# APPENDIX: GET OUTTA TOWN! HOW THE PANDEMIC RESHAPED THE VALUE OF CITY LIVING

e61 INSTITUTE

## A.1. Regression specification

The analysis uses three regression specifications that differ by how proximity to the capital city centre is measured. The overall sample is split into subsamples that each cover a single month, and the three specifications are re-estimated on every monthly subsample. This process reveals how the estimated relationships change over time. Each specification includes a range of controls to protect against the estimated proximity relationships picking up other trends, such as changes in the types of properties being listed.

The simplest specification compares the level of rents across properties inside and outside capital cities, based on ABS Greater Capital City Statistical Areas (GCCSA) boundaries (Figure 1A). The coefficient of interest shows how much lower rents are outside the capital cities relative to within capital cities in percentage terms.

The second 'binned distance' specification compares rent across properties categorised into equal-sized quintiles by distance from the capital city centre (Figure 1B). This specification allows for a flexible valuation of distance from the city centre, which is important if we expect a non-linear response to the shift to remote work.

The third specification specifically estimates the value of proximity to the city centre, while also allowing for preferences to be different within capital cities and in the regions. This specification includes a continuous measure of distance to the nearest capital city, interacted with an indicator variable for whether properties that are located inside or outside the GCCSA boundaries.

We measure proximity to the coastline in two ways. Equation 1 uses a dummy variable that switches on for properties within 20 km of the coastline and is zero otherwise. Equations 2 and 3 use continuous logarithmic distance to coastline, meaning that the coefficient measures the approximate change in values from a 1 per cent increase in distance from the coast. The results for these regressions were not sensitive to the chosen specification.

Property transactions in the dataset are allocated to the month that they were rented (for rents) or settlement occurred (for prices). The graphs in the note show the coefficients and 95 per cent confidence intervals for the given proximity measure for each monthly regression.

The variables are defined as follows:

- ln *value* is the natural logarithm of the advertised rent listed for the *i*th property in the rent equation, or of the sale price of the property in the price equation.
- *distance bins* is an indicator variable that indicates which distance bin the property falls into. The 5 bins are 0-8 km, 8-17 km, 17-34 km, 34-107 km and >107 km.
- *within CC* is an indicator variable that equals 1 for properties inside GCCSA boundaries and 0 otherwise.
- *distance* is the natural logarithm of straight-line distance from the property to the nearest capital city CBD.
- *coast distance* is the natural logarithm of straight-line distance from the property to the nearest coastline.
- *near coastline* is an indicator variable equalling 1 for properties within 20 km of the coast and 0 otherwise.
- *bedrooms*, *bathrooms*, *carspaces* are the number of bedrooms, bathrooms and car spaces in the property. We allow for a non-linear relationship in these characteristics by specifying separate coefficients on 1, 2, 3, 4 and 5+ rooms/spaces.
- *property type* is an indicator variable dividing properties into houses or strata properties.

**Within/outside capital city regression**

$$\ln value_i = \alpha + \beta(within\ CC)_i + \gamma(near\ coastline)_i + \sum_{j=0}^{5} \gamma_j(j\ bedrooms)_i + \sum_{k=0}^{5} \delta_k(k\ bathrooms)_i + \sum_{l=0}^{5} \eta_l(l\ carspaces \times property\ type)_i + \theta(property\ type = House)_i + \epsilon_i \quad (1)$$

**Binned distance regression**

$$\ln value_i = \alpha + \sum_{j=1}^{8} \beta_j (distance\ bins)_i + \gamma (coast\ distance)_i + \sum_{j=0}^{5} \gamma_j (j\ bedrooms)_i + \sum_{k=0}^{5} \delta_k (k\ bathrooms)_i + \sum_{l=0}^{5} \eta_l (l\ carspaces \times property\ type)_i + \theta (property\ type = House)_i + \epsilon_i \quad (2)$$

