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Regional Housing Markets In New Zealand: House Price, Sales and Supply Responses

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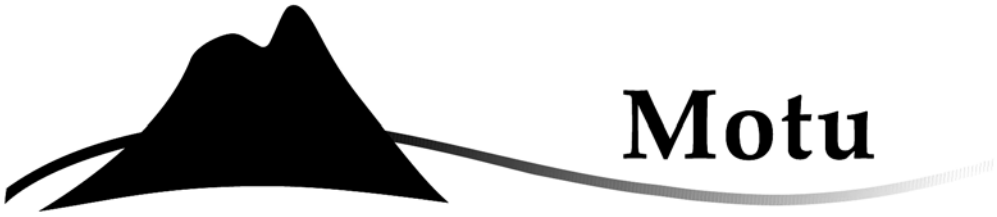

Regional Housing Markets in New Zealand: House Price, Sales and Supply Responses

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Executive Summary

House prices have risen substantially across much of New Zealand since 1981, but regional house prices have diverged. This study provides evidence on house and land prices and housing supply at the local level to underpin research into issues of sustainable housing supply across New Zealand. We detail house price movements, demographic and economic developments, and regional housing supply patterns. The responsiveness of housing supply to demand changes determines the extent of regional house price rises. Fast supply adjustment following a demand increase results in the extra demand being met by matching extra housing supply with little effect on prices. Slow supply adjustment results in the demand increase being reflected principally in house price rises. We explain determinants of long-run developments in house prices and determinants of house supply responsiveness. We estimate that a 10% increase in regional house supply (relative to population) results in an approximate 8% decline in house prices in that area.

A key finding of the study is that land prices have an important impact on new house supply: factors that push up land prices stifle new house-building activity. Limiting factors may include geographical or regulatory constraints on developing land for new residential development, or restrictions on subdivision for in-fill purposes. High construction costs (e.g. stricter building regulations) can potentially have a similar effect.

Real construction costs have stayed broadly stable since 1991. Land prices, however, have increased dramatically. Between 1981 and 2004, the real (CPI-adjusted) price of vacant residential sections rose by 286% on average across New Zealand. The increase in Auckland City was almost 700%; in Manukau, North Shore and Rodney increases were around 460%. Increases in tourist locations were also substantial: over 400% in each of Queenstown-Lakes and Thames-Coromandel. These increases compare with real house price increases of 105% across New Zealand as a whole over the same period. Queenstown-Lakes

real house prices rose by 244%, while those of Auckland City, Rodney and Thames-Coromandel rose by around 200%.

Not all regions shared high land and house price increases. Ten territorial local authorities (TLAs) experienced real house price falls between 1981 and 2004; four experienced real land price falls. Areas with negative or low real price rises were predominantly rural North Island or southern South Island regions.

Local authorities differ substantially from one another in the responsiveness of new housing supply to population pressures. In the Auckland region, between 1991/92 and 2004, Manukau had a low ratio of building consents relative to population change (0.29; approximately 3.5 people per consented dwelling). This compares with Auckland City and Waitakere (0.37), Rodney (0.41), Franklin (0.46) and Papakura (0.56; fewer than 2 people per consented dwelling). Of these TLAs, Papakura had the lowest real house price growth over the period (48%) compared with 79% for Franklin and 92%-129% for the other five. The high supply responsiveness in Papakura (especially relative to neighbouring Manukau) may in part be responsible for its lower house price pressures.

Another key factor affecting house and land prices is the rise of the holiday home. Areas that have become tourist (holiday home) destinations (e.g. Queenstown-Lakes and Thames-Coromandel) have had both high rates of house building relative to population growth and high house price rises. They also have high unoccupied dwelling rates and low occupancy rates. In these areas, the need for new house supply to respond to demand pressures is particularly important. If supply is not extremely responsive in these regions, the effect on local prices, and hence on housing affordability for local residents, is severe.

The price of a house ultimately reflects the price of the factors that comprise that house: the cost of the structure and the price of the land. If high house prices are a concern, a key policy focus has to be ensuring that construction costs and land prices are kept to a minimum consistent with other objectives. In

turn, this requires planning and regulatory processes that are conducive to the development of residential land (or of in-fill sub-division of existing land) and to the construction of new dwellings (whether single or multi-unit). The appropriate form of regulatory and planning processes that result in these outcomes needs to be a subject of close scrutiny in New Zealand as it is currently in a number of countries experiencing housing market pressures.

JEL Classification
R21, R31

Keywords
House supply, house prices, land prices, construction costs

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1 Introduction

House prices[1] have risen rapidly in New Zealand since early 2002, indicating a strong increase in demand for housing. Residential construction has also been at high levels since 2002, indicating a strong supply response. In this paper we examine the movements in house prices and new housing supply, on a regional basis in New Zealand. We also examine movements in related data - particularly population and economic variables that underpin the demand for housing, and construction costs and land prices that affect supply. The purpose of the study is to provide evidence on the factors that affect housing demand and supply at the local level.

First, we detail house price movements, discussing how prices have moved across the country (quarterly) since 1981. We compare movements both across regional councils (comparing broad areas of the country with each other) and across territorial local authorities (TLAs) within regional councils (comparing different units within the same region). Some evidence on sales activity is also presented. This descriptive exercise reveals several important patterns to be analysed further.

Second, we detail patterns in housing supply. We do so using two measures. The first is census data on all dwellings, available five-yearly from 1981-2001. This measure gives us a comprehensive measure of the housing stock, but is not so useful in explaining the dynamic response of housing supply to demand pressures. The second data source is building consents, which we use as a dynamic indicator of supply responsiveness.[2] Consents data are available quarterly from 1991 at TLA level, so can be matched to quarterly TLA price data.

[1] Throughout this paper 'house' refers to residential stand-alone dwellings. 'Dwellings' refers to a combination of stand-alone dwellings and flats/apartments.

[2] Building consents are only an indicator, rather than a comprehensive measure, of supply responsiveness since: (a) they may over-state responsiveness to the extent that some consents are not followed through to the building stage, (b) they may under-state responsiveness to the extent that unauthorised building takes place, and (c) they take no account of demolitions.

Third, we present evidence on local demographic and economic developments that may influence housing. This evidence includes data on population changes, estimated GDP and GDP per capita (at the TLA level) and output price developments, also at the TLA level. We also include census information on median incomes across TLAs.

In section 3, we update work, first presented in Grimes and Aitken (2004) in which long-run developments in house prices are explained econometrically by economic and demographic variables. The estimates indicate that a large proportion of house price developments across New Zealand's TLAs can be explained as a function of "fundamental" demographic and economic developments.

Section 4 presents entirely new work explaining house supply responsiveness (i.e. new building consents). This work indicates that housing supply is also driven strongly by underlying economic and demographic factors at the local level. A key finding here is that land prices (as well as construction costs) have an important impact on new house supply: factors that push up land prices (e.g. limited availability of land suitable for new residential development) stifle new activity.

In our concluding section, we discuss the implications of the findings in the main body of the paper. In particular, we focus on implications of the housing supply results, since these are crucial for understanding future developments in regional house prices. Where demand is high, strong new house supply responses are required to limit price pressures. We discuss cases where responsiveness may be slower than in other areas, so being a *prima facie* contributing factor to local house price pressures.

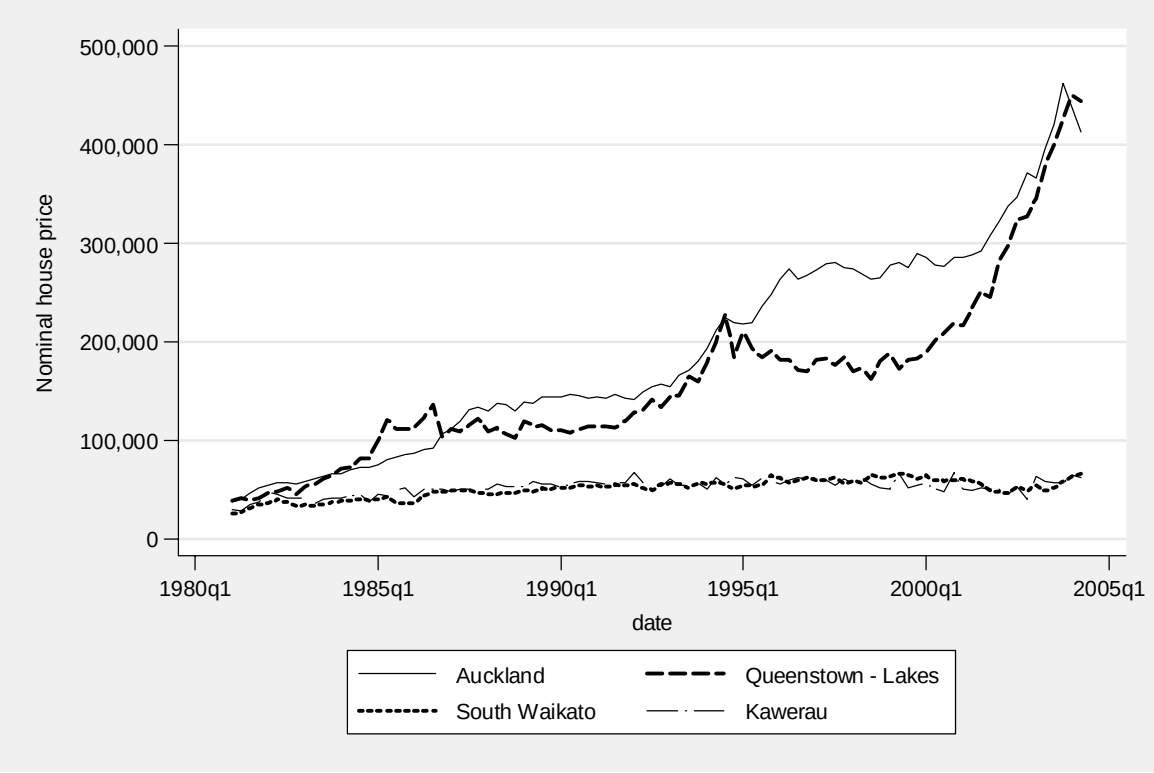
2 Statistical Overview

2.1 House and land prices

We analyse house price developments using data for median house sales prices quarterly from 1981(1) to 2004(2) across 73 TLAs.[3] Frequently, New Zealand analysts and commentators talk of "housing" as an investment category, implicitly treating housing as an homogeneous category of investment across the country. However, homogeneity in house price developments across regions is not normally the case. As an illustration, Figure 1 graphs the nominal house prices since 1981 of four TLAs (Auckland, Queenstown-Lakes, Kawerau and South Waikato); the graph demonstrates the potential for major regional house price divergence across New Zealand. As another illustration, we graph, in Figure 2, the real (CPI-adjusted) house price of two TLAs within the Waikato region: Waikato (TLA) and South Waikato. In real terms (i.e. in terms of purchasing power over goods and services), Waikato house prices rose by around 25 per cent between 1981 and 2004. By contrast, South Waikato house prices fell by almost 10%, even after a lift in 2003/04. Waikato (dairying) and South Waikato (forestry and sheep/beef) have very different economic bases and have had different population trends, which help explain this divergence. Waikato is also contiguous with Hamilton City and there are strong interactions of prices between the city and its immediate hinterland. This helps to explain the strong co-movement in prices observed between these two neighbouring TLAs (Figure 3).

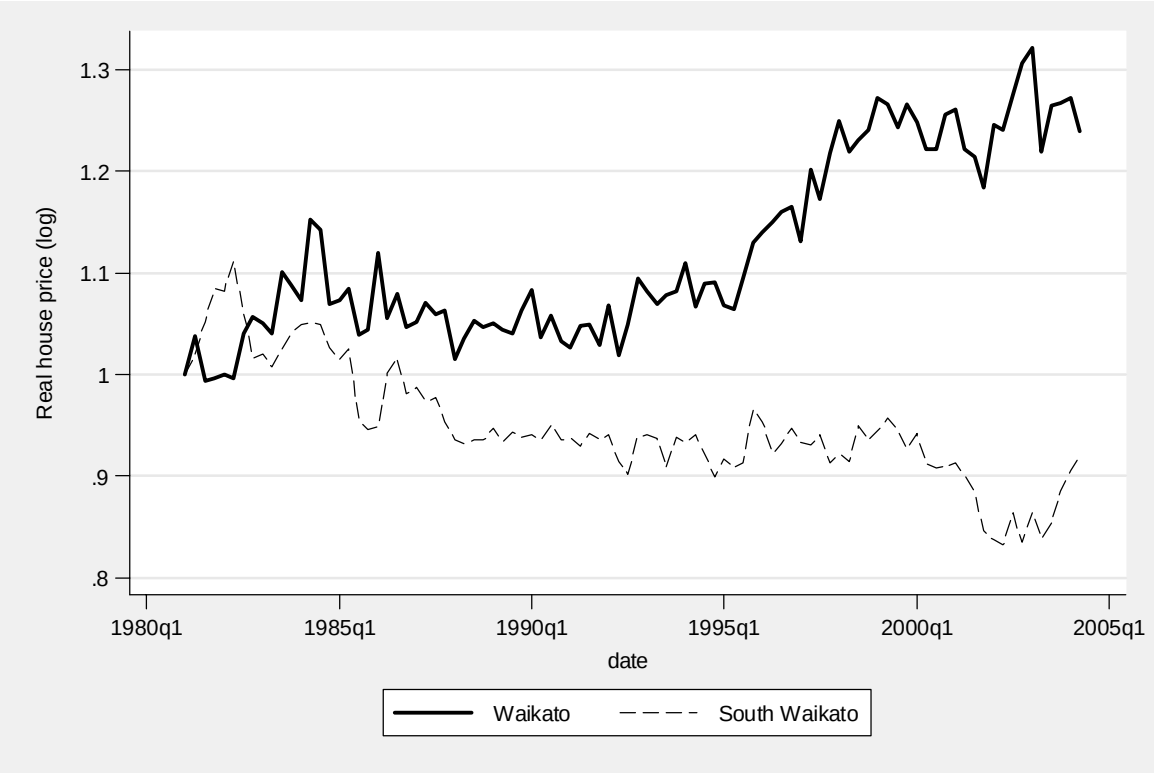
[3] We omit the Chatham Islands from the analysis owing to its small size.

Figure 1: Nominal house prices (Auckland, Queenstown, Kawerau & South Waikato)



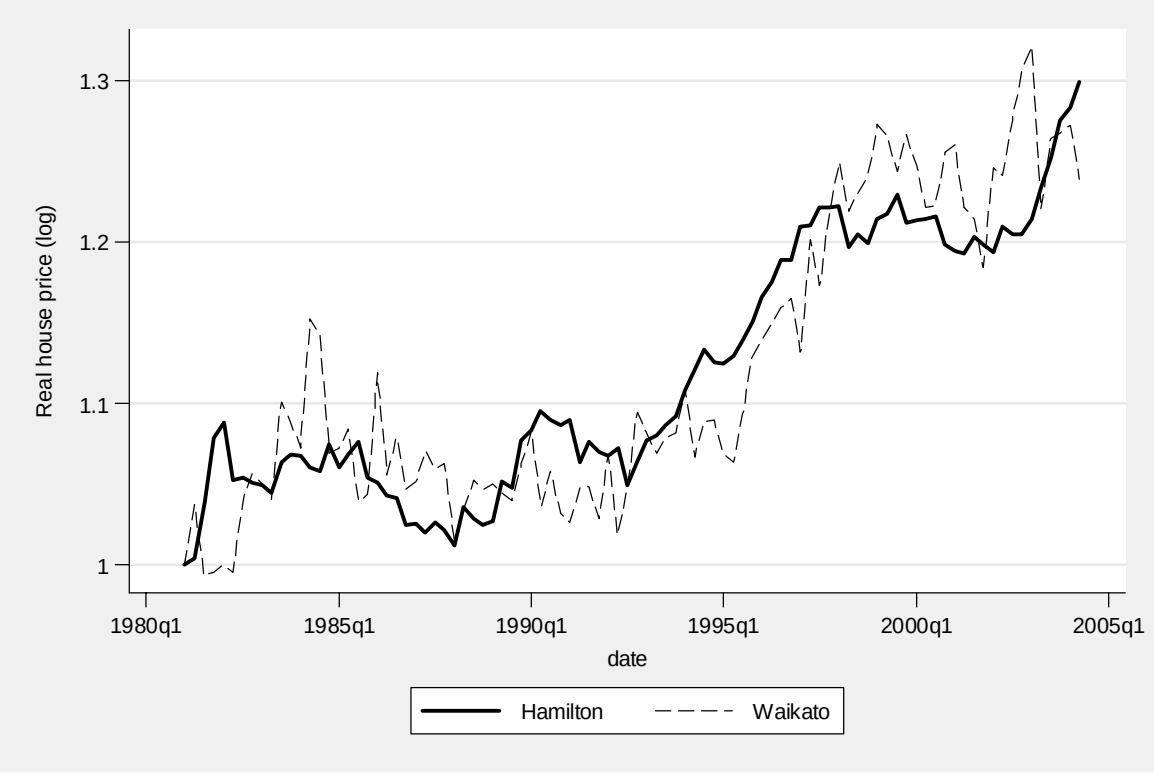
Source: Quotable Value New Zealand

Figure 2: Real House Prices (Waikato & South Waikato)



Source: Quotable Value New Zealand

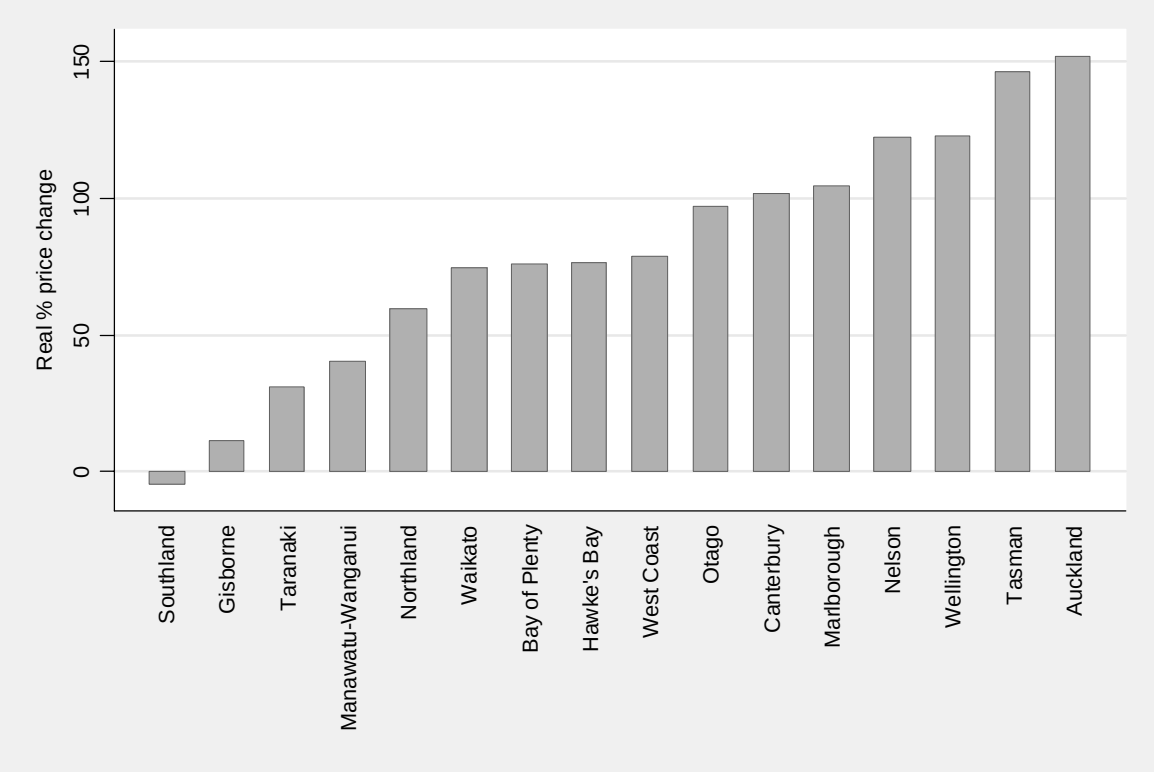
Figure 3: Real House Prices (Hamilton & Waikato)



Source: Quotable Value New Zealand

Figure 4 graphs the real percentage change in house prices between 1981 and 2004 across the sixteen regional councils. Again, strong divergence in outcomes is evident. Auckland prices have grown most strongly (rising 150% in real terms); Wellington's prices have grown by well over 100%, with Canterbury and Otago prices also doubling in real terms over the period. Strong house price growth is not just a major urban phenomenon: Tasman prices have risen almost as strongly as those of Auckland, Nelson has kept pace with Wellington and Marlborough has kept pace with Canterbury and Otago. At the other end of the scale, despite recent strong price rises, Southland's real house prices in 2004 were below its 1981 levels; Gisborne prices had hardly increased in 23 years, while Taranaki and Manawatu-Wanganui each had only modest real increases (in the order of 1.0-1.5% p.a.).

