A TOTAL RETURNS INDEX FOR INVESTOR HOUSING IN NEW ZEALAND

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ABSTRACT

The absence of a total returns index makes it difficult to compare the performance of investor housing between regions and with other asset classes in New Zealand. As a first step in overcoming this deficiency, the authors integrated information from two existing government data bases, the first covering residential rents and the second covering house sales. The relationship between gross rents and net income was established by surveying a random sample of residential property investors. This survey also provided base line information showing private sector investor housing typically sits midway between the lower quartile and median house price bands. The total returns indices confirm that the overall decline in net yields over the last decade has been more than offset by increases in property values.

Keywords: Investor housing, total returns index, investment performance, New Zealand

INTRODUCTION

The development of a total returns index for investor housing is the first step in making it possible to compare the investment performance of housing with other asset classes. Most of the information needed to construct a total returns index for New Zealand is currently available. Quotable Value NZ (QVNZ) (2004) has a long running series tracking movements in house prices by comparing average sale prices to average rating valuations and chaining these over time. The Department of Building and Housing (DBH) (2005) holds all private sector tenancy bonds and regularly publishes comprehensive information on residential rents.

However, two elements essential for total returns index construction have been lacking. Firstly, research establishing the relationship between gross rents and net income. Secondly, research determining the linkage between rental house prices and overall house prices. This paper addresses both of these issues.

The first section of this paper provides a brief overview of housing index methodology. The second section summarises a survey of private sector landlords conducted by the authors and aimed at providing the missing information on net incomes and rental house prices. The third section of the paper combines the findings from the survey with the sales and rental data bases to produce a total returns series. The sensitivity of the index is then tested for changes to the key variables.

PROPERTY INDICES

The total annual returns (before tax and debt servicing) from property investments comprise the cash flows from income (rent less vacancies) less the annual operating expenses (rates, repairs and maintenance, insurance, management etc), plus changes in the value of the property less capital expenditure. This is the approach used by the Property Council of New Zealand (2004).

Thus:

$$TR\% = \left(\left(\frac{GI - EXP}{CMV}\right)\times 100\right) + \left(\left(\frac{\left(CMV - PMV\right) - CE}{CMV}\right)\times 100\right)$$

where:

TR% = Total return for the period (before tax and debt servicing) as a percent of the current market value of the property
GI = Gross income (potential rent less vacancies and bad debts)
EXP = Annual expenses associated with operating the property (rates, insurance, management, repairs and maintenance and other expenses such as accounting)
CMV = Current market value of the property
PMV = Previous market value in last period
CE = Capital expenditure in current period.

A property index can be constructed by aggregating the returns from individual properties using the above methodology and then chaining the total returns per period over time. For example, if the index number for the base year is set at 100 and the total return in the first year is 10 percent (say 5 percent net yield plus 5 percent increase in house prices) then the index number at the beginning of the second year will be 110. Having a common index number in the base year enables index users to compare property returns between different localities, classes of property and other asset classes.

Normally the most difficult component to estimate with property indices is the changes in the market value of houses from one period to the next. Since the majority of housing in western countries is owner-occupied, most housing indices estimate changes in house prices and ignore the rental component. The extensive housing index literature identifies four main transaction based approaches; the median price method, the hedonic method, the repeat sales method and the hybrid method.

Median Price Method

The median price method computes percentage price changes in the median house price between periods. This statistic is commonly reported by professional real estate groups in the mass media and has the advantage of being both timely and easy to understand. The median price is more useful statistic than the average price, but Rossini et al (2002) point out results can be skewed by a period when most of the sales are at the expensive end of the market because lower priced housing isn't selling. Also, the median statistic is volatile with small sample sizes.

