Council Report
Te Rīpoata Kaunihera ā-rohe

A unique place. An inspiring future.
He Wāhi Tūhāhā. He Āmua Whakaohooho.

QUEENSTOWN LAKES DISTRICT COUNCIL

Planning & Strategy Committee

4 February 2025

Report for Agenda Item | Rīpoata moto e Rāraki take [3]

Department: Strategy & Policy

Title | Taitara: Update on the Joint Housing Action Plan implementation.

Purpose of the Report | Te Take mō te Pūroko

This report provides an update on the implementation of the Joint Housing Action Plan (JHAP).

Recommendation | Kā Tūtohuka

That the Planning & Strategy Committee:
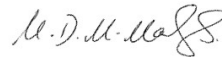
1. **Note** the contents of this report;

Prepared by:	**Reviewed and Authorised by:**
Name: Emily Irwin **Title:** Senior Strategic Planner - Housing **17 January 2025**	**Name:** Michelle Morss **Title:** GM – Strategy and Policy **17 January 2025**

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Context | Horopaki

1. The development of the Queenstown Lakes District Joint Housing Action Plan (JHAP) is one of the six priorities of the joint work programme for the Grow Well Whaiora Partnership (Priority Initiative 5). The JHAP was adopted by the Council in August 2023 and by the Grow Well Whaiora partnership in September 2023. It recognises that housing is one of the biggest challenges the district faces, and that increasing housing supply alone will not address the problem.

2. The JHAP puts forward 34 actions to improve housing outcomes in the district, to be undertaken primarily by the Queenstown Lakes District Council (QLDC), the Ministry of Housing and Urban Development (HUD), Kāinga Ora (KO), and the Queenstown Lakes Community Housing Trust (QLCHT).

Analysis and Advice | Tatāritaka me kā Tohutohu

3. Work is progressing on JHAP implementation programme, with updates on specific work programmes included below. An updated version of the Housing Challenge in Queenstown Lakes A3 (Attachment A) is also provided for your information.

Short-Term Letting Work Programme

4. In July, Infometrics published a report commissioned by Airbnb (Attachment B), looking into the impacts of Short-Term Letting[1] (STL). It asserts that STL has had a minimal effect on average rents in Queenstown Lakes District (QLD) between 2018 and 2023 ($11), far smaller than the impact of population growth ($101). They noted possible explanations include the prevalence of second homes in QLD – 28% of homes were unoccupied on census night in 2018. This trend was evident before Airbnb existed with 30% unoccupied in 2006, suggesting low substitutability of dwellings between long term rentals, owner occupier, and STL.

5. Officers commissioned a peer review of this report from Market Economics (ME) (Attachment C), which found that:

   - Data: the Infometrics report uses AirDNA data, not Airbnb data directly. This has limitations but appears to be the best data available, and reasonable for the purposes of the report. It is noted that the limitations of the AirDNA data were highlighted by Airbnb in the STL district plan change
   - Variables: the report tests whether variations in STL supply affect rental prices (and house prices). ME consider these variables (i.e. variations in STL supply, rental prices, and house prices) are appropriate. In particular, officers asked ME to consider whether measuring the impact on rental availability would be more appropriate, but ME reported that rental availability is too difficult to measure for this kind of analysis, and should be strongly correlated with rental prices anyway
   - Conclusions: ME found that overall, the analysis appears robust and the findings hold. They note that the report cannot claim that STL caused the rental price increase, nor that restricting STL would have any particular impact. This is because the report only determines correlation

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[1] Short-term letting is accommodation for visitors in residential units/flats for paying guests who stay for less than 90 days.

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not causation, and because the impacts of restricting STL are dependent on a wide range of regulatory, economic, and social/cultural factors

6. Following up on this peer review, officers are now looking to commission another piece of work to understand whether STL homes could be easily converted to long-term rentals, along with a snapshot of the size and features of the STL market in QLD. This will include quantitative data about how many homes used for STL are holiday homes, investment properties, or owner-occupied, and qualitative data around the factors that would encourage property owners to rent out their properties to long-term tenants or sell their investment properties.

7. This study will help officers test the hypothesis from the peer review – that the problem may be the large number of holiday/second homes and their complementary use for STL, as opposed to the use of STL itself. This work will respond to the need for further evidence as identified in the recent Inclusionary Housing Variation, and will be a critical input into future policy work, and help ensure future policy changes are defensible in court processes. Officers have released the Request for Proposal with proposals due in February, and a contract start date in early March.

Stakeholder Deed Monitoring

Longview

8. On 19 September, Council proposed increasing the prices for house/land packages at Longview to account for construction inflation only. The developer did not agree to this proposal, and officers are now initiating a mediation process. Officers will continue to provide updates as this process progresses.

9. The developer is complying with the infrastructure and community housing aspects of this deed, with 48 titles now transferred to QLCHT. Of these, stage one (28 homes) is now complete and filled; stage two (four homes) is underway and expected to be completed in mid-2025; construction for stage three (eight homes) is expected to begin in March 2025; and stage four is in the design phase.

Three Parks and Ballantyne Investments

10. Together, there are 38 affordable housing units and 20 community housing units overdue for these two deeds, both of which are with the same developer. On 5 December, officers met with the developer to discuss a way forward. The following points were discussed:

- Acknowledgement that it is not practically feasible to comply with the deeds immediately given the lack of residential development at Three Parks to date
- Acknowledgement that all parties may be open to variations to the deeds to reflect the changing environment since the deeds were signed, but that this has not been tested with Full Council and QLCHT
- QLDC officers stressed the importance of ensuring any variations result in the same or better outcomes for the community, i.e. at least the same number of 'affordable units' and units for QLCHT, and that these contributions are delivered in appropriate timeframes as the development progresses

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11. At the time of writing, officers are scheduling another meeting to progress these discussions, and an update will be provided verbally at the Planning & Strategy Committee meeting.

Tewa Banks Update

12. Civil works is complete, and QLCHT is now finalising the wastewater pump station before 224c issue. Stage one (15 homes) is complete, and the first six households moved in during Nov-Dec. These are the one-bedroom units allocated for Senior Housing at the front of Jopp St. The remaining nine households will move in over the next two months.

13. Construction for stage 2 (18 homes) is underway, with homes due to be occupied from June - October 2025. QLCHT is currently pricing the homes for stage 3 (18 homes) and expect to start construction in March 2025. QLCHT continue to draw down contracted HUD funding as certain milestones are reached ($17m interest free loan; $2.5m grant; $1.3m capitalised operating supplement total) along with ASB financing.

Consultation Process | Hātepe Matapaki

Significance and Engagement | Te Whakamahi I kā Whakaaro Hiraka

14. Although housing affordability is a matter of high significance to the community, this matter is of low significance because it is a noting report, as determined by reference to the Council's Significance and Engagement Policy 2024.

15. The persons who are affected by or interested in this matter are residents/ratepayers of the Queenstown Lakes District community, Kāi Tahu, Grow Well Whaiora partners, and the business community.

16. The Council consulted with the community on the JHAP ahead of adoption in 2023.

Māori Consultation | Iwi Rūnaka

17. As an output of the Spatial Plan, Aukaha and Te Ao Marama Incorporated have had oversight of the JHAP through the Grow Well Whaiora Partnership. Implementation updates are provided to the Grow Well Whaiora Steering Group on which both Murihiku and Ōtākou rohe are represented.

Risk and Mitigations | Kā Raru Tūpono me kā Whakamaurutaka

18. This matter relates to the Strategic/Political/Reputation risk category. It is associated with RISK10056 Ineffective provision for the future planning and development needs of the district within the QLDC Risk Register. This risk has been assessed as having a moderate residual risk rating.

19. This matter relates to this risk because it is of importance in terms of the management of growth for the district. Mitigation of this risk shall be achieved by ensuring that all workstreams are co-ordinated in pursuit of the agreed outcomes.

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Financial Implications | Kā Riteka ā-Pūtea

20. There are no financial implications of this report. Implementation of the JHAP has budget implications that will be considered through Long-Term Planning processes.

Council Effects and Views | Kā Whakaaweawe me kā Tirohaka a te Kaunihera

21. The following Council policies, strategies and bylaws were considered:

- Queenstown Lakes District Joint Housing Action Plan 2023-2028
- 2021-2031 Queenstown Lakes Homes Strategy
- Vision Beyond 2050: in relation to the district's goal of 'thriving community' and 'opportunities for all'
- Queenstown Lakes Spatial Plan 2021
- 2022 Climate and Biodiversity Plan
- 2024-2034 Long Term Plan
- Queenstown Lakes Proposed District Plan
- Queenstown Lakes Operative District Plan
- Economic Diversification Plan 2024: New Pathways to a Thriving Future
- 2021-2031 Queenstown Lakes Homes Strategy

22. This report doesn't contain any recommended options as it is a noting report, however the workstreams discussed are consistent with the principles set out in the named policy/policies.

Local Government Act 2002 Purpose Provisions | Te Whakatureture 2002 o te Kāwanataka ā-Kīaka

23. Section 10 of the Local Government Act 2002 states the purpose of local government is (a) to enable democratic local decision-making and action by, and on behalf of, communities; and (b) to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future. This report provides an update on the implementation of the QLSP 21 and the development of Spatial Plan Gen 2.0. Strategically planning for the growth of our communities is critical to achieving the outcomes of the QLSP 21.

24. This report doesn't contain any recommended options as it is a noting report, however the workstreams discussed:

- can be implemented through current funding under the Long Term Plan and Annual Plan.
- are consistent with the Council's plans and policies; and
- would not significantly alter the intended level of service provision for any significant activity undertaken by or on behalf of the Council or transfer the ownership or control of a strategic asset to or from the Council.

Attachments | Kā Tāpirihaka

A	The Housing Challenge in Queenstown Lakes A3 Jan 25
B	Infometrics Report: The effects of STRA on local housing markets
C	M.E. Review of Infometrics report

The Housing Challenge in Queenstown Lakes

QUEENSTOWN LAKES DISTRICT COUNCIL

Jan 2025

The Problem

Housing is critical infrastructure, and fundamental to wellbeing, sustainable well-functioning urban areas, and development. Yet:

**1350** — 1350 households are on the Queenstown Lakes Community Housing Trust waitlist (Jan 2025)

Average House Values Sep 2024

- Auckland: **$1,223,608**
- Queenstown Lakes: **$1,834,371**
- New Zealand: **$908,247**

Housing Affordability
Mean house value to mean household income ratio, March years

- Affordable Level (house prices 3x household income)
- Queenstown-Lakes District
- New Zealand
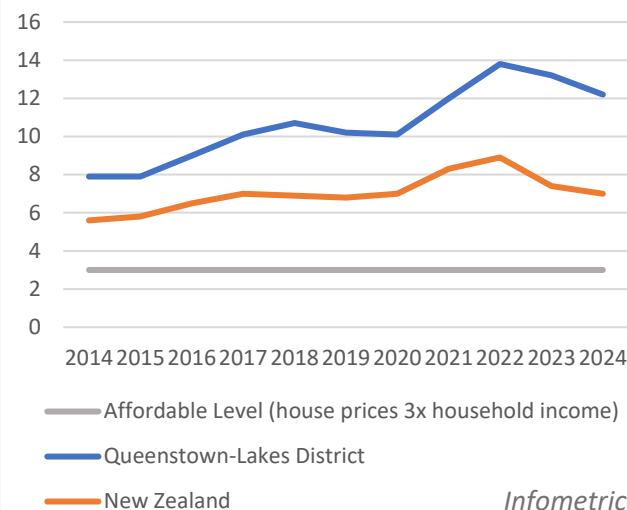
Infometrics

Population Growth
Annual change, June years

8% growth in 2023

- Queenstown-Lakes District
- New Zealand
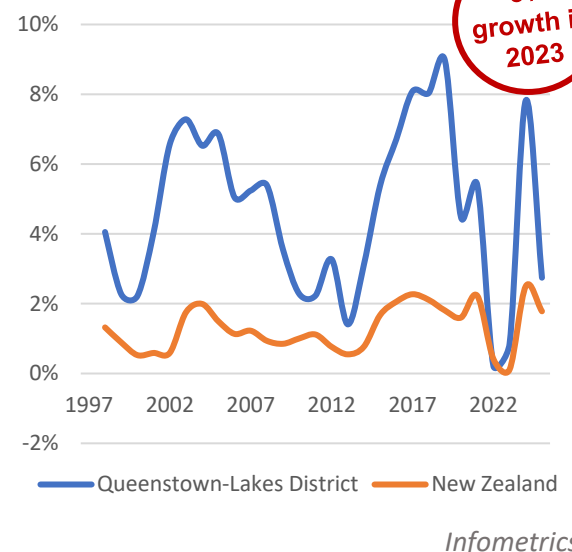
Infometrics

Average of 29,463 daily visitors to the district (year ending Nov 2024), around 35% of the population, puts pressure on services funded by ratepayers

Destination Queenstown

Drivers

- High demand from across NZ and overseas
- High building costs due to scale and location
- Infrastructure deficit: debt limits restrain investment needed to enable more housing
- Tension between protecting the character of the district and the landscape, and providing more and higher density homes
- Holiday homes/investment properties left empty or let out short-term when not in use
- Ease and profitability of short-term letting

In the year to Sep 2024, QLDC granted the highest number of dwelling building consents per 1000 residents of any territorial authority in the country (Statistics NZ). However, the market mostly delivers bigger, more expensive homes, and there are **not enough new affordable homes or rentals.**

$750 Queenstown Lakes District

$600 NZ

Median rent in Nov 2024 was $750p/w in Queenstown Lakes and $600 in NZ overall

MBIE tenancy data

44

While the district has enough plan-enabled housing capacity, both short and long term (shown through the Spatial Plan), there is still insufficient capacity in the lower price bands

Queenstown Lakes District Housing Development Capacity Assessment 2021

Impacts

Essential workers leave and businesses **struggle to attract and retain suitable staff**: the higher labour turnover rate is costing the local economy $105m-$200m a year (3-6% of QLD's GDP)
Sense Partners 2022: The economic case for Inclusionary Zoning in QLDC

When long term residents are **forced to leave** the district, it **separates friends and families** and disrupts social cohesion

Detrimental impacts on personal wellbeing, from **financial stress** and **inability to leave unsafe housing**

Migrants / ethnic communities report **discrimination** in the rental market

People are **living in cars** and campgrounds

Mana Whenua **struggle to house whanau** in the district and are unable to exercise their traditional practices e.g. mahinga kai

Some demographic groups can't afford to live here, impacting **diversity** and resilience

People are **forced to live further away**, creating car dependency, long commutes, more driving emissions, higher travel costs, and less safe roads

Employees who are **financially and housing stressed** are more **disengaged and less productive**, sometimes holding more than one job to make ends meet

The Housing Challenge in Queenstown Lakes

QUEENSTOWN LAKES DISTRICT COUNCIL

Jun 2024

Gaps in the data

Public housing (subsidised by MSD): anecdotal evidence suggests many more households are eligible than the housing register suggests

Homelessness: How many people, including longer term residents, are living in cars and campgrounds?

Short-term letting: How many houses are being used for short-term letting instead of as homes for locals?

Empty homes: census data is 5-yearly and imprecise. How many potential homes are vacant and why?

Migrants: QLD has a large migrant population. How many are struggling and ineligible for support?

Relocation: How many people are forced to leave because they can't find and retain suitable housing?

Mana Whenua: How big is the challenge to house whanau in the district?

What we're doing

Implementing the **Joint Housing Action Plan:** Working with iwi, central government partners, and the local community, incl. on:

Queenstown Lakes Spatial Plan: ensuring our priority development areas are future proofed to get the best use

Inclusionary Housing: agreements with developers where new housing developments provide an affordable housing contribution to community housing providers

Intensification and **upzoning**: to enable more housing capacity, including a special purposes zone for Te Pūtahi Ladies Mile

Supporting Community Housing Providers like the Queenstown Lakes Community Housing Trust, with funding, land and other ways to provide affordable housing

Advocacy and facilitating connections: highlighting opportunities to address the causes and help build solutions

Improving our data: to build the case for new funding and policy support from central government and our community

Short-term letting

Short-term letting supports our tourism industry and boosts local incomes

However, the shortage of homes for local residents is exacerbated in part by homes being used for short-term letting / holiday rentals

There are limits to what can be done to manage the impacts of short-term letting through existing legislation like the Resource Management Act

Our rules require everyone to register and require resource consents above a certain threshold, but it's difficult to monitor

There is insufficient data on who is letting out properties and whether they are following the rules

(see box below)

Legislative change would help us manage short-term letting

What else could help

Inclusionary Housing:

Inclusionary Housing provides a sustainable funding stream for retained affordable housing. Continued Government support and national enabling legislation could streamline this process considerably

Private investment and community support:

- Local businesses have a role to play in supporting workers accommodation initiatives and/or directly providing housing for staff. 1 in 6 businesses who answered the March '24 Business Confidence survey already provide staff accommodation

- Community support (from individuals, community groups and businesses) is critical, e.g. for inclusionary housing and increased housing density, and everyone has a role to play in helping to address the housing challenge

Updating Accommodation Supplement Boundaries:

- MSD use of 1992 data costs some residents $185 p/w

Visitor Levy:

- 3.3 million unique visitor arrivals to the district (year ending Jun 2023) equals 63 visitors per resident

- In a 2019 referendum, over 80% of locals supported a 5% levy on visitor accommodation to help pay for services and infrastructure used by visitors

Infrastructure for residents:

- To unlock housing supply, all stakeholders fund a pipeline of enabling infrastructure e.g. with GST, development contributions, a Regional Deal, the IFF Act

New legislation with stronger short-term letting controls:

To manage the impacts on housing availability and monitor compliance with the rules, it should:

- Enable new options to monitor and mitigate the impacts, e.g. data sharing, restrictions or levies

- Improve compliance by working with online platforms with stronger enforcement mechanisms

- Improve consistency in regulations, e.g. healthy homes compliance for all visitor accommodation

Investigate higher rates/levies for underutilised land, short-term letting, or empty homes: to boost housing supply and help fund housing initiatives

The effects of STRA on local housing markets

for Airbnb

July 2024

Infometrics

Economics put simply

Authorship

This report has been prepared by Rob Heyes and Adolf Stroombergen.

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Table of contents

Executive summary

This report outlines the results of an econometric analysis of the effect that short-term rental accommodation (STRA) has on the long-term residential rental and owner-occupied property markets in Queenstown-Lakes District, Auckland, Wellington City, and Christchurch City. The economic analysis is supplemented with a descriptive analysis of trends in short-term rentals and in the long-term residential rental and owner-occupied property markets in these four regions and nationally.

STRA has little influence on the housing market

Overall, our analysis found that STRA has little to no effect on rental prices and no significant effect on house prices. Our model looked at house prices and rental prices over time relative to the number of STRA listings. By controlling for population growth, interest rates, government policy, dwelling stock, and construction costs, our model demonstrates that the main drivers of rental and house price increases are population growth and interest rates.

- In Queenstown-Lakes District, STRA contributes negligibly to monthly rental price increases with the average amount being an additional 35 cents per month.

- This result means that between January 2018 and September 2023, the cumulative effect of STRA is to add $11 to the average weekly rent in Queenstown-Lakes District, compared with population growth which added $101.

- In Christchurch City, STRA contributes even less to weekly rental price increases, at only nine cents per month.

- This result means that between January 2018 and November 2023, the cumulative effect of STRA is to add $1 to the average weekly rent in Christchurch City, compared with population growth which added $64.

- In Auckland City and Wellington City, there were no significant rent increases attributable to STRA.

- STRA has no significant effect on house prices in any of the markets analysed.