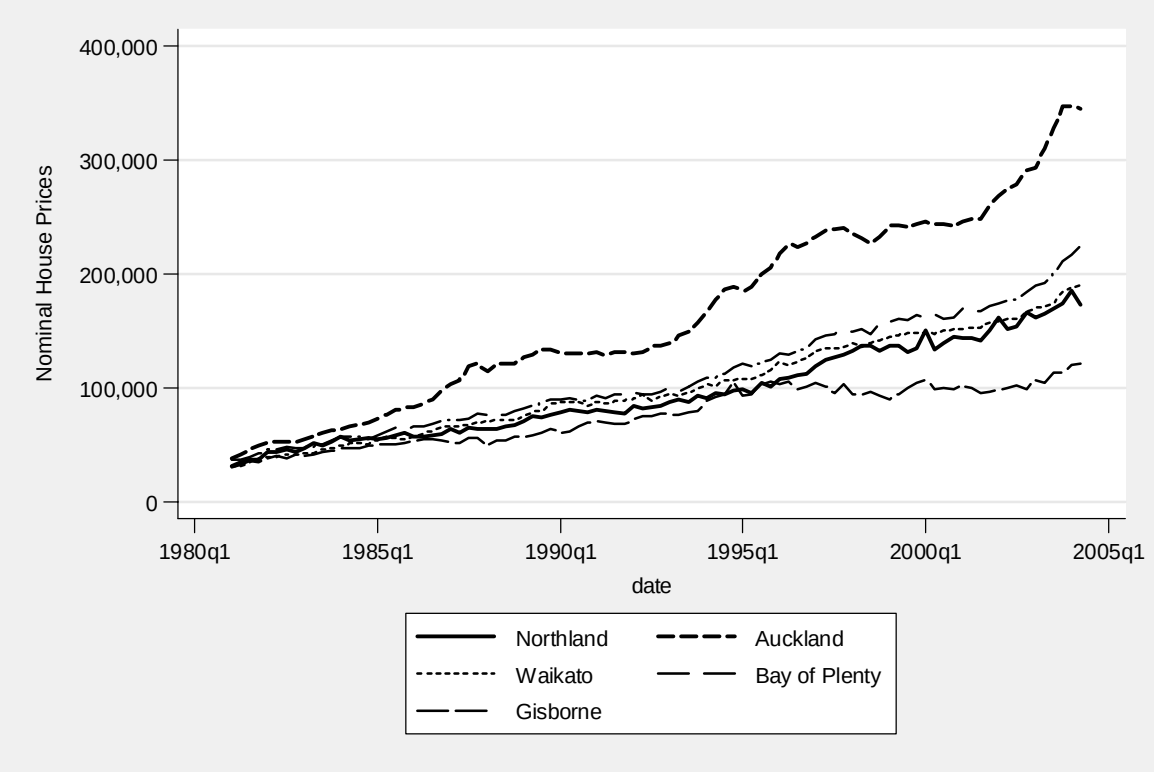
Figure 4: Regional Council House Prices % Changes (1981-2004)



Source: Quotable Value New Zealand

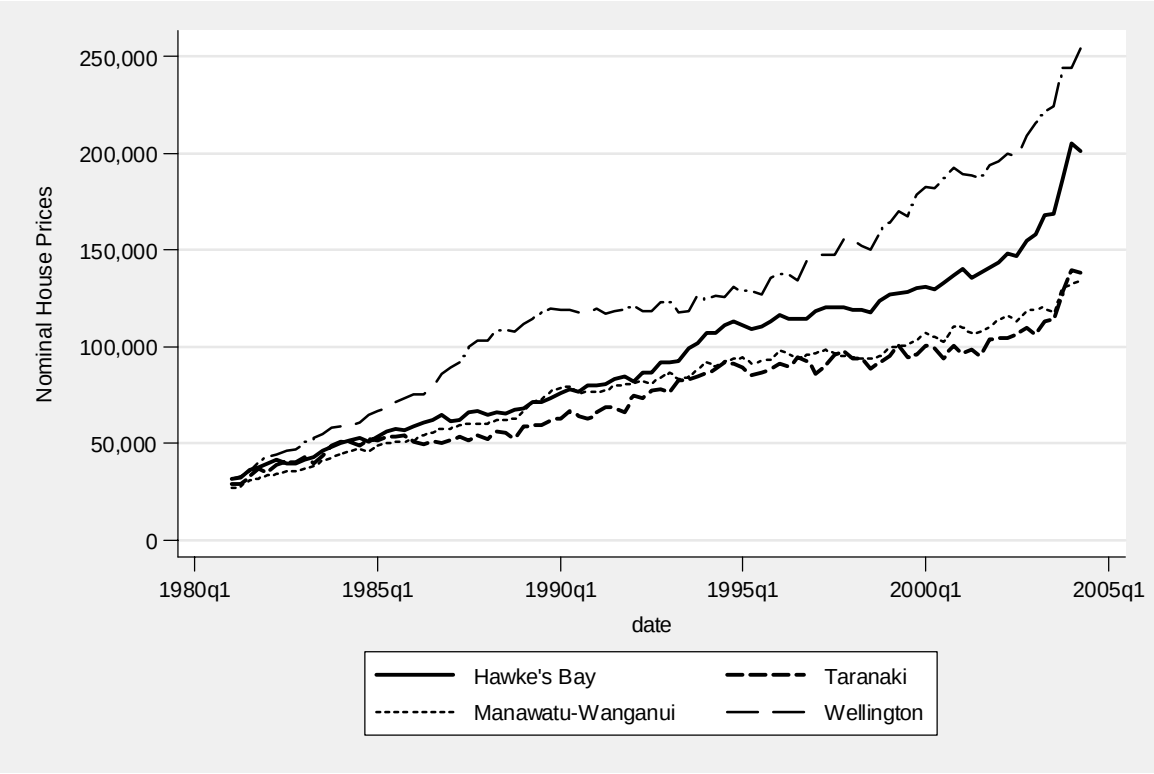
We graph regional council nominal house price developments in Figure 5 - Figure 7, dividing the country into three groups (northern North Island, southern North Island, and South Island). Doing so allows us to see similarities and differences across regions easily. For the northern group, Auckland's idiosyncratic behaviour is clear: it has risen much further than any of its surrounding regions. The three closest regions to it geographically (Northland, Waikato and Bay of Plenty) have all experienced quite similar developments to one another, while Gisborne has lagged well behind. Gisborne is the most isolated (and "rural") of these regions. Similar divergent behaviour is observed for the central region, with Wellington outstripping the surrounding regions, but with strong growth also in Hawke's Bay. The more rural areas (Taranaki and Manawatu-Wanganui) have lagged. In the South Island (where we group Nelson-Marlborough-Tasman, NMT, as a single region), two rural regions (West Coast and Southland) also lag. However NMT, which is also substantially rural, has had the fastest growing house prices.

Figure 5: Nominal House Prices (Northern North Island RCs)



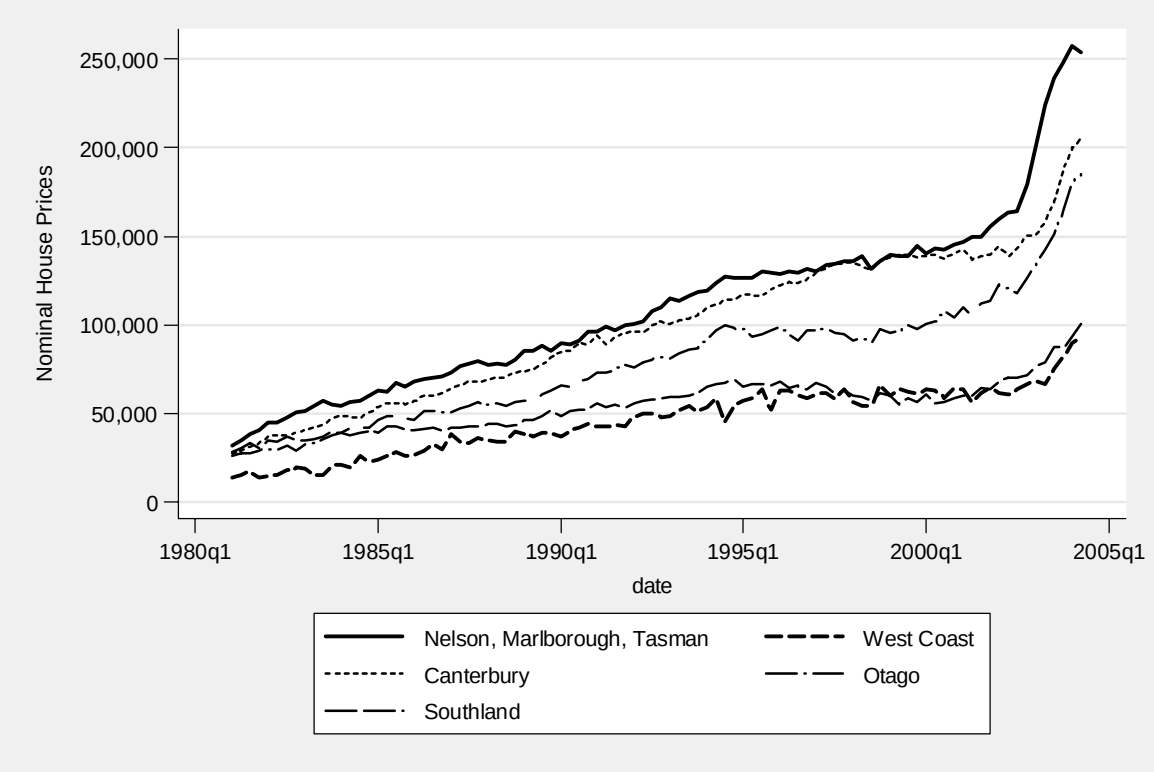
Source: Quotable Value New Zealand

Figure 6: Nominal House Prices (Southern North Island RCs)



Source: Quotable Value New Zealand

Figure 7: Nominal House Prices (South Island RCs)



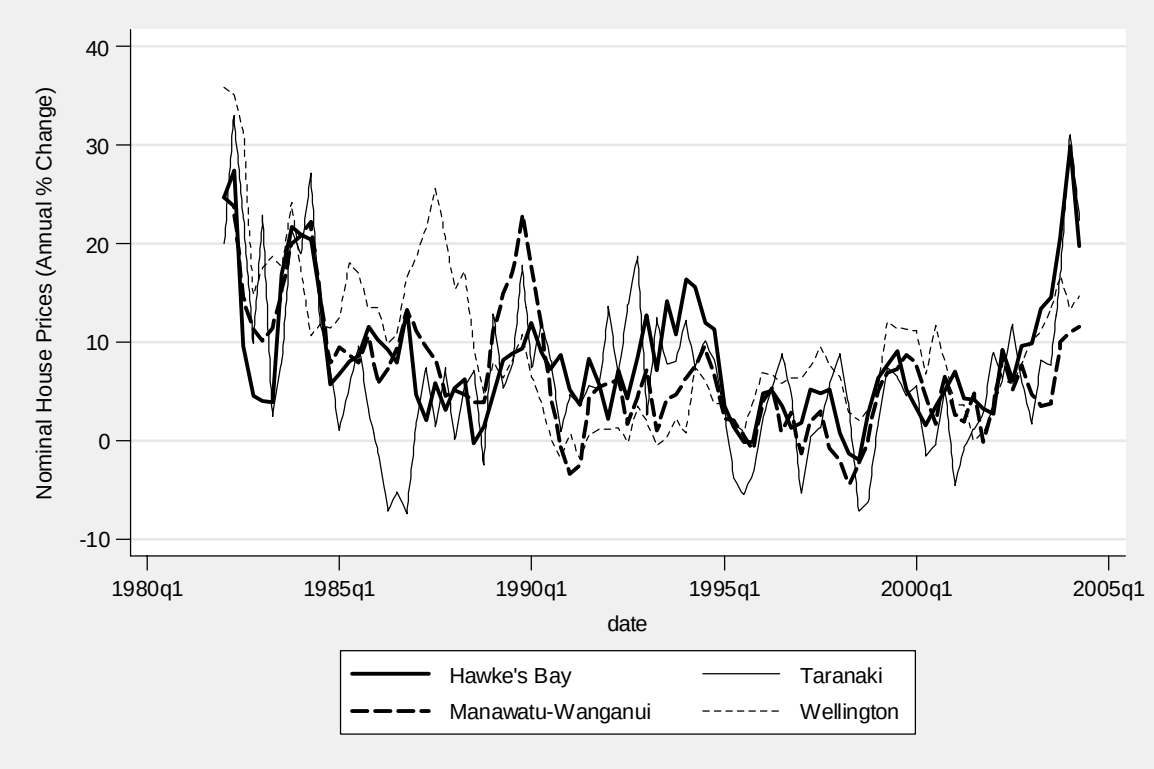
Source: Quotable Value New Zealand

One feature that is noticeable across the three graphs is that "sunshine" regions, even those that are predominantly rural - Northland, Bay of Plenty, Hawke's Bay and NMT - have each had strong house price growth relative to other rural regions. The one exception over this period is Gisborne. One possibility, to be tested in future work, is that the lack of good transport links to Gisborne means that the increasing premium apparently being paid for sunshine coasts, has not been factored into Gisborne prices simply because the transport links make the region too isolated. Alternative explanations relating to the economic and socio-economic characteristics of the region are also possible (although these too may, in part, be a consequence of the region's isolation).

Figure 4 - Figure 7 demonstrate that house prices have diverged quite strongly across regions in New Zealand since 1981. Nevertheless, even where regional prices diverge, there are frequently shorter term similarities in house price changes, driven by national factors. These similarities in developments can be punctuated by region-specific occurrences. As an example, Figure 8 presents

annual percentage changes in nominal house prices for the four regions in the southern North Island. Price changes in the early 1980s were high, as they were at the end of the period. Smaller upward cycles occurred in most regions in 1989, 1994 and 1999 (and were shared elsewhere in New Zealand). As well as these similarities, Wellington experienced strong upward price pressure during the financial boom of 1986/87, an experience not shared by the other (non-finance industry) regions. It then experienced relatively slow price increases for a prolonged period after the October 1987 share price collapse. Taranaki experienced negative price growth in 1986, possibly associated with the removal of commodity price supports at that time.

Figure 8: Nominal House Price % Change (Southern North Island RCs)

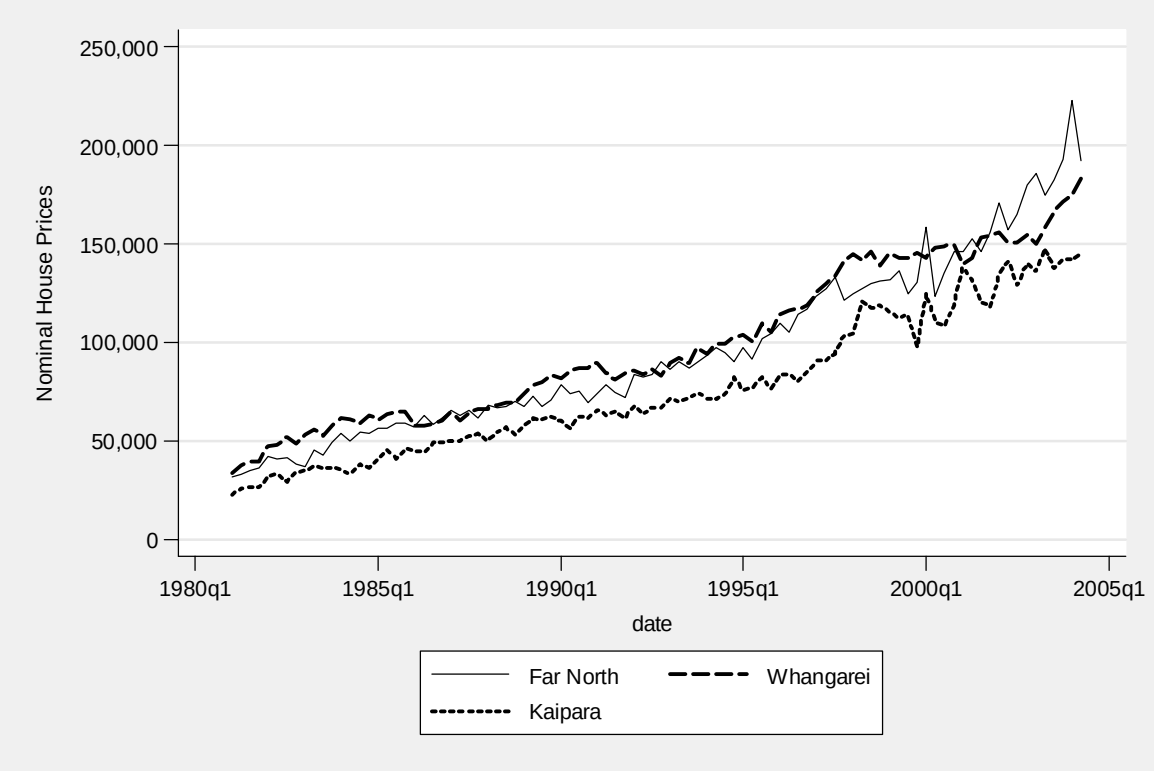


Source: Quotable Value New Zealand

Within regional councils (as illustrated in Figure 2 and Figure 3) we also find strong house price divergence or convergence depending on economic and demographic influences. Figure 9 - Figure 23 graph nominal TLA house prices within their corresponding regions (Waikato and Canterbury regions are

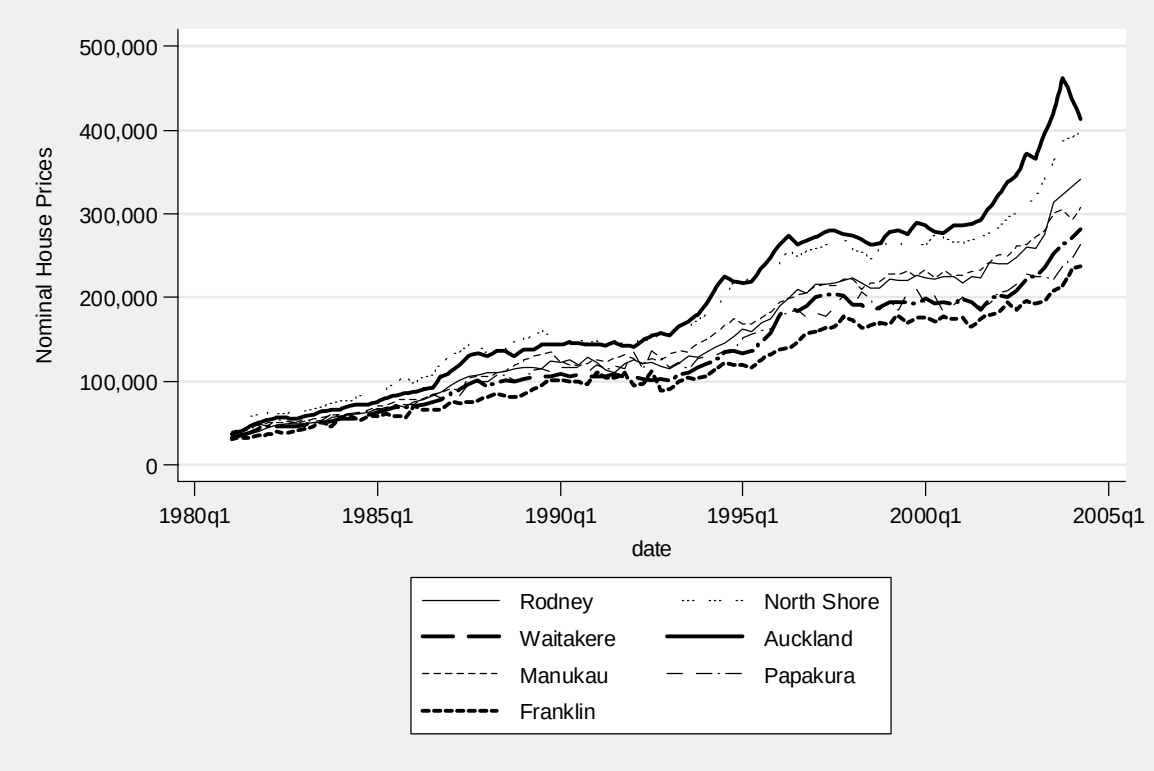
each split for clarity; Gisborne is presented together with Hawke's Bay; Nelson, Marlborough and Tasman are presented together). Strong examples of intra-regional divergence are apparent (e.g. Queenstown Lakes relative to other Otago local authorities), while examples of convergence are also apparent. For instance, within the Wellington region, three groupings are clear from the graph: Wellington city, peripheral Wellington (Porirua, Kapiti, Lower Hutt, Upper Hutt) and Wairarapa (Masterton, Carterton, South Wairarapa).

Figure 9: Nominal House Sales Price (Northland)



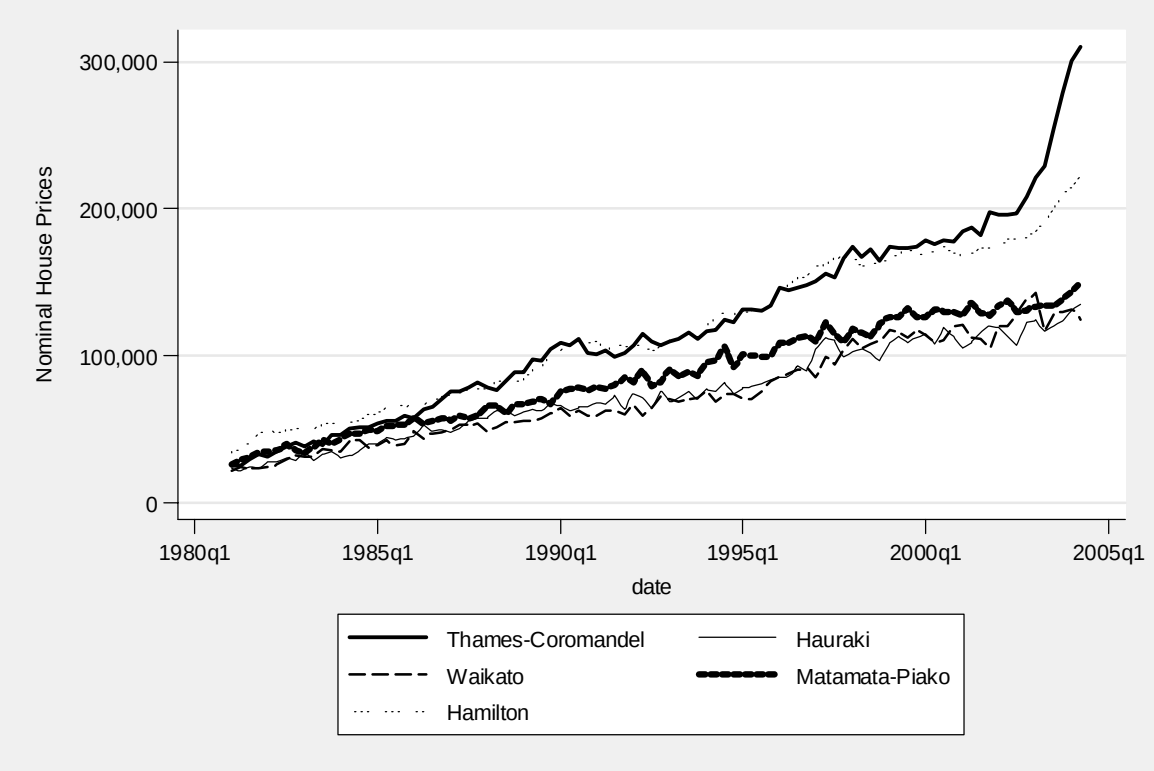
Source: Quotable Value New Zealand

Figure 10: Nominal House Sales Price (Auckland)



