Pacific Rim Real Estate Society (PRRES)
Conference 2002
Christchurch, 21-23 January

To Rent or Buy; That is the Question

Professor Bob Hargreaves
Finance, Banking and Property Department
Massey University, Palmerston North
New Zealand

Keywords: Renting or buying- houses -tenure choice -risk analysis -New Zealand

Abstract:

In New Zealand the rate of home ownership has been steadily declining. This paper examines the labour market and societal changes leading to the trend to renting. The author then goes onto develop a financial model comparing the economics of owning versus renting. This model is first presented in standard spreadsheet format and then extended to include estimates of probability and risk analysis. The author concludes that the key financial variable driving the model is house price appreciation.

Introduction

When faced with decision of whether to rent or buy housing most New Zealanders'
select the ownership option. However, over the last 15 years there has been an
appreciable reduction in the rate of home ownership. According to Christiansen (1991),
in 1986 New Zealand possibly had the highest rate of ownership in the world (73.7%).
Statistics New Zealand (1998) figures from the 1996 census showed home ownership at
70.5%. Results from the 2001 census are not yet available, but an analysis of Ministry of
Housing (2000) annual reports 1997-2000 on the growth of private sector tenancies
suggests the present rate of ownership is around 66%, a level last seen in 1956. New
Zealand now appears to approximately tenth in the world in terms of home ownership.
Clearly renting has become the preferred option for an increasing number of households.
 This paper examines the demographic, socio-economic and financial reasons behind the
trend to renting. A spreadsheet model is then presented to assist decision makers in
considering the rent buy options. This model incorporates risk analysis based on
assigning probabilities to various outcomes and uses the power of the computer to
simulate the most likely outcome. Emphasis in this paper is on the analysis of tenure
choice for households in a position to rent or buy. Chapman (1981) found inadequate
household wealth forced a majority of private tenants to rent. Twenty years on the deposit
and debt sevicing barriers remain.

Of course housing decisions are not just made on financial grounds and there are a
number of lifestyle considerations which are likely to favour buying over owning even
when the financial analysis favours renting. Amongst these are life style considerations,

security of tenure, pride of ownership, status and the ability to customise the building to meet personal requirements. From a national perspective having a property owning democracy may help to ensure political stability. From a local perspective owners are more likely than renters to be more integrated with the local community since owners have a vested interest in maintaining community property values.

The Nature of Housing

Smith (1971) pointed out the multi-faceted nature of housing since it is both an investment and consumption good. On the consumption side housing is important because in addition to providing shelter and privacy housing provides a location along with the social amenities relating to that location. In the case of rental housing the investment side (ownership) is legally separated from the consumption side. Renting is generally much more flexible than owning as tenants can move at short notice (3 weeks under residential tenancies legislation) and are not faced with the high transaction costs that owners incur when moving houses. Against this renting is a less secure form of tenure as the owners can normally reclaim their houses with 6 weeks notice. It has been suggested by Ruthven (2001) that security of tenure issue can be   partly overcome by using the commercial leasing model for residential property. He quotes US, Canadian, European and Australian examples of long term residential leases.

The Trend to Renting

Knight and Eakin (1997) identify changes in the labour market and societal changes as prime drivers in the increased popularity of renting in he USA. They contend that corporate down sizing and global competition has resulted in much shorter employment

contracts and reduced worker job security. Green and Hendershott (1999) also used US data to show a positive correlation between high rates of unemployment and high rates of home ownership, suggesting owners are less willing to move to new jobs than renters. These same trends are evident in New Zealand, since the restructuring of the economy during the 1980's. New Zealanders used to stay in the same job for long periods but this is no longer the case. Hiring workers on short term contracts is increasingly common and this means people move around much more frequently than in the past. The sector of the population most likely to rent falls within the 20-34 age group. This is also the group that moves most frequently and often change addresses in less than a year. Given this reality then it often makes sense to rent rather than buy housing.

