Te Tūāpapa Kura Kāinga
Ministry of Housing and Urban Development

Change in housing affordability indicators

Concepts, sources, and methods

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Te Kāwanatanga o Aotearoa
New Zealand Government

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Ministry of Housing and Urban Development

Change in Housing Affordability Indicators: Concepts, sources, and methods

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About the indicators

The Change in Housing Affordability Indicators (CHAI) show how affordability of renting a home, saving for a deposit, and servicing a mortgage for people entering the market has changed over time.

Each indicator compares price change with growth in median household income. They provide insight into affordability nationally, regionally, and by Territorial Authority.

Renting a home

The change in rental affordability indicator (Rental Affordability Index) compares changes in new tenancy rental prices with the growth in median household disposable (after tax) income.

Factors that can affect rental affordability are:

- Rental prices
- Household disposable income

Saving a deposit

The change in deposit affordability indicator (Deposit Affordability Index) compares changes in house sales prices with the growth in median household disposable (after tax) income.

Factors that can affect deposit affordability are:

- House sales prices
- Household disposable income

Servicing a mortgage

The change in mortgage serviceability indicator (Mortgage Affordability Index) compares changes in the purchasing power of mortgage interest payments for new home loans with the growth in median household disposable (after tax) income.

Factors that can affect mortgage serviceability are:

- Mortgage interest rates
- House sales prices
- Household disposable income

Individual experiences of affordability will vary, for example if household income doesn't change in line with the national median.

See the later section on Data sources and methods, for a detailed description of the indicators.

New Zealand Indicators at a glance

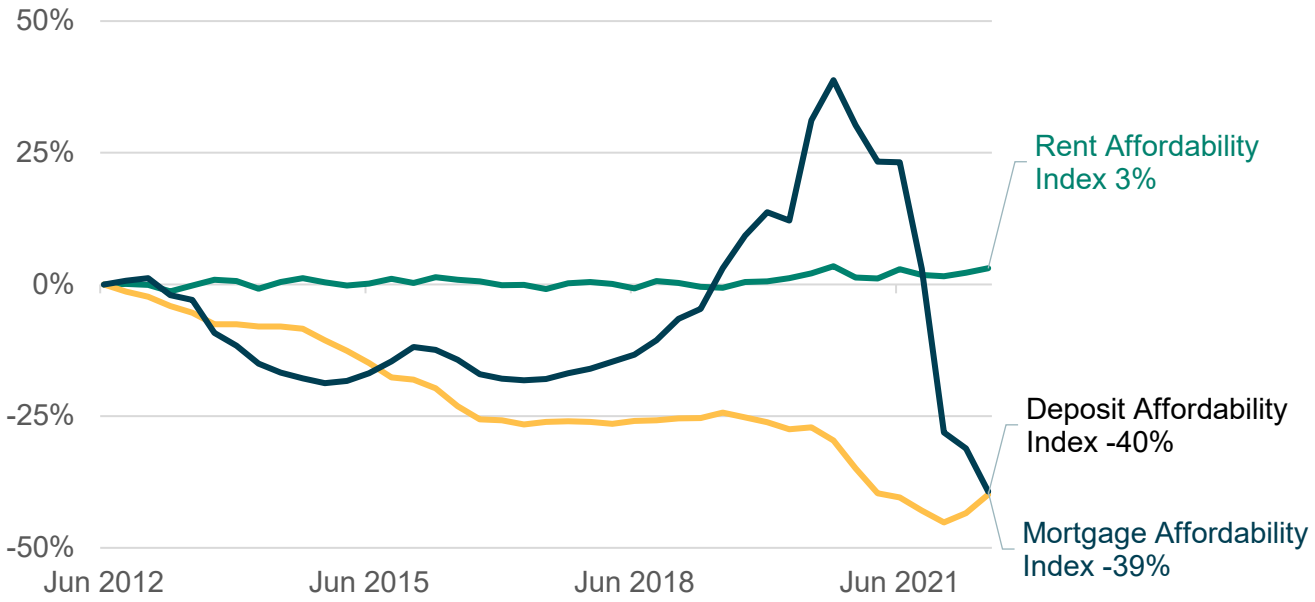
At a national level, over the past decade:

- Rental affordability is little changed nationally. Median household income growth has broadly kept pace with rental price growth. This aggregate result

hides notable variations in regional indicators, such as deteriorating rental affordability in many provincial North Island districts and cities
- Deposit affordability has deteriorated as house sales prices have increased at a faster rate than household income
- Mortgage affordability improved from mid-2019 to mid-2020 as interest rates fell, but the recent trend is a reversal as interest rates rise again.

