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## What do Rents tell us about House Prices?

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**Abstract:**

*Since 2000 there an unprecedented increase in house prices in a number of western countries, including New Zealand. House prices have risen much more rapidly than rents. This has resulted in questions being raised about the traditional relationship between residential rents and values. The objective of this paper is to determine if changes in private sector residential rents can be used to forecast changes in New Zealand house prices. The hypothesis being that there is a strong linkage between income and value in both the share markets and commercial property markets and the same effect is likely to be true for housing.*

## **Introduction**

Changes in the level of house prices are frequently reported in the media because they are of interest to the general population, property professionals and policy makers. With few exceptions, people either rent or own houses. Since 2000 the Economist (2005) has reported on an unprecedented increase in house prices in a number of western countries, including New Zealand. Home owners have enjoyed substantial increases in the value of their homes. This has given rise to the so called “wealth effect” enabling some home owners to increase spending on consumer items by borrowing against increased home equity. From the homeowners view point it makes sense to use a mortgage to fund spending because mortgage interest rates are typically considerably less than those on credit cards and unsecured consumer debt.

Aspiring first home buyers view increasing house prices as a barrier delaying their entry to ownership, since it takes longer to save for a deposit and requires a higher level of debt servicing. From a national perspective unless increases in house prices can be justified by increased labour market productivity leading to higher incomes then house price increases represent a transfer payment between existing and aspiring home owners.

An examination of historical house sales data reveals that housing markets are cyclical. Tuffey (2005) suggests that since 1970 New Zealand house prices have followed a 6-8 year cycle. Thus the level of increases seen in New Zealand from 2002-2005 are unlikely to be sustained over the next three years. The concern from a policy perspective is that if house prices fall then this may have damaging economic effects. Consumers might reduce spending since they no longer feel so wealthy, new construction might be reduced and the level of employment could fall.

There is a considerable amount of academic literature available linking real estate cycles with business cycles. Ratcliff (1949) identified a six stage real estate cycle with higher employment levels resulting in a housing market upturn. Case (1965) noted that rents were an indirect measure of market trends, usually peaking at about the same time as real estate turnover rates peaked. Pyhrr and Cooper (1982) agreed that the general business cycle and real estate cycle was strongly correlated “but not necessarily synchronised”. However, recent work by the OECD (2005) suggests that the current property boom does not follow the business cycle and is unlike anything that has occurred in the last 35 years. Low interest rates in a number of countries, combined with excess liquidity and worries about the volatility of share markets appear to have contributed to the property boom.

The objective of this paper is to determine if changes in private sector residential rents can be used to forecast changes in New Zealand house prices. The hypothesis being that there is a strong linkage between income and value in both the share markets and commercial property markets and the same effect is likely to be true for housing.

Campbell & Shiller (1998) examined long run price earnings data in the US stock market and concluded the ratios were “extraordinarily bearish”. Shiller (2000) accurately forecast the dot-com share market bust in the US by showing that when the price earnings ratio for US stock was too far away from the average historical ratio then a correction in share prices was inevitable. More recently Case & Shiller (2004) and Shiller (2005) focused attention on housing markets and expressed concern about the “irrational exuberance” occurring in some markets. They demonstrated disparity between US house prices, population increases and building costs and suggested there is a strong element of speculation in the current housing market that is not justified by fundamentals. Gallin (2004) also used US data to explore the long run relationship

between house prices and rents. Gallin concluded that house prices do correct back to rents rather than rents correcting to house prices. Carreras-i-Solanas et al (2004) studied the relationship between house prices and rents in Barcelona, Spain. They found periods when house prices were high corresponded with periods of increased demand for investor housing and rentals were an important variable in determining house prices.