Hedonic Method

Hedonic indices are described by a variety of authors including Pendelton (1965), Linneman (1986), Case et al (1991), Haurin & Hendershott (1991), Clapp et al (1991) and Malpezzi (1998). These indices utilise property sales information and multiple regression analysis to control for quality differences between houses. Hedonic methodology has been used for more than 30 years in mass appraisals for rating and taxing purposes. When the hedonic method is used to establish house price indices, the variables used to account for changes in value over time become very important. The usual method of measuring time changes is to use dummy variables. These are coded (0, 1) according to the sale date to account for changes in values between time periods. Costello (1997) commented that where large numbers of transactions are available, then hedonic methods should produce a robust price series for empirical research.

The main issue with the hedonic method is correctly specifying the regression equations to minimise the amount of unexplained variance. Correct specification relies on the availability of good data and the skill of the analyst.

Repeated Sales Method

The repeated sales index method uses transaction data for properties that have sold more than once. This method was pioneered by Bailey, Muth & Nourse (1963) and is known as the BMN method.

The BMN method avoids the variable specification problems inherent in the hedonic method. The index is compiled by regressing the log price changes between previous and current sales on a set of dummy variables. Case & Schiller (1987) refined the BMN method by using a procedure to down weight the influence of transactions with longer time periods between sales. Clapp & Giaccotto (1999) pointed out several disadvantages with the repeated sales method. These included the selection bias from ignoring single transactions, the issue of "starter homes" and problem properties that may transact frequently, and the need to revise the whole index every time a new set of data is added to the index. The repeated sales method makes the constant quality assumption that over time depreciation will be offset by maintenance expenditure. However, unless the analyst actually inspects the houses, it is not possible to validate this assumption and some houses

may have been extensively refurbished and upgraded, while others may not have been properly maintained. Larsen & Sommervoll (2004) use a large set of repeated sales to segment Norwegian data and show how different types of apartments in Oslo have appreciated at different rates.

Hybrid Method

In an attempt to overcome some of the difficulties with the hedonic and repeated sales method, Case & Quigley (1991) introduced a hybrid method which combined aspects of repeated sales and hedonic methodology. This method had the advantage of using all transaction data and appeared to increase the efficiency of the index estimate. A criticism of this approach was the complexity of the hybrid method and Quigley (1995) discussed a simplified hybrid model.

QUOTABLE VALUE INDEX

In New Zealand, the most commonly used property price indices are the QVNZ indices based on comparing sale prices with the periodic rating valuations and chaining these over time. The QVNZ rating valuations make extensive use of regression analysis methodology to set the rating valuations. Although Lum (2004) has some reservations about this type of approach, it is transaction based, inexpensive to compile and accepted in the New Zealand residential market. In an unpublished report, Singleton (2003) found Palmerston North City house price models based on rating valuations were generally more highly correlated to sale prices than repeated sales models and regression models that did not use the rating valuations. Rating valuations are an important consideration for New Zealand residential property investors when they are formulating their bid/ask prices. More recently, Bourassa et al (2005) confirmed the cost effectiveness and robustness of the methodology used in the QVNZ indexing system. Bourassa found that the QVNZ index was strongly correlated with the hedonic method and recommended that the sales price/assessment methodology be seriously considered by government agencies, given the number of advantages and few disadvantages. Clapp et al (1991) had shown that, while rating valuations contain errors in the assessments, the size of the bias was negligible.

The QVNZ indices used in the construction of the total returns index described later in this paper reduce the constant quality problem because quality changes that require a building consent are reflected in the rating valuation assessments. However, this still leaves the problem of subtle quality improvements not being reflected in the rating valuation, unless the valuers inspect the property during the sales analysis process.

TOTAL RETURNS INDICES FOR HOUSING

In the United Kingdom, both the Association of Residential Letting Agents (ARLA) (2004) and the Investment Property Databank (IPD) (2004) produce information on the returns from residential investment. ARLA uses data from mail questionnaires completed

by letting agents. The IPD residential index has wider coverage than the ARLA index and qualified valuers using the RICS guidelines assess the investment value of a sample of representative properties used in the index. In the US, the National Council of Real Estate Investment Fiduciaries (NCREIF) (2005) publish a number of property indices, including one for apartments. The main disadvantage with professional valuations is the valuation smoothing effect as pointed out by a variety of academic writers including Newell and MacFarlane (1998). This means the valuation based indices tend to be less volatile than transaction indices and lag the market.