The US societal changes discussed by Knight and Eakin relate to the tendency of families to form later and for more single income households. According to Ratcliff (1949) new household formation typically occurred when families "undoubled" and the children moved out to get married. However, marriage is no longer so important. These days young people are delaying both marriage and having children until they are older and moving out of the family home usually occurs well before marriage. Statistics New Zealand (1996) reported in 1996, 51.7% of households were married, down from 55.95 in 1991.

New Zealand also is following overseas trends for more young single person households, solo parent families and older people living longer by themselves after a spouse dies. The rate of occupancy per dwelling unit continues to fall. In 1991 there were 2.89 people per dwelling unit. By 2001 this figure had fallen to 2.79.

Winter and Stone (1998) suggest that a reduced rate of home ownership in Australia is due to increased income polarisation whereby there are more high income households at the top end and more low income households clustered at the bottom end. Pahl (1988) describes this change in social structure as shifting from an egg shaped to an hour glass shaped distribution. Statistics New Zealand (2001) household expenditure survey suggests income polarisation in New Zealand to be at least as great as that found in Australia.

The Financial Variables

The three most important financial variables driving the rent versus buy decision are usually duration, house price appreciation, mortgage interest rates and affordability in terms of monthly cash costs. Duration is the time period used for comparing renting versus buying. When people need to move frequently the high transaction costs associated with owning usually favour renting. According to Consumer (1996) the sellers transaction costs on an average home valued at $160,000 were $7,700(4.8%). Increasing the duration decreases the annual cost of amortising transaction costs.

In the past the prime financial driver favouring owning has been appreciation in the value of the property. Quotable Value (2000) shows the New Zealand house price increased by around 60% during the 1990's. As capital gains on property are not generally taxable property can have an advantage over other forms of investment that attract taxation. However, Reserve Bank Governor Dr Brash (2001) is one who believes the New Zealand economy has paid a high price, in terms of lack of growth, for tax distortions that encourage investment in real estate at the expense of investment in plant and equipment.

During inflationary times real estate is seen as a good hedge against inflation (in nominal if not real terms). Now that most western countries have inflation under control and New Zealand has the Reserve Bank Act there is much less likelihood of substantial increases in property values unless there are substantial demand pressure from population growth and immigration. Currently there is a net migration loss and the rate of natural growth in the population is quite low. For these reasons the use of historical information to project future increases in property values is risky.

Affordability also generally favours renting over owning. Buying a house normally requires a substantial deposit whereas tenants only need to supply a bond that is limited to 4 weeks rent. Saving for the deposit can be difficult when young people have other financial commitments such as servicing student loans.

Renting is likely to have monthly cash flow advantages over buying. Figure 1 shows the relative affordability of renting versus buying over the period 1992-2000. The rental affordability index uses median rents and average wages and compares this with Crews and Hopkins (1999) NZ Mortgage Affordability Index that uses mortgage interest rates, median house prices and average wages. The results of this comparison show rental affordability did not increase as fast as mortgage affordability during most of the 1990's. This analysis also shows that the rental market and the ownership market do not necessarily move in tandem. In general the ownership market is likely to be more volatile than the rental market because government intervention acts to dampen rent increases. Examples of intervention include income related rents for state houses and rent appeal

procedures in the private sector administered by the Tenancy Tribunal. House prices and

interest rate are also more volatile than median rents.

