

From Nomads to Settlers: Scenario analysis as a guide for first home owners in renting versus buying a home in Perth, Western Australia.

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Abstract

The number of nationwide First Home Owner Grant (FHOG) purchases was 54,924; in the June quarter of 2009, an increase of 94.3% over the year (REIA 2009). This paper outlines an analysis tool which compares the financial outcomes for households who are contemplating the tenure choice of renting versus buying their first home in the Perth metropolitan region with the FHOG. The model employs the user cost of capital theory to develop a model that calculates the relative cost of renting and buying for a variety of house types under a number of market growth scenarios.. The results indicate that purchasing a median priced house has an immediate net financial benefit when compared to renting a house at the median rent if the annual growth rate for the property is $\geq 2.95\%$. This model can be used by prospective purchases to aid the decision to rent or purchase using either pre-determined scenarios based on historic variable rates or employing user generated assumptions.

Introduction

The aim of this paper is to discuss a model developed to analyse the costs of buying compared to renting property in the Perth Metropolitan area for first time buyers. Using a number of different scenarios with inputs based on historic variables the purpose of the model is to aid the decision making process of the first time buyer who is contemplating the relative cost benefits of renting and buying a house.

The Perth metropolitan region has recently experienced a large property price boom in both prices and rents. The ten year annualised rate of house price growth for the Perth metropolitan area was 11.3% pa (REIWA 2009b). The decision to purchase a home at today's prices has become excessively difficult to make given the deposit required, the high entry cost and the uncertainty surrounding interest rates.

Rental prices for most suburbs have not fallen after the Global Financial Crisis of 2008 into 2009. Although the median price for Perth had fallen slightly from March 2008 to March 2009, a 7.0% fall (APM 2009). Rents did not follow suit due to a lag caused by fixed term tenancies and an insufficient supply of rental housing in key areas of the Perth metropolitan region. The vacancy rate increased by 0.7% and the median rent by 2.9% (REIWA 2009b)

The Australian government started the First Home Owner Grant (FHOG) in July 2000. From the 1st of January 2010, the grant will provide a financial assistance of \$7,000 for the purchase of an existing house and land for the eligible buyer. In addition, further financial relief for first home owners came in the form of a Stamp Duty Exemption (SDE) on the purchase of a first home below \$500,000 for eligible applicants, effectively decreasing the entry cost into home ownership by up to \$17,765. Furthermore, the Real Estate and Business Agents Supervisory Board's also contributes with more financial assistance of up to \$2,000 for eligible applicants in Western Australia with the Home Buyers Assistance Account (HBAA) (REBA 2009).

Due to the complex list of variables that has to be taken into account, we hope to provide a simplistic tool that may assist the FHOB buyer's in making their tenure change decision. Therefore, we look at user cost of housing capital as a decision making tool on the financial benefits and cost to purchase or rent, in a scenario analysis.

Finally, the Perth metropolitan region median house price and rental price is simulated in the model to derive a target annual growth rate in property price for purchasing a home to be financially beneficial from year 1 onwards. We then use the median sale and rental price of 6 sub-regions of Perth in our scenario to provide an indicator for FHOG buyers on the target annual growth rate in property price to obtain an immediate benefit from purchasing.

Research Objectives

Our first objective is to determine the variables that we will apply into our user cost model and our scenario analysis. The variables have to apply to the current market conditions in Perth and possibly into the future. We decided to use a range for rental prices, purchase prices and expected annual growth rate in property price; then using a 10 year average for some variables and expected market norms in others.

Secondly, we investigate the net financial benefits of renting or buying over the first 10 years of ownership as a FHOG buyer. We seek to provide a few possible scenarios based on the variables we selected. The scenarios were simulated to project the benefits of renting or purchasing at a range of expected annual property price growth. This would provide us with probable outcomes if our variables were a good indicator of the market in the future.

Thirdly, we are able to use the scenario analysis on 6 sub-regions within the Perth metropolitan region to determine the benefits of renting or buying in those areas based on the median purchase price and rental price. The scenario analysis should be able to provide an estimate on annual property price growth rate to achieve a net benefit from year 1 onwards based on the median prices of rent and purchase prices based on our chosen variables.

In summary, we seek to provide a range of outcomes for the FHOG buyer who is deciding on making the tenure change decision given the variables we have selected. This is done by using the total net benefits of renting minus the total net benefits of purchasing the first home based on historical evidence and expected property price growth.

