Changes in Amenity Values after COVID-19 Lockdowns in Auckland, New Zealand

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In the fight against the COVID-19 pandemic, New Zealand stood out with its ambitious elimination goal and the small death count per capita. The country’s strategy included full lockdown measures that were strict by international standards. In this paper we investigate whether New Zealand’s strict lockdowns brought significant changes to the dwelling price capitalisation of environmental amenities. Our results show a nuanced landscape. While before the pandemic, Auckland homebuyers were willing to pay a premium for dwellings located adjacent to open spaces, such premium either vanished or became a penalty during the lockdown phases. There was also a significant premium for dwellings within 300 m of beaches. But again such premium either decreases or becomes a penalty across the lockdown phases. In addition, we find a preference for dwellings located further away from Auckland CBD. Hence, some amenities that used to have a positive (or neutral) impact on the price of a property have now become disamenities from homebuyers’ perspective after the experience of the pandemic. This paper informs planners, policy-makers and private actors with a better understanding of the behaviour of Auckland’s housing market under the disruptions due to the pandemic and lockdowns.

Keywords: hedonic prices, capitalisation, open spaces, beaches, switching preferences.

1. Introduction

In the fight against the COVID-19 pandemic, New Zealand stood out with its ambitious elimination goal and the small death count per capita. While many other countries battled through their first wave and struggled with resurgences of the virus, daily lives and businesses were close to normal for New Zealanders. International media credited the Prime Minister Jacinda Ardern’s strategic leadership, including full lockdown measures that were strict by international standards. At New Zealand’s highest alert Level 4, only essential services such as grocery stores, pharmacies, clinics and petrol stations could remain open. Travel was severely limited, all gatherings were cancelled and public venues remained closed. New Zealand spent 34 days at the highest alert Level 4 in March and April 2020,
followed immediately by further 17 days on alert Level 3, during which travel to work and school were still restricted. After about 90 days without any case reported, in August, Auckland (New Zealand’s largest city) spent another 19 days under alert Level 3.

The pandemic and the lockdowns have implied that household mobility patterns for work and recreation changed substantially, including housing purchase decisions and the trade-off between housing attributes, in particular environmental amenities. Such amenities may add value to dwellings as they may reflect preferences of homebuyers with respect to ecosystem or recreation services. However, considering the strict social distancing imposed by the lockdowns and the transmissibility of the COVID-19, we posit two competing hypotheses regarding purchase decisions. First, after experiencing the pandemic, homebuyers may now wish to live closer to amenities such as open spaces or beaches to relieve the burden of mobility restrictions in case of further lockdowns. Second, homebuyers may also perceive open spaces or beaches as disamenities because they are places for significant gatherings, implying higher risks for community transmissions. This study will reveal the dynamics of these two competing hypotheses.

Hence, we investigate whether New Zealand’s strict lockdowns brought significant changes to the dwelling price capitalisation of two environmental amenities in Auckland: open spaces and beaches. Our results show a nuanced landscape, while before the pandemic Auckland homebuyers were willing to pay price premiums for dwellings located adjacent to open spaces or within 300 m of beaches, such premiums either vanished or became a penalty across the lockdown phases. In addition, we find evidence of price premiums for dwellings located further away from Auckland CBD. In other words, some amenities that used to have a positive (or neutral) impact on the price of a property have now become disamenities from homebuyers’ perspective after the experience of the pandemic.

This paper adds to the broad literature on the valuation of environmental and urban amenities. Housing markets experience cycles so that the capitalisation of amenities is not constant over time (Kuminoff et al., 2010; Bin et al., 2017; Fernandez & Bucaram, 2019; Towe & Tra, 2019). Often households may regard amenities as a hedge against likely housing price drops during market downturns (Chernobai & Chernobai, 2013; Coulson & Zabel, 2013; Sinai & Souleles, 2013; Zabel, 2015); nonetheless, during an economic recession, reductions in household income may decrease demand for amenities, provided they are normal goods (Kuminoff et al., 2010). However, an exogenous shock related to a sanitary and health crisis may imply different dynamics on the likely changes of the implicit prices of amenities (Bin et al., 2017; Towe & Tra, 2019). At least one other study has documented such changes due to the pandemic and mandated lockdowns (Irwin & Livy, 2021).

We take Auckland’s housing market as a case study because of its distinctive urban landscape characterised by a wide range of environmental amenities, and the active research on housing policies targeting to mitigate the increasing unaffordability of the last decade (Fernandez, 2019; Fernandez et al., 2020). Our study shows that the desire to be further away from potential infection hotspots may outweigh the desire to be close to environmental amenities that used to provide a positive value before the pandemic.

This paper is structured as follows: Section 2 describes the dataset and Auckland as the area of study. Section 3 describes the hedonic models we estimate. Section 4 presents and discusses the results. Section 5 concludes.

2. Data and Area of Study

Auckland is a city of 1.7 million inhabitants where the impact of the pandemic was relatively higher than the rest of New Zealand considering its population size and density. Though New Zealand fared well relative to the rest of the world, by the time of writing 2313 cases and 25 deaths were reported. Figure 1 shows the timeline of mandated lockdowns during the pandemic. The first Level 4 lockdown came into force from March 25 to April 27, followed by a Level 3 lockdown with some relaxations. Hereafter, these two periods are referred as the first lockdown. Subsequently, an inter-lockdowns phase ensued, where restrictions were further eased on May 15 when alert was reduced to Level 2, schools and businesses were allowed to reopen, but still with social distancing and a record-and-trace system. No COVID-19 cases remained in New Zealand and it was claimed the virus had been
eliminated. Major events could take place in public areas, such as open spaces and beaches. The country remained COVID-free until August 24 when four community cases were detected, and a Level 3 lockdown was immediately imposed in Auckland for three weeks, whereas the rest of the country remained in a Level 2 alert.

New Zealand’s highest lockdown level (Level 4) was more stringent than those seen in Australia and other Asian and European countries. The Oxford COVID-19 government response stringency index\(^1\) compares the pandemic-related mobility restrictions across countries. The eight policy indicators (C1-C8) summarise information on containment and closure of schools, workplaces, public events, gatherings, public transport, stay-at-home requirement, internal movement and international travels. During New Zealand’s highest lockdown level, the stringency index records 96.3 (the maximum being 100). Besides accessing essential services, people were only allowed to leave the dwelling to exercise in the nearest park. Figure 2 shows that New Zealand’s lockdown Level 4 is comparable in stringency to those in the Philippines, Vietnam, India, Italy, France, Russia and Spain. It is more stringent than those in Australia, China, Japan, Singapore, South Korea, Belgium, Denmark, Germany, Sweden and the United Kingdom. These graphs also show that the duration of the most stringent containment is similar across countries, from March to May 2020. Stringency in New Zealand increased sharply at the start, similar to many other countries; however, the rapidity at which it decreased was unseen anywhere else. This allows us to explore the lockdown phases and have confidence that any significant changes in the capitalisation of amenities are likely due to changes introduced by those phases (e.g. mobility).

