

A New Measure of Average Household Size

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Abstract

This article introduces a new, timely measure of average household size (AHS) – a key determinant of underlying demand for housing – using the data from the ABS monthly Labour Force Survey. The average number of people living in each household has declined from around 2.9 in the mid-1980s to around 2.5 since the early 2000s. More recently, the AHS declined to historical lows of a little below 2.5 people per household. This was driven by changes in Sydney and Melbourne during the pandemic, which were more exposed to health restrictions, lockdowns and changes in migration flows from overseas.

Introduction

Average household size (AHS) – the average number of adults and children living in a home – is a key determinant of underlying demand for housing. For example, a decline in AHS means more households are being formed and there is therefore greater demand for housing for a given level of population growth. Changes in AHS can be driven by structural factors, such as shifts in demographics and household preferences for how much space people want; changes in AHS can also occur in response to cyclical conditions, such as changes in housing prices and rents (Kohler and van der

Merwe 2015). During the COVID-19 pandemic, changes in AHS were an important margin of adjustment for the housing market (Ellis 2022).

Existing AHS measures are published infrequently and with a long lag, which does not allow for a timely assessment of the interaction between changes in AHS and housing market conditions. This article introduces a timelier measure of AHS – developed by the authors – that can be calculated for different groups in the Australian population, including by geographic area and household characteristics.

Table 1: Measures of Average Household Size

	LFS Measure	Census	SIH	HILDA
Frequency	Monthly	Every 5 years	Every 2 years	Annual
Publication lag (approx.)	6 weeks	11 months	2 years	1 year
Sample size (approx.)	26,000 households	All responding households	15,000 households	9,500 households

Sources: ABS; Melbourne Institute; RBA

A new measure of AHS using Labour Force Survey data

Background

Research on household size and household formation in Australia has tended to use data from the Census of Population and Housing, which is conducted by the Australian Bureau of Statistics (ABS) every five years. While the Census is an invaluable source of data on longer run trends in household formation, it is not suitable for monitoring recent and higher frequency changes in household formation such as those that occurred since the onset of the pandemic. Other sources of household-level data – including, the Survey of Income and Housing (SIH) and the Household, Income and Labour Dynamics in Australia (HILDA) survey – are also not available frequently and timely enough for real-time monitoring of household formation.

Recently, the Bank has started constructing and monitoring a new series on AHS (Graph 1). This new measure uses the data underlying the ABS's monthly Labour Force Survey (LFS). While the LFS was not specifically designed to measure AHS, it aligns closely with and addresses many of the shortcomings of the existing measures.^[1] Hereafter, the new measure constructed by the authors is referred to as the 'LFS Measure'.

The LFS Measure is timely: it is available on a monthly basis and can be updated six weeks after the end of the period that each survey references (e.g. if the survey is conducted in the first half of March, estimates for March are generally available by the fourth week of April). As a result, the LFS provides the most up-to-date estimate of AHS, with

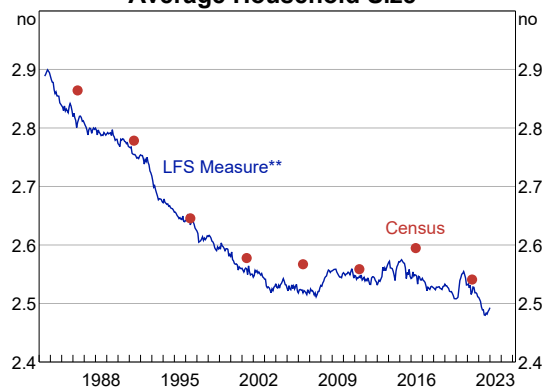
the latest data suggesting that the AHS remained around historically low levels at 2.49 people per household in January 2023. The LFS Measure also has the advantage of being based on a large nationally representative sample, with monthly data underpinning the measure available back to July 1983. The long history allows us to adjust for regular seasonal patterns and to understand trends and cycles over time. Table 1 summarises the timeliness of the various measures of AHS. Appendix A provides details on the various measures and their differences.