Motivation & related literature

The user cost of housing capital is based on a relationship between residential owner occupied housing price and net rental income generated from the property. There were many contributions to application of user cost in housing capital, rents and property value. DiPasquale and Wheaton (1996) used a simple user cost model, where the annual cost of owning a home, U_t as:

$$U_t = P_t (M_t - I_t)$$

where P_t is the current price of the home, M_t is the current mortgage rate and I_t is the expected rate of future house price appreciation.

Goodman (1989) provided a more complex specification to demonstrate that user cost can be formulated to address both the consumption and the investment aspects of the housing decision and that expected capital gains on housing are a major determinant in the derivation of user cost. The relationship between the rental rate on a housing asset r and its asset value V can be represented as:

$$r = [(1 + p^e) (1 - t_j) - (g^r + p^e)] V$$

where i is the real rate of interest, p^e is the expected inflation rate, t_j is the marginal income tax rate and g^r is the expected real rate of capital gains.

DiPasquale and Wheaton (1992) reported on the capital cost of homeownership having a significant impact on the demand for rental housing, where an increase in user cost will cause an increase in rental prices. Due to the shortage of housing supply in Western Australia and a strong demand due to years of positive interstate migration and overseas migration, a 5 year average increase of approximately 2.02% pa (ABS 2009), causing rental prices to increase.

Perth median rental prices in the March quarter of 2003, at approximately \$150 pw increased to \$360 pw in the September quarter of 2009 (REIWA 2009). This sharp increase in rent could have contributed to tenants being unable to make sufficient savings to purchase their own home.

The links between residential housing rents and after-tax user cost of rental housing capital, as explained by Blackley and Follain (1996), was to estimate a structural model of the rental housing market. Their research distinguishes between housing units and housing services and evaluates the extent and speed which real rents adjust to a shock in the user cost of capital. The Australian housing sector have experienced multiple shocks to the user cost of capital with the introduction of the FHOG in July 2000, fluctuation between \$7,000 and \$21,000 over the years. Plus the addition of the stamp duty exemption for the first home owner rate of duty in 2008, by the Duties Act 2008, of an amount up to \$17,765.

However, it seems that the real rents increased as the user cost of capital decreased in the FHOG buyer housing market. The cost of entry into home ownership for the FHOG buyer decreased due to all the financial contribution, however, rents continued to rise in that sector. There could be anecdotal evidence of renters having insufficient capital saved up to make an immediate change in tenure, the strong purchasing power of migrants coming into Perth and property prices increasing at a rate faster than the financial contributions combined in the shocks. Further study would be required in the respective areas to determine the causes.

Hargreaves (2002) developed a financial model comparing the economics of owning property versus buying for New Zealand. His conclusion was the identification of house price appreciation as the key financial variable driving his model and that ownership of >3 years with price appreciation of the home at a rate that is higher than inflation is preferred. Hargreaves's results provided some direction to the scenario analysis that we applied, for the reason that our model uses expected annual growth rate of property prices across a range of rental prices and purchase prices for the FHOG buyers in relations to our selected variables. We were then able to determine the ownership period in years where the benefits of renting outweighs purchasing and vice versa.

Diewert (2003) stipulates that user cost approach to the treatment of durable goods were simple. It calculates the cost of purchasing the goods at the beginning of the period, using the services of the durable during the period, and then netting off from these costs the benefit that could be obtained by selling the durable at the end of the period. Our scenarios are based on a similar user cost approaches to Diewert's except for the sale of the property at the end.

Bourrassa and Hoesli (2008) simulated a number of hypothetical changes to taxation and other variables to explain ownership rate. They paid particular attention to the relative cost of owning and renting based on a function of house prices, rents and user cost of owning. The results showed that high house prices - in relation to household income and wealth – and tax on imputed rent are the most important causes of Switzerland’s low ownership rate.

The increase in house prices in Perth as compared to household income and wealth may be one of the determinants of the predicament for FHOG buyers locally. The initial capital outlay increased as house prices increase while the banks require a substantial contribution in deposit and disposable income for loans to be approved, making it difficult for tenure change within a short period of time.

Smith (2009) attempted simulations of home ownership cost in Australia in an attempt to raise awareness of the real cost and affordability of housing. He indicated that home buyers did not fully understand the financial risk associated with purchasing a home and what to expect if there was a change to the current market conditions. We seek to provide an approximation to the FHOG buyers on possible outcomes on their decision to get into home ownership.

