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Home Equity Conversion Plans for the Elderly

by

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Abstract:

This paper establishes the need for home equity conversion schemes for the elderly. It then provides a review of literature pertinent to reverse mortgages paying particular attention to the different types of reverse mortgages and their associated risks. In an attempt to better quantify the general appreciation risk faced by financial institutions issuing reverse mortgages, ARIMA techniques are employed to model Canadian house prices in both current and real dollar terms. The paper ends with an examination of crossover points for hypothetical reverse mortgages issued from 1957 to 1975 with varying payment amounts and original house prices.

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1. A Demographic Need for Home Equity Conversion Plans

The changing demographic profile of the Canadian population poses a real challenge to the social support programs available to the elderly. These must address an overall greater demand for support as well as the individual needs of the elderly. All this must be accomplished at a time when the number of individuals of working age, those who provide such social support, is declining.

In Canada, demographic change and the aging population are expected to have an effect exceeding that of most other nations. The CIA task force on Retirement Savings [5] reports that the combination of decreasing fertility rates and increasing longevity will lead to an estimated 8.019 million individuals over the age of 65 in the year 2030 as opposed to the present 3.485 million. This represents a significant increase of approximately 130%. Similarly, the senior dependency ratio[1] is expected to increase from 19.8% to 38.9%. Meanwhile, the number of Canadians aged between 20 and 64 will increase a mere 17% during this same period. In absolute terms, the climb will be from 17.594 million to 20.615 million individuals. These two factors will result in a projected total dependency ratio[2] of 80.9% in the year 2030. This represents an increase of almost 25% from the 1995 figure of 64.9%. These changes are even more startling when one examines the costs associated with supporting the growing number of aged individuals.

Persons aged 65 and over form a very affluent group in Canada. They typically have had a disproportionate say in government[3] and, as Phillips and

[1]The senior dependency ratio is the ratio of those 65 and over to those aged 20 to 64. In essence this ratio measures the relative size of the retired population, expressed as a percentage of the working population. It is indicative of the burden which each Canadian of working age faces with respect to the aged in our population.

[2]Total dependency ratio is the sum of the senior dependency ratio and the youth dependency ratio. The youth dependency ration is computed as the ratio of individuals under the age of 20 to those aged 20 to 64.

[3]The elderly have traditionally been the most consistent in demanding that their legislative needs be addressed. For example, the CIA task force on Retirement Savings [5] reports that, in Canada, voter turnout has been approximately 88% for those aged 60 and over while for those aged 18-29 the turnout has hovered at 67%. Also, the projected percentage of total voters aged 65 and over will climb from 15% in 1995 to 30% in 2030 illustrating the growing influence of the aged electorate.

Gwin [13] found, are becoming even wealthier as the elderly whose working years coincided with the depression of the 1920's are being replaced by the post WWII cohort. Unfortunately, it was also found that the majority of the wealth these people hold is in illiquid assets. Most usually the largest asset held is a home which traditionally has appreciated more quickly than inflation. This, in combination with wages which have lagged behind inflation growth, have resulted in an *asset rich but income poor* group of elders.

In attempting to provide this segment of the population with a larger disposable income, one recognizes the family home as the most obvious source of said additional income. Traditionally, this has meant that the homeowner must sell and leave the home or acquire a mortgage on the owner's equity. This is feasible as a good percentage of the elderly own their own home and have no outstanding mortgage. In actual fact, of the 66.4% of homeowners over the age of 65, 59.4% own their own home with no outstanding mortgage. Also, 7% own their home but have a mortgage and 33.6% rent[4].

Table 1

Income and Housing Tenure of Canadians Over 65

Income	%	Own Home	Mortgage	w/o Mortgage	Rent
$0-6,000	3.1	54.0%	7.0%	47.0%	46.0%
$6,000-7,999	13.7	43.3%	3.2%	40.2%	56.5%
$8,000-9,999	11.5	49.9%	4.7%	44.4%	51.0%
$10,000-11,999	8.0	57.0%	4.1%	52.9%	43.0%
$12,000-14,999	15.6	71.6%	6.8%	64.8%	28.4%
$15,000-19,999	16.5	73.5%	6.6%	66.9%	26.5%
$20,000-24,999	7.6	76.4%	8.6%	67.8%	23.6%
$25,000-34,999	10.6	77.6%	10.0%	67.6%	22.4%
$34,999 and up	13.5	83.6%	12.1%	71.5%	16.4%

Yet, the first prospect appeals to few homeowners as it requires leaving one's usual place of abode while the second requires the homeowner to make regular monthly payments at a time when sources of income are limited and few. Alternately, homeowners can opt to mortgage their home and purchase an annuity to meet both interest payments on the mortgage and

[4]Table 1 provides a breakdown of housing tenure in Canada for the elderly. This table was taken from Brown and Pannu [4].

provide disposable monthly income. For this to be a viable alternative, the original house price must be rather large to offset both interest payments and the relatively heavy taxation of income derived from the annuity. Hence, the need for an equity conversion plan which allows elderly homeowners to continue living in their own homes and at the same time provide a significant supplement to their disposable income.

2. Reverse Mortgage Types

A traditional mortgage involves borrowing a large sum of money, typically not exceeding 80% of the home value, and repaying through monthly installments, both the principal amount and interest charges. Qualification for a reverse mortgage is most usually based on the borrower's ability to meet payments. Qualification for a reverse mortgage is not based on income. Rather, the critical factors are age and sex of homeowner, appraised value of the home and the required loan term. The owner's equity in a home is divided into two components: a right to live in the home and the remaining equity held by the the homeowner. In essence, a lender purchases the residual homeowner's equity by making periodic payments to the homeowner, which accumulate with interest, until a specified due date. At this point, the accumulated loan balance is repaid with funds usually derived from the sale of the home. The due date may be specified or it may be random and depend on the occurrence of a certain event. To date, most reverse mortgages fall into one of three categories. These are: (1) term reverse mortgages or fixed debt reverse annuity mortgage loans; (2) split term reverse mortgages or rising debt annuity mortgage loans ; and, (3) split equity or tenure reverse mortgages.

Term reverse mortgages provide the homeowner with monthly payments for an n-year period. This payment amount is dependent primarily on the original house value and subsequent appreciation, the chosen period of payment, and prevailing interest rates[5]. For example, consider a homeowner who wishes payments to continue for n years. Denote the value of his/her home at time t as H_t. It is clear that if i is the lender's required rate of return then;

$$\frac{H_n}{(1+i)^n} = K + \sum_{t=1}^{n} \frac{P_t}{(1+i)^t} \tag{1}$$

where K is an initial amount received by the homeowner and P_t is an annuity payment made at time t. Assuming that the home value appreciates

[5]Diventi and Herzog [8] describe a stochastic simulation approach used to estimate the amount of level-payment annuity payable

at a rate f_t during the period t to $t+1$, one could determine the appreciated value of the home at the due date as

$$H_n = H_0 \prod_{t=1}^{n} (1 + f_t) \tag{2}$$

Combining equations 1 and 2 we require that the annuity payments made satisfy the following.

$$\sum_{t=1}^{n} \frac{P_t}{(1+i)^t} = \frac{H_0 \prod_{t=1}^{n} (1 + f_t)}{(1+i)^n} - K \tag{3}$$

In this manner, adjustments can be made to annuity payment amounts once the actual rates of appreciation, say f', become known. The annuity payment amounts would now include the allocated proportion of the accrued value of the difference between payments made and payments which should have been made.

These are ideal financial instruments if the additional income is only required for a short period of time. As such, they are most recommended for those elderly homeowners who are about to retire, expect their investments to mature in the near future, or are awaiting an opening in a new housing complex. The difficulty with this type of reverse mortgage arises from the fact that the term of the mortgage, n, is most often less than the expected future lifetime of the homeowner. As such, the aged homeowner is faced with having to repay the accumulated loan balance at the end of the term. In most cases the homeowner will be able to do so only by selling their home. This leaves him/her both without a home and in need of regular income.

The split term reverse mortgage engenders similar criticisms. This type of mortgage, sometimes referred to as a rising debt reverse annuity mortgage loan, requires the financial institution to make periodic payments for a prespecified period of time. These accumulate with interest and are to be repaid only when the homeowner dies, the home is sold, or the homeowner changes residency. The problem here is that if the home does not appreciate quickly enough, the owner's equity may be used up before his/her death and subsequently the owner may be required to sell his/her home to pay off the loan and be left with even less disposable income than before.

These first two types of reverse mortgages are useful in helping to establish what qualities a viable home equity conversion plan should possess.