Population growth and interest rates drive housing market

Because STRA listings have grown over time alongside rent and house price increases, STRA has been singled out as exacerbating housing and rental affordability challenges. Our econometric model demonstrates that when controlling for other factors, the main drivers of house and rental price increases are population growth and low interest rates.

Our explanation for why STRA does not affect the housing market as much as population growth and interest rates is as follows.

1. STRA listings and rental properties are not always the same. Many entire space STRA properties are actually granny flats, private rooms that are separate but contained within a main dwelling, holiday homes, or owner-occupied dwellings rented out for short periods of time. Some of these properties might have never been, and might never be, made available on the long-term market.

2. In areas with an historically high proportion of holiday homes such as Queenstown, the rise of STRA platforms does not necessarily mean there has been a significant increase of properties that would have been long term rentals but are now being used as STRA. With 28% of dwellings being unoccupied on 2018 census night (30% as far back as 2006), many homes are potentially holiday homes that might have never been long term rentals.

3. With an historic shortage of new properties coupled with record migration, low borrowing costs, and increasing construction costs, New Zealand's housing market fundamentally suffers from a lack of supply.

In conclusion, rental and housing price increases are overwhelmingly caused by population growth and interest rates, with STRA having little to no significant effect.

Infometrics

Introduction

To what extent do STRA platforms influence long-term rents and property prices? The purpose of this report is to address this question by examining the relationship between the STRA market and the housing market in New Zealand.

Do STRA platforms such as Airbnb constrain the availability of residential properties either for long-term rental or purchase to the extent that long-term rents and property prices are inflated as a result, or are STRA platforms just one of many factors that influence long-term rents and property prices?

Our analysis of the STRA market uses AirDNA data. The AirDNA data is 'scraped' from the various STRA platforms such as Airbnb and VRBO. Algorithms are used to identify reservation nights and dual-listed properties. Therefore, the AirDNA data isn't necessarily entirely accurate and should not be interpreted as providing a definitive number of listings or reservation nights in any region. However, it is a close enough proxy for STRA listings for this analysis.

This report outlines the results of an econometric analysis of the effect that STRA rentals have on the long-term residential rental and owner-occupied property markets in Queenstown-Lakes District, Auckland, Wellington City, and Christchurch City. The econometric analysis is supplemented with a descriptive analysis of trends in STRA rentals and in the long-term residential rental and owner-occupied property markets in these four regions and nationally.

Given the complexity of economic factors that influence house values and rents, such as population growth relative to growth in the number of dwellings, employment rates, household incomes, and changes to housing market regulations, it's important that the effects of these other factors are isolated. The econometric analysis does exactly that.

To understand the effect that STRA has on the housing market, both the descriptive and econometric analyses use data on the number of entire space STRA listings. Entire space listings refer to self-contained properties rather than private or shared rooms within a broader dwelling. We note that entire space listings also capture listings such as granny flats, apartments attached to a main dwelling, private rooms that are separate to but contained within a main dwelling, holiday homes, or owner-occupied dwellings rented out for short periods of time.

Residential listings exclude commercial properties such as hotels and hostels. We focus our analysis on entire space STRA listings because these properties are sometimes perceived to be available for sale or long-term rental. However, not all of them will be available for sale or long-term rental because they include listings that would not otherwise be considered rentable, such as granny flats and self-contained units attached to a main dwelling.

STRA in New Zealand

This section looks at how the number of entire space listings on STRA platforms has varied over time from its initial growth phase to a relatively brief plateauing phase, to the upheaval brought about by the COVID-19 pandemic. It is important to note that growth in the number of STRA listings doesn't necessarily imply growth in the number of properties being made available for short-term rental. In the past, properties could have been rented out via non-digital platforms (eg newspaper advertisements, community flyers, etc), or properties such as holiday homes might not have been rented out at all and used solely their owners.

STRA listings dip during the pandemic

Entire space listings in New Zealand grew rapidly in number between 2016 and 2018 (Chart 1). In 2019 there were signs that the market was reaching an equilibrium with available[1] entire space listings starting to plateau. The COVID-19 pandemic saw both total and available entire space listings fall away somewhat, as demand for short-term accommodation from international tourists effectively ceased with the closing of New Zealand's border in 2020.

Throughout 2021 and 2022, available entire space listings rose to peaks in the summer months as growth in domestic tourism partially made up for the absence of international tourists. However, neither of these peaks were as high as the peak of the 2019/20 summer. With the reopening of the border in mid-2022, both total and available entire space listings began to recover, and currently they are on course to surpass the 2019/20 summer peak. Available entire space listings were 19% higher in November 2023 than they were in November 2019. Total entire space listings were 7.6% higher.

Chart 1

NZ STRA entire space listings dip during the pandemic
Source: AirDNA, monthly listings
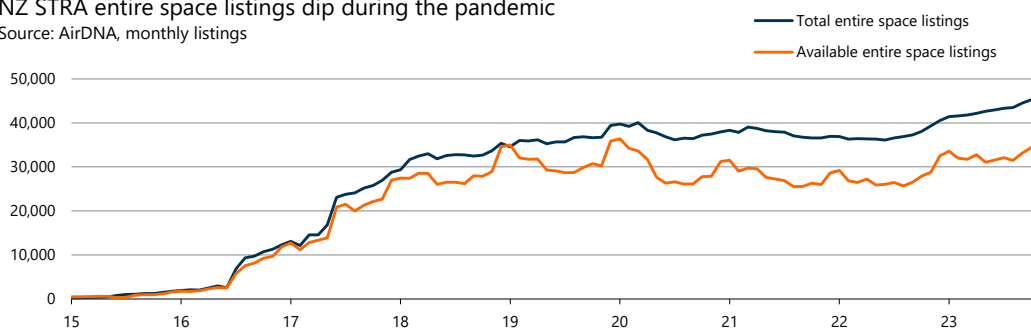
Chart 12 in the *Regional overview* section (p17) shows that the national trend of pre-pandemic growth followed by a plateauing, followed by a pandemic dip then recovery, was similar across Auckland, Queenstown-Lakes District, Wellington City, and Christchurch City.

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[1] Available listings are properties that are available for rental for at least one night in the reporting period. The reporting periods used in this analysis are either annual (as above) or monthly. Total listings include properties registered with the platform but not available for rental for any night in the reporting period.

The dip in demand for short-term entire space rentals during the pandemic can also be seen in the number of reservation nights (see Chart 26 in *Appendix A: Selected Data Series – p31)*. Reservation nights peaked at almost 4.2 million in 2019, fell 29% to almost 3.0 million in 2021, then increased 34% to almost 4.0 million in 2022. Reservation nights in 2023 are well on course to surpass the 2019 annual total (see Chart 28 in *Appendix A: Selected Data Series*).

To better understand what happened to domestic and international tourism (and therefore the demand for STRA properties) prior to and during the pandemic, we can look at guest nights in commercial accommodation as a proxy measure. Chart 29 in *Appendix A: Selected Data Series* shows the seasonality in both domestic and international guest nights.

The growth in international tourism prior to the pandemic is evident as the summer peaks get higher and higher. This growth would most likely have encouraged the growth in STRA listings during this time. Growth in affordable tourism accommodation capacity might also have encouraged more tourists to visit New Zealand, bringing with them the economic benefits of tourism spending to local economies.

International guest nights fell away almost to zero in 2020 with the closing of the border. Domestic guest nights took up some of the slack, rising above pre-pandemic levels in the summers of 2021, 2022, and 2023, as New Zealanders were unable to travel abroad, but were largely able to travel freely within New Zealand (outside of lockdowns).

Infometrics

New Zealand's housing market

The years between the Global Financial Crisis (GFC) and the COVID-19 pandemic saw rapid population growth in New Zealand, fuelled by international migration, which put upward pressure on house prices and rents. The past five years have been even more tumultuous for New Zealand, particularly with the onset of the COVID-19 pandemic. The housing market has been buffeted perhaps more than most other sectors as residential building supply chain disruptions, significant changes to Government housing and immigration policy settings, changes in interest rates, and Reserve Bank lending regulations led to rapid increases then declines in house prices, which led to a worsening then improvement in housing affordability. Against this complex backdrop, the number of STRA listings is just one of many factors that influence the housing market.

Migration fuelled population growth

From 2011, the years leading up to the COVID-19 pandemic saw the New Zealand housing market come under increasing pressure from rapid population growth driven by high net inward international migration (Chart 2), initially in Auckland, then in other parts of the country.

Chart 2

Population growth driven by international migration
Source: Stats NZ, annual net migration (arrivals to NZ minus departures)
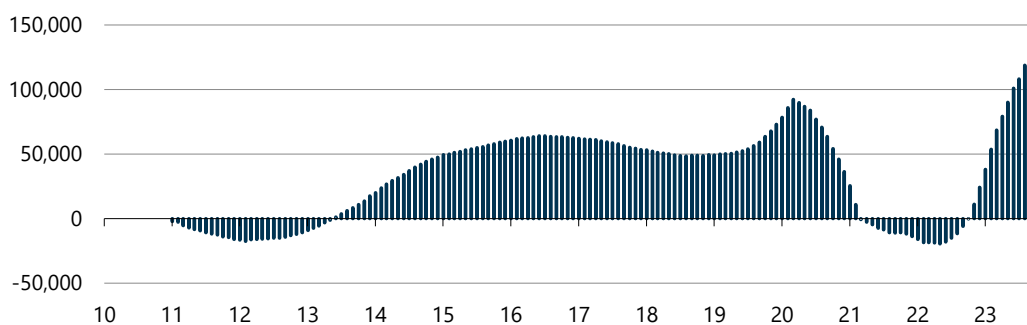
Growth in dwellings takes time to gather pace

The construction sector was unable to respond quickly enough to the increasing population, putting upward pressure on house prices and rents in many parts of the country. Between 2014 and 2020, population growth easily outstripped growth in the number of dwellings (Chart 3). Population growth began to weaken when the Labour Government introduced more restrictive immigration policies in 2017 (see *Appendix B: Policies & Regulations* for details –p36). The closing of New Zealand's border in 2020 to restrict the spread of COVID-19 saw population growth fall almost to zero, enabling some catch-up by residential construction.

Chart 3

NZ population growth outstrips dwelling growth
Source: Stats NZ & Infometrics, annual % change

— Dwellings
— Population
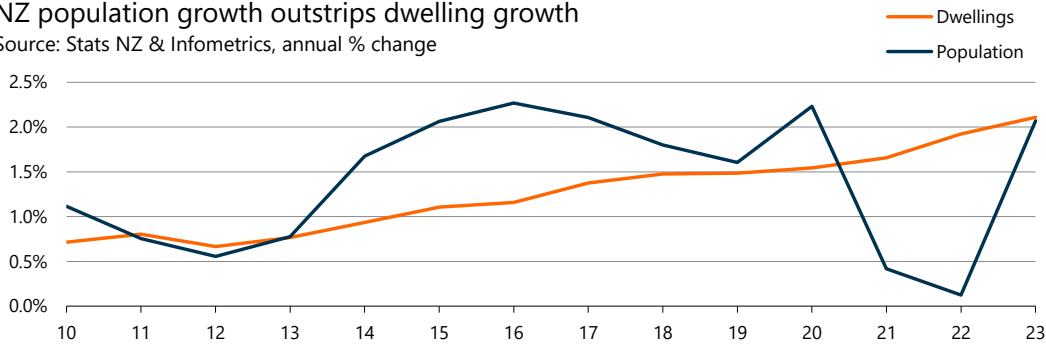
Low interest rates add fuel to the fire

In addition to population growth, house price rises prior to the pandemic were encouraged by relatively low and stable mortgage interest rates. House prices surged during the pandemic, driven largely by even lower mortgage rates (Chart 4), changes to bank lending regulations (see *Government policy reacts* – p12), elevated construction costs (see *Cost of building a house accelerates* – p11), and New Zealand's relatively benign economic and public health conditions. A lack of COVID-19 in the community also encouraged expat Kiwis to return home and buy property.

Chart 4

Mortgage rates dip during the pandemic
Source: Infometrics, quarterly averages

— Floating
— 1 yr fixed
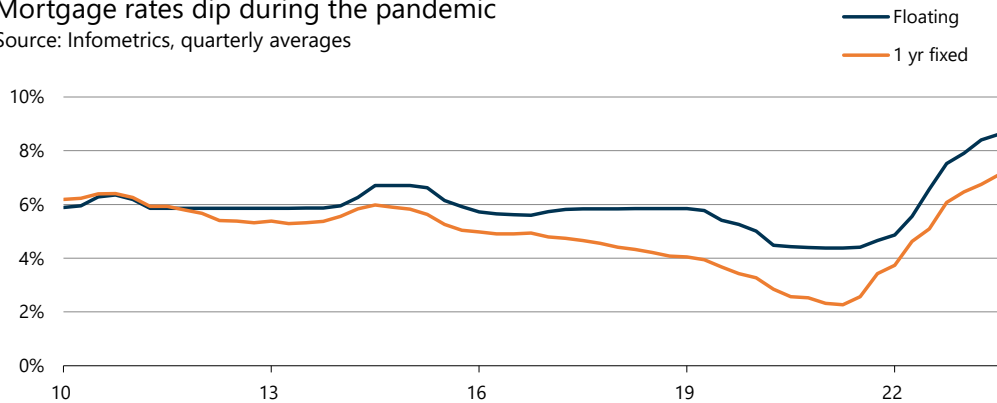
Cost of building a house accelerates

The pandemic led to price increases across the whole economy, particularly in the construction sector. A combination of supply chain disruptions, which curtailed the supply of key building products, and a surge in demand for housing and housing renovations brought about by low interest rates and money saved during lockdowns saw residential construction cost inflation accelerate to 17%pa in the June 2022 quarter, compared with a

Infometrics

12%pa increase across all asset types (Chart 5) and a 7.3% increase in prices across the whole economy (measured by the Consumers Price Index). [2]

Chart 5

Housing construction prices accellerate
Source: Stats NZ, Capital Good Price Index, annual % change, 2022Q3=1000

— Residential buildings
— All asset types
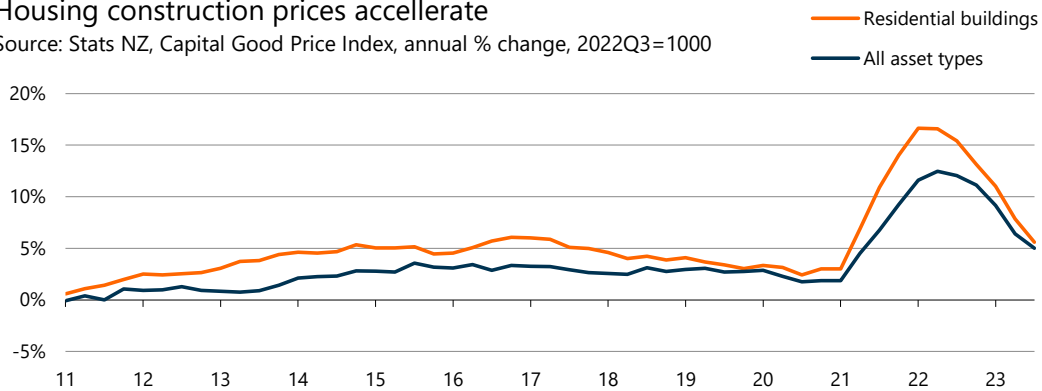
Government policy reacts

In the years prior to the pandemic, the New Zealand Government introduced several policies to address the rising unaffordability of housing such as a foreign buyer ban, KiwiBuild, and the First Home Grant. In the early months of the pandemic, the Reserve Bank loosened Loan-to-Value (LVR) restrictions amid concerns about the economic effects of COVID-related lockdowns, then subsequently tightened LVR restrictions again to address the surge in house prices. The Government also introduced policies to address the surge in house prices in 2021, such as extending the Bright Line Test and phasing out negative gearing. The current Government has committed to policies that will encourage investment in residential real estate. A more detailed list of Government and Reserve Bank policies and regulation that influenced the housing market can be found in *Appendix B: Policies & Regulations* (p36).

House price inflation is the result

Prior to the pandemic, the combination of strong population growth, low mortgage interest rates, and insufficient supply of new housing saw house price inflation in New Zealand peak at 15%pa in the June 2016 quarter compared with a 1.9% increase in household incomes (Chart 6). House price rises started to moderate in 2017 following the introduction of tighter LVR restrictions by the Reserve Bank, particularly for property investors.

At the time, the pre-pandemic house price increases seemed excessive, and there was widespread concern about New Zealand's worsening housing affordability. But during the pandemic, even lower mortgage interest rates, higher building cost inflation, and looser housing market regulations resulted in previous house price increases being dwarfed by a 31%pa rise in the September quarter 2021 quarter, compared with a rise in average household incomes of just 4.7%.

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[2] Source: Stats NZ

In 2022, house prices fell because of rising interest rates, as well as a raft of changes to housing market regulations designed to quell demand such as tighter loan-to-value requirements, an extension of the bright-line property rule, and tax changes for property investors (see the *Government policy reacts* section). According to the Law Association, tighter credit regulations relating to the Contracts and Consumer Finance Act also had the unintended consequence of making it more difficult for some house buyers to secure a mortgage.[3] Between the December quarter 2021 and the September quarter 2023 house prices fell 15% (see Chart 6).

Chart 6

NZ house prices surge relative to incomes in 2021 then retreat
Source: CoreLogic & Stats NZ, annual % change
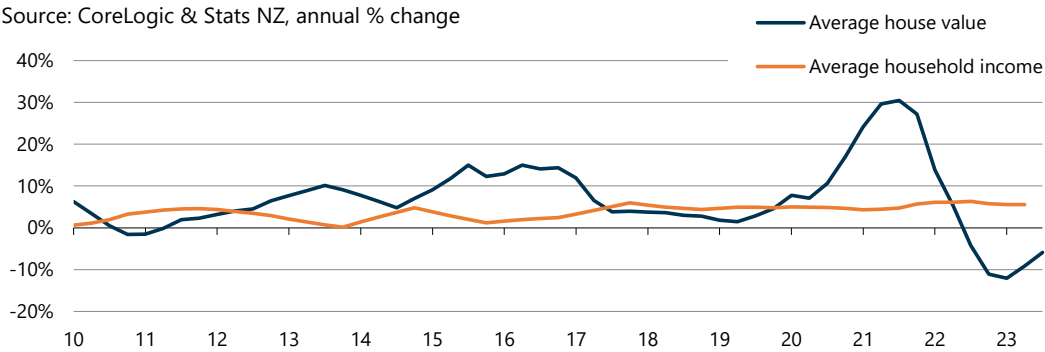
Housing affordability worsens then improves

Housing affordability in New Zealand worsened between 2012 and 2017 (Chart 7) as house prices rose faster than incomes (Chart 6). Affordability plateaued between 2017 and 2020, but the COVID-19 pandemic saw another sharp deterioration in New Zealand's housing affordability. Prior to the pandemic, the ratio of the average house value to the average household income had settled at around 7:1, having risen steadily between 2012 and 2016. During the pandemic, the ratio of the average house value to the average household income peaked at 9.2:1 in the December 2021 quarter.