Methodology and Data

Our objective is to formulate an estimated annual net financial benefit or cost to our scenario analysis. A net financial benefit to renting (+ Positive figure) would conclude that given the variables chosen, it would be better to rent for that year than to buy your first home as a FHOG buyer. A net financial cost to renting (- negative figure) would show that home ownership with the FHOG has superseded the financial benefits on renting in that year.

The model formulates a relationship between the selected variables to the expected annual growth rates in residential property in the Perth metropolitan region. The model takes the assumption that the decision maker will have a sufficient amount of capital that could be used for purchase or if renting, will invest the difference to obtain a return on 1 year fixed term deposit.

The purchase or rent decision is based on 2 main cost functions, *initial capital outlay (ICO)* and *annual benefits (AB)* in both purchase and rent scenarios. Additional details of the calculations are in the next section.

Initial Costs & Benefits

The *purchase scenario (P)* assumes initial capital outlay (*ICO*) that takes into account for:

$$(P)ICO_{t0} = D_{t0} + (S_{t0} * A_i) + MP_{t0} + C_{t0} + IF_{t0} + BF_{t0} - (FHOG_{t0} * B_i) - (HBAA_{t0} * C_i)$$

where $A_i = \left\{ \begin{array}{l} 0 \text{ if Stamp Duty Exempt} \\ 1 \text{ if Full Stamp Duty Applies} \\ \mu \text{ if Marginal Rate of Stamp Duty Applies} \end{array} \right\}$

$$B_i = \left\{ \begin{array}{l} 0 \text{ if does not qualify for FHOG} \\ 1 \text{ if qualify for FHOG} \end{array} \right\} \quad C_i = \left\{ \begin{array}{l} 0 \text{ if does not qualify for HBAA} \\ 1 \text{ if qualify for HBAA} \end{array} \right\}$$

with our variables defined as

D = the upfront cash component on the purchase value,

S = stamp duty,

MP = a once off moving cost for purchase,

C = conveyance or settlement fee,

IF = a once off inspection fee,

BF = a once off bank fee and

FHOG = First Home Owner Grant.

HBAA = Home Buyers Assistance Account

All initial capital outlay costs are calculated at *t0* to simplify the equation.

The *rent scenario (R)* assumes *initial capital outlay (ICO)* that takes into account for:

$$(R)ICO_{t0} = SD_{t0} + MR_{t0} + DR_{t0}$$

with our variables defined as

SD = a security deposit or bond,

MR = moving cost and

DR = double rental of 2 weeks.

Again, all initial capital outlay costs are calculated at *t0* to simplify the equation.

Therefore,

$$(P)ICO_{t0} - (R)ICO_{t0} = SAV_{t0}$$

with

SAV = Total capital placed in savings if not used to purchase first home at *t0*.

Annual Costs & Benefits

The savings in renting at *initial cost & benefits* will then grow at an annual rate of the 10 year average 1 year fixed deposit savings rate. Where the *rent scenario (R)* also looks into *annual benefits (AB)* over the renting period that takes into account for

$$(R)AB_i = [SAV_i (1 + FD_i)] - [R\$_i (1 + AC_i)] - (TAX_i * SAV_i * FD_i) - \{D_i [(MR_i + DR_i)(1 + AC_i)^3 + SDI_i] \}$$

$$\text{where } D_i = \begin{cases} 0 & \text{if rental} \neq \text{multiple of year 3} \\ 1 & \text{if rental} = \text{multiple of year 3} \end{cases} \quad \text{and} \quad SDI_i = SD_i (1+AC_i)^3 - SD_i$$

with our variables as

SAV = Total capital placed in savings if not used to purchase first home at *t0*.

FD = 10 Year average 1 year fixed deposit savings rate (RBA 2009c)

R\$ = annual rent,

TAX = tax on interest earned in fixed deposit savings account,

SDI = security bond or deposit increase,

MR = moving cost every 3 years,

DR = double rent for 2 weeks every 3 years due to moving time; and

AC = increasing annually at the 10 year average consumer price index (RBA 2009a)

The *purchase scenario (P)* takes into account into the *annual benefits (AB)* from purchasing the first home as

$$(P) AB_i = V_i * (1 + GR_i) - AP_i - [(IMC_i + TR_i) * (1 + AC_i)]$$

Where

PB = Financial purchase benefits

V = Purchase price

GR = Growth rate

AP = Amortisation payments

IMC = Insurance and maintenance cost

TR = Taxes and rates

AC = Increasing annually at the 10 year average consumer price index (RBA 2009a)

Finally, we are able to calculate the *annual net financial benefits (NFB)* of renting to purchasing the first home with the Australian government's FHOG by

$$NFB_i = (R) AB_i - (P) AB_i$$

where a positive (+) amount shows net financial benefits of renting over purchasing and a negative (-) amount shows a net financial benefit in purchasing.