SURVEY METHODOLOGY

The main objectives of the survey were firstly to establish the relationship between gross and net income and the capitalisation rates for residential investor housing and secondly to determine the relationship between the value of rental housing and the value of housing as a whole.

A mail questionnaire was sent directly to the property owners. As more than 80 percent of private sector rental property in New Zealand is self managed, the mail questionnaire method was considered to be the most reliable survey method.

A random sample of 3000 private sector landlords from throughout New Zealand was generated from the DBH (Tenancy Services Division) database. This data base is comprehensive and the chances of sample bias are small, since under the Residential Tenancies Act all tenancy bonds must be lodged with the DBH.

A total of 907 landlords responded to the survey before the cut off date at the end of June 2004. This represented a 30.2% response rate. A reminder letter was not used due to the complex mailing procedure and additional cost considerations. The 907 landlords represented 1585 separate properties, on average 1.74 properties per landlord.

SURVEY RESULTS

The 1585 properties in the survey comprised three main groups; houses (1062), flats (314) and apartments (90). There were a variety of other property types on one title including; owner occupied houses and rental flats and owner occupied houses and rented bed sitters. The houses were predominantly 3 bedrooms, detached and located in the suburbs. This paper only reports on the analysis of the houses group, because there is currently no reliable time series data on the prices for apartments and flats.

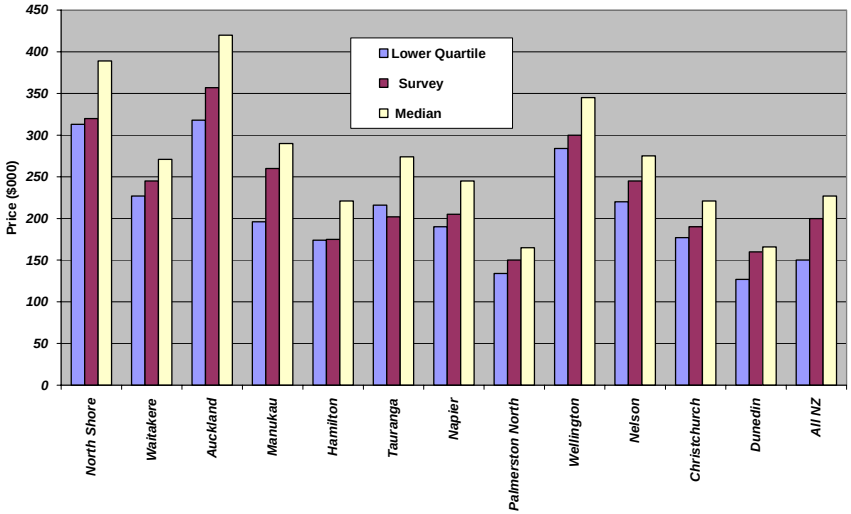
The respondents were asked to provide information on how long they had owned the property, the price paid, the expenses and their estimate of the current market value. In addition, there was a question on their capital expenditure over the previous year. This information was used to calculate capital gains, gross and net yields and to compare the average of the owners valuations with house sales statistics. According to Kiel & Zabel (1999), there may be a tendency for owners to slightly over value owner-occupied housing. In the case of this survey, the median time of ownership was so short it was possible to compare the purchase price with the estimated sale price and compare this with changes in the property market over the period. The figures supplied appear to be in line with the existing QVNZ house price index increased 19.8% in 2003 and Real Estate Institute (2004) statistics show the median price of a house increased by 18% in the period May 2003 to May 2004.