A priority for the homeowner is his/her ability to reside in the home until the time of his/her death with payments continuing until the owner's death or at least for as long as the owner resides in the home. Also, the homeowner should not be required to repay any portion of the loan, as he/she is in no position to do so, until the sale of the home. At this point, the homeowner's liability should be limited by his/her equity in the home.

These characteristics are combined in the type of reverse mortgage referred to as a tenure reverse mortgage. It allows the homeowner residency in their own home until the time of death and provides annuity payments over the same period of time. The repayment of the loan occurs at the time of death or at whichever point the homeowner wishes to move out of the home or sell it. If, when the accumulated loan balance is to be repaid, there is an excess amount of equity vis-a-vis the accumulated loan balance, the residual equity goes to the estate of the homeowner. This offers the homeowner protection against losses which would otherwise be incurred upon early termination of the reverse mortgage.

3. Risks Associated with Reverse Mortgages

The basic characteristics of a reverse mortgage can be represented graphically. Consider a home with original selling price of $150,000. Figure 1 illustrates the risks involved if this home appreciates at a rate of 6% per annum and if mortgage lending rates are 14%[6]. Note that the accumulated loan balance, which include both monthly payments of $600 and accumulated interest, exceeds the original selling price of the home during the eighth year. More importantly, we define the crossover point as the point in time where the accumulated loan balance exceeds the estimated selling price. This critical point indicates at what time a portion of the loan becomes unrecoverable. Furthermore, the longer the period after the crossover point extends, the larger the unrecoverable portion of the loan grows. In this particular example, the crossover point occurs during the 16^{th} year. By the twentieth year, the excess of the estimated accumulated loan balance over the estimated selling price of the home is approximately $265,000[7].

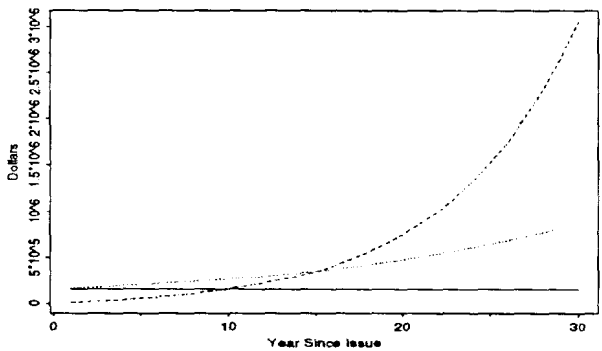

Figure 1: Characteristics of a Reverse Mortgage

The above figure suggests that reverse mortgages are most effective at the extreme ages for both the homeowner and financial institution. The

[6]The appreciation rate and nominal semi-annual lending rate chosen are approximately the average experienced rates or the most recent 12 years.

[7]See appendix A for the year by year progression of the reverse mortgage.

older homeowner will benefit from the relatively larger monthly payments which will result from the equity being spread over a shorter expected future lifetime. Alternately, the lender will diminish the risk of having the accumulated loan balance exceed the estimated property value if the homeowner is older as, once again, the expected future lifetime of the homeowner coincides with the period of payment, and this period is shortened. In essence, the lender is selecting his risks in such a manner as to minimize the expected life years lived by homeowners after the crossover point.

Also, the above figure illustrates the need to incorporate both total home value and appreciation in the calculation of benefits arising from a reverse mortgage. If appreciation is ignored, monthly payments to the homeowner will only provide an insignificant supplement to disposable income. These conditions contrast the usual mortgage environment where only a percentage, most commonly 75% to 80%, of the home value is covered by the mortgage.

Table 2

Determination of Crossover Point

Monthly Payment	$300	$500	$700	$1000	$1200
Yr. Loan Balance $\geq$ Org. Price	14	10	10	8	7
Yr. Loan Balance $\geq$ Accum. Value	23	18	14	11	9

4. Risk Impact Upon Crossover Point

It has been shown that the risk faced by financial institutions issuing reverse mortgages arises from individuals retaining their homes after the crossover point. As such, the lender should be wary of all factors which may predispose an individual to an extended life as a homeowner. Also, those factors which cause the accumulated loan balance to exceed the estimated selling price should be properly assessed as it is these factors which determine the amount of risk involved with the issuance of reverse mortgages[8]. There are five such factors and they lead to the following risks previously identified by Phillips and Gwin [13]:

- length of residency risk
- interest rate risk
- general home appreciation risk
- specific home appreciation risk
- expense risk

The length of residency risk arises from the fact that the expected future lifetime of a homeowner is the major consideration used to determine the amount of each monthly payment. Payments most usually persist until the death of the homeowner or until the homeowner ceases to live in their home. The lender must consider both mortality rates and rates at which elderly homeowners leave their home. The latter has been approximated by Phillips and Gwin [13] as the rate at which elders enter a nursing home. These two rates are interdependent as both are usually a function of health. Using these rates the table below compares the unfunded excess of loan balance over home value for both average and below average loan terminations.

The tables below assume that one hundred reverse mortgages are issued at the nominal interest rate of 14%, providing monthly payments

[8]It should be noted that the homeowner also faces risks when engaging in a reverse mortgage. For example, homeowners are exposed to inflation risk. That is the risk that there will be a reduction in the real value of their annuity in light of a high inflation environment.

of $600. All loan terminations are assumed to occur at year end and the unfunded loan balance is net of an assumed 10% cost applied to cover the cost associated with the sale of a home. As such, the amount to be recovered by the financial institution equals the accumulated loan balance prior to the crossover point but the resulting unfunded loan balance after the crossover point is found by subtracting the 90% of the estimated selling price from the accumulated loan balance.

The total amounts listed at the bottom of the sixth column in tables 3 a and b represent the total amount by which the accumulated loan balance exceeds the estimated price of the home. On an aggregate basis, the slightly lower terminations resulted in an unfunded loan balance 1.78 times as large as when average terminations were assumed. This amounts to 24.82% of the total value of assets at origination. At the time of origination, if the loan balance excess is discounted at the mortgage lending rate, the absolute difference attributable to termination rate differences is $19,533,356.

Interest rate risk (C-3), is often circumvented by a financial institution if the lender can match both positive and negative cash flows. This form of immunization against C-3 risk is difficult with reverse mortgages in light of their illiquidity and the unorthodox pattern of resulting cash flows. That is, the large and often persistent negative cash flows which characterize reverse mortgages often continue for ten years or more. This consideration is compounded by the amount of new business that is being written.

Both fixed and variable rate reverse mortgages have their advantages and disadvantages. A fixed interest rate allows a lender to project future loan balances more accurately and facilitates the assessment of both length of residency risk and home appreciation risk. Alternately, a variable interest rate reverse mortgages does not have these benefits yet reduces the amount of interest rate risk.

As previously noted, the appreciated home value is used to determine the amount of the monthly payments made as these amounts would not provide sufficient payments if only the original home value was used. Appreciation rates are volatile and will vary not only with time, but also with geographic local and house type. Thus, when the actual rate of appreciation differs from the assumed rate, as will invariably be the case, the crossover point will be shifted. The lender is especially concerned with drops in the rate of appreciation as this will advance the crossover point resulting in a larger number of homeowners remaining in their home after the

Table 3a

Sensitivity to Length of Residency Risk

Average Terminations are Assumed

Year n	Accumulated Loan Balance Per Issue	Estimated Selling Price Per Issue	Amount Recovered Per Issue if Loan is Paid in	Loans in Effect	Unfunded Loan Balance
1	$7,753	$159,000	$7,753	96	$0
2	16,630	168,540	16,630	93	0
3	26,793	178,652	26,793	89	0
4	38,429	189,372	38,429	84	0
5	51,751	200,734	51,751	79	0
6	67,003	212,778	67,003	73	0
7	84,464	225,545	84,464	67	0
8	104,456	239,077	104,456	59	0
9	127,345	253,422	127,345	52	0
10	153,551	268,627	153,551	44	0
11	183,553	284,745	183,553	37	0
12	217,903	301,829	217,903	30	0
13	257,229	319,939	257,229	24	0
14	302,254	339,136	302,254	18	0
15	353,803	359,484	323,535	14	121,072
16	412,822	381,053	342,947	10	279,496
17	480,391	403,916	363,524	7	350,601
18	557,752	428,151	385,336	5	344,832
19	646,321	453,840	408,456	4	237,865
20	747,725	481,070	432,963	3	314,761
21	863,821	509,935	458,941	2	404,879
22	996,739	540,531	486,478	1	510,261
23	1,148,916	572,962	515,666	0	633,250
24	1,323,143	607,340	546,606	0	0
25	1,522,615	643,781	579,403	0	0
26	1,750,990	682,407	614,167	0	0
27	2,012,456	723,352	651,017	0	0
28	2,311,807	766,753	690,078	0	0
				Total	$3,197,017

