# Background paper 6 Links between public housing and employment in South Australia and Western Australia

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| Key points |
| * Datasets drawn from South Australian and Western Australian public housing administrative records, spanning the years from 2004 to 2013, were used to analyse: * factors associated with exits from public housing * factors associated with tenant transitions into employment * the effect of public housing on employment. * Employment status was not found to be significantly related to exiting public housing in South Australia and Western Australia early in a person’s tenancy, but employed tenants were more likely to exit the longer they had been in public housing, relative to those who were not employed. * Tenants who had been low priority applicants while on the waiting list were more likely to become employed than tenants who had been priority applicants and had urgent housing needs. This is likely to be because the former had a greater capacity for employment. * Evidence on the welfare lock hypothesis (that public housing applicants limit their employment while on the waiting list to remain eligible for public housing) was not conclusive. The analysis suggests that the probability of employment increased after entering public housing. However, these results should be interpreted with caution because they are likely to be biased in favour of finding a positive association between public housing and employment. * Linking state and Centrelink data would allow a more thorough empirical test of the welfare lock hypothesis because it would provide more frequent income and employment data for people before, during and after their time on the waiting list. Other related avenues of research merit further attention, such as whether welfare locks might affect public housing tenants in states and territories where tenant income limits exist. |
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Public housing is designed to help people who have low incomes and who face significant disadvantage to obtain adequate and stable accommodation. This paper addresses three key questions.

1. What factors are associated with exits from public housing (section 2)?
2. What factors are associated with public housing tenants becoming employed (section 3)?
3. How does transitioning from a public housing waiting list into a public housing property affect employment — is there any evidence of a welfare lock, that is, do applicants avoid employment in order to remain under the public housing income eligibility limit (section 4)?

Few Australian studies have examined these questions. A couple of analyses used Western Australian data for 1999 to 2005 (Dockery et al. 2008; Whelan 2009). The current study adds to this work by analysing data from both South Australia and Western Australia, and for a more recent time period: 2004 to 2013.

The paper opens with a description of the data and methodologies used in the Commission’s analysis.

## Data, institutional detail and research methods

### Datasets were constructed from administrative records

The analysis presented in this paper is based on administrative records for public housing applicants and tenants,[[1]](#footnote-1),[[2]](#footnote-2) which cover the period from 2004 to 2013.[[3]](#footnote-3) The Commission is very grateful to the Housing SA division of the Department for Communities and Social Inclusion in South Australia and the Department of Housing in Western Australia for providing these records, answering the Commission’s queries about the data and providing feedback on the research. That said, the views in this background paper (BP) are the Commission’s only.[[4]](#footnote-4)

The administrative records are a rich source of data, in that they cover all public housing applicants and tenants, and offer more information on applications and tenancies than is available in nationally representative datasets. The records are confidentialised — they do not include identifying information such as names or addresses. The Commission constructed datasets from the records. Variables include:[[5]](#footnote-5)

* dates at which individuals entered and exited a waiting list or public housing
* level of housing need while on a waiting list
* demographic characteristics of applicants and tenants
* income details.

In 2013, there were about 40 500 households in public housing in South Australia, compared with about 36 200 in Western Australia.

The populations analysed in this paper differ from those considered in BP 3 and BP 5, which used datasets built from Centrelink payment records, because:

* they include public housing tenants who are not income support recipients
* applicants for public housing are identified.

The characteristics of public housing applicants and tenants in this data are described in detail in BP 4. Descriptive statistics for the individuals included in the multivariate analysis presented in this paper can be found in annex A (table 2 and table 3).

The administrative data have some drawbacks. A key drawback is that income information (from which employment status is inferred) is not observed for every individual in every year. This information is updated especially infrequently for applicants. The problems this creates for the analysis of welfare locks are explained in section 4. Furthermore, detailed information on variables that may have important influences on employment, such as education or drug and alcohol problems, are not collected for administrative purposes and are therefore not available for the analysis.

Because of differences in the format and extensiveness of the records provided by each state, the analysis was conducted on working‑age household heads for South Australia,[[6]](#footnote-6) but on working‑age individuals for Western Australia. This issue should be kept in mind when interpreting the results of the study and in making any comparisons between the two states.

### Key institutional detail

There are important differences in the management of applicants and tenants in each state.[[7]](#footnote-7)

* In South Australia, the waiting list consists of three categories for new applicants.
* Category 1 includes households that have an urgent housing need.
* Category 2 includes households that have a high housing need.
* Category 3 includes households that do not have high or urgent housing needs but meet income and asset tests.

In Western Australia there are only two categories.

* Priority applicants are in urgent need of housing.
* Wait‑turn applicants meet eligibility requirements but are not in urgent need.

In both states, being placed in a higher priority category depends on factors such as homelessness, domestic violence and long‑term health issues (BP 4). The circumstances in which applicants for public housing in South Australia qualify for category 1 or 2 status are similar to those for priority applicants in Western Australia, making these groups somewhat comparable. Category 3 applicants in South Australia are similar to wait‑turn applicants in Western Australia.

* South Australia’s income limits for public housing eligibility are the highest in Australia, while Western Australia has the lowest limits. In Western Australia, the income limit for a single household without disability applying for housing in a metro or country area is $430 per week. In South Australia, the income limit for singles is more than double, at $970 (SCRGSP 2014). This means that if welfare locks do exist, their effects are likely to be more marked in Western Australia, as a smaller increase in employment is needed for an applicant to become ineligible for public housing.
* In South Australia, people living in public housing are not subject to income eligibility limits, so welfare locks do not affect tenants. Welfare locks might influence tenants in Western Australia, as tenant income limits were introduced in 2006.
* In South Australia, tenant incomes are assessed twice a year (in April and October) for rent review purposes. In Western Australia, tenant incomes are assessed yearly from the date that the tenant entered into public housing. Tenants in both states are required to notify the housing authority of income changes when they occur, but this does not always happen. In both states, the main occasions at which applicant incomes are assessed are at entry onto the waiting list and before an offer of housing is made, although income records might be updated if applicants voluntarily report their income or if an assessment is conducted for other services within the same department.

### Research methods

This analysis uses two techniques similar to those used by Dockery et al. (2008).

* Survival analysis methods are applied to two research questions, namely, the characteristics associated with the timing of:
* public housing exits
* tenant transitions into employment.

Survival analysis models the time until a particular event occurs. In the context of this paper, the events of interest are tenant exits from public housing and transitions into employment[[8]](#footnote-8), respectively. Cox proportional hazards regressions, a survival analysis method, are used to relate observed characteristics to the timing of these events.

* The difference‑in‑difference method is used to estimate the impact of entry into public housing on employment and to provide evidence on whether welfare locks occur. This method analyses changes in employment among a pool of applicants for public housing, comparing changes between one group that enters public housing and another group that remains on the waiting list within the period analysed. (A simplified illustration of the method is provided in box 1.) It takes into account observed characteristics, such as age and gender, as well as time effects, which can control for the potential influence on employment of factors such as macroeconomic conditions and policy changes. The method also factors in unobserved differences between public housing entrants and remaining applicants, to the extent that these differences are constant over time.