Methodology

The LFS Measure is simple to construct. As part of the LFS, the ABS collects information on the characteristics of each household, including the number of adults and children who usually live in the dwelling. These questions have been asked every month since mid-1983. Both the LFS and Census estimates of AHS in Graph 1 count the

Graph 1

Average Household Size*



* Average number of persons usually resident in an occupied private dwelling; excludes visitors and persons in non-private dwellings (e.g. hotels and hospitals).

** Estimated using Labour Force Survey microdata; seasonally adjusted. Sources: ABS; RBA

number of persons who are usually resident in the same private dwelling and exclude visitors and people who usually live in non-private dwellings (such as nursing homes, hotels and boarding schools).

The LFS Measure is calculated by the authors using the following methodology:

1. The number of residents in each household is counted by summing the number of adults and children within each occupied private dwelling for each month of the survey. Visitors to the household are excluded from this count.
2. The average number of people in each household across Australia is calculated for each month. In order to ensure this is broadly representative of the whole population, our average is weighted by the probability of the adults appearing in the LFS.
3. The series is seasonally adjusted to minimise the effects of any variations arounds holidays, the university calendar or other seasonal events, although the seasonal effects are small.^[2]

The series can be revised over time if the ABS make changes to the population measures the LFS data are aligned to.

An example of the code is provided in Appendix B, and graph data are available on request.

Recent developments in household size

At the onset of the pandemic

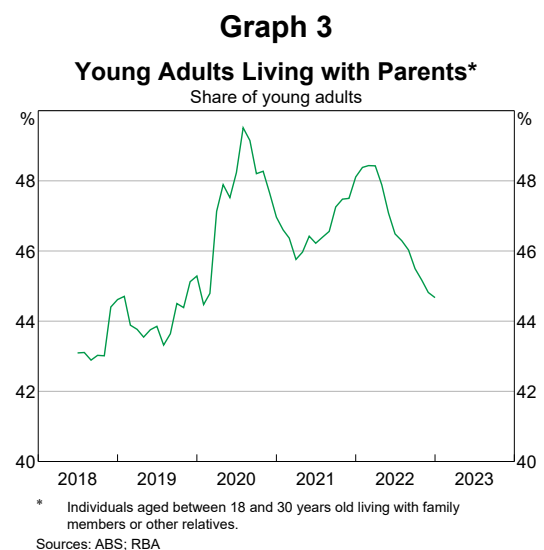
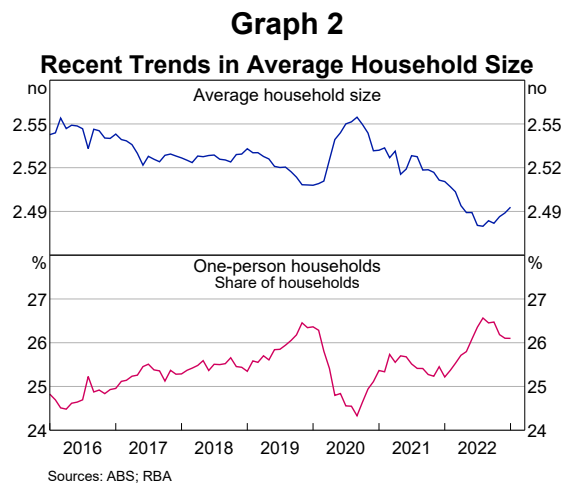
The LFS Measure shows that AHS picked up noticeably at the beginning of the COVID-19 pandemic (Graph 2, top panel). Household sizes grew, on average, by around 2 per cent between February and September 2020, during which time a large share of the population was under lockdown.

The spike in AHS reflected compositional changes in households (Ellis 2022). The share of households with one person fell by 2 percentage points, while the share of households with three or four people increased by a similar amount (Graph 2, bottom panel). In part, these shifts likely reflected a large number of young adults moving home with their families, with the share of those aged 18–30 years

old living with their parents rising by 5 percentage points to a historical high (Graph 3). These trends were likely driven by efforts to lower housing expenses at a time of labour market weakness and economic uncertainty, the shift to online learning and work, as well as a desire to live with others amid social distancing outside households.