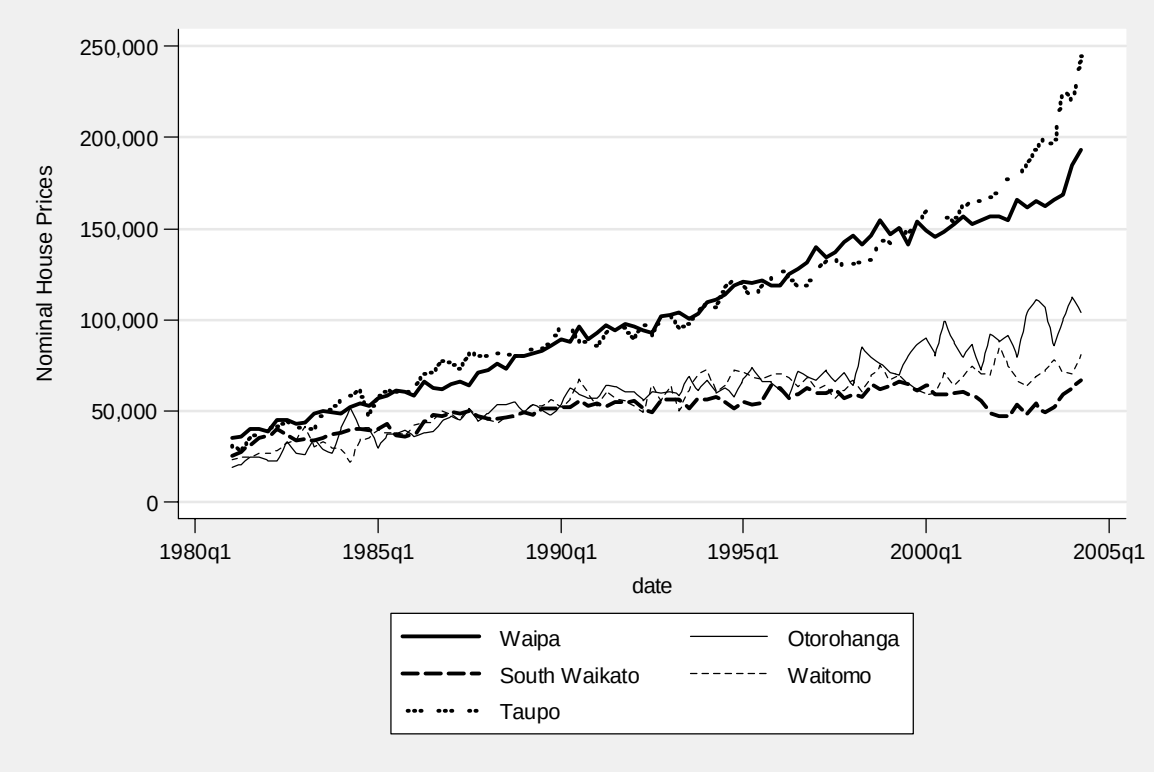
Source: Quotable Value New Zealand

Figure 11: Nominal House Sales Price (North Waikato)



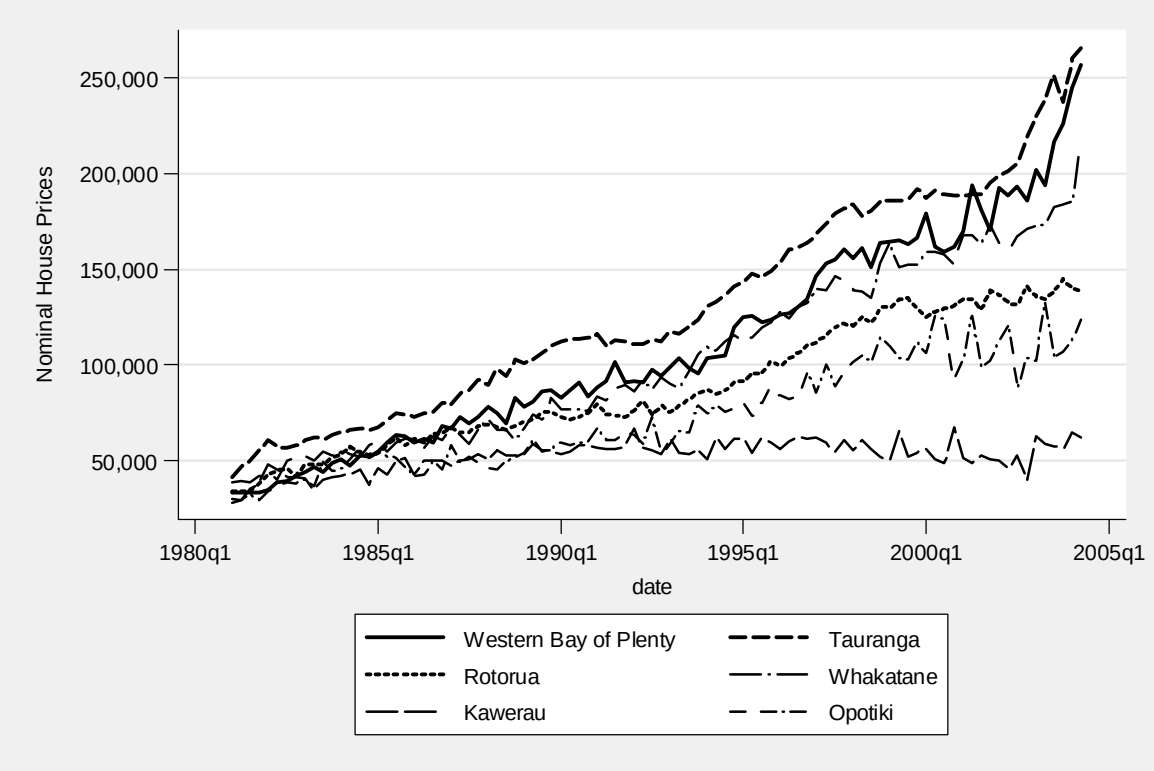
Source: Quotable Value New Zealand

Figure 12: Nominal House Sales Price (South Waikato)



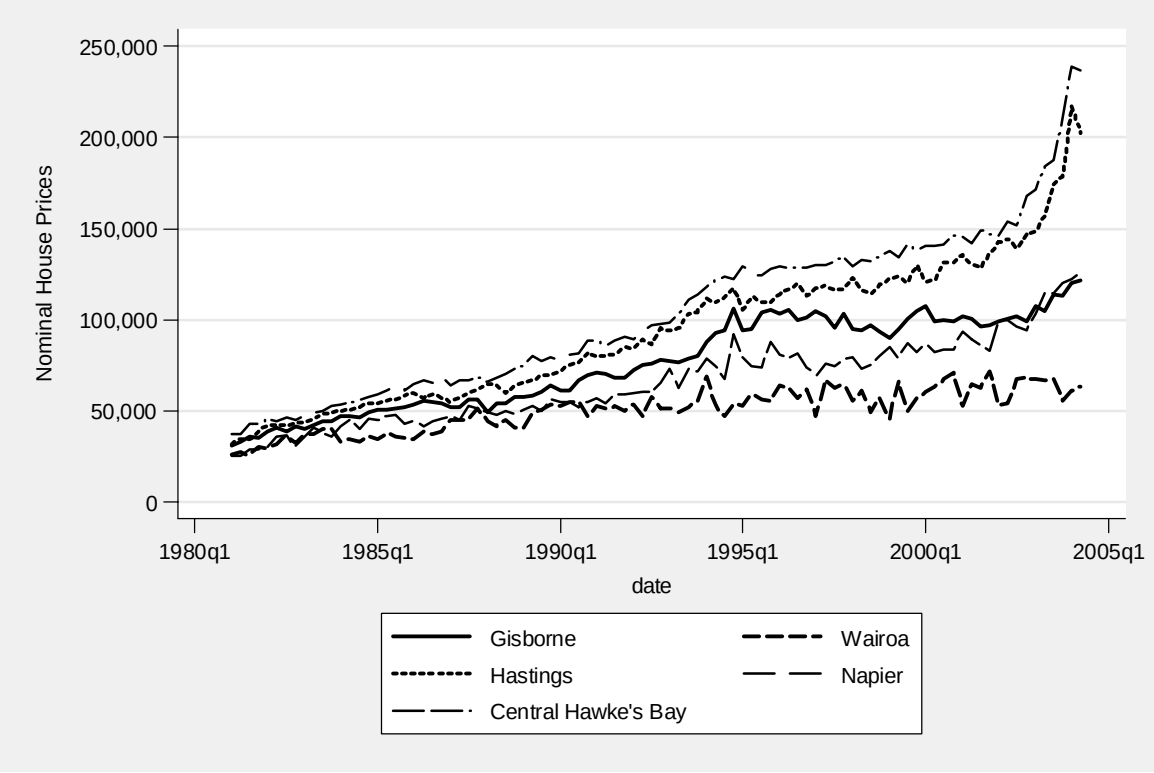
Source: Quotable Value New Zealand

Figure 13: Nominal House Sales Price (Bay of Plenty)



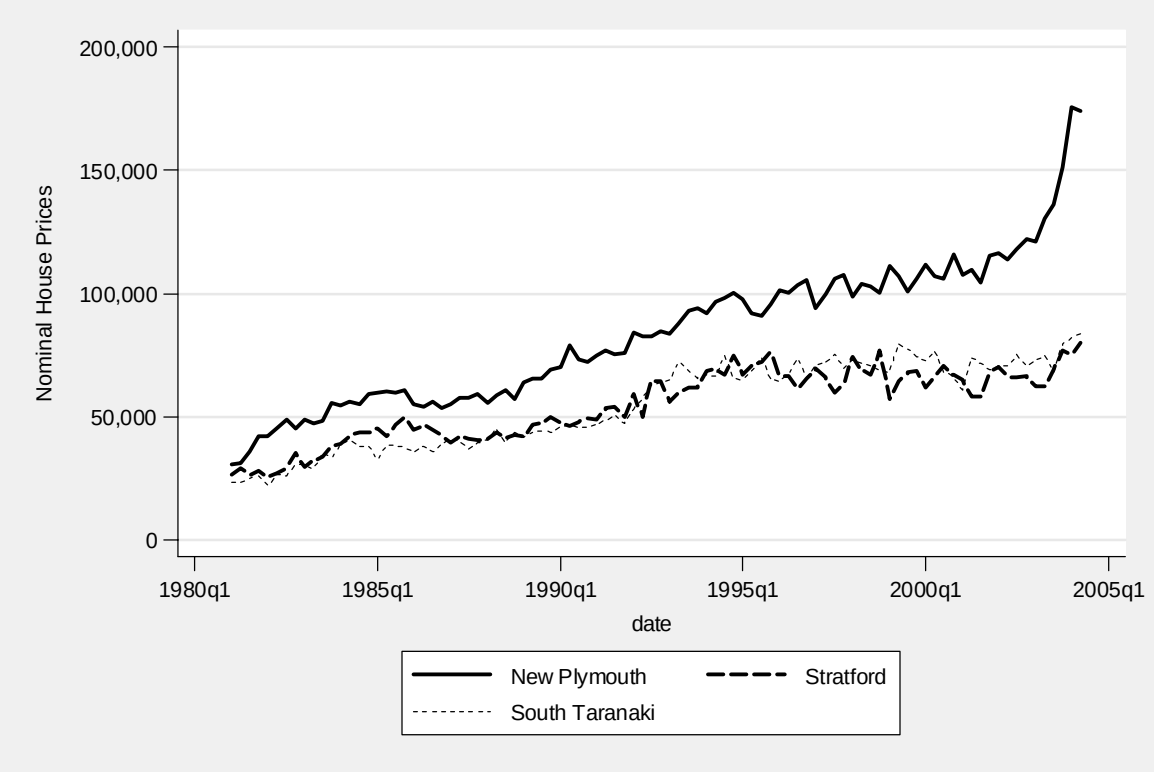
Source: Quotable Value New Zealand

Figure 14: Nominal House Sales Price (Gisborne & Hawke's Bay)



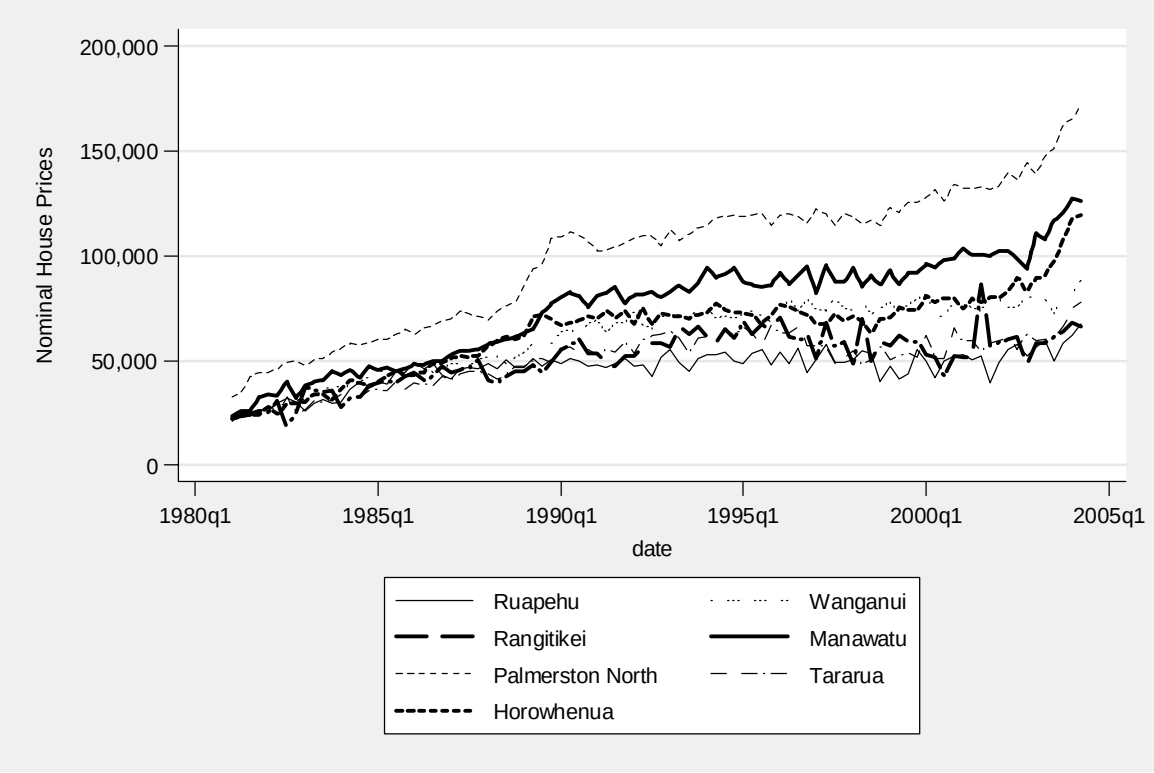
Source: Quotable Value New Zealand

Figure 15: Nominal House Sales Price (Taranaki)



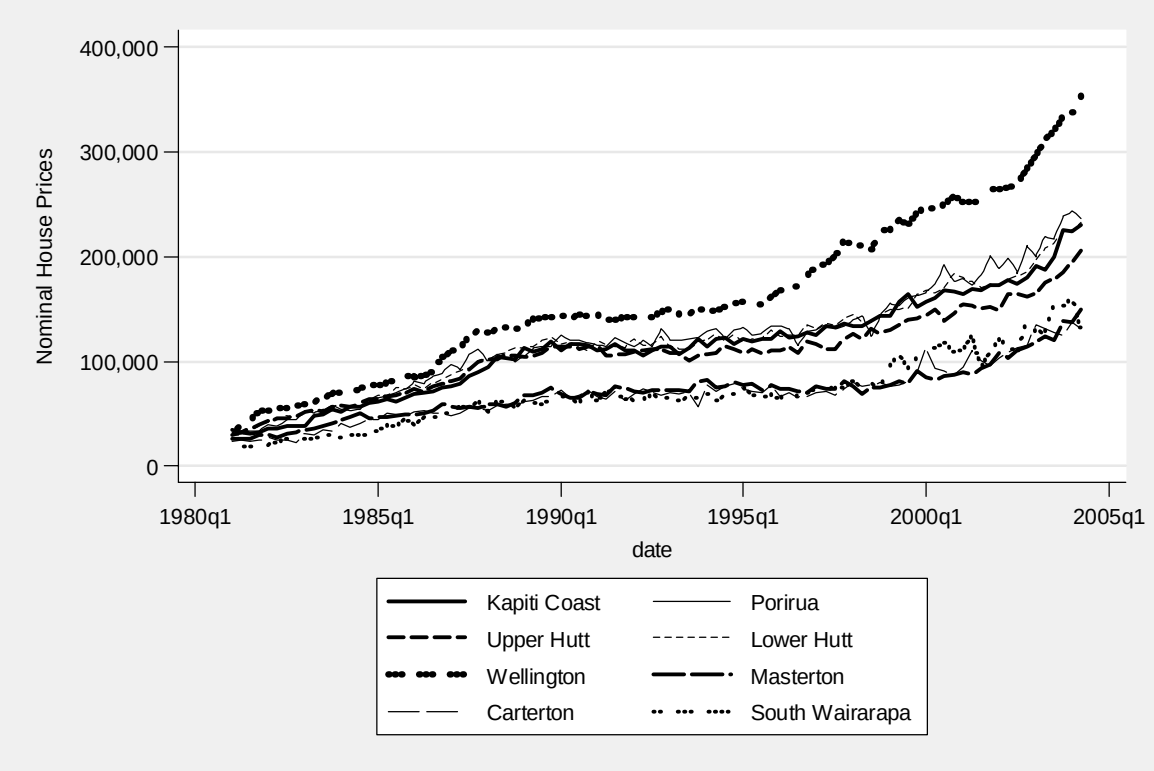
Source: Quotable Value New Zealand

Figure 16: Nominal House Sales Price (Manawatu-Wanganui)



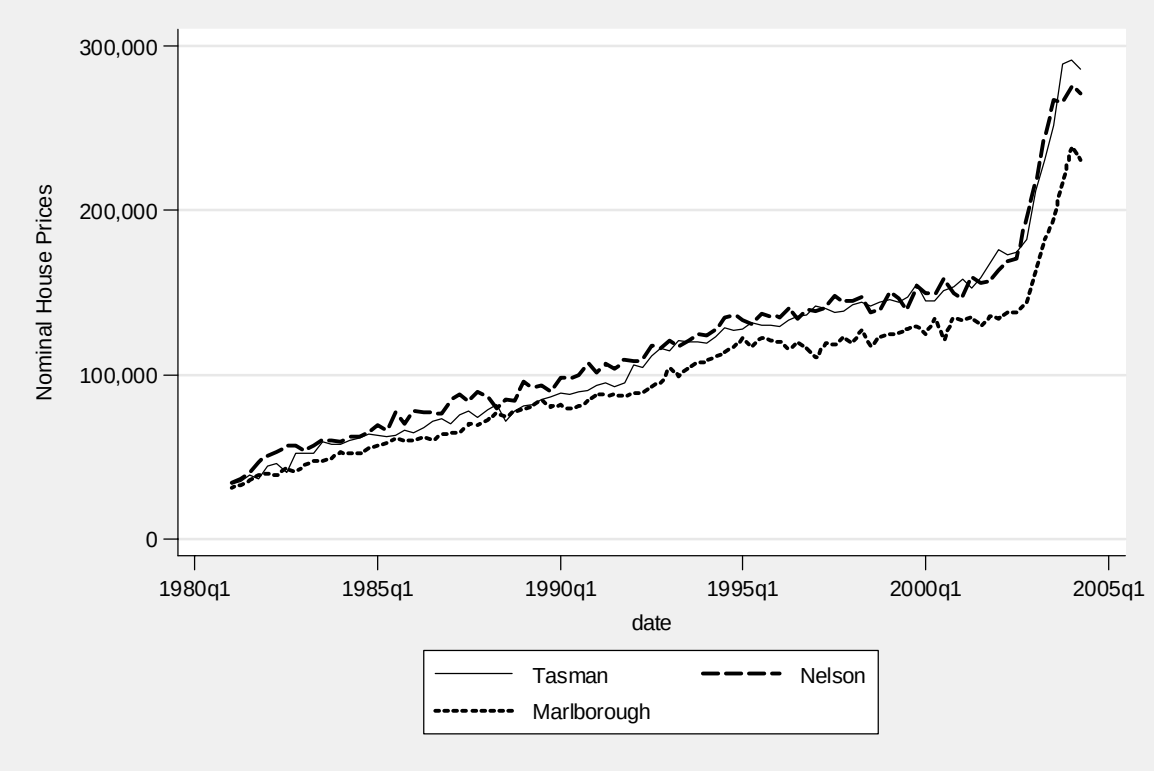
Source: Quotable Value New Zealand

Figure 17: Nominal House Sales Price (Wellington)



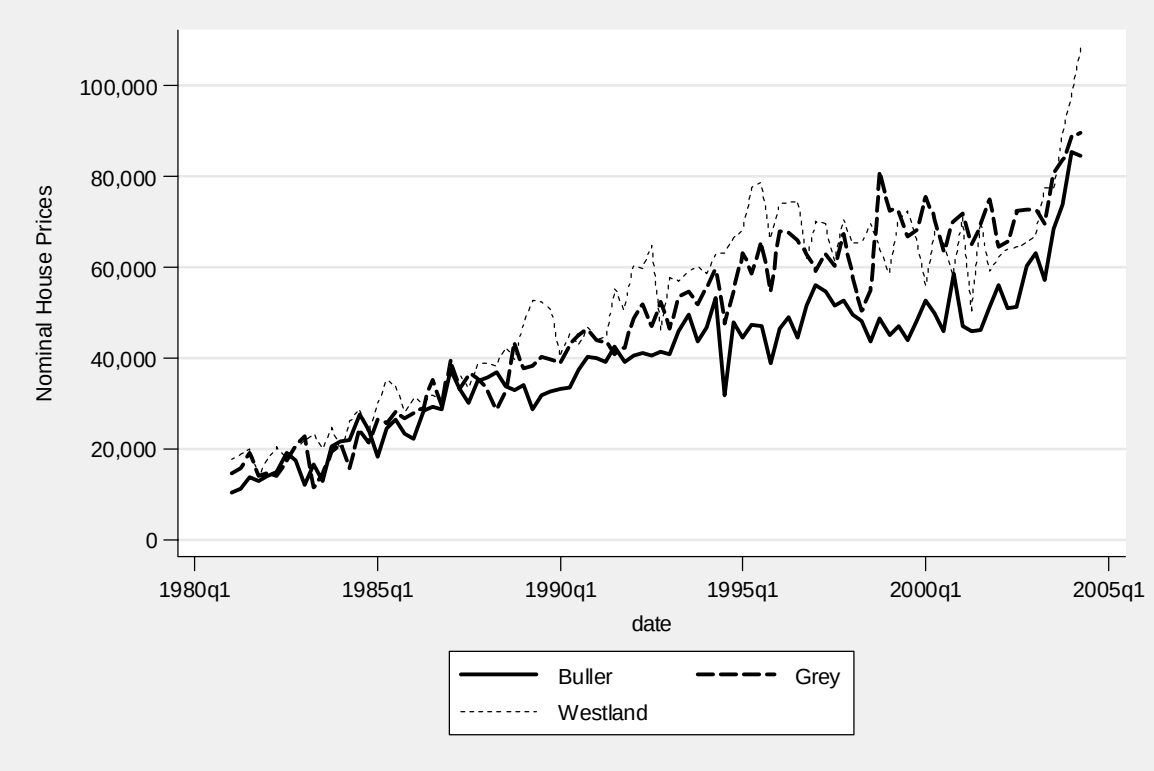
Source: Quotable Value New Zealand

Figure 18: Nominal House Sales Price (Nelson, Marlborough, Tasman)