Table 3b

Sensitivity to Length of Residency Risk

Below Average Terminations are Assumed

Year n	Accumulated Loan Balance Per Issue	Estimated Selling Price Per Issue	Amount Recovered Per Issue if Loan is Paid Year n	Loans in Effect	Unfunded Loan Balance
1	$7,753	$159,000	$7,753	97	$0
2	16,630	168,540	16,630	95	0
3	26,793	178,652	26,793	92	0
4	38,429	189,372	38,429	88	0
5	51,751	200,734	51,751	84	0
6	67,003	212,778	67,003	79	0
7	84,464	225,545	84,464	74	0
8	104,456	239,077	104,456	68	0
9	127,345	253,422	127,345	62	0
10	153,551	268,627	153,551	54	0
11	183,553	284,745	183,553	48	0
12	217,903	301,829	217,903	41	0
13	257,229	319,939	257,229	35	0
14	302,254	339,136	302,254	28	0
15	353,803	359,484	323,535	24	121,072
16	412,822	381,053	342,947	19	349,370
17	480,391	403,916	363,524	14	584,335
18	557,752	428,151	385,336	11	517,248
19	646,321	453,840	408,456	10	237,865
20	747,725	481,070	432,963	8	629,522
21	863,821	509,935	458,941	6	809,759
22	996,739	540,531	486,478	4	1,020,522
23	1,148,916	572,962	515,666	3	633,250
24	1,323,143	607,340	546,606	2	776,236
25	1,522,615	643,781	579,403	2	0
26	1,750,990	682,407	614,167	1	1,136,824
27	2,012,456	723,352	651,017	1	0
28	2,311,807	766,753	690,078	0	1,621,729
				Total	$5,679,480

crossover point. As such, a greater portion of a larger number of loans will be unrecoverable.

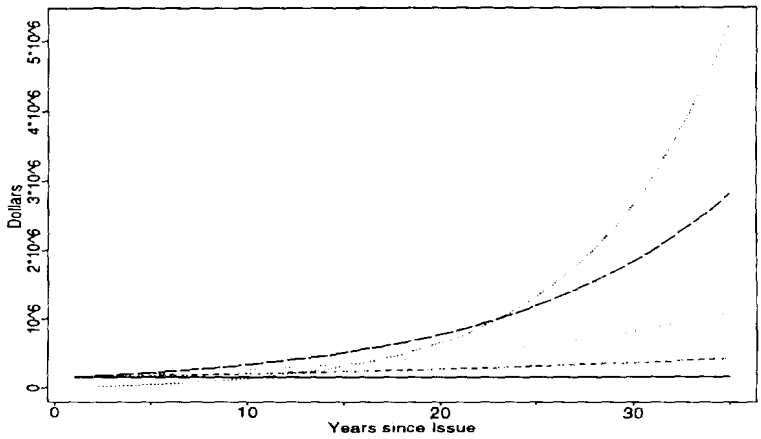

Figure 2: Appreciation Rates and Crossover Points

Figure 2 illustrates the change in crossover points when different rates of appreciation are assumed. The accumulated loan value is plotted against the estimated selling price of a home assumed to appreciate at 3%, 6%, and 9% per annum. The crossover points occur at year 12, 16, and 23. Appendix B contains an examination of crossover points for different rates of appreciation and different interest rates.

In addition to a general appreciation risk, the lender must be concerned with the actual rates of appreciation on specific homes. The lender may accurately predict general appreciation, but each home is subject to local factors which will cause that particular home to appreciate at a more rapid or less rapid rate. The most obvious factors, specific to each individual home, are maintenance of property and uninsured loss of property due to fire or natural catastrophe[9]. The homes held by elderly homeowners are especially

[9]There exist several alternatives as to the manner in which responsibilities for maintenance and insurance can be allocated. The original homeowner has no incentive to provide for anything more than the minimum amount of maintenance to keep the home livable as

susceptible to specific appreciation rates as their homes are most usually older and consequently in need of more maintenance than newer structure. Also, it is natural to assume that older homeowners will experience the most difficulty in properly maintaining their homes and, as such, be most likely to neglect needed repairs.

This risk functions in a manner similar to general appreciation risk except that it operates on individual homes as opposed to the aggregate portfolio of homes. A lender is concerned specifically with the number of homes in a portfolio which will experience less than average appreciation and the difference in appreciation between those homes and the average home. This is a critical risk as the homeowner benefits if appreciation rates exceed expectations but, if otherwise, the financial institution will suffer most of the costs.

Finally, reverse mortgages are a relatively new product and as such may engender expenses which are not easily predictable. While the potential market for such a product exists, it may be difficult to solicit elderly homeowners to opt for a reverse mortgage when relatively few people have heard of them. Financial institutions wishing to provide these equity conversion instruments will have to experiment with various methods of soliciting clientele. In addition, there are administrative and legal expenses which differ from the usual expenses faced by those pricing insurance products.

Phillips and Gwin [13] claim that the five risks described above can be designed so as to have only a minimal interdependence. For example, it may be the case that during times of low appreciation rates, homeowners would be inclined to invest less time and money in the maintenance of their homes thereby increasing the costs attributable to the individual home appreciation risk. This effect would be difficult to quantify but is assumed to be very slight. As such, costs associated with each of the two appreciation risks can be estimated independently and a fee be charged for each of the two. In fact, this can be done for each of the risks.

Minimization of the cost associated with each of these risks can be effected through conservatism, diversification, sharing of risk with the home-

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the maximum liability he/she will face is limited to the value of the home. More stringent conditions may be imposed upon the homeowner regarding maintenance responsibilities but the most obvious resolution is to have the lender provide for both maintenance and insurance. The lender would be in a better position to purchase insurance and maintenance services and at the same time would have an incentive to keep expenses low.

owner, and asset-liability matching. The most obvious method of conservatism involves reducing the benefit amount. Unfortunately, reducing the benefit amount would limit the ability of a reverse mortgage to meet its goal of providing a significant amount of disposable income to the elderly homeowner. As such, reductions in benefit amount would result in reduced marketability.

Diversification involves issuing reverse mortgages for homes in different regions. This measure would reduce the specific home appreciation risk as a portfolio would not be as adversely affected by depressed housing prices in any particular region. Diversification can also be along the lines of housing type. This would protect a portfolio from any drops in the value of a particular house type. For example, it would be unwise to invest solely in condominiums as a decline in the demand for such housing would have a significant and negative impact on the portfolio of homes.

A shared appreciation fee is a good example of how the risks of a reverse mortgage may be more equitably allocated to both investor and homeowner. A shared appreciation fee would provide the investor with larger returns on homes which appreciate at a higher rate. These returns can then be used to cover losses suffered on those homes which did not appreciate as expected. Alternatively, one can encourage homeowners to help reduce specific home appreciation risk by providing them with incentives to properly maintain their homes. For example, any appreciation in excess of a predetermined amount can be returned to the homeowner.

Variable interest rates also help or hurt both homeowner and investor. When interest rates are low, the homeowner and investor are both rewarded. The former, with low interest accumulation resulting in larger residual equity and the latter, with lower loan losses. With high interest rates the opposite is true.

5. Analysis of Canadian House Prices

General appreciation risk could be limited if one could accurately predict future appreciation rates. This analysis of Canadian house prices attempts to arrive at a model which predicts the average Canadian house price in future years. It would be most useful in predicting the appreciation rate of a diversified portfolio of homes. A similar analysis can be conducted on data specific to a particular geographic local and house type. The resulting model would be more appropriate in reducing specific home appreciation risk.