Figure 1 - Indicators at a glance

Diversity in experiences of change in affordability since June 2012
For people entering the market for the first time, New Zealand



Higher change in affordability index means becoming more affordable.

Summary of data used

The CHAI are calculated from the following inputs:

- household incomes
- rents
- house sales prices, and
- mortgage rates.

The first 3 components show notable regional variation (see figures 3 and 6). Mortgage rates are set nationally, however mortgage rates interact with house sales prices to affect the Mortgage Affordability Index.

Data sources and methods

Changes in rental prices

Rental prices are sourced from Tenancy Bonds data relating to private sector rentals. These are representative of the rental costs of new tenancies (a 'flow' concept). Summary statistics are created by Te Tūāpapa Kura Kāinga - Ministry of Housing and Urban Development

(HUD), where these are not already published by Stats NZ. Timeseries use a quality-adjusted rental price index which controls for changes in the 'quality-mix' of properties newly rented over time. The index methodology (a *property fixed-effects regression* estimator) is an internationally recognised approach and consistent with that used for the New Zealand Consumers Price Index, and Rental Price Index released by Stats NZ (see Stats NZ, 2019; Bentley, 2022).

Changes in house sales prices

House sales data is supplied by CoreLogic. Timeseries use a quality-adjusted house price index which controls for changes in the 'quality-mix' of properties sold over time. The index methodology (a *Sales Price Appraisal Ratio*) is an internationally recognised approach widely used in New Zealand (see Eurostat, 2013; Armstrong et al., 2017).

Interest price index

Mortgage rates are sourced from the Reserve Bank of New Zealand (RBNZ). We use the 2-year special rate series, a balance between short-term rates commonly adopted and market expectation of future rate changes. An interest price index, designed to reflect changes in the purchasing power of mortgage interest payments, is calculated as the combined (multiplicative) effect of changes in mortgage rates and house sales prices.

Income

Income series use data from Stats NZ. Regional timeseries of *annual household disposable (after tax) income* are created by the HUD. Tax data, origined from Inland Revenue, is used to interpolate and extrapolate Household Economic Survey (HES)-calibrated Census estimates of household income. See *Modelled regional income timeseries* (Ministry of Housing and Urban Development, 2022) for further details.

Rental Affordability Index

The Rental Affordability Index is a summary measure of changes in rental prices compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than rent prices; negative changes imply declining affordability as rent prices are rising faster than incomes.

Formally, the change in the Rental Affordability Index RAI, between period *s* and period t, for geographic region r, can be expressed as:

$$\Delta RAI_{r,s,t} = \frac{\Delta Income_{r,s,t}}{\Delta RPI_{r,s,t}} \quad (1)$$

where

$$\Delta Income_{r,s,t} = \frac{Income_{r,t}}{Income_{r,s}} \quad (2)$$

$$\Delta RPI_{r,s,t} = \frac{RPI_{r,t}}{RPI_{r,s}} \quad (3)$$

$Income_{r,t}$ is the median household income for region *r*, in period *t* and $RPI_{r,t}$ is the Rental Price Index in for region *r*, in period *t.*

Deposit Affordability Index

The Deposit Affordability Index is a summary measure of changes in house sales prices compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than house sales prices; negative changes imply declining affordability as house sales prices are rising faster than incomes. The index does not account for any temporal changes in bank lending practices, such as those resulting from changes in macro-prudential policy.

Formally, the change in the Deposit Affordability Index DAI, between period s and period t, for geographic region r, can be expressed as:

$$\Delta \mathrm{D}AI_{r,s,t} = \frac{\Delta Income_{r,s,t}}{\Delta \mathrm{H}PI_{r,s,t}} \quad (4)$$

where

$$\Delta \mathrm{H}PI_{r,s,t} = \frac{HPI_{r,t}}{HPI_{r,s}} \quad (5)$$

$HPI_{r,t}$ is the House Price Index in for region *r*, in period *t.*

Mortgage Affordability Index

The Mortgage Affordability Index is a summary measure of changes in the purchasing power of mortgage interest payments (an interest price index) compared with changes in income. Positive changes in the affordability index imply greater affordability as incomes are increasing faster than the interest price index; negative changes imply declining affordability as the interest price index is rising faster than incomes.

