and income is important for a fuller picture of economic wellbeing. Factoring the cost of living into incomes enables greater understanding of actual buying power of a given income within a location.

This section compares the cost of living index with income data, using a sample of 85 SLAs. The sample was reduced from the original 131 locations through the removal of:

  o   28 towns that were not the largest within their SLA, to ensure the towns surveyed were representative of the SLA in which they were located; and

  o   A further 18 towns which did not contain enough items to sufficiently cover the major HES groups.

A cost of living adjusted measure of income was calculated by dividing income per taxpayer by the cost of living index and multiplying the resulting value by 100. This adjustment has been made to capture differences in the buying power of regional incomes. Table 6 provides summary statistics.

The adjusted income measure has a slightly narrower range (A$20 318) than the unadjusted income measure (A$22 506) and the coefficient of variation remains unchanged. The minimum SLA value for income per taxpayer is 84 per cent of the sample mean, but this drops to 77 per cent for the adjusted income measure. Overall, it appears that consideration of the cost of living neither exacerbates nor narrows regional differences in economic wellbeing within Australia.

Table 6   Summary statistics for income and the cost of living index

|	Income per taxpayer 2003–04 (A$)	Income adjusted for the cost of living index	Cost of living index 2006
Mean	38 166	37 334	102.6
Minimum	32 173	28 886	91.7
Maximum	54 679	49 204	133.9
Coefficient of variation	11%	11%	7%

Notes: Based on a sample of 85 SLAs. Excludes SLAs in which the sampled town for the cost of living data was not the largest and where there was insufficient coverage for a cost of living index.

Source: BITRE analysis based on BITRE *Taxable Income Database* and cost of remoteness dataset.

Figure 10 shows the relationship between the cost of living index and income by SLA. While the correlation of the whole sample is 0.18, this is greatly influenced by a single SLA. The removal of the SLA with the highest income and cost of living reduces the correlation to –0.04. There appears to be no systematic relationship between the cost of living index and income in the sampled towns.

Figure 10 Relationship of cost of living index to income across SLAs
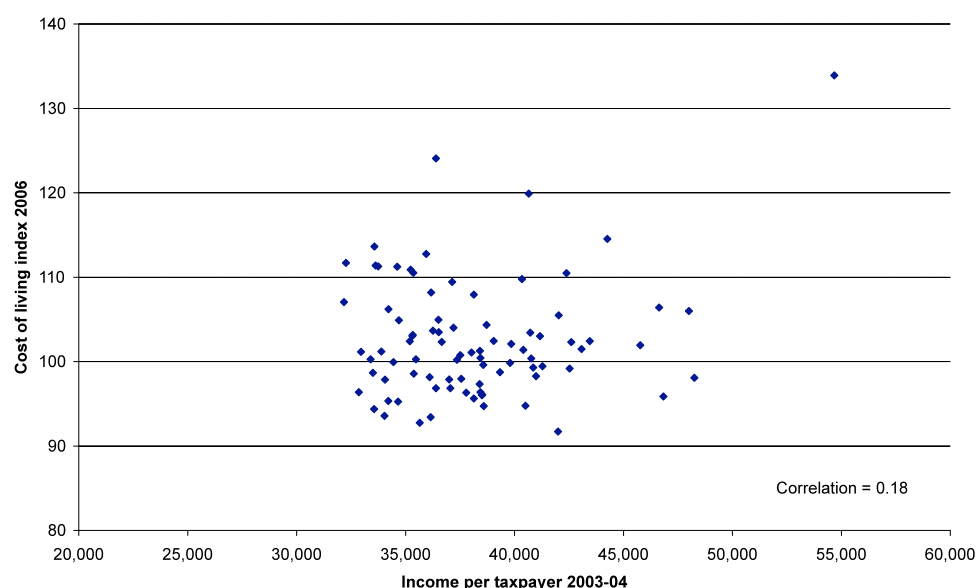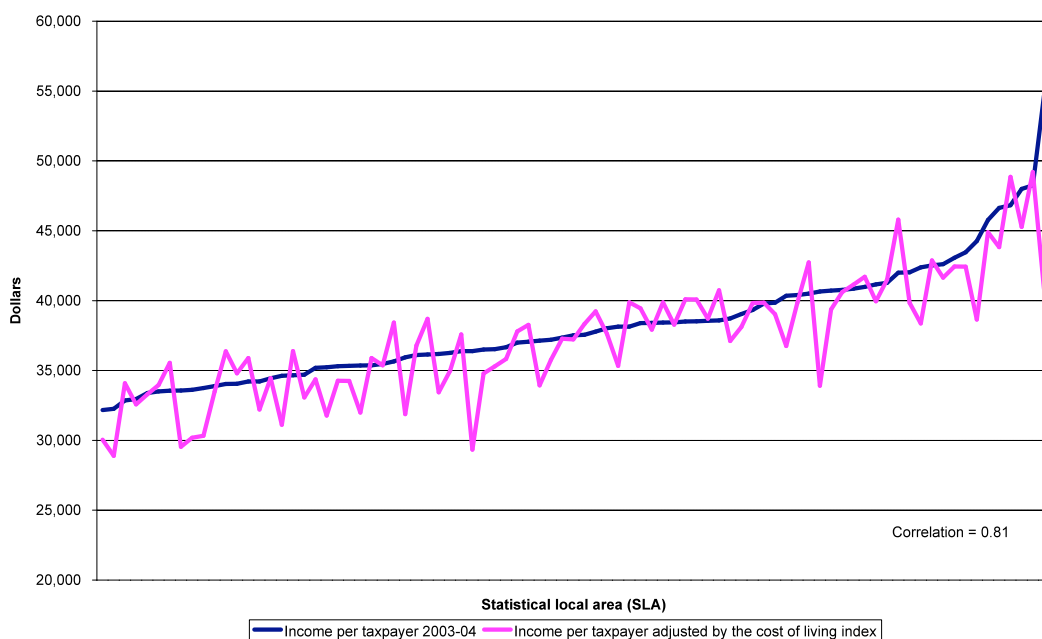