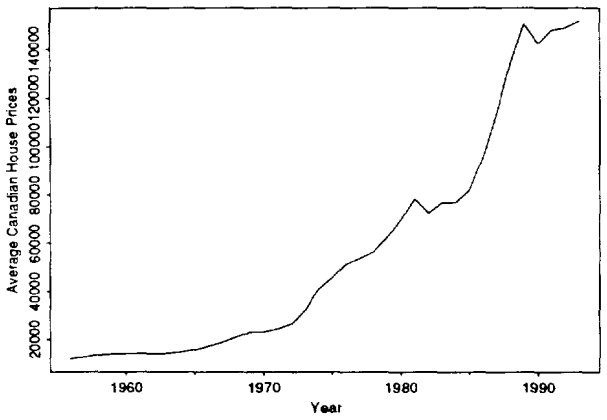

Figure 3: Average Canadian Residential House Prices

The Canadian Mortgage and Housing Corporation records annual residential sales under the Multiple Listing Service for the years 1956 to 1993. Above, Figure 3 plots the average price of homes being resold. House prices have risen over most of the past 30 years. The average annual rate of change is a 7.49% increase per annum. The most recent years are characterized by increased volatility which makes such a series difficult to model. In fact, it appears that the dynamics affecting house prices have changed dramatically. This brings into question the validity of an ARIMA modeling approach. Adjustments to these prices using average house size could be justified. This

is especially true when one considers average house prices in real dollars. Unfortunately, the CMHC records national average house size but does so by decade[10] while the MLS lists average house prices of homes being resold. For such an adjustment to be made, the distribution of homes sold each year by date of construction would be required. Nonetheless, *real house price* can be arrived at by discounting or accumulating for inflation. This is done in the figure below. Real average Canadian house prices are plotted against house prices in 1993 dollars and 1956 dollars. Both altered series follow the same basic pattern. Accounting for inflation simply reduces the overall range of prices.

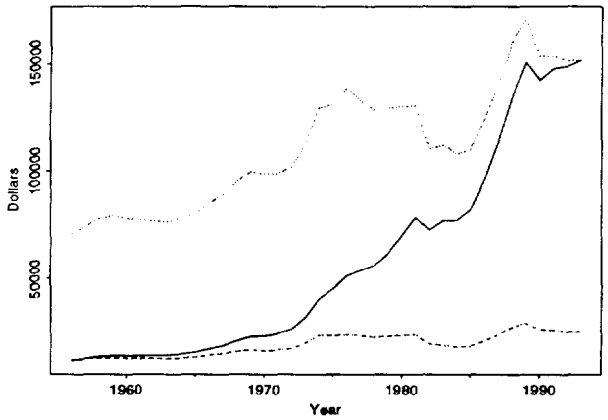

Figure 4: Average Canadian Residential House Prices vs. Real House Prices in 1993 and 1956 Dollars

Consider the unadjusted house price data. Any attempt to model this series using ARIMA time series techniques must first address the non-constant mean. As such, we consider the differenced series. This produces a series with mean sufficiently stable to allow for modeling. Unfortunately, the variance does not appear to satisfy stationarity assumptions. This is due to the increased volatility of the series in the most recent years. The Box-Cox

[10]See Appendix D for average house sizes by decade of construction.

power transformations are well suited to quell variance which increase with the level. These are of the form

$$\Xi(Q_t) = \frac{Q_t^{\lambda} - 1}{\lambda} \tag{4}$$

where $\Xi(Q_t)$ is the transformed series. Unfortunately, the use of such transformations often result in adequate models which produce extremely large confidence limits for future predictions. For example, $\lambda = -\frac{1}{2}$ appears to be an appropriate transform of this series. A first difference of this transformed series, which is the negative inverse of the root of the original series, is depicted in Figure 5. It appears to be sufficiently stable to be modeled. A second difference, it may be argued, produces an even more constant mean but such a transformation eradicates most significant autocorrelations in the data. It produces only one significant autocorrelation and one significant partial autocorrelation, both at lag 4.

Figure 5 also shows the autocorrelation and partial autocorrelation functions corresponding to this transformed series. The former shows significant autocorrelation at lag 1 and an exponential decay thereafter. As the decay is sinusoidal, the resulting parameter estimate of ϕ will be less than 1. The bottommost plot shows no significant partial autocorrelations exist. This, in conjunction with the exponential decay of the autocorrelation function, would suggest an autoregressive moving average model of order 1. This means that, if we denote house prices at time t by Q_t and $\tilde{Q}_t = Q_t - \mu_Q$, then

$$\nabla ln(\tilde{Q}_t) = \phi(\nabla ln(\tilde{Q}_{t-1})) + \epsilon_t \tag{5}$$

where ∇ is the backward shift operator and ϵ_t is a sequence of white noise[11]. This model was supported by the residual diagnostic tests conducted. The resulting residuals appeared to be normally distributed with mean zero and constant variance. They are plotted in the first portion of Figure 6. The second portion of Figure 6 shows that no residual autocorrelation remains unaccounted for with this model and the tests for goodness of fit all supported this model at 5% alpha levels.

The resulting parameter estimate of ϕ was 0.7876383 and it had a variance of 0.01054516. The log-likelihood was minimized at -485.6107. Table 4,

[11]A white noise sequence is characterized by its zero mean and constant variance.

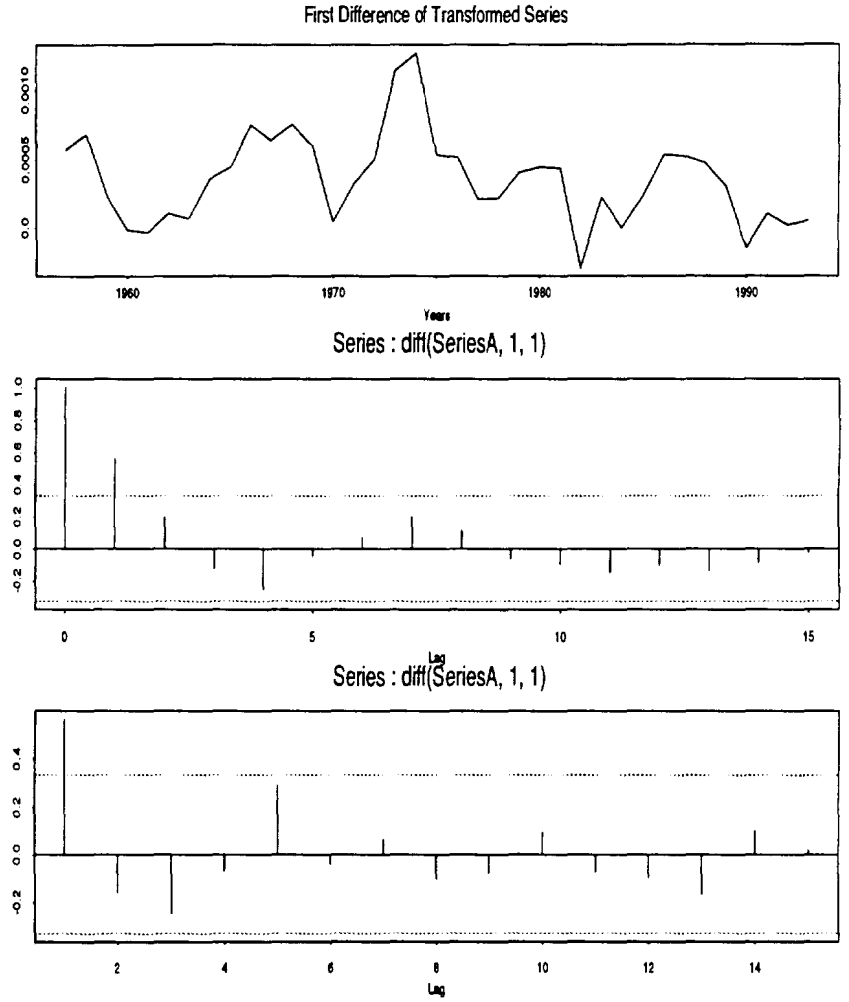

Figure 5: Transformed Series with ACF and PACF

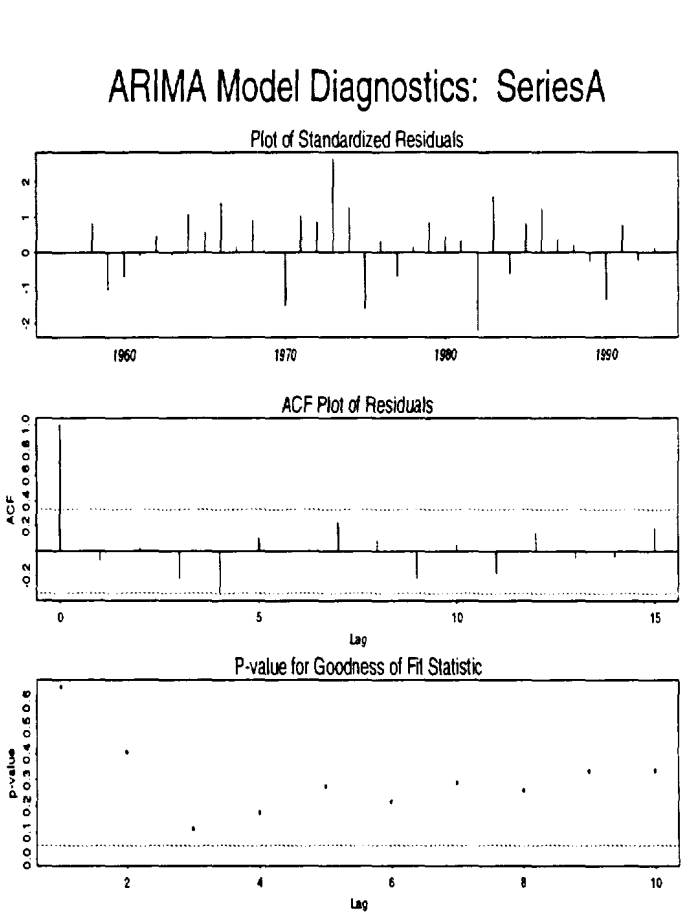

Figure 6: Model Diagnostic Tests

below, contains forecasts generated by this model for a period of ten years with 95% confidence limits. These limits are computed as shown below and are plotted in figure 7.