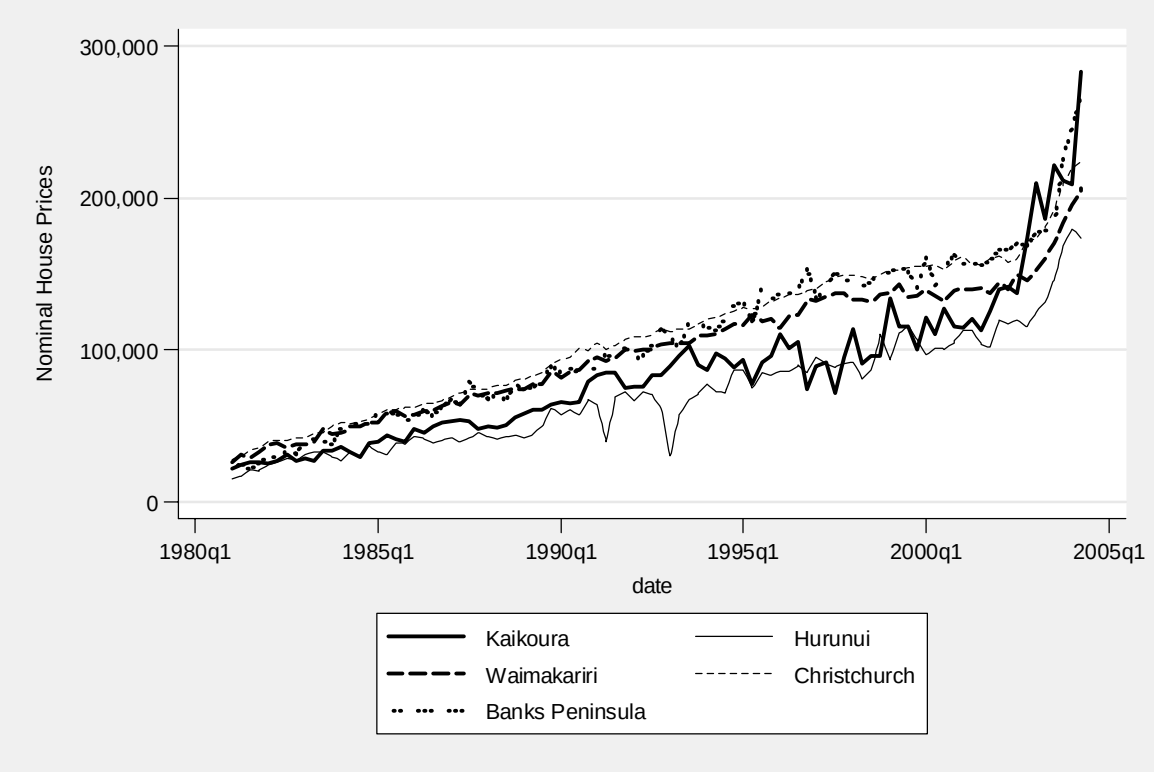
Source: Quotable Value New Zealand

Figure 19: Nominal House Sales Price (West Coast)



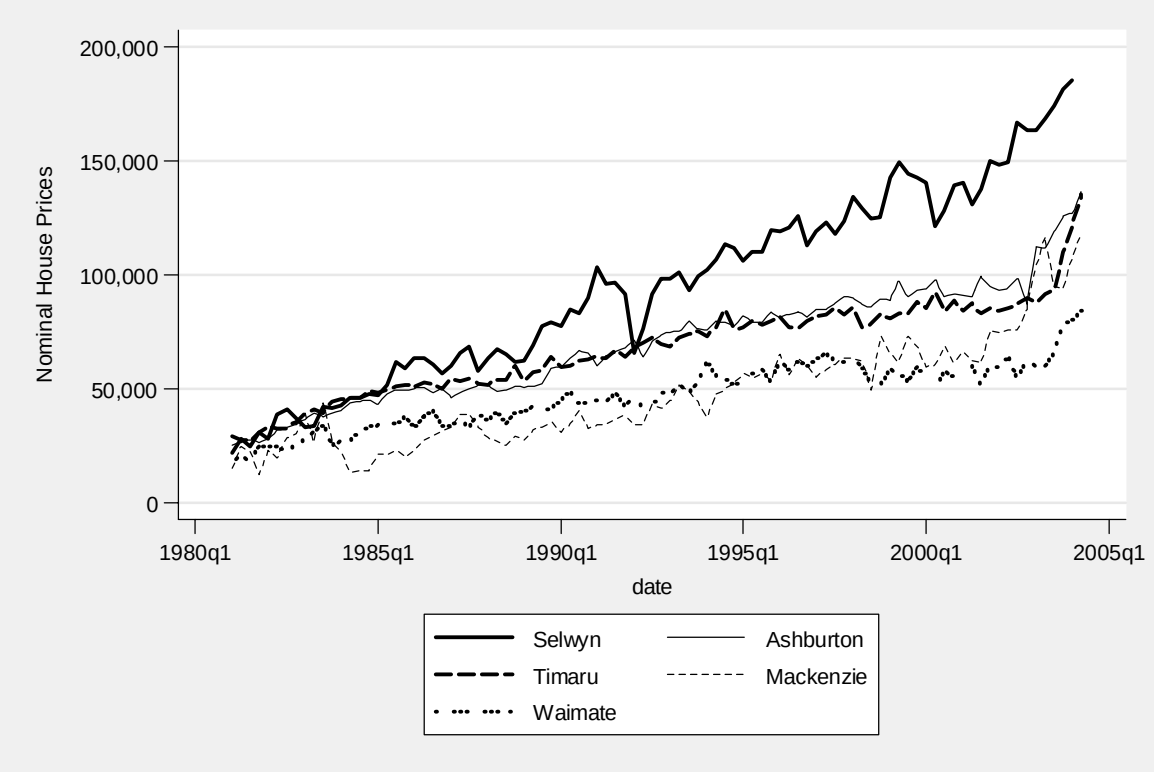
Source: Quotable Value New Zealand

Figure 20: Nominal House Sales Price (North Canterbury)



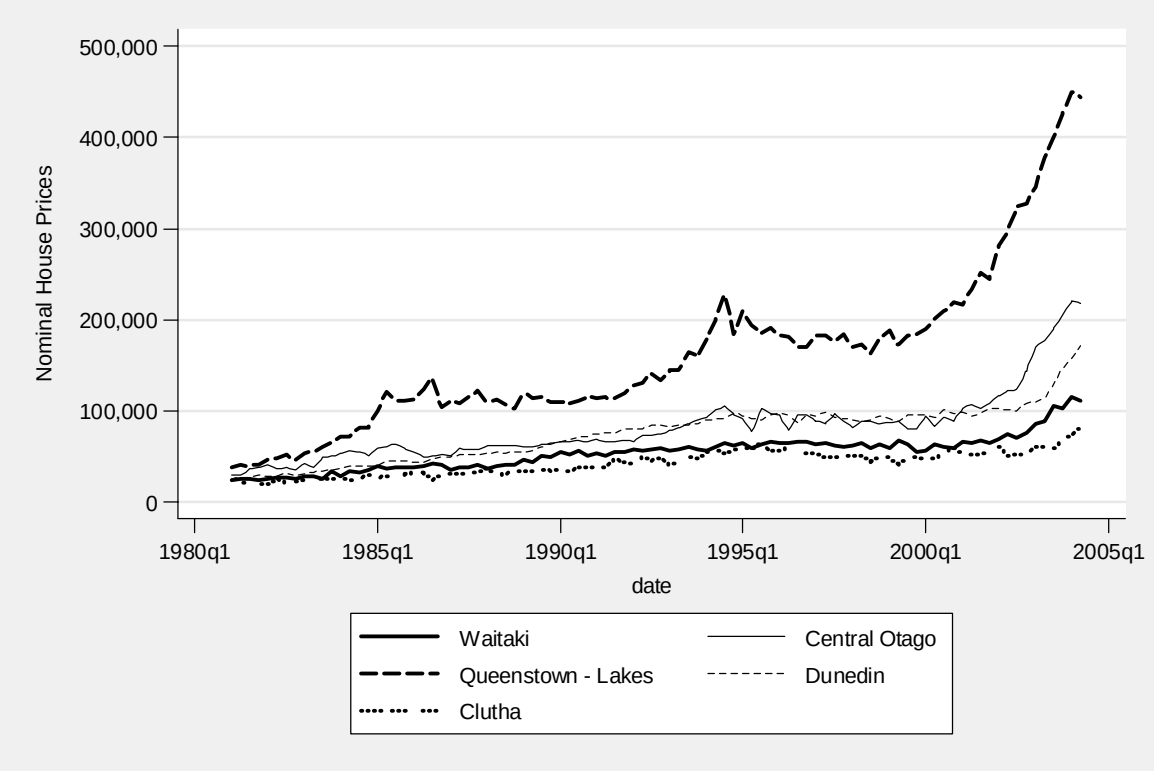
Source: Quotable Value New Zealand

Figure 21: Nominal House Sales Price (South Canterbury)



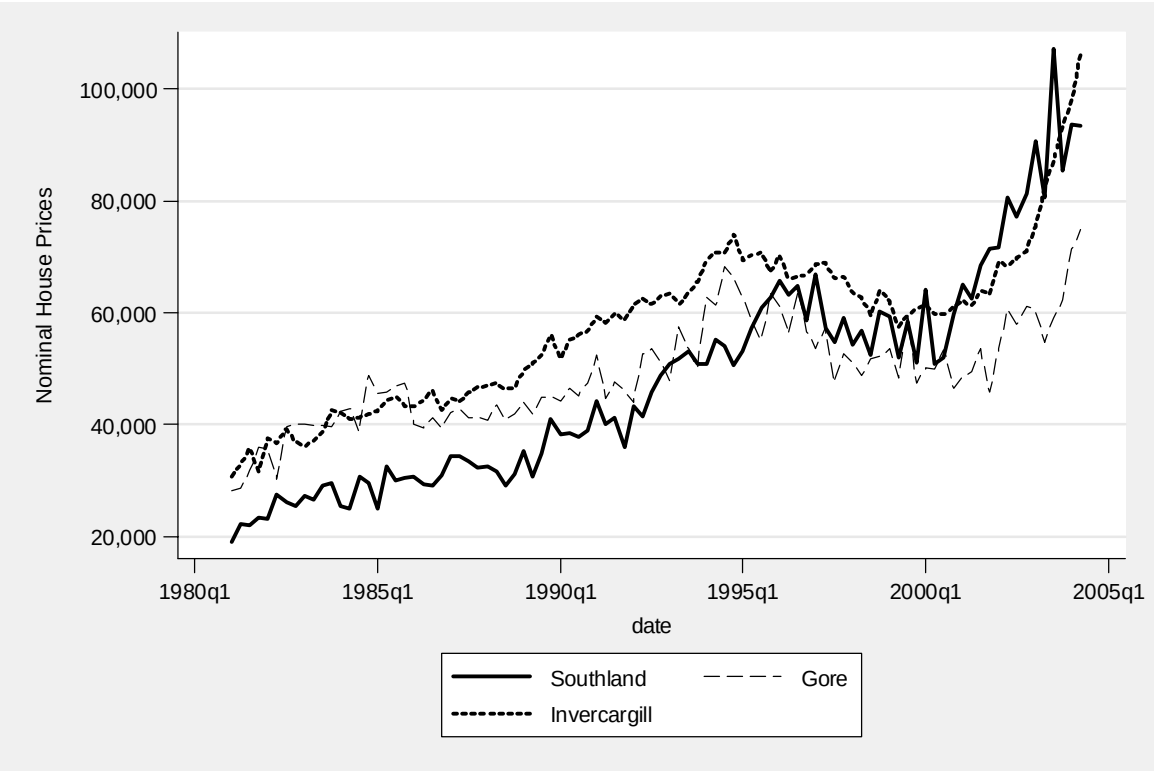
Source: Quotable Value New Zealand

Figure 22: Nominal House Sales Price (Otago)



Source: Quotable Value New Zealand

Figure 23: Nominal House Sales Price (Southland)



Source: Quotable Value New Zealand

Figure 24: Real House Prices Changes (1981-2004)

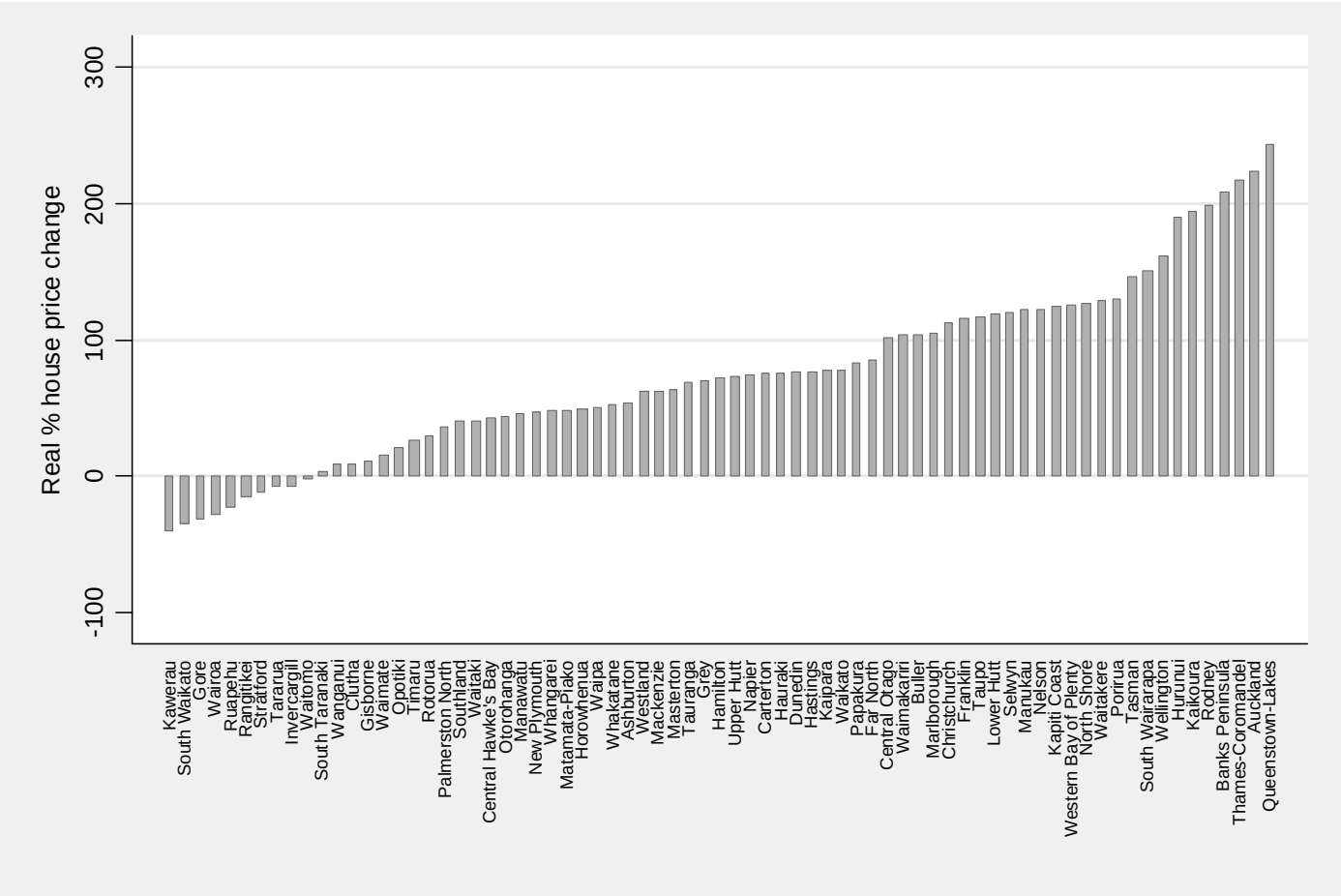


Figure 25: Vacant Section Real % Change (1981-2004)

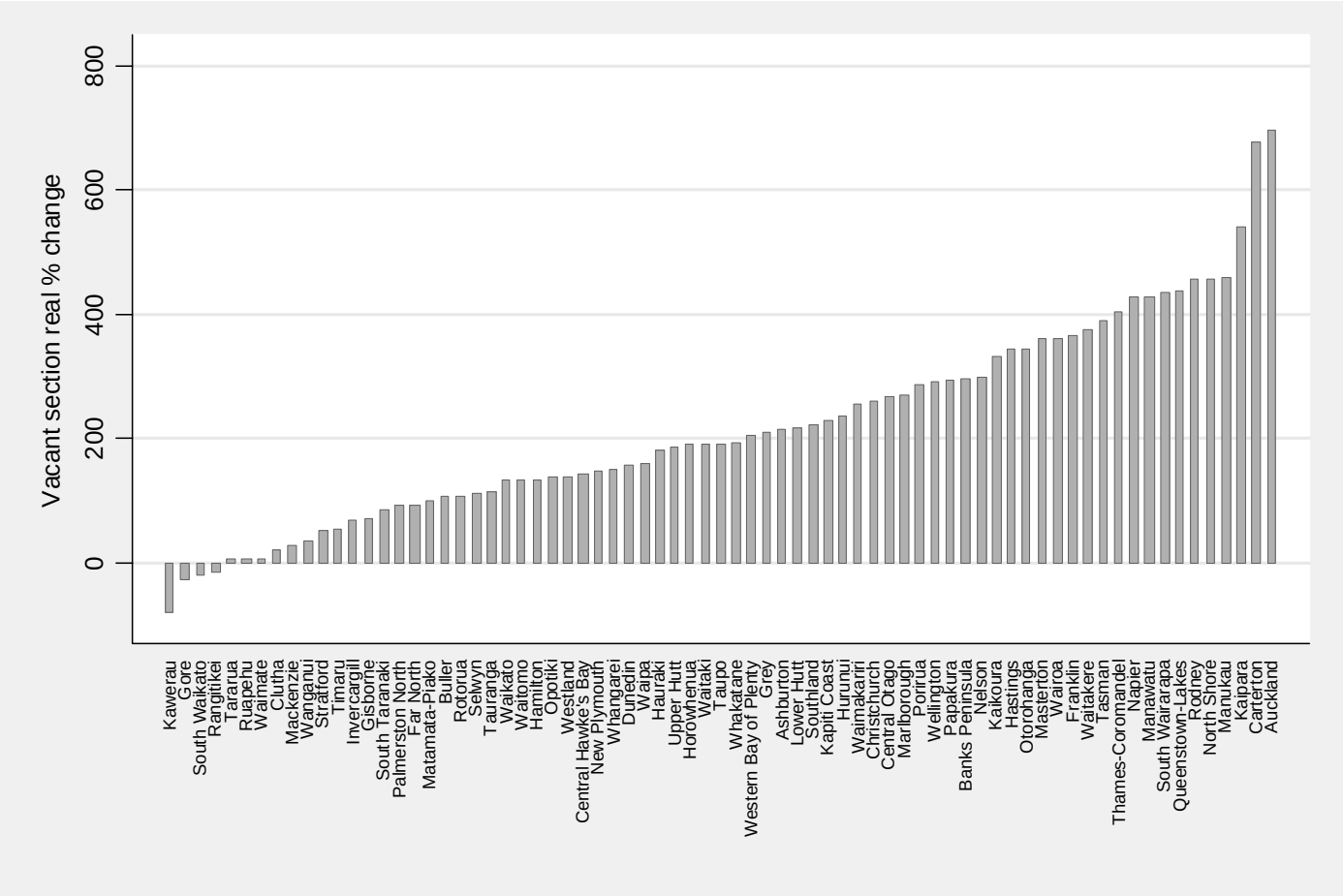


Figure 24 summarises the TLA information, presenting the real percentage house price change over 1981-2004 for each TLA. Four TLAs saw their real house prices at least triple over the 23 year period, while 26 experienced at least a doubling in real prices. However, ten TLAs saw real house prices decline over the 23 year period. When we examine this latter group, it is dominated by southern South Island and rural North Island areas. Each of these areas tended to experience population stagnation or decline and low economic growth over much of the past two decades. Strongly performing areas are dominated by the major urban centres and vacation destinations.

Further information at the TLA level is presented in Table 1. The first three columns of the table present the real median sales price for each TLA for 1981 (average of four quarters), 1992 and 2004 (average of four quarters to 2004(2)).[4] In 2004, median prices varied from $60,000 - $62,000 in Ruapehu, Kawerau, South Waikato and Wairoa, to $432,000 - $440,000 in Queenstown-Lakes and Auckland City.

The next three columns split the period in half and present the average percentage change in real sales price from 1981-1992, 1992-2004 and for the whole period 1981-2004. For the period 1981-1992, New Zealand real house price growth was 18%, varying from –34% in Gore to 71% growth in Banks Peninsula. Negative real sales price growth was experienced in 26 TLAs.

In contrast, between 1992 and 2004 real price growth has been significantly higher, with New Zealand-wide growth of 74%. Real prices declined by 16% in Kawerau and grew by 155% in the Queenstown-Lakes district. Only six TLAs experienced real declines, while ten areas had growth in excess of 100%.

Over the entire period 1981-2004, real house price growth across New Zealand was 105%, ranging from –40% and –35% in Kawerau and South Waikato, to 223% and 244% in Auckland City and Queenstown-Lakes. Twenty-six TLAs had growth of more than 100% while ten had negative real growth.

[4] The prices are presented in terms of June 2004 dollars.

Several rural South Island areas, Mackenzie, Southland, Central Otago and Clutha have had sharp reversals in fortune between the earlier and latter periods. All experienced negative growth between 1981-1992, but strong real increases between 1992 and 2004, with two areas, Mackenzie and Central Otago, experiencing growth of over 100%.

The final column of Table 1 presents the average number of sales per quarter in each TLA. This provides a measure of depth in the market. Not surprisingly, large urban areas have deep markets (high sales). Small rural areas have relatively few sales; for instance, Otorohanga averaged 22 house sales per quarter. There is no clear correlation between sales activity and long run house price increase. For instance, Invercargill, which had negative real price growth over the entire period had an active housing market, with an average 404 house sales per quarter. The more important issue raised by small sales volumes (especially in rural areas) is that purchasers and sellers wishing to transact in that area have a thin market. They are therefore likely to face longer waits in order to purchase or sell. House prices are also likely to be more volatile relative to prices in larger areas.[5]

A house represents a bundle of attributes. Its land is area-specific so the land value reflects changing attitudes towards living in that region (witnessed, for instance, with rising house prices in accessible sunny, coastal locations). The house also includes the housing structure, so the house price in part reflects the quality of the structure. Relative construction costs do not vary hugely across regions,[6] but land prices (and land price increases) do.