From late 2020

The increase in AHS at the onset of the pandemic abruptly reversed in late 2020, with AHS declining over the following two years from 2.55 individuals per household to a historical low of 2.48 individuals by August 2022. This trend could reflect an increase in the demand for space, as people spent more time at home, both due to pandemic-related health restrictions and the increased ability for some to work from home.^[3] Population growth was also



much lower than expected during the pandemic, due to lower net overseas migration and the closure of international borders. This contributed to a period of high rental vacancy rates and lower advertised rents, particularly in Sydney and Melbourne, in 2020. Greater affordability, combined with changed preferences and strong income growth, likely encouraged individuals to form smaller households with more space per person over 2021 and 2022.

The decline in AHS contributed to a sizeable increase in demand for the number of homes in Australia, which helped offset the relatively slow growth in the population during the pandemic (Graph 4).^[4] A rough calculation suggests that across the Australian population of more than 25 million people, a decline in AHS of the magnitude observed between early 2020 and September 2022 (around 1 per cent, without any change in population growth) would alone imply an increase of around 120,000 households.

The outlook for AHS is uncertain. AHS has increased slightly since the end of 2022, possibly in response to tightness in many rental markets, particularly regional areas (see discussion below). But many structural factors that have contributed to the formation of smaller households over recent decades – such as an aging population, falling fertility and marriage rates, and higher household incomes – are still relevant today. Furthermore, it is not clear whether the preference for additional space will endure.

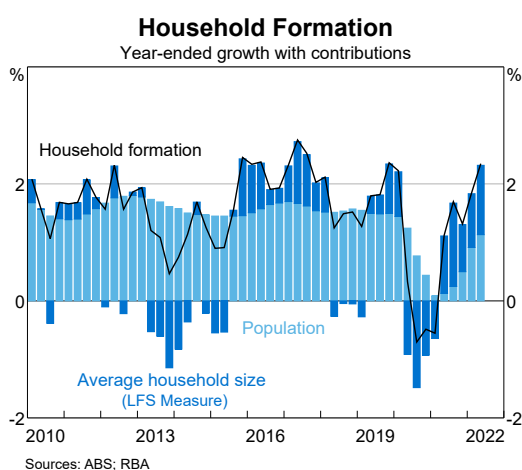
Trends by location

AHS varies considerably by location. Capital cities, on average, have larger households than regional Australia, likely reflecting higher housing costs (Graph 5). It may also reflect compositional factors. New households, such as those created by permanent arrivals from overseas, tend to be larger and more likely to settle in capital cities than regional areas due to the proximity to employment and education opportunities.

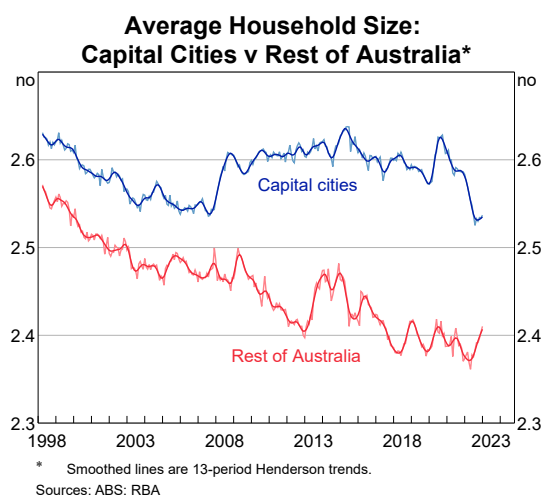
The up-down cycle in AHS since the onset of the pandemic has largely been driven by developments in capital cities, in particular Sydney and Melbourne (Graph 6). These cities experienced a sharp increase in the AHS at the start of the pandemic. They had longer and more stringent lockdowns compared with other parts of Australia, which may have led to a greater shift and persistence in preferences for additional space. Both cities were also more exposed to changes in overseas migration associated with the international border closure than other parts of the country. In part reflecting the decline in arrivals, Sydney and Melbourne experienced weaker rental markets at the onset of the pandemic relative to other capital cities and regional areas, with large increases in rental vacancy rates and declines in advertised rents by mid-2020 (Graph 7).