Notes: Based on a sample of 85 SLAs. Excludes SLAs in which the sampled town for the cost
          of living data was not the largest and where there was insufficient coverage for a cost
          of living index.

Source: BITRE analysis based on BITRE *Taxable Income Database* and cost of remoteness
          dataset.

The lack of a systematic link between them in no way reduces the importance of either prices or income to wellbeing in specific regions. Figure 11 compares SLA estimates of income with the cost of living adjusted income measure. In other words, when the cost of living is considered, what is the actual buying power of regional incomes?

The figure demonstrates the importance of using more than just income to determine economic wellbeing. Some SLAs with virtually identical unadjusted incomes per taxpayer differ substantially in terms of the buying power of those incomes. For instance, the two SLAs with the highest unadjusted income differ by approximately A$6 000. When the cost of living is taken into account, however, their positions are reversed, and the region with the lower unadjusted income has greater buying power of about A$8 000 due to its lower cost of living. The adjusted and unadjusted measures of income are, however, quite closely linked overall, with a correlation coefficient of 0.81.

Figure 11 Relationship between income and cost of living index adjusted income

Notes: Based on a sample of 85 SLAs. Excludes SLAs in which the sampled town for the cost of living data was not the largest and where there was insufficient coverage for a cost of living index.

Source: BITRE analysis based on BITRE *Taxable Income Database* and cost of remoteness dataset.

The SLAs were ranked by both unadjusted and adjusted incomes from highest (1) to lowest (85), and the change in ranks was compared (see Table 7). Of the 85 SLAs, 40 fell in rank, 41 rose in rank and 4 retained the same rank.

The ABS' Remoteness Structure classifies regions to one of five categories (major cities, inner regional, outer regional, remote, very remote) based on physical distance from services and opportunities for social interaction. Figure 3 maps the remoteness classes. Of the 17 SLAs that declined in rank by 10 or more places, 11 were remote or very remote. Of the 20 SLAs which improved by 10 or more places, all were located in inner and outer regional areas.

Table 7 **SLAs which experienced greatest change in rank once income was adjusted for the cost of living**

Region	Improvement in rank	Region	Decline in rank
Grafton NSW	+25	Broome WA	−48
Greater Bendigo–Central VIC	+24	Moyne South VIC	−32
Yarriambiack South VIC	+24	Wyndham-East Kimberley WA	−26
Bass Coast Balance VIC	+24	Derby-West Kimberley WA	−24
Dorset TAS	+21	Three Springs WA	−23
East Gippsland–Bairnsdale VIC	+19	Longreach QLD	−22
North Grampians–St Arnaud VIC	+17	Quilpie QLD	−19
Mount Gambier SA	+16	Roma QLD	−18
Tumut NSW	+15	Hastings Part A NSW	−17
Wattle Range West SA	+14	Lacepede SA	−16
Rockhampton QLD	+14	Coober Pedy SA	−14
Geraldton WA	+14	Nhulunbuy NT	−14

Notes: Based on a sample of 85 SLAs. Excludes SLAs in which the sampled town for the cost of living data was not the largest and where there was insufficient coverage for a cost of living index.