While most property professionals accept the prices paid for housing in the current market are the best indicator of value some economists are more inclined to take a longer term view of value and question the short run efficiency of the property market. The longer term view recognises the tendency of property markets to overshoot “fundamental value” both on the high side and the low side of the property cycle. It is difficult to define fundamental value but a common view is that yields should be a function of the average price earnings over a long period. Shiller (2005) attributes this occurrence to a variety of psychological factors and the herd like behaviour resulting from both face to face and media communications. For example, if social conversation between friends is focused on how much money some of the group have made from real estate investments then other members of the group may feel some what jealous and excluded from the money making conversations unless they also purchase property.

### **Valuation of Income Real Estate**

According to economic theory the value of a real estate asset is the present worth of the future income generated by the asset. Income now is worth more in present value terms than income in the future because income now can be invested and earn interest. Income in the future has a cost associated with it since the opportunity to

earn interest now is foregone. Thus future income needs to be discounted at rate reflecting the opportunity cost of the interest as follows:

$$V = \sum_{t=0}^T \frac{(R_t - C_t)}{(1+i)^t} \quad (1)$$

where  $V$  = the value of the asset

$t$  = holding period

$R$  = Rent

$C$  = Annual costs

$i$  = discount rate

and

$$V = \frac{(R - C)}{r} \quad (2)$$

$r$  = the capitalisation rate

Heady (1953) explained that the discounting formula shown in equation 1 reduces to the capitalisation formula in equation 2 when it is assumed the income stream will continue unchanged into perpetuity.

In the rental housing market buyers and sellers are relatively unsophisticated investors and instead of using net income often use gross income. This simplified form of the equation 2 known as the capitalisation method where :

$$V = \frac{R}{r} \quad (3)$$

In theory the assumptions used in the simplified capitalisation method in equation 3 are unlikely to hold true for most classes of real estate, particularly those in the built environment. For example, housing has a finite lifespan, rental income streams fluctuate over time and most investors only hold investment property for relatively short periods of time. Never the less as Wendt (1974) points out if investors are setting prices on the basis of gross income capitalisation then this metric will be what determines the price of real estate. In addition investors may be put off trying to calculate net income due to the lumpy nature of repairs and maintenance expenditure and difficulties in assessing the quality of the present management.

The capitalisation formulas in equations 2 and 3 do not explicitly calculate the income stream associated with the residual value of a property at the end of the holding period. However the capitalisation rates derived from market transactions do in fact reflect investors expectations of future changes in property values. For example, the fact that capitalisation rates are currently well below mortgage interest rates reflects an expectation of future capital growth in property values.

Selecting the appropriate capitalisation rate is one of the challenges when using the income approach. The free flow of money around the world has tended to equalise capitalisation rates across national boundaries. In the current New Zealand environment international investors have driven down yields in line with capitalisation rates with their country of origin. However, direct property is normally viewed as a medium to long term investment and once capitalisation rates drop below the long term average investors are exposed to interest rate risk.

If the property market is functioning in accordance with conventional economic theory then the price of housing should be such that buyers are indifferent between renting and owning. In this situation the price of a house really would be a function

of the discounted value of future income. In practice consumers of housing services normally place more weight on ownership due to a variety of intangible factors that are hard to quantify. Haurin et al (2002) has shown the children of owners tend to have better educational outcomes than the children of renters. This is possibly because renting is a less secure form of tenure and renters tend to move more than owners. Owners may also spend money on “non productive” items that give them personal satisfaction but would not necessarily be reflected in rents. For example, sound proofing a teenagers’ bedroom to mitigate the rest of the family from noise from a drum set may cost thousands of dollars and not result in any increase in rents. Similarly in colder cities the presence a swimming pool may not add value to a house because the typical buyer considers the costs of pool maintenance and security exceeds the benefits of pool usage.

### **The Housing Market**

Since around two thirds of houses in New Zealand are owner occupied the majority of buyers and sellers do not explicitly use the rental income capitalisation approach to establishing value. Instead they rely on a more direct approach called the comparable sales approach to valuation. This approach makes the subject house the benchmark and arrives at the value by adjusting sales of comparable houses for variations from the benchmark. Buyers, particularly first home buyers, may give implicit recognition to the income capitalisation approach since they have a choice between owning and renting. The rent versus buy calculation is a variation of the income capitalisation approach.