Table 2 presents equivalent information to that presented in Table 1, concentrating on the prices of vacant residential sections.[7] This measure provides information on the value of land underpinning house prices. Figure 25 presents this information in graphical form (and can be compared with Figure 24 for real

[5] This behaviour can be seen from the TLA house price graphs which indicate that smaller, rural TLAs have more quarter to quarter volatility than do larger, urban TLAs.
[6] As indicated by the regional house construction cost data that we present subsequently.
[7] This includes three QVNZ land categories: Vacant land on which typically a single dwellings house will be built, vacant land on which multiple housing units will be built and bare land which has an immediate potential for subdivision into dwelling house sites.

house sales prices). Across New Zealand as a whole, real section prices virtually quadrupled (a 286% real increase) between 1981 and 2004. This increase compares with an approximate doubling (105% real increase) in real house prices over the same period. Between 1992 and 2004, real section prices increased by 155%. Land prices have thus inflated at a much greater rate than the value of structures.

Between 1981 and 2004, only four TLAs experienced a real decline in land values: Rangitikei, South Waikato, Gore and Kawerau. Over the first half of the period, however, 30 TLAs experienced a decline in the real price of residential land; in the second half of the period real land prices dropped only in Kawerau. Very strong growth occurred in three Auckland TLAs (Auckland City, North Shore City and Manukau City), particularly in the second half of the period. Growth has also been strong in the tourist destination Queenstown-Lakes. Perhaps surprisingly, several relatively small TLAs with low or even negative population growth (Carterton, Kaipara, South Wairarapa, Manawatu, Wairoa and Otorohanga) have also had sizeable increases in the price of sections.[8] In some of these cases, but not all, growth may be attributable to increased demand for tourism/vacation purposes; in other cases, few sales are available so the data may not reflect the overall land valuation in the area.

Across regions, there is a strong relationship between the full period increase in real land prices and real house prices. The cross-sectional correlation coefficient between the two for the period is 0.67.[9] A comparison of Table 1 and Table 2 reveals not only that land prices have inflated faster, on average, than house prices, but that the dispersion of regional land price increases is greater than the dispersion of regional house price increases. Over 1981-2004, the highest rate of real house price increase was 244% (Queenstown-Lakes), while the highest rate of real residential land price increase was 697% (Auckland). Kawerau experienced the highest rates of both house price decrease and residential land price decrease; the real residential land price decrease (at 79%) was virtually twice its decrease in real house prices.

A cross-sectional regression of real house price changes (HP%) on real residential land price changes (LP%) and a constant over 1981-2004 gives the following results (t-values in brackets):

$$HP\% = 16.44 + 0.27*LP\%$$
$$(1.69) \quad (7.57)$$
$$R^2 = 0.45$$

These results are consistent with the descriptive statistics reviewed above. They indicate that, on average across the country, a 1% increase in real residential land prices translates into a 0.27% increase in real house prices;[10] the effect is highly statistically significant. In the absence of real land price increases, the equation predicts that real house prices would have increased by just 16.4% over the 23 year period, or by roughly 0.7% p.a. This is in keeping with real construction costs rising at a broadly similar rate to consumer prices over the period, which appears reasonable. As a result of this observation, it is important to examine the role of residential land prices further in terms of their effect on the housing market. We do so in section 4.

2.2 Housing Supply

Table 3 presents total occupied dwellings (private and public) at TLA level from the 1981, 1991 and 2001 censuses. The total housing stock increased by 35% between 1981 and 2001. Regionally, the strongest growth in the housing stock occurred in tourism related areas and coastal areas. The housing stock in Queenstown-Lakes almost tripled over the 20-year period to 2001. Rodney, Western Bay of Plenty, Kapiti Coast, Franklin, Thames-Coromandel and the Far North all had increases in the housing stock of over 60%. Eight rural areas had declines in their housing stock between 1991 and 2001 ranging from –6% to –1%.

[8] Carterton had population growth of 17% between 1981 and 2004; Kaipara, 8%; South Wairarapa, 9%; Manawatu, 14%; Wairoa, -24%; Otorohanga, -2%.
[9] The rank correlation coefficient between the two is 0.72.
[10] It is likely that our measure of land prices is "noisy" (i.e. includes some inaccuracies); the result is that the estimated coefficient may understate the true effect.

More detailed information on housing stock changes between each census is given in Table 4.

Table 5 reports data on the fastest and slowest growing housing stocks over the last five censuses for TLAs with a population of more than 50,000. The ability of some areas to expand their housing stock is quite remarkable. Rodney has increased its housing stock by an average of 24% in each 5-year interval in line with its population growth of 104% between 1981 and 2001. Tauranga and Franklin have also seen average intercensal growth of 19% and 16%, respectively. At the other extreme, Invercargill City lost 1% of its housing stock between 1996 and 2001, while losing 5% of its population.

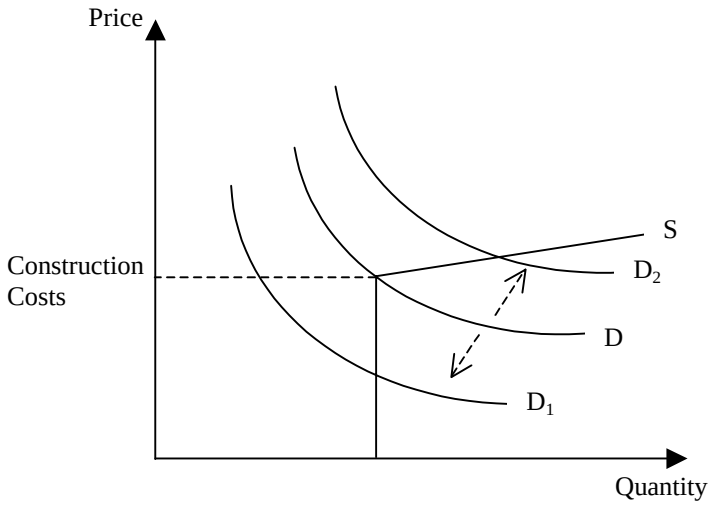
Glaeser and Gyourko (2005) provide theoretical and empirical support for the propositions that city growth rates tend to be highly skewed, with cities growing more quickly than they decline. Positive shocks tend to increase long run population more than they increase long run house prices, whereas negative shocks tend to reduce house prices more than they reduce population. They also predict that urban decline will be more persistent than growth because a negative shock results in a slow rate of population loss. This is a consequence of the durable nature of houses, which limits the rate at which cities decline.

The durability of housing also implies that in response to a negative shock, cities are likely to be faced with relatively small loss in housing stock in conjunction with large declines in house prices. These patterns are illustrated in Figure 26. The housing market is originally at the intersection of demand (D) and supply (S) with corresponding house prices and housing stocks (measured along axes Price and Quantity). If demand falls (to D_1), house prices drop sharply in the face of virtually constant housing supply since the same stock of houses remains in the locality. If demand rises (to D_2), long run supply increases (provided land is available) so the housing stock rises strongly without major price rises. However if supply is not responsive (i.e. if the S curve slopes steeply upwards), the effect is a sharp rise in prices with much less quantity response.

The level of sales prices relative to a linear long-run trend gives a rough indication as to whether prices could be construed as being ‘under’ or ‘over’

valued at a particular time. Comparing the price of houses in each local authority in the second quarter of 2004 to a linear trend shows house prices being 22% above trend on average for New Zealand. South Island TLAs dominate those with prices above trend, with Kaikoura, Central Otago, Invercargill and Queenstown-Lakes having prices above trend of 77%, 70%, 52% and 51%, respectively. Gore, Mackenzie, Tasman, Masterton, Timaru, Marlborough and Waitaki are also above trend by an average of 44%. At the lower end, Waikato prices are 2% below trend, Rotorua 1% above trend, South Wairarapa, Matamata-Piako and Wanganui are all 5% above trend. Part of the reason behind this pattern of regions with above trend relative to those with on-trend observations (in 2004) relates to the different time path of house price rises across areas. The southern South Island had a long period of stagnant house prices followed by a late-period catch-up. It is a moot point whether the stagnation period or the recent catch-up (if either) represents "out of equlibrium" behaviour. Whatever is the case in this regard, the national pattern is one where house prices are generally well above trend in recent quarters. In turn, this may suggest that housing supply still has some catching up to do with past increases in house demand.

Figure 26: Housing Supply and Construction Costs



Source: Glaeser and Gyourko (2005)

Building consents indicate future building activity. Using monthly data gathered by local authorities since 1991 it is possible to examine the number and value of building consents issued for houses and apartments.[11] Data are also available for consents issued as a requirement for major alterations and additions to residential buildings. Table 6 summarises key information on building consents since 1991 across TLAs.

Five of the seven highest-ranked TLAs in terms of total building permits (for new houses and apartments) are in the Auckland region. Auckland City is noticeable for its high proportion of apartments to houses; Manukau has a greater number of consents for new houses (excluding apartments) than does Auckland. Tauranga is of particular interest. Despite not being a major city (at the start of the period) it is ranked fifth of all TLAs in terms of its consents. Over this period, its real house price increase (80%) was little different to the New Zealand average (74%). Its real land price increase (58%) was approximately one-third the New Zealand average (155%). This responsiveness of building activity in the face of low land price increases (i.e. in costs) is consistent with the model of Glaeser and Gyourko outlined above.

There is a strong cross-sectional correlation between house prices and building consents, with a correlation coefficient of 0.81 between quarterly real median sales price growth and the number of quarterly building consents. Thus areas that have had high house price growth also tend to have had large increases in new housing stock. This relationship is as expected from a standard investment model in which entrepreneurs invest more when the price of the output (houses) rises.

However this relationship is complicated if there are substantial changes in the price of inputs. In the case of housing, input costs correspond particularly to construction costs and land prices. Trends in land prices have been reviewed in section 2.1. Table 7 presents data on the real cost of building a

[11] 'Consents' refers to the number of units covered by consents. For example, one consent for an apartment building can cover multiple units. Building Consents reported here are seasonally adjusted.

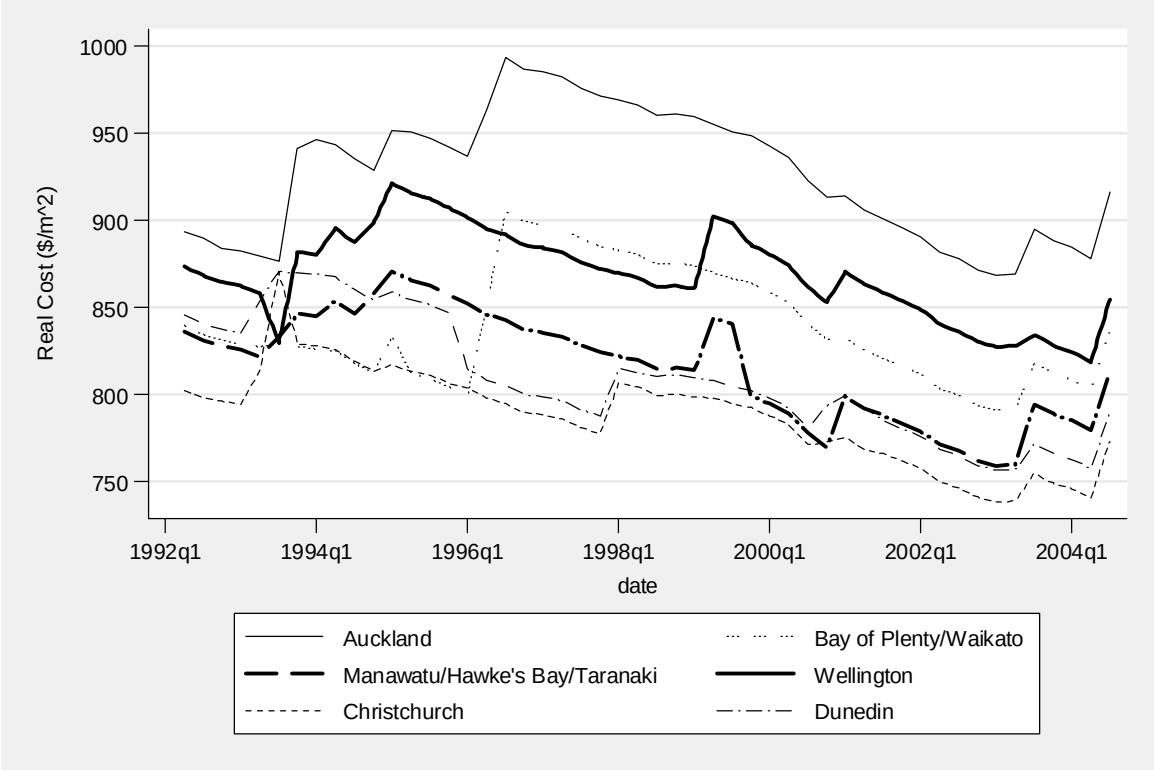
standard house for six geographically large regions.[12] The real cost per square metre has fallen between 1992 and 2004 in all regions except Auckland, where it has remained virtually unchanged.[13] Figure 27 shows however, that there has been an upturn in costs in all regions since mid-2003. In addition, there has been a trend towards larger houses (new stand-alone dwellings are approximately 50% larger in 2005 than they were in the early 1990s).[14] In section 4, we examine the relationship between supply responsiveness (measured using building consents), house prices, construction costs and land prices.

[12] Standard house specification: 2001 onwards: 94m^2; 3 bedroom; level site; timber pile base; fibre cement base lining with plastic vents; timber steps; fibre cement weatherboards; R 2.2 batts to walls, R 2.4 batts to ceilings; truss gable roof with ceiling battens; Zincalume roofing and accessories; aluminium joinery; particle board floor; Gib board to walls and ceilings; shower over bath; separate wc; separate laundry with ss tub and cupboard under; 12 lights; 16 power outlets; average quality wallpaper; conventional four element stove.
1992 - 2000: 94m^2; 3 bedroom; level site; concrete pile basement/fibre cement lined; concrete steps; weatherboards; all exterior walls and ceilings lined with 75mm batts; corrugated iron gable roof; timber joinery; particle board floor; gibraltar board walls; sloping ceiling with exposed rafters to dining room/lounge; flat ceiling to other areas; separate shower/bath/laundry; separate WC; 12 lights; 16 power points; average quality wallpapers; conventional four ring stove.

[13] Data from the Department of Building and Housing (sourced from Maltby's and the former Building Industry Authority) show that real construction costs have increased by an (unweighted) average of 27% between July 1999 and July 2004 across six regions. For the same period, New Zealand Building Economist data show an (unweighted) average real decline of 3% across six regions for a 'standard' house. NZBE data for an 'executive' house (149m^2) also show a similar decline over this period. This discrepancy indicates that future work needs to be done on determining the best ways of measuring construction costs that adjust for quality changes, on a regional basis over time.

[14] Source: Statistics New Zealand building consent data. Size of house is a choice variable of the new owner/developer and so is correctly accounted for in the construction cost data which is measured per square metre.

Figure 27: Real Residential Construction Costs (1992-2004)



Source: New Zealand Building Economist

2.3 Demographic variables

Population growth and decline has varied significantly across TLAs over the last 24 years as shown in Table 8. New Zealand's population grew by 26% between 1981 and 2004;[15] across TLAs, growth ranged from –40% in Mackenzie to 257% in the Queenstown-Lakes district. Twenty-five TLAs experienced a fall in population, while 11 had increases of more than 50%.

There is a very strong relationship between population and dwelling stock. Across 73 TLAs and 94 quarters the correlation between the logarithm of the dwelling stock and the logarithm of the population gives an R^2 of 0.99. The estimated coefficient of 0.98 in a regression of (log) dwelling stock on (log) population is also very close to one.

[15] The 2004 figure is an estimate by Statistics New Zealand. The total New Zealand population from the 2001 census was 3,737,277.

The coefficient estimates (and R^2s) using intercensal *changes* are below those in levels, but still quite close to one; the coefficient for the change in dwellings regressed on the change in population between 1981 and 1986 is 0.81 and between 1996 and 2001 it is 0.82. The relationship appears stable over time. The strength of these relationships suggests that variation in population is accommodated substantially through changes in the dwelling stock, although there has also been a material trend decline in the number of people per dwelling.

Changes in the number of people per dwelling can occur either through change in the occupancy rate or vacancy rate.[16] The vacancy rate used here is the ratio of empty dwellings to total dwellings (occupied and unoccupied). Unoccupied dwellings includes both empty dwellings and dwellings with residents away on census night. Empty dwellings include unoccupied baches and holiday homes, which should ideally be excluded from a vacancy rate. With existing data it is not possible to do so. Thus what we refer to as the "vacancy rate" represents two principal factors: mis-match (i.e. dwellings that are unoccupied and potentially available to filled by tenants or owners), and dwellings that are owned as holiday homes and are not necessarily available for tenants. An understanding of each of these factors is important for interpreting the appropriateness of the current fit between housing supply and demand. Further work to differentiate between these two categories is warranted in future.

Significant variation in either the vacancy rate or the occupancy rate would mean that the tight link between dwelling stock and population established above could weaken. There is significant change in the number of empty residential dwellings and in the vacancy rate. In 1986, the mean rate across 73 TLAs was 9.3% with a standard deviation of 8.4%. In 2001 the rate was down slightly to 8.9% with a standard deviation of 6.7%. As expected, the vacancy rate is higher in several areas where holiday homes are prominent, such as Thames-Coromandel and Queenstown-Lakes. This indicates that our measure of the "vacancy rate" is affected by inclusion of holiday homes as vacant dwellings,

[16] The vacancy rate used here is the ratio of empty dwellings to total dwellings (occupied and unoccupied). Unoccupied dwellings includes both empty dwellings and dwellings with residents away on census night. Empty dwellings include unoccupied baches and holiday homes, which should ideally be excluded from a vacancy rate. With existing data it is not possible to do so.

further underscoring the need to obtain better information on true vacancies and on the numbers of holiday homes across different areas.

Table 9 presents data on the occupancy rate (usually resident population divided by the total number of occupied dwellings) for the three census years 1981, 1991 and 2001. With the exception of Auckland City, by this measure, all TLAs have had a reduction in their occupancy rate between 1981 and 2001.

Table 10 lists the top ten and bottom ten local authorities by occupancy rate in 2001. Of the top ten TLAs by occupancy rate, four (Manukau, Waitakere, Papakura and Franklin) are in Auckland, while Porirua is in Wellington. In each case, these areas tend to be the poorer parts of the city, as measured by median income (see Table 11). Given the high price of houses in Auckland and Wellington, these high occupancy rates (particularly in Manukau which has a rate well above any other area) may indicate that crowding, driven by low real incomes, is an issue in these local authorities. A further three TLAs in the top ten (Otorohanga, Kawerau and South Waikato) have very low house prices. While these areas also have low median incomes, it is hard to attribute the high occupancy rates to high housing costs in these cases. More likely, the high occupancy rates reflect demographic characteristics (e.g. ethnicity, family size).

Areas with low occupancy rates tend to be either vacation areas (e.g. Thames-Coromandel), where vacation homes may be prevalent, or to be in rural South Island (reflecting demographics). Only one obvious "retirement" area (Kapiti) is included amongst this group; it also has a number of vacation homes. As the population ages, choice of retirement location is likely to become more prominent as a determinant of regional occupancy rates.

2.4 Economic variables

Table 12 and Table 13 present GDP and GDP per capita[17] for TLAs between 1981 and 2004. While Auckland City is the largest TLA, Queenstown-Lakes has had the largest percentage increase in GDP between 1981 and 2004 of 299% (reflecting its strong population growth). Only two TLAs have seen a real decline in GDP between 1981 and 2004: Kawerau and Ruapehu, which are relatively small TLAs that have seen population decline over this period. There is a strong cross-sectional correlation between house prices and per capita GDP across TLAs, with a correlation coefficient of 0.51. This indicates that wealthier areas (in terms of production per capita) tend to have higher house prices. (However the correlation between the changes in the two variables is only 0.08.)

The largest growth in GDP per capita occurred in Mackenzie (167%), Hurunui (131%) and Clutha (102%) between 1981 and 2004. Queenstown-Lakes has had the lowest per capita growth over this period, reflecting its industry mix (including a sizeable portion of low-paid services).

The Output series of the Producers Price Index provides information on changes in the level of prices across 17 major industry classifications. This national level data has been weighted by TLA employment to form a real PPI Output series for each Local Authority. Similarly, we have constructed a real commodity price series for each TLA weighted by the agricultural commodity mix of that TLA.[18] In each case, there is a moderately strong correlation of house prices with these local output price series. The cross-sectional correlation between real house prices and real PPI(O) is 0.51, while that between real house prices and real commodity prices is 0.49. Local economic factors therefore appear to be related to local house prices. These economic relationships are explored further in section 3.

[17] Gross TLA Product is formed using National GDP by industry data, weighted by TLA employment in each industry as a proportion of total NZ employment in each industry.
[18] For details of the construction of the PPI(O) and commodity price series, see Grimes and Aitken (2004).

3 Housing Demand

House prices respond to the forces of supply and demand for housing services. If demand increases in a certain region, we can expect to see upward pressure on house prices in the region until such time as demand pressures decline (due to the price increases) and demand is once again equated with supply. Another response to the increase in demand (investigated further in section 4) is that new housing construction will occur, so housing supply will tend to rise, placing a dampening influence on house prices. We take the approach that the short-term supply response has minimal effect on the housing stock within one to two quarters (or even over one to two years), so the primary immediate effect of a housing demand change is on house prices. A long-term effect of a demand increase is to increase housing supply; the degree of the resulting offsetting impact on prices is determined by the speed and degree of new supply responsiveness.

Our theoretical approach to modelling regional house price determinants in each region is based on the demand model of Pain and Westaway (1996). The model, and our use of it, is explained in detail in Grimes et al (2004), so we just give a flavour for its rationale here. Pain and Westaway formulate the decision facing a typical consumer as one where each household allocates its lifetime wealth over consumption of housing services in each period of life, non-housing consumption in each period of life, and over its bequest. Under certain standard assumptions, the real price that people are prepared to pay for a certain quality of housing in an area is given as a function of:

- the area's dwelling density (ratio of dwellings to population);[19]
- per capita incomes in the area; and
- the user cost of capital.

[19] Note that when we refer to "dwelling density" we are referring solely to the ratio of dwellings to population; we are not referring to density in a spatial (dwellings/area) context.

We have data for the dwelling density and for the user cost of capital in each TLA.[20] We proxy local per capita incomes by our measure of per capita real TLA production, supplemented by the real value of commodity prices relevant to each TLA. The latter captures the income effects (for a given level of production) that accrue, especially to primary producers, when the prices of commodity production rise or fall.