We use records of 113,137 residential sales transactions between January 2017 and November 2020, obtained from the sales and valuation dataset of the Auckland Council. Records are split into five groups based on transaction dates: before the pandemic; during the first lockdown; the inter-lockdowns phase; during the second lockdown; and post-lockdowns. We remove any observations that do not seem arms-length, with missing variables, plus any extreme outliers. Panel (a) of Figure 3 shows the number of transactions by month and year. There are two peak sales periods every year: October–December, and February to March, during the austral spring and summer, before and after Christmas. In 2020 before the pandemic, January and February sales were similar to those in previous years. The lockdown in late March caused a significant decrease in transactions in April, during which 698 were sold, about a fifth of the usual volume. Sales volume recovered quickly in the inter-lockdowns phase, exceeding previous years. The second lockdown in August brought a small decline in sales; though the sales volume is still larger than August in previous years\(^2\). Panel (b) shows the

\(^1\)https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker The *Financial Times* provides an excellent visualisation on the index by country across time: https://ig.ft.com/coronavirus-lockdowns/

\(^2\)Sales volume for November are lower than expected. We argue this is due to data reporting delays. We still decided to use the full available dataset.

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monthly mean nominal sales price. The heated Auckland property market reached a new high in 2020, following an ongoing trend, which was further fuelled by historically low mortgage rates. Table 1 shows descriptive statistics for each of the five phases in the lockdown timeline. We note that prices are slightly higher after the first lockdown, but all other statistics are similar across time periods.

Figure 4 shows the spatial dispersion of transactions. For each observation we calculate the Euclidean distance from the property centroid to the edge of the nearest open space (parks, regional reserves, conservation areas, or playgrounds), the nearest beach and the centroid of the CBD. We argue that the heterogeneity in distances provides the variation necessary for identifying temporal differences in the capitalisation of these amenities (Irwin & Livy, 2021).

3. Empirical Strategy
Hedonic prices models are the workhorse for exploring homebuyers’ preferences and trade-offs between properties, land and locations in the housing market (Rosen, 1974; Coulson & Zabel, 2013; Zabel, 2015; Bade et al., 2020). When choosing between different dwellings and locations, households
make trade-offs that reveal the value they place on amenities. Equilibrium is reached when differences in dwelling prices reflect differences in dwelling characteristics in such a way that buyers and sellers cannot do better by making alternative choices (Ahlfeldt & Maennig, 2010; Moro et al., 2013).

Buyers often value the presence of amenities and neighbourhood attributes and are willing to pay higher prices up to a point where the marginal cost of proximity to such amenities equals their marginal benefits (Dahal et al., 2019). Considering the policy relevance of ecosystem services provided by amenities (due to the increasing pressure from population growth, the range of services they provide, their excludability and the degree of public or private involvement in their provision and maintenance) (Abbott & Allen Klaiber, 2013), as well as the likely disruption introduced by the pandemic and lockdowns in their capitalisation, we carry out two levels of analysis: for adjacency to open spaces and beaches, and for the character of neighbourhoods represented by the catchment over which those amenities may capitalise. Our specification is as follows:

Figure 3. (a) Housing Sales and (b) Average Sales Price by Month and YearSource: Sales and valuation dataset of the Auckland Council [Colour figure can be viewed at wileyonlinelibrary.com]
### Table 1. Descriptive Statistics

| Variable                  | Pre-lockdowns (Jan. 2017–Mar. 25 2020) | First lockdown (Mar. 26–May 14 2020) | Inter-lockdowns phase (May 15–Aug. 12 2020) | Second lockdown (Aug. 16–Aug. 30 2020) | Post-lockdowns (Sep. 1–Nov 30 2020) |
|---------------------------|----------------------------------------|--------------------------------------|-----------------------------------------------|---------------------------------------|-------------------------------------|
|                           | Mean         | Std. dev.    | Mean          | Std. dev.     | Mean          | Std. dev.     | Mean          | Std. dev.     | Mean          | Std. dev.     |
| Sale price                | 946,388      | 555,362      | 1,046,744     | 623,061       | 1,018,535     | 548,824       | 1,079,111     | 617,584       | 1,028,193     | 514,546       |
| Distance to open space (m)| 161.5        | 193.6        | 155.4         | 151.0         | 160.0         | 174.7         | 158.1         | 152.5         | 154.4         | 165.7         |
| Distance to beach (m)     | 4689.8       | 4864.1       | 4024.5        | 4399.0        | 4881.7        | 4994.7        | 4960.2        | 5010.1        | 5024.5        | 5036.2        |
| Distance to CBD (m)       | 15,323.6     | 11,417.3     | 13,714.4      | 9858.9        | 15,695.3      | 11,083.1      | 15,994.7      | 11,449.6      | 16,617.1      | 11,193.7      |
| Distance to school (m)    | 643.6        | 793.1        | 650.8         | 800.6         | 653.5         | 853.4         | 653.9         | 820.7         | 656.3         | 888.0         |
| Distance to road (m)      | 780.8        | 696.5        | 848.3         | 704.2         | 781.3         | 698.9         | 780.1         | 690.8         | 766.8         | 675.3         |
| Distance to waterway      | 729.3        | 715.4        | 739.2         | 704.7         | 706.3         | 692.8         | 707.0         | 692.4         | 669.9         | 685.5         |
| Slope                    | 3.1          | 2.3          | 3.2           | 2.3           | 3.1           | 2.3           | 3.0           | 2.3           | 3.0           | 2.3           |
| Floorspace (m²)           | 148.8        | 71.6         | 146.8         | 70.4          | 149.1         | 69.4          | 149.1         | 70.3          | 145.8         | 66.5          |
| Age moment of sale        | 36.9         | 26.3         | 44.7          | 26.5          | 40.5          | 25.6          | 42.0          | 25.4          | 40.9          | 23.7          |
| Elevation (m)             | 40.6         | 24.0         | 40.0          | 22.5          | 40.4          | 24.4          | 40.9          | 24.3          | 40.2          | 24.1          |
| Water view                | 0.10         | 0.15         | 0.10          | 0.10          | 0.10          | 0.11          | 0.10          | 0.11          | 0.10          | 0.11          |
| Orientation               |             |              |              |               |              |               |              |               |              |               |
| North                     | 0.29         | 0.29         | 0.28          | 0.28          | 0.28          | 0.28          | 0.28          | 0.28          | 0.28          | 0.28          |
| South                     | 0.21         | 0.23         | 0.22          | 0.22          | 0.22          | 0.22          | 0.22          | 0.22          | 0.22          | 0.22          |
| East                      | 0.24         | 0.24         | 0.25          | 0.23          | 0.23          | 0.23          | 0.23          | 0.23          | 0.23          | 0.23          |
| West                      | 0.27         | 0.25         | 0.26          | 0.27          | 0.27          | 0.27          | 0.27          | 0.27          | 0.27          | 0.27          |
| Observations              | 94,588       | 698          | 9106          | 4028          | 4717          |               |               |               |               |               |
\[ \ln(P_{ijt}) = \beta_0 + \beta_c X_i + \beta_d \text{Amenities}_i + \beta_L \text{Lockdown}_t + \beta_{DL} \text{Amenities}_i \times \text{Lockdown}_t + \gamma_j + \delta_t + \varepsilon_{it} \quad (1) \]

