

# The Impact of Housing Choice on Future Household Wealth

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## Abstract

Is owning a home the correct housing choice for the average household, and, if so, how do we know? In North America, about two-thirds of households own their homes, and this figure is increasing after a period of decline. This paper provides a financial model that can be used to comprehensively analyze the impact the rent/buy decision has on wealth. The results of two case studies suggest that the financial impact of homeownership may not be as positive as perceived by the average North American household. The model can be easily adapted by users to reflect different assumptions. © 2003 Academy of Financial Services. All rights reserved.

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## 1. Introduction

The choice of housing is one of the major decisions facing households and all must decide whether a home should be owned or rented? For a large majority of North Americans, ownership is the preferred choice, quite often a major life goal. In Canada, 64.2% and in the United States 67.8% of households now own their homes and this figure has been gradually increasing after a period of decline during the 1980s. For single families, the figure averages 75% but ranges over 90% depending on family income.<sup>2</sup> Furthermore, in North America, surveys show that 86% of adults prefer to own a home and two-thirds of renters would buy a home if they could afford one (see Cisneros, 1995; Royal Bank, 2002).

A Royal Bank (2002) survey reveals a reason for the high incidence of homeownership:

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84% of respondents believed a home was a good investment and a wise financial choice. For owners, the rate was 88%, for renters, 77%. In addition, governments and society encourage the achievement of this goal with many policies directed to current and potential homeowners. It seems society can be split into two groups: those who are homeowners and those who wish to be. For many one person households, renting is the only option given income constraints and the reduced need for living space.<sup>3</sup> For the majority of North Americans, however, once household size reaches two adults, homeownership becomes a viable, usually desirable option. In North America it seems to have become accepted wisdom that buying a house is the intelligent choice when making the housing decision. Is this the case for the average household, however, and, if so, how do we know?

Given the major impact the decision has on family finances, it seems clear that a thorough financial analysis should be completed. This paper introduces a financial model that can be used by households and their advisors to comprehensively analyze whether a house should be purchased or rented. A template, based on the model, is developed that displays the financial consequence of the choice. Numerous factors affect the decision and the analysis is quite intricate. With an information set regarding the choice of buying or renting a home, the expected financial outcome can be estimated and the household can decide if buying is financially wise.

Many North Americans innately believe that buying is superior to renting both financially and psychologically. While the financial aspects of the question can be modeled and analyzed, the emotional, social, and psychological reasons for owning a home are highly subjective and, in general, difficult to quantify. The output of the model presented in this paper, however, allows the user to implicitly value these factors. Even though the model's output may suggest that renting is the optimal financial choice, when the non-quantitative factors are considered, buying may be preferred. The implied value of the psychological reasons for owning may offset any explicit financial "cost" of ownership.

The remainder of this paper is organized as follows. The following section reviews the literature regarding housing choice. An applied model is then developed that can be used to analyze the housing question. The purpose of the model is to determine household wealth in the future assuming a home is purchased. In Section 4, the model is empirically illustrated with two case studies using average housing data and a spreadsheet template derived from the model. The template allows users to complete their own analysis, with their own data. Based on the results of the case studies, Section 5 considers the reasons a household would buy a home. Section 6 considers the implications of the results and concludes the paper.

## **2. Literature review**

There is a voluminous literature concerning the housing decision and attempts to categorize this body of work is subject to debate. It seems two major approaches have been taken in researching the issue. The first considers the impact household characteristics, as indicated by demographic, social, and economic variables, have on housing choice at a point in time or over time. Examples of this approach include Artle and Vanaiya (1978), King (1980), Blackley and Follain (1988), Jones (1989), Hughes (1991), Haurin, Hendershott, and

Wachter (1994), Rosen (1996), and Di Salvo and Ermisch (1997). The results indicate that there is a strong positive relationship between ownership and specific variables. For example, homeownership directly increases with age (up to a point when ownership begins to decline), household size, income, and wealth, education level, parental wealth, and social standing (likely a proxy for income, education, and wealth). Homeownership is also conditional on race (at least in the United States), household mobility, location, and type of household (e.g., married or non-traditional family). These variables are powerful indicators of housing choice.

The second approach used to research housing choice focuses on the economic variables that affect the relative costs of owning and renting. Two paths have been followed to explore this issue. First, the choice is theoretically modeled, assuming the housing market is in equilibrium, based on both applied (available) and theoretical (often indeterminate) variables. Usually, the model is not empirically tested. Examples include Muth (1969) and Meyer and Wieand (1996). Second, the question is modeled but the empirical analysis focuses on the impact of a relatively narrow subset of variables. Examples of this method include: Rosen (1979) who focuses on the impact of taxation; Kearn (1979) on inflation, market imperfections, and mortgage contracts; Diamond (1980) on taxation, inflation, and house appreciation rate expectations; Peiser and Smith (1985) on inflation; Linneman (1985) on taxation, transaction costs, and market quality; Henderson and Ionnides (1989) on taxation and market imperfections; Berkovec (1989) and Chinloy (1991) on the risks of homeownership; Gabriel and Rosenthal (1993) on type of mortgage (ARM or FRM); and Haurin et al. (1996) on borrowing constraints.

This paper differs from earlier work in a number of ways. It does not attempt to explain the housing decision using a large dataset that focuses on household characteristics. Nor does it present a theoretical model of housing choice. Rather, the paper develops an applied model that considers the relative costs of owning and renting based on an extensive list of variables (some actual, others forecasted). The model calculates the financial impact the choice of housing has on household wealth. The model is then empirically illustrated using two case studies. For these case studies, average data are collected from government and housing industry agencies or based on current economic or financial conditions.

A contribution of this approach is that it does not assume that the choice of housing is based solely on theory or on the expected financial outcome. Benefits are derived from qualitative factors, including the basic utility of ownership. Though difficult to quantify and completely subjective, the psychological factors affecting housing choice must be recognized and implicitly valued. Even though the model may suggest that renting is the optimal financial choice, the qualitative benefits of ownership may offset the financial “cost” of ownership.

The model and results are also presented in a unique fashion. A spreadsheet template, derived from the model, is provided that can be easily used by others to analyze housing choice. For those interested in exploring the issue, being able to replicate the analysis with different, user-defined variables is valuable. The results are presented in a spreadsheet format that outlines the yearly costs of owning and renting. The overall financial outcome of owning rather than renting over the total period that housing is consumed is then presented. Finally,

Table 1  
Variables required for the housing choice decision analysis

Variable	Symbol	Brief description
1. Household wealth	$W_N$	Household wealth at the end of year N.
2. House price	$C_0$	Purchase price of house including renovation costs.
3. Closing costs	CC	All fees required to finalize the purchase (i.e.: lawyer fees, mortgage insurance, points, etc)
4. Downpayment	DP	The percent of the purchase price the household provides (converted to dollars).
5. Mortgage rate	$k_m$	The interest rate on the mortgage over the amortization period.
6. Amortization period	$n$	The total period the household takes to pay off the mortgage.
7. Ownership cost	$O_t$	After-tax cost of owning the house in year $t$ ; includes mortgage, property taxes, and maintenance and repairs.
8. Rent	$R_t$	Cost of renting a comparable property, less benefits included in rent, in year $t$ .
9. Security deposit	SD	Deposit required at beginning of rental agreement.
10. Net downpayment	NDP	Difference between the downpayment and the security deposit.
11. Cost inflation (%)	$f_t$	Rate at which costs and rent increase in year $t$ .
12. Net cost of buying invested	NCI	The sum of the yearly series of net cost of buying invested over the period of the analysis.
13. House appreciation rate (%)	$i_H$	Rate at which housing appreciates in value.
14. Rate of return (%)	$i_F$	Return earned on the investment in financial assets.
15. Selling costs	$SC_N$	Cost of selling the house at the end of the period of the analysis (includes real estate commission and closing costs).
16. Capital gains tax rate	$T_{CG}$	Marginal tax rate on capital gains income of the individuals claiming the capital gains.
17. Marginal tax rate	$T_M$	The tax rate of the individual claiming the mortgage interest and property taxes against income (not applicable in Canada).
18. Period of analysis	$N$	Total period of analysis, amortization period doubled.

the analysis is reduced to a single number: expected future household wealth assuming a home is purchased. For completeness, the present value of household wealth is also provided.