Formally, the change in the Mortgage Affordability Index MAI, between period s and period t, for geographic region r, can be expressed as:

$$\Delta \mathrm{M}AI_{r,s,t} = \frac{\Delta Income_{r,s,t}}{\Delta \mathrm{I}PI_{r,s,t}} \quad (6)$$

where

$$\Delta \mathrm{IPI}_{r,s,t} = \Delta \mathrm{H}PI_{r,s,t} \times \Delta \mathrm{MIR}_{s,t} \quad (7)$$

$$\Delta \mathrm{MIR}_{s,t} = \frac{\mathrm{MIR}_t}{\mathrm{MIR}_s} \quad (8)$$

$Income_{r,t}$ is the median household income for region *r*, in period *t* and $RPI_{r,t}$ is the Rental Price Index in for region *r*, in period *t.*

IPI is the Interest Price Index. The conceptual approach, tracking the multiplicative effect of changes in mortgage rates and house sales prices, is consistent with the methodology used for the mortgage interest series in the Household Living-costs Price Index (see Stats NZ, 2016). The intuition for this approach is, all else equal:

- increases in house sales prices will decrease the purchasing power of mortgage payments (so increase the price index)
- increases in mortgage rates will decrease the purchasing power of mortgage payments (so increase the price index).

MIR_t is the average of the monthly Mortgage Interest Rates in the period t, $\Delta \mathrm{MIR}_{s,t}$ is an index of changes in the average 2-year fixed special mortgage rates for new residential lending, using the RBNZ publication *B21 New residential mortgage special interest rates* (series ID *'INRL.MAL2.D2'*). The series has been backcast prior to January 2017 using the average 2-year standard rates, as published by the RBNZ (series ID *'MTGE.MBI.T10'* from *B20 New residential mortgage standard interest rates*)) from December 2004 – December 2016 and *Key Graph Data: Mortgage Interest Rates - 2 year fixed rate* prior to December 2004.

Limitations of this approach

Indicators do not reflect differing experiences of affordability

The indicators compare the change in median household income relative to overall house and rent price movements, as well as changes in average home loan interest rates. However, individual experiences of affordability will vary, for example households with incomes lower than the median. Experience of affordability will also differ for households that do not experience median income growth or that pay different home loan interest rates.

We are exploring creating richer indicators of housing affordability, such as demographic analysis and statistics for Māori and other groups. Due to data limitations these require using less timely data than the Change in Affordability Indicators created so far.

Indicators show change in affordability, not relative affordability

The indicators only show change over time (i.e. whether affordability is getting better or worse), not whether things are 'affordable' or not. This means it is not possible to compare the level of affordability between areas. Affordability in one area can improve more than another's over a period of time whilst its level of affordability remains worse.

Indicators show 'market entry' affordability

The indicators show 'market entry' affordability (i.e. starting a new tenancy, entering homeownership) and not affordability for those already in tenancies or home ownership.

Seasonal Series

Some of the series are seasonal – for example, rent prices tend to peak in the first quarter of each year. For short term analysis, it is best to use the same time of year for the start and end of your comparison.

Modelled Income Series

The median household income data has been modelled by creating income benchmarks using the Household Economic Survey (to estimate calibration and coverage factors which are applied to Census income estimates). Tax data is used to estimate regional income timeseries between benchmarks and to extend the regional time series to the latest period. Due to this, the latest data is subject to revision.