Equation (1) estimates the relationship between housing prices, \( P_{ijt} \), and a vector of housing and neighbourhood features, \( X_i \); dummy variables to quantify proximity and exposure to the amenities, \( \text{Amenities}_i \) (Mittal & Byahut, 2019); a categorical variable, \( \text{Lockdown}_t \), that takes the value of zero for transactions during the pre-pandemic baseline, and different from zero for a dwelling selling either during the first lockdown, the inter-lockdowns, the second lockdown and the post-lockdowns phases; and, the interaction between the latter two variables. These interaction terms are the primary interest of our study as they will reveal any changes to capitalisation due to the pandemic and lockdowns. Indexes \( i, j \) and \( t \) stand for dwellings, census area units (to proxy for neighbourhoods or suburbs) and time, respectively. \( \text{Amenities}_i \) takes the value of 1 if the dwelling is adjacent relative to an open space (<50 m.) or a beach (<300 m.). Auckland beaches are usually separated from dwellings by streets or other buffer areas, thus adjacency analysis should be implemented at a larger distance. In a separate set of regressions we also test if the amenities introduce a value that spreads over larger areas that define the character of the neighbourhood (Gibbons et al., 2014; Fernandez & Martin, 2020). For this alternative specification, \( \text{Amenities}_i \) now takes the value of 1 if the dwelling locates within 300 m from an open space or 1500 m from a beach. Table 2 breaks down the observations by their location relative to amenities and lockdown phases.

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All models include fixed effects by suburb to proxy for unobservable time-invariant features such as school quality or any other character features at neighbourhood-level (Ahlfeldt & Maennig, 2010; Klaiber et al., 2017; Towe & Tra, 2019). Time effects by quarter and year are included to control for annual trends and to capture intra-annual cyclical movements (Moore et al., 2020). Equation (1) then accommodates changes over time and identifies likely variations in the capitalisation of proximity to open spaces, beaches and CBD.

### 4. Results

Table 3 shows our first set of estimation results for dwellings that are adjacent to open spaces or beaches. We find that prior to the pandemic, adjacency to an open space capitalise positively with a premium amounting about 1.1% relative to a non-adjacent dwelling. Nonetheless, turning to the interaction between adjacency and the lockdown indicators, we find changes in the capitalisation. In particular, there are sign reversals on the inter-lockdowns phase to a discount of 0.86%, a peak discount of 3.88% during the second lockdown, and then 1.34% in the post-lockdowns phase, implying that relative to the pre-pandemic phase, price discounts are up to $42,300 on average. Therefore, relative to the pre-pandemic baseline, households’ preferences may have changed because of the mandated lockdowns as now open spaces may be perceived as disamenities. Arguably, in the context of the pandemic, open spaces are likely to be perceived as option to mitigate the burden of the restrictions of potential lockdowns.

Results for adjacency to beaches are more nuanced. Before the pandemic there is a positive capitalisation of about 5.6% on prices, which decreases dramatically during the inter-lockdowns (1.32%) and post-lockdowns (0.17%) phases. That is, at average prices the premium decreases from $53,700 to $13,600 and $1776 respectively. Even more, the capitalisation becomes a price penalty (1.8%) during the second lockdown, amounting $19,600. These contrasting results reveal that during lockdowns there is a preference against high usage of beaches and surrounding areas, due to the potential risk of infection. But, on the other hand, during COVID-free phases, beaches may be perceived as an option to mitigate the burden of the restrictions of potential lockdowns.

Interestingly, before the pandemic, proximity to Auckland CBD did not capitalise in prices. However, after lockdowns homebuyers’ preferences may have switched toward properties further away.
from the CBD, amounting on an effect of $44,700 at average prices. This may align with households preferring to locate farther from gathering hotspots or the reliance on remote work.

Capitalisation rates of amenities vary when the scope of analysis increases to the catchment area of open spaces or beaches, which define the character or “niceness” of the neighbourhood (Abbott & Klaiber, 2011; Klaiber et al., 2017; Fernandez, 2020). Results in Table 4 show that open spaces in the catchment area do not capitalise on prices, but during the inter-lockdowns phase a discount of about 5.14% arises ($53,000 at average prices). Such discount vanishes for the rest of lockdown phases. These results may imply that the perception of higher infection risk does not diminish as we increase the spatial focus of the model. On the other hand, the negative capitalisation of open spaces during the inter-lockdowns is larger in absolute value relative to the adjacency analysis in Table 3. Arguably, the potential disamenity attribute introduced by congestion and high usage of open spaces (and subsequently lower social distancing) outweighs any character value of the neighbourhood.

Again, changes in the capitalisation of beaches are nuanced. There is first a significant price premium for dwellings in the catchment area (3.6%), which decreases to about 0.57% during the inter-lockdowns phase. Then it becomes a discount in the second lockdown, 0.74%, and recovers to a premium of about 0.35% in the post-lockdowns phase. That is, though the use of beaches may be perceived as exposure to a potential hotspot for infection, the positive capitalisation still reflects they are also perceived as a source to relieve the burden of stringent lockdowns.

About the capitalisation of distance to the CBD, results are similar to those in Table 3.