AHS in Sydney and Melbourne declined over 2022 and has remained around historical low levels, alongside a considerable tightening in rental

Graph 4



Graph 5



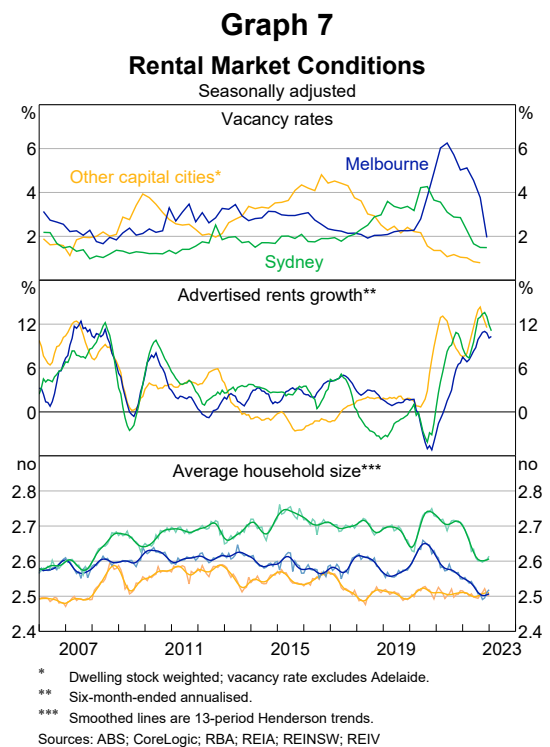
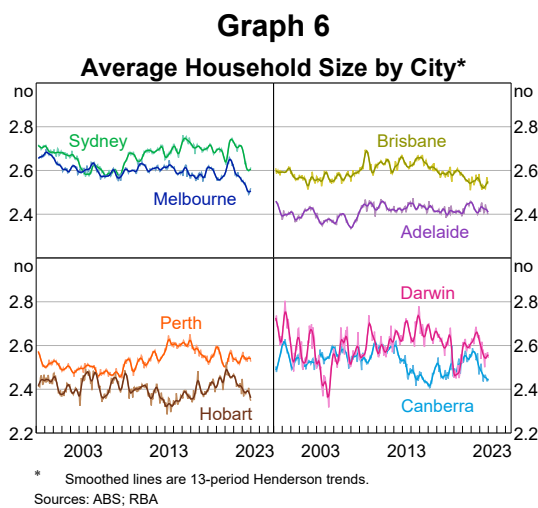
market conditions in both cities (Agarwal, Gao and Garner 2023). By contrast, there are some signs of AHS increasing or stabilising in some other capital cities, such as Brisbane, and regional areas, where rental markets have been tight for a longer period of time.

Conclusion

The new LFS Measure of AHS has the advantage of being timely, frequent and based on a large representative survey. Given the detailed demographic and employment-related information available in the LFS microdata, there are many other subgroups for which we could calculate AHS. This article has focused on changes in AHS following the onset of the pandemic and examined developments in living arrangements and in different parts

of Australia. However, the LFS Measure can also be used to examine how AHS has changed across different types of households, including by industry and occupation of employment.

Other researchers can make use of the data and code developed as part of this article.^[5] The Bank will continue to closely monitor developments in AHS using this new measure, as well as assessing its role as an indicator of underlying housing demand.