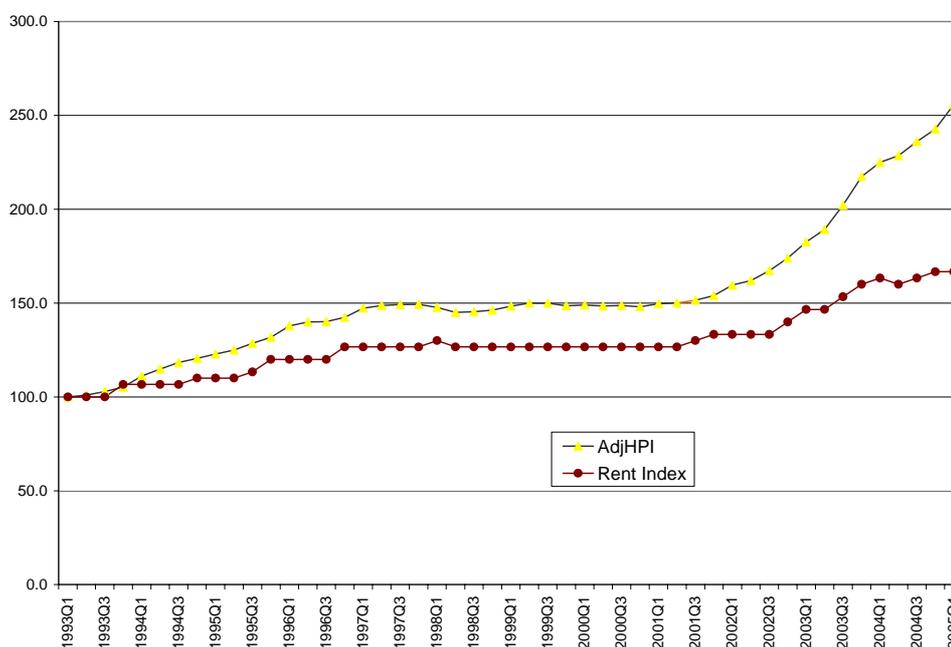
Census data from statistics NZ (2001) and projections by DTZ (2005) show nationally the percentage of rental housing will be around 38 percent by 2012 and in Auckland City this figure will be closer to 50 percent. Private sector rentals in New Zealand are

regulated by the Residential Tenancies Act. This legislation allows landlords to set rents at market levels and only provide short term security to tenants. For most tenants this is not a problem as the average length of a residential tenancy is for less than one year. The high churn rate for residential tenancies means the Tenancy Bond Division of the Department of Building and Housing (DBH, 2005) is able to supply the public with a large volume of up to date residential rental information. The problem of adjusting for over rented or under rented houses is not an issue in New Zealand due the short duration of tenancies. Detailed rental information is available down to a neighbourhood level and the types of dwelling categorised by single family home, apartments and flats. The data is also split up according to the number of bedrooms. This paper utilises DBH rental information to explore the relationship between residential rents and house prices.

### **Comparing Indices**

Figure 1 compares the movements from 1993-2005 in the Quotable Value NZ (2005) house price index with the national index of private sector rents based on DBH median rentals for houses. A starting date of 1993 was selected because prior to this time private sector rental data was either not available or not reliable. There is a longer rental time series available from Statistics New Zealand (2005) as part of the consumer price index (cpi). However, as Rosborough (2005) identified the rents used in this series do not necessarily reflect market rents as they include both private sector and government (social housing) rents. Since the 1980s New Zealand has had periods when state housing had subsidised (income related) rents and other periods when the rents on state houses were set at market levels.

**Figure 1: All New Zealand House Price and Rent Indices 1993-2005**



While house prices and rents have both moved upwards since 1993 it is clear that the rate of increase in house prices has been greater. For example, basing both indices at 100 in 1993 by the first quarter of 2005 the house price index was 255, representing an average compound rate of increase since 1993 of 8.14 percent. The comparable figure for rents was 166 and a compound rate of 4.35 percent. Over this 12 year period a 1 percent increase in rents resulted in an average 1.87 percent increase in house prices, although rents were only one factor influencing house prices.