$$\Xi^{-1}(\mu - 1.96 * \sigma) \leq \Xi^{-1}(\mu) \leq \Xi^{-1}(\mu + 1.96 * \sigma) \tag{6}$$

Note that μ and σ represent the generated forecast and the standard deviation of said forecast respectively. Ξ^{-1} is the inverse of the Box-Cox transformation. For example, if the Box-Cox transformation employed were logarithmic, our confidence interval would be;

$$e^{\mu - 1.96 * \sigma} \leq e^{\mu} \leq e^{\mu + 1.96 * \sigma} \tag{7}$$

Table 4

Forecasts Generated by ARIMA(1,1,0) Model With 95% Confidence Limits

Year	Lower	House Price	Upper
1994	$125,353.50	$154,358.00	$194,730.40
1995	103,953.99	156,259.10	260,855.60
1996	86,503.56	157,781.30	374,080.00
1997	72,855.46	158,995.90	581,892.80
1998	62,264.36	159,962.50	1,014,100.00
1999	53,994.87	160,730.10	2,130,478.00
2000	47,461.36	161,338.50	-
2001	42,227.73	161,820.20	-
2002	37,975.92	162,201.10	-
2003	34,474.50	162,502.10	-

Analysis of this series using the logarithmic transformations is contained in Appendix E.

A first difference of the real Canadian house prices once again suggests the need for a transformation to quell increasing variance. In this case, the logarithmic transformation appears to stabilize the variance. A first difference is taken to arrive at a constant mean. The transformed series, along with its ACF and PACF are presented below in Figure 8.

There are slight, but significant autocorrelations at lag 1 and 4. The partial autocorrelations are insignificant at all lags. An autoregressive model

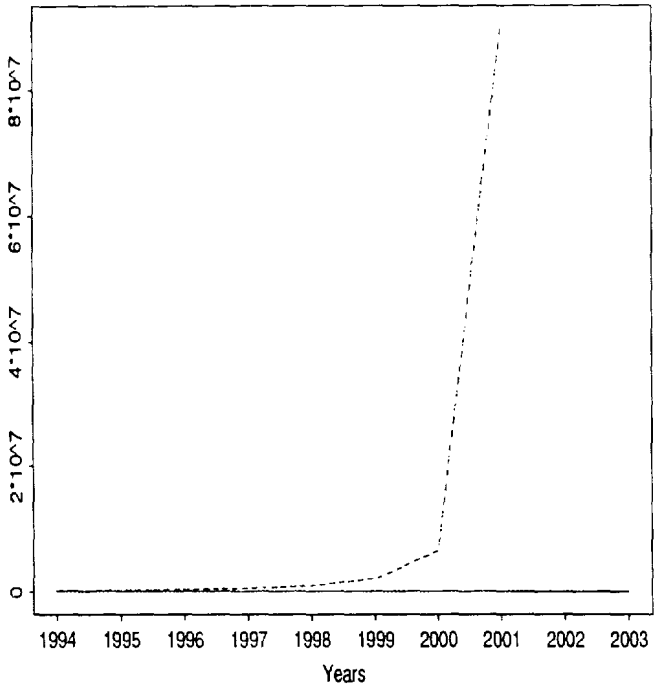

Figure 7: Projections with 95% Confidence Limits

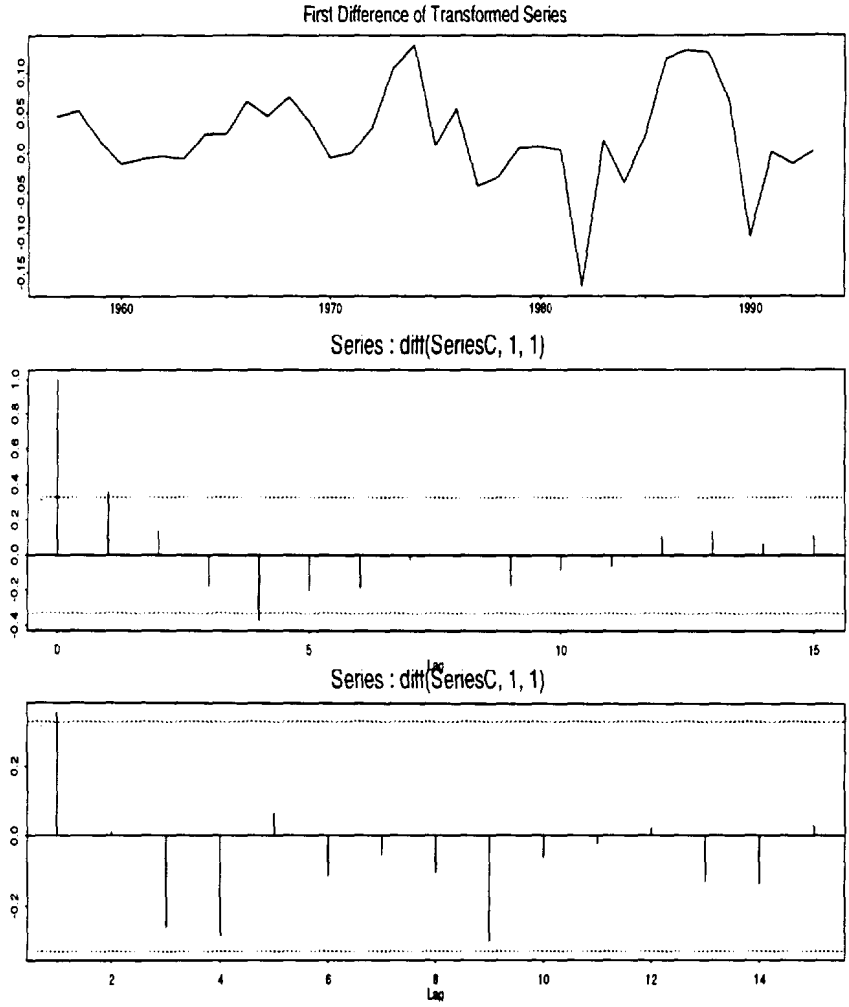

Figure 8: Transformed Series with ACF and PACF

of order 1 produces parameter estimate of $\phi = 0.4210546$ with variance of 0.02285314. It minimizes the log-likelihood at -103.5358. The figure below shows that all residual autocorrelations are accounted for and the goodness of fits tests are all satisfied at the 5% alpha levels.

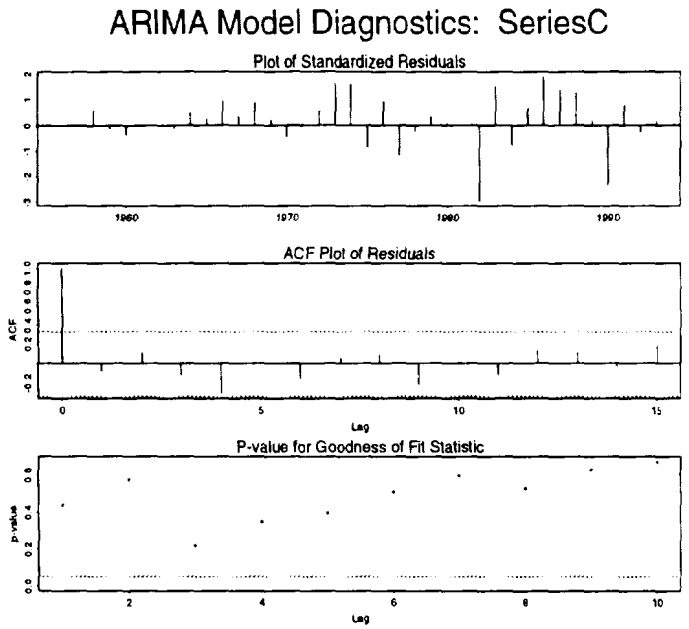

Figure 9: Model Diagnostic Tests

Unfortunately, the resulting residuals appear to be non-normally distributed. These are plotted at the top of Figure 9 and also in Figure 11. They appear to have increasing variance. The predictions for a ten year period are included in Table 5 along with their 95% confidence limits. These are plotted in Figure 10.