Chart 7

NZ housing affordability worsens in 2022 then improves
Source: Corelogic & Infometrics, ratio of ave house value to ave household income

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[3] Source: https://thelawassociation.nz/how-the-cccfa-crashed-the-property-market/

![Infometrics logo]
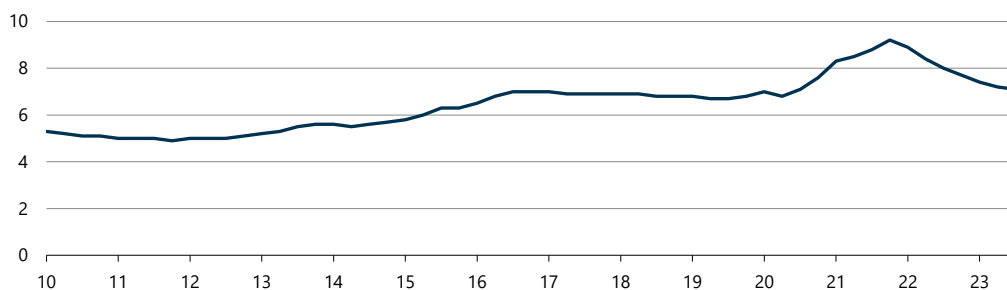
Since December 2021, housing affordability has improved as house prices have declined, albeit not back to pre-pandemic levels. A recent surge in net inward international migration since the New Zealand border opened in mid-2022 has more than likely prevented any further house price falls. From April 1, 2024, the Government reintroduced mortgage interest deductibility for rental properties, which could encourage property investment, putting upward pressure on prices. However, broader economic conditions such as interest rate hikes and a weakening economy are expected to moderate any house price rises for the foreseeable future.

Long-term rents increase ahead of incomes

Rental growth rates have been less volatile than house price growth rates, but they were nonetheless consistently ahead of growth in household incomes. Between 2015 and 2021, annual growth in the average rent in New Zealand hovered around 5%pa. During the pandemic, annual growth in the average rent peaked at 7.1%pa in the June 2022 quarter before falling back to 5.0%pa in the September 2023 quarter (Chart 8).

Chart 8

NZ rent growth peaks in 2021 then falls back
Source: MBIE, average rent, annual % change
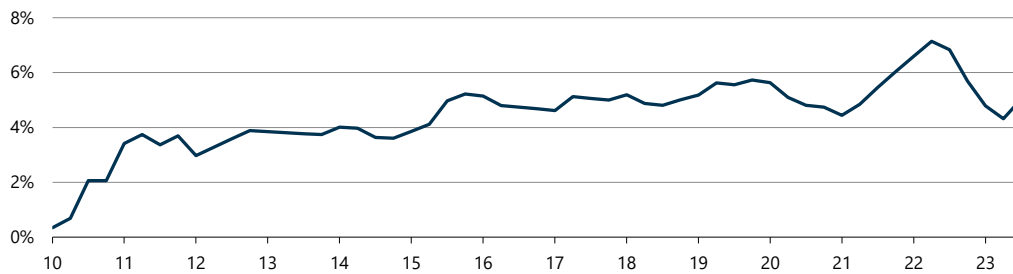
Rental affordability plateaus during the pandemic

Looking over the course of the past two decades, relatively modest but consistent increases in the average rent mean there has been a sustained worsening in rental affordability, driven by population growth and an insufficient supply of long-term rental properties.

Rental affordability in New Zealand worsened between 2012 and 2018 for many of the same reasons that housing affordability worsened. During the pandemic, rental affordability plateaued, with the average rent making up 22% of the average household income, up from a low of 19.7% in 2011 (Chart 9).

Infometrics

Chart 9

NZ rental affordability plateaus during the pandemic
Source: MBIE, Stats NZ & Infometrics, ave rent as % of ave household income

Household formation behaviours change

As population grew faster than the number of dwellings, the average household size increased from 2.60 people per household in 2012 to 2.69 in 2018 (see Chart 30 in *Appendix A: Selected Data Series* – p31). This rise was partly the result of people needing to form bigger households because of an affordable housing shortage. Another consequence of worsening housing and rental unaffordability was growth in the number of people on the Housing Register. In the September 2015 quarter just under 3,400 applicants were on the Housing Register. By the March 2022 quarter, the number had increased seven-fold to almost 26,900 (see Chart 31 in *Appendix A: Selected Data Series*).

STRA is just one of many factors influencing the housing market

To examine whether STRA listings influence house prices and rents, we start by looking at available entire space listings alongside growth in house prices (Chart 10) and long-term rents (Chart 11). If STRA does have a strong influence on the housing market, we would expect to see periods when STRA listings are growing coincide (perhaps with a time lag) with house prices rises and rises in long-term rents. Similarly, any falls in listings would coincide with weaker house price and long-term growth, or even falls in prices and rents.

Chart 10

New Zealand house prices vs STRA listings
Source: AirDNA & Corelogic
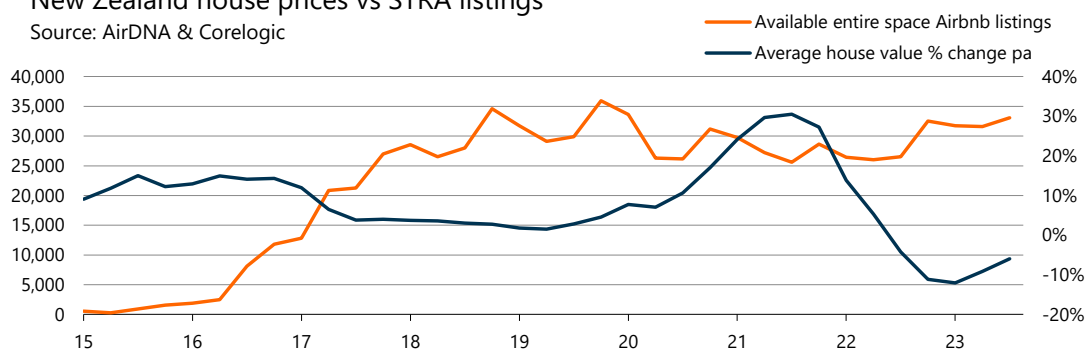
In terms of STRA listings, three distinct time periods are evident in the charts. In 2016 and 2017, available entire space listings were growing, but house price growth was steady or weakening, and growth in long-term rents was steady. House price inflation and growth in long-term rents may have been influenced more by net inward migration coming off its peak and more houses being built.

In 2020 and 2021, available entire space listings dipped, but house price growth surged and growth in long-term rents weakened then increased. Low interest rates, changes to lending regulations and other housing market policies, a strong economy, and previously high levels of net inward international migration, most likely had significant impacts on house prices and rents.

Chart 11

New Zealand rent growth vs STRA listings
Source: AirDNA & MBIE

— Available entire space Airbnb listings
— Average rent % change pa
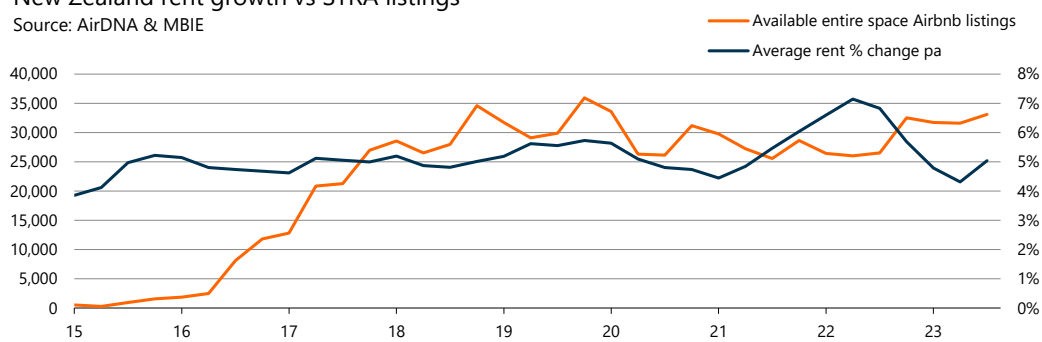
In 2022 and 2023, available entire space listings recovered, but house price growth weakened, then prices fell and growth in long-term rents weakened. Rising interest rates were arguably having the greatest effect on the housing market at this time.

On the face of it, the effects of STRA on the national housing market appear to be muted compared to more fundamental economic forces such as population growth and mortgage interest rates. The remainder of this report looks at STRA listings and housing markets in key visitor markets.

Infometrics

Regional overview

This section provides an overview of the STRA and housing markets of the four regions covered in our analysis. We focus on key differences across the four regions as well as similarities. Similarities demonstrate how national forces tend to underpin regional trends. Further unique aspects of each region's STRA sector and housing market are covered in the regional sections further on in this report.

The scale of the STRA sector differs across regions

At a peak of just over 7,000 in 2019, the number of STRA listings is greatest in Auckland, reflecting the fact that Auckland makes up a third of the New Zealand population (Chart 12). All four regions have experienced similar trends in STRA listings over the past eight years: a growth phase in 2016 and 2017, a plateauing in 2018 and 2019, then a dip followed by a recovery during the pandemic. Within years, there is seasonality, with summer peaks particularly noticeable in Auckland and Queenstown-Lakes District. These similarities are unsurprising given that demand for short-term accommodation tends to be influenced by national trends such as the demand from international and domestic tourists.

Chart 12

STRA available entire space listings dip during the pandemic
Source: AirDNA
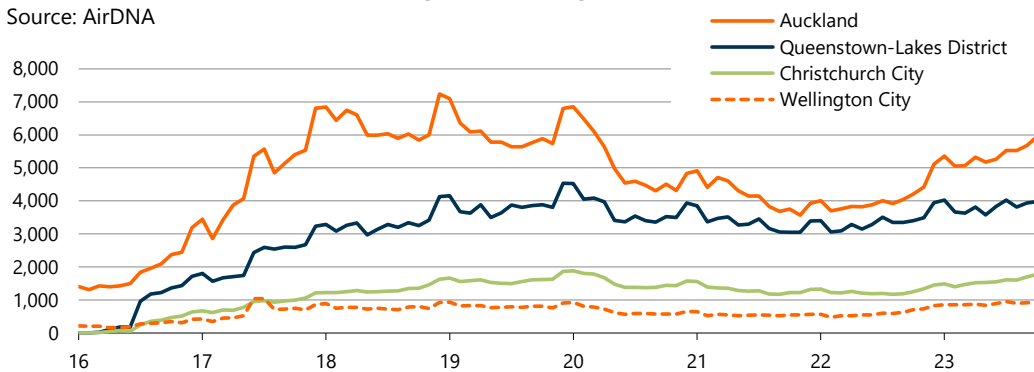
House price trends over time are broadly similar

The four regions covered in this analysis have common features in terms of house price changes. House price growth accelerated in 2015 and 2016 (except for Christchurch). Growth then weakened, plateaued, then spiked in 2021 during the pandemic, before house prices fell in 2022 and 2023 (Chart 13).

Historically, house prices have been higher in Queenstown-Lakes District compared with the other three regions and with the national average. As far back as the March 2010 quarter, the average house price in Queenstown-Lakes was $600,180, compared with $518,921 in

Infometrics

Auckland, $502,004 in Wellington City, $361,392 in Christchurch City and $400,111 nationally.[4]

Queenstown-Lakes District is different to the three urban centres of Auckland, Wellington City, and Christchurch City, in that there are significantly more visitors relative to ratepayers in Queenstown. This difference has had two effects, both of which contributed to higher house prices long before STRA listings began to grow. Firstly, the large number of visitors has meant that there has been a large number of temporary seasonal workers in Queenstown-Lakes, which has pushed up demand for housing. Secondly, the large number of visitors has resulted in holiday homes comprising a significant proportion of the housing stock for many years. Census data from 2018 tells us that roughly 28% of all homes in the district were unoccupied on Census night (6 March 2018). In the 2006 Census, the proportion was very similar, at 30%.

Our econometric analysis will examine whether the STRA sector has contributed to rising long-term rents and house in Queenstown-Lakes District, or whether the trend we see in Chart 13 is driven more by other factors such as interest rate movements or population growth outpacing growth in the number of dwellings.

Chart 13

House prices spike in 2021 then fall
Source: Corelogic, annual % change in average house values

Auckland
Wellington City
Christchurch City
Queenstown-Lakes District

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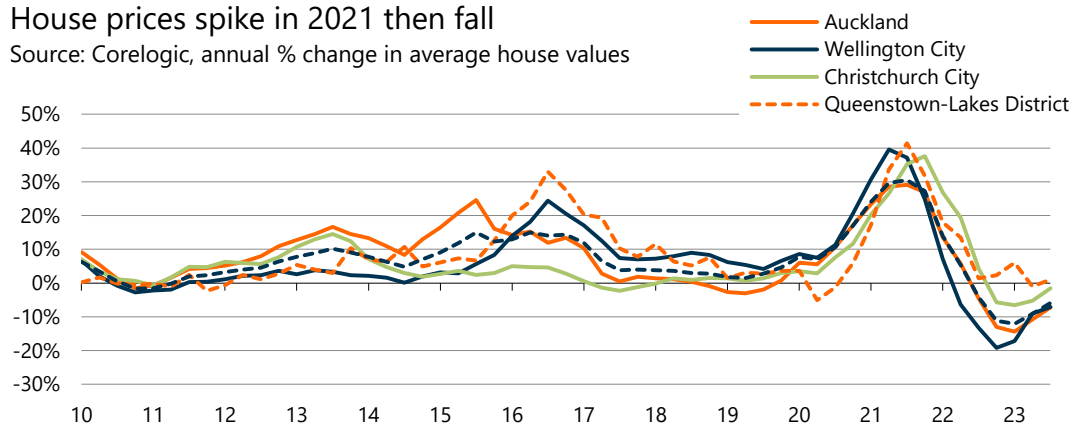
[4] Source: CoreLogic

Queenstown-Lakes District

This section looks at the relationship between STRA and the Queenstown-Lakes District housing market.

Our conclusion is that the Queenstown-Lakes District housing market has been subject to a number of localised forces such as population growth and the economic effects of the pandemic, as well as national forces such as changing interest rates, lending regulations, and government housing policy.

Against this backdrop, the STRA effect on the local housing market is small. STRA has increased long-term residential monthly rents by only 35 cents in an average month. This means that between January 2018 and September 2023, the cumulative effect of STRA is to add $11 to the average residential rent, which is a mere 1.6% of the average weekly rent in September 2023. This result compares with population growth, which added $101 to the average weekly rent over the same period.

We also find that STRA listings have no significant effect on house values.

Our interpretation as to why STRA has little effect on the Queenstown-Lakes housing market is that STRA listings and long-term rental properties are not always the same. Many entire space STRA properties are granny flats, apartments attached to a main dwelling, private rooms that are separate to but contained within a main dwelling, holiday homes, or owner-occupied dwellings rented out for short periods of time. Some overlap does exist between STRA and the long-term rental market, but the two markets are mostly discrete, even though they have some common demographic and economic drivers.

The prevalence of holiday homes is a key feature of Queenstown. With 28% of Queenstown dwellings being unoccupied on 2018 census night (30% as far back as 2006), it suggests that many homes are potentially holiday homes, which may have never been long term rentals and never will be. Therefore, the rise of STRA platforms in Queenstown does not necessarily mean there has been a significant increase in properties that would have been long term rentals, but which are now being used as STRA.

Listings dip during the pandemic

Entire space listings in Queenstown-Lakes District grew rapidly in 2016 and 2017. Available entire space listings plateaued in 2018 and 2019 as the market reached a state of equilibrium between tourist demand and the supply of both STRA and commercial accommodation (see Chart 12 in *Regional overview* – p17).

The number of available entire space listings dropped in 2020, as international tourism ground to a halt with the closing of the New Zealand border. Summer peaks in available entire space listings are evident throughout 2021 and 2022, as growth in domestic tourism and the short-lived Trans-Tasman travel bubble gave the local tourism sector a boost, especially during school holidays. However, neither of these peaks were as high as the 2019/20 summer peak. Available entire space listings began to recover with the reopening of the border in mid-2022 and are on course to surpass the 2019/20 summer peak, with available entire space listings 8.2% higher in November 2023 than they were in November 2019.

Reservation nights in Queenstown-Lakes District for entire space listings peaked at almost 584,000 in 2019, declined 43% to almost 334,000 in 2021, before increasing 60% to 534,000 in 2022 (see Chart 27 in *Appendix A: Selected Data Series* – p31).

STRA and the Queenstown-Lakes housing market

Broadly speaking, trends in the Queenstown-Lakes District housing market reflect trends in the wider New Zealand housing market. However, both house prices and rents in Queenstown-Lakes District are much higher than the national average.

Notwithstanding the fact that Queenstown-Lakes District's house prices have been higher than the national average since Infometrics began measuring prices in 2005, in the post-Global Financial Crisis period, prices rose only moderately in Queenstown-Lakes between 2012 and 2015, despite population growth running well ahead of growth in the number of dwellings (Chart 14) during this time.

Chart 14

Queenstown population growth outstrips dwelling growth
Source: Infometrics, annual % change
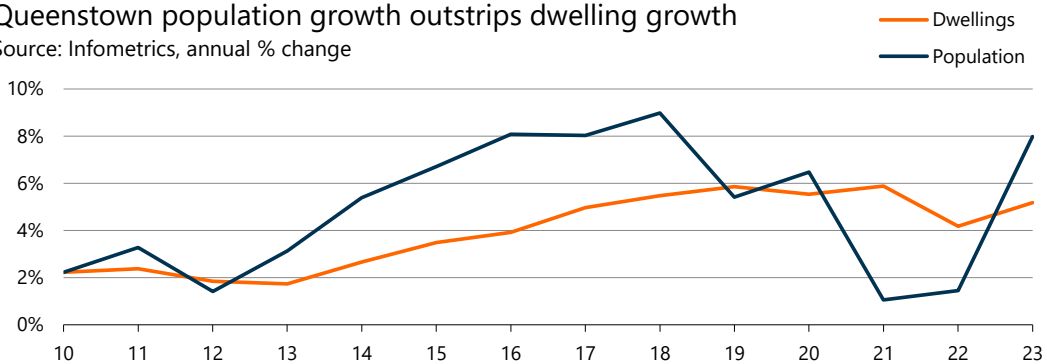
Chart 15

Queenstown-Lakes District house price inflation vs STRA listings
Source: AirDNA & Corelogic
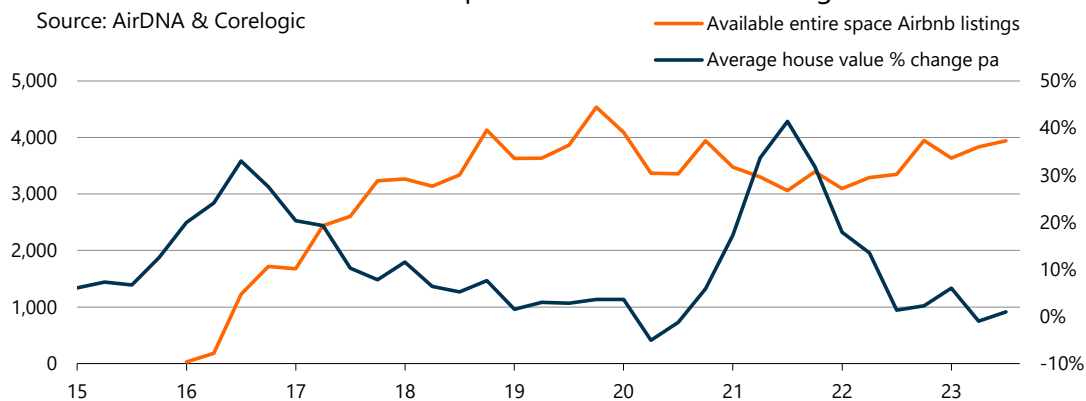
House price inflation started to accelerate in 2015, peaking at 28%pa in the December 2016 quarter. Available entire space STRA listings were also growing strongly during this time (Chart 15). But in 2017, house price inflation fell away as listings remained high. During this period, population growth in Queenstown-Lakes District was running faster than growth in the overall number of dwellings, which arguably added much stronger upward pressure on house prices.

House prices in Queenstown-Lakes increased considerably during the pandemic, rising 41%pa at their peak in the September 2021 quarter. The spike in house prices was driven largely by national factors such as very low interest rates, New Zealand's relatively good public health conditions, a lack of COVID-19 in the community, expat Kiwis to returning home and buying property, and relaxations in Loan-to-Value lending requirements between 2018 and 2021. STRA listings had declined during this time.