Episodic data[[9]](#footnote-9) were used in the survival analysis models, whereas yearly panel data were used in the difference‑in‑difference models. A full description of the data and research methodology used in generating the results presented in this paper can be found in annex A.

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| Box 1 The difference‑in‑difference method |
| In this paper, the difference‑in‑difference method is used to analyse the effect on employment participation of moving into public housing (PH) by comparing differences in changes in employment between people who remain on the waiting list and those who enter public housing.  Consider a simple example with two groups of people and two time periods.   * *Group A:* applicants who never enter public housing in the time periods under consideration. * *Group E:* applicants who enter public housing. * *Time before PH:* groups A and E are applicants on the waiting list. * *Time after PH:* group E has entered public housing while group A remains on the waiting list.   The model assumes that the change in the probability of employment for both groups over time would have been the same if neither had entered public housing. That is, the difference in the probability of employment between both groups would have been (YE1 – YA1) in both time periods.  The effect of public housing is calculated as the difference in the probability of employment between the two groups ‘after PH’, minus the difference between the two groups ‘before PH’.  Effect of PH = (YE2 – YA2) – (YE1 – YA1)  In the analysis in this paper, ‘before PH’ and ‘after PH’ correspond to the time around which a tenant enters public housing, which is different for each tenant. |
| This figure illustrates how the effect of public housing is calculated in a simple difference-in-difference model with two periods. More details can be found in the text within the box. |
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## Analysis of public housing exits

The question of how exits from public housing are associated with various demographic and tenancy characteristics is examined using survival analysis methods. Of particular interest are the links between employment and public housing exits. Limitations to the analysis are discussed in annex A.

### Existing evidence

There is limited information on the reasons why tenants leave public housing and their outcomes after moving (AIHW 2014). The few Australian studies that have analysed the dynamics of public housing tenancies have presented a mixed picture of the links between various factors, including employment, and exits from public housing.

* Whelan (2009) analysed the determinants of tenancy lengths, using a dataset created from public housing administrative records from Western Australia from 1999 to 2005. The length of spells in public housing was found to depend on individual characteristics. Lone parents and single households were likely to stay longer in public housing than couple households. Tenants with low earnings from employment were less likely to exit public housing than tenants with higher earnings.
* Seelig et al. (2008) examined housing pathways of income support recipients using a longitudinal dataset compiled from Centrelink administrative data covering 1993 to 2003. Although increases in earned income were observed before and after exits from public housing to private rental, modelling suggested that exits from public housing to any tenure in general were associated with lower levels of earned income. This highlights the importance of the destination tenure in the analysis of exits and employment.
* More recently, Wiesel et al. (2014) examined social housing exits using both qualitative and quantitative methods, including:
* a cohort analysis based on administrative records for tenants who entered public housing in New South Wales in 2007 and in Victoria in 2007‑08
* a longitudinal analysis of public housing tenants in the Household, Income and Labour Dynamics in Australia survey from 2002 to 2010
* surveys and interviews of tenants in New South Wales and Victoria.

The authors found that the link between employment and exit from public housing was weak. This was attributed in part to tenant concerns about long‑term job security. However, employment did make private rental a more viable option for tenants who exited social housing for other reasons, such as to move in with a new partner. It was also found that financial hardship caused some tenants to struggle to sustain tenancies once they exited social housing and some experienced multiple exits and re‑entries into the social housing sector.

### What factors are associated with exits from public housing?

#### South Australia

##### Patterns of exit from public housing

An analysis of the time that head tenants aged 15 to 64 in South Australia spend in public housing shows that about 19 per cent of head tenants can be expected to leave within two years, and about 37 per cent within five years (figure 1).[[10]](#footnote-10) In comparison, private tenancy lengths are much shorter: of the low‑income households in private rental that were provided a bond guarantee by Housing SA and whose tenancy ended in 2012‑13, half had tenancies that lasted for less than 60 weeks (based on unpublished bond data from Housing SA).

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| Figure 1 Cumulative probability of exiting public housing over time — South Australia**a** |
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| a Head tenants aged 15 to 64. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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##### Correlates of exits from public housing

The Cox proportional hazards model of exits aims to identify the unique links between observed characteristics and public housing exits. Box 2 explains how the results of multiple regression models should be interpreted. In the model used in this paper, controls were included for employment status, waiting list category, gender, age, receipt of Disability Support Pension (DSP), partnered status, number of children, Indigenous status, country of birth, location, housing type and number of bedrooms. Variables capturing changes over time in the relationship between these controls and exits were included where such time‑varying impacts were found to matter.

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| Box 2 Interpreting results in a multiple regression analysis |
| Multiple regression analysis involves the study of the relationships between multiple factors and an outcome variable. The analysis aims to identify the unique contribution of each factor on the outcome. Results for a particular factor are interpreted ‘holding other factors constant’. For example, in the results of the analysis of exits from public housing, the relationship between employment and exit is interpreted holding fixed other characteristics that are included in the model, including waiting list category, gender and age.  The results of a multiple regression analysis may be different from the results of an analysis that looks only at one factor and the outcome. This is because there could be other characteristics that affect both the factor of interest and the outcome, which are not taken into account in a simple analysis. For example, it is likely that gender and age are related to both employment and the probability of exiting public housing. If the relationship between employment and exit from public housing was examined without taking into account gender and age, the effects of gender and age on exit would be combined in the results for employment. Therefore, the unique links between employment and exit cannot be isolated in a simple analysis.  A multiple regression model may not be able to take into account all possible factors affecting the outcome, for example, in cases where there is a lack of data on a particular variable. If there are factors in the regression that are correlated with omitted variables, then their coefficients will be biased. Where panel data are available, statistical techniques exist to take unobserved factors into account, to the extent that they are constant over time. |
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Figures 2 and 3 display the differences in the probability of exiting public housing for various groups. Where the bar is above (below) zero, head tenants with the given characteristic were more (less) likely to exit public housing than those with the default characteristic, holding other factors constant.[[11]](#footnote-11) The 95 per cent confidence interval of the estimate (indicated by the vertical line) shows that many of the relationships are statistically significant.[[12]](#footnote-12)

For example, the large interval in figure 2 indicates that, early in their tenancy, tenants who were employed were no more (or less) likely to exit public housing than tenants who were not employed. This is consistent with Wiesel et al.’s (2014) finding that employment was not a significant driver of exits. However, the likelihood of exit was found to increase over time for the employed in this analysis — employed tenants were more likely to exit than non‑employed tenants three years after entry to public housing.