### 3. The housing choice model

A household must choose between owning and renting a home and on the optimal level of housing quality. For a given level of housing quality (value, location, size, type, etc.) and from a purely financial perspective, the housing decision should be based on the difference between the expected future wealth of owning a home ( $W_N^O$ ) and the expected future wealth of renting a home ( $W_N^R$ ). If  $W_N$  (household wealth at future year N) is positive then, financially, buying is superior to renting. Therefore, a household should own a home if:

$$W_N = W_N^O - W_N^R > 0 \quad (1)$$

The variables necessary to model housing choice are identified and described in Table 1. Because a home purchase implies a long-term commitment, with the benefits and costs realized over many years, the period of the analysis (time N) should be quite long. For

example, during the period the mortgage is outstanding, the cost of owning will be much greater than when the mortgage is retired. Therefore,  $N$  should be longer than  $n$ , the mortgage amortization period.  $N$  is assumed to be  $n$  doubled, to a maximum of 45 years.<sup>4</sup>

$W_N^O$  is based on the value of the house at time  $N$  less the future value of the cost of owning a house over time  $N$ . The implication of the second term in (2) is that by owning, the household will forego the opportunity to invest the yearly ownership costs ( $O_t$ ) in financial assets that earn  $i_F$ :

$$W_N^O = C_O(1 + i_H)^N - \sum_{t=1}^N O_t(1 + i_F)^{N-t} \quad (2)$$

The ownership cost in year  $t$  ( $O_t$ ) is the sum of the mortgage payments ( $MP_t$ ), property taxes ( $PT_t$ ), and maintenance and repairs ( $MR_t$ ), adjusted for inflation, less, if applicable, the tax savings associated with the yearly interest portion of the mortgage payments ( $IP_t$ ) and property taxes as follows:

$$O_t = [MP_t + (PT_t + MR_t)(1 + f_t)^{t-1}] - [IP_t + (PT_t)(1 + f_t)^{t-1}]T_M \quad (3)$$

If the household rents, the net downpayment (NDP), the downpayment that would be used to purchase the house less the security deposit that is required when renting, can be invested in financial assets earning  $i_F$ .  $W_N^R$  is based on the after-tax value of the NDP at time  $N$  less the future value of the cost of renting a house over time  $N$ . As in (2), the implication of the second term in (4) is that by renting, the household will forego the opportunity to invest the yearly rental costs ( $R_t$ ) in financial assets that earn  $i_F$ :

$$W_N^R = [\{NDP(1 + i_F)^N - (NDP)\}(1 - T_{CG}) + DP] - \sum_{t=1}^N (R_t)(1 + i_F)^{N-t} \quad (4)$$

The cost of renting in year  $t$  ( $R_t$ ) is the sum of the monthly rent payments, less any benefits included in the rent that an owner would have to pay (e.g., heat or cable television), adjusted for inflation as follows:<sup>5</sup>

$$R_t = (R_1) * (1 + f_t)^{t-1} \quad (5)$$

Substituting Eqs. (2) and (4) into Eq. (1) and rearranging the terms yields:

$$W_N = [C_O(1 + i_H)^N] - [\{NDP(1 + i_F)^N - (NDP)\}(1 - T_{CG}) + DP] - \left[ \sum_{t=1}^N (O_t - R_t)(1 + i_F)^{N-t} \right] \quad (6)$$

Therefore,  $W_N$ , household wealth associated with buying, is a function of:

1. The value of the house at time  $N$ ;
2. less, the after-tax future value of the net downpayment that the household can invest in financial assets when renting;
3. less, the difference between the after-tax “net cost of owning” at time  $N$ .

The first term in (6) is associated with one of the principal factors influencing the decision to buy a home: the investment motive. This motive is illustrated in statements such as: “By buying a home, I will be paying myself, not a landlord. Each mortgage payment builds equity in the house for my family.” The investment (forced saving) motive for purchasing certainly appears to be convincing.<sup>6</sup> In addition, as the mortgage is paid-off, it is possible to use the increasing equity in the house as collateral for a home equity loan that can also be used for investment purposes, further supporting this motive. The value of the house appreciates at  $i_H$  for  $N$  years. Assuming this value is not subject to tax, this is home equity and thus, part of household wealth.<sup>7</sup>

The second term in (6) considers the opportunity cost of owning. At the time of the original purchase, the household “invested” the net downpayment in the house. Instead, if the household rents, the net downpayment can be invested in financial assets. This may be a logical choice given the components of household wealth. Total household wealth is the combination of net worth (the difference between a household’s assets and liabilities) and human capital (the present value of all future employment earnings). For the majority of households, wealth consists almost entirely of home equity and human capital.<sup>8</sup> This suggests that households own very poorly diversified portfolios of assets, violating a basic principle of investment management. A consequence of holding an undiversified portfolio of assets is the possibility of extreme “shocks” to the portfolio’s value. Also, since common equity based investments have provided, over time, the highest rate of return of any asset class,<sup>9</sup> it seems that North American households are, on average, not maximizing investment opportunities.

A prospective (or current) homeowner considering this issue may reason that buying (owning) is not as attractive an option as first thought. Therefore, rather than “invest” in the purchase of a home, perhaps a more logical option is to split the consumption and investment role of housing by renting (consuming) a home and investing in financial assets earning  $i_f$ . If so, then the net downpayment appreciates for  $N$  years and becomes a taxable capital gain. The downpayment is added to the after-tax capital gain and this is the opportunity cost associated with using the downpayment to buy the house.

The third term in (6) is the “net cost of owning,” the difference between the cost of owning and renting a house for each year  $t$  of period  $N$ . If  $O_t > R_t$ , owning costs more than renting and a renter will invest the difference in financial assets for one period earning  $i_f$ , and the resulting future value added to the following year’s positive value. The positive series is expected to occur during the first half of period  $N$  and the final value in this series is cumulated to time  $N$  to determine the future value of the positive differences in the “net cost of owning.” During the remainder of period  $N$ , the cost of renting will be greater and the owner will invest the difference. The negative series of “net cost of owning” will conclude at time  $N$  and is the future value of the benefit of owning rather than renting.