Across New Zealand, the strong economy also contributed to house price growth, but the same cannot be said for Queenstown-Lakes District, whose tourism-dependent economy contracted sharply in 2020 because of the closure of New Zealand's border to international tourists.

Rents in Queenstown-Lakes District have been much more sensitive to local economic conditions, rising during the later stages of the migration-fuelled population boom in 2015 and 2016 as STRA listings were increasing. However, population growth was also running faster than growth in the overall number of dwellings during this time, which arguably added much stronger upward pressure on rents (Chart 16).

Rents then declined steeply by 17%pa in the March 2021 quarter during the pandemic as STRA listings fell away. However, at the same time an exodus of relatively mobile workers released from the Queenstown-Lakes tourism industry during the pandemic resulted in a steep drop in demand for rental accommodation and therefore rents.
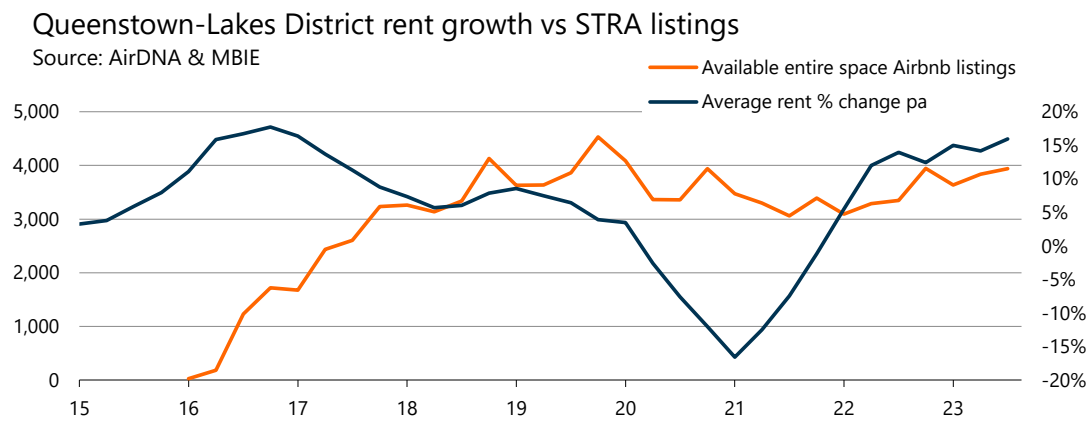
Chart 16

Queenstown-Lakes District rent growth vs STRA listings
Source: AirDNA & MBIE

We need to determine the relative strength of the various influences on the Queenstown-Lakes District property market. How does the influence of the STRA sector compare to national factors such as interest rates and housing market regulations, and local factors such as the strength of the local economy, population growth, and growth in the overall supply of new dwellings? The second half of this section reports on an econometric analysis of the effects of STRA on the Queenstown-Lakes District housing market.

Analysing the STRA effect

This section outlines the results of an econometric analysis that addresses the following research question: to what extent are rents for long-term accommodation in the Queenstown-Lakes District affected by the supply of entire space properties?

Infometrics

Given the complexity of economic factors that influence long-term residential rents, a key benefit of econometric analysis is that it can control for influences such as incomes, population growth, mortgage costs, tourism growth, and housing market regulations, and isolate the effect of properties being listed on platforms such as Airbnb.

As the time period covered by the available STRA data spans 2016-2023, our analysis also allows for restrictions related to COVID-19. Local government property rates and central government tax rates also vary between long-term rental properties and short-term visitor accommodation (such as provided through Airbnb). However, as far as we can determine, the differences have not changed markedly over the sample period.

The results both for Queenstown-Lakes District and its constituent suburbs are outlined in the next section. A detailed outline of how the econometric model was developed and modelling issues that needed to be addressed can be found in *Appendix C: model development* (p39).

Results: STRA and long-term rents

We find that the effect of the number of STRA listings on long-term residential rents in Queenstown-Lakes District is small, increasing residential monthly rents by only 35 cents in an average month. This means that between January 2018 and September 2023, the cumulative effect of STRA is to add about $11 to the average residential rent, which is a mere 1.6% of the mean rent in September 2023. This result compares with population growth, which added $101 to the average weekly rent over the same period. Detailed results can be found in Table 3 in *Appendix C: model development*.

The lag of rents has by far the strongest effect. As explained in *Appendix C: model development*, the presence of the lagged rent term is consistent with partial adjustment under which rents may take some time to adjust to changes in population and mortgage costs (and to the first lockdown), or with adaptive expectations under which landlords adjust rents according to their expectations about those factors.

Results: subdistricts within Queenstown-Lakes District

Queenstown and Wanaka dominate the STRA supply in Queenstown-Lakes District, accounting for over 80% of total available entire space listings. Our analysis indicates that there is little location-specific variability in STRA supply over time, except for Glenorchy. Glenorchy has a very small number of listings and constitutes only 1% of the total.

We estimated a model for each Queenstown-Lakes District subdistrict. Each subdistrict model had the same variables as the Queenstown-Lakes District model above, but the number of available STRA listings for each subdistrict is used in place of the number of available Queenstown-Lakes District listings, and subdistrict rents replace Queenstown-Lakes District rents as the dependent variables. A time series for rents in Glenorchy was not available.

For all subdistricts, we found that at subdistrict level an effect of STRA supply on long-term residential rents cannot be seen in the data.

Results: STRA and house values

Our subsidiary research question is: to what extent are house prices in Queenstown-Lakes District affected by the supply of STRA properties?

We found that STRA listings do not influence house values in Queenstown-Lakes District. As an explanation of house values, our model is not entirely satisfactory. We expected population to be a significant explanatory variable, but it failed to feature, perhaps because population growth was weakening during the sample period just as the local residential construction sector was building more houses. The mortgage interest rate does appear, with the expected negative relationship. An increase in the mortgage interest rate of one percentage point is associated with a decline in house values of almost 0.4%. See *Queenstown-Lakes District house value model development* (p44) in *Appendix C: model development* for a more detailed outline of the model's development and final results.

Auckland

This section looks at the relationship between STRA and the Auckland housing market. The STRA sector in Auckland is the largest in the country in terms of the number of listings. In terms of listings as a proportion of the dwelling stock, Auckland's proportion is like other urban centres such as Wellington City and Christchurch, and it is much smaller than tourism destinations such as Queenstown-Lakes District.

Like many other regions in New Zealand, the past 10 or so years have seen an increase in the number of available entire space listings in Auckland, followed by a small decline then recovery during the pandemic. Increases then declines in the number of listings in Auckland often coincide with increases and moderation/declines in rents and to a lesser extent house prices. On the face of it, these trends suggest that the STRA sector could be influencing the local housing market. However, our econometric analysis has found that STRA listings in Auckland had no significant effect on long-term rents or house values.

STRA and the Auckland housing market

Chart 17 shows the number of available entire space STRA listings alongside growth in long-term rents in Auckland. Rents rose sharply in 2015 as population growth was running faster than growth in the number of dwellings (Chart 18).

Chart 17

Auckland rent growth vs STRA listings
Source: AirDNA & MBIE

Available entire space Airbnb listings
Average rent % change pa

Chart 18

Auckland population growth outstrips dwelling growth
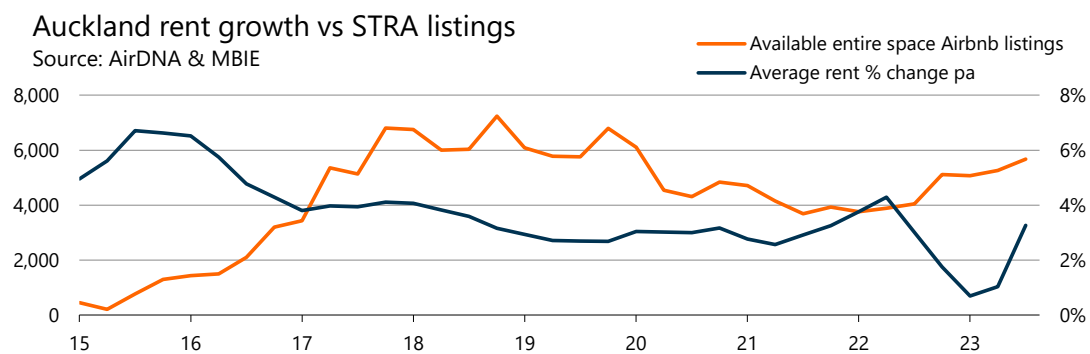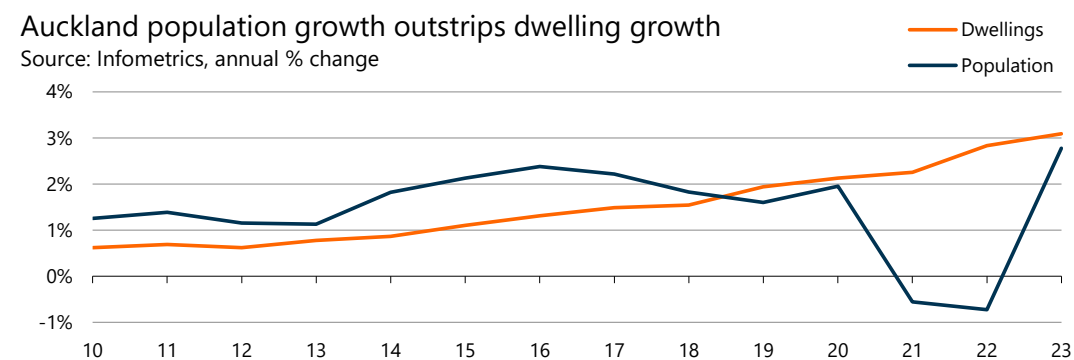Source: Infometrics, annual % change

Dwellings
Population

Since 2016, rent increases have been maintained at a fairly moderate pace due to low interest rates (which kept property investors' costs down), improving housing supply, and weakening population growth brought about by a moderation then cessation in net inward migration and an exodus of Aucklanders to more affordable regions (some of whom were presumably renters who felt they could more easily get on the property ladder elsewhere). The moderation in rent increases coincided with growth in the number of STRA listings.

The pandemic saw weak growth in Auckland's average rent at the same time as STRA listings fell away because international tourism ground to a halt with the closed border. The Auckland population also declined during this period, which would have also put downward pressure on long-term rents. In 2023, the average rent in Auckland declined at the same time as available entire space listings were growing, which suggests that Auckland rents were being influenced by other factors.

Chart 19 shows the number of available entire space STRA listings alongside growth in house prices in Auckland. In 2015 and 2016, house price inflation in Auckland briefly accelerated as available entire space STRA listings were growing strongly. But with available entire space STRA listings equivalent to just 3% of the Auckland owner-occupied housing stock even at their peak, the potential for STRA to influence prices is limited.

Chart 19

Auckland house price inflation vs STRA listings
Source: AirDNA & Corelogic
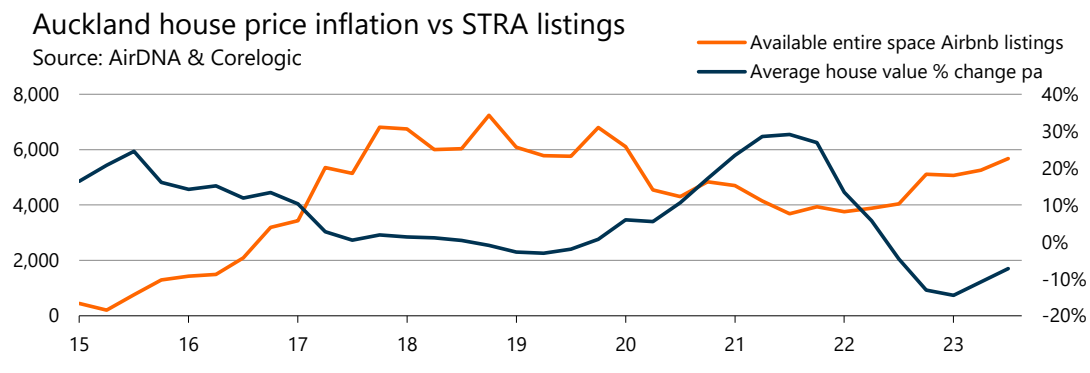
During the pandemic, available entire space STRA listings fell away as house price inflation was pushed even higher – principally by low interest rates, New Zealand's relatively good economic and public health conditions, a lack of COVID-19 in the community, expat Kiwis returning home and buying property, and relaxations in Loan-to-Value lending requirements between 2018 and 2021. Arguably, Auckland fared worse than other parts of the country in terms of COVID-19 outbreaks and resulting lockdowns, which had implications for the local economy.

Low interest rates and rising house prices created profitable conditions for residential construction. As a result, growth in dwellings continued to gather pace in Auckland despite a small decline in the size of the Auckland population, which contributed to house price inflation moderating in 2022.

The limited influence of STRA is borne out in the next section, which shows that STRA entire space listings had no significant effect on house values in Auckland.

Analysing the STRA effect

We applied the models developed for Queenstown-Lakes District to examine the effect of STRA listings on long-term rents and house values in Auckland, with minimal changes in specification. We did not investigate the effect of possible explanatory variables that were discarded in the Queenstown-Lakes District models, such as GDP and tourism spending. We also concentrated on the period from January 2018 to avoid the structural break with the earlier period during which STRA was in an establishment phase (as we did for Queenstown-Lakes District).

Chart 12 in the main body of the report shows available STRA entire space listings in Auckland. The average monthly rent in Auckland is shown in Chart 36 in *Appendix A: Selected Data Series* (p31).

The STRA listings profile in Auckland is similar to those of Wellington and Christchurch Cities. However, the rent profile is quite different. There are no January-February spikes in Auckland, but there is a noticeable drop in rents over the period February 2022 to November 2022.

Results: STRA, residential rents, and house values

Our modelling found that the number of available STRA entire space listings had no significant effect on either long-term residential rents or house values in Auckland. A fuller explanation of the residential rents model development and final results can be found in *Auckland residential rents model results* (p45) in *Appendix C: model development*.

Wellington City

This section looks at the relationship between STRA and the Wellington City housing market. Like many other regions in New Zealand, the past 10 or so years have seen an increase in the number of available entire space STRA listings in Wellington City, followed by a small decline then recovery during the pandemic. The STRA sector is relatively small in Wellington compared with tourism destinations such as Queenstown-Lakes District. Our econometric analysis found that STRA had no influence on rents and house prices in Wellington City.

STRA and the Wellington housing market

Chart 20 shows the number of available entire space STRA listings alongside growth in the average long-term rent in Wellington City. Between 2016 and 2020, growth in the average rent in Wellington City was gathering pace, as STRA listings were either rising or at a high level.

Chart 20

Wellington City rent growth vs STRA listings
Source: AirDNA & MBIE

— Available enitre space Airbnb listings
— Average rent % change pa

For much of this period, population growth in Wellington City was running faster than growth in the number of dwellings, which would have also put upward pressure on rents (Chart 21).

Chart 21

Wellington City population growth outstrips dwelling growth
Source: Infometrics, annual % change

— Dwellings
— Population

The pandemic saw growth in the average rent weaken as STRA listings were falling away. The Wellington population also declined during this period, putting downward pressure on long-term rents. In 2023, Wellington City's average rent declined as available entire space listings were growing steeply, which suggests that Wellington rents are influenced by other factors.

Chart 22 shows the number of available entire space STRA listings alongside growth in the average house price in Wellington City. In 2016, house price inflation in Wellington City briefly accelerated as available entire space STRA listings were growing strongly. With available entire space STRA listings equivalent to less than 3% of the Wellington City owner-occupied housing stock even at their peak, the STRA effect is arguably small compared with other economic drivers. During the pandemic, available entire space STRA listings declined as house price inflation was pushed even higher, principally by low interest rates.

Chart 22

Wellington City house price inflation vs STRA listings
Source: AirDNA & Corelogic

Legend: Available entire space Airbnb listings; Average house value % change pa

Analysing the STRA effect

We applied the models developed for Queenstown-Lakes District to examine the effect of STRA listings on long-term residential rents and house values in Wellington City with minimal changes in specification. We also concentrated on the period from January 2018 to avoid the structural break with the earlier period during which STRA was in an establishment phase (as we did for Queenstown-Lakes District).

Chart 12 in the main body of the report shows available STRA entire space listings in Wellington City. The average monthly rent in Wellington City is shown in Chart 37 in *Appendix A: Selected Data Series* – p31).

Results: STRA, residential rents and house values

Our modelling found that the number of available STRA entire space listings had no significant effect on either long-term residential rents or house values in Wellington. A fuller explanation of the residential rents model development and final results can be found in *Wellington City residential rents model results* (p46) in *Appendix C: model development*.
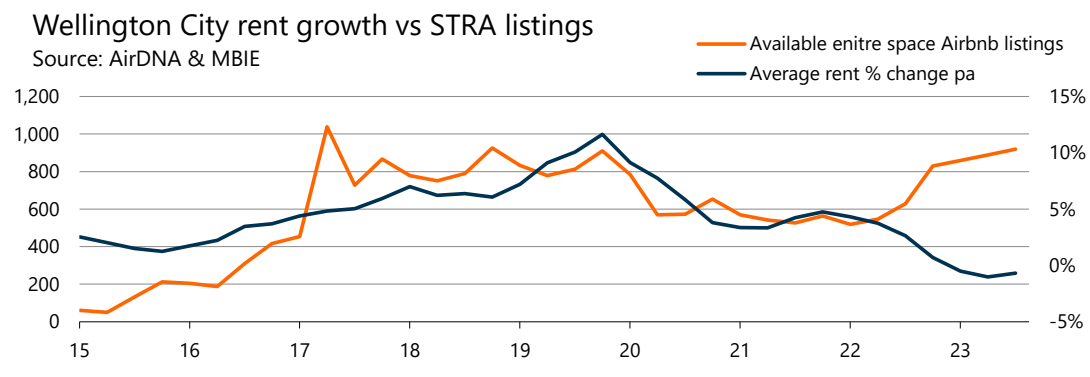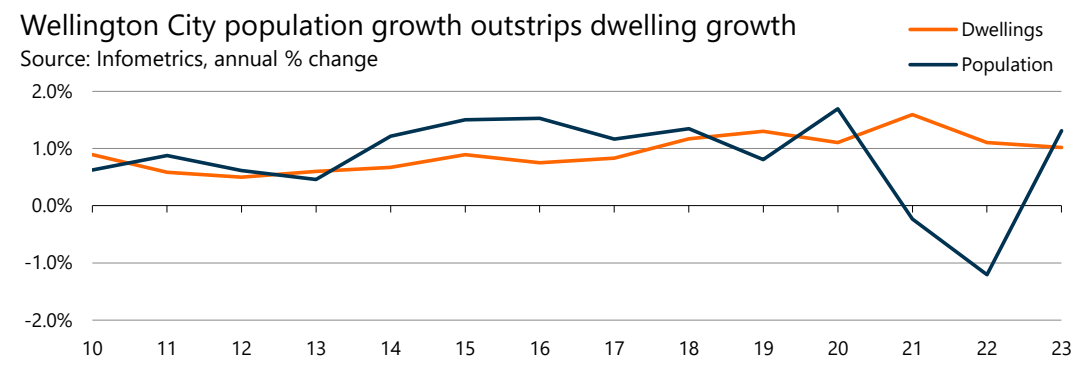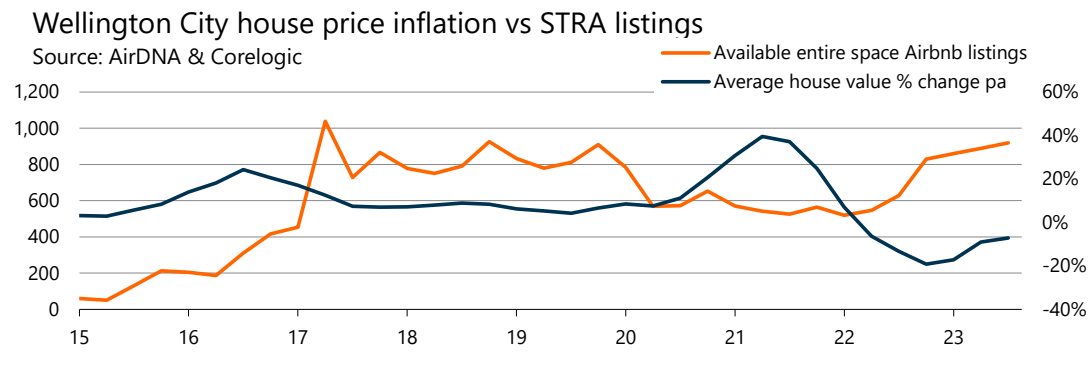
Infometrics

Christchurch City

This section looks at the relationship between STRA and the Christchurch City housing market. Like many other regions in New Zealand, the past 10 or so years have seen an increase in the number of available entire space STRA listings in Christchurch City, followed by a small decline then recovery during the pandemic. The STRA sector is relatively small in Christchurch compared with tourist destinations such as Queenstown-Lakes. Our econometric analysis of STRA in Christchurch finds an even smaller influence on long-term rents compared with Queenstown-Lakes, and no influence of STRA on Christchurch City house prices.