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| Figure 2 Differences in probability of exiting public housing, by employment status — South Australia**a,b,c,d,e**  Per cent |
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| a Head tenants aged 15 to 64. b All comparisons are made with respect to the default category. In this case, the default is ‘not employed’. c Percentage difference calculated as the hazard ratio minus one. d Vertical line indicates 95 per cent confidence interval. e Refer to footnote 12. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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Tenants who were in categories 2 (high housing need) or 3 (standard applicant) when they were on the waiting list were initially less likely to exit public housing than tenants who were in category 1 (urgent housing need) (figure 3). On average, category 3 tenants were 14 per cent less likely to exit public housing than category 1 tenants, whereas category 2 tenants were about 24 per cent less likely to exit than category 1 tenants, other characteristics equal. This suggests that some people who were deemed to be in greater need of housing prior to public housing entry may have had more difficulty in sustaining their public housing tenancy than their peers in other applicant categories. Research into the housing experiences of homeless people with a mental disability in New South Wales found that those who were in public housing had problems sustaining their tenancy because of factors such as difficulties in meeting rent payments and a lack of support services (Sowerwine and Schetzer 2014). Differences in the probability of exit between categories were found to decline over time in this analysis, suggesting that category 1 tenants who did not exit public housing early in their tenancy were more similar to category 2 and 3 tenants in terms of their probability of exit.

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| Figure 3 Factors associated with exiting public housing — South Australia**a,b,c,d,e,f**  Percentage difference in probability of exit, compared to default group |
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| a Head tenants aged 15 to 64. b All comparisons are made with respect to the default category. For example, a male tenant was 22 per cent more likely to exit public housing than a female tenant. c Percentage difference calculated as the hazard ratio minus one. d Vertical lines indicate 95 per cent confidence intervals. e Refer to footnotes 11 and 12. f Location, stock type and number of bedrooms are not illustrated in these figures, but are detailed in annex A. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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Tenants were more likely to exit the younger they were when they entered public housing (figure 3). Young head tenants in South Australia might have had unobserved characteristics associated with greater life instability, leading to higher probabilities of exit when compared with older tenants. The differences in the probability of exit between age groups declined slightly over the study period.

Tenants receiving the DSP were more likely to exit public housing than non‑DSP recipients initially, but the difference fell over time (figure 3). Similar to the results for the waiting list category, this could be due to the presence of a subgroup of tenants who received the DSP, such as people with a mental disability, who might have had relatively more unstable patterns of housing and so were more likely to exit public housing early in their tenure. Other DSP recipients may have been more entrenched in public housing — for example, people with a physical disability may not have been able to find similar accommodation in the private rental market that suited their needs.

Public housing tenants in South Australia were generally more likely to exit if they were male, Indigenous, single or if they had fewer children, holding all other factors constant (figure 3).

It is possible that some tenants who exited public housing re‑entered at a later date. For example, tenants who were from category 1 or those who had a mental disability and exited public housing early in their tenure may have experienced an urgent need for housing again later in their lives and hence could have re‑applied for public housing. The analysis presented does not take into account re‑entries into public housing.[[13]](#footnote-13)

#### Western Australia

##### Patterns of exit from public housing

In Western Australia, on the basis of analysis of data for 2004 to 2013, about 31 per cent of tenants can be expected to exit within two years and over half within five years (figure 4). These percentages are higher than those found in the South Australian analysis, which only examined household heads, and may be explained by other household members being more transitional than the household head. For example, relationship breakdowns and adult children moving out of the family home may mean that these other household members stay in the household for a shorter period of time when compared with the household head. Other possible explanations include differences in state policies and administrative rules or differences in the characteristics of people housed within each state.

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| Figure 4 Cumulative probability of exiting public housing over time — Western Australia**a** |
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| a Tenants aged 15 to 64. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
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##### Correlates of exits from public housing

The Cox proportional hazards model of exits for Western Australia controlled for employment status, waiting list category, gender, age, receipt of DSP, partnered status, number of children and Indigenous status.[[14]](#footnote-14) Time‑varying relationships were also included in the model.

Like in South Australia, employment was not found to be significantly related to public housing exits immediately after entry to public housing, but tenants who had been in public housing for longer were more likely to exit if they were employed, compared with those who were not employed (figure 5).

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| Figure 5 Differences in probability of exiting public housing, by employment status — Western Australia**a,b,c,d,e**  Per cent |
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| a Tenants aged 15 to 64. b All comparisons are made with respect to the default category. In this case, the default is ‘not employed’. c Percentage difference calculated as the hazard ratio minus one. d Vertical line indicates 95 per cent confidence interval. e Refer to footnote 12. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
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In contrast to the South Australian results, ‘wait‑turn’ tenants were initially more likely to exit public housing than those who had a priority application (figure 6). (Whelan (2009) drew a similar conclusion using Western Australian data for 1999 to 2005.) It is unclear whether this is due to differences between states or differences between household heads and other household members. Intuitively, individuals who were in the wait‑turn category are more likely to be able to sustain a tenancy outside of public housing and so may decide to vacate their property, although this was not observed in the South Australian results. Tenant income limits in Western Australia could also be playing a role — it may be that wait‑turn tenants were more likely to exceed the income eligibility limit for public housing. Nevertheless, similar to South Australia, the difference in the probability of exit between priority and wait‑turn tenants declined over time.

Other differences from the South Australian results are evident. For example, partnered head tenants in South Australia were initially less likely to exit public housing, whereas partnered tenants in Western Australia were more likely (although the sizes of these relationships were small), and tenants receiving DSP were initially more likely to exit in South Australia, whereas those in Western Australia were less likely to exit. However, for both of these factors, the differences between tenants among each group decreased over time in South Australia.

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| Figure 6 Factors associated with exiting public housing — Western Australia**a,b,c,d,e,f**  Percentage difference in probability of exit, compared to default group |
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| a Tenants aged 15 to 64. b All comparisons are made with respect to the default category. For example, a male tenant was 32 per cent more likely to exit public housing than a female tenant. c Percentage difference calculated as the hazard ratio minus one. d Vertical lines indicate 95 per cent confidence intervals. e Refer to footnote 12. f Location was excluded from the model due to model misspecification issues. There were insufficient data on country of birth and number of bedrooms to include these variables in the model. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
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Similar to Whelan (2009), public housing exits were found to be negatively associated with age, number of children and being female. Although people receiving the DSP were less likely to exit public housing,[[15]](#footnote-15) this may be a more recent phenomenon as Whelan (2009) found that those who had a disability were more likely to exit — a result that is more consistent with the South Australian analysis. Furthermore, while no significant relationship with employment at entry into public housing was found in this analysis, Whelan (2009) found that tenants earning low amounts of income from employment were less likely to exit public housing, and the probability of exit increased with earnings. These different findings suggest that changes in the relationship between various factors and public housing exits can occur over time.[[16]](#footnote-16)

### What do these findings mean?

The results shed some light on public housing exits, but there is still much to understand about the forces behind these exits. For example, the factors affecting exit may differ depending on the reasons for vacating public housing. Detailed information was not available on the reasons for exits, which might have been voluntary or due to eviction. Evidence on the drivers behind voluntary exits and evictions, and more information on tenant outcomes after exit, would be valuable.[[17]](#footnote-17) Furthermore, past studies have found patterns of multiple exits and re‑entries into social housing among some tenants (Seelig et al. 2008; Wiesel et al. 2014). Further work on exits from private rental for low‑income populations and re‑entries to social housing could add to the evidence on housing stability among low‑income renters, specifically on whether the stability of tenure in public housing has positive effects on employment.