Rental versus Buying Affordability
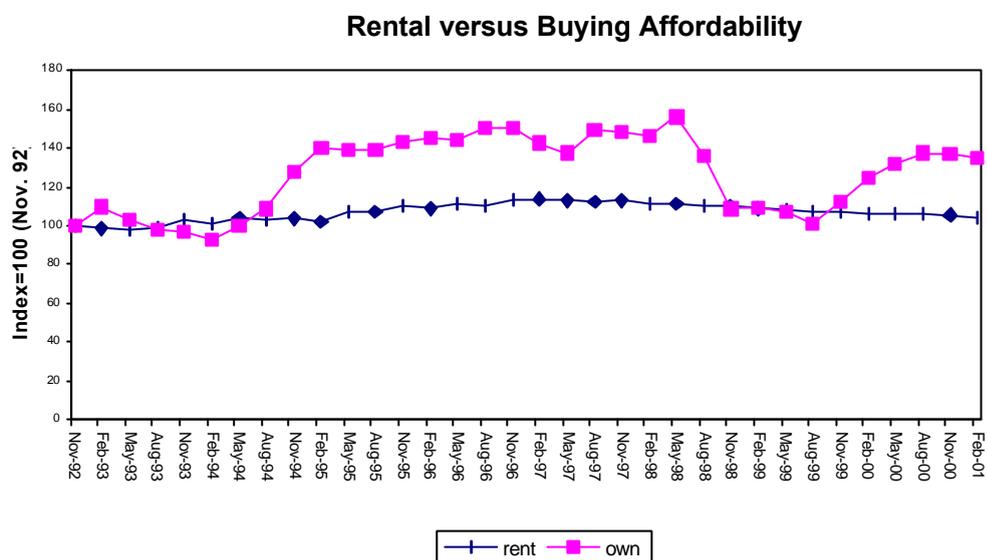
The Financial model

In purely financial terms the decision to rent or buy housing is very similar to the

decisions that businesses make when renting or buying equipment items such as cars or

computers. Both involve financing and investment and are described by Solis and

Shahrokhi (1989) as hybrid capital budgeting decisions. Brealy and Myers (2000) state

that the decision rule should be clear in concept. Buy the asset if the equivalent annual

cost of ownership is less than the lease rate you can get from an outsider. Thus if you can

rent the asset to yourself cheaper than you can rent it from some one else then it pays to

buy.

The discounted cash flow approach is the standard methodology used for assessing the

rent/buy decision. This can be considered from either the point of view of the owner or

from the tenant's viewpoint. Jaffe and Sirmans (1995) developed discounted cash flow

models for assisting lease/buy commercial property decisions. Both leasing and buying involve a series of negative cash flows and the best option is the one that has the smallest negative cash flow. Black and Emary (1993) developed spreadsheets for New Zealand residential tenure choice using the work of Johnson (1981). In this case the models consider the owners viewpoint with the income being rent and the discount rate being the after tax cost of capital. Sandbrook (1999) extended the Black and Emary approach to incorporate both forecast and sensitivity analysis.

Example:

This example is based on a typical 3-bedroom house. The rental of $190 per week is taken from Ministry of Housing (2001) data. The purchase price of $175,000 is the Real Estate Institute (2001) median house price for January 2001. The discount rate used in the spreadsheet (4%) is the after tax cost of capital based on 5 year Government stock. The expense items for repairs and maintenance, insurance and rates have been estimated. Allowances for vacancies and bad debts and management are not included because the spreadsheets are constructed from the point of view of an owner using imputed rents to calculate the rate of return on a housing investment. The initial spreadsheet analysis ignores the effect of leverage and assumes 100% equity financing, a five-year hold period, rents, costs and property values increasing at 2½% per year and a 4% discount rate. Table 1 shows the 5-year cash flows for this typical property.

Table 1

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Income						
Rental		9880	10127	10380	10640	10906
Expenses						
Repairs& Maint.		1750	1794	1839	1885	1932
Insurance		350	359	368	377	386
Rates		1250	1281	1313	1346	1380
Total expenses		3350	3434	3520	3608	3698
Net Income		6530	6693	6861	7032	7208
Cash Flow (5 years)	-175800	6530	6693	6861	7032	196192
Internal Rate of Return	5.25%					
NPV(4%)	9647					

In this example we have a positive net present value of $9647 and an internal rate of
return of 5.25%. This means the capital employed in the housing investment is earning a
higher after tax return than if it was invested in 5-year government stock. Table 2 shows
the actual return to equity when there is a five-year duration, rents and costs are
increasing at 2.5% per year and there are a number of capital appreciation scenarios. In
this case the table mortgage is assumed to be for 15 years at an interest rate of 7.5%.