**Distance with capital city boundary regression**

$$\begin{aligned} \ln value_i = {} & \alpha + \beta_1 (within\ CC)_i + \beta_2 (within\ CC \times distance) i + \beta_3 (outside\ CC \times distance)_i \\ & + \delta_1 (within\ CC \times coast\ distance)_i + \delta_2 (outside\ CC \times coast\ distance)_i \\ & + \sum_{j=0}^{5} \gamma_j (j\ bedrooms)_i + \sum_{k=0}^{5} \delta_k (k\ bathrooms)_i + \sum_{l=0}^{5} \eta_l (l\ carspaces \times property\ type)_i \\ & + \theta (property\ type = House)_i + \epsilon_i \end{aligned} \quad (3)$$

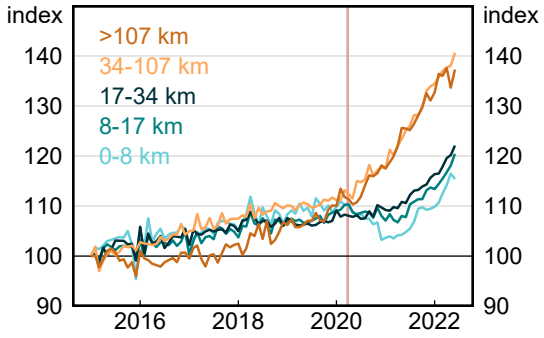
# A.2. Mean rent index

Figure A.1 shows the mean advertised rent on properties located within the given distance bands, indexed to January 2015. The figure shows that rents were generally growing at the same pace across Australia until the first pandemic lockdown in March 2020, after which rents grew much more rapidly in areas beyond 34 km from the centres of capital cities. These distances incorporate properties on the urban fringe and in regional areas.

**Figure A.1**

**Mean Rent Index***

By distance to the nearest capital city centre, Jan 2015 = 100



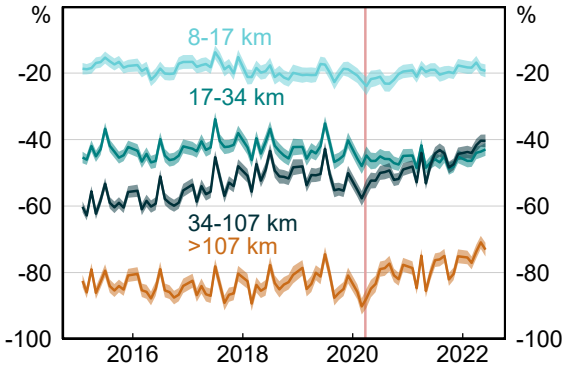

* Red line shows the date of first COVID-19 lockdown on 25 March 2020.
Sources: ABS; e61 Institute; PropTrack

# A.3. Results for property sales

I replicate some of the results using property sales data and find limited evidence of a preference shift away from proximity to city centres. This result is consistent with previous work showing after accounting for the large upward revaluation of larger homes, the discount for living further from city centres is little-changed (Ryan, 2022).

There is little shift in the pricing of properties by distance bins relative to inner city properties (Figure A.2), except for the 76-166 km bin. Even then, the change is minor compared to the movements in the level of relative rents. Together with the rental results, this may suggest that households are viewing the changes in working patterns as a temporary phenomenon, as housing sales markets are forward-looking asset markets, while rental markets reflect more short-term preferences for property (Campbell et al., 2009).