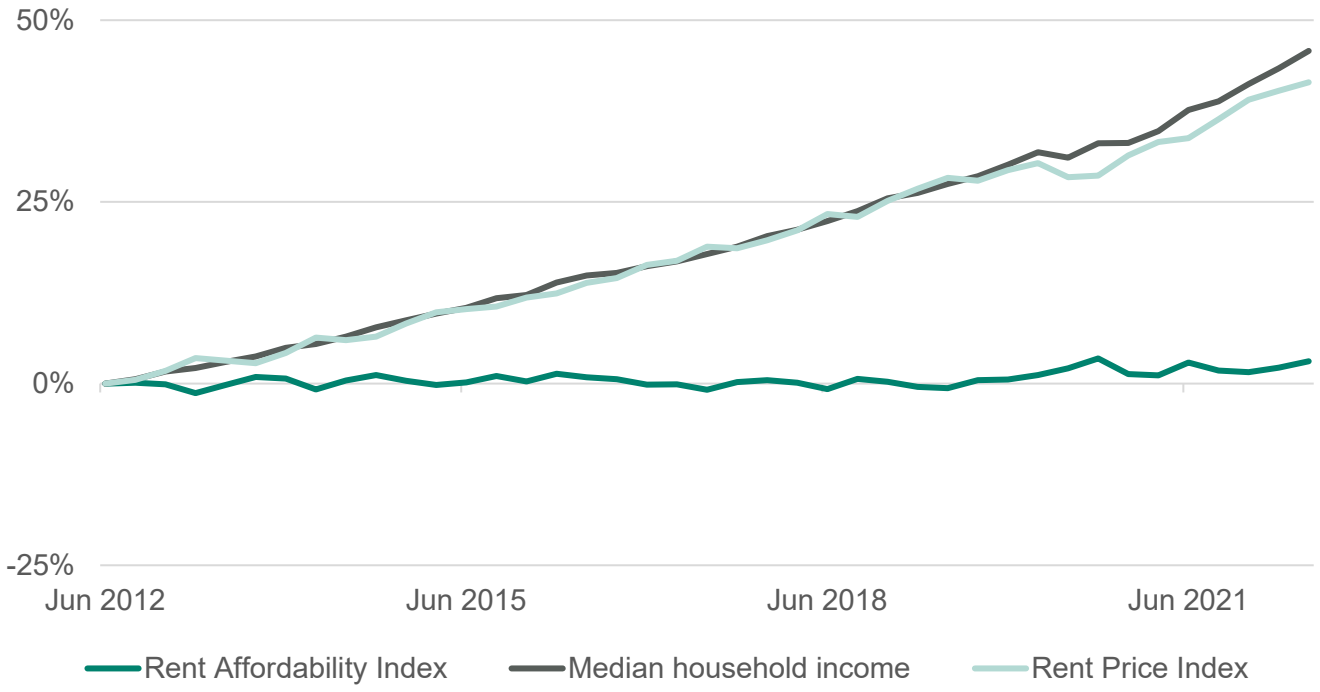
Details of the Measures

Rental affordability

Change in New Zealand rental affordability

Rental affordability has remained reasonably constant nationally with changes in median income matches change in in rent prices.

Figure 2 - Rental affordability, New Zealand, 2012-2022



Higher affordability index means becoming more affordable.

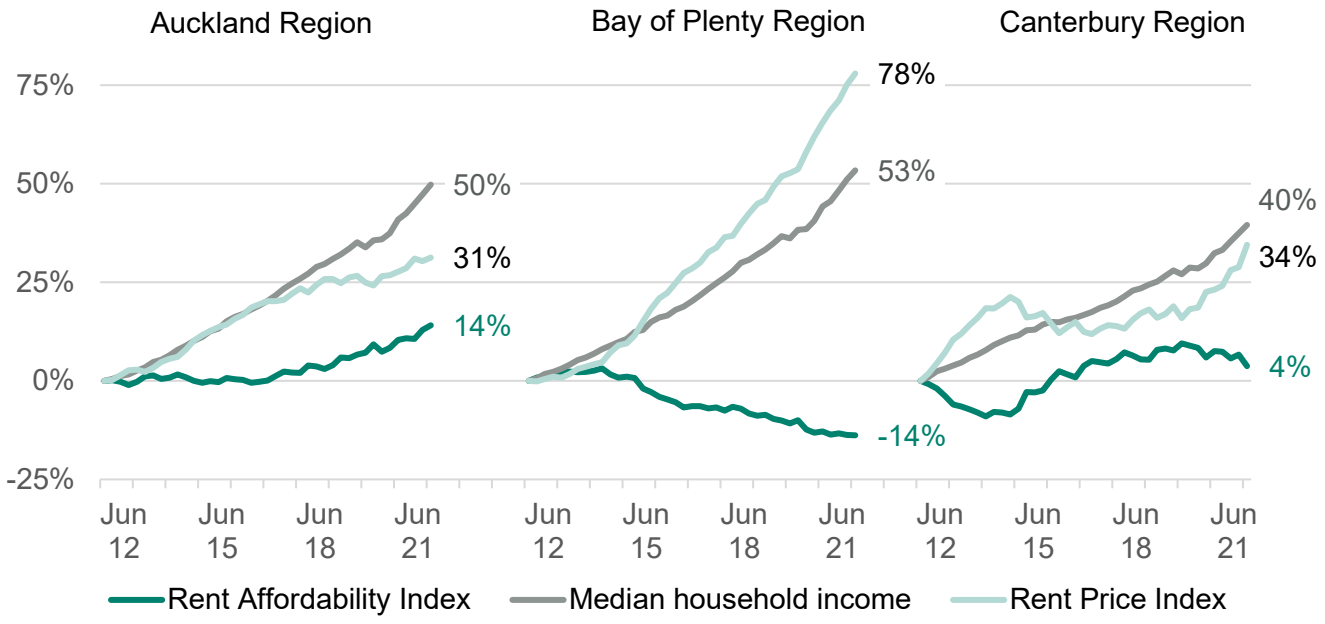
Table 1 – Summary of Change in Rental Affordability 2012 - 2022, New Zealand