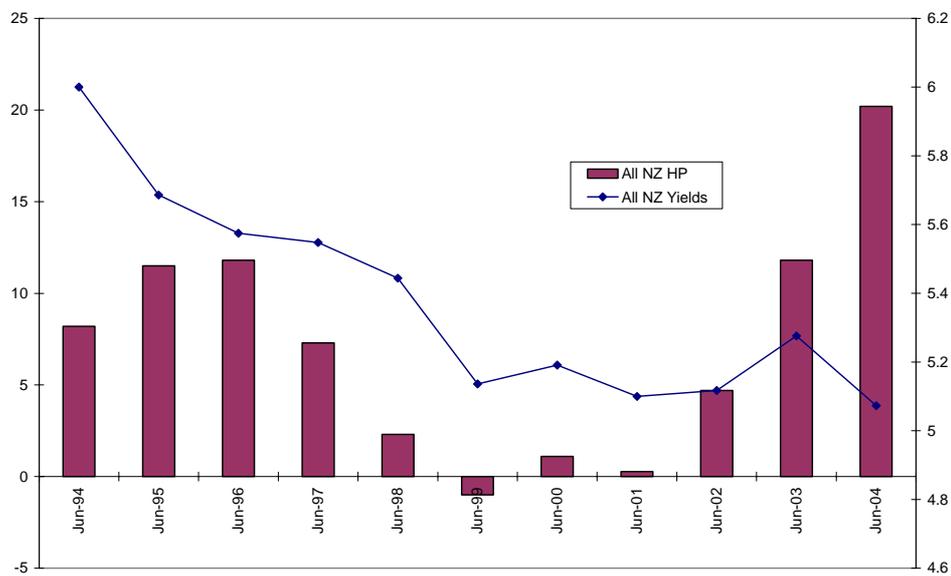
For the first six years house values had an average compound rate of increase of 6.78 percent compared with rents at 4.02 percent. For the second 6 years the house price index increased at 9.5 percent and rents at 4.68 percent.

### **Effect on Yields**

The consequence of house prices increasing at a faster rate than rents has been a decline in net yields. Yields are simply the relationship between income and value

and the term yield is the equivalent of capitalisation. Figure 2 charts the all New Zealand net yields from June 1994 to June 2004, as reported by Hargreaves and Shi (2005), on the right hand scale against six monthly capital returns (changes in the house price index) on the left hand scale. Clearly yields have been trending down over the period and are less volatile than house prices.

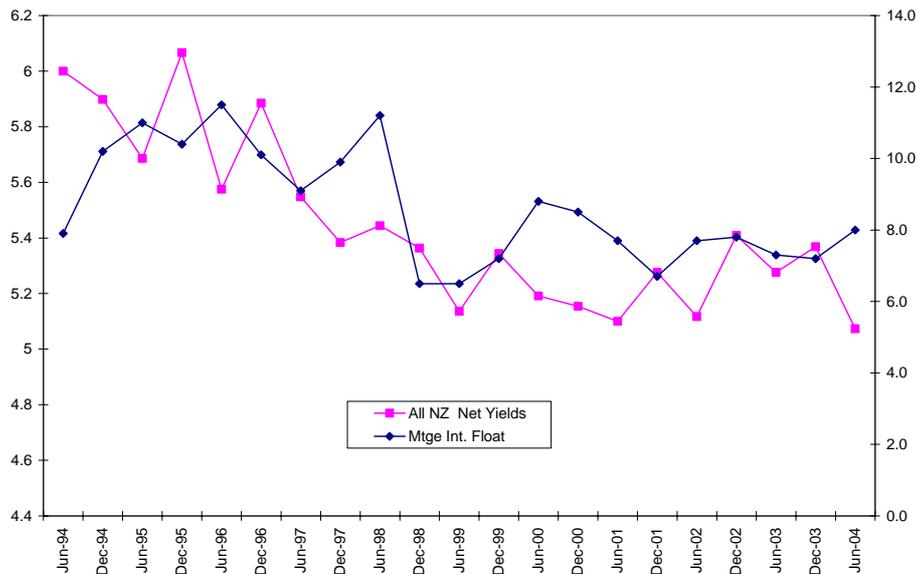
**Figure 2: Net Yields (RHS) and Percent Changes in House Prices (LHS)**