The results suggest that South Australian and Western Australian tenants differ, on average, in a few factors associated with exits from public housing — notably waiting list category and receipt of DSP, both of which reflect housing need. However, the differences between tenants decreased over the period in public housing for both of these factors in South Australia, and for the waiting list factor in Western Australia. Further research is required to examine whether differences in the results between states are due to state policies, or the characteristics of people housed within each state or the research populations — head tenants and other household members.[[18]](#footnote-18)

Despite some differences between the South Australian and Western Australian results, both analyses suggest that employment is not significantly related to exiting public housing initially. This may be because the relationship between employment and exit depends on the reason for exit — tenancies could end because of eviction due to rent arrears or because of voluntary exit due to gains in employment. More information on the reasons for exiting would be useful in this respect. In both states, employed tenants were more likely to exit public housing than non‑employed tenants the longer they had been in public housing. It could be that there were fewer evictions and more voluntary exits among people who had been in public housing for a long time. It is likely that employed people are more likely to be able to sustain a tenancy outside of public housing, as suggested by Wiesel et al. (2014).

Other topics of interest for future research include investigations into how exits are impacted by housing adequacy. In particular, a measure could be included in the model that assessed the number of people in the household against the number of bedrooms in the property. Tenants might be more likely to exit if there is overcrowding, and less likely to exit if they have spare bedrooms. Future research could also examine how impacts of various factors differ by family type. Knowledge of the effects on exits among singles and lone parents would be particularly useful, as these are key groups among public housing tenants. These topics could not be examined within the timeframe of this project.

## Analysis of tenant transitions into employment

Survival analysis methods are also used to examine transitions into employment and the factors associated with becoming employed, for tenants who were not initially employed when they entered public housing.[[19]](#footnote-19),[[20]](#footnote-20)

The results are subject to data limitations. In particular, tenant incomes, from which employment status was inferred, are primarily observed at rent reviews rather than when incomes change. The rent reviews occur twice‑yearly (in April and October) in South Australia and yearly (from the date the household entered public housing) in Western Australia. Tenants are asked to notify their state housing authority of changes in their incomes when they occur, but do not always do so. This means that transitions into employment may not be observed in the data at the exact month of the change. In addition, spells of employment may go unrecorded if they occur between income assessments. As a result, the estimated probabilities of tenants becoming employed, presented below, are likely to be underestimates. Furthermore, lack of a control group in this analysis means that causal impacts of entry into public housing on gains in employment cannot be identified — the analysis simply looks at transitions into employment after becoming a public housing tenant. Data limitations are further discussed in annex A.

### Existing evidence

Other Australian research of public housing tenants’ employment outcomes reported that:

* those who were in the labour force tended to be younger, Indigenous and more likely to have children when compared with other tenants (descriptive analyses from the National Social Housing Survey of public housing tenants in 2007 (AIHW 2008)). The latter two factors are likely to be related to age, because of the younger Indigenous population in public housing and younger age profile of tenants with children. The main reasons given by survey respondents for not participating in the labour force included disability or old age, caring for children and lack of childcare, as well as a lack of training, education and experience. Transport options and location were not found to be very important to employment. However, the response rate for the survey was low (37 per cent) and the results might be affected by selection bias
* the main barriers to employment among housing assistance recipients (including public housing tenants and private renters receiving Commonwealth Rent Assistance) included mental and physical disabilities, family responsibilities, transport options and location (Hulse and Saugeres 2008)
* among families with two children, public housing subsidies had a small negative effect on the employment participation of men, but no significant effect on women. Men who were sole parents were less likely to work, as were Indigenous women (Dockery et al. 2008).

### What factors are associated with tenants becoming employed?

#### South Australia

##### Patterns of transitions into employment

Across the study period, about 11 per cent of working‑age head tenants in South Australia were already employed at entry into public housing.[[21]](#footnote-21) About 18 per cent of tenants who were not working at entry to public housing are expected to have found employment within two years of entering public housing, and about 29 per cent within five years (figure 7).[[22]](#footnote-22) (While an individual may have found employment, this does not mean that they were in employment for the remainder of their time in public housing.)[[23]](#footnote-23)

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| Figure 7 Cumulative probability of becoming employed over time — South Australia**a,b** |
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| a Working‑age head tenants who were not employed at entry to public housing. b These estimates are mainly based on income observations at entry to public housing and at rent reviews in April and October each year. To the extent that employment changes at different times are not recorded in the data, probabilities will be understated. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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##### Correlates of transitions into employment

Cox proportional hazards models were used to estimate the links between various factors and transitions to employment, including waiting list category, age, receipt of DSP, partnered status, number of children, Indigenous status, country of birth and location, as well as the time‑varying impacts of these variables. Results are presented separately by gender because the factors associated with employment tend to differ between men and women.[[24]](#footnote-24)

Tenants who were in category 2 (high housing need) or category 3 (standard applicant) while on the waiting list were more likely to become employed after they entered public housing than those who were in category 1 (urgent housing need) (figure 8). For example, a male tenant from category 3 was initially 57 per cent more likely to become employed than someone from category 1. This suggests that tenants housed from category 2 or category 3 might have been more employable than those from category 1. Tenants housed from category 1 could have had unobserved characteristics that hindered their chances of finding employment, relative to people from other categories. These differences were generally found to decrease with the length of time in public housing.

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| Figure 8 Differences in probability of becoming employed, by waiting list category — South Australia**a,b,c,d,e,f**  Per cent |
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| a Working‑age head tenants who were not employed at entry to public housing. b Category 1 includes households that have an urgent housing need, category 2 includes households that have a high housing need, and category 3 includes households that do not have high or urgent housing needs but meet income and asset tests. c All comparisons are made with respect to the default category for the respective gender. In this case, the default is category 1. d Percentage difference calculated as the hazard ratio minus one. e Vertical lines indicate 95 per cent confidence intervals. f Refer to footnote 12. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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Apart from waiting list category, other characteristics that were found to be related to employment included age, receipt of DSP, partnered status, number of children, Indigenous status and country of birth, some of which had relationships that varied slightly over time (figure 9). There were few differences between men and women, but an increase in age was negatively related to the probability of becoming employed for men, as was an increase in the number of children for women, although the latter effect declined over time.