We then calculated the financial user cost of a FHOG Buyer and compared it with a typical price range of \$250,000 to \$550,000 and rental values of \$100 pw to \$1000 pw. Scenario analysis on expected annual growth rate on property price of -4% pa, 0% pa, 4% pa and 8% pa is tested and the results shown in the latter part of this paper.

Chosen Variables

The following variables are the 10 year average from July 1999 to June 2009, taken from the Reserve Bank of Australia in October 2009:

- Nominal standard variable interest rates for home loans of 7.29% pa – we selected a fully amortising standard variable rate, over the other types of mortgages, due to the home owner wanting to pay off the mortgage as soon as possible (RBA 2009b).
- 1 year nominal fixed deposit savings rate of 4.85% pa – selected to assist us in providing a savings rate that could possibly be obtained if the FHOG buyer chose to rent and place the capital in a 1 year fixed deposit savings account (RBA 2009c). 4.89% pa effective rate based on interest calculated daily paid monthly.
- Inflation rate was based on Consumer Price Index for Australia of 3.17% pa – this variable was chosen to provide us with a growth rate for most of the annual and recurring cost in our model (RBA 2009a). The variables that increase at the 3.17% pa rate are listed below:
 - Insurance and maintenance cost
 - Taxes and rates for local government
 - Increase in annual rental price
 - Increase in moving cost for rental; and
 - Increase in security bond or deposit for rental.

We believe that the 10 year average was sufficient as an indicator for our model.

A tax on interest earned in the annual 1 year fixed deposit savings account was approximated at 20% based on the FHOG buyer being somewhere in the lower tax brackets. Insurance and maintenance cost was approximated at 0.5% of the purchase price of the property. Taxes and rates for local government were approximated at 0.5% of the purchase price of the property.

The mortgage would be based on an 80% loan to value ratio, 25 year loan term, monthly compounding and monthly payments. A \$500 bank fee on purchase was selected as most bank fees are within the approximate range of \$0 to \$1,000 (CANSTAR 2009). Inspection fees on purchase were set at \$1,000 due to approximate costs of timber pest inspections, structural reports for buildings and a bank instructed valuation report, which are regarded as the norm in Perth for our property price range.

A once off moving cost when buying was estimated at \$2,000. A recurring moving cost every 3 years when renting was estimated at \$1,000 for the respective years, which increases annually at the rate of inflation of 3.17% pa. Settlement fees on conveyance of title was set at 0.35% of purchase price based on the Settlement Agents Fees set out by the Settlement Agents Supervisory Board (SASB 2009). Finally, a 22.51% rate of duty applies if the house and land had a dutiable value of \$500,000 to \$600,000 as a FHOG buyer based on the Duties Act 2008.

Limitations

The scenario analysis model is based on a purchase of a typical house in the Perth metropolitan region, Western Australia, due to variables that may only apply to Western Australia such as FHOG concessions, fees, costs and information. The model is formulated to function on residential properties that do not have a higher best use such as additional capabilities to subdivide to obtain a higher profit. Therefore, it is based on a standard residential dwelling without an overcapitalised building or large amounts of excess land.

The following assumptions apply:

- the purchase price is equal to the valuation price,
- the purchaser will be purchasing an existing house with a green title property, due to the additional strata levies and fees that may apply to such properties,
- the purchaser can afford to service the loan and is able to secure a loan based on the variables we have chosen,
- the purchaser is eligible for the FHOG, the property is stamp duty exempt and may be eligible for the HBAA; and
- the purchaser would choose to purchase their first home in the same localised market that they would rent in to maintain the same level of utility.

To simplify the model, the purchaser will never sell the home; will continue to live in it to accumulate equity and thus excluding selling cost and possibilities of taxes on capital gains on the property.

Due to heterogeneous characteristics of real estate, the model cannot be used to accurately represent any individual property and is meant only to provide an approximation at best, of what may happen in the given scenarios based on past information.

Some of the variables are chosen from 10 year averages from several sources and may not be the perfect indicator of future market performance. Any changes in any of the variables used in this model may greatly change the results of the model. The amounts reported in the scenario analysis are not in present value terms and serve only as an approximate future amount.