The two series of the “net costs of owning” are evaluated separately since, in both cases, the funds are invested in financial assets and the gain is subject to tax. The difference between the respective ending future values and the sums of the cumulative yearly “net costs of owning” [the net amounts invested (NAI)] for each series is a taxable capital gain. The future after-tax capital gain associated with the negative “net cost of owning” is subtracted from the future after-tax capital gain associated with the positive “net cost of owning,” and

if the difference is positive, owning was more costly than renting during period  $N$ . This process is illustrated in (7) and (8) for the series of positive “net costs of owning.” A similar process will apply for the negative series.

$$FV\_PNCO = [ \{ (NCO_t * i_F) + NCO_{t+1} * i_F + NCO_{t+2} * i_F + \dots + NCO_{t+n} * i_F \} ] * i_F^{N-t*} \quad (7)$$

$$ATCG\_PNCO = [(FV\_PNCO - NAI) * (1 - T_{CG})] + NAI \quad (8)$$

where:  $FV\_PNCO$  = future value of the positive net costs of owning;

$NCO_t = O_t - R_t$  (“net cost of owning”) for all year  $t$ 's where  $O_t > R_t$ ;

$i_F = 1 + i_F$ ;

$t^*$  = the year the positive series of the “net costs of owning” ends;

$ATCG\_PNCO$  = after-tax capital gain associated with the positive “net costs of owning”;

$NAI$  = the net amounts invested; the cumulative yearly “net costs of owning”;

$T_{CG}$  = capital gains tax rate.

Substituting (8), and the implied result for the negative series of “net costs of owning,” for the third component of (6) yields the following housing choice model:

$$W_N = [C_o(1 + i_H)^N] - [\{NDP(1 + i_F)^N - (NDP)\}(1 - T_{CG}) + DP] - [ATCG\_PNCO - ATCG\_NNCO] \quad (9)$$

The model generates three after-tax future values and these are used to determine the net financial outcome of buying versus renting at year  $N$ . If the result is positive then, financially, buying is superior to renting.

The risks of housing choice have not been considered thus far. Meyer and Wieand (1996) discuss this issue and illustrate that homeowners are subject to three major types of risks while renters avoid housing risk. Meyer and Wieand (1996) indicate that the risks of ownership include the concentration of household wealth in housing when it is owned, the illiquidity of housing, and the higher fixed costs and lack of flexibility of ownership.

#### 4. Empirical Applications of the Housing Choice Model

An average Canadian (American) household with an average income is considering purchasing an average home in an average community in Canada (the United States). Both households have considered the emotional, social, and psychological reasons to own a home and are strongly leaning towards purchasing. While the emotional arguments to purchase are strong, both households want to consider the financial implications of the decision. This section of the paper illustrates the model developed above using these average Canadian and American households.<sup>10</sup>

Table 2

Values of the variables used for the average household housing choice decision case studies

Variable	Amount in Canada	Amount in U.S.	Note
1. $W_N$	Unknown	Unknown	Value determined by the model.
2. $C_0$	\$164,100	\$147,800	Median price of a home.
3. CC	2% of house price	2% of house price	Minimum closing costs incurred when buying.
4. DP	25%	20%	Downpayment varies due to different regulations in the two countries concerning conventional mortgages.
5. $k_m$	8.5%	8.5%	Based on on historic yields on long-term government bonds adjusted for the risk of mortgages.
6. n	20 years	20 years	Balance mortgage payments with total interest paid.
7. $O_t$	Property taxes: 1.2%; maintenance and repairs: \$572	Property taxes: 1.2%; maintenance and repairs: \$396	Mortgage calculated using above data, property taxes are a percent of house value, maintenance and repairs as given. Latter two costs increase each year at $f_t$ .
8. $R_t$	\$829 per month	\$876 per month	Increases each year at $f_t$ , the inflation rate.
9. SD	$R_t$	$R_t$	Payable at beginning of rental, refundable at end.
10. NDP	DP-SD	DP-SD	Difference available to invest if housing is rented.
11. $f_t$	3% per year	3% per year	Inflation rate for costs.
12. NCI	Varies	Varies	Based on the net cost of buying for each year.
13. $i_H$	2.5% per year	3.5% per year	Based on historic data and demographics.
14. $i_F$	12.5% per year	12.5% per year	Based on historic returns on common equity based financial securities.
15. $SC_N$	7% of house value at year N	7% of house value at year N	Minimum amount given real estate commission of 6%.
16. $T_{CG}$	17%	25%	Capital gains tax rate for middle-income households.
17. $T_M$	N/A	31%	Marginal tax rate for middle-income households; only used in U.S. example.
18. N	Total period of analysis	Total period of analysis	Assumed to be n doubled.

For empirical applications of the housing choice model, values for many of the variables used must be estimated, and thus, are subject to forecast error. While being a possible limitation of the analysis, the use of estimates in empirical applications of models is common in the literature (see Diamond, 1980 and Haurin et al., 1994) and is unavoidable. Because it is assumed that an average household is considering the purchase of an average home in an average neighborhood, average housing data is used in the analysis. Table 2 provides the values used in the two case studies while the rationale for the values is provided below. The sensitivity of the result to changes in the values of certain variables concludes this section.

In 2001, the median selling price of existing single-family homes in the United States was \$147,800 (National Association of Realtors, 2002), the mean selling price in Canada was \$164,100 (Canadian Mortgage and Housing Corporation, CMHC, 2002).<sup>11</sup> Closing costs vary but will average, at least, 2% of the value of the house. Selling costs at time N will average, at least, 7% of the value of the house given that the real estate commission is 6%. To qualify for a conventional mortgage, a downpayment of 25% is required in Canada, 20% in the United States.<sup>12</sup> These data are used in the analysis. To ensure a reasonable mortgage payment but a minimal total amount of interest paid over the life of the mortgage, an amortization period of 20 years is used.<sup>13</sup>

Mortgage interest rates are based on current market rates and the term of the mortgage: the

longer the term, the higher the rate. Buyers selecting shorter-terms in order to benefit from lower interest rates will sign a number of different mortgage contracts over the amortization period and, for the model, the average mortgage rate over the total period must be estimated. This rate will be based on current rates and estimates for the future. The long-term government bond yield reflects market expectations of future rates. In both Canada and the United States, long-term government bonds yielded between 5.0% and 7% between 1995 and 2002. Assuming 6% and adding a premium of 250 basis points for the greater risk associated with mortgages and the risk of renewing mortgages at various times in the future, results in a rate of 8.5% used in the case studies.

To analyze housing choice, the cost of renting an equivalent house in terms of size, quality, and location must be determined and as with house prices, this is location-based. HUD (2002) reports that the median rent for new rental units in the United States in 2001 was \$876 per month.<sup>14</sup> CMHC (2001) reports that in the 57 urban centers sampled, the mean rent for 2001 was \$727. Adjusted for a four-bedroom unit, rent averaged \$829 per month and this amount is used. A security deposit of one month's rent is assumed to be payable at the beginning of the lease period, refundable at termination. The difference between the down-payment and the security deposit is the amount that will be invested if the household rents.

Maintenance and repairs are incidental costs that keep a property in ordinary working condition. The U.S. Department of HUD (2002) reports that households spent, on average, \$396 per year on maintenance and repairs in 2001. In Canada, Statistics Canada (2000) reports that households spent, on average, \$572 per year in 1999. In both Canada and the United States, property taxes were 1.2% of housing values (see the 1997 American Housing Survey and Statistics Canada, 2001a).

House appreciation rates are location-based but are subject to inflationary expectations and demographic forces.<sup>15</sup> In North America, many believe that long-run inflationary pressures have subsided suggesting that housing prices will stabilize. In addition, the population is aging and the baby boomers (the largest cohort of the population) who aspired to purchase homes have, for the most part, now done so. The generation following the boomers, "Generation X," is much smaller and with lower expected incomes. These factors suggest that the period of large increases in house values may be over for the foreseeable future.