When building a residential rental total returns index, a decision has to be made about which set of house price data typifies private sector rental properties. This is important because price has a direct influence on the yields. The most obvious alternatives are the median price or the lower quartile price, both published regularly by QVNZ. Figure 1 compares the median prices reported from the survey with the QVNZ median and lower quartile prices for the main cities and for all New Zealand. This chart shows the survey median lying between the QVNZ figures for most cities, particularly the larger cities with more robust data sets. On average, this figure was within 3 percent of the median prices shown in the survey.

Another way of looking at where private sector rental housing sits in the overall house price spectrum is to consider the total percentage of rental housing and the proportion of this that is central government and local authority social housing. By 2001, rental housing comprised around 28 percent of the housing stock and was increasing at about 0.6 percent per year, so by 2004 rental housing comprised around 30 percent of the national housing stock. Private sector rental housing comprises around 80 percent of the rental housing stock. Owner-occupier rates are lowest in the cities, particularly Auckland City which will have 50 percent rental housing within the next 7-10 years. In general, the housing values are lower with social housing due to the stigma associated with some of the state housing neighbourhoods. Private rental housing can usually be switched in and out of the owner occupier market, depending on market conditions.

Where the percent of rental properties is high as in Auckland City (44 percent in 2001), it is not realistic to assume rental houses are confined to the less expensive suburbs. Analysis of data from Statistics New Zealand (2001) from the 1991-2001 censuses shows rental housing increasing across all established suburbs and the same is true across all cities.

Figure 1: Comparing House Prices: June 2004



An additional test to see if the responses from the questionnaire are reflective of the rental market as a whole is to compare the median rental levels for houses from the DBH (Tenancy Bond Division) data base with the median rents reported in the survey. This comparison is reported in Figure 2 and shows a strong correlation. Nationally, the median rent for houses from the survey was $245 per week and from the DBH data $260. On average, across all the locations shown in Figure 2, the two sets of data are within 1.7% of each other.

Figure 3 compares the gross yields derived directly from the survey respondents with theoretical gross yields derived from the DBH median rents and both QVNZ lower quartile and median house prices. As expected from the results from Figure 1, the survey data generally falls between the two QVNZ statistics.

Analysis of the survey data showed vacancies averaged 1.5 weeks per year and expenses averaged 23 percent of gross rentals. Where rental houses are self managed by the landlord, a management fee of 7 percent was included to reflect the opportunity cost of the landlords time and provide a basis for comparing investor housing with other asset classes.