Table 2

Increased Value % pa	2	3	4	5
No borrowing				
Internal Rate of Return%	5.03	5.87	6.69	7.48
Table Mortgage 50%				
Internal Rate of Return%	2.64	4.21	5.69	7.09
Internal Rate of Return%	0.87	3.05	5.07	6.95

In this example ownership is the preferred option where there is no mortgage but the situation is less clear when there is a mortgage. The mortgage interest rate exceeds the internal rate of return for all the no borrowing scenarios. This means return on equity invested reduces as more money is borrowed. However, renting is the best financial option wherever the internal rate of return is less than 4%. Table 3 summarises returns when duration is reduced to 3 years.

Table 3

Increased Value % pa	2	3	4	5
No borrowing				
Internal Rate of Return%	4.54	5.45	6.34	7.22
Table Mortgage 50%				
Internal Rate of Return%	1.34	3.1	4.81	6.47
Table Mortgage 66%				
Internal Rate of Return%	-1.83	0.72	3.16	5.49

With a 3-year duration transaction costs (real estate, legal and valuation fees) are spread over a shorter period and this reduces returns compared to a five-year duration.

Scenario Analysis

Some of the assumptions have relatively little influence on the final result but others are crucial. For example, if the expenses are underestimated by 10% this only reduced the IRR from 5.86% to 5.76%. However, if the sale price is overestimated by 10% then the

IRR declines to 4.04%. Conventional spreadsheet analysis normally only considers a small number of the possible outcomes generated when "what if" questions are asked. This deficiency can be overcome by using the power of the computer to simulate a large number of scenarios. This can be done either by writing a macro for the spreadsheet or by using one of the commercial templates that overlay spreadsheets and contain pre-written macros.

In this example the "@risk" overlay template used was developed by Palisade (1994). The program asks the user to specify the variables to be simulated. The user then specifies a range of possible outcomes and a probability distribution to each variable. To demonstrate the application of "@risk" to the rent/buy decision the variables chosen were changes in property values, rents and rents. A triangular distribution was chosen for each variable. The range of outcomes for annual average changes in property values was 1% minimum, 2.5% mid point and 4% maximum. In the case of weekly rents the 3 values were $190, $210 and $220. The interest rates tested were 6%,7% and 9%. Once the risk profile has been specified the program uses Monte Carlo simulation to perform risk analysis by generating a randomly selected set of values based on a probability distribution specified in the cells. Each "what if" combination is called an iteration. Simulation is the process that generates the distribution of possible outcomes from many iterations.
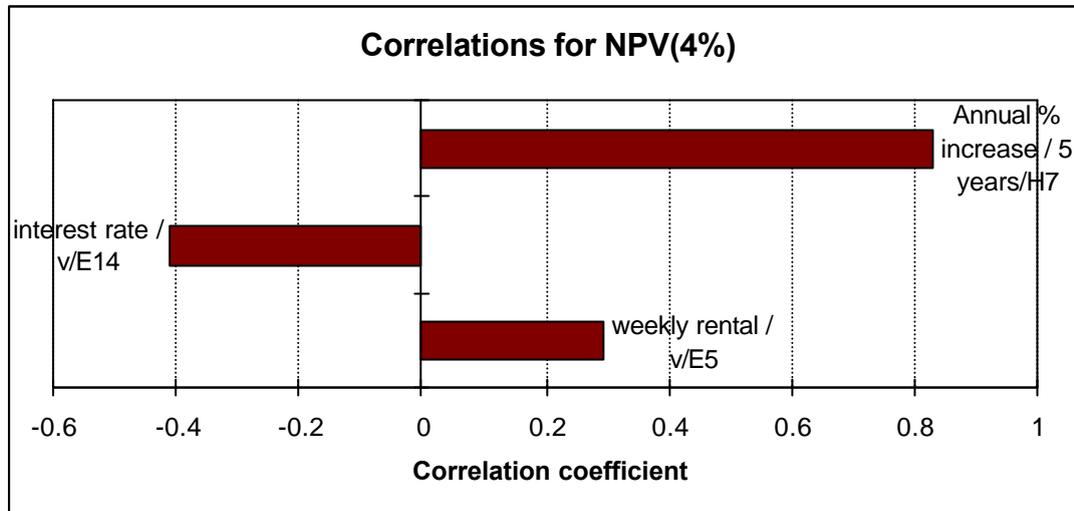
Figure 2 shows the probability distribution for the net present value based on a 4% discount rate and 500 iterations.