STRA and the Christchurch housing market

Chart 23 shows the number of available entire space STRA listings alongside growth in the average long-term rent in Christchurch City. Between 2016 and 2020, increases in the number of STRA listings coincide with strengthening growth in the average rent.

Chart 23

Christchurch City rent growth vs STRA listings
Source: AirDNA & MBIE

— Available entire space Airbnb listings
— Average rent % change pa
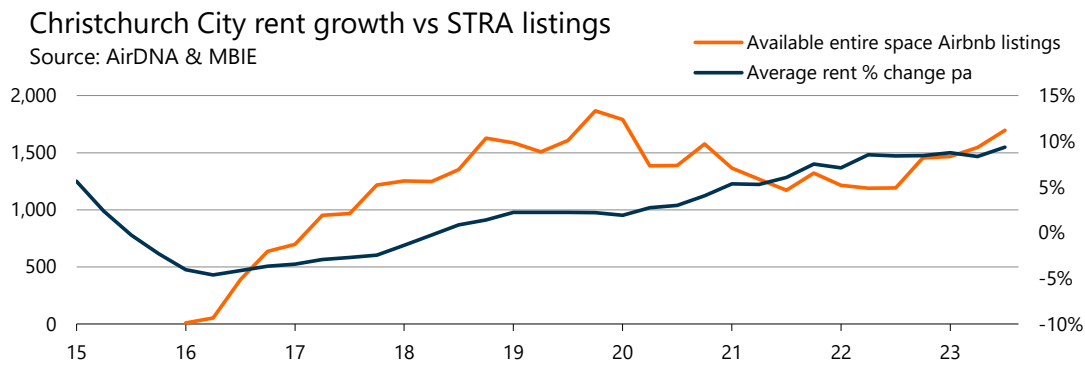
However, the Christchurch population was also growing at this time, which would have put upward pressure on rents (Chart 24).

Chart 24

Christchurch City population growth outstrips dwelling growth
Source: Infometrics, annual % change

— Dwellings
— Population

During the pandemic, growth in long-term rents continued apace at a time when STRA listings fell away, which suggests other forces were responsible for increasing rents.

Chart 25 shows the number of available entire space STRA listings alongside growth in the average long-term rent in Christchurch City. Between 2016 and 2020, house prices in Christchurch were either static or declining due to the after-effects of the 2011 earthquake. The strong increase in STRA available entire space listings during this time clearly put little upward pressure on house prices. During the pandemic, house price inflation spiked as STRA listings were falling, which is further evidence that other factors were influencing house prices.

Chart 25
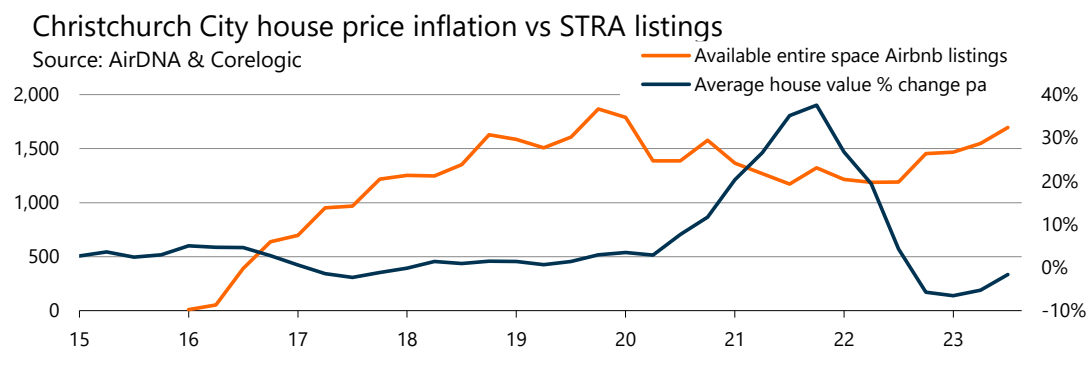
Christchurch City house price inflation vs STRA listings
Source: AirDNA & Corelogic

Analysing the STRA effect

We applied the models developed for Queenstown-Lakes District to examine the effect of STRA listings on long-term residential rents and house values in Christchurch City with minimal changes in specification. We also concentrated on the period from January 2018 to avoid the structural break with the earlier period during which STRA was in an establishment phase (as we did for Queenstown-Lakes District).

Chart 12 in the main body of the report shows available STRA entire space listings in Christchurch City. The average monthly rent in Christchurch City is shown in Chart 38 in *Appendix A: Selected Data Series* p31).

Results: STRA, residential rents and house values

Our modelling found that the number of available STRA entire space listings had very little effect on long-term residential rents in Christchurch City, amounting to only $0.09 per week in an average month. The cumulative effect is $1, which is 0.2% of the mean rent at the end of the sample period (here extended to November 2023). This result compares with the cumulative effect of population growth of $64.

The number of available STRA entire space listings had no significant effect on house values in Christchurch City. A fuller explanation of the residential rents model development and final results can be found in *Christchurch City residential rents model results* (p47) in *Appendix C: model development*.
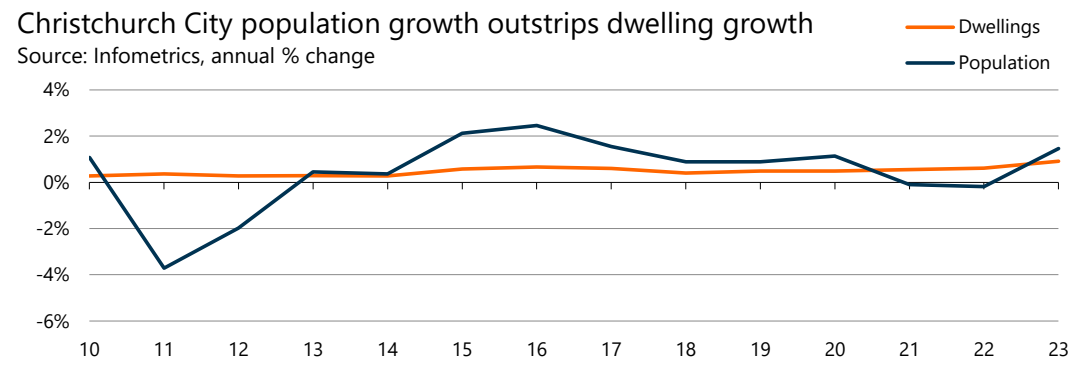
Appendix A: Selected Data Series

The following charts add further detail to the descriptive analysis in the main body of the report.

Chart 26

NZ STRA entire space reservation nights dip during the pandemic
Source: AirDNA
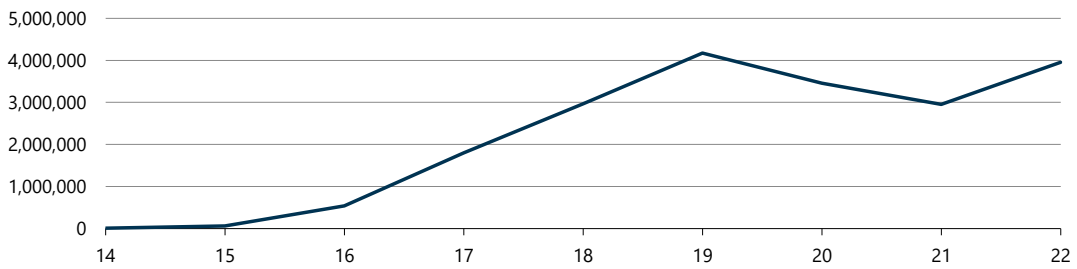
Chart 27

STRA entire space reservation nights dip during the pandemic
Source: AirDNA

Auckland
Queenstown-Lakes District
Christchurch City
Wellington City
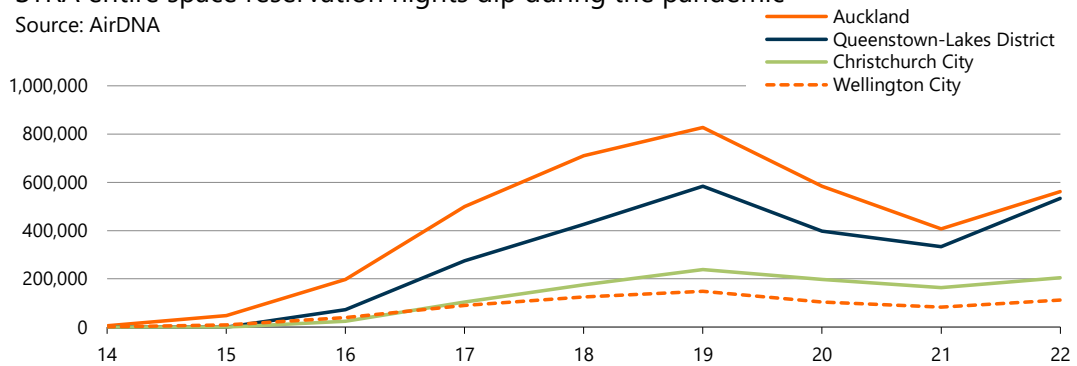
Chart 28

Post-pandemic NZ STRA entire space reservation nights on course to surpass 2019
Source: AirDNA

2019
2023

Infometrics
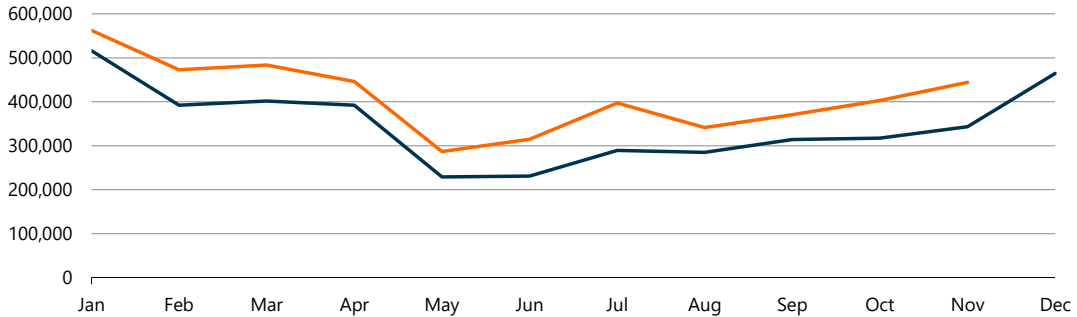
Chart 29[5]

NZ domestic tourism takes up the slack
Source: Stats NZ pre 2020, MBIE from 2020
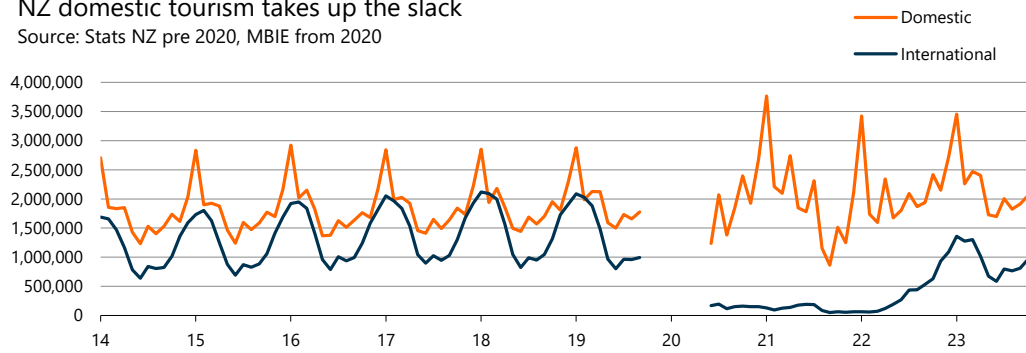
Chart 30

Average household size increases
Source: Stats NZ
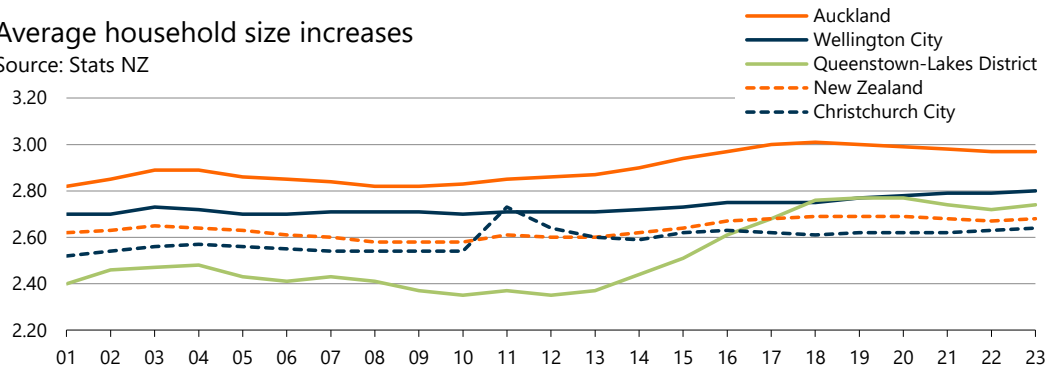
Chart 31

New Zealand state housing applicants grow
Source: Ministry of Social Development, applicants on the Housing Register
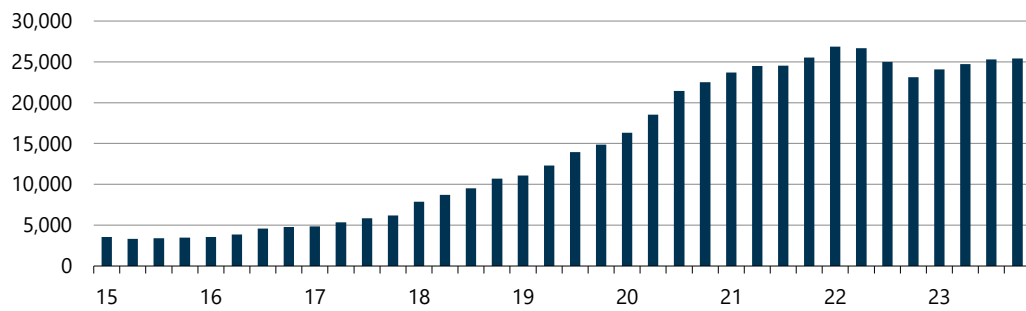
The following charts show the main data series used in the econometric analysis.

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[5] No single data source tracks domestic and international tourist guest nights leading up to, and right the way through, the pandemic. Instead, Chart 29 tracks two separate data series with very similar data collection methodologies. There is a break in these two series between October 2019 and May 2020.

Chart 32

Queenstown-Lakes District geometric mean residential weekly rent
Source: MBIE
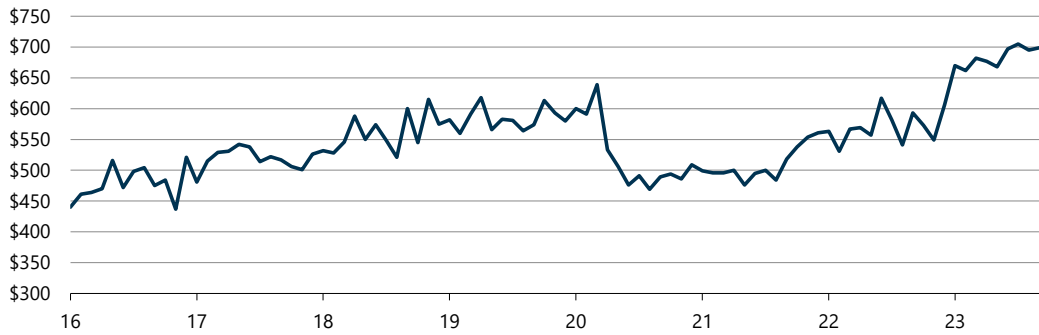
Chart 33

Residuals from 2-stage Queenstown-Lakes District rent equation
Source: Infometrics
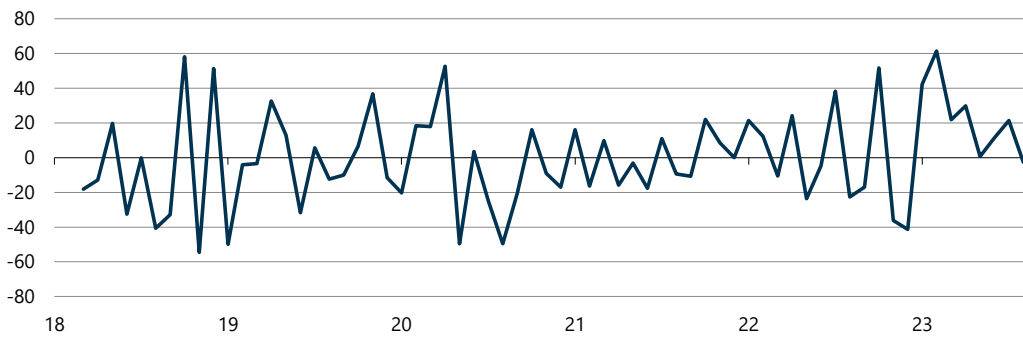
Chart 34

Queenstown-Lakes District house values
Source: CoreLogic, quarterly % change
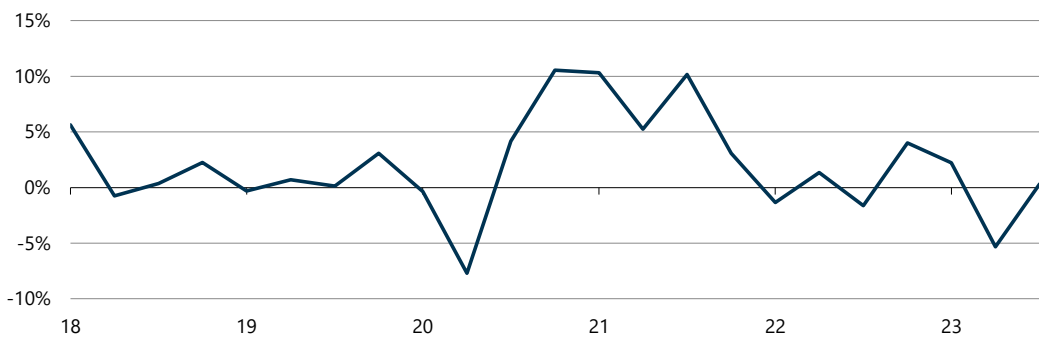
Chart 35