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| Figure 9 Factors associated with becoming employed — South Australia**a,b,c,d,e,f**  Percentage difference in probability of employment, compared to default group |
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| a Working‑age head tenants who were not employed at entry to public housing. b All comparisons are made with respect to the default category for the respective gender. For example, a male tenant who was 35 to 44 years old when they were allocated housing was initially 17 per cent less likely to become employed than a male tenant who was 16 to 24 years old. c Percentage difference calculated as the hazard ratio minus one. d Vertical lines indicate 95 per cent confidence intervals. e Refer to footnotes 11 and 12. f Location is not illustrated in these figures, but is detailed in annex A. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
|  |
|  |

#### Western Australia

##### Patterns of transitions into employment

Across the study period, about 18 per cent of working‑age tenants in Western Australia were employed when they entered public housing.[[25]](#footnote-25) Similar to the patterns observed by Dockery et al. (2008), kinks in the probability of employment are observed about every 12 months due to the income assessments that the Department of Housing (WA) conducts each year (figure 10).[[26]](#footnote-26)

|  |
| --- |
| Figure 10 Cumulative probability of becoming employed over time — Western Australia**a,b** |
| |  | | --- | |  | |
| a Working‑age tenants who were not employed at entry to public housing. b These estimates are mainly based on income observations at entry to public housing and at rent reviews every year thereafter. To the extent that employment changes at different times are not recorded in the data, probabilities will be understated. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
|  |
|  |

The figure shows that about 23 per cent of tenants who were not initially employed are expected to have found employment two years after entering public housing, and about 39 per cent are expected to have found employment within five years of entering public housing.[[27]](#footnote-27) These probabilities are greater than those for South Australian public housing tenants. Differences between the state results might reflect differences in: the measured tenant populations (that is, head tenants in South Australia versus all tenants in Western Australia); economic conditions in the two states over the study period; or because of a smaller proportion of high needs entrants in Western Australia.

##### Correlates of transitions into employment

Cox proportional hazards models of transitions into employment were estimated for Western Australia, controlling for waiting list category, age, self‑reported disability, partnered status, number of children, Indigenous status and location, as well as time‑varying effects of these variables.

Similar to South Australia, tenants who were in the wait‑turn category were initially more likely to become employed than those who were in the priority category (figure 11). These relationships were not found to change over time. The relationships between other factors and the probability of becoming employed were also broadly similar to those in South Australia (figure 12).

### What do these findings mean?

The findings suggest that there are some transitions into employment among working‑age head tenants in South Australia and working‑age tenants in Western Australia following entry into public housing, although the analysis does not say whether the gains in employment are caused by public housing. The trend towards a more tightly targeted allocation of public housing, and declining employment rates for tenants (BP 4), suggests that some tenants may need more intensive assistance in gaining employment than they currently receive. Past examples of intensive case management programs provide some evidence that these programs can have positive effects on employment (chapter 5).

|  |
| --- |
| Figure 11 Differences in probability of becoming employed, by waiting list category — Western Australia**a,b,c,d,e,f**  Per cent |
| |  | | --- | |  | |
| a Working‑age tenants who were not employed at entry to public housing. b Priority applicants are in urgent need of housing and wait‑turn applicants meet eligibility requirements but are not in urgent need. People with an unknown waiting list category entered the waiting list before 2004 and therefore did not have a waiting list record available in the data provided. They are more likely to be wait‑turn applicants. c All comparisons are made with respect to the default category for the respective gender. For example, a male tenant who was in the wait‑turn category while on the waiting list was initially 47 per cent more likely to become employed than a male tenant who was a priority applicant. d Percentage difference calculated as the hazard ratio minus one. e Vertical lines indicate 95 per cent confidence intervals. f Refer to footnote 12. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
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|  |

In this analysis, waiting list category may be capturing a number of factors that are related to employment. People from higher priority categories might have unobserved characteristics that limit their probability of becoming employed after entering public housing. For example, people who have recently experienced rough sleeping or domestic violence may find it more difficult to secure employment immediately after entering public housing. Accurate and detailed recording of the reasons for being placed in a priority category would allow researchers to analyse the association between these characteristics and entry to employment for public housing tenants.

As in the analysis of public housing exits, future research could examine whether housing adequacy has an impact on transitions into employment, and how impacts of various factors differ depending on household type. Better and more frequent collection of income data would allow other avenues of research to be explored, such as how hours of work change and how long tenants remain in employment.

|  |
| --- |
| Figure 12 Factors associated with becoming employed — Western Australia**a,b,c,d,e,f**  Percentage difference in probability of employment, compared to default group |
| |  | | --- | |  | |
| a Working‑age tenants who were not employed at entry to public housing. b All comparisons are made with respect to the default category for the respective gender. For example, a male tenant aged 25 to 34 at entry to public housing was initially 56 per cent more likely to become employed than a male tenant aged 16 to 24 years. c Percentage difference calculated as the hazard ratio minus one.d Vertical lines indicate 95 per cent confidence intervals. e Refer to footnotes 11 and 12. f Location is not illustrated in these figures, but is detailed in annex A. There were insufficient data on country of birth to include this variable in the models. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
|  |
|  |

## Do welfare locks exist?

The welfare lock hypothesis suggests that applicants for public housing might avoid employment to remain under the income eligibility limit for public housing. If welfare locks do affect applicants, then employment rates are likely to be relatively low for people on the waiting list, but increase after they become public housing tenants and are no longer subject to strict income limits.[[28]](#footnote-28)

A simple investigation in BP 4 indicated that, in South Australia and Western Australia, employment rates increased while applicants were waiting for public housing over the decade to 2013. (An example of this type of analysis is presented in figure 13.)[[29]](#footnote-29) This observation suggests that welfare locks are not present. Employment rates also generally increased following a move into public housing. This could reflect a positive influence of housing stability on employment. (People might be more likely to work after moving into public housing because of the stability and security that it brings to their lives.) It might also reflect macroeconomic conditions or policy changes (although BP 4 concludes that these are not compelling explanations for the patterns in the data). Furthermore, the counterfactual is unknown — it is possible that employment rates would have been similar whether people moved or did not move into public housing. If that were the case, the patterns in the data would not be attributable to welfare locks or stability effects.

Difference‑in‑difference analysis was used to further examine welfare locks. The employment statuses of applicants who entered public housing and those who remained on the waiting list were compared, taking into account individual characteristics, time effects and unobserved characteristics (to the extent that they were constant over time). Time effects account for changes in macroeconomic conditions and policy.

The results presented below are subject to a number of important data limitations which could result in some bias in estimates (box 3).