Indicator variables for dwellings sold during the inter-lockdowns and post-lockdowns phases are significant in both Tables 3 and 4. The interpretation of our results might not hold should the mix of properties sold during lockdown phases differ systematically, in unobservable ways, from those sold before lockdown. Nonetheless, Table 1 shows that the mix of properties is largely similar in observed

Table 3. Regression Results for Changing Capitalisation of Adjacency to Open Areas, Beaches and CBD

|                              | Coefficient | SE  | p-Value |
|------------------------------|-------------|-----|---------|
| Adjacent to open spaces (1:Yes) | 0.011       | 0.005 | 0.024   |
| Interaction: first lockdown  | 0.010       | 0.024 | 0.672   |
| Interaction: inter-lockdowns | −0.020      | 0.008 | 0.018   |
| Interaction: second lockdown | −0.051      | 0.015 | 0.001   |
| Interaction: post-lockdowns  | −0.024      | 0.011 | 0.029   |
| Adjacent to beaches (1: Yes) | 0.055       | 0.013 | 0.000   |
| Interaction: first lockdown  | −0.008      | 0.066 | 0.905   |
| Interaction: inter-lockdowns | −0.044      | 0.017 | 0.011   |
| Interaction: second lockdown | −0.077      | 0.024 | 0.001   |
| Interaction: post-lockdowns  | −0.056      | 0.022 | 0.111   |
| Distance to CBD              | −0.102      | 0.064 | 0.108   |
| Interaction: first lockdown  | 0.010       | 0.013 | 0.447   |
| Interaction: inter-lockdowns | 0.042       | 0.009 | 0.000   |
| Interaction: second lockdown | 0.027       | 0.018 | 0.143   |
| Interaction: post-lockdowns  | 0.042       | 0.007 | 0.000   |
| Sold in first lockdown       | −0.120      | 0.120 | 0.319   |
| Sold in inter-lockdowns phase| −0.369      | 0.081 | 0.000   |
| Sold in second lockdown      | −0.175      | 0.173 | 0.311   |
| Sold in post-lockdowns       | −0.320      | 0.073 | 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in Table A1 in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.
characteristics across the phases. Therefore, a direct comparison with pre-pandemic behaviour may still be sensible for dwellings sold during the first and second lockdowns (Irwin & Livy, 2021). Furthermore, considering the likely delay on the registration of sales transactions, results for the second lockdown may reflect the last weeks of the inter-lockdowns phase.

Robustness checks can be found in the Appendix. Table A3 changes the definition of the lockdown dummy. It may be observed that effects from phases cancel out, thus our specification above offers a richer set of implications. Tables A4 and A5 show that the size of open spaces does not change the capitalisation effects of adjacency estimated in Table 3. That is, size has a small negative capitalisation during the inter-lockdowns phase of about $9000 that vanishes in the post-lockdowns phase.

Also, open spaces in the central or peripheral areas of Auckland characterise for different ecosystem services, typologies and features that make up a bundle of amenities. Bundling may have implications on the interpretation of results. As a further robustness check, we incorporate a dummy variable that takes the value of 1 if there is a waterway (e.g. creek or river) in the adjacency (50 m) or catchment (300 m) area of a dwelling. Table A6 shows that there is a positive capitalisation of about 11% ($120,000 at average prices) during the first lockdown phase. However, such premium vanishes afterwards and no significant effect is found for the catchment area.

Therefore, though open spaces are relevant for residential and commercial planning, and provide benefits such as areas to exercise and socialise, those benefits became their weaknesses during the lockdown phases (Dahal et al., 2019). Contrary to past literature where open spaces or beaches are usually regarded as amenities or hedges against recessions, lockdowns may have induced relocation towards areas not necessarily in their proximity. Past literature has also focused on the effects of

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**Table 4. Regression Results for Changing Capitalisation of Catchment Areas to Open Spaces, Beaches and CBD**

|                        | Coefficient | SE  | p-value |
|------------------------|-------------|-----|---------|
| Catchment of open spaces (1:Yes) | 0.017       | 0.010 | 0.087   |
| Interaction: first lockdown | 0.016       | 0.038 | 0.680   |
| Interaction: inter-lockdowns | -0.053      | 0.020 | 0.008   |
| Interaction: second lockdown | -0.025      | 0.030 | 0.410   |
| Interaction: post-lockdowns | -0.049      | 0.027 | 0.075   |
| Catchment of beaches (1:Yes) | 0.035       | 0.016 | 0.032   |
| Interaction: first lockdown | 0.008       | 0.025 | 0.736   |
| Interaction: inter-lockdowns | -0.031      | 0.014 | 0.028   |
| Interaction: second lockdown | -0.044      | 0.019 | 0.022   |
| Interaction: post-lockdowns | -0.033      | 0.013 | 0.012   |
| Distance to CBD          | -0.114      | 0.066 | 0.086   |
| Interaction: first lockdown | 0.011       | 0.013 | 0.396   |
| Interaction: inter-lockdowns | 0.041       | 0.008 | 0.000   |
| Interaction: second lockdown | 0.024       | 0.019 | 0.199   |
| Interaction: post-lockdowns | 0.041       | 0.007 | 0.000   |
| Sold in first lockdown   | -0.144      | 0.124 | 0.249   |
| Sold in inter-lockdowns phase | -0.308      | 0.075 | 0.000   |
| Sold in second lockdown  | -0.133      | 0.163 | 0.415   |
| Sold in post-lockdowns   | -0.261      | 0.070 | 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in Table A2 in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.

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3https://knowledgeauckland.org.nz/publications/auckland-monthly-housing-update-january-2021/
economic cycles (due to structural breaks) on the capitalisation of amenities. Nonetheless, the COVID-19 pandemic is an exogenous shock but associated with a health crisis. Thus, our results are sensible considering that part of the pandemic management in New Zealand involved keeping strict social distancing for extended periods.

5. Discussion
In the fight against the COVID-19 pandemic, New Zealand stood out with its ambitious elimination goal and the small death count per capita. New Zealand’s mandated lockdowns were more stringent than those seen in Australia and other Asian and European countries. Lockdowns introduced sharp changes in mobility that disrupted the housing market and altered the utility of environmental amenities. In this paper we investigate whether New Zealand’s strict lockdowns brought significant changes to the dwelling price capitalisation of surrounding amenities. We focus on open spaces (e.g. parks, reserves) and beaches because of their distinctiveness in Auckland’s environment. Auckland’s case study is also relevant because of the policy debate on housing policies targeting to mitigate the increasing unaffordability in the city in the last decade (Fernandez, 2019).

For the amenities considered in this paper, two competing hypotheses are possible: First, it is possible that after experiencing the pandemic, homebuyers now wish to be closer to those amenities to relieve the burden of mobility restrictions in case of further lockdowns. Second, homebuyers may also perceive them as places for gatherings, with potential risks for community transmissions.