Residuals from Queenstown-Lakes District house values equation
Source: Infometrics
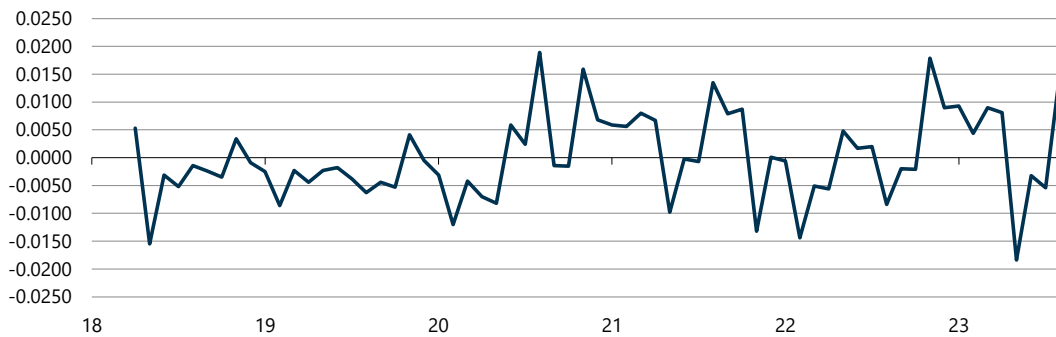
Chart 36

Auckland geometric mean residential weekly rent
Source: MBIE
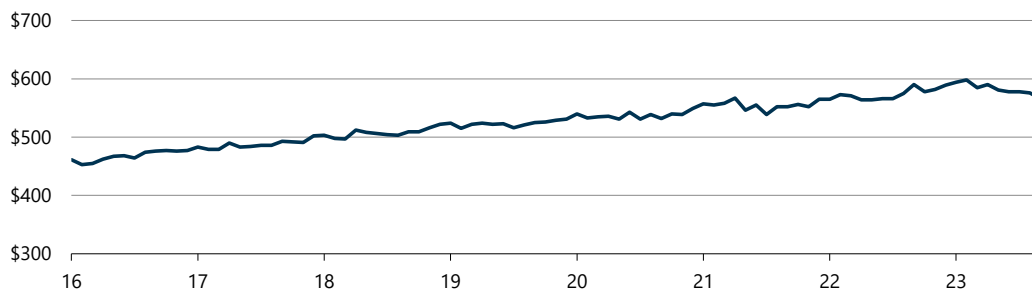
Chart 37

Wellington City geometric mean residential weekly rent
Source: MBIE

Chart 38

Christchurch City geometric mean residential weekly rent
Source: MBIE
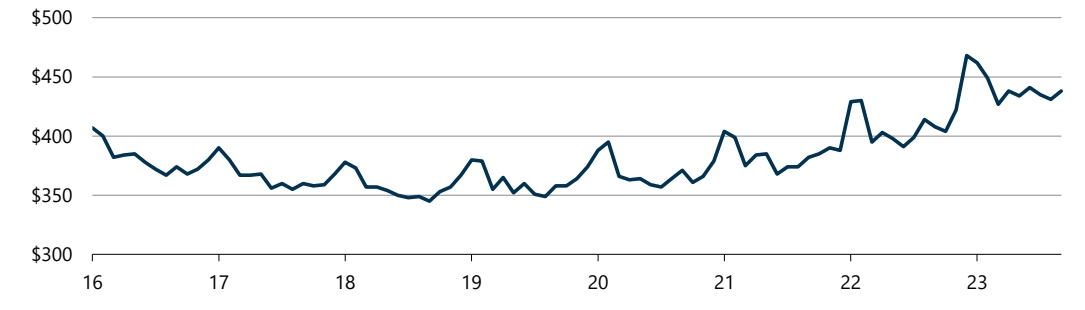
Appendix B: Policies & Regulations

Loan-to-Value restrictions

- 1 October 2013, LVR restrictions introduced by the Reserve Bank with banks required to restrict new residential mortgage lending at LVRs over 80% to no more than 10% of the dollar value of their total new residential mortgage lending.

- 1 October 2016, LVR restrictions were tightened to a maximum 5% of new lending at LVRs above 60% for investors.

- 1 May 2020, the Reserve Bank removed LVR restrictions.

- 1 March 2021, LVR restrictions were reinstated at the same level as before the onset of the pandemic: a maximum of 20% of new lending at LVRs above 80% for owner-occupiers and a maximum of 5% of new lending at LVRs above 70% for investors.

- 1 May 2021, LVR restrictions for investors were further tightened to a maximum of 5% of new lending at LVRs above 60%.

- 1 November 2021, LVR restrictions for owner-occupiers were further tightened to a maximum of 10% of new lending at LVRs above 80%.

- 1 June 2023, LVR restrictions eased to a 15% limit for loans with LVR above 80% for owner occupiers, and a 5% limit for loans with LVR above 65% for investors.

Bright Line Test

- October 2015, the National Government introduced a two-year bright-line period for residential property investment, meaning that investment properties sold within two years of purchase after this date were subject to tax on any increase in value.

- March 2018, the Labour government increased the bright-line period from two years to five years.

- March 2021, the Labour Government announced it intended to extend the bright-line period from five years to 10 years for residential property acquired on or after 27 March 2021.

- March 2024, the National Government reduced the bright-line test for residential property to two years.

Foreign buyer ban

- October 2018, the foreign buyer ban was introduced by the Labour Government to prevent persons from overseas (excluding Australia and Singapore) from buying residential land, after international buyers were perceived to be buying homes ahead of local buyers.

- The current National Government is considering allowing foreign buyers to invest in any residential land.

Debt-to-income ratios

- The Reserve Bank introduced debt-to-income ratios in July 2024. The ratios restrict bank lending to borrowers with a debt-to-income ratios of over six for owner-occupiers and over seven for investors.

Negative gearing

- October 2021, the Labour Government started to phase out mortgage interest as a tax-deductible expense for residential property investors.

- In March 2024, the National Government announced that investors would be able to claim 80% of their interest expenses as a cost for tax purposes from 1 April 2024, and 100% from 1 April 2025.

Schemes to support people to buy homes

- First Home Grant is available to people who have been contributing to their KiwiSaver for at least three years, depending on other eligibility factors.

- Kāinga Ora – Home and Communities offers a range of home ownership options when buying a house or land to build on.

- First Home Loans are issued by selected banks and other lenders and underwritten by Kāinga Ora. First Home Loans allow the lender to provide loans that would otherwise sit outside their lending standards.

- Kāinga Whenua Loans are for individuals who have a right to live on multiple-owned Māori land to build, purchase, or relocate a house on that land. The loan can also be used for repairs and maintenance for an existing house on multiple-owned land.

- The KiwiBuild real estate development scheme was pursued by the Labour Government in 2018.

GST

- From 1 April 2024, online marketplace operators (such as Airbnb) will collect GST at the standard 15% rate on listed services that are performed, provided, or received in New Zealand. They will pay 6.5% to Inland Revenue Department and will pass on 8.5% to people and businesses providing listed services.

Immigration policy

The Labour Government introduced more restrictive immigration policies in 2017. These policies included:

- the introduction of a maximum duration of three years for Essential Skills workers in lower-skilled employment, after which these workers needed to spend 12 consecutive months outside New Zealand, and

- requiring partners and children of Essential Skills workers in lower-skilled employment to meet the requirements for a visa in their own right.

- In May 2022, the Labour Government introduced the Green List to help streamline the residence pathway for migrants working in skilled occupations. The Green List contains highly skilled roles that have been identified as being in high demand globally and in ongoing shortage in New Zealand. Employers don't need to provide proof of advertising for these occupations when progressing a work visa job check application. Eligible migrants working in these occupations have clear pathways to residence.

- In July 2022, the Labour Government introduced the Accredited Employer Work Visa (AEWV). The AEWV is now the main temporary work visa in New Zealand. The AEWV replaced six work visas with a single visa process. Employers must be accredited to employ migrants on this visa. Migrants can stay for up to five years on this visa if they are paid at or above the median wage rate. The current National Government has indicated it will be making changes to the AEWV to balance getting more highly skilled workers into New Zealand against the need to support them with adequate infrastructure.

Infometrics

Appendix C: model development

Queenstown-Lakes District residential rent model development

In seeking to isolate the possible effect of the supply of STRA listings on residential rents, we need to allow for other factors that could influence rents. Typical factors might include:

- population

- some measure of real income or spending such as GDP

- house prices and interest rates, or the supply of dwellings

- general price inflation, and

- tourism numbers or spending.

Given the sample period, we should also allow for restrictions related to COVID-19 and the changes to mortgage interest deductibility for rental property. Local government property rates and central government tax rates also vary between long-term rental properties and short-term residential visitor accommodation provided on STRA platforms. However, as far as we can determine, the differences did not change markedly over the sample period.

Our sample period begins in January 2016. The AirDNA data is monthly, which provides benefit in terms of the number of observations, but some of the other data series are not monthly and so require interpolation. The selected variables are as follows.

- The supply of STRA properties, as measured by available entire space listings in Queenstown-Lakes District, which is a more useful variable than total entire space listings, because the latter is measured over 12 months, whereas available listings are monthly.

- Queenstown-Lakes District average (geometric mean) rent on residential property, sourced from Ministry of Business, Innovation and Employment (MBIE).

- The effects of COVID-19 restrictions (synthetic variables for April-May 2020, or April 2020 to September 2021, and for the opening of the border in July 2022).

- A synthetic variable for the phase out of mortgage interest deductibility for rental property (100% to 30 September 2021, 75% from then to 31 March 2023, and 50% from then to the end of our sample period).

- Tourism (measured by electronic card spending in Otago, sourced from MBIE).

- Queenstown-Lakes District population (interpolated from Stats NZ data).

- Consumers' Price Index (CPI) as a general measure of inflation (interpolated from quarterly Stats NZ data).

- Queenstown-Lakes District real Gross Domestic Product (GDP), interpolated from quarterly Infometrics data.

- As a proxy for mortgage servicing costs: mean dwelling values in Queenstown-Lakes District multiplied by the two-year mortgage interest rate (from RBNZ and Infometrics data).

- Chart 12 in the main body of the report illustrates the data for the number of STRA listings in Queenstown-Lakes District, and in *Appendix A: Selected Data Series*, Chart 32 shows the geometrics mean rent, and residuals from the regression analyses are shown in Chart 33 and Chart 35.

Many of the variables listed above are correlated with each other; for example, GDP, tourism spending, and COVID-19 restrictions, potentially giving rise to multicollinearity. Of particular concern is that the number of STRA listings could be partially determined by some of the same factors that influence rents. Thus, in order to identify whether STRA supply independently affects rents, we need to strip out the effect of the common factors. The multicollinearity issue is dealt with in *Multicollinearity and other issues* (p41).

Queenstown-Lakes District initial results

The model was put through three stages of development. Table 1 presents initial results for the entire sample period. The effect of the number of STRA listings on rents, while statistically significant and positive as expected, has a small effect. Over the sample period its mean effect on weekly rents was to increase them by $1.21 per month. Changes in mortgage costs had a slightly more pronounced effect, but the effect of population growth was an order of magnitude larger. Both are also statistically significant.

Table 1

Econometric analysis initial results, effect of STRA on Queenstown-Lakes District long-term rents

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.749	0.000	75% of previous period's value carries forward
1st Covid lockdown	-47	0.025	The lockdown reduced rents by $47/week
Population change	287.9	0.004	Mean effect on rents was $58.16
Mortgage cost change	6.1	0.01	Mean effect on rents was $1.89
Available entire space Airbnb listings	0.028	0.002	Mean effect on rents was $1.21
Constant	-6.5	0.868	

R2=0.80, Errors: JB Normal statistic = 0.29

Source: Infometrics

The lag of rents has by far the strongest effect. As explained in *Appendix D: Lagged Effects* (p49), the presence of the lagged rent term is consistent with partial adjustment under which rents may take some time to adjust to changes in population and mortgage costs (and to the first lockdown), or with adaptive expectations, under which landlords adjust rents according to their expectations about those factors.

The end of 2017 constitutes a structural break in the series, which is not surprising given the rapid growth in listings before then. Excluding 2016 and 2017 from the data but making no changes to model specification yields the results shown in Table 2.

Table 2

Econometric analysis results, 2018 onwards

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.691	0.000	69% of previous period's value carries forward
1st Covid lockdown	-44.2	0.04	The lockdown reduced rents by $44/week
Population change	478.5	0.005	Mean effect on rents was $77.17
Mortgage cost change	6.33	0.1	Mean effect on rents was $2.67
Available entire space Airbnb listings	0.035	0.006	Mean effect on rents was $0.45
Constant	-27.2	0.527	

R2=0.80, Errors: JB Normal statistic = 0.57

Source: Infometrics

The results are as expected. The effect of population growth increases, while the effect of STRA listings declines markedly (beyond its rapid expansion phase). Compounding the $0.45 over the 68 months of the sample period produces a total effect at the end of the period of $31, or about 4.4% of the mean rent in September 2023.

Excluded from both models is the synthetic variable for the changes in interest deductibility, as it has no measurable effect on rents. It is possible, however, that the variable is too crude, as any effect will vary with when properties were purchased and how much debt landlords have on rental property. A study of rents based on unit records might reveal greater insights, but that is beyond the ambit of this research.

Multicollinearity and other issues

The results in Table 1 and Table 2 do not present any strong evidence of multicollinearity, nor of correlation between the error term and STRA listings. Yet it is good practice to be sure, therefore we adopted a two-stage approach. Firstly, regressing STRA supply against lagged supply, Otago tourist spending, Otago Gross Domestic Product (GDP), and a synthetic variable for the month of December when STRA listings tend to peak, which is the only statistically significant monthly effect. The Otago population proved to be insignificant, as its effect is likely captured by GDP.

STRA supply probably responds more to tourism market trends than to population pressure (and vice versa for rents), but tourism might also induce more migration into the Queenstown-Lakes District of people who support the tourism industries – restaurant and bar staff, hotel cleaners, drivers, and so on – all of whom need accommodation. Another explanatory factor that ideally would be included is hotel occupancy, but the relevant series from Stats NZ was discontinued in 2019. However, contacts in the industry note that substitutability between hotels and short-term residential stays is not particularly high. In any case, general pressure on guest accommodation would be picked up by aggregate tourist spending.

Queenstown-Lakes District final results

The residuals from the equation for STRA supply, stripped of the effect of the above factors that could possibly affect rents as well, are then used in a second regression for rents. The estimated model also incorporates lagged effects. Table 3 presents the results

for the 2018-2023 sample period. The effect of the filtered number of STRA listings (denoted as STRA* in Table 3) is again small, only $0.35 per week in an average month.

Table 3[6]

Summary of 2-stage rent model results

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.861	0.000	86% of previous period's value carries forward
1st Covid lockdown	-53.2	0.016	The lockdown reduced rents by $53/week
Population change	74.8	0.044	Mean effect on rents was $14.08
Mortgage cost change	2.95	0.047	Mean effect on rents was $2.80
STRA*	0.061	0.007	Mean effect on rents was $0.35
Constant	63.8	0.127	

R2=0.77, Errors: JB Normal statistic = 0.63

Source: Infometrics

The similarity of results in Table 2 and Table 3 confirms that multicollinearity is not severe. The two-stage approach suggests that about 22% of the total effect of STRA listings on rents (which is already small) is actually coming through the effect of variables such as Otago GDP and tourist spending.

Subdistricts within Queenstown-Lakes District

Data on STRA listings and (geometric) mean rents is available for a number of subdistricts within the Queenstown Lakes District. Table 4 shows the correlation of the number of listings and mean rent for each subdistrict with those variables for the whole Queenstown-Lakes District area, and the shares of each subdistrict's listings in the total.

Clearly Queenstown and Wanaka dominate the STRA supply, accounting for over 80% of the total. Most of the correlation coefficients are high, indicating little location-specific variability in STRA supply over time, except for Glenorchy. The latter has a very small number of listings and constitutes only 1% of the total. It might be considered a rather unique location.

Potential Queenstown area residents may well consider all the subdistricts as within commuting distance of one another, although Wanaka, Lake Hawea, and Albert Town are somewhat separated from the others. To the extent that the various locations are residential substitutes for each other, pressure from a growing population on rents in one location will spread to the others. That substitutability might also apply to demand for STRA accommodation.

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[6] The population and mortgage cost series are normalised differently for this model. That changes the coefficients in the equations, but not the effect sizes.

Table 4

Queenstown-Lakes District subdistrict correlation analysis

	Correlation with QLD listings	Mean number of listings	Share of QLD listings	Correlation with QLD rent
Queenstown-Lakes District	1	2822	100%	1
Albert Town	0.9	122	4.3%	0.73
Arrowtown	0.85	165	5.9%	0.6
Glenorchy	0.47	29	1.0%	N/A
Kawarau Falls	0.69	82	2.9%	0.6
Lake Hawea	0.87	65	2.3%	0.47
Lake Hayes	0.74	37	1.3%	0.63
Queenstown	0.93	1550	54.9%	0.67
Wanaka	0.92	773	27.4%	0.63

Source: AirDNA, MBIE & Infometrics

Similarly, for mortgage costs (which are based on national interest rates and Queenstown-Lakes District house values), the levels may vary across subdistricts, but the trends would likely be parallel. With regard to tourism spending in Otago, one would expect that to be dominated by spending in Queenstown-Lakes District, again with similar trends across the subdistricts.

Accordingly, we estimate a model for each subdistrict that has the same variables as the Queenstown-Lakes District model, but the number of available STRA listings for each subdistrict is used in place of the number of available Queenstown-Lakes District listings, and subdistrict rents replace Queenstown-Lakes District rents as the dependent variables. A time series for rents in Glenorchy was not available.

For all subdistricts the models collapsed, and the STRA variable had statistically insignificant effects, except for Lake Hawea, which had a negative coefficient on STRA listings. Therefore, it seems that even, or especially, at a fairly fine spatial level, an effect of STRA supply on rents cannot be seen in the data. That outcome also supports the theory that the wider Queenstown-Lakes District area should be seen as a single market as far as rents are concerned.

Looking again at Table 4, although mostly still quite high, the rent correlations are lower than the listings correlations, reflecting locational and property-specific differences such as the number of bedrooms, accessibility, and length of tenure.

The other inference from the results in Table 4 is that aggregate measures, notably Queenstown-Lakes District population, mortgage costs, and even COVID-19 restrictions, are too crude to capture the heterogeneity in rents that exists at the subdistrict level.

Caveats

Although it seems that over the last five years there has been a very small effect of STRA listings on long term rents in the Queenstown Lakes District (and perhaps none at all at finer spatial levels), it is possible that the model is not sensitive enough to pick up a consistent effect from STRA listings to rent. Notably:

1. There may be considerable heterogeneity across property owners, types of accommodation (such as rooms versus entire dwellings, with or without a

swimming pool) and locational attributes that are hidden by averages, even at the subdistrict level.

2. We have no explicit measure of unmet rental demand to assess how that is affected by STRA listings. We cannot use the number of active bonds as a measure, as all it tells us is where realised demand and supply intersect. Still, the modelling results confirm that regional population growth has a consistently strong effect on rents, which will also capture unmet rental demand if that leads to higher rents – as one would expect. Nevertheless, there could be some aggregation bias from the changing age (and locational) composition of the population.

3. The short time period, initial rapid growth in STRA, and interruptions from the effects of COVID-19 mitigation policies, make it difficult to firmly establish long-run relationships.

4. Extending the time series beyond the end of 2023 may enable a better understanding of how property owners trade off income from long-or short-term (STRA) rental against flexibility of the use of dwellings (own use versus use by others) and regulatory hassles and compliance (tax obligations, property rates differentials and so on), as depicted in Table 5.