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| --- |
| Figure 13 Employment rates pre and post a move into public housing**a,b**  Single‑person households |
| |  | | --- | |  | |
| a Observations include working‑age individuals who are observed both as an applicant and a tenant between 2004 and 2013, whose category did not change while on the waiting list, and who were still in public housing one year after entry. b Employment rates at ‘1 year after entry into public housing’ are inferred from the first income observation more than ten months after entry. |
| *Sources*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished); Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
|  |
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### Existing evidence

Only one other study has tested the welfare lock hypothesis using Australian data. Dockery et al. (2008) used administrative records from the Department of Housing in Western Australia from 1999 to 2005 to look at differences in employment rates between public housing applicants and tenants. They found that:

* tenants had a higher probability of becoming employed than applicants
* entry into public housing was associated with improved probabilities of employment for both men and women in both priority and wait‑turn categories.

Dockery et al. (2008) argued that, for priority applicants, increases in employment after entry into public housing were likely due to stability effects because they were more likely to be in unstable housing situations while on the waiting list. In contrast, they argued that wait‑turn applicants were more susceptible to welfare locks, as they were likely to be in stable housing while on the waiting list. Because the increase in the probability of employment for wait‑turn applicants was found to be more than twice that of priority applicants after moving into public housing, Dockery et al. (2008) concluded that the welfare lock effect was stronger than the stability effect.

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| --- |
| Box 3 Qualifications to the analysis — selection bias |
| The difference‑in‑difference analysis makes use of panel datasets that are constructed from South Australian and Western Australian public housing administrative records for applicants and tenants. Although these data are rich, in that they cover all public housing applicants and tenants, income information (from which employment status is inferred) is not available for every individual at each year of the data. To the extent that missing data are non‑random, selection bias may arise. Data are missing from the panel datasets for two main reasons.   * Incomes are assessed infrequently for applicants. Income data are more likely to be out of date for lower priority applicants who have been waiting longer. Individuals were only included in the panel for a particular year if they were on the waiting list at 30 June and had an income observation within the past financial year. * Applicants may exit the waiting list before being housed. Individuals were only included in the panel for the years in which they were on the waiting list or in public housing.   Analysis suggests that applicants who were missing income data (after their initial income assessment at entry to the waiting list) and those who exited the waiting list were more likely to be employed. As a result, applicants who were observed in the data after their initial income observation were less likely to be employed. To the extent that this is the case, entrants to public housing would be compared with a subset of less employable applicants and the estimate of the effect of public housing would be biased upwards, as illustrated below. Therefore, it is difficult to conclude confidently that public housing promotes (or does not promote) employment. Further details are available in annex A. |
| |  | | --- | | Legend.  **Actual effect of public housing**  **Observed effect of public housing**  **bias**  Probability of employment  Before PH  After PH | |
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|  |

Qualitative studies also suggest that welfare locks may exist, although overall conclusions about the impact of a move into public housing on employment are mixed. Hulse and Saugeres (2008) conducted in‑depth interviews of housing assistance recipients in New South Wales and Victoria and reported that several public housing applicants were not working so that they could remain eligible for housing. A number of study participants stated that lack of housing stability had impacted their capacity to find work. Another qualitative study found that some tenants worked less following a move into public housing because of the increased disposable income generated from rent savings, while others reported that an increase in self‑esteem and additional disposable income helped them look for work (Phipps and Young 2005).

Other studies have not focused specifically on the welfare lock hypothesis, but some Australian and overseas studies have examined the relationships between housing assistance (both public housing and rent subsidies) and the labour supply of recipients. Results on the whole are mixed. However, the largest studies from the United States have found that receiving housing assistance leads to lower labour supply in the short term (Carlson et al. 2008; Jacob and Ludwig 2012; Olsen 2001; Olsen et al. 2005).

### How does transitioning from a waiting list into public housing affect employment?

#### South Australia

Assuming that the data provide an accurate reflection of applicant employment, public housing had a positive and significant effect on employment, even after individual characteristics (waiting list category, age, receipt of DSP, partnered status, number of children, Indigenous status and country of birth) and time effects were taken into account. For both men and women in South Australia, the predicted probability of employment increased (by 8 percentage points and 7 percentage points, respectively) after entry into public housing (figure 14).[[30]](#footnote-30),[[31]](#footnote-31)

The links between observed characteristics and employment were broadly similar to those in the survival analysis of tenant transitions into employment in section 3. Details are provided in annex A.

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| --- |
| Figure 14 Average predicted probability of employment — South Australia**a,b** |
| |  | | --- | |  | |
| a Working‑age household heads who did not change waiting list category over time. Applicants could change to a higher or lower priority category if their circumstances changed. b Vertical lines indicate 95 per cent confidence intervals. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
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#### Western Australia

As in South Australia, and assuming that the data accurately reflect applicants’ employment statuses, public housing had a positive and significant effect on employment in Western Australia, even after individual characteristics (waiting list category, age, receipt of DSP, self‑reported disability, partnered status, number of children, Indigenous status and location) and time effects were taken into account. After moving into public housing, the probability of employment for men increased by about 11 percentage points on average. For women, the increase was lower, at about 5 percentage points (figure 15). Dockery et al. (2008) find the same percentage point increases for both men and women using Western Australian data from 1999 to 2005. As in South Australia, the links between observed factors and employment were generally consistent with those in the survival analysis of tenant employment, and are detailed in annex A.

|  |
| --- |
| Figure 15 Average predicted probability of employment — Western Australia**a,b** |
| |  | | --- | |  | |
| a Working‑age individuals who did not change waiting list category over time. Wait‑turn applicants could change to the priority category if their circumstances changed. b Vertical lines indicate 95 per cent confidence intervals. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
|  |
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#### Welfare lock or stability effect?

In order to investigate the potential effects of welfare locks versus stability effects, this paper follows Dockery et al. (2008) and estimates separate models for applicants from different categories. In the case of South Australia, applicants from category 3 exhibit the lowest levels of disadvantage, and therefore are the most comparable to wait‑turn applicants in Western Australia, whereas category 1 or 2 applicants are likely to experience more disadvantage, and are similar to priority applicants.

If the data are assumed to accurately reflect applicants’ employment rates, the results suggest that category 3 applicants experienced greater increases in their probability of employment after entering public housing than did category 1 or 2 applicants (figure 16).[[32]](#footnote-32) This is in line with Dockery et al. (2008)’s finding of greater increases in employment for wait‑turn applicants than priority applicants. Applying Dockery et al.’s (2008) argument, the results suggest that category 1 and 2 applicants experienced a relatively small housing stability effect and category 3 applicants were subject to a relatively large welfare lock which was removed after entering public housing.

|  |
| --- |
| Figure 16 Average predicted probability of employment by category — South Australia**a,b** |
| |  | | --- | |  | |
| a Working‑age household heads who did not change waiting list category over time. Applicants could change to a higher or lower priority category if their circumstances changed. b Vertical lines indicate 95 per cent confidence intervals. |
| *Source*: Author’s estimates based on DCSI, Housing SA, administrative data (unpublished). |
|  |
|  |