This paper does not take into account for any individual preferences such as specific tenure choice, security of tenure and social status.

Scenario Analysis

Scenario analyses were simulated on purchase prices at \$250,000 to \$550,000; with \$100,000 increments. These purchase prices were tested with the set of chosen variables (holding everything constant) to provide us with a possible financial outcome over a 10 year period. For example; with 0% pa property price growth, there would be higher financial benefits annually to rent a property at \$220 pw than to buy the first home at \$250,000 based on the chose variables. If rentals were at \$320 pw, there would be higher financial benefits annually to buy the \$250,000 first home. The tables below are summaries of the outcome.

The price model is shown below if expected annual growth rate for property price pa is 0%.

For a home at \$250,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$220	\$283	\$7,404	\$12,774	\$19,553	\$26,154	\$30,738	\$36,829	\$42,654	\$46,186	\$51,294
\$240	-\$882	\$5,121	\$9,247	\$14,746	\$19,980	\$23,052	\$27,589	\$31,757	\$33,468	\$36,701
\$260	-\$2,047	\$2,837	\$5,719	\$9,938	\$13,806	\$15,366	\$18,348	\$20,861	\$20,751	\$22,109
\$280	-\$3,211	\$554	\$2,192	\$5,131	\$7,633	\$7,680	\$9,107	\$9,965	\$8,033	\$7,516
\$300	-\$4,376	-\$1,729	-\$1,335	\$324	\$1,459	-\$6	-\$134	-\$931	-\$4,685	-\$7,077
\$320	-\$5,541	-\$4,012	-\$4,862	-\$4,484	-\$4,714	-\$7,692	-\$9,374	-\$11,827	-\$17,403	-\$21,669

For a home at \$350,000.

Rent pw	1	2	3	4	5	6	7	8	9	10
\$360	\$69	\$7,237	\$12,069	\$18,363	\$24,188	\$27,298	\$31,950	\$35,972	\$36,891	\$39,374
\$380	-\$1,095	\$4,953	\$8,542	\$13,555	\$18,014	\$19,612	\$22,709	\$25,076	\$24,173	\$24,782
\$400	-\$2,260	\$2,670	\$5,015	\$8,748	\$11,841	\$11,926	\$13,468	\$14,180	\$11,455	\$10,189
\$420	-\$3,425	\$387	\$1,487	\$3,941	\$5,667	\$4,240	\$4,228	\$3,284	-\$1,263	-\$4,404
\$440	-\$4,589	-\$1,896	-\$2,040	-\$866	-\$507	-\$3,446	-\$5,013	-\$7,612	-\$13,981	-\$18,996

The price model is shown below if expected annual growth rate for property price pa is 0%.

For a home at \$450,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$520	\$770	\$6,945	\$10,081	\$14,697	\$18,472	\$18,690	\$20,446	\$21,113	\$17,703	\$15,797
\$540	-\$395	\$4,662	\$6,554	\$9,890	\$12,298	\$11,004	\$11,205	\$10,217	\$4,985	\$1,205
\$560	-\$1,560	\$2,379	\$3,027	\$5,083	\$6,124	\$3,318	\$1,964	-\$679	-\$7,733	-\$13,388
\$580	-\$2,724	\$96	-\$501	\$275	-\$49	-\$4,368	-\$7,276	-\$11,575	-\$20,451	-\$27,981
\$600	-\$3,889	-\$2,187	-\$4,028	-\$4,532	-\$6,223	-\$12,054	-\$16,517	-\$22,471	-\$33,169	-\$42,573