	1 YEAR	5 YEAR	10 YEAR
Rent Price Index	6%	19%	41%
Median household income	6%	24%	46%
Rent Affordability Index	0%	4%	3%

Regional diversity

Experiences of rental affordability are diverse. Summary statistics for the whole of New Zealand can hide substantial regional differences. Affordability has deteriorated in much of provincial New Zealand as rental prices have increased faster than incomes (Fig. 3). Trends in the **Rental Price Index** show regional differences in price change. These trends explain most short-term variation in affordability, since median income growth is typically smoother and less variable across regions.

Figure 3 - Rental affordability, Selected regional councils



New Zealand rental affordability in context

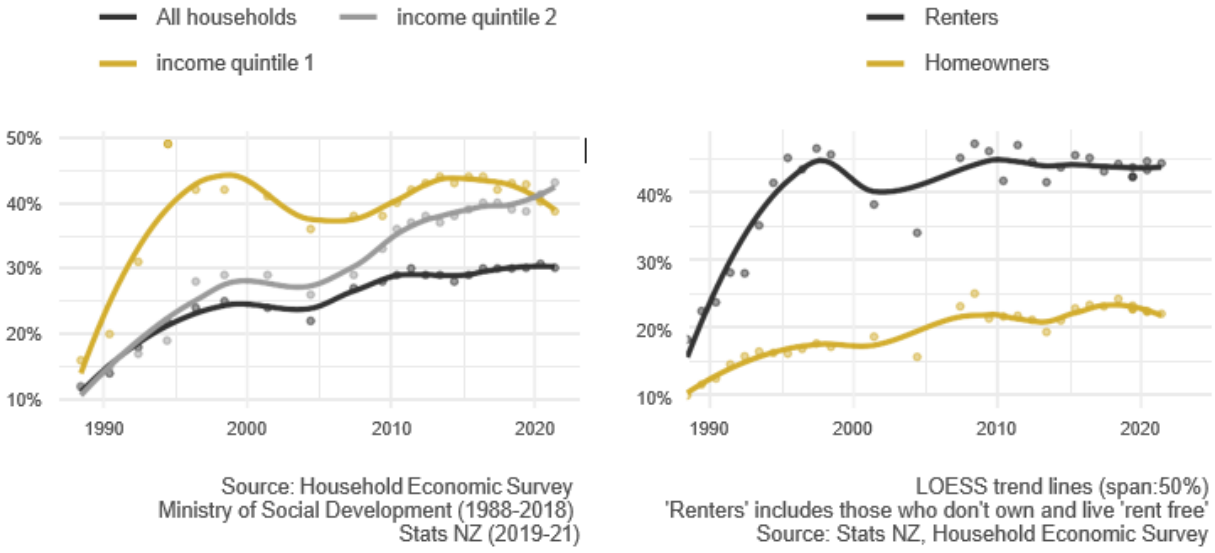
Stats NZ's Household Economic Survey (HES) shows that renters typically have lower incomes than owner-occupiers and spend a greater share of their income on housing costs. The proportion of renters with a housing cost overburden (spending more than 30% of

income on housing) has been broadly flat over the past decade, following a substantial increase during the 1990s.

Consistent with this evidence, the Rental Affordability Index for New Zealand is little changed over the past 10 years (Fig. 2). Rental price inflation has broadly tracked the growth in household income. This nationwide trend may not be a good representation for lower income households, where housing cost burdens have been noticeably increasing for income quintile 2 (the second lowest income group, which excludes those with unusually low annual income such as the self-employed). It is also important to note that the HES reports that household income grew at a faster rate than personal income over the years ending June 2009 – June 2019, and that average household size increased over the same period. Household formation may have been impacted by housing costs.