Residential investment yields are also quite strongly correlated with mortgage interest rates. Figure 3 shows yields continuing to track down at the same time lower interest rates were helping to push up house prices. From 1993-2004 the floating mortgage interest rates were on average 3.2 percent higher than average yields. Although appreciation in house prices (8.2 percent on average) was more than double the gap between yields and floating mortgage interest rates highly leveraged investors were being placed in a risky position. This was because small increases vacancy and interest rates resulted in some investor houses showing negative cash flows. While loss attributing company structures can be used to offset negative cash flow houses

against other income it usually does not make sense to continue to run losses unless these losses are more than offset by future profits.

**Figure 3: Floating Mortgage Interest Rates (RHS) and Net Yields (LHS)**



As the rate of increase in house prices slows down and eventually flattens buyers are likely to demand higher yields. Higher yields are possible if rents increase but currently this does not appear to be a very likely scenario. It is more likely the prices for some classes of investor housing will at least stabilise and possibly decline. It can be argued that lower yields are justified so long as mortgage interest remain low but this argument overlooks the fact that interest rates are more volatile than yields since property is a long term investment .

**Do Rents lead House Prices?**

Figure 4 charts the quarterly percentage change in house prices for New Zealand against the percentage change in rents from 1993-2005. Changes in house prices are

on the left hand axis and changes in rents on the right hand. Over this period rents appeared to lead house prices down in the late 1990's and up in 2001. In nominal terms the all New Zealand figure for rents declined twice over the period but remained static for much of the 1998-2001 period. On the other hand house prices declined in five of the quarterly periods. Data on rental vacancy rates is not available but there may be a tendency for landlords to accept higher vacancy rather than reduce rents.

**Figure 4: Percent Changes in Rents and House Prices (1993-2005)**

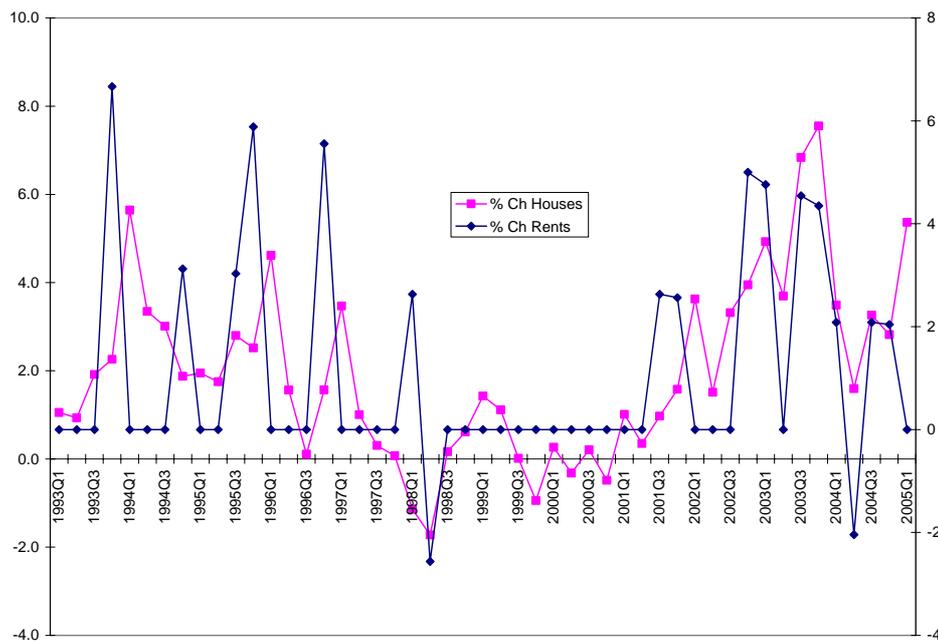


Table 1 shows the correlation coefficients between 6 monthly percentage changes for house price and rental data for all New Zealand as well as Auckland, Wellington and Christchurch cities. The adjusted coefficients are where the rental data is lagged 6 months.