Between 1980 and 2001, the median price of existing single family homes in the United States increased, on average, 4.2% per year (HUD, 2002). In Canada, new housing prices increased a more modest 2.5% per year, however, this masks a decline in housing prices over the 1990 to 1998 period (Statistics Canada, 2001c). In North America, housing stock per capita and the ratio of consumer and mortgage debt to after-tax income (at over 100%) are both at record levels. Housing starts surged in the latter part of the 1990s through 2002 and this may put downward pressure on prices in the future. Also, the ratio of house prices to average disposable income, an important determinant of house prices, is reaching a peak last touched in the late 1980s. Given the expected economic and demographic "drag" on housing prices, a reasonable estimate for the nominal rate of increase in prices in the long-term is 2.5% for Canada, 3.5% for the United States.<sup>16</sup> The average change in the CPI in North America during the 1990s has been about 3% per year, and this rate is used to adjust the yearly costs in the model.

Because a home purchase is long-term in nature, the financial assets purchased with the funds not invested in the house will also be selected for the long-term. The academic literature and practice clearly show that common equity based financial securities are the most attractive investment vehicle, over the long-term, given their ability to maximize returns while diversifying and controlling risk. For example, Ibbotson Associates (2002) reports that between 1926 and 2001, the annual return on the Standard and Poor's 500 Index averaged 12.6% while for an index of small capitalization stocks the average return was 16.1%. Between 1950 and 2001, the annual return on the Toronto Stock Exchange 300 Index averaged 12% while over the 1972 to 2001 period the annual return on the Morgan Stanley Capital International's EAFE (Europe, Australia, Far East) Index averaged 13.1%.

A household not purchasing a home will instead invest their funds in a diversified portfolio of common equity based securities. Based on historic rates of return, a long-term investor should expect an average annual return of 12.5%. More conservative investors may receive lower returns, however, given the long-term nature of the analysis, an investment advisor would likely not be serving a client's best interests by recommending an alternative strategy.<sup>17</sup> While a portion of the investment return may be dividend income that is subject to tax on a yearly basis, much of the return will be capital gains because equity securities are used. Capital gains are taxed when realized, in this case at time N. The capital gains tax rate for middle-income taxpayers in Canada is 17%, in the United States it is roughly 25%.<sup>18</sup> These rates are used to calculate the after-tax value of the capital gains. The marginal ordinary tax rate is used to determine the after-tax cost of the mortgage interest and property tax expenses if, as in the United States these items are tax deductible. In the United States, the marginal ordinary federal tax rate for middle-income taxpayers is 31% and this rate is used in the analysis.

Spreadsheet templates, based on the model, are used to analyze housing choice. Tables 3 and 4 illustrate the model for the average Canadian and American household, respectively. The spreadsheets contain three sections. The first, the worksheet, provides information regarding the variables. The second, the yearly analysis, provides the positive and negative "net costs of owning" and the two series of future cumulative values.<sup>19</sup> The third, the overall result, calculates the future value of the house, the after-tax future value of the net down-payment, and the after-tax future value of the "net costs of owning." Household wealth at time N indicates the expected change in wealth assuming a home is purchased. The present value of this value is also provided.

The results may be surprising. It seems that *renting* is the best financial option for both the average Canadian and American household. In Canada, the "loss" associated with buying a median priced home is substantial: about \$5 million by the end of 40 years (\$1.5 million on a present value basis). In the United States, even with the tax incentives associated with ownership, there is a "loss" associated with buying a median priced home though the loss is "only" about \$282,000, \$86,000 on a present value basis.

The sensitivity of the overall result to changes in the values of certain key variables is an important issue. Table 5 displays the impact changes in the values have on the results and indicates the breakeven values for each of the variables; the point where, holding all other variables constant, a household would be indifferent to buying or renting. If the purchase

Table 3  
Analysis of buying versus renting: Canada

<b>1. Worksheet</b>								
House Price	\$164,100	Net Downpayment	\$41,017					
Closing Costs (%)	2.00%	Property Taxes (% of cost)	1.20%					
Closing Costs (\$)	\$3,282	Property Taxes (\$)	\$1,969					
Downpayment (%)	25.00%	Repairs & Maintenance	\$572					
Downpayment \$	\$41,846	House Appreciation Rate	2.50%					
Mortgage	\$125,537	Cost Appreciation Rate	3.00%					
Interest Rate	8.50%	Rate of Return	12.50%					
Amortization Period (years)	20	Period of Analysis (years)	40					
Monthly Mortgage Payment	\$1,077.81	Marginal tax rate	34.00%					
Rent	\$829	Capital gains tax rate	17.00%					
Security Deposit for Rental	\$829	Selling Costs (at end)	7.00%					
<b>2. Yearly Analysis: "Net Costs of Owning"</b>								
Cost of Buying	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>
Mortgage	12,934	12,934	12,934	12,934	12,934	12,934	12,934	12,934
Expenses	2,541	2,617	2,696	2,777	2,860	2,946	3,034	3,125
Total Cost of Buying	15,475	15,551	15,630	15,710	15,794	15,880	15,968	16,059
Total Cost of Renting	<u>9,948</u>	<u>10,246</u>	<u>10,554</u>	<u>10,870</u>	<u>11,197</u>	<u>11,532</u>	<u>11,878</u>	<u>12,235</u>
Net Cost of Buying	5,527	5,305	5,076	4,840	4,597	4,347	4,090	3,824
FV of Investment	5,527	11,522	18,038	25,133	32,872	41,328	50,584	60,731
Running Sum of Investments	5,527	10,832	15,907	20,747	25,345	29,692	33,781	37,606
Cost of Buying	<u>Year 9</u>	<u>Year 10</u>	<u>Year 11</u>	<u>Year 12</u>	<u>Year 13</u>	<u>Year 14</u>	<u>Year 15</u>	<u>Year 16</u>
Mortgage	12,934	12,934	12,934	12,934	12,934	12,934	12,934	12,934
Expenses	3,219	3,316	3,415	3,518	3,623	3,732	3,844	3,959
Total Cost of Buying	16,153	16,249	16,349	16,451	16,557	16,665	16,777	16,893
Total Cost of Renting	<u>12,602</u>	<u>12,980</u>	<u>13,369</u>	<u>13,770</u>	<u>14,183</u>	<u>14,609</u>	<u>15,047</u>	<u>15,499</u>
Net Cost of Buying	3,551	3,269	2,980	2,681	2,373	2,057	1,730	1,394
FV of Investment	71,874	84,127	97,623	112,506	128,943	147,118	167,237	189,536
Running Sum of Investments	41,156	44,426	47,406	50,086	52,460	54,516	56,246	57,641
Cost of Buying	<u>Year 17</u>	<u>Year 18</u>	<u>Year 19</u>	<u>Year 20</u>	<u>Year 21</u>	<u>Year 22</u>	<u>Year 23</u>	<u>Year 24</u>
Mortgage	12,934	12,934	12,934	12,934	0	0	0	0
Expenses	4,078	4,200	4,326	4,456	4,590	4,727	4,869	5,015
Total Cost of Buying	17,012	17,134	17,260	17,390	4,590	4,727	4,869	5,015
Total Cost of Renting	<u>15,964</u>	<u>16,443</u>	<u>16,936</u>	<u>17,444</u>	<u>17,967</u>	<u>18,506</u>	<u>19,061</u>	<u>19,633</u>
Net Cost of Buying	1,048	691	324	(54)	(13,378)	(13,779)	(14,192)	(14,618)
FV of Investment	214,276	241,752	272,295	(54)	(13,438)	(28,897)	(46,701)	(67,157)
Running Sum of Investments	58,689	59,380	59,704	(54)	(13,432)	(27,211)	(41,403)	(56,021)
Cost of Buying	<u>Year 25</u>	<u>Year 26</u>	<u>Year 27</u>	<u>Year 28</u>	<u>Year 29</u>	<u>Year 30</u>	<u>Year 31</u>	<u>Year 32</u>
Mortgage	0	0	0	0	0	0	0	0
Expenses	5,166	5,321	5,480	5,645	5,814	5,989	6,168	6,353
Total Cost of Buying	5,166	5,321	5,480	5,645	5,814	5,989	6,168	6,353
Total Cost of Renting	<u>20,222</u>	<u>20,829</u>	<u>21,454</u>	<u>22,097</u>	<u>22,760</u>	<u>23,443</u>	<u>24,146</u>	<u>24,871</u>
Net Cost of Buying	(15,056)	(15,508)	(15,973)	(16,453)	(16,946)	(17,455)	(17,978)	(18,518)
FV of Investment	(90,608)	(117,442)	(148,096)	(183,061)	(222,890)	(268,206)	(319,709)	(378,191)
Running Sum of Investments	(71,077)	(86,585)	(102,559)	(119,011)	(135,958)	(153,412)	(171,391)	(189,908)
Cost of Buying	<u>Year 33</u>	<u>Year 34</u>	<u>Year 35</u>	<u>Year 36</u>	<u>Year 37</u>	<u>Year 38</u>	<u>Year 39</u>	<u>Year 40</u>
Mortgage	0	0	0	0	0	0	0	0
Expenses	6,544	6,740	6,942	7,151	7,365	7,586	7,814	8,048
Total Cost of Buying	6,544	6,740	6,942	7,151	7,365	7,586	7,814	8,048
Total Cost of Renting	<u>25,617</u>	<u>26,385</u>	<u>27,177</u>	<u>27,992</u>	<u>28,832</u>	<u>29,697</u>	<u>30,588</u>	<u>31,506</u>
Net Cost of Buying	(19,073)	(19,645)	(20,235)	(20,842)	(21,467)	(22,111)	(22,774)	(23,458)
FV of Investment	(444,538)	(519,750)	(604,954)	(701,415)	(810,558)	(933,989)	(1,073,512)	(1,231,159)
Running Sum of Investments	(208,981)	(228,627)	(248,861)	(269,703)	(291,170)	(313,281)	(336,055)	(359,513)