For a home at \$550,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$680	\$11,087	\$16,648	\$18,477	\$21,822	\$23,968	\$21,733	\$21,049	\$18,835	\$11,587	\$5,805
\$700	\$9,922	\$14,364	\$14,950	\$17,015	\$17,794	\$14,047	\$11,808	\$7,939	-\$1,131	-\$8,788
\$720	\$8,758	\$12,081	\$11,423	\$12,207	\$11,621	\$6,361	\$2,567	-\$2,957	-\$13,849	-\$23,381
\$740	\$7,593	\$9,798	\$7,896	\$7,400	\$5,447	-\$1,324	-\$6,673	-\$13,853	-\$26,567	-\$37,973
\$760	\$6,428	\$7,515	\$4,368	\$2,593	-\$727	-\$9,010	-\$15,914	-\$24,749	-\$39,284	-\$52,566
\$780	\$5,263	\$5,231	\$841	-\$2,215	-\$6,900	-\$16,696	-\$25,155	-\$35,646	-\$52,002	-\$67,159
\$800	\$4,099	\$2,948	-\$2,686	-\$7,022	-\$13,074	-\$24,382	-\$34,396	-\$46,542	-\$64,720	-\$81,751
\$820	\$2,934	\$665	-\$6,213	-\$11,829	-\$19,248	-\$32,068	-\$43,636	-\$57,438	-\$77,438	-\$96,344
\$840	\$1,769	-\$1,618	-\$9,741	-\$16,636	-\$25,421	-\$39,754	-\$52,877	-\$68,334	-\$90,156	-\$110,936
\$860	\$605	-\$3,901	-\$13,268	-\$21,444	-\$31,595	-\$47,440	-\$62,118	-\$79,230	-\$102,874	-\$125,529
\$880	-\$560	-\$6,185	-\$16,795	-\$26,251	-\$37,769	-\$55,126	-\$71,359	-\$90,126	-\$115,592	-\$140,122

The price model is shown below if expected annual growth rate for property price pa is 2%.

For a home at \$250,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$120	\$1,106	\$8,720	\$15,108	\$22,981	\$31,002	\$37,627	\$45,862	\$54,219	\$61,003	\$69,509
\$140	-\$58	\$6,437	\$11,581	\$18,174	\$24,828	\$29,941	\$36,621	\$43,323	\$48,285	\$54,916
\$160	-\$1,223	\$4,154	\$8,054	\$13,367	\$18,655	\$22,255	\$27,380	\$32,427	\$35,567	\$40,323
\$180	-\$2,388	\$1,870	\$4,526	\$8,559	\$12,481	\$14,569	\$18,139	\$21,531	\$22,849	\$25,731
\$200	-\$3,552	-\$413	\$999	\$3,752	\$6,307	\$6,883	\$8,899	\$10,635	\$10,131	\$11,138
\$220	-\$4,717	-\$2,696	-\$2,528	-\$1,055	\$134	-\$803	-\$342	-\$261	-\$2,587	-\$3,455
\$240	-\$5,882	-\$4,979	-\$6,055	-\$5,863	-\$6,040	-\$8,489	-\$9,583	-\$11,157	-\$15,305	-\$18,047

For a home at \$350,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$240	\$58	\$6,796	\$11,810	\$18,355	\$24,802	\$29,257	\$35,354	\$41,268	\$44,916	\$50,282
\$260	-\$1,107	\$4,513	\$8,283	\$13,548	\$18,628	\$21,571	\$26,114	\$30,372	\$32,198	\$35,689
\$280	-\$2,272	\$2,229	\$4,755	\$8,741	\$12,454	\$13,885	\$16,873	\$19,476	\$19,480	\$21,097
\$300	-\$3,436	-\$54	\$1,228	\$3,933	\$6,281	\$6,199	\$7,632	\$8,580	\$6,762	\$6,504
\$320	-\$4,601	-\$2,337	-\$2,299	-\$874	\$107	-\$1,487	-\$1,609	-\$2,316	-\$5,956	-\$8,089
\$340	-\$5,766	-\$4,620	-\$5,826	-\$5,681	-\$6,067	-\$9,173	-\$10,849	-\$13,212	-\$18,674	-\$22,681

For a home at \$450,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$360	\$1,087	\$7,031	\$10,756	\$16,061	\$21,025	\$23,404	\$27,463	\$31,036	\$31,654	\$33,991
\$380	-\$77	\$4,748	\$7,228	\$11,254	\$14,851	\$15,718	\$18,222	\$20,140	\$18,936	\$19,398
\$400	-\$1,242	\$2,465	\$3,701	\$6,447	\$8,677	\$8,032	\$8,982	\$9,244	\$6,218	\$4,806
\$420	-\$2,407	\$182	\$174	\$1,639	\$2,504	\$346	-\$259	-\$1,653	-\$6,500	-\$9,787
\$440	-\$3,572	-\$2,102	-\$3,353	-\$3,168	-\$3,670	-\$7,339	-\$9,500	-\$12,549	-\$19,218	-\$24,380

The price model is shown below if expected annual growth rate for property price pa is 2%.