People will be prepared to pay extra for higher quality housing. Quality is a function both of house-specific attributes (more bedrooms etc) and neighbourhood-specific attributes (e.g. more amenities, "nicer neighbours", etc). We "quality adjust" our house prices by: (a) using sales prices solely for stand-alone residential dwellings (so comparing like with like as much as possible); (b) using the median rather than the average price in each TLA so that the observed price is relatively immune to the presence of "outliers" (e.g. of the sale of an unrepresentative extremely highly priced house in a TLA in a specific quarter); and (c) smoothing the resulting price series by relating the median sales prices to the government valuation of the median house (allowing the overall portion of house price changes to be included, while adjusting for the effect of individual house quality variation).[21] We enter two variables to proxy for the neighbourhood characteristics:[22]

- proportion of the workforce aged over 15 who are in employment (hypothesised to raise the perceived quality of the area); and
- population size (or, equivalently, density) which is hypothesised to have a positive relationship with provision of (public and/or private) amenities in a region.[23]

[20] Our user cost of capital comprises the real interest rate (i.e. the nominal interest rate less inflation) minus the expected rate of capital gains (proxied by the rate of annual real capital gains over the past three years within that TLA).
[21] Our method for doing so is based on that of Bourassa et al (2004).
[22] In addition, we include a separate constant term (fixed effect) for each TLA and a separate time trend for each TLA; these variables capture level and trending quality variables relevant to each TLA for which we do not have data. They can proxy, for instance, for changing valuations of climate relevant to each locality.
[23] In previous work (Grimes et al, 2004) we estimated the relationship with and without the population term; the results were similar across both specifications, although the absolute value of the coefficient on the dwelling density term rose when population was omitted.

Finally, we add a variable, real construction costs, to proxy for people's expectations regarding the rapidity of response of new housing supply. The higher is the level of real construction costs (other things being equal) the lower will be the new supply response, so the higher will be house prices. Another way of viewing this variable is to consider that people price the value of the housing structure according to its replacement cost, which in turn is a function of construction costs.

Our data corresponding to TLA i in quarter t is outlined below:

Variable	**Definition**
$\mathbf{P}_{it}$	log of the real median house price
$\mathbf{XPROD}_{it}$	log of per capita production
$\mathbf{XEMP}_{it}$	log of the workforce participation rate for people over 15
$\mathbf{POP}_{it}$	log of usually resident population
$\mathbf{COM}_{it}$	log of the real commodity price relevant to the TLA
$\mathbf{DD}_{it}$	log of the dwelling density (dwellings/population)
$\mathbf{CPID}_{t}$	log of the ratio of CPI for purchase and construction of new dwellings to total CPI
$\mathbf{UC}_{it}$	real user cost of capital using TLA-specific capital gains
$\mathbf{UCD}_{t}$	dummy variable = 1 prior to 1985(1) and 0 thereafter to proxy for financial deregulation

We use this data to estimate an equation across all 73 TLAs for the 94 quarters covering 1981q1 to 2004q2 (6,862 observations). The very large number of observations enables us to obtain precise estimates of the effect of each of the variables. We estimate the equation using two estimation techniques: ordinary least squares (OLS) and Prais-Winsten (PW).[24] The results are as follows:

[24] The latter method allows us to take into account heteroskedasticity and autocorrelation in the estimates.

Dependent variable: P **Independent variables:**	**(OLS)**	**(PW)**
XPROD	0.2717***	0.2008***
	(7.00)	(2.69)
COM	0.4231***	0.2640***
	(6.01)	(2.67)
XEMP	0.5215***	0.6035***
	(9.63)	(5.82)
POP	0.4099***	0.5328***
	(3.28)	(2.77)
CPID	0.4138***	0.4267***
	(14.93)	(6.56)
DD	-0.7876***	-0.7899***
	(5.02)	(3.15)
UC	-0.0109***	-0.0069***
	(39.92)	(11.05)
UCD	-0.0492***	-0.0053
	(8.35)	(0.41)
Constant	1.4125	-0.2772
	(1.14)	(0.15)
Observations	6862	6862
Adjusted R-squared	0.9534	
Root mean squared error	0.0878	0.0722
Robust t statistics in parentheses (OLS) or absolute value of z statistic (PW) * significant at 10%; ** significant at 5%; *** significant at 1% TLA specific linear time trend and fixed effects included but not reported		

Interpreting these results, we find that increases in perceived neighbourhood quality and in per capita incomes place pressure on house demand. A 1% increase in per capita production raises real house prices by between 0.2% and 0.3%; a 1% increase in real commodity prices raises house prices between 0.26% and 0.42%. If employment participation rises by 1%, the effect is to raise real house prices by 0.5% to 0.6%. Demand caused by population growth also raises house prices. A 1% rise in population (holding the housing stock constant) raises real house prices by around 0.8% via the dwelling density term and by a

further 0.4% to 0.5% through the amenity effect (i.e. through the population variable).

These increases in demand are ameliorated by supply responses. A 1% increase in house supply relative to population (i.e. in dwelling density) has the effect of reducing house prices by approximately 0.8%. Thus new house supply in response to demand changes (driven for example by population growth) has an important potential for dampening long run house price responses. In addition, changes in real construction costs impact on house prices. If construction costs were to fall by 1%, the estimated effect is a 0.4% reduction in house prices. Finally, financial developments also affect house prices. If the real user cost of capital rises by one percentage point (e.g. from 6% to 7%) the estimated effect is to reduce house prices by 0.7% to 1.1%.[25]

Our findings here are broadly similar to those in our earlier reported work that used a shorter sample period that ended in 2002 (Grimes et al, 2004). The same variables are statistically significant here as in that work. However the absolute value of the coefficients on each of the income variables (XPROD and COM) are lower here than with the shorter sample, possibly suggesting that 'fundamental' economic factors have been less influential for house prices in the past two years than over the full sample. The construction cost and dwelling density coefficients, by contrast, are higher in the extended sample suggesting that supply-related factors may have become more influential in recent years.

The significance of financial, demand and supply factors on house prices is in accord with theory and with studies internationally. While housing policy may be able to do little about demand factors or (national and international) financial developments, the influence of housing supply factors means that policy may influence house prices by ensuring that new housing supply is responsive to demand pressures. We explore the degree of supply responsiveness across New Zealand in section 4.

[25] Our estimates (pertaining to UCD) indicate that financial deregulation may have had the effect of raising house prices, possibly by increasing the provision of credit. However this effect is not statistically significant when estimated using the Prais-Winsten technique.

4 Housing Supply

New house supply has an important role in determining house prices and in mediating urban dynamics. This is because of the durability of housing which creates an asymmetry in growth and decline. In declining areas, house prices and incomes are likely to fall long before houses are demolished (Glaeser and Gyourko, 2005). Urban expansion is determined by the elasticity of housing supply. Popular areas with high density and high levels of regulation are more likely to see relatively static changes in population with high house price and income growth. When supply expands quickly in response to demand pressures, however, the housing stock and population can grow quickly with little pressure on house prices (Glaeser and Gyourko, 2005).

Given the importance of new housing supply - and the paucity of work domestically on it - we examine this issue in some depth. First, we review work that has been conducted internationally on the topic. Second, we examine the issue econometrically in New Zealand, building on some of the statistical summary work in section 2. We find strong determinants of new house supply in New Zealand, with supply affected both by the price of houses and the costs of building new houses (including land, construction and financial costs).

An article by DiPasquale (1999) entitled *'Why Don't We Know More about Housing Supply?*, argues that in comparison with a large amount of empirical work on housing demand the empirical evidence on housing supply is limited. In particular the connection between housing construction and construction costs remains largely elusive in studies carried out using (mainly) US data.

Stock/flow models, determining the level of house prices and the volume of housing construction, have been the primary theoretical model for analysing housing investment. Follain (1979), Poterba (1984), DiPasquale and Wheaton (1994) and Topel and Rosen (1988) represent four alternative, but related, approaches to examining new housing supply. Poterba (1984) is the most

influential version in this stream.[26] Neither Topel and Rosen nor Poterba explicitly address the role of land. Poterba focuses on the price of housing structures only.

More recently DiPasquale and Wheaton (1994) have estimated a simple model of housing construction combining a stock adjustment process with a long run spatially-based definition of the equilibrium housing stock. Prices generate new construction only if those prices dictate a level of the stock that is higher than the current level. New construction is a function of price levels, cost shifters, and the lagged housing stock. Similarly to Poterba and Topel and Rosen, they find no significant relationship between construction costs and the level of construction.

Using British data, Meen (2000) jointly estimates housing starts, house prices, the short term interest rate and construction costs using a vector error correction framework. In testing for the weak exogeneity of house prices and interest rates, he finds that new construction has only a weak effect back on to prices; prices are primarily reflecting demand, while interest rates are determined by things other than the housing market. He therefore estimates a joint model for housing starts and construction costs, given house prices and interest rates. The modelling finds a relatively low long-run price elasticity of supply of 0.33. In relation to Figure 26, this represents relatively inelastic supply, or a steeply sloping supply curve, implying that increased demand will be met primarily by higher prices.

In contrast to the asset approaches of Poterba et al, more recent work by Mayer and Somerville (1996, 2000a, 2000b) uses models of residential construction based on the theory of urban land development presented in Capozza and Helsey (1989). They use a methodology analogous to Tobin's Q. Mayer and Somerville argue that because housing starts are a flow variable, representing the change in the housing stock, net of removals, that housing starts should be a function of other flow variables, including the change in house prices and costs. A model where starts are a function of the price level would predict a permanent

[26] See also Blackley (1999), DiPasquale and Wheaton (1994), Topel and Rosen (1988) and Tsoukis and Westaway (1994).

increase in the number of housing starts resulting from a one-time increase in population or house prices.[27]

Mayer and Somerville (2000b) estimate a model where housing starts are a function of current and lagged prices and cost changes. They also augment their basic equation with the lagged values of median time-to-sale for new homes, a non-price measure of market conditions. This is similar to DiPasquale and Wheaton (1994) and Topel and Rosen (1988) who also use indicators of market conditions. Also included is the first lag of the housing stock to control for the role of depreciation in explaining new construction. They estimate that the housing stock adjusts quite rapidly to a demand shock; within one year, which is much faster than the 35 years in DiPasquale and Wheaton (1994). The supply elasticities estimated by Mayer and Somerville are moderate. They find that a 10% rise in real house prices leads to a 0.8% increase in the housing stock; accomplished by an immediate 63% increase in quarterly starts. Over a year, annual starts increase by a total of 37%.

Recent work has focused explicitly on the role of regulation. See for example Mayer and Somerville (2000a), Glaeser and Gyourko (2002, 2003), Glaeser et al (2005a, 2005b) and Green et al (2005). Green et al (2005) estimate supply elasticities for 44 U.S. metropolitan areas, following a model based on Capozza and Helsey (1989). Using survey data on land regulation they estimate supply elasticities and find that areas that are heavily regulated always exhibit low elasticities.

A joint system of three equations with changes in population, real income per capita, and real housing prices as the dependent variables is estimated by Glaeser et al (2005a). Their analysis suggests that geographical variation in house supply is an important factor in explaining higher house prices. By interacting labour demand with the degree of housing supply regulation they find that in response to an increase in labour demand, more inelastically supplied

[27] We believe that this argument, however, is incorrect. The Q theory of investment derives from fundamentals that new investment is determined by the levels of output and input prices. Both prices and quantities adjust to restore equilibrium following a shock, without the explosive increase in new investment posited by Mayer and Somerville.

housing markets have lower population growth and stronger house price appreciation. The magnitudes of these effects are also quite large, with a 1% increase in labour demand in areas with strongly regulated housing supply associated with increases in house prices of $19,000 per year.

Several studies have found material and land cost variables to be insignificant or to have the wrong sign. Studies that have included land costs include DiPasquale and Wheaton (1994) who use a price series for surrounding farmland. They use an index for labour costs and one for materials which they weight to form one cost index. Both their cost index and land price are statistically insignificant in all of their specifications. Mayer and Somerville (2000b) use a building material cost index, but do not include the cost of land as an explanatory variable. The estimated coefficient on their construction cost index is insignificant. Green et al (2005) do not use any measure for land prices (or construction costs).

While existing studies have found it difficult to explain new housing starts with direct measures of construction costs and land prices, this may be because they are using poor proxies for these variables. Our interest is in New Zealand supply elasticities and we wish to determine if we can explain the new housing supply across TLAs over time by standard price and cost variables. We proxy the responsiveness of new housing supply by the number of building consents granted in each TLA in each quarter. In line with the intentions of the studies reviewed above, we explain the number of housing consents (relative to TLA population) by: real house prices (which should have a positive impact on consents), real construction costs (negative impact), real land prices (negative impact), and real interest costs (negative impact). We also test whether inclusion of a proxy for dwelling density (dwellings/population) impacts on consents over and above price effects (a high dwelling density will tend to reduce the rate of new construction).

Our data corresponding to these variables are described below (each for TLA i in quarter t):

Variable	Definition
$\mathbf{C/Pop}_{it}$	log of seasonally adjusted building consents issued divided by population
$\mathbf{H/Pop}_{it}$	log of housing stock divided by population
$\mathbf{R}_{t}$	real 90-day interest rate (national)
$\mathbf{COST}_{it}$	log of real house construction cost
$\mathbf{LAND}_{it}$	log of real value of vacant land zoned for residential development per hectare

Building consents are available at TLA level from Statistics New Zealand on a monthly basis from January 1991 to June 2004. This data includes typical owner-occupied houses with a value greater than $4,999.[28] Data on the number of houses in each TLA are from the 1991, 1996 and 2001 censuses. These data were interpolated to form quarterly observations.

We use Quotable Value New Zealand (QVNZ) quarterly data for median residential house sale prices in each region (as in section 3). Our residential land value data are derived from QVNZ valuations that split residential property values into structures and land components. Valuations are done on a 3 yearly cycle and we use this data to construct a flexible trend representing changing TLA land prices over the period 1992-2004. Data on construction costs are sourced from the New Zealand Building Economist and is available on a quarterly basis from 1992 to 2004, for 6 regions. Costs are available for standard and executive dwellings; we use the standard dwelling cost. The cost (measured as dollars per square metre) represents average installed prices. The cost includes trade materials price, ruling labour rates, plus an average allowance (according to local conditions) for overheads, subcontractors, and subcontractors' profit where applicable.

[28] Includes house not attached to others, unit/flat/townhouse/studio attached and unattached horizontally, apartment blocks attached vertically, granny flat unattached, dwellings added to other building, communal accommodation and other residential dwellings not elsewhere included.

We estimate two specifications, one with and one without the dwelling stock variable [specifications (1) and (2) respectively]. Theoretically the effects of this variable should operate through the house price variable and so it should not appear separately. By including and excluding it, we test whether the specification is robust to its addition. The results of the two specifications (each estimated using OLS) are presented below. In each case, we enter the current and lagged house sales price (no further lags were significant); the current value only of each other variable is included (lags of these variables are not significant when included together with the current variable). The results are robust to the inclusion and exclusion of the housing stock variable. The equations explain approximately 80% of the variation in building consents across the 3,169 observations (i.e. across TLAs and across time). Given that housing consents is a volatile variable, this indicates that the price terms together explain the bulk of developments in new housing supply.

Dependent variable: C/Pop **Independent variables:**	**(1)** **(OLS)**	**(2)** **(OLS)**
P_{it}	0.9649***	1.0288***
	(7.55)	(8.01)
P_{it-1}	0.6730***	0.7138***
	(4.97)	(5.26)
H/Pop_{it}	-4.3359***	
	(2.94)	
$COST_{it}$	-1.4993***	-1.4692***
	(5.58)	(5.48)
R_t	-0.2354***	-0.2175***
	(6.64)	(6.21)
$LAND_{it}$	-0.7027***	-0.6905***
	(8.56)	(8.41)
Constant	-16.3491***	-11.9897***
	(9.90)	(19.74)
Observations	3169	3169
Adjusted R-squared	0.7900	0.7892
RMSE	0.3873	0.3880
Robust t statistics in parentheses * significant at 10%; ** significant at 5%; *** significant at 1% TLA specific linear time trends and TLA fixed effects included but not reported		

Interpreting these results, we find that a 1% increase in real house prices within a TLA raises housing consents by approximately 1% in the first quarter and by a further 0.7% in the following quarter. However, rises in other costs curtail new housing consents. A 1% rise in real construction costs reduces housing consents by approximately 1.5%. In practice, however, real construction costs have generally been on a slight falling trend across New Zealand since 1995/96 (see Figure 27), so contributing to a slight increase in housing consents. A 1 percentage point increase in real interest rates reduces new housing consents by approximately 0.2%. These effects are broadly as expected.

The influence of land prices is particularly interesting. A 1% increase in real land prices is estimated to reduce housing consents by approximately 0.7%. We have already seen, in section 2, that residential land prices in New Zealand

have increased at roughly double the rate of house prices since 1992. In some cases (e.g. Auckland), the ratio of land price increase to house price increase has been much higher still.

Where land prices have increased substantially, two effects may occur. The first, reflected in our estimates, is that new housing may not come on-stream quickly despite a substantial rise in the price of houses. The reason is that it costs too much (in terms of section price) to build a new dwelling. The second effect is that new housing construction will occur, but it will be focused towards apartments which are less land-intensive that stand-alone dwellings. This is most likely to occur in cities (particularly in congested cities) where demand for inner city apartments is high, at least relative to apartment demand in less congested areas. Stand-alone housing starts in such areas will be curtailed and/or development may shift elsewhere. For example, Auckland has seen a strong increase in apartment building consents over 1991-2004 (Table 6) while Rodney (which has had a much lower ratio of land price to house price increase) has had strong stand-alone housing consents.

5 Implications

While housing developments are a central social policy concern, the determinants of housing are shown here to be driven strongly by economic forces. We observe materially different housing developments across New Zealand since 1981. Some local authorities have witnessed more than a trebling of their real house prices, while others have had sizeable declines over this 24 year period. These patterns are also evident at a regional council level, indicating that divergence in experience is not just a small area phenomenon. The divergent house price developments reflect divergent demographic and economic developments across regions. They are reflected also in the rate of new housing starts, which vary substantially across the country.

We are able to explain a high proportion of house price developments over TLAs and over time as a function of a small number of economic and demographic variables. All areas are affected by national financial trends (e.g. by real interest rates) and also by construction cost developments (which are highly correlated across regions). Areas with higher per capita incomes and better amenities tend to have higher house prices than do other areas. The supply of houses also has a powerful effect. If house price increases are a concern, then our estimates (in section 3) indicate that a potent way to ameliorate these increases is to raise the stock of dwellings in an area. A 10% increase in the stock of dwellings (relative to population) is estimated to result in an approximate 8% decline in house prices in that area.

New dwelling construction responds positively to house price increases, so to a large extent the housing system has self-stabilising mechanisms built into it. However our estimates in section 4 point to a potential bottleneck that could, in some cases, stifle this adjustment. New housing is curtailed (inter alia) by high land prices. If geographical or regulatory factors make new residential land scarce (or difficult to subdivide), the effect will be to raise the value placed on existing sections and so raise residential land prices. In turn, this constriction of residential land reduces new housing supply which further pushes up prices. Rises in

construction costs (which may emerge from the imposition of new, stricter construction regulations) have the same effect. Nevertheless, real construction costs have been relatively stable since the early 1990s, albeit varying in a consistent way across regions. Thus the strong upward movements in land prices are likely to have had a greater effect in curtailing new housing coming on-stream than have construction cost changes.

Current high real house prices across many areas, coupled with moderately stable construction costs continue to encourage strong residential construction in many areas. However, land price increases are operating in the other direction (i.e. to curtail supply). We expect that the balance of these forces will see continued moderate to strong house construction activity over the next two years, albeit down from recent peaks. House construction activity will continue to show strong regional diversity as a result of strong regional divergence in economic, demographic, house price and land price developments.

Some TLAs have very different new house supply responses than do others. If we concentrate our attention on TLAs that have had population growth of at least 2,000 between 1992 and 2004 (so as to rule out possibly spurious relationships driven by small samples, and also to concentrate on those areas towards the right-hand portion of Figure 1) we can document these differences in supply response. Table 14 presents average quarterly building consents expressed as a proportion of the average quarterly population change in each TLA over 1991/92-2004. The table presents this data for the 32 TLAs with population change exceeding 2,000 over this period. TLAs are listed in order of "least responsive" to "most responsive".[29]

Four Auckland TLAs (Manukau, North Shore, Auckland City, Waitakere) have the lowest ratio of building consents to population change, ranging between 0.29 (Manukau) and 0.37 (Auckland City and Waitakere). Over 1992-2004, these TLAs each had real house price growth of 92% to 129%. Within the greater Auckland region, Rodney had slightly more responsive consents (0.41) and similar real house price growth (111%). Franklin had more responsive

[29] The discussion below indicates why quotation marks are used in this sentence.

consents (0.46) and had lower real house price growth (79%). Papakura was more responsive still (0.56) and had the lowest real house price growth (48%).

Within Auckland, therefore, there appears to be a relationship between house supply responsiveness (i.e. a high ratio of building consents to population change) and trend price increases: the more responsive is supply, the lower is the house price growth. The contrast between (neighbouring) Papakura and Manukau is particularly stark with the latter apparently more conducive to facilitating new house supply.[30]

However this relationship is swamped by another factor - tourism - when the relationship is examined across New Zealand as a whole.[31] The "most responsive" TLAs on this measure are Thames-Coromandel, Taupo and Napier - all tourist destinations. Thames-Coromandel, the "most responsive" TLA nevertheless had real house price growth over this period of 103%; Taupo and Napier had 84% and 82% real house price growth respectively. The TLA with the highest real house price growth over this period, Queenstown-Lakes (at 155%), had moderately responsive consents relative to population change (0.47).

Census population figures do not pick up all the housing pressure caused by increased tourism-related attractiveness of an area. In locations such as Queenstown-Lakes and Thames-Coromandel, the necessity for strongly responsive residential building following high demand pressures is especially crucial. This is because new building must cater for new housing demand both of residents and of non-residents (where the latter includes New Zealand and international owners of holiday homes, as well as casual tourists). If new house supply is not especially responsive to demand in these areas, the effect is transmitted through large house price rises. These price rises, in turn, impact directly on residents' housing affordability.

The implications of these findings for policy are therefore unambiguous. If high house prices (i.e. poor housing affordability) is a concern, a

[30] Differences in desired household size across TLAs (e.g. stemming from ethnicity differences or age group differences) may also be part of the explanation.
[31] For those TLAs with population change exceeding 2,000 over the period.

key policy focus has to be on ensuring that construction costs and land costs are kept to a minimum consistent with other objectives (e.g. ensuring adequate building standards and ensuring appropriate land use for the community). In turn, this requires a planning and regulatory process that is conducive to the development of residential land (or of in-fill sub-division of existing land) and to the construction of new dwellings (whether single or multi-unit). The nature of regulation and planning processes that enables this to occur is an important issue. This issue needs to be researched further in a comparative study involving multiple local authorities across New Zealand. This work could usefully draw on the insights and approaches of the United States studies cited in section 4, albeit modified to incorporate New Zealand-specific factors.

Fundamentally, the price of a house will reflect the price of the factors that comprise that house, the two fundamental factors being the structure and the land. New Zealand and international evidence indicates that expanding regions that keep these costs under control will see robust new housing development without the price pressures faced by regions with higher costs.