Table 3  
(Continued)

<b>3. Overall Result: Wealth at End of the Period of Analysis Assuming Purchase</b>		
<b>a) Future Value of House</b>		
Value of House at End of Period	\$ 440,619	
less: Closing Costs	<u>30,843</u>	
Proceeds of Sale		\$409,776
<b>b) After-tax Future Value of Downpayment</b>		
Value of Downpayment	4,560,994	
less: Net Initial Downpayment	<u>41,017</u>	
Capital Gain	4,519,977	
Taxes	<u>768,396</u>	
After-tax Value of Downpayment		3,834,443
<b>c) After-tax Future Value of the Yearly "Net Costs of Owning"</b>		
Value of Benefit of Renting	\$ 272,295	
FV of Benefit of Renting at Time N	3,230,300	
less: Amount Invested During Period	<u>59,704</u>	
Capital Gain	3,170,596	
Taxes	<u>(539,001)</u>	
After-tax Value of the Benefit of Renting		2,691,299
<b>Value of Benefit of Buying</b>	<u>1,231,159</u>	
FV of Benefit of Renting at Time N	1,231,159	
less: Amount Invested During Period	<u>359,513</u>	
Capital Gain	871,646	
Taxes	<u>(148,180)</u>	
After-tax Value of the Benefit of Buying		<u>1,082,979</u>
After-tax Future Value of the Cost of Buying		1,608,320
Household Wealth at Year N (FV)		<u>(\$5,032,988)</u>
Present Value of Household Wealth		<u>(\$1,542,897)</u>

price of the house was 10% higher than the value used, the "loss" associated with buying increases by about \$1.4 million in Canada and almost \$1 million in the United States. To be indifferent, the house price would have to fall by about 36% to \$105,000 in Canada, a modest 3.1% in the United States to \$143,000. For the remainder of the variables, the results are very robust to changes in the values for Canada, less so in the United States.

For example, in the Canadian (United States) case, rent would have to increase by over 52% (3%), the house appreciation rate by 274% (28%), inflation by 158% (13%), or the rate of return would have to decline by 44% (4%) before the indifference point is reached. Reducing the downpayment to only 10% has a minor impact in Canada but swings the decision to buying in the United States given the tax deductibility of interest on the mortgage.

The sensitivity analysis to this point only considers one variable in isolation; however, a number of variables could change and this could have a dramatic effect on the result. For example, if rent increased to \$1,000, the house appreciation and inflation rates to 5%, and the rate of return declined to 11%,  $W_N$  becomes about \$1 million in Canada and \$3.4 million in the United States, clearly favoring the purchase alternative.<sup>20</sup>