For a home at \$550,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$520	\$9,404	\$12,693	\$13,031	\$14,943	\$16,113	\$13,831	\$13,198	\$11,592	\$6,029	\$2,099
\$540	\$8,240	\$10,410	\$9,504	\$10,136	\$9,939	\$6,145	\$3,957	\$696	-\$6,689	-\$12,494
\$560	\$7,075	\$8,127	\$5,976	\$5,328	\$3,765	-\$1,541	-\$5,284	-\$10,201	-\$19,407	-\$27,086
\$580	\$5,910	\$5,844	\$2,449	\$521	-\$2,408	-\$9,227	-\$14,525	-\$21,097	-\$32,125	-\$41,679
\$600	\$4,746	\$3,560	-\$1,078	-\$4,286	-\$8,582	-\$16,912	-\$23,765	-\$31,993	-\$44,842	-\$56,272
\$620	\$3,581	\$1,277	-\$4,605	-\$9,094	-\$14,756	-\$24,598	-\$33,006	-\$42,889	-\$57,560	-\$70,864
\$640	\$2,416	-\$1,006	-\$8,133	-\$13,901	-\$20,929	-\$32,284	-\$42,247	-\$53,785	-\$70,278	-\$85,457
\$660	\$1,252	-\$3,289	-\$11,660	-\$18,708	-\$27,103	-\$39,970	-\$51,488	-\$64,681	-\$82,996	-\$100,050
\$680	\$87	-\$5,572	-\$15,187	-\$23,516	-\$33,277	-\$47,656	-\$60,728	-\$75,577	-\$95,714	-\$114,642
\$700	-\$1,078	-\$7,856	-\$18,714	-\$28,323	-\$39,450	-\$55,342	-\$69,969	-\$86,474	-\$108,432	-\$129,235

The price model is shown below if expected annual growth rate for property price pa is 4%.

For a home at \$250,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$100	-\$2,729	\$703	\$2,721	\$5,932	\$9,032	\$10,523	\$13,291	\$15,888	\$16,666	\$18,789
\$120	-\$3,894	-\$1,580	-\$806	\$1,125	\$2,859	\$2,838	\$4,050	\$4,992	\$3,948	\$4,196
\$140	-\$5,058	-\$3,863	-\$4,333	-\$3,683	-\$3,315	-\$4,848	-\$5,191	-\$5,904	-\$8,770	-\$10,397

For a home at \$350,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$120	\$46	\$6,075	\$10,694	\$16,600	\$22,443	\$26,667	\$32,263	\$37,727	\$41,346	\$46,401
\$140	-\$1,119	\$3,792	\$7,167	\$11,793	\$16,270	\$18,981	\$23,022	\$26,831	\$28,628	\$31,808
\$160	-\$2,284	\$1,509	\$3,639	\$6,985	\$10,096	\$11,295	\$13,781	\$15,935	\$15,910	\$17,215
\$180	-\$3,448	-\$774	\$112	\$2,178	\$3,922	\$3,609	\$4,540	\$5,038	\$3,193	\$2,623
\$200	-\$4,613	-\$3,058	-\$3,415	-\$2,629	-\$2,251	-\$4,076	-\$4,700	-\$5,858	-\$9,525	-\$11,970

For a home at \$450,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$220	\$240	\$4,474	\$6,801	\$10,371	\$13,583	\$14,585	\$16,888	\$18,700	\$17,980	\$18,577
\$240	-\$925	\$2,191	\$3,274	\$5,563	\$7,409	\$6,899	\$7,647	\$7,804	\$5,262	\$3,985
\$260	-\$2,089	-\$93	-\$253	\$756	\$1,235	-\$787	-\$1,594	-\$3,093	-\$7,455	-\$10,608
\$280	-\$3,254	-\$2,376	-\$3,781	-\$4,051	-\$4,938	-\$8,473	-\$10,835	-\$13,989	-\$20,173	-\$25,201

The price model is shown below if expected annual growth rate for property price pa is 4%.

For a home at \$550,000.