The correlation coefficients increase significantly when the rental data is lagged by one period giving more weight to the assertion that changes in rental levels aren't immediately reflected in changes to house prices. There are a number of reasons why rents might move before house prices. Firstly investor buyers work done by Shiller (2004) using US data shows rents are more closely correlated to movements in wages and salaries than to house prices. Using New Zealand data we also find over the period 1993-2005, average weekly wages increased by 36 percent compared to rental increases of 66 percent and house price increases of 150 percent. Thus from an affordability point of view landlords can justify increasing rents as wages rise.

**Table 1**

**Correlations of Rents and House Prices (1993-2005)**

	<b>Unadjusted</b>	<b>Adjusted (6 month lag)</b>
All New Zealand	.15	.80
Auckland	.30	.75
Wellington	-.18	.38
Christchurch	.27	.65

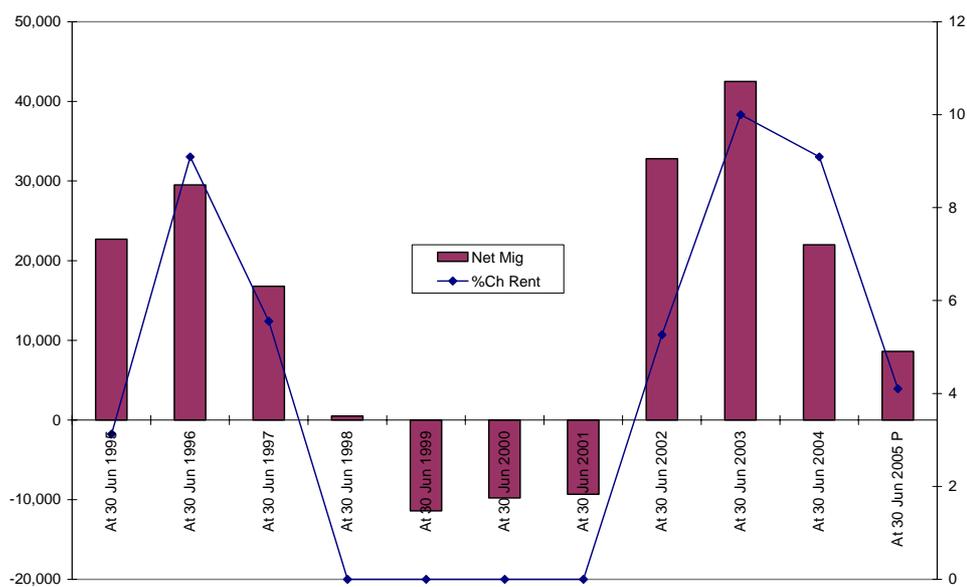
**Rents and Net Migration**

One of the key demand drivers in the New Zealand rental market is net migration. The rate of natural increase in the population averaged 29,000 persons over the period June 1995 to June 2005 with a standard deviation of only 1440 persons. Conversely over the same period net migration averaged 13,100 persons, with a standard deviation of 18,700. Net migration has a history of providing “shocks” to residential rents because in the short run it is hard to match a relatively inelastic supply of housing with sudden changes in demand. Doubling up families does enable housing to

be used more efficiently but increasing the overall housing stock can only be accomplished by building new houses. Also, existing owner occupied housing can be switched to rental housing as the percentage of households renting continues to increase. However, switching housing from owner occupied to rental does not add to the housing stock.