Figure 4 - New Zealand Rental affordability: Context

Households with high housing costs burden
Household who spend more than 30% of disposable income on housing costs



Deposit affordability

New Zealand

Nationwide deposit affordability decreased during the past year (Fig. 5). House sales prices increased faster than household income.

Figure 5 - Deposit affordability, New Zealand

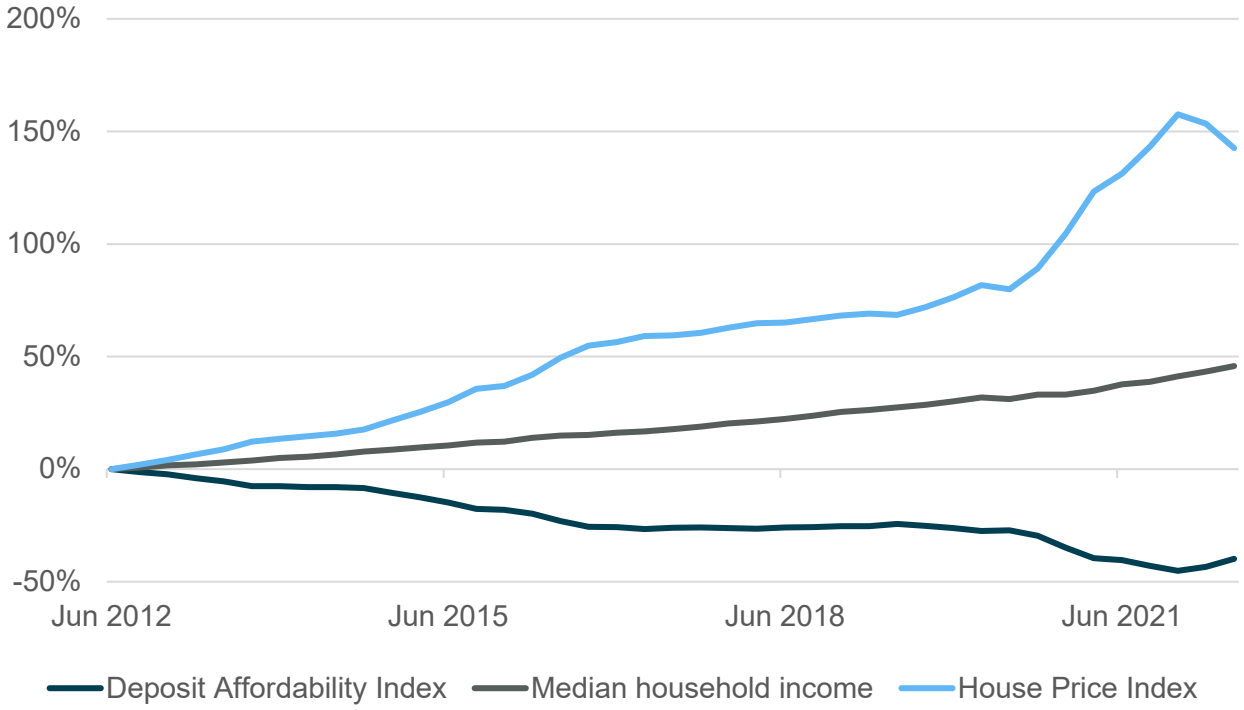


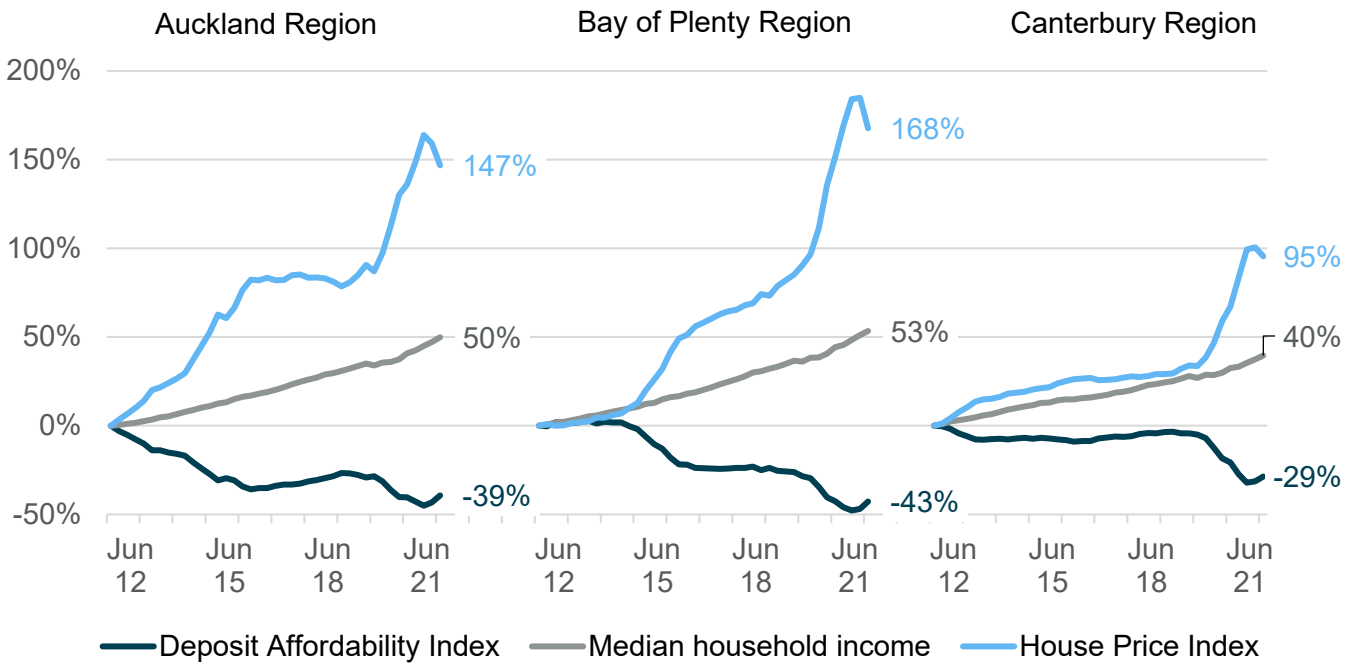
Table 2 – Summary of Change in deposit affordability 2012 - 2022, New Zealand

	1 YEAR	5 YEAR	10 YEAR
House Price Index	5%	52%	143%
Median household income	6%	24%	46%
Deposit Affordability index	1%	-19%	-40%

Regional diversity

Over the past decade, house sales prices have increased faster than growth in household income. This represents a decrease in deposit affordability for aspiring homeowners, since a greater proportion of annual income is required to raise a deposit, at a fixed proportion of house purchase price (regional deposit affordability and house sales prices are shown in Fig. 6).

Figure 6 - Deposit affordability, Selected regional councils



Mortgage affordability

Mortgage affordability improved from mid-2019 to mid-2020 as interest rates fell, but the recent trend is a reversal as interest rates rise again (Fig. 7).