Figure 2
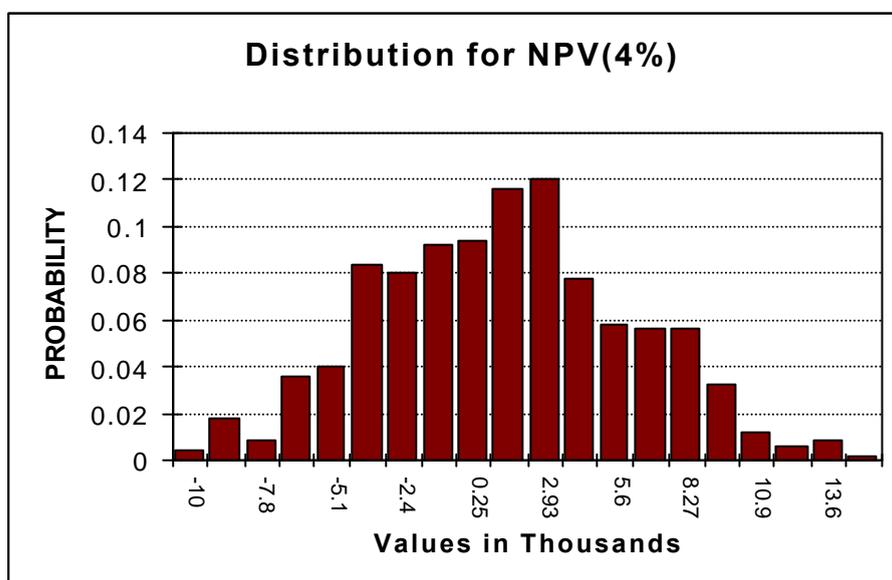
The "@risk" program can also generate tornado graphs showing the sensitivity of the analysis to the variables. Figure 3 shows the tornado graph for the three variables; changes in property values, interest rates and rents. Clearly, changes in property values dominate the return on equity invested with interest rates being the next most important variable and rents having slightly less effect.

Figure 3

Correlations for NPV(4%)

(Bar chart showing correlation coefficients: "Annual % increase / 5 years/H7" approximately 0.83; "weekly rental / v/E5" approximately 0.29; "interest rate / v/E14" approximately -0.41. X-axis labeled "Correlation coefficient" ranging from -0.6 to 1.)

Regional Variations

The decision to rent or buy is likely to vary depending on the geographic locations of a particular property. In general terms it pays to buy in areas with good prospects for capital appreciation in the value of the property. Capital appreciation is strongly linked to demographics. Population pressures drive real estate values. The drift in population is clearly mainly northwards and also eastwards.

Summary and Conclusions

Over the last 15 years there has been a significant increase in the percentage of house holds renting rather than owning housing. Reasons for this trend include reduced job security, delayed formation of new families, more solo parent households and more single person households. During most of the 1990's affordability favoured renting over owning. Also the cash outlays associated with renting are usually more predictable and less volatile than these associated with owning (interest rates, operating expenses and changes in property values).