Figure 2: Comparing Rents: June 2004

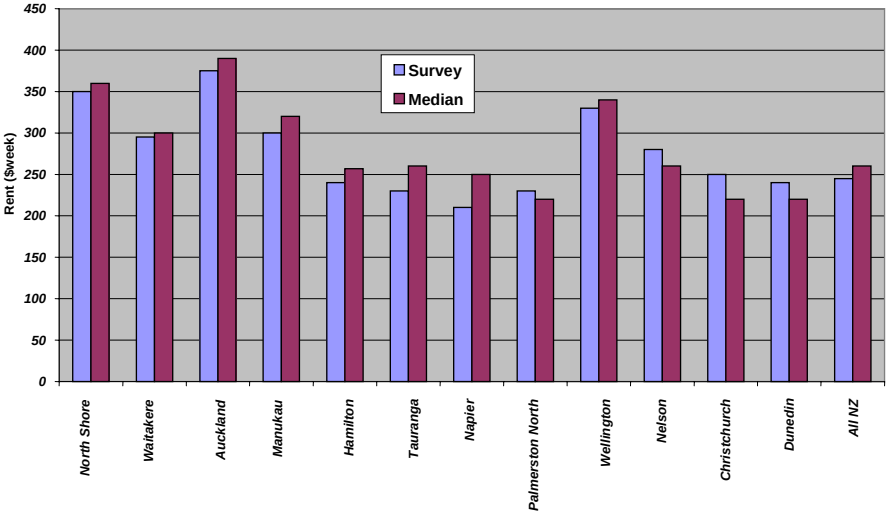
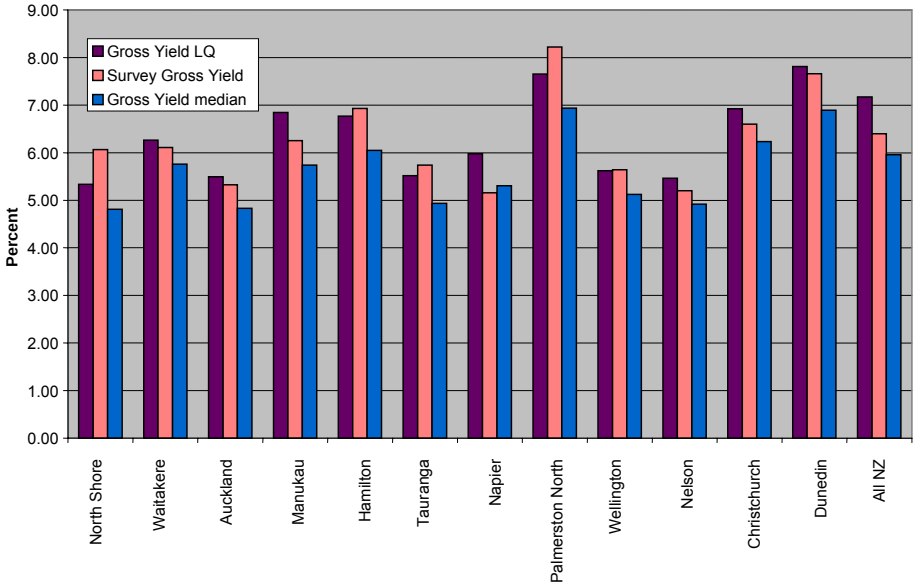


Figure 3: Comparing Gross Yields



DEVELOPING THE INDEX

Annual returns to investor housing comprise cash flow from the rents less expenses and changes in the value of the property from one year to the next. The annual cash flow was estimated by taking the DBH median rental information for houses and adjusting for vacancy (1.5 weeks) and expenses (23 percent of gross income) as analysed from the survey. For example, in the case of North Shore City in 1994, the index figure (rounded to whole number) computed as 116 which is 16 percent up on the 1993 base value for the index of 100. The 16 percent increase comprised a net yield of 6.02 percent and increases in house prices of 9.9 percent. It was not possible to verify the older net yield data from the 2004 snapshot, so this should be treated with caution since the relationship between gross income and net income may have changed slightly over time. Further survey work will be needed to sustain the index on an ongoing basis. Calculating the net yield also involved making a decision about which set of house prices to use when constructing the index. The results shown in Figure 1 indicate that on average rental house price fall between the QVNZ median and lower quartile house prices. The decision was made to average the median and lower quartile house prices on the basis that this was a more accurate reflection of the growing population of private sector rental houses than simply using the lower quartile house price data. The QVNZ house price indices for each City were used to compute the annual changes in property values.

Given the above assumptions, a total returns series was developed for the period June 1993 to June 2004. Table 1 shows the total returns indices over this period for the main urban centres and for all New Zealand.

The net yield data was characterised by yields decreasing over time in all localities and yields being highest in slow growing localities and lowest in fast growing areas. Net yields are now below the market rate of interest on bank deposits and government bonds for most localities. This means that investors are increasing reliant on capital gains in the value of housing to offset the increased risks associated with rental housing investments.

The changes in house prices over time are largely related to demographic trends and the resultant demand pressures. Internal migration trends show a drift to warmer climates and jobs. This has meant significant growth in the Auckland region and slow growth in the South Island and on the western side of the North Island. Immigrants are mainly from China and prefer to live in Auckland.