Figure 7 - Mortgage affordability, New Zealand

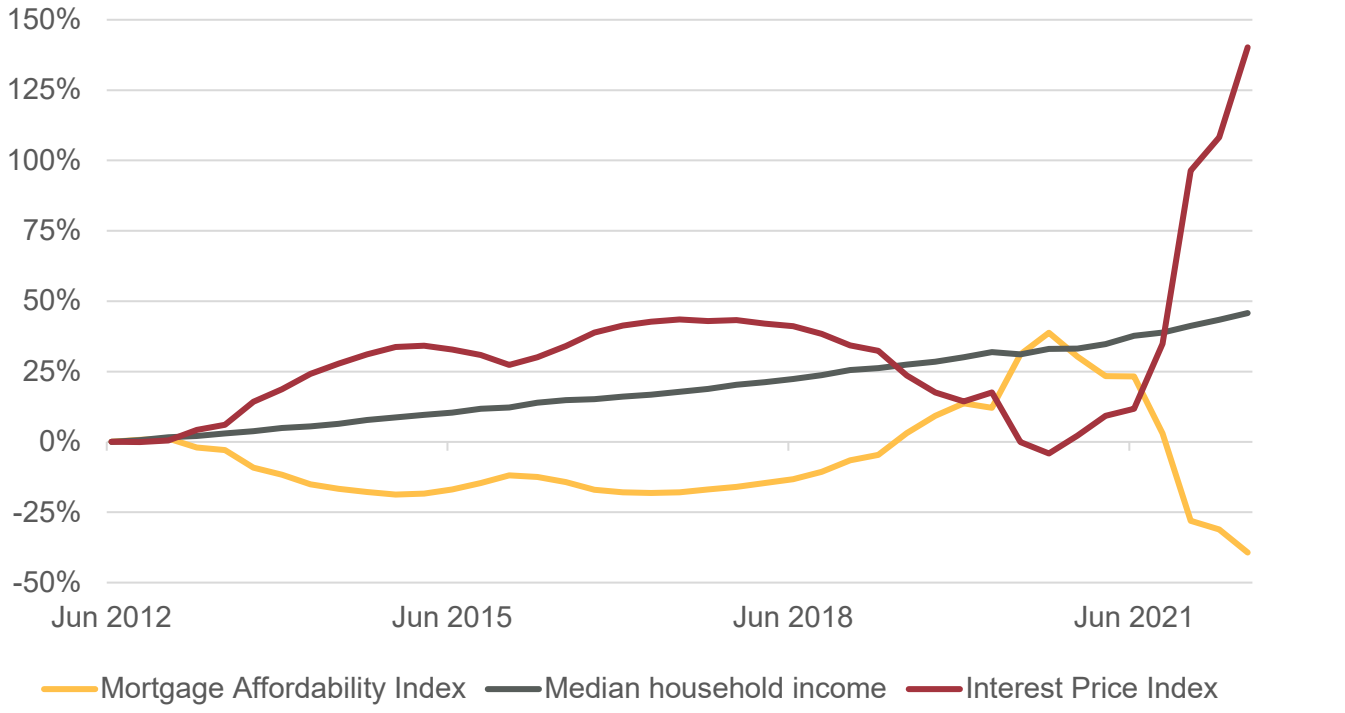
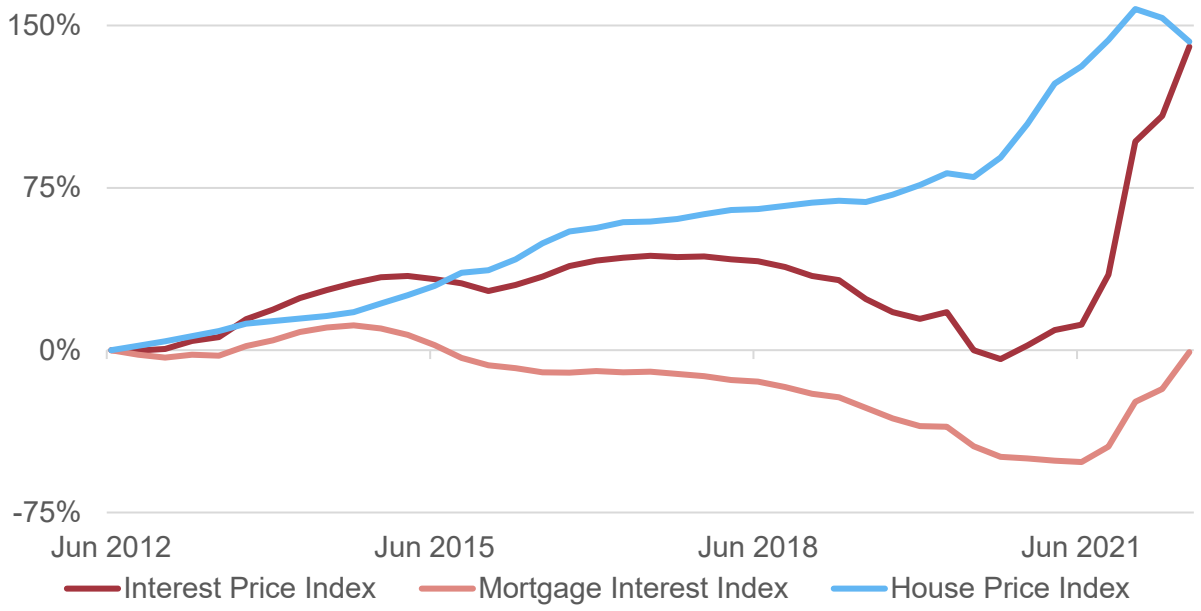


Figure 8 - Purchasing power of mortgage interest payments, New Zealand



Purchasing power of mortgage interest payments

The Mortgage Affordability Index is calculated by comparing an Interest Price Index, reflecting the purchasing power of mortgage interest payments, with the growth in household income. The Interest Price Index tracks the multiplicative effect of changes in mortgage rates and house sales prices - see *Data sources and methods*, for details.

The Interest Price Index is higher than a decade ago. Decreases in mortgage interest rates have been offset by increases in house sales prices (Fig. 8).

References

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