Our results show that, while before the pandemic Auckland homebuyers were willing to pay a premium for dwellings located adjacent to open spaces or within 300 m of beaches, such premiums either vanished or became a penalty during the subsequent lockdown phases. Furthermore, we find preferences change towards dwellings located further away from Auckland CBD. In other words, some amenities that used to have a positive (or neutral) capitalisation on dwelling prices have become disamenities from homebuyers’ perspective after the experience of the pandemic. Arguably, location decisions are now to be further away from potential infection hotspots even if they provide amenities such as recreation or ecosystem services.

Nonetheless, results and implications of this paper add to the broad literature on the valuation of environmental amenities (Allpress et al., 2016; Fernandez & Bucaram, 2019; Cheung & Fernandez, 2020). Housing markets experience cycles, which may entail changes on the capitalisation of urban and environmental amenities (Zabel, 2015; Fernandez & Bucaram, 2019). Households may regard amenities as a hedge against price drops during market downturns (Chernobai & Chernobai, 2013; Coulson & Zabel, 2013; Sinai & Souleles, 2013; Zabel, 2015). Also, in an economic recession, a reduction in household income may decrease homebuyers’ demand for amenities, provided they are normal goods (Kuminoff et al., 2010). In either case, hedonic prices models estimate the changing implicit prices of amenities and reflect their capitalisation on housing prices. Consequently, it is possible to detect changes in the preferences of homebuyers across lockdowns phases.

Past literature has also explored the permanence or transiency of the valuation of amenities. Any changes may be related to the relative development of land where amenities sit (Smith et al., 2002). For example, undeveloped land (e.g. protected open spaces, public or regional open spaces and conservation areas) may be perceived as fixed or as unlikely to change in time; land uses such as golf courses, or agricultural or forestry land, may be perceived as potentially changing due to private decisions. This difference of perceptions is relevant because they affect the valuation of amenities (Andersson & West, 2006; Rajapaksa et al., 2017; Andersson et al., 2019; Fernandez & Bucaram, 2019). Nonetheless, results in this paper show that it cannot be concluded that changes in the valuations due to the pandemic and the lockdowns are permanent.

Remaining questions are left for future research as more data become available are, namely: First, is it likely that other changes may have occurred in the composition of dwellings sold across the lockdown phases due to the macroeconomic measures taken to keep interest rates low, which resulted in the heating up of the housing market in 2020? Second, considering new residential developments intended to promote intensification of the city, will development contributions and rates (based on provision of urban and environmental amenities) be permanently or transiently affected by
lockdown impacts? Third, how will the housing market respond once international borders reopen and immigration rates increase?

Our approach in this paper goes beyond the usual valuation of amenities implemented to identify types of open space that have the greatest importance to households, or to compare relative values of these open spaces with other land uses. We combine hedonic prices valuation with an unprecedented exogenous and non-economic shock that permeated the whole economy. As Auckland suffers from a persistent unaffordability problem whose face may have been altered by the disruptions of the pandemic, policy perspectives should be updated on how amenities should be provided, planned, designed and maintained (Dahal et al., 2019; Nicholls, 2019). Hence, this paper informs planners, policy-makers and private actors with a better understanding of the behaviour of Auckland’s housing market.

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### Table A1. Regression Results for Changing Capitalisation of Adjacency to Open Areas, beaches and CBD

|                                               | Coefficient | SE  | p-value  |
|------------------------------------------------|-------------|-----|----------|
| Sold in first lockdown                         | −0.120      | 0.120 | 0.319    |
| Sold in inter-lockdowns                       | −0.369      | 0.081 | 0.000    |
| Sold in second lockdown                       | −0.175      | 0.173 | 0.311    |
| Sold in post-lockdowns                        | −0.320      | 0.073 | 0.000    |
| Open spaces: adjacency                         | 0.011       | 0.005 | 0.024    |
| Interaction: first lockdown                   | 0.010       | 0.024 | 0.672    |
| Interaction: inter-lockdowns                  | −0.020      | 0.008 | 0.018    |
| Interaction: second lockdown                   | −0.051      | 0.015 | 0.001    |
| Interaction: post-lockdowns                   | −0.024      | 0.011 | 0.029    |
| Beaches: adjacency                             | 0.055       | 0.013 | 0.000    |
| Interaction: first lockdown                   | −0.008      | 0.066 | 0.905    |
| Interaction: inter-lockdowns                  | −0.044      | 0.017 | 0.011    |
| Interaction: second lockdown                   | −0.077      | 0.024 | 0.001    |
| Interaction: post-lockdowns                   | −0.056      | 0.022 | 0.111    |
| Distance to CBD                                | −0.102      | 0.064 | 0.108    |
| Interaction: first lockdown                   | 0.010       | 0.013 | 0.447    |
| Interaction: inter-lockdowns                  | 0.042       | 0.009 | 0.000    |
| Interaction: second lockdown                   | 0.027       | 0.018 | 0.143    |
| Interaction: post-lockdowns                   | 0.042       | 0.007 | 0.000    |
| Distance to school                             | −0.008      | 0.008 | 0.339    |
| Distance to road                                | 0.005       | 0.003 | 0.186    |
| Distance to waterways                          | 0.004       | 0.003 | 0.222    |
| Mass view: one*                                | 0.005       | 0.008 | 0.525    |
| Mass view: water*                              | 0.014       | 0.012 | 0.238    |
| Walls construction material**                  | −0.001      | 0.019 | 0.973    |
| fibrous cement                                 | −0.028      | 0.009 | 0.001    |
| rough cast                                     | −0.038      | 0.009 | 0.000    |
| wood                                           | −0.100      | 0.011 | 0.000    |
| mixture materials                              | 0.006       | 0.010 | 0.540    |
| Other                                          | 0.013       | 0.006 | 0.019    |
| Roof construction material***                  | −0.019      | 0.021 | 0.369    |
| Other (aluminium, brick, fibrous cement)       | −0.035      | 0.007 | 0.000    |
| Tiles                                          | −0.049      | 0.017 | 0.005    |
| Mixture materials                              | 0.005       | 0.012 | 0.677    |
| Orientation*                                   | −0.001      | 0.007 | 0.907    |
| North                                          | 0.000       | 0.000 | 0.349    |
| south                                          | 0.000       | 0.000 | 0.045    |
| West                                           | 0.000       | 0.000 | 0.725    |
| Slope                                          | −0.005      | 0.002 | 0.001    |
| Floorspace (sq m)                              | 0.002       | 0.000 | 0.000    |
| House age                                      | 0.000       | 0.000 | 0.045    |
| Elevation                                      | 0.000       | 0.000 | 0.349    |
| Log of land value                              | 0.488       | 0.013 | 0.000    |
| Quarter 2                                      | −0.002      | 0.009 | 0.820    |