The total returns indices are based on un-leveraged returns before tax. As the interest rate on borrowed money has generally been well under the total returns reflected in Table 1, many investors will be exceeding these returns. It is important to consider un-leveraged returns as a starting point when making comparison with the total returns from other asset classes because the degree of leverage is something personal to the risk/return profile of individual investors.

Table 1: Total Returns Indices

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
North Shore	100	116	144	176	193	199	207	211	234	260	306	381
Waitakere	100	120	151	194	224	235	239	246	255	280	320	405
Auckland	100	124	159	194	220	226	235	246	260	298	363	422
Manukau	100	112	136	172	203	218	226	238	248	272	314	373
Papakura	100	111	133	172	212	229	230	239	231	239	269	327
Hamilton	100	115	132	156	178	194	198	203	198	215	244	293
Tauranga	100	116	136	158	185	208	207	218	231	248	283	374
Napier	100	119	131	143	155	165	173	188	209	230	274	364
Palmerston Nth	100	110	120	128	136	144	153	168	185	201	227	278
Porirua	100	109	119	129	142	165	194	218	262	288	320	394
Upper Hutt	100	107	118	126	137	160	182	203	229	254	287	350
Lower Hutt	100	107	118	131	147	175	196	222	252	280	314	388
Wellington	100	109	124	148	173	208	225	257	293	314	367	443
Nelson	100	113	124	133	144	153	158	169	180	208	282	350
Christchurch	100	111	129	148	168	181	187	196	197	211	240	314
Dunedin	100	111	124	136	142	142	151	165	177	197	244	321
Invercargill	100	114	125	134	143	141	146	150	159	195	245	329
All NZ	100	115	135	160	181	196	204	218	231	255	300	376

Table 2 shows the percent average returns over the eleven year period June 1994 to June 2004, as well as the percent standard deviations and the risk ratios (average return divided by the standard deviation) associated with these returns. Generally, the results in Table 2 confirm lower average returns are associated with lower risk areas, but Wellington City is a notable exception since it shows high returns and low risk. The lower risks associated with Wellington City are thought to relate to its position as the capital city and the increasing percentage of stable public service renters. Past returns give some guidance to likely future returns as they include the long term demographic trends of internal migration being characterised by a population drift both North and East and external immigration focusing on the Auckland region. The cyclical fluctuations in national net migration figures are thought to account for part of the volatility of total returns, particularly in the Auckland region.

Table 2: Volatility of Returns

	Average	Standard Deviation	Risk ratio
North Shore	*13.20*	*8.35*	*0.63*
Waitakere	*13.98*	*10.17*	*0.73*
Auckland	*14.31*	*9.01*	*0.63*
Manukau	*12.96*	*7.78*	*0.60*
Papakura	*11.81*	*10.46*	*0.89*
Hamilton	*10.49*	*7.20*	*0.69*
Tauranga	*13.03*	*8.66*	*0.66*
Napier	*12.71*	*8.03*	*0.63*
Palmerston Nth	*9.81*	*4.59*	*0.47*
Porirua	*13.38*	*5.14*	*0.38*
Upper Hutt	*12.13*	*4.47*	*0.37*
Lower Hutt	*13.18*	*4.38*	*0.33*
Wellington	*14.57*	*4.78*	*0.33*
Nelson	*12.42*	*9.62*	*0.77*
Christchurch	*11.24*	*8.21*	*0.73*
Dunedin	*11.50*	*8.91*	*0.77*
Invercargill	*11.91*	*11.08*	*0.93*
All NZ	*12.97*	*6.53*	*0.50*

INDEX SENSITIVITY

The gross rental and house price information used in the construction of the total returns index has been taken from reliable government agency data bases. The survey of residential property investors provided a 2004 snapshot of the relationship between gross rents and net income (before tax and debt servicing), as well as the most likely price band to use for investor housing

Back casting the index to 1993 is based on the assumption that the ratio of expenses to gross rents has been consistent over time. This is taken as the most likely scenario. To test the sensitivity of the key assumptions, the indices were recalculated under both more optimistic and more pessimistic scenarios. The more optimistic scenario assumed the same ratio of expenses to income and vacancy rate as the most likely scenario and based the house prices on lower quartile data. The pessimistic scenario used the same set of house prices as the most likely scenario, but increased expenses from 23 percent to 26 percent of gross rents and increased the annual vacancy rate from 1.5 weeks to 3 weeks.