Table 5

Property use trade offs

Options	Income	Flexibility	Tax & regulations	Admin/upkeep
Long-term rental	Good	Low	High, mostly central government	Medium
STRA	Good per night	Good	High, mostly local government	High
Own use	Zero or very low	Full option value	Relatively few	Low

The likely effect of aggregation bias in points 1 and 2 above is to attenuate the coefficients on mortgage costs and population, but how that might change the coefficient on STRA listings is unknown.

With regard to points 3 and 4, a longer time period may see some substitution between short-and long-term accommodation offerings in response to changes in taxes and regulations, but again the likely effect on the estimated relationships is not clear.

Queenstown-Lakes District house value model development

As discussed above there is a structural break in the STRA listings series at the end of 2017, so the house value model uses data from January 2018. Potential explanatory variables (in addition to STRA listings) include population, mortgage interest rates, and synthetic variables for COVID-19. Unfortunately, we do not have variables that directly capture constraints on housing supply such as local regulations and building material shortages, although we would not expect their absence to materially influence any measured effect of STRA listings on house values.

Chart 34 in *Appendix A: Selected Data Series* depicts the quarterly change in Queenstown-Lakes District house values. Stationarity considerations mean that house values, population and STRA listings are in percentage change form, and mortgage interest rates are differenced. The best model we could obtain is presented in Table 6.

Queenstown-Lakes District final results

As an explanation of house values, the model is not entirely satisfactory. One would have expected population to be a significant explanatory variable, but it failed to feature. The mortgage interest rate does appear, with the expected negative sign. An increase in the mortgage interest rate of one percentage point is associated with a decline in house values of almost 0.4%.

It is also clear that the effect of STRA listings on house values is statistically indistinguishable from zero (3.8E-06 means 0.00038%).

Table 6

Econometric analysis results, effect of STRA on Queenstown-Lakes District house values

	Coefficient	p-value	Interpretation
House values lagged	0.5234	0.000	52% of previous period's value carries forward
1st Covid lockdown	-0.0238	0.000	The lockdown reduced rents by $2.4% per month
Mortgage rate change	-0.0038	0.001	1 percentage point => -0.38% change
Change in available entire space STRA listings	3.80E-06	0.366	Not statistically significant
Constant	0.0221	0.000	

R2=0.69, Errors: JB Normal statistic = 0.74

Source: Infometrics

There is a degree of heteroskedasticity in the residuals (see Appendix A), which might be caused by monetary and fiscal policies during the latter stages of COVID-19. This finding could mean that the p-values in Table 6 are understated, although that would support the finding of no significant effect of STRA listings on house values.

Auckland residential rents model results

The model results estimating the effect of available STRA entire space listings on long-term residential rents in Auckland are summarised in Table 7. Key results are as follows.

- The STRA listings variable is statistically insignificant – it had no significant effect on rents.

- The lag of rents is the largest contributor to the model's explanatory power, so it is possible that potentially key variables are missing. On the other hand, the lagged term might be capturing the dynamics of partial adjustment or adaptive expectations (as discussed in *Appendix D: Lagged Effects* – p49) in connection with population and house values.

- The synthetic variable for the first Covid lockdown is excluded as it was not statistically significant.

- The mortgage cost variable, which is a combination of house prices and the two-year mortgage interest rate, has been split into its two components, but

only the former is statistically significant. Note, however that is in level form,[7] so the effect is presented as an elasticity. In this case, a 10% change in house values is associated with a 0.7% change in rent.

Table 7

Econometric analysis results, effect of STRA on Auckland long-term rents

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.866	0.000	87% of previous period's value carries forward
Population change	1.43	0.058	Mean effect on rents was $2.36
House values	0.033	0.001	Elasticity at the mean is 0.07
STRA	0.003	0.192	Zero, because not statistically significant
Constant	34.2	0.189	

R2=0.92, Errors: JB Normal statistic = 0.81

Source: Infometrics

The heterogeneity of the Auckland area is undoubtedly contributing to smaller coefficients than those for Wellington and Christchurch (see below), most notably on that for the (filtered) number of STRA listings.

Wellington City residential rents model results

The Wellington City STRA listings profile is like that of Auckland and Christchurch. The long-term residential rent profile is like that of Christchurch but different to Auckland. Both Wellington and Christchurch Cities have January-February spikes in long-term rents (perhaps corresponding to the start of the academic year), whereas Auckland doesn't. This spike in rents has been included in the Wellington City model. The results for Wellington are presented in Table 8. Key results are as follows.

- As for Auckland, the STRA listings variable is statistically insignificant – it had no significant effect on rents. In the single equation version of the model (and over the full sample period), STRA listings and the change in population cannot be simultaneously included. Therefore, any effect of STRA on rents seems to be entirely explained by changes in population.

- A new synthetic variable corresponding to January and February is included to pick up the spikes in rents at this time of year.

- The elasticity with respect to house values is 0.23.

The lack of normality in the residuals is not serious. It is caused by the model underestimating rents in November 2019, 2021, and 2023. The reason for this underestimation is not immediately apparent.

---

[7] The drop in house prices in 2021 makes the series I(0).

Table 8

Econometric analysis results, effect of STRA on Wellington City long-term rents

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.56	0.000	56% of previous period's value carries forward
January to February months	34.1	0.000	In Jan-Feb rents are higher by $34 per week
Population change	48	0.038	Mean effect on rents was $4.97
House values	0.123	0.001	Elasticity at the mean is 0.226
STRA	0.034	0.517	Zero, because not statistically significant
Constant	106.5	0.002	

R2=0.80, Errors: JB Normal statistic indicates long right tail

Source: Infometrics

Christchurch City residential rents model results

The Christchurch City STRA listings profile is similar to that of Auckland and Wellington. The long-term residential rent profile is similar to that of Wellington City but different to Auckland. Both Wellington and Christchurch Cities have January-February spikes in long-term rents (perhaps corresponding to the start of the academic year), whereas Auckland doesn't. This spike in rents has been included in the Christchurch City model. The results for Christchurch are presented in Table 8. Key results are as follows.

- The effect of the filtered number of STRA listings is very small, at only $0.09 per week in an average month. The cumulative effect is $1, which is 0.2% of the mean rent at the end of the sample period (here extended to November 2023). This figure compares with the cumulative effect of population growth of $64.

- The elasticity with respect to house values is 0.23, the same as for Wellington.

- In the single equation model that includes the raw number of STRA listings, the effect on weekly rents is higher at $0.36/month, while the effect of population change is 27% lower than in Table 9. Hence population growth had a direct effect on rents, but also an indirect effect via STRA listings.

- Running the single stage model for the entire period (from January 2016 for Christchurch) produces very similar results, with the effect of STRA listings on weekly rents being lower at $0.25/month.

Table 9

Econometric analysis results, effect of STRA on Christchurch City long-term rents

	Coefficient	p-value	Interpretation
Long-term rent lagged	0.598	0.000	60% of previous period's value carries forward
January to February months	14.1	0.004	In Jan-Feb rents are higher by $14 per week
Population change	25.8	0.009	Mean effect on rents was $5.90
House values	0.152	0.000	Elasticity at the mean is 0.227
STRA	0.08	0.002	Mean effect on rents was $0.09
Constant	64.7	0.001	

R2=0.92, Errors: JB Normal statistic = 0.15

Source: Infometrics

Appendix D: Lagged Effects

To circumvent the problem of multicollinearity and preserve degrees of freedom when the right-hand side of an equation needs to incorporate lagged effects, the lag structure is frequently approximated by some polynomial function. The Almon distributed lag structure is given by:

$$Y_t = \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \dots + \mu_t \qquad (1)$$

- where the β may be linked via a polynomial function.

In particular, Koyck extended the idea of linking the β by postulating a geometrically declining lag function, giving rise to an equation of the form:

$$Y_t = \beta(w_0 + w_1 L + w_2 L^2 + \dots)X_t + \mu_t$$

- where L is the lag operator such that $L^i X_t$ denotes X_{t-i} and where $w_i = (1-\lambda)\lambda^i$.

The equation then condenses to:

$$Y_t = \beta(1-\lambda)X_t + \lambda Y_{t-1} + \mu_t - \lambda\mu_{t-1} \qquad (2)$$

However, a lagged dependent variable in an equation similar to (2) would also arise in a situation of *partial adjustment* or *adaptive expectations*. Under the former for example, rents may take some time to adjust to changes in population, which fits well with the generally slow pace of population change.

$$Y_t^* = \alpha + \beta X_t$$

- where Y* represents the optimal value of Y in response to given X. Y* cannot be observed, but a relationship between it and the observed Y might be given by:

$$Y_t - Y_{t-1} = \gamma(Y_t^* - Y_{t-1}) + \mu_t \qquad 0 < \gamma <= 1$$

Amalgamating these equations yields:

$$Y_t = \alpha\gamma + \beta\gamma X_t + (1-\gamma)Y_{t-1} + \mu_t \qquad (3)$$

Under the *adaptive expectations* model property owners adjust rents according to their expectations about factors such as population growth. Expectations X* of the exogenous variable X are based on past observations. Thus:

$$X_t^* - X_{t-1}^* = \delta(X_t - X_{t-1}^*) \qquad 0 < \delta <= 1$$

Given also $Y_t = \alpha + \beta X_t^* + \mu_t$

- with some algebraic manipulation these can be amalgamated to yield:

$$Y_t = \alpha\delta + \beta\delta X_t + (1-\delta)Y_{t-1} + \mu_t - (1-\delta)\mu_{t-1} \qquad (4)$$

Equations (2) to (4) all have the same form, differing only in their error structure, although for estimation purposes this difference is not trivial.

The three situations given by equations are not mutually exclusive. Indeed, they are not even exhaustive of the possibilities. Property owners' behaviour may be based on expectations about population or other factors such as mortgage costs (not just on what is actually observed), their behaviour may be slow to respond to changes in these variables, or the changes may have a memory effect – they need to be seen as more than transitory before they induce a behavioural response.

Regarding equation (3) for example, the effect of X on Y can be determined by estimating σ and θ in the equation below and calculating the desired β from equation (3).

$$Y_t = \omega + \sigma Y_{t-1} + \theta X_t + \mu_t$$

For this equation, OLS yields consistent and efficient estimates for uncorrelated errors. However, the estimates will be biased, although correcting for bias often leads to worse estimates overall (such as in terms of mean squared error) due to an accompanying increase in variance.[8]

Thus, this equation, or with the addition of serially correlated errors, is our preferred specification for a long-term model of rents. We also adjust for possible bias caused by endogeneity.

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[8] Ignoring orders of magnitude smaller than n^{-2}, the bias is approximately equal to $-2/n$.

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Appendix E: Miscellaneous Tests

Unit root tests for stationarity reveal the following.

- The STRA listings series is I(0).

- The Queenstown-Lakes District rent series is I(1).

- STRA listings and Queenstown-Lakes District rents are not cointegrated.

- Population, GDP, and the proxy for mortgage costs are I(1). Therefore, these series are differenced before entering any regression equation.

- Tourist spending (measured from 2018) is I(0), although it would probably be I(1) over a longer period.

Correlation between STRA listings and the error term in an equation for rents (such as caused by STRA listings and rents affecting each other simultaneously) could lead to biased parameter estimates. However, testing revealed no such correlation. We also investigated Granger causality from STRA supply to rents and from rents to STRA supply. In each case, the models incorporate lags 1-3 and 12. On the basis of F-tests, there is no improvement in the rent model by adding lagged STRA supply, nor in the STRA model by adding lagged rents, which reinforces the above finding of little direct influence in either direction.[9]

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[9] The Granger causality test is an important econometric tool used to assess the predictive relationship between two variables. When the test fails to reject the null hypothesis, it indicates that one variable is not useful for forecasting the other. In the context of studying the relationship between rent and Airbnb supply, if the Granger causality (and reverse causality) tests yield results of failing to reject the null, it means that Airbnb supply does not provide useful information for predicting rent, and vice versa. Hence, when conducting Granger causality tests, it is specifically referred to as testing whether Airbnb supply Granger-causes rent, which differs from examining whether Airbnb supply directly causes an impact on rent.

Infometrics

The effects of STRA on local housing markets:

M.E Review of Infometrics report

9 December 2024

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consulting

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Contents

Tables and Figures

1　Introduction

In July 2024, Infometrics prepared a report for Airbnb on the factors affecting property rents and house prices across New Zealand. The Report, titled *'The effects of Short-term Rental Accommodation (STRA) on local housing markets'* ('The Report')*,* covers four regions around New Zealand, including Queenstown Lakes District (QLD). The Queenstown Lakes District Council (QLDC) commissioned Market Economics Ltd (M.E) to review Infometrics' Report.

Subjecting the method and conclusions to peer review strengthens the confidence in the findings. While we are unable to access the underlying data or analysis itself, we can extract and scrutinise parts of the analysis from the reported data. This enables a comparison of The Report with existing academic literature and an assessment of the method's validity. While we are unable to replicate the analysis (due to data limitations), we comment on the assumptions, approach and findings.

STRA has relevance for QLD given the prevalence of second homes, the importance of local visitor economy and the well established accommodation/housing challenges. The ways in which STRA influences the district has economic and socio-economic implications. Accordingly, this review attempts to elaborate on the findings that may have application to policy makers in QLD.

We focus on the data presented in the QLD section of The Report, but also include some discussion of the national data where relevant.

1.1　Limitations and caveats

There are many features of The Report's analysis and method which are not explicitly defined or explained. These include the definition of regression variables, the analytical specification, and the composition of the underlying data sample. There is a short list of Caveats in Appendix C of The Report, which relate to the QLD results. On the whole, however, The Report does not include a discussion of the numerous limitations considered when selecting the approach and methodology. We discuss limitations we have identified in the sections below.

On 23/10/2024 Market Economics met with Rob Heyes and Adolf Stroombergen of Infometrics to discuss the work and to clarify various queries. The limitations and background work underpinning the work that are not articulated in the report were also discussed. The key takeaways of the meeting are integrated into this review and our conclusions. Overall, the discussion helped build confidence that our interpretation of The Report and supporting process is appropriate and correct.

2 Technical review

This section provides an overview of the data sources, model specifications and key points of the Report. The section concludes with a discussion of the findings.

2.1 Data sources

The data sources include listings and other data used for descriptive statistics and inclusion in regression equations. Each element is dealt with under a separate heading.

2.1.1 Listings

As part of this review, we considered international literature regarding Airbnb/STRA/other short-term rental platforms, and their effect on rents or housing markets. Consideration was also given to literature in adjacent areas, such as market studies of STRA in holiday destinations. For The Report, Infometrics defines STRA as listings as drawn from AirDNA data.

There are three main sources of accommodation listings across the literature:

- **AirDNA** – Infometrics (2024), Fyfe et al. (2023), Buzzachi (2019).
- **Inside Airbnb** – Van Haaren (2021), Garcia-Lopez et al. (2019), Sheppard & Udell (2016).
- **Bespoke scripts to scrape Airbnb / STRA sites through their APIs[1]** – Domenech et al. (2019), Barron et al. (2018).

Inside Airbnb and bespoke scraping scripts are doing similar things, just selecting their own set of variables to record. AirDNA, however, includes additional data that is provided by subscribers who connect their properties to the platform's database for market insights.[2] It is also a well-established platform which uses additional technical processes to improve its data, such as identifying booked days vs days that are blocked by the host. All three sources obtain most of their records by web scraping Airbnb and other similar sites at regular intervals, structuring and formatting the data before undertaking quality assurance. AirDNA and Inside Airbnb are third parties who enable access to this data.[3]

An alternative source that The Report might have utilised is data held internally by Airbnb. Given the research was commissioned by Airbnb, we might expect them to have capacity to share internal data. However, the use of AirDNA data instead suggests that the veracity of this dataset was sufficient for Airbnb to approve its use. The Report states that the data quality is sufficient as a proxy, and this is echoed throughout the literature. Moreover, unless using internal data, the other options generally present the same flaws, without the benefits of the subscribers' uploads and level of quality scrutiny. Through our conversation with Infometrics, it was understood that complications with Airbnb sharing internal data made its use unviable.

AirDNA only collects data on two platforms: Airbnb (2014 onwards) and Vrbo (2018 onwards)[4], both of which are included in The Report's sample. Airbnb is the dominant platform, both in NZ and internationally. This

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[1] API = Application Programming Interface. This is effectively a window into the mechanics or underlying data of websites or software.
[2] AirDNA – How it works
[3] Unfortunately, accessing Inside Airbnb's data for New Zealand – and for the entire time series – requires a bespoke data request, so we have not reviewed its substitutability for AirDNA.
[4] Vrbo was previously HomeAway.

means that if an accommodation option is listed on alternative sites and not on Airbnb or Vrbo, then it is not included in the analysis. Alternative platforms include:

- Holiday houses (part of TradeMe),
- Lodgify,
- Bachcare, and
- Relaxaway.

Other studies note that many listings appear on multiple platforms, so, to avoid double counting, they only scrape Airbnb. This suggests that they cannot, or practicalities limit the ability to, identify duplicates. Because the analysed variable is the total number of listings (in the AirDNA data), provided this number is highly correlated with the number of available space listings excluded from the AirDNA data, the findings will be no different. If there were inherent differences in the characteristics of the listings on the various platforms, or the correlation wasn't consistent through time, you could get some slightly different effects. We have not tested this – and nor have the authors due to lack of data. Regardless, we would not expect there to be major differences between the AirDNA data and a series with complete coverage of all platforms.

The Report only includes "available entire space listings", which ignores private rooms or shared spaces. This approach removes a portion of accommodation that is associated with situations where dwellings are shared across multiple renters e.g., young, independent travellers that work in Queenstown for a short term. The effects of excluding this segment from the overall analysis is not assessed (though the limitation is noted in The Report). The authors also note that this definition will include spaces which might not be suitable for long-term rent (rentable), but that this is very hard to disaggregate.

Many transmission mechanisms between STRA and rents are plausible. How a property is used is at the discretion of its owner.[5] For example, in the absence of Airbnb, a granny flat attached to a property might be used as a long-term rental. Alternatively, in the absence of Airbnb, that entire property might cease to be viable as a second home or primary dwelling, causing it to be sold and/or converted into a rental property. No analysis is presented in The Report on different definitions of Airbnb space to understand these relationships, however.

In terms of the definition used[6], an analysis could be performed with different definitions of Airbnb space variables, such as all available listings, to understand whether the findings are consistent and whether there is some interplay between the markets and other listing types.

Overall, AirDNA data appears to be the best available source to enable analysis. While there are limitations to the data, other sources do not overcome these, and suffer from additional other flaws. We note that, The Report does not show or describe the sample, or the associated limitations.

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[5] The discussion of key points from the report (section 2.4) includes a recommendation to survey property owners' intentions, and try to understand the uses of properties prior to Airbnb.
[6] See footnote 15.

2.1.2 Other data

In addition to the AirDNA data, The Report draws from a variety of other sources as outlined in Table A. These sources are combined with the AirDNA data to create panel data for regression analysis. The table includes commentary about the sources.

Table A: Data in Regressions

Variable	Source	M.E Comments
Long-term rent	MBIE	Geometric mean for area, e.g., QLD. This data is recorded when new rental bonds are lodged each month, rather than being an average of all properties being rented.[7] Therefore, the sample of existing rental properties included will change each month, in addition to the new ones that are added. There will be a bias towards properties where new bonds are lodged frequently, rather than longer term rentals. This could affect the representativeness of the rent data if, for example, rent increases for long-standing tenants are lower because landlords wish to keep them in place. There are also minor implications for the relationship between, and interpretation of, rent and lagged rent, because changes will be will not capture a similar sample.
House value	Corelogic	Geometric mean for area
Long-term rent lagged	MBIE	Lagged over 1 month
House values lagged	Corelogic	Lagged over 1 month
Mortgage cost change	RBNZ and Infometrics	Mean property value multiplied by two-year mortgage interest rate
Population	Stats NZ	The population set that is used is not stated.
Inflation- CPI	Stats NZ	This is a general measure of inflation. There are several indices[8] and applying these to rents or house prices would effectively explain away large parts of the variation through time. By adjusting for CPI, the Report shows changes over and above general inflation, which is at the core of this research question.