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Table A1. (Continued)

|                          | Coefficient | SE  | p-value |
|--------------------------|-------------|-----|---------|
| Quarter 3                | 0.001       | 0.009 | 0.907   |
| Quarter 4                | 0.005       | 0.008 | 0.540   |
| Year of sale             |             |     |         |
| 2018                     | 0.023       | 0.008 | 0.005   |
| 2019                     | 0.026       | 0.008 | 0.002   |
| 2020                     | 0.100       | 0.013 | 0.000   |
| Quarter and year interactions |        |     |         |
| Quarter 2*2018           | -0.005      | 0.010 | 0.635   |
| Quarter 2*2019           | -0.028      | 0.011 | 0.014   |
| Quarter 2*2020           | -0.017      | 0.024 | 0.492   |
| Quarter 3*2018           | -0.008      | 0.012 | 0.489   |
| Quarter 3*2019           | -0.007      | 0.010 | 0.462   |
| Quarter 3*2020           | 0.007       | 0.025 | 0.783   |
| Quarter 4*2018           | -0.015      | 0.010 | 0.162   |
| Quarter 4*2019           | 0.026       | 0.010 | 0.008   |
| Quarter 4*2020           | -0.001      | 0.026 | 0.962   |
| Intercept                | 7.560       | 0.694 | 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.
* Reference: others. ** reference: brick. *** reference: iron. * reference: east.

Table A2. Regression Results for Changing Capitalisation of Catchment to Open Areas, Beaches and CBD

|                          | Coefficient | SE  | p-value |
|--------------------------|-------------|-----|---------|
| Sold in first lockdown   | -0.144      | 0.124 | 0.249   |
| Sold in inter-lockdowns  | -0.308      | 0.075 | 0.000   |
| Sold in second lockdown  | -0.133      | 0.163 | 0.415   |
| Sold in post-lockdowns   | -0.261      | 0.070 | 0.000   |
| Open spaces: catchment   | 0.017       | 0.010 | 0.087   |
| Interaction: first lockdown | 0.016     | 0.038 | 0.680   |
| Interaction: inter-lockdowns | -0.053   | 0.020 | 0.008   |
| Interaction: second lockdown | -0.025    | 0.030 | 0.410   |
| Interaction: post-lockdowns | -0.049   | 0.027 | 0.075   |
| Beaches: catchment       | 0.035       | 0.016 | 0.032   |
| Interaction: first lockdown | 0.008     | 0.025 | 0.736   |
| Interaction: inter-lockdowns | -0.031   | 0.014 | 0.028   |
| Interaction: second lockdown | -0.044    | 0.019 | 0.022   |
| Interaction: post-lockdowns | -0.033    | 0.013 | 0.012   |
| Distance to CBD           | -0.114      | 0.066 | 0.086   |
| Interaction: first lockdown | 0.011     | 0.013 | 0.396   |
| Interaction: inter-lockdowns | 0.041    | 0.008 | 0.000   |
| Interaction: second lockdown | 0.024    | 0.019 | 0.199   |
| Interaction: post-lockdowns | 0.041    | 0.007 | 0.000   |
| Distance to school        | -0.007      | 0.008 | 0.392   |
| Distance to road          | 0.004       | 0.003 | 0.203   |
| Distance to waterways     | 0.004       | 0.003 | 0.193   |
| Mass view*               | None        |     |         |
| Mass view*               | 0.005       | 0.008 | 0.528   |

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|                        | Coefficient | SE  | p-value |
|------------------------|-------------|-----|---------|
| Water                  | 0.018       | 0.012 | 0.136   |
| Walls construction material**: |             |     |         |
| concrete               | 0.001       | 0.019 | 0.966   |
| fibrous cement         | -0.028      | 0.009 | 0.001   |
| rough cast             | -0.037      | 0.009 | 0.000   |
| wood                   | -0.098      | 0.011 | 0.000   |
| mixture materials      | 0.006       | 0.010 | 0.564   |
| Other                  | 0.013       | 0.006 | 0.016   |
| Roof construction material***: |           |     |         |
| Other (aluminium, brick, fibrous cement) | -0.018 | 0.021 | 0.385   |
| Tiles                  | -0.036      | 0.007 | 0.000   |
| Mixture materials      | -0.048      | 0.017 | 0.005   |
| Orientation+           |             |     |         |
| North                  | -0.005      | 0.012 | 0.691   |
| south                  | 0.000       | 0.007 | 0.966   |
| West                   | 0.003       | 0.008 | 0.748   |
| Slope                  | -0.005      | 0.002 | 0.002   |
| Floorspace (sq m)      | 0.002       | 0.000 | 0.000   |
| House age              | 0.000       | 0.000 | 0.036   |
| Elevation              | 0.000       | 0.000 | 0.424   |
| Log of land value      | 0.491       | 0.013 | 0.000   |
| Quarter 2              | -0.002      | 0.009 | 0.831   |
| Quarter 3              | 0.001       | 0.009 | 0.924   |
| Quarter 4              | 0.005       | 0.008 | 0.560   |
| Year of sale           |             |     |         |
| 2018                   | 0.022       | 0.008 | 0.006   |
| 2019                   | 0.026       | 0.008 | 0.002   |
| 2020                   | 0.100       | 0.013 | 0.000   |
| Quarter and year interactions |         |     |         |
| Quarter 2*2018         | -0.005      | 0.010 | 0.619   |
| Quarter 2*2019         | -0.028      | 0.011 | 0.015   |
| Quarter 2*2020         | -0.016      | 0.024 | 0.500   |
| Quarter 3*2018         | -0.008      | 0.011 | 0.498   |
| Quarter 3*2019         | -0.007      | 0.010 | 0.475   |
| Quarter 3*2020         | 0.008       | 0.025 | 0.756   |
| Quarter 4*2018         | -0.014      | 0.010 | 0.184   |
| Quarter 4*2019         | 0.026       | 0.010 | 0.008   |
| Quarter 4*2020         | -0.001      | 0.026 | 0.984   |
| Intercept              | 7.623       | 0.721 | 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.