Table 4  
Analysis of Buying Versus Renting: United States

<b>1. Worksheet</b>								
House Price	\$147,800	Net Downpayment	\$29,275					
Closing Costs (%)	2.00%	Property Taxes (% of cost)	1.20%					
Closing Costs (\$)	\$2,956	Property Taxes (\$)	\$1,774					
Downpayment (%)	20.00%	Repairs & Maintenance	\$396					
Downpayment \$	\$30,151	House Appreciation Rate	3.50%					
Mortgage	\$120,605	Cost Appreciation Rate	3.00%					
Interest Rate	8.50%	Rate of Return	12.50%					
Amortization Period (years)	20	Period of Analysis (years)	40					
Monthly Mortgage Payment	\$1,046.64	Marginal tax rate	31.00%					
Rent	\$876	Capital gains tax rate	25.00%					
Security Deposit for Rental	\$876	Selling Costs (at end)	7.00%					
<b>2. Yearly Analysis: "Net Costs of Owning"</b>								
<b>Cost of Buying</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>
Mortgage	12,560	12,560	12,560	12,560	12,560	12,560	12,560	12,560
Expenses	2,170	2,235	2,302	2,371	2,442	2,515	2,591	2,668
Total Cost of Buying	14,729	14,794	14,861	14,930	15,002	15,075	15,150	15,228
less: Tax Savings	3,699	3,650	3,595	3,535	3,471	3,401	3,323	3,237
After-tax Cost of Buying	11,030	11,144	11,266	11,395	11,530	11,674	11,828	11,991
Total Cost of Renting	10,512	10,827	11,152	11,487	11,831	12,186	12,552	12,928
Net Cost of Buying	518	317	114	(91)	(301)	(512)	(724)	(937)
FV of Investment	518	900	1,126	(91)	(404)	(966)	(1,811)	(2,975)
Running Sum of Investments	518	835	949	(91)	(392)	(904)	(1,629)	(2,566)
<b>Cost of Buying</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>	<b>Year 12</b>	<b>Year 13</b>	<b>Year 14</b>	<b>Year 15</b>	<b>Year 16</b>
Mortgage	12,560	12,560	12,560	12,560	12,560	12,560	12,560	12,560
Expenses	2,748	2,831	2,916	3,003	3,093	3,186	3,282	3,380
Total Cost of Buying	15,308	15,390	15,475	15,563	15,653	15,746	15,841	15,940
less: Tax Savings	3,142	3,037	2,922	2,795	2,656	2,503	2,335	2,150
After-tax Cost of Buying	12,166	12,353	12,553	12,767	12,997	13,243	13,506	13,789
Total Cost of Renting	13,316	13,716	14,127	14,551	14,988	15,437	15,900	16,377
Net Cost of Buying	(1,150)	(1,363)	(1,574)	(1,784)	(1,991)	(2,195)	(2,394)	(2,588)
FV of Investment	(4,497)	(6,421)	(8,798)	(11,682)	(15,133)	(19,219)	(24,015)	(29,605)
Running Sum of Investments	(3,716)	(5,078)	(6,652)	(8,436)	(10,427)	(12,621)	(15,015)	(17,603)
<b>Cost of Buying</b>	<b>Year 17</b>	<b>Year 18</b>	<b>Year 19</b>	<b>Year 20</b>	<b>Year 21</b>	<b>Year 22</b>	<b>Year 23</b>	<b>Year 24</b>
Mortgage	12,560	12,560	12,560	12,560	0	0	0	0
Expenses	3,482	3,586	3,694	3,804	3,919	4,036	4,157	4,282
Total Cost of Buying	16,041	16,146	16,253	16,364	3,919	4,036	4,157	4,282
less: Tax Savings	1,948	1,726	1,482	1,215	1,073	1,105	1,138	1,173
After-tax Cost of Buying	14,093	14,420	14,771	15,149	2,846	2,931	3,019	3,109
Total Cost of Renting	16,869	17,375	17,896	18,433	18,986	19,555	20,142	20,746
Net Cost of Buying	(2,775)	(2,955)	(3,125)	(3,284)	(16,140)	(16,625)	(17,123)	(17,637)
FV of Investment	(36,081)	(43,545)	(52,114)	(61,912)	(85,791)	(113,140)	(144,405)	(180,093)
Running Sum of Investments	(20,379)	(23,333)	(26,458)	(29,742)	(45,883)	(62,507)	(79,631)	(97,268)
<b>Cost of Buying</b>	<b>Year 25</b>	<b>Year 26</b>	<b>Year 27</b>	<b>Year 28</b>	<b>Year 29</b>	<b>Year 30</b>	<b>Year 31</b>	<b>Year 32</b>
Mortgage	0	0	0	0	0	0	0	0
Expenses	4,410	4,543	4,679	4,819	4,964	5,113	5,266	5,424
Total Cost of Buying	4,410	4,543	4,679	4,819	4,964	5,113	5,266	5,424
less: Tax Savings	1,208	1,244	1,281	1,320	1,359	1,400	1,442	1,485
After-tax Cost of Buying	3,203	3,299	3,398	3,500	3,605	3,713	3,824	3,939
Total Cost of Renting	21,369	22,010	22,670	23,350	24,051	24,772	25,515	26,281
Net Cost of Buying	(18,166)	(18,711)	(19,272)	(19,851)	(20,446)	(21,059)	(21,691)	(22,342)
FV of Investment	(220,771)	(267,078)	(319,735)	(379,553)	(447,443)	(524,433)	(611,678)	(710,480)
Running Sum of Investments	(115,434)	(134,145)	(153,417)	(173,268)	(193,714)	(214,773)	(236,464)	(258,806)

Table 4  
(Continued)

<b>2. Yearly Analysis: "Net Costs of Owning"</b>								
<b>Cost of Buying</b>	<u>Year 33</u>	<u>Year 34</u>	<u>Year 35</u>	<u>Year 36</u>	<u>Year 37</u>	<u>Year 38</u>	<u>Year 39</u>	<u>Year 40</u>
Mortgage	0	0	0	0	0	0	0	0
Expenses	<u>5,587</u>	<u>5,755</u>	<u>5,927</u>	<u>6,105</u>	<u>6,288</u>	<u>6,477</u>	<u>6,671</u>	<u>6,871</u>
Total Cost of Buying	5,587	5,755	5,927	6,105	6,288	6,477	6,671	6,871
less: Tax Savings	<u>1,530</u>	<u>1,576</u>	<u>1,623</u>	<u>1,672</u>	<u>1,722</u>	<u>1,774</u>	<u>1,827</u>	<u>1,882</u>
After-tax Cost of Buying	4,057	4,179	4,304	4,433	4,566	4,703	4,844	4,990
Total Cost of Renting	<u>27,069</u>	<u>27,881</u>	<u>28,718</u>	<u>29,579</u>	<u>30,467</u>	<u>31,381</u>	<u>32,322</u>	<u>33,292</u>
Net Cost of Buying	(23,012)	(23,703)	(24,414)	(25,146)	(25,900)	(26,678)	(27,478)	(28,302)
FV of Investment	(822,302)	(948,792)	(1,091,805)	(1,253,427)	(1,436,006)	(1,642,184)	(1,874,935)	(2,137,604)
Running Sum of Investments	(281,819)	(305,521)	(329,935)	(355,081)	(380,982)	(407,659)	(435,137)	(463,439)
<b>3. Overall Result: Wealth at End of the Period of Analysis Assuming Purchase</b>								
<i>a) Future Value of House</i>								
Value of House at End of Period						\$ 585,179		
less: Closing Costs						<u>40,963</u>		
Proceeds of Sale								\$ 544,216
<i>b) After-tax Future Value of Downpayment</i>								
Value of Downpayment						3,255,373		
less: Net Initial Downpayment						<u>29,275</u>		
Capital Gain						3,226,098		
Taxes						<u>806,524</u>		
After-tax Value of Downpayment								\$2,479,000
<i>c) After-tax Future Value of the Yearly "Net Costs of Owning"</i>								
Value of Benefit of Renting					\$ 1,126			
FV of Benefit of Renting at Time N					87,951			
less: Amount Invested During Period					<u>949</u>			
Capital Gain					87,002			
Taxes					<u>(21,750)</u>			
After-tax Value of the Benefit of Renting							66,200	
Value of Benefit of Buying					<u>2,137,604</u>			
FV of Benefit of Renting at Time N					2,137,604			
less: Amount Invested During Period					<u>463,439</u>			
Capital Gain					1,674,165			
Taxes					<u>(418,541)</u>			
After-tax Value of the Benefit of Buying							<u>1,719,063</u>	
After-tax Future Value of the Cost of Buying								(1,652,862)
Household Wealth at Year N (FV)								<u>(\$281,921)</u>
Present Value of Household Wealth								<u>(\$86,425)</u>

## 5. Discussion: why own a home?

The above results clearly indicate, using average housing data, that homeownership is a losing proposition in Canada, marginal in the United States. Why, then, is homeownership a major life goal for so many? What factors motivate a household to buy a home and to

Table 5

Sensitivity of the results of the average household case studies to changes in the values of the variables