For Western Australia, both priority applicants and wait‑turn applicants were found to have experienced an increase in their probabilities of employment after entering public housing (figure 17). The size of the increase was greater for wait‑turn applicants than for priority applicants in percentage point terms for both men and women. However, the difference between categories was not as pronounced as it was in South Australia. This might be due to the different populations analysed (head tenants in South Australia and all tenants in Western Australia). Similar to South Australia, the findings suggest the presence of stability effects for priority applicants and welfare locks for wait‑turn applicants.

|  |
| --- |
| Figure 17 Average predicted probability of employment by category — Western Australia**a,b** |
| |  | | --- | |  | |
| a Working‑age individuals who did not change waiting list category over time. Wait‑turn applicants could change to the priority category if their circumstances changed. b Vertical lines indicate 95 per cent confidence intervals. |
| *Source*: Author’s estimates based on Department of Housing (WA), administrative data (unpublished). |
|  |
|  |

However, even assuming that the results are reliable, caution is required in interpreting them in this manner. That is, even if increases in employment for low priority applicants are observed to be larger than increases in employment for higher priority applicants, this might not be a good indicator of welfare locks. It might be argued that higher priority applicants are more likely to be subject to welfare lock effects than low priority applicants because they have a higher probability of entering public housing. There could be a greater incentive for them to limit their employment for a short time while on the waiting list, so that they remain eligible and receive the expected benefits that come with a public housing tenancy. In contrast, lower priority applicants have a smaller chance of entering public housing and may wait years before they are offered a place. Hence, they might believe that limiting their employment over such a long time period is not worthwhile. Therefore, it is difficult to interpret this as evidence of a welfare lock, that is, that applicants were deliberately not seeking employment in order to remain eligible for public housing.

### What do these findings mean?

This analysis suggests that entering public housing leads to an increase in a person’s probability of employment, other factors equal. However, as mentioned, data issues mean that the estimated effect of public housing on employment is likely to be overstated. Therefore, no clear conclusions can be drawn about the effect of public housing on employment from these results. That said, sections 4 and 8 in BP 4 provide somewhat stronger evidence of stability effects.

Because employment status is inferred from employment income, regular collection of income data for applicants is needed to enable robust analysis of the welfare lock hypothesis. To isolate the effects of welfare locks for applicants, it would be ideal to have longitudinal data on employment participation for people before they enter a public housing waiting list, and after they exit a waiting list for a reason other than entry into public housing. This would allow researchers to see the effect that entry onto (or exit from) the waiting list may have on employment. Linkage of Centrelink income records with data from state housing authorities holds the potential of creating data with these characteristics. Fortnightly earnings information could be obtained for income support recipients before, during and after their time on the waiting list.

Randomised controlled trials would also allow the issue of welfare locks to be examined more clearly. For example, the employment outcomes of applicants who are subject to income limits could be compared with the outcomes of similar applicants who are not subject to income limits.[[33]](#footnote-33)

With tenants now required to meet income limits on an ongoing basis in Queensland and Western Australia, the existence of welfare locks for tenants merits further investigation. There is potential for the difference‑in‑difference method to be applied to public housing data from Western Australia and South Australia, where the treatment is the introduction of tenant income limits affecting tenants in Western Australia, while South Australian tenants who are not subject to income limits could be used as the control group. This analysis could not be explored within the timeframe of this project but could be considered as part of future research on the topic of welfare locks.

## References

AIHW (Australian Institute of Health and Welfare) 2008, Labour force participation and employment in public housing rental housing in Australia, October, Bulletin 66.

—— (Australian Institute of Health and Welfare) 2014, *Housing assistance in Australia 2014*, Cat. no. HOU 275, AIHW, Canberra, http://www.aihw.gov.au/WorkArea/  
DownloadAsset.aspx?id=60129549033 (accessed 11 February 2015).

Carlson, D., Haveman, R., Kaplan, T. and Wolfe, B. 2008, *Long-Term Effects of Public Low-Income Housing Vouchers on Work, Earnings and Neighborhood Quality*, Discussion Paper, 1338–08, Institute for Research on Poverty.

Dockery, A.M., Ong, R., Whelan, S. and Wood, G. 2008, *The relationship between public housing, wait lists, tenure and labour market outcomes*, Research Paper, 9, Australian Housing and Urban Research Institute.

Hulse, K. and Saugeres, L. 2008, *Home life, work and housing decisions: a qualitative analysis*, Research Paper, 7, Australian Housing and Urban Research Institute.

Jacob, B.A. and Ludwig, J. 2012, ‘The effects of housing assistance on labor supply: Evidence from a voucher lottery’, *American Economic Review*, vol. 102, no. 1, pp. 272–304.

Olsen, E. 2001, *Housing programs for low-income households*, April, 8208, NBER Working Paper Series, National Bureau of Economic Research, www.nber.org/  
papers/w8202 (accessed 21 July 2014).

Olsen, E.O., Tyler, C.A., King, J.W. and Carrillo, P.E. 2005, ‘The Effects of Different Types of Housing Assistance on Earnings and Employment’, *Cityscape: A Journal of Policy Development and Research*, vol. 8, no. 2, pp. 163–187.

Phipps, P. and Young, P. 2005, *Housing assistance and non-shelter outcomes*, Final Report, 74, Australian Housing and Urban Research Institute.

SCRGSP (Steering Committee for the Review of Government Service Provision) 2014, *Report on Government Services 2014*, Productivity Commission, Canberra.

Seelig, T., O’Flaherty, M., Haynes, M. and Han, J.H. 2008, *Housing consumption patterns and earnings behaviour of income support recipients over time*, Final Report, 118, Australian Housing and Urban Research Institute, http://www.ahuri.edu.au/publications/  
p20257/ (accessed 22 April 2013).

Sowerwine, S. and Schetzer, L. 2014, *Somewhere over the rainbow - The opinions and experiences of people living with mental illness in getting housing*, May, Public Interest Advocacy Centre Ltd.

Whelan, S. 2009, ‘The dynamics of public housing tenure in Australia’, *Australian Economic Review*, vol. 42, no. 2, pp. 155–176.

Wiesel, I., Pawson, H., Stone, W., Herath, S. and McNelis, S. 2014, *Social housing exits: incidence, motivations and consequences*, Final Report, 229, Australian Housing and Urban Research Institute.