Table 5

Forecasts Generated by ARIMA(1,1,0) Model With 95% Confidence Limits

Year	Lower	House Price	Upper
1994	$143,664.10	$152,158.40	$161,155.00
1995	137,766.40	152,227.70	168,207.00
1996	132,946.30	152,256.90	174,372.40
1997	128,950.40	152,269.20	179,804.80
1998	125,558.20	152,274.40	184,675.20
1999	122,610.70	152,276.50	189,120.00
2000	119,998.60	152,277.50	193,239.20
2001	117,646.30	152,277.80	197,103.90
2002	115,500.90	152,278.00	200,765.50
2003	113,524.20	152,278.10	204,261.40

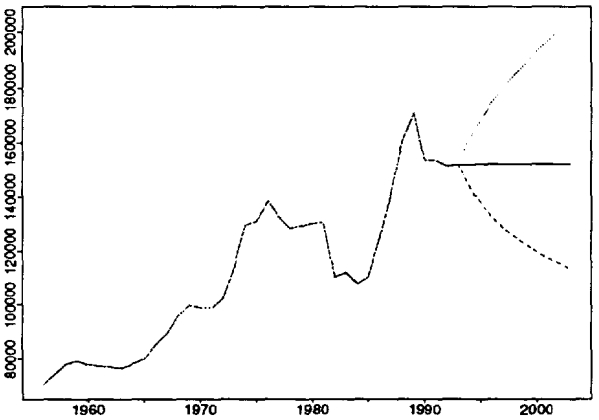

Figure 10: Projections for Ten Year Period

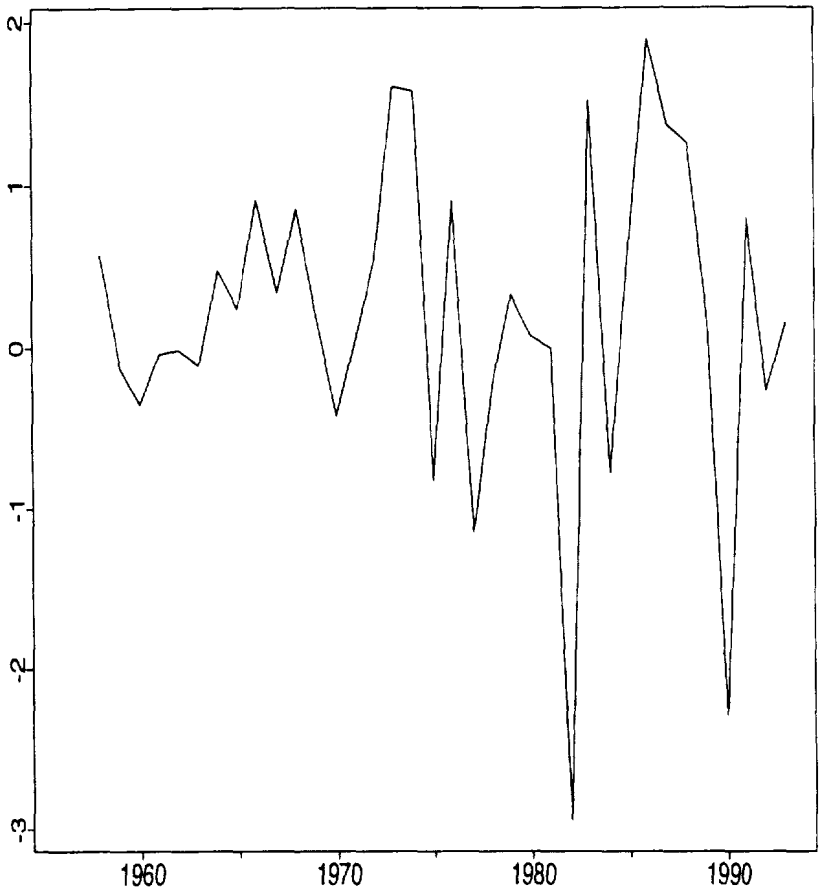

Figure 11: Model Residuals

6. Historic HEC Scenarios

The past experience in both appreciation rates and mortgage lending rates provide a plausible collection of realizable data. It will be of interest to examine the accumulated loan balance vis-a-vis the appreciated home value for hypothetical home equity conversion plans issued at several dates in the past. To make the results of such an examination applicable in the context of present day mortgages, a few adjustments are required. For example, the increased volitility of interest rates which have characterized the most recent period of time have resulted in mortgages which allow for a more dynamic mortgage lending rate. That is to say, a guarantee period of 25 years may have been the norm for a mortgage issued in 1955, whereas a mortgage issued today would most likely offer no more than a five year fixed interest rate with an option to fix a new rate at the end of the five year term. As this is the case, the subsequent analysis assumes that all mortgages were issued at the beginning of the year and offered a fixed rate of interest for five years. At the end of the five years, it is assumed that the homeowner elects to fix the lending rate at the then current market rate for a further five years. This pattern is repeated for the duration of the loan. Homes are assumed to appreciate annually at the average annual rate of appreciation. These rates are listed in Appendix C, while the mortgage lending rates are listed in the Report on Canadian Economic Statistics issued by the Canadian Institute of Actuaries [6].

Each year of issue will result in a different initial mortgage lending rate as well as different rates being assessed at each of the subsequent renewal dates. Appendix F illustrates the progression of hypothetical reverse mortgages issued in 1957, 1960, 1965, 1970 and 1975. In each case, four possible monthly payment amounts are considered. These are; \$300, \$600, \$900 and \$1200. Also, in each case, the reverse mortgage is amortized until 1992 and the residual homeowner's equity is reported on that date. If this amount is negative it indicates that portion of the loan which has become unrecoverable. Note that in certain cases, specifically those cases where the reverse mortgage is issued in 1957 or 1960, the most recently tabulated results would correspond to reverse mortgages being in effect for a period in excess of 30 years.

A table of crossover points is provided below[12]. Most of the issue

[12]A graphical depiction of Table 6 and Table 7 is available in Appendix F and G

dates considered show that with payments of up to $7200 per annum, payable monthly, homes experienced appreciation sufficient so as to maintain a negative unfunded loan balance.

Table 6

Hypothetical Reverse Mortgage Crossover Points With Year of Crossover and Unfunded Loan Balance as of 1992

Year of Issue	$3,600 p.a.	$7,200 p.a.	$10,800 p.a.	$14,400 p.a.
1957	1992 (35) $60,123	1984 (27) $2,093,431	1983 (26) $4,126,739	1980 (23) $6,160,048
1960	- ($684,493)	1991 (31) $296,695	1983 (23) $1,277,884	1973 (13) $2,259,072
1965	- ($937,388)	- ($304,356)	1991 (26) $328,675	1985 (20) $961,707
1970	- ($636,811)	- ($255,934)	1991 (21) $124,943	1986 (16) $505,820
1975	- ($333,106)	- ($131,126)	1991 (16) $70,853	1987 (12) $272,853

It should be noted that the crossover points decrease as the date of issue increases. That is, more recently issued reverse mortgages become unfunded more quickly than those mortgages issued in the late 50's and early 60's. This is attributable to the higher mortgage lending rates as well as the sluggish appreciation rates of the early 1980's. It should be made clear that those combinations of issue date and payment amount which have no crossover date listed are characterized by the fact that their remaining equity never drops below zero. This by no means indicates that such mortgages will not become, in some part, unfunded but rather that they have not done so by 1992. In fact, some mortgages will have an unfunded loan balance which alternates between negative and positive. This suggests that the crossover point is not an ideal measure of the liability faced by the issuer of a reverse mortgage. After the initial crossover point, high appreciation rates can cause the accumulated house value to once again surpass the accumulated loan balance. This can also occur in light of moderate appreciation rates and relatively low interest rates.

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respectively

While the above results indicate that for the majority of cases, the crossover point will occur some twenty years after issue, these results will vary with both payment amount and original house price. Table 7 below illustrates this point for a reverse mortgage issued in 1957. It examines the unfunded loan balance for reverse mortgages on homes with original house prices of $100,000 to $300,000.