* Reference: others. ** reference: brick. *** reference: iron. + reference: east.
**Table A3. Regression Results for Different Definitions of Lockdowns Dummy – Adjacency and Catchment**

| Dummy definition for lockdowns phases | L4 lockdown only - March 25–April 27 | L4 and L3 lockdown - March 25–May 14 | L4, L3 and inter-lockdowns - March 25–August 11 | L4, L3, inter-lockdowns and L3 again- March 25–August 30 | Everything after L4 lockdown – March 25–November 30 |
|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
|                                      | \( \beta \) | SE | \( p \)-value | \( \beta \) | SE | \( p \)-value | \( \beta \) | SE | \( p \)-value | \( \beta \) | SE | \( p \)-value |
| Adjacency                            |                                      |                                       |                                       |                                       |                                       |
| Adjacent to open spaces (1:Yes)      | 0.006 0.004 0.139                   | 0.007 0.004 0.115                   | 0.007 0.005 0.098                   | 0.008 0.005 0.069                   | 0.011 0.005 0.024                   |
| Interaction: Lockdown dummy          | 0.015 0.024 0.532                   | -0.022 0.017 0.191                 | -0.014 0.008 0.070                 | -0.019 0.008 0.013                 | -0.026 0.008 0.001                 |
| Adjacent to beaches (1:Yes)          | 0.046 0.012 0.000                   | 0.046 0.012 0.000                   | 0.049 0.013 0.000                   | 0.050 0.013 0.000                   | 0.055 0.013 0.000                   |
| Interaction: Lockdown dummy          | 0.000 0.006 0.195                   | -0.020 0.038 0.605                 | -0.036 0.016 0.030                 | -0.040 0.016 0.012                 | -0.052 0.015 0.001                 |
| Distance to CBD                      | -0.097 0.063 0.127                 | -0.097 0.063 0.126                 | -0.100 0.063 0.114                 | -0.101 0.063 0.111                 | -0.102 0.064 0.108                 |
| Interaction: Lockdown dummy          | 0.005 0.013 0.710                   | 0.017 0.008 0.031                  | 0.038 0.008 0.000                  | 0.038 0.008 0.000                  | 0.038 0.009 0.000                  |
| Sold in dummy phase                  | -0.085 0.116 0.465                 | -0.186 0.071 0.009                 | -0.387 0.074 0.000                 | -0.389 0.075 0.000                 | -0.365 0.081 0.000                 |
| Catchment                            | 0.010 0.008 0.243                   | 0.010 0.009 0.222                   | 0.014 0.009 0.123                   | 0.015 0.009 0.114                   | 0.017 0.010 0.087                   |
| Catchment of open spaces (1:Yes)     | 0.023 0.038 0.543                   | -0.019 0.026 0.463                 | -0.044 0.018 0.013                 | -0.045 0.018 0.016                 | -0.042 0.021 0.042                 |
| Interaction: Lockdown dummy          | 0.030 0.016 0.056                   | 0.030 0.016 0.056                   | 0.033 0.016 0.044                   | 0.033 0.016 0.041                   | 0.035 0.016 0.033                   |
| Adjacent to beaches (1:Yes)          | 0.014 0.024 0.564                   | 0.006 0.019 0.757                  | -0.025 0.013 0.056                 | -0.029 0.013 0.024                 | -0.033 0.013 0.009                 |
| Interaction: Lockdown dummy          | -0.109 0.066 0.100                 | -0.109 0.066 0.099                 | -0.111 0.066 0.090                 | -0.112 0.066 0.088                 | -0.114 0.066 0.087                 |
| Distance to CBD                      | 0.006 0.012 0.639                   | 0.016 0.007 0.029                  | 0.037 0.008 0.000                  | 0.037 0.008 0.000                  | 0.036 0.009 0.000                  |
| Interaction: Lockdown dummy          | -0.117 0.121 0.336                 | -0.172 0.072 0.018                 | -0.337 0.069 0.000                 | -0.336 0.071 0.000                 | -0.310 0.074 0.000                 |
### Table A4. Regression Results for Changing Capitalisation of Adjacency to Open Areas and Size, Beaches and CBD

|                          | Coefficient | SE   | p-value |
|--------------------------|-------------|------|---------|
| Adjacent to open spaces (1:Yes) | 0.011       | 0.005| 0.024   |
| Interaction: first lockdown | 0.012       | 0.024| 0.609   |
| Interaction: inter-lockdowns | −0.019     | 0.008| 0.020   |
| Interaction: second lockdown | −0.050     | 0.015| 0.001   |
| Interaction: post-lockdowns | −0.025     | 0.011| 0.024   |
| area_park_site_test      | 0.000       | 0.000| 0.719   |
| _IdumXarea__1            | 0.000       | 0.000| 0.320   |
| _IdumXarea__2            | 0.000       | 0.000| 0.556   |
| _IdumXarea__3            | 0.000       | 0.000| 0.194   |
| _IdumXarea__4            | 0.000       | 0.000| 0.059   |

**Adjacent to beaches (1: Yes)**

|                          | Coefficient | SE   | p-value |
|--------------------------|-------------|------|---------|
| Interaction: first lockdown | −0.009     | 0.066| 0.891   |
| Interaction: inter-lockdowns | −0.044     | 0.017| 0.011   |
| Interaction: second lockdown | −0.077     | 0.024| 0.001   |
| Interaction: post-lockdowns | −0.056     | 0.022| 0.010   |

**Distance to CBD**

|                           | Coefficient | SE   | p-value |
|---------------------------|-------------|------|---------|
| Interaction: first lockdown | 0.010       | 0.013| 0.433   |
| Interaction: inter-lockdowns | 0.042       | 0.009| 0.000   |
| Interaction: second lockdown | 0.027       | 0.018| 0.142   |
| Interaction: post-lockdowns | 0.042       | 0.007| 0.000   |

**Sold in lock-downs**

|                           | Coefficient | SE   | p-value |
|---------------------------|-------------|------|---------|
| Sold in first lockdown     | −0.123      | 0.120| 0.308   |
| Sold in inter-lockdowns   | −0.370      | 0.081| 0.000   |
| Sold in second lockdown    | −0.177      | 0.173| 0.308   |
| Sold in post-lockdowns     | −0.319      | 0.073| 0.000   |

**Notes:** Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.

### Table A5. Regression Results for Changing Capitalisation Open Areas and Size, beaches and CBD – Catchment

|                           | Coefficient | SE   | p-value |
|---------------------------|-------------|------|---------|
| Catchment of open spaces (1:Yes) | 0.017       | 0.010| 0.088   |
| Interaction: first lockdown | 0.016       | 0.038| 0.677   |
| Interaction: inter-lockdowns | −0.053      | 0.020| 0.008   |
| Interaction: second lockdown | −0.025      | 0.030| 0.412   |
| Interaction: post-lockdowns | −0.049      | 0.027| 0.074   |
| area_park_site_test (sq km) | 0.000       | 0.001| 0.703   |
| _IdumXarea__1             | −0.003      | 0.003| 0.321   |
| _IdumXarea__2             | −0.001      | 0.001| 0.554   |
| _IdumXarea__3             | −0.002      | 0.001| 0.023   |
| _IdumXarea__4             | 0.003       | 0.001| 0.060   |