Table 1: House Sales Prices (Residential Dwellings)[1]

Territorial Local Authority	1981 Med. real Sales Price ($000)	1992 Med. real Sales Price ($000)	2004 Med. real Sales Price ($000)	Real % Price Change (1981-1992)	Real % Price Change (1992-2004)	Real % Price Change (1981-2004)	Average No. Quarterly Sales
Queenstown-Lakes	126	170	432	35	155	244	107
Auckland	136	192	440	41	129	223	1739
Thames-Coromandel	89	140	284	56	103	217	226
Banks Peninsula	75	128	230	71	80	208	69
Rodney	110	155	329	41	111	199	354
Kaikoura	77	101	227	31	125	194	17
Hurunui	58	86	168	49	95	190	43
Wellington	130	183	339	41	85	161	849
South Wairarapa	61	83	153	36	84	150	52
Tasman	114	139	280	23	101	146	186
Porirua	103	152	236	49	55	131	210
Waitakere	117	131	268	12	104	129	948
North Shore	171	192	387	12	102	127	1042
Western Bay of Plenty	105	119	235	14	98	125	135
Kapiti Coast	98	140	221	42	58	124	268
Nelson	122	143	273	17	90	123	276
Manukau	137	159	305	16	92	122	1120
Selwyn	82	101	181	24	78	121	61
Lower Hutt	103	151	226	47	49	119	520
Taupo	103	121	222	18	84	117	259
Franklin	103	125	223	21	79	116	156
Christchurch	100	141	212	41	51	112	2008
Marlborough	108	117	221	8	89	105	228
Buller	38	52	78	36	50	104	63
Waimakariri	93	128	189	38	47	103	193
Central Otago	104	92	209	-12	129	101	103
Far North	107	108	200	1	84	86	169
Papakura	133	164	243	24	48	84	174
Waikato	73	84	131	14	56	78	110
Kaipara	80	84	143	5	69	78	70
Hastings	109	113	194	3	71	77	267
Dunedin	85	105	151	23	44	77	772
Hauraki	73	91	127	25	40	75	81
Carterton	75	89	131	19	47	75	34
Napier	125	120	219	-4	82	75	295
Upper Hutt	111	141	192	27	36	73	191
Hamilton	124	135	213	9	58	72	614
Grey	50	64	86	27	34	70	86
Tauranga	151	142	256	-6	80	69	626
Masterton	84	91	138	8	51	64	133
Mackenzie	63	49	103	-23	112	63	30
Westland	55	74	90	34	21	62	39
Ashburton	84	89	129	6	45	54	124
Whakatane	125	114	191	-9	67	53	131
Waipa	119	123	179	3	45	50	163
Horowhenua	74	90	111	21	23	49	180
Matamata-Piako	95	106	142	11	34	49	112
Whangarei	118	108	176	-9	63	49	355
New Plymouth	108	106	160	-2	50	47	382

Manawatu	85	104	124	22	19	46	120
Otorohanga	70	75	101	7	34	44	22
Central Hawke's Bay	85	78	121	-8	55	43	50
Waitaki	77	73	109	-5	48	41	133
Southland	68	57	96	-16	68	41	117
Palmerston North	120	137	163	15	19	36	386
Rotorua	109	99	142	-10	44	30	399
Timaru	90	89	114	-1	28	26	258
Opotiki	93	79	112	-14	41	21	26
Waimate	65	57	76	-13	32	16	28
Gisborne	106	96	118	-10	23	11	174
Clutha	65	59	71	-10	21	10	88
Wanganui	75	88	82	17	-7	9	259
South Taranaki	77	76	79	-1	5	4	120
Waitomo	78	70	76	-9	8	-2	33
Invercargill	104	79	97	-24	22	-7	404
Tararua	75	76	69	1	-8	-7	78
Stratford	86	76	76	-12	-0	-12	41
Rangitikei	76	71	65	-6	-9	-15	63
Ruapehu	77	60	60	-22	0	-22	59
Wairoa	86	67	62	-23	-6	-27	27
Gore	97	64	67	-34	5	-31	72
South Waikato	94	68	62	-28	-9	-35	118
Kawerau	101	72	61	-29	-16	-40	41
New Zealand	112	132	230	18	74	105	267

[1] June 2004 dollars. Ranked by 1981-2004 real percentage price changes.
Source: Quotable Value New Zealand.

Table 2: Sales Price of Vacant Residential Sections[1]

Territorial Local Authority	1981 Med. real Sales Price ($000)	1992 Med. real Sales Price ($000)	2004 Med. real Sales Price ($000)	Real % Price Change (1981-1992)	Real % Price Change (1992-2004)	Real % Price Change (1981-2004)	Average No. Quarterly sales
Auckland	39	71	308	84	332	697	218
Carterton	10	14	77	42	450	679	6
Kaipara	21	27	138	26	408	542	22
Manukau	48	85	270	77	216	460	267
North Shore	45	81	249	82	207	457	174
Rodney	36	71	201	96	184	457	172
Queenstown-Lakes	38	59	203	56	245	438	103
South Wairarapa	15	21	81	38	287	436	16
Manawatu	22	28	119	25	325	429	21
Napier	30	45	157	53	245	428	44
Thames-Coromandel	35	61	178	72	193	405	130
Tasman	37	60	180	62	203	390	66
Waitakere	39	57	184	49	220	376	186
Franklin	27	41	127	49	214	367	53
Wairoa	26	20	120	-24	505	361	5
Masterton	15	21	71	34	245	361	19
Otorohanga	16	18	72	12	298	345	4
Hastings	30	50	134	66	169	344	45
Kaikoura	33	41	141	26	242	332	6
Nelson	47	69	188	46	173	299	48
Banks Peninsula	24	51	94	116	84	297	25
Papakura	51	79	200	56	154	295	36
Wellington	35	74	138	111	86	292	91
Porirua	33	66	128	99	94	286	44
Marlborough	30	44	113	44	158	272	70
Central Otago	27	21	100	-21	365	269	37
Christchurch	37	64	135	71	112	262	297
Waimakariri	24	47	85	96	82	256	57
Hurunui	24	27	81	12	200	237	22
Kapiti Coast	29	54	95	87	76	230	90
Southland	17	11	56	-35	400	224	25
Lower Hutt	32	58	100	83	74	219	42
Ashburton	25	33	78	34	136	216	22
Grey	17	8	53	-53	564	210	18
Western Bay of Plenty	37	52	114	41	117	207	52
Whakatane	36	40	105	11	165	194	33
Taupo	35	50	102	44	103	193	82
Waitaki	18	9	52	-51	494	192	18
Horowhenua	21	23	62	9	168	192	35
Upper Hutt	36	54	103	51	90	186	26
Hauraki	23	21	63	-5	196	181	20
Waipa	29	44	77	48	76	161	40
Dunedin	26	24	67	-9	184	158	62
Whangarei	43	46	107	7	135	150	79
New Plymouth	26	33	65	26	97	147	64
Central Hawke's Bay	26	15	64	-43	332	145	9
Westland	12	10	30	-17	189	140	12
Opotiki	32	27	78	-17	189	139	7

Hamilton	37	52	86	42	65	134	156
Waitomo	15	12	35	-23	204	134	5
Waikato	24	21	57	-12	164	133	20
Tauranga	43	59	93	37	58	116	216
Selwyn	29	28	63	-5	124	113	30
Rotorua	34	38	71	12	85	108	67
Buller	14	7	30	-52	335	107	14
Matamata-Piako	33	31	66	-7	115	100	20
Far North	48	34	93	-29	172	93	100
Palmerston North	36	54	69	52	27	93	61
South Taranaki	17	14	31	-18	127	87	15
Gisborne	35	29	60	-17	108	73	19
Invercargill	31	29	53	-9	85	69	28
Timaru	23	22	36	-5	64	56	25
Stratford	20	18	30	-9	68	52	4
Wanganui	26	31	35	20	14	37	25
Mackenzie	36	6	46	-83	644	28	13
Clutha	14	7	18	-51	150	22	13
Waimate	17	6	18	-66	212	7	3
Ruapehu	28	14	30	-50	115	7	16
Tararua	22	16	23	-26	43	6	10
Rangitikei	17	13	14	-26	14	-15	8
South Waikato	25	12	20	-50	63	-18	7
Gore	21	14	15	-33	11	-25	7
Kawerau	29	10	6	-66	-38	-79	6
New Zealand	35	53	135	51	155	286	54

[1] June 2004 dollars. Ranked by 1981-2004 real percentage price changes.
Source: Quotable Value New Zealand.

Table 3: Dwelling Stock[1]

Territorial Local Authority	Total dwellings 1981	Total dwellings 1991	Total dwellings 2001	% Change 1981-1991	% Change 1991-2001	% Change 1981-2001
Queenstown-Lakes	2,391	4,233	7,059	77	67	195
Rodney	12,231	19,992	28,668	63	43	134
Western Bay of Plenty	7,101	10,491	14,082	48	34	98
Tauranga	18,027	25,251	35,490	40	41	97
Kapiti Coast	9,441	13,530	17,460	43	29	85
Waimakariri	7,500	9,654	13,653	29	41	82
Franklin	9,870	13,608	17,730	38	30	80
Thames-Coromandel	6,273	9,306	11,046	48	19	76
Far North	11,823	16,260	19,800	38	22	67
Selwyn	5,652	6,903	9,396	22	36	66
Waitakere	34,464	44,943	56,181	30	25	63
Tasman	9,825	12,648	15,963	29	26	62
Opotiki	2,067	2,856	3,231	38	13	56
Manukau	53,775	67,338	83,823	25	24	56
Papakura	8,985	11,823	13,551	32	15	51
Taupo	7,821	9,957	11,793	27	18	51
Banks Peninsula	2,241	2,784	3,360	24	21	50
Marlborough	10,407	12,957	15,513	25	20	49
Whangarei	17,352	21,942	25,644	26	17	48
Waipa	9,834	12,219	14,445	24	18	47
North Shore	45,696	54,534	66,615	19	22	46
Nelson	11,424	13,686	16,284	20	19	43
Hamilton	29,253	34,896	41,502	19	19	42
Hurunui	2,823	3,363	3,981	19	18	41
Whakatane	8,382	10,434	11,532	24	11	38
Rotorua	16,719	20,820	22,773	25	9	36
Waikato	10,053	11,880	13,533	18	14	35
Kaipara	4,998	5,889	6,633	18	13	33
Central Otago	4,605	5,574	6,003	21	8	30
Porirua	11,469	13,521	14,931	18	10	30
Horowhenua	8,877	10,659	11,535	20	8	30
Kaikoura	1,089	1,236	1,413	13	14	30
Manawatu	7,776	9,204	10,065	18	9	29
Hauraki	4,884	5,838	6,318	20	8	29
Christchurch	95,787	107,694	123,279	12	14	29
South Wairarapa	2,739	3,291	3,513	20	7	28
Auckland	103,770	112,827	132,918	9	18	28
New Plymouth	20,304	23,889	25,626	18	7	26
Palmerston North	20,946	23,958	26,424	14	10	26
Napier	16,578	18,840	20,913	14	11	26
Hastings	19,221	22,077	24,201	15	10	26
Carterton	2,106	2,421	2,646	15	9	26
Ashburton	8,148	9,132	10,230	12	12	26
Westland	2,586	2,955	3,246	14	10	26
Central Hawke's Bay	3,909	4,365	4,782	12	10	22
Matamata-Piako	8,931	10,086	10,815	13	7	21
Masterton	7,224	8,073	8,721	12	8	21
Wellington	52,386	55,734	62,733	6	13	20
Wanganui	14,235	16,317	16,800	15	3	18
Upper Hutt	11,322	12,411	13,242	10	7	17
Buller	3,477	3,939	4,053	13	3	17
Timaru	14,766	16,107	17,112	9	6	16

Dunedin	38,466	41,400	43,980	8	6	14
Gisborne	13,614	14,727	15,519	8	5	14
Otorohanga	2,655	2,916	2,997	10	3	13
Lower Hutt	30,882	33,081	34,653	7	5	12
Grey	4,542	4,875	5,037	7	3	11
Waitaki	7,668	8,340	8,409	9	1	10
Kawerau	2,145	2,481	2,343	16	-6	9
Southland	10,071	10,554	10,953	5	4	9
Waitomo	3,171	3,330	3,414	5	3	8
Gore	4,530	4,845	4,869	7	0	7
Invercargill	18,387	19,740	19,743	7	0	7
Waimate	2,706	2,886	2,904	7	1	7
Tararua	6,258	6,768	6,699	8	-1	7
Clutha	6,261	6,480	6,684	3	3	7
Stratford	3,171	3,381	3,336	7	-1	5
South Taranaki	9,699	10,308	10,194	6	-1	5
Rangitikei	5,481	5,727	5,691	4	-1	4
Wairoa	3,108	3,315	3,174	7	-4	2
South Waikato	8,004	8,322	8,118	4	-2	1
Ruapehu	5,217	5,445	5,139	4	-6	-1
Mackenzie	1,926	1,491	1,557	-23	4	-19
New Zealand	1,011,525	1,184,757	1,367,673	17	15	35

[1] Total occupied dwellings (private and public). Ranked by 1981-2001 percentage changes.
Source: Statistics New Zealand.

Table 4: Dwelling Stock (Intercensal % Change)[1]

Territorial Local Authority	% Change 1981-1986	% Change 1986-1991	% Change 1991-1996	% Change 1996-2001
Queenstown-Lakes	39	27	37	22
Tauranga	19	18	18	19
Rodney	30	25	22	17
Waimakariri	13	14	21	17
Selwyn	10	11	17	16
Kapiti Coast	18	22	14	13
Manukau	11	13	11	12
Franklin	15	19	16	12
Waitakere	12	16	12	12
Western Bay of Plenty	23	20	20	12
Tasman	13	14	14	11
Hamilton	8	10	8	10
North Shore	10	9	11	10
Auckland	3	5	8	9
Far North	19	16	12	8
Waipa	14	9	9	8
Hurunui	9	10	10	8
Marlborough	12	11	12	7
Banks Peninsula	11	12	13	7
Taupo	14	11	11	7
Whangarei	17	8	10	7
Porirua	9	8	4	6
Thames-Coromandel	24	20	12	6
Nelson	9	10	12	6
Papakura	13	17	8	6
Wellington	3	3	6	6
Christchurch	6	6	8	6
Waikato	10	8	8	6
Ashburton	7	5	6	5
Carterton	2	12	4	5
Kaikoura	8	5	9	5
Kaipara	10	8	7	5
Palmerston North	6	8	6	4
Central Hawke's Bay	8	4	5	4
Hastings	8	6	6	4
Napier	8	6	7	4
Rotorua	12	11	6	3
Horowhenua	11	8	5	3
Upper Hutt	4	5	3	3
Masterton	4	7	5	3
Whakatane	12	11	7	3
South Wairarapa	8	11	4	3
Central Otago	19	2	5	3
Manawatu	9	9	6	3
Hauraki	8	11	6	2
Timaru	5	4	4	2
Matamata-Piako	7	5	5	2
Westland	11	3	8	2
New Plymouth	12	5	6	2
Dunedin	4	4	5	2
Lower Hutt	3	4	3	1
Opotiki	19	16	12	1
Gisborne	5	3	4	1
Clutha	2	2	4	0

Wanganui	8	6	3	0
Southland	4	1	4	0
Gore	3	4	1	0
Invercargill	4	3	1	-1
Waitomo	4	1	4	-1
Waimate	3	3	2	-1
Otorohanga	7	3	4	-1
Waitaki	4	4	3	-2
Tararua	5	3	1	-2
Buller	8	5	5	-2
South Taranaki	3	3	1	-2
Grey	5	2	6	-2
South Waikato	4	-1	0	-2
Stratford	5	2	2	-3
Rangitikei	4	1	3	-3
Kawerau	8	7	-2	-4
Mackenzie	-30	10	8	-4
Wairoa	3	4	1	-5
Ruapehu	7	-3	3	-9

[1] Total occupied dwellings (private and public). Ranked by 1996-2001 percentage changes.
Source: Statistics New Zealand.

Table 5: Dwelling Stock Growth (TLAs with population >50,000)

1981-1986			
Bottom Five		**Top Five**	
Lower Hutt	3%	Rodney	30%
Wellington	3%	Far North	19%
Auckland	3%	Tauranga	19%
Dunedin	4%	Whangarei	17%
Invercargill	4%	Franklin	15%
1986-1991			
Bottom Five		**Top Five**	
Invercargill	3%	Rodney	25%
Wellington	3%	Franklin	19%
Dunedin	4%	Tauranga	18%
Lower Hutt	4%	Waitakere	16%
New Plymouth	5%	Far North	16%
1991-1996			
Bottom Five		**Top Five**	
Invercargill	1%	Rodney	22%
Lower Hutt	3%	Tauranga	18%
Dunedin	5%	Franklin	16%
New Plymouth	6%	Far North	12%
Hastings	6%	Waitakere	12%
1996-2001			
Bottom Five		**Top Five**	
Invercargill	-1%	Tauranga	19%
Lower Hutt	1%	Rodney	17%
Dunedin	2%	Manukau	12%
New Plymouth	2%	Franklin	12%
Rotorua	3%	Waitakere	12%

Source: Statistics New Zealand

Table 6: Building Consents[1]

Territorial Local Authority	Average quarterly Building Consents (Houses & apartments) 1991-2004	Average quarterly Building Consents (Apartments only) 1991-2004	Average quarterly Building Consents (Alterations & additions) 1991-2004
Auckland	676	332	451
Christchurch	498	30	255
Manukau	482	20	157
North Shore	329	46	214
Tauranga	303	11	103
Waitakere	302	36	118
Rodney	234	10	111
Wellington	225	82	280
Hamilton	198	7	75
Whangarei	126	0	67
Queenstown-Lakes	112	9	42
Franklin	110	0	53
Waimakariri	104	1	33
Kapiti Coast	102	4	59
Thames-Coromandel	101	2	71
Far North	100	2	54
Tasman	95	1	57
Western Bay of Plenty	84	0	54
Marlborough	84	1	54
Dunedin	81	3	152
Selwyn	80	0	33
Palmerston North	74	1	65
Nelson	73	2	52
Taupo	72	4	52
Rotorua	64	2	64
Hastings	64	3	67
Waipa	63	0	43
New Plymouth	58	1	82
Napier	56	1	50
Papakura	55	4	23
Waikato	54	0	35
Lower Hutt	42	1	100
Ashburton	36	0	29
Timaru	36	0	55
Porirua	34	0	41
Whakatane	31	0	28
Central Otago	29	0	24
Kaipara	29	0	23
Horowhenua	28	1	29
Matamata-Piako	28	0	27
Gisborne	27	1	37
Upper Hutt	27	2	31
Invercargill	25	1	52
Wanganui	24	2	41
Manawatu	23	0	33
Southland	23	0	39
Hurunui	22	0	13
Masterton	22	0	22
Hauraki	22	0	16
Banks Peninsula	18	0	22
Waitaki	14	0	27

South Taranaki	12	0	27
South Wairarapa	12	0	17
Buller	11	0	16
Clutha	11	0	18
Grey	11	0	19
Westland	11	0	11
Central Hawke's Bay	10	0	21
Opotiki	9	0	8
Ruapehu	8	0	10
Tararua	8	0	16
Carterton	8	0	8
Otorohanga	7	0	10
Gore	7	0	11
Kaikoura	6	0	5
Mackenzie	6	1	9
South Waikato	6	0	14
Rangitikei	6	0	17
Waitomo	5	0	8
Stratford	5	0	8
Waimate	4	0	9
Wairoa	4	0	9
Kawerau	1	0	3

[1] Ranked by Average Quarterly Building Consents (Houses & Apartments).
Source: Statistics New Zealand

Table 7: Regional Residential Construction Costs[1]

Region	Average Real Cost ($/m^2) 1992	Average Real Cost ($/m^2) 2004	% Change 1992-2004
Auckland	887.3	891.8	0.5
Bay of Plenty/Waikato	833.4	815.1	-2.2
Manawatu/Hawke's Bay/Taranaki	830.0	791.7	-4.6
Wellington	867.2	831.4	-4.1
Christchurch	797.7	752.1	-5.7
Dunedin	839.8	769.0	-8.4

[1] Costs are for a 'standard' house. See footnote 12 for a full definition.
Source: New Zealand Building Economist

Table 8: Population[1]

Territorial Local Authority	Population 1981	Population 1992	Population 2004	% Change 1981-1992	% Change 1992-2004	% Change 1981-2004
Queenstown-Lakes	6,212	10,650	22,200	71	108	257
Rodney	38,352	59,200	86,600	54	46	126
Tauranga	54,949	70,700	101,300	29	43	84
Kapiti Coast	25,981	36,100	46,200	39	28	78
Western Bay of Plenty	24,466	32,700	41,400	34	27	69
Waimakariri	24,747	29,700	41,000	20	38	66
Thames-Coromandel	16,333	23,200	26,500	42	14	62
Manukau	203,233	246,600	326,200	21	32	61
Franklin	35,404	45,000	56,500	27	26	60
Waitakere	121,677	150,100	189,200	23	26	55
Tasman	30,138	36,000	45,800	19	27	52
Selwyn	20,958	22,700	30,800	8	36	47
North Shore	144,024	163,800	209,300	14	28	45
Auckland	301,306	332,400	420,700	10	27	40
Papakura	31,628	38,800	43,500	23	12	38
Far North	41,792	51,300	57,400	23	12	37
Hamilton	94,275	105,500	129,300	12	23	37
Nelson	34,162	37,500	45,300	10	21	33
Marlborough	32,674	37,300	42,300	14	13	29
Opotiki	7,408	9,110	9,580	23	5	29
Whangarei	57,134	65,300	72,200	14	11	26
Banks Peninsula	6,602	7,330	8,300	11	13	26
Waipa	33,169	37,800	41,500	14	10	25
Christchurch	278,946	295,800	344,100	6	16	23
Taupo	27,325	30,200	33,700	11	12	23
Porirua	41,709	46,400	50,600	11	9	21
Palmerston North	64,407	70,500	78,100	9	11	21
Rotorua	56,979	63,900	67,800	12	6	19
Wellington	154,612	157,700	182,600	2	16	18
Waikato	35,947	38,700	42,400	8	10	18
Carterton	6,128	6,690	7,140	9	7	17
Manawatu	24,773	27,400	28,300	11	3	14
New Plymouth	61,319	67,800	69,200	11	2	13
Kaikoura	3,245	3,530	3,630	9	3	12
Hastings	63,681	66,500	71,100	4	7	12
Horowhenua	28,030	30,100	30,600	7	2	9
South Wairarapa	8,126	8,770	8,840	8	1	9
Whakatane	31,350	33,000	34,000	5	3	8
Dunedin	112,730	115,300	121,900	2	6	8
Kaipara	16,762	17,700	18,050	6	2	8
Hauraki	15,832	17,350	16,900	10	-3	7
Napier	53,287	53,300	56,100	0	5	5
Hurunui	10,199	9,230	10,650	-10	15	4
Masterton	22,415	22,700	23,300	1	3	4
Ashburton	25,705	25,100	26,700	-2	6	4
Matamata-Piako	29,362	29,800	30,300	1	2	3
Wanganui	42,455	44,700	43,600	5	-2	3
Lower Hutt	98,157	98,000	100,300	-0	2	2
Upper Hutt	38,142	37,600	37,900	-1	1	-1
Central Otago	15,216	16,200	15,050	6	-7	-1
Timaru	43,734	43,000	43,100	-2	0	-1

Otorohanga	9,742	9,640	9,500	-1	-1	-2
Westland	8,233	8,280	7,900	1	-5	-4
Central Hawke's Bay	13,704	13,400	13,150	-2	-2	-4
Buller	10,390	10,700	9,640	3	-10	-7
Gisborne	48,562	46,900	44,900	-3	-4	-8
Invercargill	57,070	54,500	51,700	-5	-5	-9
Tararua	19,793	19,550	17,800	-1	-9	-10
Waitaki	22,244	21,700	19,950	-2	-8	-10
Grey	14,586	14,000	13,050	-4	-7	-11
Southland	32,901	31,300	29,400	-5	-6	-11
Waitomo	11,024	10,100	9,660	-8	-4	-12
Stratford	10,122	9,760	8,750	-4	-10	-14
Gore	14,615	13,450	12,500	-8	-7	-14
South Taranaki	32,667	30,100	27,600	-8	-8	-16
Waimate	8,578	7,870	7,100	-8	-10	-17
Clutha	21,151	18,550	17,350	-12	-6	-18
Rangitikei	18,986	17,100	14,900	-10	-13	-22
Kawerau	8,788	8,300	6,800	-6	-18	-23
South Waikato	30,190	26,600	23,300	-12	-12	-23
Wairoa	11,324	10,450	8,620	-8	-18	-24
Ruapehu	18,919	17,850	13,700	-6	-23	-28
Mackenzie	6,291	4,090	3,750	-35	-8	-40
New Zealand	3,227,077	3,529,950	4,060,060	9	15	26

[1] Ranked by 1981-2004 percentage changes.