Table 7

Hypothetical Reverse Mortgage Crossover Points With Year of Crossover and Unfunded Loan Balance as of 1992

Original House Price	$3,600 p.a.	$7,200 p.a.	$10,800 p.a.	$14,400 p.a.
$100,000	1985 (28) $717,851	1983 (26) $2,751,160	1967 (10) $4,784,468	1964 (7) $6,817,776
$150,000	1992 (35) $60,123	1984 (27) $2,093,431	1983 (26) $4,126,739	1980 (23) $6,160,048
$200,000	- ($597,606)	1986 (29) $1,435,703	1984 (27) $3,469,011	1983 (26) $5,502,319
$250,000	- ($1,255,334)	1986 (29) $777,974	1985 (28) $2,811,282	1984 (27) $4,844,591
$300,000	- ($1,913,308)	1992 (35) $120,246	1985 (28) $2,153,554	1984 (27) $4,186,862

Conclusion

This paper attempts to arrive at a stochastic model for Canadian house prices. It concludes that ARIMA models are unable to deal with the change in volatility of appreciation rates associated with the most recent period in time. More sophisticated modeling techniques are required to fit a model which passes residual diagnostic tests and produces reasonably tight confidence limits for predictions.

An analysis of hypothetical reverse mortgages illustrates the relative stability of crossover points with respect to time. Variation does exist with respect to both original house price and monthly payment amount. Further work is needed to properly establish the proper amount to be loaned given an original house price and home owner age. Nonetheless, it appears that reverse mortgages can indeed be a viable alternative for elderly homeowners in need of a supplement to monthly income.

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Appendix A
Progression of a Reverse Mortgage

The following illustrates the progression of a reverse mortgage for twenty years with monthly payments of $600. The original selling price of the home value is $150,000 and is assumed to appreciate at a rate of 6% per annum. The nominal mortgage lending rate is assumed to be 14% and all figures are reported at year end.

Table A.1

Progression of a Reverse Mortgage

Year	Accumulated Loan Balance (A)	Estimated Selling Price (B)	Unfunded Loan Balance (A)-(B)
0	$0	$150,000.00	$-150,000.00
1	7,753.43	159,000.00	-151,246.57
2	16,630.33	168,540.00	-151,909.66
3	26,793.50	178,652.40	-151,858.90
4	38,429.31	189,372.54	-150,942.24
5	51,751.15	200,733.84	-148,982.69
6	67,003.32	212,777.87	-145,774.55
7	84,465.53	225,544.54	-141,079.01
8	104,458.02	239,077.21	-134,619.20
9	127,347.41	253,421.84	-126,074.43
10	153,553.48	268,627.15	-115,073.67
11	183,556.82	284,744.78	-101,187.97
12	217,907.63	301,829.47	-83,921.84
13	257,235.87	319,939.24	-62,703.36
14	302,262.78	339,135.60	-36,872.81
15	353,814.09	359,483.72	-5,669.64
16	412,835.18	381,052.75	31,782.43
17	480,408.43	403,915.92	76,492.52
18	557,773.43	428,150.87	129,622.17
19	646,347.79	453,839.93	192,507.87
20	747,757.02	481,070.32	266,686.70

Appendix B
Crossover Point Analysis Vis-a-Vis Different Appreciation Rates

The tables below list the first year in which the accumulated loan value exceeds the estimated selling price. As all mortgages are assumed to terminate at year end, the actual turnover point may proceed the turnover point recorded below by a period of time not exceeding twelve months. Note that there is no provision made to provide for costs of disposition.

Appreciation rates are effective annual rates whereas mortgage lending rates are quoted on a semiannual basis. The former are listed across the top of the following tables while the latter are listed along the right of each table.

Table B.1

Crossover Points for a Reverse Mortgage

providing $300 a month

	3%	6%	9%	12%
6%	35	-	-	-
10%	23	37	-	-
14%	18	23	36	-
20%	14	16	20	27

Table B.2

Crossover Points for a Reverse Mortgage

providing $600 a month

	3%	6%	9%	12%
6%	20	-	-	-
10%	15	22	-	-
14%	12	16	23	-
20%	10	12	14	19

Table B.3

Crossover Points for a Reverse Mortgage

providing $900 a month

	3%	6%	9%	12%
6%	14	28	-	-
10%	11	15	31	-
14%	10	12	16	-
20%	8	9	11	14

Table B.4

Crossover Points for a Reverse Mortgage

providing $1200 a month

	3%	6%	9%	12%
6%	11	16	-	-
10%	9	11	18	-
14%	8	9	12	19
20%	7	8	9	11

Appendix C
House Price Data

Data concerning national average house prices from 1956 to 1993 was provided by the Canadian Mortgage and Housing Center (CMHC). Consumer price index figures are taken from the Canadian Institute of Actuaries *Report on Canadian Economic Statistics 1924-1993*, May 1994 release.

Table C.1
National Average House Prices, Annual Appreciation, Running Averages and CPI from 1956 to 1993

Year	Average Price (Cdn $)	Appreciation (%)	Avg. Appreciation to Date (%)	CPI (%)
1956	$11,993			3.24
1957	12,781	6.6	7.49	1.79
1958	13,823	8.1	7.51	2.64
1959	14,208	2.8	7.50	1.29
1960	14,186	-0.2	7.64	1.27
1961	14,127	-0.4	7.88	0.42
1962	14,303	1.3	8.13	1.67
1963	14,420	0.8	8.35	1.64
1964	15,064	4.5	8.61	2.02
1965	15,917	5.7	8.75	3.16
1966	17,536	10.2	8.86	3.45
1967	19,111	9.0	8.81	4.07
1968	21,272	11.3	8.80	3.91
1969	23,234	9.2	8.70	4.79
1970	23,376	8.2	8.68	1.31
1971	24,581	5.2	8.70	5.16
1972	26,595	8.2	8.86	4.91
1973	32,306	21.5	8.89	9.36
1974	41,057	27.1	8.26	12.30
1975	45,878	11.7	7.27	9.52
1976	51,359	11.9	7.02	5.87
1977	53,888	4.9	6.74	9.45
1978	56,637	5.1	6.85	8.44
1979	62,485	10.3	6.97	9.69
1980	69,968	12.0	6.73	11.20
1981	78,731	12.5	6.32	12.20
1982	72,718	-7.6	5.80	9.23
1983	77,228	6.2	7.03	4.51
1984	77,187	-0.1	7.11	3.77
1985	82,280	6.6	7.91	4.38
1986	96,440	17.2	8.08	4.19
1987	114,125	18.3	6.77	4.12
1988	134,586	17.9	4.85	3.96
1989	150,777	12.0	2.24	5.17
1990	142,509	-5.5	-0.20	5.00
1991	148,097	3.9	1.57	3.78
1992	149,070	0.7	0.40	2.14
1993	151,994	0.1	0.10	1.70