**Catchment of beaches (1: Yes)**

|                           | Coefficient | SE   | p-value |
|---------------------------|-------------|------|---------|
| Interaction: first lockdown | 0.009       | 0.025| 0.701   |
| Interaction: inter-lockdowns | −0.031      | 0.014| 0.028   |
| Interaction: second lockdown | −0.044      | 0.019| 0.023   |
Table A5. (Continued)

| Interaction: post-lockdowns | Coefficient | SE  | p-value |
|-----------------------------|-------------|-----|---------|
| Interaction: first lockdown  | 0.011       | 0.013| 0.380   |
| Interaction: second lockdown | 0.024       | 0.019| 0.197   |
| Interaction: post-lockdowns | 0.041       | 0.008| 0.000   |
| Sold in first lockdown      | −0.148      | 0.125| 0.238   |
| Sold in inter-lockdowns     | −0.309      | 0.076| 0.000   |
| Sold in second lockdown     | −0.135      | 0.163| 0.410   |
| Sold in post-lockdowns      | −0.260      | 0.070| 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.

Table A6. Regression Results for Changing Capitalisation Open Areas Size, Waterways, Beaches and CBD – Adjacency

| Adjacency to open spaces (1:Yes) | Coefficient | SE  | p-value |
|----------------------------------|-------------|-----|---------|
| Interaction: first lockdown      | 0.001       | 0.005| 0.019   |
| Interaction: inter-lockdowns     | −0.021      | 0.008| 0.012   |
| Interaction: second lockdown     | −0.051      | 0.015| 0.001   |
| Interaction: post-lockdowns      | −0.023      | 0.011| 0.037   |
| dum_water50                      | −0.010      | 0.011| 0.343   |
| _ldumXdum_w_1                    | 0.107       | 0.051| 0.036   |
| _ldumXdum_w_2                    | 0.018       | 0.015| 0.248   |
| _ldumXdum_w_3                    | −0.003      | 0.019| 0.885   |
| _ldumXdum_w_4                    | −0.017      | 0.018| 0.349   |
| Adjacency to beaches (1: Yes)    | 0.055       | 0.013| 0.000   |
| Interaction: first lockdown      | −0.004      | 0.066| 0.953   |
| Interaction: inter-lockdowns     | −0.043      | 0.017| 0.012   |
| Interaction: second lockdown     | −0.077      | 0.024| 0.001   |
| Interaction: post-lockdowns      | −0.056      | 0.022| 0.010   |
| Distance to CBD                  | −0.103      | 0.063| 0.106   |
| Interaction: first lockdown      | 0.009       | 0.013| 0.504   |
| Interaction: inter-lockdowns     | 0.042       | 0.009| 0.000   |
| Interaction: second lockdown     | 0.027       | 0.018| 0.142   |
| Interaction: post-lockdowns      | 0.042       | 0.007| 0.000   |
| Sold in first lockdown           | −0.111      | 0.119| 0.350   |
| Sold in inter-lockdowns          | −0.368      | 0.081| 0.000   |
| Sold in second lockdown          | −0.177      | 0.173| 0.308   |
| Sold in post-lockdowns           | −0.322      | 0.073| 0.000   |

Notes: Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25–May 14; Inter-lockdowns phase: May 15–August 10; Second lockdown: lockdown August 12–August 30; Post-lockdowns: August 31–November 30.
### Table A7. Regression Results for Changing Capitalisation Open Areas Size, Waterways, Beaches and CBD – Catchment

|                                    | Coefficient | SE  | p-value |
|------------------------------------|-------------|-----|---------|
| Catchment of open spaces (1:Yes)   | 0.017       | 0.010 | 0.081   |
| Interaction: L4/L3 lockdown (March 25 – May 14) | 0.011       | 0.038 | 0.769   |
| Interaction: Inter-lockdowns phase (May 15 – August 10) | −0.056      | 0.020 | 0.006   |
| Interaction: L3 lockdown (August 12 – August 30) | −0.027      | 0.030 | 0.368   |
| Interaction: Post-lockdowns (August 31 – November 30) | −0.053      | 0.027 | 0.053   |
| dum_water300                        | 0.000       | 0.008 | 0.984   |
| _IdumXdum_w_1                       | 0.031       | 0.027 | 0.242   |
| _IdumXdum_w_2                       | 0.022       | 0.014 | 0.107   |
| _IdumXdum_w_3                       | 0.019       | 0.017 | 0.256   |
| _IdumXdum_w_4                       | 0.028       | 0.012 | 0.019   |
| Catchment of beaches (1: Yes)       | 0.035       | 0.016 | 0.032   |
| Interaction: L4/L3 lockdown (March 25 – May 14) | 0.008       | 0.024 | 0.739   |
| Interaction: Inter-lockdowns phase (May 15 – August 10) | −0.031      | 0.014 | 0.025   |
| Interaction: L3 lockdown (August 12 – August 30) | −0.044      | 0.019 | 0.022   |
| Interaction: Post-lockdowns (August 31 – November 30) | −0.032      | 0.013 | 0.014   |
| Distance to CBD                     | −0.113      | 0.066 | 0.088   |
| Interaction: L4/L3 lockdown (March 25 – May 14) | 0.007       | 0.013 | 0.611   |
| Interaction: Inter-lockdowns phase (May 15 – August 10) | 0.038       | 0.008 | 0.000   |
| Interaction: L3 lockdown (August 12 – August 30) | 0.021       | 0.018 | 0.230   |
| Interaction: Post-lockdowns (August 31 – November 30) | 0.037       | 0.007 | 0.000   |
| Sold in first lockdown              | −0.113      | 0.127 | 0.375   |
| Sold in inter-lockdowns phase       | −0.283      | 0.073 | 0.000   |
| Sold in second lockdown             | −0.114      | 0.159 | 0.472   |
| Sold in post-lockdowns              | −0.232      | 0.067 | 0.001   |

**Notes:** Models include internal housing and neighbourhood characteristics, as well as Area Unit fixed and time effects. Full set of results is in the Appendix. Standard errors are clustered at suburb level. First lockdown: March 25 – May 14; Inter-lockdowns phase: May 15 – August 10; Second lockdown: lockdown August 12 – August 30; Post-lockdowns: August 31 – November 30.