The selection of AirDNA data to conduct this analysis is valid and appropriate. However, we note some limitations associated with the definition to include only entire homes and to exclude properties with only a partial inclusion (i.e., only a room or a portion of the dwelling is included in the listing), which are not discussed in The Report, nor is analysis conducted on its validity. Additionally, the rental data is only a sample of the market and is biased towards properties which experience more churn of renters, which could be more notable given the extent of transience and seasonality in QLD, linked to its visitor economies.

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[7] Tenancy Services – About the rental bond data
[8] Prices (M1) - Reserve Bank of New Zealand - Te Pūtea Matua

2.2   Model specifications

As noted above, the exact technical specification is not reported. Such a specification would include regression equations and definitions for individual variables. We report the basic approach based on our interpretation of the Report. The analysis begins with a series of linear regressions, first on average rents in QLD in each month from 2016 – 2023, and then on average property prices over the period. Each model in this set would therefore have n = 95 observations[9], where each observation (row) consists of the average weekly rent in a month, and the corresponding values of the other variables in the same month.

Next, the analysis restricts the sample to 2018 – 2023 because of what the authors describe as a "structural break" in the data[10]. Therefore, the analysis excludes the first two years. The model is seeking to understand the impact of Airbnb as an established entity, which might be different from what occurred pre-2018. This yields 67 months of data: January 2018 – August 2023[11].

Because 2018 – 2023 straddles the period of the Covid-19 pandemic, the authors attempt to account for this fundamental change, but ideally you would want to conduct another round of analysis with enough data in the aftermath of Covid-19 and compare the outputs. Where final results are referenced in The Report, such as in the executive summary and main body, these correspond to the restricted panels from 2018 – 2023. This means that the total analysis period is relatively short.

Appendix C of The Report explains that the model seeks to isolate the effect of STRA supply on residential rents. We exclude the house price regressions for simplicity. The Report (Table 2) contains a summary of an initial regression and outlines the variables and parameters. Our understanding of these variables is summarised in Table B.

Table B: Variables in Initial Stage Regressions

Variable	Description
Dependent variables	
Long-term rent	QLD geometric mean weekly rent from new rental bonds lodged in month t, adjusted for CPI.
Independent variables	
Long-term rent lagged	QLD geometric mean weekly rent from new rental bonds lodged in month t-1, adjusted for CPI.
1st Covid lockdown	A dummy variable for months in the lockdown period
Population change	Population in month t minus population in month t - 1
Mortgage cost change	Average property value multiplied by two-year mortgage interest rate in time t, minus the equivalent value for period t- 1, both adjusted for CPI
Available entire space STRA listings	Count of the available entire space STRA listings in QLD in month t

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[9] The first observation must be dropped to enable the recording of a lag term against all observations.
[10] The end of rapid initial growth, described in The Report as an establishment phase.
[11] An observation must be dropped, as above.

The dependent variable is average rents (and average house prices). Alternate variables which seek to capture rental availability or a measure of market capacity are likely to lead to measurement error, so using rents is preferred. Analysis could attempt to quantify the number of listings or duration of listings, but due to the fragmented nature of the supply market which now spans multiple platforms and can also be informal, these measures do not tend to be robust. Moreover, rents and house prices are a function of complex interactions and factors - property sellers and landlords tend to charge the maximum amount possible given the market.

The analysis adopts a two-stage approach to test whether variations in STRA supply, which cannot be explained by associated variables, affect rents.[12] The following variables are used in the residual equation:

- lagged STRA supply,
- Otago tourist spending,
- Otago GDP, and
- a synthetic variable for December.

The key challenge in terms of including Airbnb listings in a regression equation is that there could be other factors correlated with Airbnb listings that are affecting rent. There could also be reverse causality between rents and Airbnb listings. The Infometrics approach attempts to alleviate some of these issues by accounting for factors correlated with Airbnb, but this doesn't enable causal inference alone. Causality tests also show that there isn't strong correlation or causation either from STRA supply to Airbnb or vice versa. The tests that the authors use, a Granger causality test, would assess whether knowing past values of STRA supply can help forecast future values of rent, rather than there being a direct cause-and-effect relationship. For such results, different empirical specifications are required.

We interpret the coefficient on STRA* in The Report's final table to represent *the impact of the quantity of STRA in the current period which cannot be accounted for by the quantity of STRA in the previous period, tourism spending, Otago GDP or the month of December.* This method is creative and should strengthen the intuition of the STRA* variable – it also justifies beginning the series in January 2018 after which the STRA quantity in the previous period is more stable.

We cannot make conclusions about what rental prices would be if STRA was eliminated or if some other policy was imposed. Airbnb's proliferation before 2018 could have steadily increased rents, an effect which the regressions in their current form would leave unmeasured (in the error term) or contained in the lagged rent covariate.

Table 3 in The Report shows the final results for QLD. Comparing these results with Table 2 shows the impact of using the two-stage approach. The increased coefficient on STRA supply, and changes in other coefficients, suggest that the residual equation has stripped out some of the effects of regressors – those which were correlated with inclusions in the residual equation.

Small P-values do show that the effects of the included variables are statistically significant. However, the model specification precludes controlling for many other factors affecting rent such as size of property, condition, amenities, location and neighbourhood characteristics. Some of the variation between months could be simply due to the nature of properties comprising the sample. As noted above, this could change significantly each month because it is taken from the properties where bonds were lodged.

---

[12] Essentially, the residuals from a regression on STRA supply become new independent variables in the final regression, capturing unexplained variation in STRA supply which correlate with rent variations.

Overall, the modelling concludes that population change is associated with $101 of the increase in average rents over the 67 months, whereas STRA supply is associated with just $11. Proportionally, these represent approximately 63% and 7% of the total increase over the period.[13]

2.3   Key points of The Report

The Report sets out the factors judged to influence housing markets in key regions of NZ and nationally. It covers Queenstown-Lakes District (QLD) as well as other key markets around New Zealand, including Auckland, Wellington City and Christchurch City, each of which exhibits unique rental and owner-occupied property markets.[14]

The Report begins by presenting several data series relating to STRA and the New Zealand housing market. The key messages relating to these aspects outlined in the report are:

- Available entire space[15] listings grew from 0 to c37,000 between 2015 and 2020, before dipping during the pandemic and recovering to pre-pandemic levels in 2023.
- NZ population growth has exceeded dwelling growth since 2010.
- Housing affordability has worsened since 2010 from 5x household incomes to a peak of 9x household incomes in 2022.
- Spending on housing rent, as a share of household income, increased from 20% to 22% between 2013 and 2020. It has plateaued since then.
- The number of available entire space listings doesn't appear highly correlated with average rent or average house prices.

At a regional level for QLD:

- There are fewer available entire space listings than in Auckland, but this gap narrowed during the pandemic.
- On a per capita basis, there are many more listings in QLD than Auckland, and the growth in QLD has been faster. In 2017 there were 0.046 listings per person in QLD vs 0.002 in Auckland; in 2023 it was 0.076 vs 0.003 for QLD and Auckland, respectively.
- Population growth has exceeded dwelling growth to a greater degree than nationally, and
- Rents have grown from $450 per week in 2016 to $700 per week in 2023, recovering from a downward step change in 2020.

The Report concludes that STRA has had a minimal effect on average rents in QLD between 2018 and 2023 ($11), far smaller than the impact of population growth ($101). Infometrics asserts the most important factor in explaining average rents is a variable capturing average rents in a previous period. That is, there is a high degree of carry forward from rents in a period t-1 to a period t. Possible explanation for the low impact of

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[13] Data extracted from Tenancy Services for February 2018 – August 2023 geometric mean rent in QLD
[14] Tauranga might have been included as another major city, also one where STRA is likely to be notable. However, we recognise the resource limitations of this project and the inability to analyse every location within New Zealand.
[15] Entire space listings refer to self-contained properties rather than private or shared rooms within a broader dwelling, as per the definition on page 7 of The Report.

STRA include the prevalence of second homes in QLD – 28% of homes were unoccupied on census night in 2018. Because this trend was evident before Airbnb, too, with 30% unoccupied in 2006, The Report suggests that there is low substitutability of dwellings between rental, owner occupier and STRA. In order to understand substitutability, one would need to survey property owners about their property's use prior to Airbnb, or their intentions for its use either in Airbnb's absence or with more stringent restrictions. It would be difficult to elicit this measure through a statistical analysis of the housing stock without some qualitative research, even if you had data on the location, amenities and characteristics of all properties.

The Report also finds no significant effect of STRA on house prices. Interestingly, when the analysis looked more granularly at subdistricts within QLD, no effect of STRA on rents or house values was evident.

2.4   Discussion

The Report's analysis is novel and creative in the ways it seeks to overcome data limitations. This method's absence from the literature is not a reason to dismiss it. Instead, it points to a slightly different research question and the data realities (limited availability) for this project. Overall, while the findings have limitations that dilute some of the usefulness, they are a good starting point for discussion.

The Report focusses on rental prices aggregated at the QLD level, whereas the other approaches across the literature use more granular aggregations, including at an individual property level. When restricted to a subdistrict level, no effects of Airbnb were found. It would have been interesting to run regressions on the full panel with subdistrict fixed effects, which is an approach adopted throughout the literature. However, we understand that data limitations voided this approach. An explanation for splitting the sample to only include 2018 onwards could also be included. Analysing the whole sample with time fixed effects for the pre-2018 period could show this. It is our understanding that lots of empirical approaches were tested and dismissed for lack of informative results, but not having these in the report – or access to the data ourselves – limits our ability to comment on the approach's completeness.

How to interpret the meaning of the STRA* variable in The Report is not entirely clear. The reviewed literature provides effect sizes relating to unit or proportional increases in Airbnb density, e.g., a doubling of Airbnbs within a given radius is associated with x% higher rents. The effect sizes in these studies tend to be larger than those in The Report, with most finding that Airbnb puts upward pressure on rents and house prices, once controlling for other factors. The same is true of population. These other studies also tend to establish causal inference between STRA and rents/housing markets, which The Report does not achieve with the selected method, though we acknowledge the large increase in resource required to undertake such a study.

The Report uses available entire space listings in QLD as its measure of STRA. Other studies vary in their approach to measurement, but mostly aim to capture all active listings.[16] The Report selects entire space listings because this is available at monthly intervals in the AirDNA data, which is a necessary level of granularity given the sample structure and method (whereby the two-stage regression relies on lagged listings data from the previous period). An analysis of the different possible variables to capture STRA would have been interesting to understand whether this is the best definition to use.

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[16] Some sub-optimal techniques include all listings that have ever been an Airbnb, rather than active ones in the month.

Market Economics liaised with Infometrics regarding these points. The reasons for omission from The Report include lack of data, resourcing, and project scope. In many areas, this discussion validated our interpretation of the work as well as understanding of the approach as well as points not mentioned in the final report.

Some potential gaps or shortcomings that the report could have addressed are:

- **More clarity around the data sample and underlying definitions:**
  - Which platforms are included and what share of properties are omitted as a result?
  - Why is the data sample restricted to 2018 onwards?
  - What is the effect of running regressions on the whole sample with time fixed effects for the high-growth period?
  - How many observations does each model have?
- **Explaining the variables included in regressions:**
  - How are they constructed and what is the resulting interpretation, particularly of the STRA* variable?
  - What are the regression specifications?
  - Make the lack of causal inference clearer.
- **Be clearer about shortcomings and limitations:**
  - There is limited discussion of the limitations of the method or approach, despite all methods having some issues. Understanding these is necessary to assign a level of confidence to the outputs. The reflections should include the lack of controls for geographic area fixed effects or the features of individual properties. There should be an analysis using different definitions of STRA. A discussion of the rental sample is also important.

The Report has several key policy implications. It suggests that:

- Policies which constrain or limit the use of properties for STRA are unlikely to have major impacts on average rents. Ensuring that residential construction keeps pace with population growth will have a greater bearing on rents and house prices.
- Despite not being found to cause rent increases, STRA is a major and growing part of economies throughout New Zealand. Its proliferation in areas such as QLD mean that understanding its economic and social impacts are essential for policy decisions.
- Data-driven policy- and evidence-based decisions making is constrained by the data limitations and the resources required to undertake comprehensive analyses of this topic. Qualitative research understanding the intentions of property owners in the absence of Airbnb could be informative to supplement this work and establish the extent of substitutability between STRA and rental properties.
- The growth of Airbnb stabilised after 2018 but this series and housing market trends were severely disrupted by Covid-19. There has only been a short horizon of data to assess this policy question since. Revisiting it to understand the post-pandemic trends and comparing these with historic results should yield interesting and informative findings.

The role of Airbnb in supporting the QLD economy, specifically the visitor economy, is acknowledged. The Report focuses on the entire dwelling, but this excludes an important segment of potential demand (i.e., dwellings where a room/portion is made available for short stayers). Understanding the relative share of this segment in the context of the overall dwelling market is important. Other policy implications associated with

the housing market (not necessarily Airbnb) relates to the large share of dwellings that are not usually occupied. QLD has seen significant growth and is one of New Zealand's fastest growing areas. Providing for growth must account for this share but it adds uncertainty around infrastructure capacity, and changes the loads placed on infrastructure and amenities (e.g., making demand peaky around holiday periods). Accurately reflecting such dynamics and considerations during the planning phases is crucial. In addition, the ongoing load that short-term visitors place on local amenities must be considered in a way that ensures equitable and fair distribution of costs and cost recovery.

3 Conclusion

This peer review of '*The effects of Short-term Rental Accommodation (STRA) on local housing markets' (The Report)*, was commissioned to provide an independent assessment of the findings, including an assessment of the technical process, appropriateness of the data, interpretation of the results, and the limitations of the work.

Given the data and resource limitations, the method is robust. To obtain potentially better results would require access to individual listings and their characteristics, and a far more intensive analytical process such as those discussed in the literature review. We can conclude that the presence of STRA, at the observed level, in QLD is associated with $0.35 higher average rents each month. This translates into $11 (7%) of the increase in rents between 2018 and 2023.

Data availability and looking at monthly data on average rents and house prices for the whole of QLD means that property- or neighbourhood-specific factors affecting these markets are not captured. While the report's focus on average effects is useful, there is no discussion of impacts at the margin or for different housing types. The average measure (of rents as used) captures the rent of properties (houses) that began to be rented in that month i.e., it does not cover all rental properties, irrespective of when the bond was lodged.

We cannot claim that Airbnb has caused the increase in rents, however. Meanwhile, population increases are shown to be much more strongly correlated with the average rent rises than STVA. With population growing faster than the housing stock, the result is always likely to be upward pressure on prices. Another interesting finding is the lack of effect found when looking at the subdistricts of QLD individually, though seeing the results of an analysis across the full panel with subdistrict fixed effects might have yielded additional insights.

Appendix

Comparison with the literature

There are two broad methodological approaches to answering questions about Airbnb on rental levels in the literature:

- Instrumental variable approach.
- Buffer zone approach.

Both use data on individual sales or rents within broader locations (zip codes/neighbourhoods). We understand that these approaches are more labour intensive and require access to more granular data than was feasible for The Report. Both approaches stress the need to be careful about causality. In linear regressions without instrumental variables or a treatment group[17], the analyst must be mindful to explain that the explanatory variables are associated with changes in rents or house prices, rather than causing them.[18] Some additional tests can be performed to understand the nature of relationships, such as the Granger-causality tests applied in The Report.

The highlights of each approach are presented below.

a) Instrumental variable approaches

This method was introduced by Barron et al. (2018) in an analysis of Airbnb throughout the USA. It was re-applied by Garcia-Lopez et al. (2019) in Barcelona, and Buzzachi (2019) in Florence.

When applying this approach, the authors begin with basic linear regressions on rental rates and house prices, including zipcode fixed effects (capturing inherent differences in neighbourhoods) and other controls. Next, they construct an instrumental variable to overcome the endogeneity problem (i.e., listings differ and are not the same) with Airbnb listings. Their instrument is Google search trends for an area interacted with a measure of how "touristy" a zipcode is in 2010, which is uncorrelated with the time-varying housing markets shocks in each zipcode. The exercises undertaken to select and validate the instrument enable a causal inference between Airbnb and both rents and house prices. In essence, this is because the only way in which the instrument affects rents and house prices is through the variable of interest, Airbnb's growth. There is no influence of hidden biases.

At the median owner-occupancy rate (72%) per zipcode, a 1% increase in Airbnb listings leads to a 0.018% increase in rents and 0.026% increase in house prices. This shows that:

- At the 25th percentile owner-occupancy rate (56%) it leads to a 0.024% increase in rents and 0.037% increase in house prices.
- At the 75th percentile owner-occupancy rate (82%) the effect falls to 0.014% and 0.019% increases for rents and house prices respectively.

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[17] Including randomised control trials.
[18] For example, Barron et al. (2018). Section 6.1, p.25 – 26 and Sheppard & Udell (2016) section 5 and section 6, p28 - 39

Garcia-Lopez et al. obtains similar results for Barcelona, despite nearly all Airbnbs there being secondary residences, a characteristic that the authors identify as unique. They also stratify their results showing that for areas with the highest number of Airbnbs, the increases in rents and house prices were around 3.5x higher.[19]

b) Buffer zone approaches

This method requires the addresses – or equivalent geographic information – of individual sales (or rental prices) to create the buffer zones around each property. Two papers were identified with this approach, Sheppard (2018) in New York city and Van Haaren (2021) in Amsterdam, both of which assess the impact on house prices. We focus on the work by Sheppard as it is more complete. The approach uses hedonic modelling and 'difference in difference' techniques to estimate the effects.

Hedonic method (essentially just linear regression)
The analysis runs linear regressions on sale prices controlling for:

- area (square footage),
- building characteristics,
- demographics (crimes),
- proximity to transport, and
- borough fixed effects.

The Airbnb variable is the count of listings within a locality radius of the sold property (150m, 300m etc.). Airbnb's effect is found to be consistently positive and statistically significant, with a doubling of Airbnbs in the locality associated with a 6.5% increase in property values.[20]

Difference in differences
This involves establishing a synthetic *treatment* group and comparing it to an *untreated* group. The authors do this by identifying properties without Airbnbs within 300m from 2009, classifying these as outside the impact of Airbnb, whereas sales with some Airbnbs within a 300m buffer are considered impacted. The panel is split between those treated before 2009 and after 2009, when Airbnb proliferated in the USA. In the model with full controls, having Airbnbs within the buffer zone caused a 32% increase in value. This approach therefore considers the density and coverage of Airbnb listings, not their existence.

Observations

In the instrumental variable approach from the literature, geographical units are aggregated to zipcodes, which have an average of c8,000 people in them. The other studies use Barcelona's basic statistical areas (7,000 inhabitants each), and "homogenous zones" in Florence (c10,000 inhabitants each). There are, of course, nuances in the level of homogeneity within these areas, such as city zip codes vs rural ones, and neighbourhoods within cities. These studies also use the median rent price, which is less likely to be skewed by extremes and more representative of prevailing rents. These studies are able to include geographic area fixed effects to account for unobserved differences between each area such as crime rates, demography etc. In the buffer zones approaches, the observations relate to individual house sale listings, which requires address

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[19] From 2012 – 2016 rents rose on average 1.9% and house prices rose on average 5.3%
[20] This is in the baseline buffer zone, which is not explicitly defined but is somewhere between 1000m and 1400m

data. They also control for unique features of each area and the properties themselves. We did not find application of this approach to rental markets, however.

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