Source: Statistics New Zealand.

Table 9: Occupancy rates[1]

Territorial Local Authority	Occupancy rate (1981)	Occupancy rate (1991)	Occupancy rate (2001)
Manukau	3.78	3.60	3.56
Porirua	3.64	3.39	3.32
Otorohanga	3.67	3.30	3.20
Waitakere	3.53	3.26	3.14
Papakura	3.52	3.23	3.12
Kawerau	4.10	3.35	3.11
Waikato	3.58	3.22	3.05
Selwyn	3.71	3.33	3.01
Franklin	3.59	3.22	3.01
South Waikato	3.77	3.23	2.98
Opotiki	3.58	3.13	2.95
Whakatane	3.74	3.13	2.95
Rotorua	3.41	3.05	2.94
Gisborne	3.57	3.18	2.93
Auckland	2.90	2.91	2.93
Ruapehu	3.63	3.27	2.92
Wairoa	3.64	3.15	2.92
North Shore	3.15	2.97	2.92
Hamilton	3.22	2.98	2.88
Hastings	3.31	3.01	2.88
Waipa	3.37	3.06	2.87
Waitomo	3.48	3.06	2.86
Lower Hutt	3.18	2.95	2.86
Far North	3.53	3.10	2.85
Upper Hutt	3.37	3.03	2.85
Palmerston North	3.07	2.86	2.85
Manawatu	3.19	2.93	2.80
Matamata-Piako	3.29	2.94	2.80
Western Bay of Plenty	3.45	3.06	2.79
South Taranaki	3.37	2.93	2.79
Waimakariri	3.30	3.02	2.78
Central Hawke's Bay	3.51	3.07	2.76
Taupo	3.49	2.99	2.76
Tararua	3.16	2.88	2.74
Rodney	3.14	2.86	2.74
Stratford	3.19	2.90	2.73
Hauraki	3.24	2.95	2.73
Whangarei	3.29	2.96	2.73
Wellington	2.95	2.82	2.73
Rangitikei	3.46	3.02	2.72
Dunedin	2.93	2.77	2.71
Kaipara	3.35	2.99	2.71
Southland	3.27	2.98	2.68
New Plymouth	3.02	2.82	2.67
Masterton	3.10	2.79	2.66
Tasman	3.07	2.80	2.66
Christchurch	2.91	2.73	2.65
Horowhenua	3.16	2.81	2.65
Carterton	2.91	2.71	2.65
Wanganui	2.98	2.73	2.64
Napier	3.21	2.83	2.64
Nelson	2.99	2.71	2.63
Tauranga	3.05	2.74	2.63
Clutha	3.38	2.89	2.63

Marlborough	3.14	2.84	2.62
Grey	3.21	2.87	2.62
Gore	3.23	2.77	2.62
Invercargill	3.10	2.77	2.59
Hurunui	3.61	2.72	2.55
South Wairarapa	2.97	2.64	2.54
Ashburton	3.15	2.76	2.54
Kaikoura	2.98	2.81	2.53
Queenstown-Lakes	2.60	2.40	2.53
Timaru	2.96	2.68	2.50
Kapiti Coast	2.75	2.59	2.50
Waimate	3.17	2.74	2.49
Westland	3.18	2.81	2.46
Central Otago	3.30	2.89	2.46
Waitaki	2.90	2.60	2.44
Mackenzie	3.27	2.77	2.43
Buller	2.99	2.69	2.43
Banks Peninsula	2.95	2.60	2.39
Thames-Coromandel	2.60	2.42	2.34

[1] Occupancy rate defined as total usually resident population divided total occupied dwellings.
Ranked by 2001 occupancy rate.
Source: Statistics New Zealand.

Table 10: Occupancy Rate (Top 10 and Bottom 10 TLAs)[1]

Top 10	
Manukau	3.56
Porirua	3.32
Otorohanga	3.2
Waitakere	3.14
Papakura	3.12
Kawerau	3.11
Waikato	3.05
Franklin	3.01
Selwyn	3.01
South Waikato	2.98
Bottom 10	
Kapiti Coast	2.5
Timaru	2.5
Waimate	2.49
Central Otago	2.46
Westland	2.46
Waitaki	2.44
Buller	2.43
Mackenzie	2.43
Banks Peninsula	2.39
Thames-Coromandel	2.34

[1] Occupancy rate (2001)
Source: Statistics New Zealand

Table 11: Real Personal Median Income (Census)[1]

Territorial Local Authority	Real Median Income 1986	Real Median Income 1991	Real Median Income 1996	Real Median Income 2001	% Change 1986-1991	% Change 1991-1996	% Change 1996-2001	% Change 1986-2001
Selwyn	16,759	17,313	17,915	20,979	3	3	17	25
Southland	16,349	16,360	17,095	20,410	0	4	19	25
Clutha	16,136	15,395	15,853	18,721	-5	3	18	16
Queenstown-Lakes	20,032	19,361	21,336	23,004	-3	10	8	15
Ashburton	16,127	15,519	16,250	18,444	-4	5	14	14
Rodney	17,402	16,757	17,273	19,541	-4	3	13	12
Franklin	19,009	18,514	19,279	21,313	-3	4	11	12
South Wairarapa	16,507	15,878	15,415	18,342	-4	-3	19	11
Waimakariri	16,752	16,209	17,228	18,423	-3	6	7	10
Waimate	13,536	13,387	14,363	14,814	-1	7	3	9
Hurunui	15,421	14,671	15,304	16,825	-5	4	10	9
Waipa	18,240	17,304	18,396	19,788	-5	6	8	8
Auckland	20,574	19,219	20,260	22,318	-7	5	10	8
Central Hawke's Bay	17,558	16,089	16,413	18,757	-8	2	14	7
South Taranaki	18,217	16,711	17,895	19,405	-8	7	8	7
Carterton	16,171	15,406	15,561	17,165	-5	1	10	6
Waitomo	16,500	14,862	15,451	17,453	-10	4	13	6
Matamata-Piako	19,003	18,134	20,107	20,100	-5	11	-0	6
Wellington	25,613	25,907	25,389	26,964	1	-2	6	5
North Shore	22,187	22,098	21,759	23,348	-0	-2	7	5
Manawatu	17,906	17,414	17,003	18,712	-3	-2	10	5
Gore	17,455	15,739	16,074	18,222	-10	2	13	4
Tararua	17,244	16,590	16,563	17,859	-4	-0	8	4
Tasman	15,618	14,899	15,526	16,149	-5	4	4	3
Otorohanga	17,149	15,819	16,558	17,689	-8	5	7	3
Banks Peninsula	18,186	16,318	17,004	18,610	-10	4	9	2
Marlborough	16,589	15,985	16,203	16,956	-4	1	5	2
Stratford	17,933	15,867	16,467	18,207	-12	4	11	2
Western Bay of Plenty	17,144	14,878	15,839	17,297	-13	6	9	1
Kaikoura	15,461	14,090	15,005	15,599	-9	6	4	1
Waitakere	20,782	19,385	19,917	20,785	-7	3	4	0
Waikato	18,274	16,124	16,411	18,266	-12	2	11	-0
Mackenzie	16,434	14,381	15,081	16,413	-12	5	9	-0
Papakura	21,037	18,701	19,032	20,719	-11	2	9	-2
Taupo	18,186	16,529	16,894	17,892	-9	2	6	-2
Kapiti Coast	18,208	17,862	16,465	17,912	-2	-8	9	-2
Lower Hutt	22,336	21,153	20,752	21,962	-5	-2	6	-2
Westland	17,372	15,792	16,154	17,004	-9	2	5	-2
Rotorua	19,437	16,744	17,723	18,558	-14	6	5	-5
Kaipara	16,574	14,277	14,705	15,809	-14	3	8	-5
Christchurch	18,473	16,631	16,376	17,564	-10	-2	7	-5
Upper Hutt	22,149	21,076	19,558	20,966	-5	-7	7	-5
Waitaki	15,820	14,527	14,861	14,956	-8	2	1	-5
Nelson	18,105	16,540	16,596	17,104	-9	0	3	-6
Tauranga	17,870	16,363	16,003	16,828	-8	-2	5	-6
Porirua	21,930	18,175	18,894	20,517	-17	4	9	-6
Thames-Coromandel	15,701	14,294	14,532	14,652	-9	2	1	-7
Manukau	20,413	18,028	17,873	18,963	-12	-1	6	-7
Timaru	16,874	15,421	15,498	15,665	-9	0	1	-7

Masterton	17,833	15,986	15,794	16,471	-10	-1	4	-8
Hastings	17,975	16,035	15,583	16,550	-11	-3	6	-8
Palmerston North	18,836	16,718	16,165	17,244	-11	-3	7	-8
Rangitikei	17,772	15,754	15,891	16,256	-11	1	2	-9
Napier	18,445	15,999	15,866	16,853	-13	-1	6	-9
Far North	15,523	12,979	13,304	14,065	-16	2	6	-9
Whakatane	17,578	14,840	15,471	15,916	-16	4	3	-9
Hamilton	19,861	17,929	16,728	17,937	-10	-7	7	-10
Gisborne	17,218	14,883	14,979	15,279	-14	1	2	-11
Horowhenua	16,182	14,916	14,332	14,355	-8	-4	0	-11
Wairoa	16,664	13,837	14,169	14,619	-17	2	3	-12
Central Otago	17,841	15,582	14,980	15,644	-13	-4	4	-12
Hauraki	17,493	15,437	15,081	15,247	-12	-2	1	-13
Ruapehu	19,298	16,270	15,938	16,742	-16	-2	5	-13
Buller	15,435	13,455	13,383	13,336	-13	-1	-0	-14
Wanganui	17,259	15,409	14,855	14,838	-11	-4	-0	-14
New Plymouth	19,236	16,669	16,304	16,405	-13	-2	1	-15
Grey	17,472	14,775	14,901	14,756	-15	1	-1	-16
Whangarei	19,568	15,614	15,427	16,427	-20	-1	6	-16
Opotiki	15,482	12,189	12,341	12,899	-21	1	5	-17
Dunedin	17,505	15,153	14,427	14,541	-13	-5	1	-17
Invercargill	19,545	16,654	16,226	16,194	-15	-3	-0	-17
South Waikato	21,555	16,826	16,303	17,623	-22	-3	8	-18
Kawerau	19,553	15,166	14,044	13,528	-22	-7	-4	-31
New Zealand	19,283	17,654	17,733	18,985	-8	0.4	7	-2

[1] June 2001 dollars. Ranked by 1986-2001 real percentage changes.

Source: Statistics New Zealand.

Table 12: Real Gross Product ($ million)[1]

Territorial Local Authority	Product 1981	Product 1992	Product 2004	% Change 1981-1992	% Change 1992-2004	% Change 1981-2004
Queenstown-Lakes	52,800	79,129	210,711	50	166	299
Rodney	259,478	377,687	763,294	46	102	194
Selwyn	111,951	153,995	308,533	38	100	176
Waimakariri	139,613	199,684	382,295	43	91	174
Western Bay of Plenty	128,193	176,276	326,676	38	85	155
Franklin	206,300	288,200	523,784	40	82	154
Hurunui	36,262	47,758	88,681	32	86	145
Tasman	164,347	213,469	391,176	30	83	138
Tauranga	340,175	409,605	787,616	20	92	132
Kapiti Coast	162,676	212,619	351,246	31	65	116
Thames-Coromandel	85,419	109,933	179,984	29	64	111
Marlborough	176,179	224,704	370,599	28	65	110
Banks Peninsula	36,902	44,661	74,906	21	68	103
Ashburton	127,485	153,909	254,093	21	65	99
Kaikoura	13,707	16,120	27,083	18	68	98
Manukau	1,366,830	1,499,770	2,656,719	10	77	94
Waitakere	878,846	1,042,305	1,691,656	19	62	92
Waipa	187,839	227,691	356,948	21	57	90
Auckland	2,156,266	2,349,480	4,017,443	9	71	86
Carterton	32,260	37,768	59,288	17	57	84
North Shore	1,183,483	1,372,547	2,168,154	16	58	83
Central Hawke's Bay	65,526	75,661	119,434	15	58	82
Hamilton	623,009	708,755	1,129,104	14	59	81
Nelson	210,030	245,570	379,792	17	55	81
Otorohanga	40,823	47,800	72,607	17	52	78
Kaipara	73,979	83,942	131,275	13	56	77
Christchurch	1,784,654	2,004,463	3,104,783	12	55	74
Papakura	218,033	251,154	378,927	15	51	74
Waikato	205,533	230,857	355,826	12	54	73
Taupo	145,876	175,084	252,227	20	44	73
Manawatu	140,525	175,045	242,180	25	38	72
Far North	194,501	200,594	334,086	3	67	72
South Wairarapa	42,820	48,777	73,044	14	50	71
Southland	163,503	195,129	277,689	19	42	70
Hauraki	75,382	95,670	125,693	27	31	67
Waitomo	52,414	58,413	87,384	11	50	67
Central Otago	83,030	100,223	138,146	21	38	66
Clutha	94,312	107,090	156,813	14	46	66
Matamata-Piako	150,624	178,419	249,544	18	40	66
Waimate	34,993	39,564	57,369	13	45	64
Mackenzie	19,544	21,018	31,983	8	52	64
Whakatane	144,854	154,700	227,794	7	47	57
Hastings	347,555	379,233	544,377	9	44	57
Palmerston North	413,669	466,253	647,404	13	39	57
Wellington	1,371,949	1,482,173	2,146,723	8	45	56
Gore	74,727	84,803	115,736	13	36	55
Waitaki	108,362	129,641	166,974	20	29	54
Westland	43,797	54,883	67,315	25	23	54
Opotiki	31,218	30,431	47,820	-3	57	53
Horowhenua	137,259	148,845	209,725	8	41	53
Timaru	233,613	247,790	355,797	6	44	52

South Taranaki	153,169	175,518	232,805	15	33	52
Whangarei	356,948	350,598	534,147	-2	52	50
Buller	53,735	65,825	80,083	22	22	49
Tararua	97,079	113,429	144,568	17	27	49
Masterton	119,514	127,537	177,713	7	39	49
Napier	301,611	320,293	447,457	6	40	48
Dunedin	656,898	706,870	966,253	8	37	47
Rotorua	353,331	354,828	515,241	0	45	46
Porirua	305,510	308,480	436,933	1	42	43
Grey	79,768	91,543	113,961	15	24	43
New Plymouth	402,581	447,246	572,985	11	28	42
Stratford	52,356	56,042	73,853	7	32	41
Lower Hutt	705,885	740,161	990,102	5	34	40
Wanganui	234,125	235,193	311,405	0	32	33
Upper Hutt	272,309	292,202	358,362	7	23	32
Rangitikei	87,777	88,539	113,193	1	28	29
Gisborne	234,659	220,875	299,315	-6	36	28
Invercargill	353,860	362,696	434,951	2	20	23
Wairoa	49,869	47,643	57,086	-4	20	14
South Waikato	150,812	142,210	163,540	-6	15	8
Ruapehu	111,438	96,088	102,846	-14	7	-8
Kawerau	41,992	39,643	37,912	-6	-4	-10
New Zealand	20,348,350	22,842,751	35,383,167	12	55	74

[1] June 2004 dollars. Ranked by 1981-2004 real percentage price changes.
Source: Motu Economic Research and Statistics New Zealand.

Table 13: Per capita Real Gross Product[1]

Territorial Local Authority	Per capita Product 1981	Per capita Product 1992	Per capita Product 2004	% Change 1981-1992	% Change 1992-2004	% Change 1981-2004
Mackenzie	3,195	5,130	8,532	61	66	167
Hurunui	3,591	5,160	8,307	44	61	131
Clutha	4,483	5,785	9,041	29	56	102
Waimate	4,088	5,037	8,084	23	61	98
Ashburton	4,961	6,114	9,508	23	56	92
Central Hawke's Bay	4,776	5,646	9,082	18	61	90
Waitomo	4,766	5,783	9,049	21	56	90
Southland	4,977	6,234	9,445	25	52	90
Selwyn	5,320	6,728	9,985	26	48	88
Otorohanga	4,193	4,949	7,648	18	55	82
Gore	5,138	6,305	9,268	23	47	80
South Taranaki	4,702	5,846	8,446	24	44	80
Kaikoura	4,219	4,538	7,456	8	64	77
Waitaki	4,876	5,964	8,383	22	41	72
Central Otago	5,403	6,303	9,172	17	46	70
Tararua	4,903	5,808	8,130	18	40	66
Waimakariri	5,610	6,656	9,290	19	40	66
Kaipara	4,400	4,742	7,273	8	53	65
Rangitikei	4,635	5,183	7,610	12	47	64
Stratford	5,175	5,740	8,449	11	47	63
Marlborough	5,365	5,988	8,746	12	46	63
Banks Peninsula	5,574	6,047	9,011	8	49	62
Buller	5,156	6,141	8,316	19	35	61
Westland	5,304	6,631	8,524	25	29	61
Matamata-Piako	5,126	5,965	8,236	16	38	61
Franklin	5,786	6,352	9,250	10	46	60
Grey	5,469	6,539	8,737	20	34	60
Carterton	5,271	5,605	8,296	6	48	57
South Wairarapa	5,256	5,533	8,265	5	49	57
Tasman	5,417	5,887	8,515	9	45	57
Hauraki	4,754	5,490	7,446	15	36	57
Timaru	5,345	5,753	8,250	8	43	54
Waipa	5,628	5,994	8,586	6	43	53
Western Bay of Plenty	5,173	5,330	7,874	3	48	52
Manawatu	5,657	6,354	8,558	12	35	51
Wairoa	4,420	4,567	6,647	3	46	50
Waikato	5,703	5,942	8,385	4	41	47
Whakatane	4,616	4,672	6,700	1	43	45
Masterton	5,338	5,600	7,627	5	36	43
Christchurch	6,383	6,743	9,006	6	34	41
Napier	5,653	5,997	7,971	6	33	41
Hastings	5,442	5,687	7,648	4	34	41
Horowhenua	4,879	4,927	6,854	1	39	40
South Waikato	5,010	5,369	7,030	7	31	40
Taupo	5,326	5,776	7,473	8	29	40
Gisborne	4,834	4,709	6,672	-3	42	38
Lower Hutt	7,190	7,547	9,866	5	31	37
Nelson	6,135	6,471	8,363	5	29	36
Dunedin	5,829	6,105	7,920	5	30	36
Invercargill	6,213	6,660	8,415	7	26	35
Auckland	7,135	7,035	9,534	-1	36	34
Upper Hutt	7,144	7,764	9,452	9	22	32

Wellington	8,865	9,381	11,728	6	25	32
Hamilton	6,590	6,690	8,709	2	30	32
Rodney	6,654	6,300	8,782	-5	39	32
Thames-Coromandel	5,154	4,701	6,785	-9	44	32
Wanganui	5,505	5,244	7,148	-5	36	30
Palmerston North	6,417	6,568	8,276	2	26	29
Ruapehu	5,885	5,394	7,541	-8	40	28
Papakura	6,851	6,442	8,701	-6	35	27
New Plymouth	6,525	6,578	8,279	1	26	27
North Shore	8,178	8,332	10,333	2	24	26
Tauranga	6,134	5,745	7,748	-6	35	26
Far North	4,612	3,882	5,817	-16	50	26
Waitakere	7,180	6,903	8,920	-4	29	24
Rotorua	6,166	5,530	7,597	-10	37	23
Kapiti Coast	6,199	5,823	7,582	-6	30	22
Manukau	6,681	6,045	8,117	-10	34	22
Opotiki	4,174	3,321	4,991	-20	50	20
Whangarei	6,185	5,344	7,388	-14	38	19
Porirua	7,283	6,632	8,629	-9	30	18
Kawerau	4,790	4,778	5,596	-0	17	17
Queenstown-Lakes	8,313	7,226	9,412	-13	30	13
New Zealand	6,286	6,443	8,701	2	35	38

[1] June 2004 dollars. Ranked by 1981-2004 real percentage price changes.

Source: Motu Economic Research and Statistics New Zealand.

Table 14: Average Quarterly Building Consents as a Ratio of Average Quarterly Population Change: 1991/92-2004

Territorial Local Authority	Building Consents / Population Change 1991/92 - 2004
Manukau	0.29
North Shore	0.35
Auckland	0.37
Waitakere	0.37
Porirua	0.39
Hamilton	0.40
Rodney	0.41
Wellington	0.43
Waimakariri	0.44
Nelson	0.45
Franklin	0.46
Western Bay of Plenty	0.46
Tasman	0.47
Queenstown-Lakes	0.47
Palmerston North	0.47
Selwyn	0.47
Tauranga	0.48
Kapiti Coast	0.48
Christchurch	0.49
Papakura	0.56
Dunedin	0.59
Hastings	0.67
Waikato	0.70
Far North	0.79
Rotorua	0.79
Marlborough	0.81
Waipa	0.82
Whangarei	0.88
Lower Hutt	0.88
Napier	0.96
Taupo	0.99
Thames-Coromandel	1.47

Source: Statistics New Zealand

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