Figure 5 charts the annual percentage change in rents on the right hand axis and net migration statistics from 1995-2005 on the left hand scale. Negative net migration from 1999-2001 is clearly related to a static level of national rents. Strongly positive net migration levels in 2002 and 2003 coincided with annual rent increases peaking at 10 percent in 2003. Currently net migration is on a downward trend with some evidence of increased vacancies and falling rents appearing in over supplied sections of the market such as Auckland apartments.

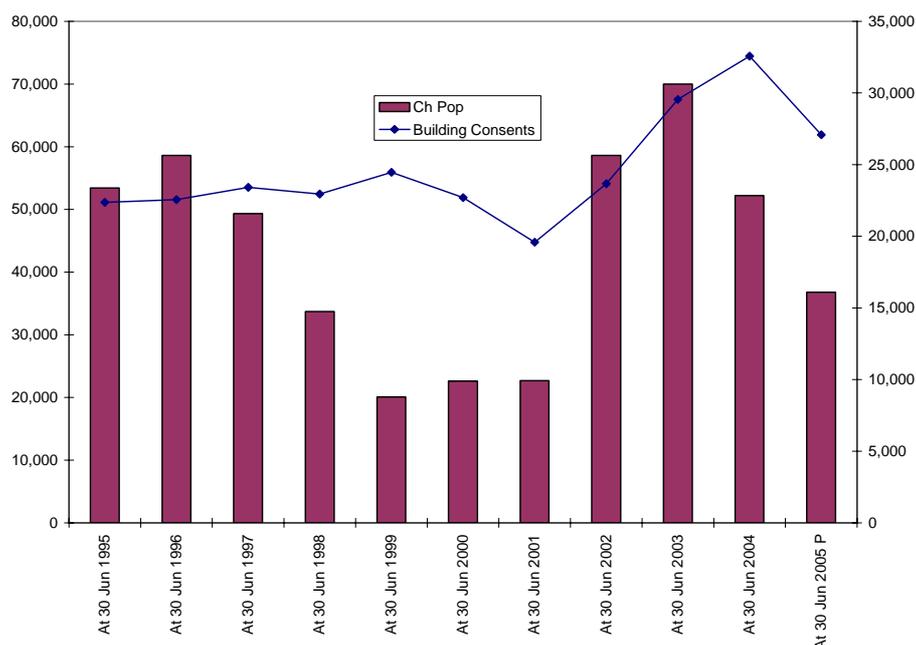
**Figure 5: Net Migration (LHS) and Annual Percentage Change in Rents (RHS)**



## The Supply Side

Rents are sensitive to changes in the supply of new housing in relation to changes in the population. Figure 6 uses population and building consent data from Statistics NZ (2005) to illustrate how it is very difficult for residential property developers to equate supply with demand. One problem for developers is the time it takes from commencing a new project to completion. Delays may be caused by regulations relating to land rezoning and subdivision, new building regulations, a shortage of materials and workers or changes in demand. Another problem for developers is that they all tend to see the same demand signals, tend not to talk to each other and compete for first mover advantage. This means developers who are slow to move may end up with unsold inventory in an over supplied market. For example, the rate of population growth slowed from 1997-2001 but the number of consents for new buildings increased through to 1997-1999. More recently the annual increase in population peaked in 2003, about a year before building consents peaked.