Scenario	Outcome for Canada			Outcome for US		
	$W_N$ (FV)	PV	B/E point	$W_N$ (FV)	PV	B/E point
Base model	−\$5,032,988	−\$1,542,897	N/A	−\$ 281,921	−\$ 86,425	N/A
$C_0$ incr by 10%	−\$6,440,153	−\$1,974,273	\$105,400	−\$1,198,529	−\$367,417	\$143,200
$R_t$ to \$1,000	−\$3,055,779	−\$ 936,770	\$1,265	+\$1,024,476	+\$314,060	\$902
$i_H$ to 6%	−\$3,873,029	−\$1,187,304	9.35%	+\$ 674,576	+\$206,796	4.49%
$f_t$ to 6%	−\$2,373,590	−\$ 230,766	7.74%	+\$2,550,321	+\$247,948	3.38%
$i_F$ to 11%	−\$2,613,245	−\$ 801,108	7.00%	+\$ 442,579	+\$135,676	12.03%
DP to 10%	−\$4,423,946	−\$1,356,191	N/A	+\$ 230,865	+\$ 70,773	N/A
Combination:						
$R_t$ \$1,000						
$i_H$ 5%	+\$ 999,569	+\$ 141,984	N/A	+\$3,380,382	+\$480,169	N/A
$f_t$ 5%						
$i_F$ 11%						

continue to own (upgrade) rather than rent? In North America, there appears to be a commitment to homeownership that only radical economic, personal, or health considerations change. Four factors seem to be at work. First, as discussed earlier, many individuals believe that real estate is a good investment. Survey data clearly show that the vast majority of both owners and renters hold this view. Based on the above analysis, this belief should perhaps be questioned.

Second, emotional, social, and psychological factors are powerful influences and, often, the deciding factors in the choice of housing. While these variables are, generally, non-quantitative and difficult to include in a financial analysis, they are powerful influences that appear to be reinforced by society as a whole. Such influences include: pride of ownership, family traditions, privacy, tranquillity, and sanctuary, security and stability, parental desires, and a desire to live in a particular way, location, or neighborhood.<sup>21</sup> Also, homeownership is often considered a symbol of status. If status is measured in terms of financial condition, there may be some support for this view. Research indicates that renters are more likely to overspend and are almost twice as likely to have debt repayment difficulties as are homeowners. In models used to predict insolvency/bankruptcy, key variables are living arrangements (own or rent and length of time at current residence), age, and net worth. Each of these variables favor owners.<sup>22</sup> Financial institutions appear to be aware of these relationships since, “Do you own or rent?” is a standard question on loan applications.

Third, government programs reinforce the investment and social aspects of homeownership. Governments have a societal and economic interest in ownership; it is viewed as a way of ensuring family and community stability, of increasing incomes, of providing people with a “stake in society,” and as an incentive for families to “take control of their lives.”<sup>23</sup> In addition, home purchases result in housing construction. A key leading economic indicator is housing starts; the impact of housing construction resonates throughout the economy. As a consequence, governments in many countries have enacted numerous policies that encourage the flow of capital into housing markets and reduce the cost of homeownership through the tax system.

In North America, governments have actively promoted homeownership since the 1930s. Examples of government involvement include: government-sponsored deposit and mortgage insurance; the creation of agencies to promote housing such as “Fannie and Ginnie Mae” in the United States and the CMHC in Canada; first-time home buyer programs providing educational and other incentives to participants; regulations encouraging/requiring banks to lend money to low and moderate income individuals and households; and regulations requiring housing developers to construct specific types of housing.

In addition, governments have enacted tax policies that: allow for the total or partial deferral of capital gains on principal residence sales, target savings incentives to first-time home buyers [Engelhardt (1994) analyzes one Canadian program], and allow owners to deduct certain ownership expenses (e.g., mortgage interest and property tax payments) from income. These types of policies encourage renters to become owners and, generally, reward ownership. In principle, when renters become owners new housing construction should result, positively impacting the economy.<sup>24</sup>

Also, given that tax savings to one group of taxpayers must be offset by either tax increases, in general or to a particular group, or reduced spending on programs, then society, by not opposing these incentives, implicitly encourages ownership as the preferred choice. In the United States, various flat tax proposals have generated opposition from lobby groups associated with the housing market since these models often call for the elimination of the mortgage interest deduction.

Fourth, households may be motivated to buy since there may be a perception that there is a lack of attractive rental properties available on reasonable terms. If so, this may necessitate many searches for new housing and many time and income consuming household moves. Also, rental properties may not be located in desirable areas. “A safe community” is often cited as a key factor used when looking for a home. If rental properties are located in “undesirable” areas, this may bias decisions in favor of purchasing.<sup>25</sup> While this may be the case in certain housing markets and/or in certain preferred neighborhoods, the market system should respond if enough people voice a desire for a specific type of rental property in certain types of neighborhoods.

## **6. Implications and conclusion**

For most households, housing choice is the most important financial decision ever made. Many choose to buy a home based on emotional, social, and psychological factors and, likely, in the belief that it is a wise investment choice. For some, this may be the case; for others, however, it is a mistake from which it takes many years to recover. In general, the vast majority of households do not know if the decision to buy a home is financially prudent; it is usually assumed it is. This paper modeled the housing choice decision and then illustrated the model for an “average” Canadian and American household. The results suggest that purchasing a home may not be the optimal financial choice for North American households. The “loss” associated with ownership may range into the millions of dollars over the period of ownership, although a home equity loan may reduce or reverse this “loss.”

There are several limitations to the analysis. First, since average housing data are used in

the two case studies presented, the results may not be relevant for individual households or whole regions of a country. Second, the saving program implicit in the rental option must be strictly followed implying significant discipline and commitment. Spending all or a portion of the downpayment or the yearly savings from renting invalidates the analysis. While this may appear to pose a serious problem for the model, it is very simple and “painless” for a household to set-up an automatic investment plan (AIP) where a predetermined amount is invested in financial securities on a regular and consistent basis.

Third, the emotional, social, and psychological benefits associated with homeownership are not directly considered in the model. These are difficult to quantify and completely subjective. The model does, however, implicitly value the psychological factors through the output. Based on the model’s “bottom line,” Household Wealth at Year N, the user must evaluate whether the psychological benefits offset any financial “cost” of ownership. Even though the model may suggest that renting is the optimal financial choice, the implied value of the psychological benefits of owning may offset any explicit financial “cost” of ownership.

Fourth, two variables, the return on financial assets and the house appreciation rate, can have a major impact on the result. If a household does not receive the double-digit average yearly returns on financial assets and/or the house appreciation rate approaches double-digits, the decision for the “average” household would swing to buying, particularly in the United States. Fifth, the case studies presented implicitly assume that the population of buyers and renters are similar with respect to income, risk tolerance, spending patterns, and social characteristics and needs. The significant differences in these variables across society can impact the results.

These limitations, however, also highlight one of the strengths of the analysis. The model and template approach allow for individual inputs and thus optimal information for individual decision-making. The model is a rational approach to analyzing the most important financial decision most households make. It allows for both optimal and non-optimal actions by households.

In conclusion, it is clear that a multitude of factors affect housing choice, but the decision can be modeled. For empirical applications, forecasts for key variables must be made and while these are subject to error, most households, with guidance and support, can complete the required analysis. While housing choice is the most significant financial decision most households make, it is often made using emotional rather than financial reasoning. It is surprising how little impartial guidance is offered to help households make this vital decision.

With housing, it is often said that renting is “lost money” while buying is “a good investment in your future.” While this may be true, a family should rationally and critically analyze the question to determine the impact of the decision on their economic position. The effect of homeownership on future wealth may not be as positive as the average North American household currently believes.