**Figure A.2**
**Difference in Prices***
Compared to <8 km from capital city centre**




* Excludes coefficients for January due to seasonality.
** Red line shows the date of first COVID-19 lockdown on 25 March 2020. Lines show regression coefficients controlling for property characteristics, while shaded ribbons indicate 95 per cent confidence intervals.
Sources: ABS; e61 Institute; PropTrack

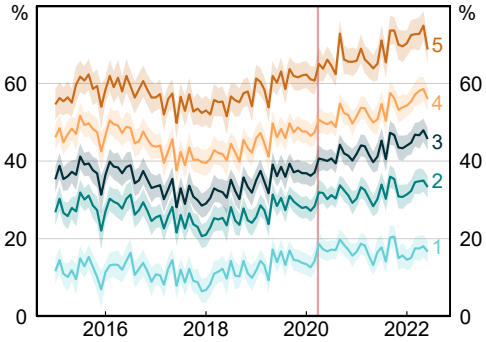
# A.4. Additional coefficient graphs

The following figures plot the coefficients on the number of bedrooms and carspaces in the regressions. Other coefficients are unaffected by changes driven by remote work (e.g. bathrooms) or are discussed in the main text (e.g. distance to coastline).

The value of dwellings with additional bedrooms relative to dwellings with no bedrooms (i.e. studio apartments) has increased, but this change is broadly in line with the pre-pandemic trend (Figure A.3). This suggests that there has not been a marked shift in preferences for additional space, although this may be better captured by floor space measures (I have not used this measure as coverage is incomplete).

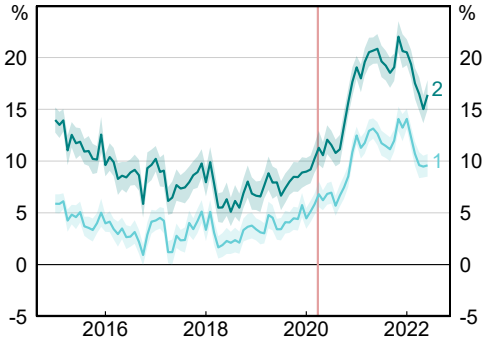
The value of a car space has doubled for apartments and other strata properties (Figure A.4). This may reflect a preference shift away from using public transport due to health concerns and is consistent with increased demand for cars during the pandemic that drove up the price of new and used cars. There was no equivalent increase in demand for houses with more carspaces, which may reflect a combination of more street parking in areas with detached dwellings and more difficulty measuring the number of parking spaces in a house (because people could park their additional cars in the driveway or front lawn).

**Figure A.3**
**Increase in Rents for Dwellings***
With n bedrooms compared to no bedrooms




* Red line shows the date of first COVID-19 lockdown on 25 March 2020. Capital city boundaries are defined using ABS Greater Capital City Statistical Area boundaries. Lines show regression coefficients controlling for property characteristics, while shaded ribbons indicate 95 per cent confidence intervals.
Sources: ABS; e61 Institute; PropTrack

**Figure A.4**
**Increase in Rents for Apartments***
With n carspaces compared to zero carspaces




* Red line shows the date of first COVID-19 lockdown on 25 March 2020. Capital city boundaries are defined using ABS Greater Capital City Statistical Area boundaries. Lines show regression coefficients controlling for property characteristics, while shaded ribbons indicate 95 per cent confidence intervals.
Sources: ABS; e61 Institute; PropTrack

# A.5. Comparison scenario

This section provides more detail on how the $1300 per year relative increase in rent on the urban fringe relative to the inner city is calculated.

The pre-pandemic period is defined using the February 2020 regression outputs. The post-pandemic period is defined using the most recent regression for June 2022. The regression specification used is the one in equation 2. The representative property I model is an apartment with 2 bedrooms, 2 bathrooms and 1 car space, with the inner city property located 10 km from the coastline, and the urban fringe property located 50 km from the coastline. The results are not sensitive to alternative sensible values of the coastline distance.

The $1300 per year figure is the change in the difference in the predicted rent for a dwelling located 34-107 km from the city centre and a dwelling located less than 8 km from the city centre as defined in equation 4.

(4) $$\text{Difference} = \left[(\text{city centre rents})_{pre} - (\text{urban fringe rents})_{pre}\right] - \left[(\text{city centre rents})_{post} - (\text{urban fringe rents})_{post}\right]$$