**Figure 6: Increase in Population (LHS) and Building Consents (RHS)**

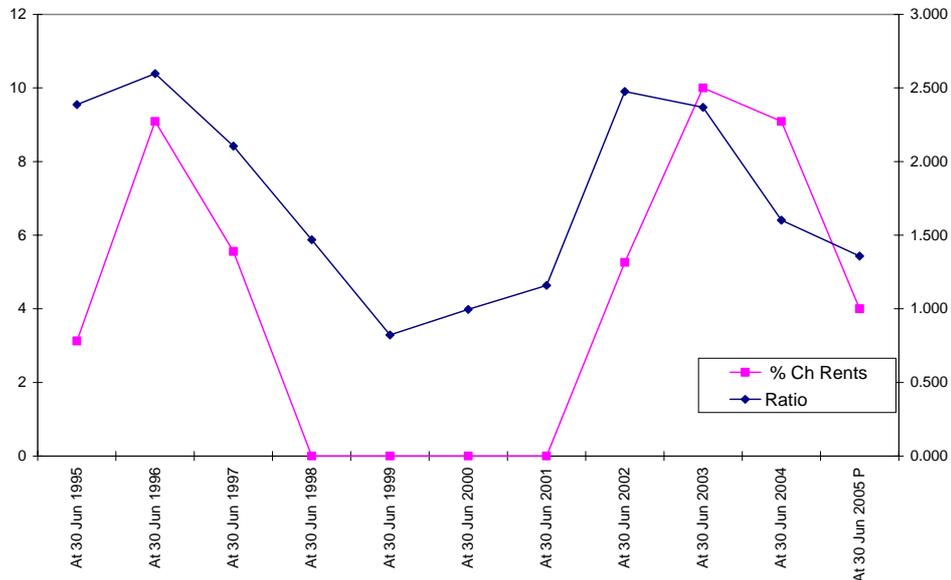


One measure of assessing the equilibrium supply of new housing is to consider the annual number of new dwelling consents divided by the annual increase in population. This figure needs to be viewed in the context of Statistics New Zealand (2001) data showing the average dwelling occupancy rate per household reduced from 2.89 in 1991 to 2.78 in 2003. This is largely a reflection of the trends for people to have smaller families and for more single person households. It is anticipated that the next census in 2006 occupancy will average around 2.7.

Over the last decade the average ratio of population increase to new building consents was 1.9 with a high of 2.56 in 1996 and a low of 1.35 in 2005. In other words in mid 2005 we were planning to build 100 new dwelling units for each increase in population of 135 persons. Certainly not all building consents translate into actual building completions, but most do and the 2005 ratio suggests oversupply.

Figure 7 charts this ratio for the period June 1995 – June 2005 on the right hand scale against the annual percentage change in rents over the same period. These two series show a correlation coefficient of .718 and confirm that upward pressure on rents after 2001 was a consequence of both reduced building activity from 1999 and a significant increase in population (due to net migration) in 2002.

**Figure 7: Ratio of Population Increase to Building Consents (RHS) and Percentage Change in Rents (LHS)**



Rents are also sensitive to overbuilding and Figure 7 shows rent increases reducing since 2003 as the June 2005 ratio of population to building consents was well below the 10 year average.

**Summary and Conclusions**

Rents are a useful leading indicator when forecasting changes to house prices. The analysis in this paper suggests rents lead prices by 6 months. In turn net migration leads rents, particularly in the Auckland area. Rents are also sensitive to the supply of new housing since it is difficult for developers to match supply with demand. With the yields on investor housing now being well below mortgage interest rates it is clear that there is an ongoing expectation that future capital gains will more than make up the difference.

The relationship between income and value is less pronounced for housing compared to commercial property and the share market. This is because housing is largely owner occupied and the benefits from ownership embrace a number of psychological factors that are hard to quantify in dollar terms. Also housing transacts relatively infrequently and owner occupiers are hedged against the risks of future changes in both rents and house prices. Never the less the private sector rental housing market in New Zealand is substantial, comprising nearly 30 percent of the housing stock and growing. Over the last decade the main increase in rental housing has been in the suburbs where single family homes have been switched from owner-occupied to rentals and in inner city Auckland where about 70 percent of apartments are rentals. The ability of individual housing units to be easily switched from owner occupation to rentals helps to cement the income value relationship.

The combination of DBH rental information with QVNZ house price data shows gross yields have been declining over the last decade. This decline has been largely a function of increasing house prices with rents increasing at a much lower rate than house prices. The acceptance by investors of declining yields could possibly be justified if two conditions are satisfied. Firstly, mortgage interest rates continue to decline. Secondly, house prices continue to escalate at rates of 15-20 percent per year. Neither of these conditions seem likely to be met, at least in the short term. The history of real estate cycles shows house prices will need to adjust.

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