## Notes

1. I thank students in my personal finance course who gave me the idea for this paper. As well, I am grateful for the many helpful and insightful comments and suggestions

- provided by Michael Hennessey, Roberta MacDonald, three anonymous referees, and the journal editor, Conrad Ciccotello, that greatly helped in developing the manuscript.
2. For Canada, the data is for 2000 and is from Statistics Canada (2001b). For the U.S., the data is from the U.S. Department of Housing and Urban Development (2002, HUD) and is for 2001.
  3. Rosen (1996) indicates that one-person households are more than twice as likely as single family households to rent. Also, statistics for North America indicate that the homeownership rate for one person households is roughly 40% with the large majority of these owners being older than 40.
  4. This does not imply that a household will live in the same house for  $N$  years, rather that once a house is purchased, ownership normally remains the housing choice for many years. While a household may own many different homes over this period, the overall effect is that housing is owned not rented. Also,  $N$  may be any number of years but, to not bias the outcome in favor of renting,  $N$  should be longer than  $n$ , but is not a requirement of the model.
  5. Household insurance and utilities are not included in the model because it is assumed that these expenses will be the same whether the household buys or rent. It is likely the case, however, that both expenses will be greater when owning. Thus, the analysis likely underestimates the costs associated with owning.
  6. A Royal Bank (2002) survey reported that 84% of respondents believed that a house is a good investment with higher percentages of affluent and highly educated people holding this view. Many believe that buying a home is better than investing in financial assets.
  7. In Canada, capital gains on the sale of a principal residence are tax exempt. In the United States, individual (joint return) taxpayers can exclude up to \$250,000 (\$500,000) of capital gains from the sale of housing.
  8. See Blume and Friend (1975) for the foundation research and Mankiw and Zeldes (1991), Hye and Hanna (1995), Fratantoni (1998), and Tracy et al. (1999) for more recent empirical results. Fratantoni (1998) suggests that households' modest holdings of risky financial securities is explained by the high fixed costs associated with homeownership. Renters, with lower fixed housing costs, have more opportunity to invest in equities and earn higher returns.
  9. See Ibbotson Associates (2002) for annual and average return data between 1926 and 2001 for the various classes of financial assets.
  10. Given the differences in average data, mortgage calculations, and the treatment of ownership expenses between Canada and the United States, separate empirical applications of the model are necessary.
  11. Housing values and appreciation rates are location-based. If, in a particular market, demand is high (low) or housing scarce (abundant), values and appreciation rates for similar housing could be significantly different from national averages. For example, in the United States, the average price in the 139 Metropolitan markets sampled by the National Association of Realtors ranged from \$84,000 to \$475,900. The average price in the 29 markets sampled by CMHC (2002) ranged from \$79,500 to \$370,000. See

- Muth (1969) for a theoretical discussion of the impact location has on value and Blackley and Follain (1983) and Malpezzi et al. (1998) for empirical support.
12. In both Canada and the United States, the downpayment can be as low as 5%. The impact of lower downpayments on the analysis is considered in Section 4 of the paper.
  13. As the amortization period of a mortgage is extended, the monthly payment falls but at a decreasing rate while the total interest paid increases at an increasing rate. For example, when the amortization period is extended from 20 to 25 years on a \$100,000 mortgage at 8.5%, the mortgage payment declines a modest 7.2%, however, the total interest paid increases by 30.7%.
  14. The 2001 fair market value (FMV) rent data published by HUD for a four-bedroom unit for 2,680 metropolitan and non-metropolitan areas in the United States indicates that monthly rentals ranged from \$419 to \$2,536 with a median rent of \$629 per month. The third quartile rental amount was \$734 suggesting that the rent amount used in the case study may be high biasing the analysis in favor of buying.
  15. Diamond (1980) and Peiser and Smith (1985) demonstrate that returns to owning are highly sensitive to inflation; expectations of rising (falling) inflation encouraged (discouraged) homeownership. Hughes (1991), Mankiw and Weil (1989), McFadden (1994), and Foot (1996) indicate that demographic patterns affect the demand for and price of housing.
  16. For the very long-term this appears to be a reasonable estimate given that Eichholtz (1997) reports that between 1628 and 1973, the real increase in housing prices in a consistently high quality neighborhood in Amsterdam averaged 0.50% per year.
  17. Ho et al. (1994) support this view in their model of the portfolio allocation decision individuals must make to ensure sufficient funds are available for retirement. Their results indicate that the vast majority of individuals should hold an investment portfolio consisting solely of common equity based securities.
  18. In the United States, the tax rate on long-term capital gains is 20%. With State taxes considered, the rate will average about 25%. In Canada, the marginal income tax rate for middle-income earners is roughly 34% but because only 50% of capital gains are taxable, the net tax rate is 17%. This analysis reasonably assumes that the realization of the capital gains will be spread over time and over the adult members of the household.
  19. Interested readers may freely download the templates from the author's Web site at [www.upei.ca/~sbusines/faculty/hennessey/bus421.html](http://www.upei.ca/~sbusines/faculty/hennessey/bus421.html). A separate part of the spreadsheet, not displayed in Table 4, calculates the amount of monthly mortgage interest payments, sums this amount, adds the yearly property taxes, and multiplies this amount by the marginal tax rate to determine the tax savings associated with these deductions. This figure is subtracted from the total cost of buying to determine the yearly after-tax cost of buying.
  20. An important issue for a homeowner is the impact of the equity that builds in a home over time, both as the mortgage is gradually retired and as the market value of the home increases. The increasing equity may be used to offset the apparent financial loss associated with owning. An owner can access the equity in the home through a home equity loan. This issue was fully analyzed but because of space limitations the

results are not presented; the complete results are available from the author. In summary, the results indicate that the “loss” associated with buying for the average Canadian household is reduced, but is still a substantial \$3.6 million. For the average American household, the decision is altered. The benefit of investing the home equity loan makes buying the optimal decision with future wealth of \$1.25 million.

21. Because people derive utility from ownership, it is impossible to assume the housing market is efficient in the manner proposed (and rejected in tests) by Linneman (1985). Consumers of housing are not purely rational and repeatedly demonstrate a preference for ownership. Consequently, ownership costs are likely higher, rental costs lower than in equilibrium. A sizeable literature documenting the inefficiency of the housing market has emerged since 1985; see Gatzlaff and Tittiroglu (1995) and Cho (1996) for excellent reviews of this literature.
22. DeVaney and Lytton (1995) review this research. Homeowners are generally older and wealthier, both in terms of family income and net worth. This reality, however, presents a case of circular reasoning: do households own a home because they are wealthier or are they wealthier because they own a home?
23. Meyer et al. (1994) and Cisneros (1995) discuss these issues. Krueckeberg (1999), in contrast, argues that the view that owners are better citizens than renters is false and that in the United States, a wide-spread bias against renters has existed since colonial times; ownership is given too much social significance. He concludes that perhaps it is time for a civil rights movement for renters.
24. Oswald (1996) contradicts this view in a study that examines the relationship between the level of homeownership and the unemployment rate in 20 industrialized countries. Oswald reports that the level of homeownership is positively related to the level of unemployment. A 10% increase in the homeownership rate is associated with a 2% increase in the unemployment rate. It seems that a high rate of homeownership *may not be good for the economy* and that rather than encouraging home ownership, governments may be wise to promote a healthy market for rental housing.
25. The Department of HUD (2002) reports that in 2001, the homeownership rate in United States city centers (often viewed as areas “undesirable” in which to live) was 51.9% while outside metropolitan areas the rate was 75%.

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