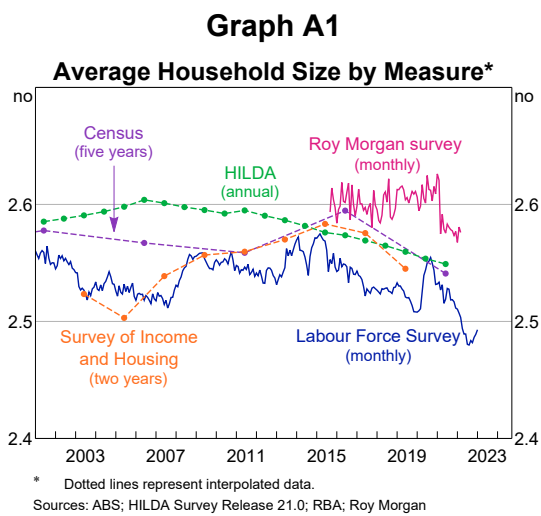
Appendix A: Various measures of AHS

The LFS Measure of AHS aligns with other measures (Graph A1). AHS steadily declined from around 2.9 people per household in the mid-1980s to be close to 2.6 people by the late 1990s, consistent with Census data. AHS was relatively flat from the early 2000s until the mid-2010s, before continuing on a downward trend over the 2020s, which is evident in all other AHS measures.

The consistent results reflects that these measures are conceptually similar, although there are a few differences in scope and coverage. All estimates of

AHS measure the number of persons who are usually resident in the same private dwelling. Most people who usually live in the household but were temporarily absent during Census night or the survey (e.g. for work, school, other purposes or because they were temporarily overseas) are treated as being part of the household. These measures also exclude visitors to the household. Furthermore, visitor-only households and people usually living in non-private dwellings (such as nursing homes, hotels, boarding schools and hospitals) are excluded from the average.

There are also small level differences between the LFS estimate of AHS and others that likely relate to variation in scope and coverage of each source of data. For example, the SIH and the LFS both exclude households in very remote geographical areas or with members of the Australian defence force, while these households are included in the Census. However, this has only a small impact on the aggregate data, as households in very remote areas constitute a small portion of the population and households with defence personnel have mostly similar household sizes.



Appendix B: Sample code for Stata

A list of variable names and definitions can be found at ABS (2023).

```
*****
* Set up and cleaning
*****
* Use LLFS microdata. The date has been recoded to a monthly variable.
`hhid`, `id`, `weight` `date` are the variable names for household id,
individual id, representative weight and date.
use lffsdata.dta
keep if date >= tm(1983m7)

* Recode missing values for number of children aged 14 years or younger
(nkid14h)
replace nkid14h =. if nkid14h <0 & nkid14h !=.

* Drop all visitors and non-private dwellings
drop if urstatus!=1

*****
* Generate the national LFS Measure of AHS
*****
* Count the number of usual adult residents in the household. This
excludes visitor from the count and assigns this figure to each person in
the household.
bysort hhid date: egen ahs = count(id)

* Add the number of resident children to this figure, providing the total
number of persons who are usually resident in the same private dwelling.
replace ahs = ahs + nkid14h

* Create a household-level weight, based on the average probability of
each adult appearing in the LFS.
collapse (mean) ahs weight, by(hhid date)

* Calculate the average number of people in each household across
Australia for each month.
collapse (mean) ahs [weight = weight], by(date)
```

Endnotes

- [*] The authors are from Economic Analysis Department. They would like to thank staff from the Australian Bureau of Statistics for making the LFS microdata available, and in particular Scott Marley for his assistance.
- [1] This data comes from the Longitudinal Labour Force Survey (LLFS). For further details on the data, including on how to apply for access, see ABS (2023). Previously, in the 1990s, the Labour Force Survey was used to adjust estimates of household size based on Census data. See ABS (1999).
- [2] The US Census Bureau's X13-ARIMA-SEATS methodology is applied to seasonally adjust the series.
- [3] Before the pandemic, households with at least one full-time teleworker lived in larger homes than those that did not (Stanton and Tiwari 2021).
- [4] These pandemic trends are consistent with experience in the United States, where greater household formation increased demand for rental properties (Waller 2022).
- [5] Full data and coding is available on request: contact rbainfo@rba.gov.au.

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