The discounted cash flow model presented in this paper shows that when the holding period is longer than 3 years owning is the preferred option provided that the rate of appreciation in the value of the property exceeds the inflation rate. When the interest rate on borrowed funds exceeds the discount rate used in the analysis the duration of ownership will need to be longer before break-even occurs.

In areas faced with static or declining property values ownership does not usually measure up as the best financial option. In such cases it may make more sense to rent and acquire a property asset in an expanding area.

The analysis presented in this paper uses simulations to go a step beyond the conventional spreadsheet "what if" scenarios. Literally thousands of iterations are considered and probabilities are attached to key outcomes. Property professionals are encouraged to make use of risk analysis as it provides them with another tool to improve

service quality to their clients. In the final analysis the rent/buy decision is often

dictating by non-financial considerations relating to 'lifestyle'' and our cultural heritage

which favours ownership.

References Cited

Brash D.T. (2001) Address to "Catching the Knowledge Wave Conference", Auckland

www.rbnz.govt.nz/speeches/01078581.html

Brealey R.A. & Myers S. (2000), Principles of Corporate Finance, (6th Ed) Irwin McGraw-Hill

Black C.G. & Emary R.H. (1993), 'The Financial Evaluation of Renting versus Buying a Home.' Land Economics

Review, vol 4, no. 2, pp 12-22

Chapman R. (1981)   "To Rent or Buy?" Research paper 82/1, National Housing Commission, Wellington.

Consumer's Institute (1996), "Homeownership: Should you rent?" Consumer 350, p.27

Crews G.& Hopkins J. (1999), New Zealand Mortgage Affordability Index, Massey University Real Estate Analysis

Unit.

Green R.K. & Hendershott P.H. (1999), 'Home Ownership and Unemployment in the U.S.' National Multi-Unit

Housing Council, Washington

www.nmhc.org/publicat/recent/unemploy/body.html

Jaffe A.J. & Sirmans C.F. (1995), Fundamentals of Real Estate Investment (3rd Ed), Prentice Hall, New Jersey

Johnson M.S. (1981), ' A Cash flow Model of Rational Housing Tenure Choice' AREUEA Journal, vol 9, no. 1,

pp 1-17

Knight J.R. & Eakin C.F. (1997), 'A New Look at the Home Ownership Decision' Real Estate Issues, vol 23, no.2,

pp 20-29

Ministry of House (2000), Annual Report for Year End 30th June 2000

www.minhousing.govt.nz/annreport.html

Palisade (1994), Risk Analysis for Spreadsheets, Palisade Corporation, New York

Pahl R. (1998)"Some remarks on informal work, social polarisation and social structure" International Journal of Urban

and Regional Research, vol 12,no 2, pp247-267

Quotable Value (2000), Urban Property Sales Statistics – Half Year ended 30 June 2000, Quotable Value, New Zealand

Ratcliff R.U. (1949), Urban Land Economics, McGraw-Hill Book Co., New York

Real Estate (2001), Housing Facts, Real Estate Institute, February

Ruthven P.K. (2001), "Home Ownership v. Leasing: Points to Ponder", New Zealand Real Estate, February

Sandbrook E. (1999), 'Too Close to Home: The Tenure Decision in New Zealand in the 1990's', unpublished research

report, Massey University

Smith W.F. (1971), Housing: The Social and Economics Elements, University of California Press, Berkeley

Solis R. & Shahrokhi M. (1989), 'LP: An Expert System for Lease versus Purchase Decisions', <u>Managerial Finance</u>, vol 15, no. 5, pp 28-32

Statistics New Zealand (1996), <u>Census 1996</u>, Department of Statistics

Statistics New Zealand (1998), <u>Housing</u>, Statistics New Zealand

Statistics New Zealand (2001), "Household Expenditure Survey", Statistics New Zealand