

Is there a delay between when housing prices increase, and rental costs increase?

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Introduction

- The housing market cooling has gained traction and is expanding geographically across the country.
- The housing market has peaked, and lower expectations are fueling the current slump. Though activity has slowed, homes are still selling swiftly across the country, with some locations performing better than others.
- Data set:
 - 1) Mean Weekly Housing Costs And Rental Prices with selected household characteristics for different states in Australia 2019-2020 from ABS [1]
 - 2) Residential Property Price Index in Eight Capital Cities in Australia 2003-2021 from ABS [2]
- Concern rental vacancy rate: hit all time from 2016 but since 02/2017, the general vacancy rate for residential rental properties in Adelaide has declined. Adelaide, Australia, has a 0.4% residential rental property vacancy rate in 02/2022. [3]
- Identify a best model fit the level of delay
- Validate the model's prediction accuracy

This study aim to understand:

- Is there any delay between changes in housing price and rental price
- How long is the lag between housing price and rental price

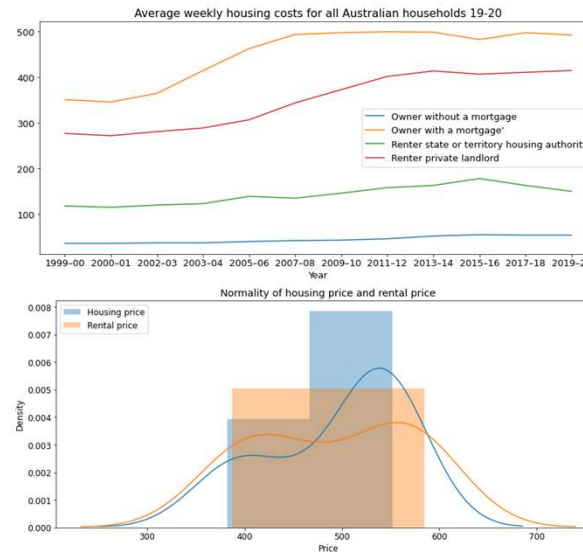
Hypotheses

To achieve the aim, the dataset of housing and rental price from ABS is analyzed and a hypothesis test was performed. For this analysis, my conjecture is that there is no lag between changes in housing prices and rental prices. Thus, this test aims at having sufficient evidence to not reject the null hypothesis.

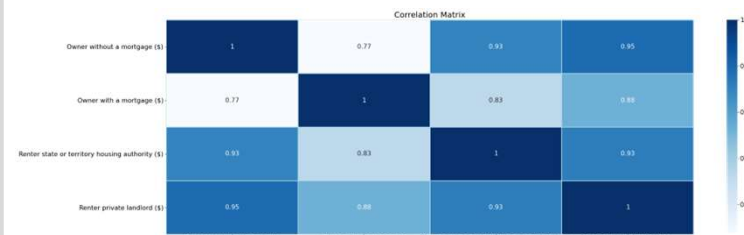
Null Hypothesis (H₀): There is no delay between changes in housing prices and rental prices.

Alternative Hypothesis (H_A): There is a delay between changes in housing prices and rental prices.

Results



- As we can see in normality chart above, the distribution of housing and rental price are normal.
- There's an evidence of 2 years lag between housing and rental price in the first line chart.
- It seems that the trend between housing price and rental cost is quite similar in both charts.
- However, it is necessary to have a further test to look at if there is any small lag between housing and rental price and how long it happens.



The correlation chart indicates evidence to see there is a strong linear relationship between rental cost and housing cost as $r=0.93$ and 0.95 .

Methods

- Testing the all variables if its distribution has shape of a normal curve.
- Find variable normal -> housing price normal
- Apply Linear Regression Model, testing independent variable normal distribution: $R = a + bH_t - x + e$
 - a: constant, there's natural gap between housing and rental price
 - B: how they move, changes variable
 - H: housing price
 - t: current time
 - x: the lag
 - e: error terms
- Apply AIC to determine the best linear regression model, a lower AIC score is better.
- Create models for variance delay.
- Find out which model fit the data best and how well it can match the series of rental price.
- Test normality to see parameter has normal distribution, use function lm

Discussion

- The results show that there is a strong linear relationship between housing cost and rental cost. Therefore, it might be there is no delay between changes in those two prices. However, it is necessary to have further test in the future to see if there is any small delay and for how long.
- The available data have a shortcoming: The latest data are from 2021, so it is possible that the characteristics of the relevant households may have changed since the most recent survey.

References

1. Australian Bureau of Statistics (19-20 financial year/25th May 2022), *Housing Occupancy and Costs*, <https://www.abs.gov.au/statistics/people/housing/housing-occupancy-and-costs/latest-release>, accessed 10/09/2022.
2. Australian Bureau of Statistics (December 2021/15th March 2022), *Residential Property Price Indexes: Eight Capital Cities*, <https://www.abs.gov.au/statistics/people/housing/housing-occupancy-and-costs/latest-release>, accessed 08/09/2022.
3. L. Granwal May 2022, Statista, *Vacancy rate of rental properties in Adelaide Australia 2012-2022*, <https://www.statista.com/statistics/1109588/australia-rental-home-vacancy-rate-in-adelaide/>