Rent pw	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
\$320	\$10,051	\$12,866	\$13,293	\$14,931	\$15,934	\$14,154	\$13,620	\$12,253	\$7,687	\$4,338
\$340	\$8,887	\$10,582	\$9,765	\$10,124	\$9,761	\$6,468	\$4,379	\$1,357	-\$5,031	-\$10,255
\$360	\$7,722	\$8,299	\$6,238	\$5,317	\$3,587	-\$1,218	-\$4,862	-\$9,539	-\$17,749	-\$24,847
\$380	\$6,557	\$6,016	\$2,711	\$510	-\$2,586	-\$8,904	-\$14,103	-\$20,435	-\$30,466	-\$39,440
\$400	\$5,393	\$3,733	-\$816	-\$4,298	-\$8,760	-\$16,590	-\$23,343	-\$31,332	-\$43,184	-\$54,032
\$420	\$4,228	\$1,450	-\$4,344	-\$9,105	-\$14,934	-\$24,275	-\$32,584	-\$42,228	-\$55,902	-\$68,625
\$440	\$3,063	-\$834	-\$7,871	-\$13,912	-\$21,107	-\$31,961	-\$41,825	-\$53,124	-\$68,620	-\$83,218
\$460	\$1,899	-\$3,117	-\$11,398	-\$18,720	-\$27,281	-\$39,647	-\$51,065	-\$64,020	-\$81,338	-\$97,810
\$480	\$734	-\$5,400	-\$14,925	-\$23,527	-\$33,455	-\$47,333	-\$60,306	-\$74,916	-\$94,056	-\$112,403
\$500	-\$431	-\$7,683	-\$18,453	-\$28,334	-\$39,628	-\$55,019	-\$69,547	-\$85,812	-\$106,774	-\$126,996

Results Summary

We found the expected annual growth rate of property price to be the major determinant in the outcome of the FHOG buyer's scenario analysis. The scenario analysis also indicated a large advantage for FHOG buyers to stay below the \$500,000 purchase price. As the purchase price increase over the \$500,000; renting becomes increasingly beneficial for the FHOG buyer in our model.

When we used the median house price of \$460,000 and the median rental price of \$360 pw for the Perth metropolitan region as at September 2009 (REIWA 2009), a target annual growth rate for property price of $\geq 2.95\%$ pa is required to return a net financial benefit in buying as a FHOG from year 1 onwards.

The model was also used on the median price and median rental, from the September quarter 2009 from REIWA's Market Update, of 6 sub-regions in the Perth metro area. We selected 3 sub-regions from the southern suburbs and 3 sub-regions from the northern suburbs. Please refer to the table below.

Northern Suburbs by REIWA Sub-Region	Median Price	Median Weekly Rent	Target Growth Rate in Property Price
Bassendean / Bayswater	\$438,000	\$330	3.10% pa
Stirling East	\$400,000	\$330	2.57% pa
Wanneroo South	\$423,000	\$375	2.35% pa

Southern Suburbs by REIWA Sub-Region	Median Price	Median Weekly Rent	Target Growth Rate in Property Price
South Perth / Vic. Park	\$585,000	\$350	7.05% pa
Cockburn	\$443,400	\$360	2.78% pa
Rockingham / Kwinana	\$352,500	\$310	2.33% pa

(REIWA 2009)

From the table above, we are able to summate that the South Perth and Victoria Park sub-region, which have a median price of \$585,000 and a median weekly rent of \$350 pw, will require more than double the growth than that of the September quarter 2009 Perth median house price and rental price of 2.95% pa. Therefore, further supporting the benefits to purchase below the \$500,000 price as a FHOG buyer.

Conclusion

In conclusion, the simulations have indicated that FHOG buyers in Perth enjoy an extensive amount of subsidies that makes ownership more attractive by increasing affordability. Due to the diminishing benefits of the FHOG over the \$500,000 price range, the simulation signifies that FHOG buyers should focus at purchasing their first home at close to or under \$500,000.

Due to the strong demand of FHOG buyers in the Perth market over the last few years and the subsidies that make home ownership so attractive, the model suggest that there could be an artificial price bubble caused by the Australian government's FHOG in the <\$600,000 housing market. An in depth investigation would be required to determine the link between the FHOG housing market price and the effects of the grant itself.

From the research done for this paper, further studies could be done on using this model to compare the gap in benefits of FHOG buyers and Non-FHOG buyers. There may be applications to feasibilities on purchasing residential investment properties within the Perth metro region by measuring the dependence of annual property price appreciation and rental prices. We could look into using the model to determine growth rates required if there was an increase in interest rates or a decline in rental prices.

In addition, the model could be used as a feasibility model for individuals interested in purchasing a property in Perth based on their selected assumptions. We have also considered investigating the financial benefits, or losses, that FHOG buyers could experience if they use their first home as an income producing investment after meeting the FHOG requirements. More studies could be done to identify the qualitative reasons for tenure change in Australia, as it is common occurrence for the purchase in property to be a financial disaster: but a social and psychological triumph.

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