1. The South Australian records include state owned and managed Indigenous housing, which is public housing specifically for Indigenous people. In this paper, all statistics reported for public housing in South Australia include state owned and managed Indigenous housing. [↑](#footnote-ref-1)
2. The Western Australian records include some properties owned by the housing department that are externally managed. In this paper, all statistics reported for public housing in Western Australia include these externally managed households. [↑](#footnote-ref-2)
3. For most variables that change over time, the South Australian applicant records were provided in yearly snapshots at 30 June, while tenant records were at the date the household exited public housing, or at 30 June 2013 for tenants who had not yet exited. Income data were available at each income assessment (every six months for tenants), and disability data were available at each disability assessment. In the Western Australian data, most variables were provided in an episodic format, with a start and end date. [↑](#footnote-ref-3)
4. This background paper is one of six produced as part of a research project examining the links between housing assistance and employment. [↑](#footnote-ref-4)
5. A number of decisions about how to treat the records had to be made in the process of building the datasets. These are described in annex A. [↑](#footnote-ref-5)
6. In South Australia, each applicant or tenant household contains a nominated household head who is responsible for the application or the tenancy. Comprehensive data were not available on dates of entry to and exit from the waiting list or public housing for other household members. [↑](#footnote-ref-6)
7. For a full description of institutional arrangements in public housing, see BP 1. [↑](#footnote-ref-7)
8. Transitions from non‑employment to employment were examined. Non-employment was defined to include all people who are not working (as suggested by their wage and salary income), regardless of whether or not they were searching for work. This is different from unemployment, which comprises people who are not working and are actively searching for work. [↑](#footnote-ref-8)
9. The episodic data contained observations at the dates that tenants entered and exited public housing and at each update of their income. [↑](#footnote-ref-9)
10. These survival analysis estimates take into account censoring. In the context of this analysis, censoring occurs when an individual is still observed in public housing by the end of the study period. [↑](#footnote-ref-10)
11. Where the bar at three years after entry to public housing is the same as that at entry, the time-varying relationship for that variable was not found to be significant. For example, in figure 3, the gender chart shows that males in South Australia were 22 per cent more likely to exit public housing than females both at entry and three years after entry, and this is because no time-varying relationship was found for gender. [↑](#footnote-ref-11)
12. 95 per cent confidence intervals are not displayed for relationships at three years after entry to public housing due to difficulties in calculating these intervals at three years. Standard errors for time‑constant and time‑varying components of the hazard ratio for each factor are displayed in the tables of results in annex A. [↑](#footnote-ref-12)
13. If an individual entered public housing more than once within the study period, only their first entry is considered in the analysis. [↑](#footnote-ref-13)
14. Other factors, such as country of birth, that were controlled for in the South Australian analysis were not controlled for in the Western Australian analysis due to there being insufficient data on these variables for all tenants (annex A). [↑](#footnote-ref-14)
15. DSP receipt is used as a disability indicator in this analysis because self-reported disability does not require a medical confirmation. [↑](#footnote-ref-15)
16. The different findings could also be explained by differences in the variables included in each model, to the extent that those variables are correlated with employment. [↑](#footnote-ref-16)
17. Analysis using data available in the Household, Income and Labour Dynamics in Australia Survey on the reasons for changing address among public housing tenants could provide some insight on this issue. This could be considered in future research on this topic. [↑](#footnote-ref-17)
18. This analysis was not feasible with these data because dates of entry and exit into public housing were not available for all household members in South Australia and because of difficulties in identifying a unique household head in the Western Australian data. [↑](#footnote-ref-18)
19. The analysis examines tenants aged 16 to 64 years, rather than 15 to 64 years as in the above section, because income data are mainly collected on people aged 16 and over. [↑](#footnote-ref-19)
20. Because applicant incomes are infrequently updated, changes in employment status are rarely captured. Therefore, transitions into employment were only examined for tenants and not for applicants. [↑](#footnote-ref-20)
21. This result is reasonably consistent with the employment rates at entry to public housing presented in figure 13. This is because the vast majority of entrants to public housing in South Australia are from category 1 (BP 4, figure 8). [↑](#footnote-ref-21)
22. These survival analysis estimates take into account censoring. See annex A, table 7 for a list of cases where censoring occurs in this analysis. [↑](#footnote-ref-22)
23. The employment rate of all working-age head tenants in South Australia in 2013 was about 19 per cent (BP 4), suggesting that not all tenants stay in employment after finding a job. [↑](#footnote-ref-23)
24. As in section 2, where the bar is above (below) zero, tenants with the given characteristic were more (less) likely to become employed than those with the default characteristic, holding other factors constant. The 95 per cent confidence interval of the estimate at entry to public housing (indicated by the vertical line) shows whether the relationship is statistically significant from zero. If no significant time-varying relationship is found for the variable, the bar at three years after entry to public housing is the same as that at entry. [↑](#footnote-ref-24)
25. This is higher than the employment rates at entry to public housing presented in figure 13 because of differences in the people included in each piece of analysis. The survival analysis of tenants includes those who did not have income observed in the data at entry to the waiting list, whereas they are not included in the data underlying figure 13. About 37 per cent of tenants in the survival analysis did not have an income observation at entry to the waiting list, about half of whom were people who applied for public housing before 2004 (the date from which waiting list records were available). One explanation that accounts for the higher employment rates at entry to public housing in the survival analysis is the fact that people applying for public housing in remote areas of Western Australia tend to be housed quickly and have higher employment rates. Those who were housed quickly are included in the survival analysis but not in the analysis in figure 13 because there is only one income assessment that corresponds to both entry onto the waiting list and entry into public housing. [↑](#footnote-ref-25)
26. The patterns are not observed in the South Australian data because their rent reviews are conducted in April and October each year, so each tenant will have been in public housing for different durations at the reviews. [↑](#footnote-ref-26)
27. The employment rate of all working-age tenants in Western Australia in 2013 was about 22 per cent (BP 4), suggesting that not all stay in employment after finding it. [↑](#footnote-ref-27)
28. Welfare locks might still affect public housing tenants in states and territories where ongoing income eligibility limits exist for tenants, such as in Western Australia. [↑](#footnote-ref-28)
29. Rather than examining all household heads in South Australia and all tenants in Western Australia, figure 13 depicts employment rates for single‑person households only, to facilitate a better comparison between the two states. [↑](#footnote-ref-29)
30. The average predicted probabilities of employment before and after public housing are the predicted averages in the years before entering public housing and in the years after entering public housing, respectively. [↑](#footnote-ref-30)
31. Predicted probabilities from the random effects logit models underlying the figures presented below are lower than observed rates of employment. Predicted probabilities from pooled logit models for the same samples are much closer to observed rates of employment. It is not clear why the random effects estimates are relatively low. One possible explanation for this outcome is that it is due to the fact that random effects models set the individual-specific random effect as zero (the average random effect), while predicted probabilities from the pooled models have a (likely non-zero) constant term that is the same for all individuals. [↑](#footnote-ref-31)
32. It is likely that category 3 (wait-turn) applicants’ employment data are less accurate than those for category 1 and 2 (priority) applicants because category 3 (wait-turn) applicants have longer wait times and thus more opportunities to enter employment while on the waiting list. [↑](#footnote-ref-32)
33. This may be difficult to implement on the grounds of fairness. However, trials have the potential to improve employment outcomes for some, in contrast to not improving outcomes for anyone. To avoid the issue of self‑selection bias in a trial, applicants could self‑nominate to participate in the trial, and then be allocated to treatment and control groups through a process of random selection. [↑](#footnote-ref-33)