The results of this analysis are summarised in Table 3 showing the average of the three scenarios over the period June 1994- June 2004. The difference column is the optimistic average return less the pessimistic average return. It is interesting to note that there are relatively small differences in the average total returns (about 1.2 percent) between the pessimistic and optimistic scenarios. This illustrates just how much total returns are being driven by changes in house prices and the relatively small influence that running expenses have on total returns.

Table 3: Index Sensitivity

	Pessimistic	*Most likely*	*Optimistic*	*Difference*
North Shore	*12.86*	*13.20*	*13.80*	*0.94*
Waitakere	*13.59*	*13.98*	*14.53*	*0.94*
Auckland	*13.96*	*14.31*	*15.17*	*1.21*
Manukau	*12.57*	*12.96*	*14.09*	*1.52*
Papakura	*11.44*	*11.81*	*12.52*	*1.07*
Hamilton	*10.12*	*10.49*	*11.00*	*0.87*
Tauranga	*12.69*	*13.03*	*13.58*	*0.89*
Napier	*12.33*	*12.71*	*13.27*	*0.94*
Palmerston Nth	*9.37*	*9.81*	*10.51*	*1.14*
Porirua	*12.97*	*13.38*	*14.68*	*1.70*
Upper Hutt	*11.67*	*12.13*	*12.77*	*1.10*
Lower Hutt	*12.73*	*13.18*	*14.55*	*1.82*
Wellington	*14.19*	*14.57*	*15.29*	*1.10*
Nelson	*12.06*	*12.42*	*12.99*	*0.94*
Christchurch	*10.83*	*11.24*	*11.92*	*1.09*
Dunedin	*11.01*	*11.50*	*12.54*	*1.52*
Invercargill	*11.32*	*11.91*	*13.57*	*2.25*
All NZ	*12.57*	*12.97*	*14.21*	*1.63*

SUMMARY AND CONCLUSIONS

The total returns index developed in this paper is a transaction based index utilising actual rental and property sales information from two existing public data bases. Rental information is taken from the DBH data base and house sales information from the QVNZ data base. The QVNZ indices are based on the average ratio of rating valuations to sale prices over time. These indices overcome most of the constant quality problems found with hedonic indices, because rating valuations include building upgrades that have building consents issued by the local authority. The index also does not suffer from the

smoothing effects found with most valuation based property indices. The relationship between gross income and net income was established from a comprehensive survey of property investors undertaken by the authors in 2004.

The main limitation with the total returns indices presented in this paper is the assumption that the ratio of expenses to gross rents was consistent over the period 1994 – 2004. However, modelling under differing assumptions shows the indices are relatively insensitive to changes in the expenses ratio. This is because for most cities, over the last decade, average annual capital gain in property values exceeded average net yields and thus diluted the influence of changes to the expenses ratio. Also, the historical pattern is for rents and property expenses to move broadly in line with wages and salaries.

Another limitation is the total returns index only applies to detached single family homes and excludes flats and apartments. The reason for this is the absence of a reliable time series showing price movements for flats and apartments. Periodic surveys of residential property owners will be needed to sustain the total returns indices on an ongoing basis. Further research is required to see if the costs of annual surveys can be minimised by using a web based system that encourages participation by offering residential investors a benchmarking service.

The next stage of this research will be to compare the returns from housing with other asset classes and to take into account the effect of taxation and gearing housing investments with borrowed money.

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