Source: BITRE analysis based on BITRE *Taxable Income Database* and cost of remoteness dataset.

The median population of the SLAs which declined in rank by 10 or more places was slightly more than half (6 795) of those which improved 10 or more places (12 873).

Remote small towns dominate the list of SLAs which experienced the greatest decline in rank, while regional cities and towns dominate the list of SLAs which experienced the greatest improvements in rank.

Only one major city, Sydney, fell more than 10 places. None rose more than 10 places. Adjusting for the cost of living recognises that Sydney's high housing costs impact negatively on the economic wellbeing of residents. However, adjusting for the cost of living does not have a major impact on assessments of relative economic wellbeing for Australia's other major cities.

The above analysis suggests that neither wealth nor income have a strong relationship with the cost of living. However, the cost of living is systematically linked with a region's remoteness and, to some degree with its population size. For some regions, shifting attention to the buying power of regional incomes provides a markedly different picture of the region's comparative economic wellbeing. Unadjusted measures of average income tend to overstate buying power for remote locations and understate buying power for residents of cities and towns in inner and outer regional areas of Australia.

Summary

This paper has brought together the results of three BITRE regional research projects covering three distinct, but related, aspects of household economic wellbeing — income, wealth and the cost of living. All three projects have sought to improve data availability and understanding of economic conditions in Australia's regions, but they have adopted quite different methodological approaches. One is reliant on manipulation of administrative data (taxable income), another involves the application of small area estimation techniques (household wealth) and the third involves extensive fieldwork (cost of remoteness).

The comparison of the three projects reveals there is no single preferred solution to filling regional information gaps in Australia. The preferred methodology will vary based on the nature of the research question and whether relevant data sources already exist. The improved availability of spatial information from administrative datasets probably represents the most realistic way of achieving substantial improvements in the availability of regional statistics for Australia. Small area estimation techniques have potential for topics where some relevant small area data already exists, while primary data collection through surveys and fieldwork has an important role to play in advancing knowledge of topics where there is little existing data.

This paper has explored the nature of the regional relationship between wealth and income and the key messages are summarised below:

- o Regional wealth and regional income are moderately positively correlated. However, much of the strength of this association arises from the strong connection between wealth and income at the top end of the scale. When the top wealth decile is excluded, the link between income and wealth is fairly weak.

- o The wealth and income data present highly contrasting messages about economic wellbeing for roughly one-fifth of SLAs.

- o Many mining centres have high incomes and low wealth, as do many high population density urban SLAs.

- o There are two main types of region which have high wealth combined with low incomes: agriculturally based regions and sea change communities. Based on income statistics alone, these regions may be assessed as disadvantaged, but households often have substantial wealth holdings that can be used to support consumption and maintain lifestyle.

- o Wealth and income measures tend to provide different signals about economic wellbeing when regions have a particularly young or old age structure. Almost half of the observed difference in the regional wealth and income rankings can be attributed to regional differences in age structure.

- o Wealth displays a greater degree of spatial variation than income. Thus, reliance on income data may understate the extent of regional disparities in economic wellbeing.

Spatial differences in the cost of living are systematically influenced by remoteness, but neither wealth nor income is closely related to the cost of living at the regional scale.

Consideration of regional differences in the cost of living neither widens nor narrows existing regional income disparities. However, for some regions, shifting attention to the buying power of regional incomes provides a very different picture of the region's relative position. Therefore, it is important to take the cost of living into account, because it can substantially alter comparative assessments of regional economic wellbeing.

Focusing on a single measure of regional economic wellbeing, such as income, has obvious benefits in terms of simplicity. However, such an approach can provide misleading messages about the relative economic wellbeing of regions. The results of this paper suggest that reliance on income data alone:

- tends to overstate the economic wellbeing of mining towns, which have low wealth and a high cost of living;

- may understate the economic wellbeing of the more accessible agriculturally based regions which are characterised by low incomes, high wealth and a moderate cost of living;

- may also understate the wellbeing of regional cities, which lie below the national average in terms of both income and wealth, but face a relatively low cost of living;

- but is less misleading for Australia's major cities, which enjoy moderate to high incomes, moderate to high wealth (except for some outer suburbs) and a moderate cost of living.

The paper highlights the value of undertaking a more integrated assessment, which takes into account spatial differences in various aspects of economic wellbeing. It also reveals some of the complexities and limitations of bringing together datasets that were designed for different purposes. Future BITRE research will consider extending this paper's approach to incorporate regional information on welfare dependency, poverty, inequality, consumption and economic security.

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