Table C.2
Average Canadian House Price in Real Terms

Year	Average Price (Cdn $)	CPI (%)	Accumulated CPI	Real House Prices (1993$)	Discounted CPI	Real House Prices (1956$)
1956	$11,993	3.24	5.888410	$70,619.71	1.000000	$11,993.00
1957	12,781	1.79	5.784861	73,936.31	0.968617	12,379.89
1958	13,823	2.64	5.636069	77,907.38	0.951583	13,153.74
1959	14,208	2.8	5.564290	79,057.43	0.927108	13,172.35
1960	14,186	-0.2	5.494510	77,945.11	0.915300	12,984.45
1961	14,127	-0.4	5.471529	77,296.29	0.903822	12,768.29
1962	14,303	1.3	5.381655	76,973.82	0.900042	12,873.30
1963	14,420	0.8	5.294820	76,351.31	0.885258	12,765.42
1964	15,064	4.5	5.189983	78,181.90	0.870974	13,120.35
1965	15,917	5.7	5.031003	80,078.48	0.853719	13,588.80
1966	17,536	10.2	4.863222	85,281.46	0.827577	14,512.39
1967	19,111	9.0	4.673030	89,306.27	0.799978	15,288.38
1968	21,272	11.3	4.497189	95,664.21	0.768692	16,351.62
1969	23,234	9.2	4.291621	99,711.52	0.739767	17,187.75
1970	23,376	8.2	4.236128	99,023.72	0.705953	16,502.34
1971	24,581	5.2	4.028269	99,018.88	0.696824	17,128.63
1972	26,595	8.2	3.839738	102,117.80	0.662632	17,622.70
1973	32,306	21.5	3.511099	113,429.60	0.631619	20,405.10
1974	41,057	27.1	3.126535	129,773.10	0.577560	23,972.78
1975	45,878	11.7	2.854762	130,970.80	0.514301	23,595.09
1976	51,359	11.9	2.696478	138,488.40	0.469595	24,117.95
1977	53,888	4.9	2.463662	132,761.80	0.443558	23,902.48
1978	56,637	5.1	2.271913	128,674.30	0.405261	22,952.78
1979	62,485	10.3	2.071212	129,419.70	0.373719	23,351.86
1980	69,968	12.0	1.862601	130,322.50	0.340705	23,838.45
1981	78,731	12.5	1.660072	130,699.20	0.306389	24,122.35
1982	72,718	-7.6	1.519795	110,516.50	0.273074	19,857.42
1983	77,228	6.2	1.454210	112,305.80	0.249999	19,306.96
1984	77,187	-0.1	1.401378	108,168.20	0.239211	18,463.98
1985	82,280	6.6	1.342574	110,467.00	0.230520	18,967.22
1986	96,440	17.2	1.288582	124,270.90	0.220847	21,298.51
1987	114,125	18.3	1.237593	141,240.30	0.211966	24,190.61
1988	134,586	17.9	1.190451	160,218.10	0.203578	27,398.81
1989	150,777	12.0	1.131931	170,669.10	0.195824	29,525.73
1990	142,509	-5.5	1.078029	153,628.80	0.186197	26,534.81
1991	148,097	3.9	1.038764	153,837.80	0.177331	26,262.17
1992	149,070	0.7	1.017000	151,604.20	0.170872	25,471.88
1993	151,994	0.1	1.000000	151,994.00	0.167292	25,427.36

Appendix D
Housing Statistics

Included in the CMHC's review of the Canadian housing industry from 1943 to 1993 [7] are housing statistics. These statistics are provided on a decennial basis and are based on a typical mid-decade house. The CMHC reports housing starts, average house size, average selling price and various measures of construction costs and man hours required. It is recognized that these statistics are not definitive.

Table D.1

Average House Size by Decade of Construction

Decade	m^2	ft^2
1940's	75	800
1950's	100	1100
1960's	110	1100
1970's	100	1070
1980's	114	1230

Appendix E
Analysis of House Prices Using Logarithmic Transformation

The figure below depicts the transformed house price series along with it's ACF and PACF. The series was differenced once to stabilize the mean. Once again, a first order autoregressive model, ARIMA(1,1,0), appears to be appropriate. The fitting of this model resulted in an estimate of ϕ of 0.7354947. This parameter had a variance of 0.01275132. The log-likelihood was minimized at -95.13072.

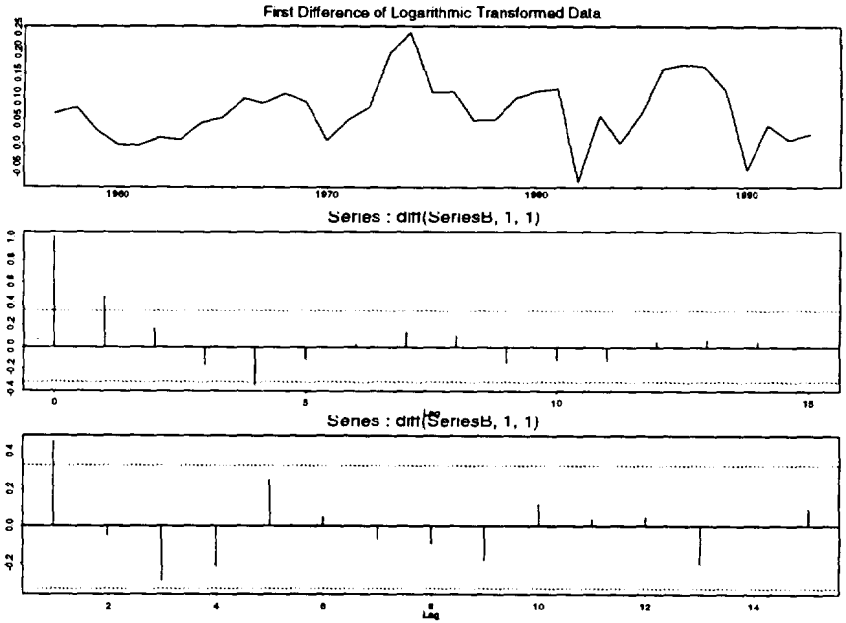


Figure 12: Transformed Series with ACF and PACF

Once again, the residual diagnostic tests show no remaining autocorrelations and the goodness of fit test suggests an adequate fit at all lags at a 5% alpha level. It is questionable whether or not the residuals are normally distributed with mean zero and constant variance. These are plotted separately in Figure 14.

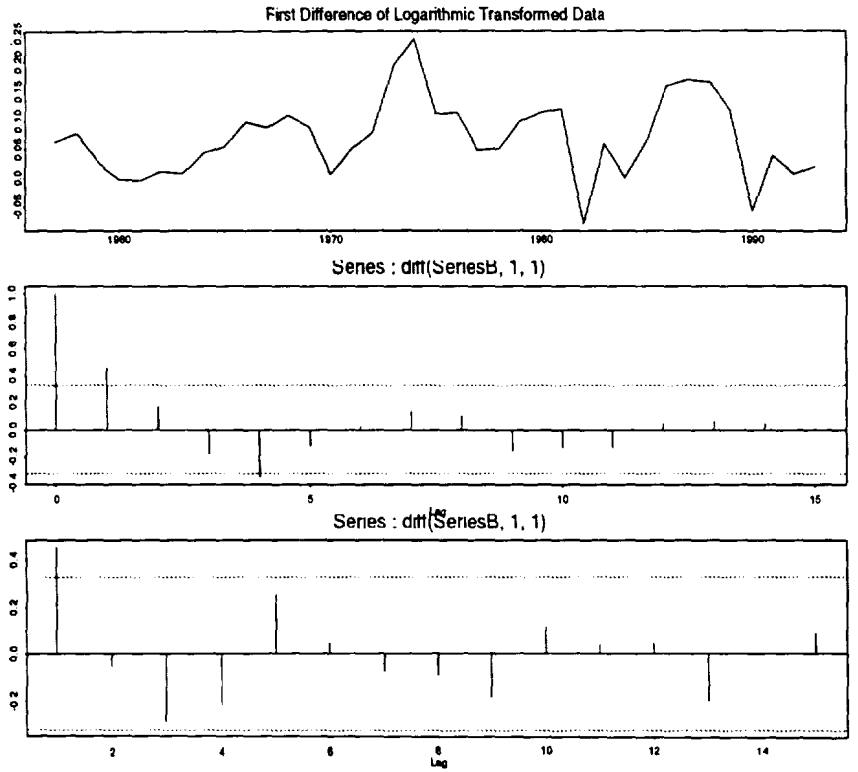


Figure 13: Residual Diagnostic Tests

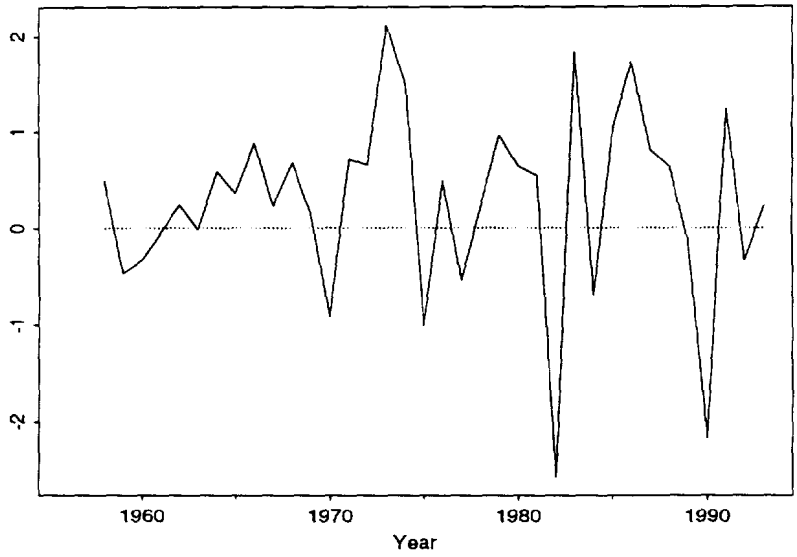


Figure 14: Plot of Model Residuals

The forecasts generated by this model are listed below. While this model produces much tighter confidence limits, it must be recognized that it arguably does not satisfy model assumptions.

Table E.1

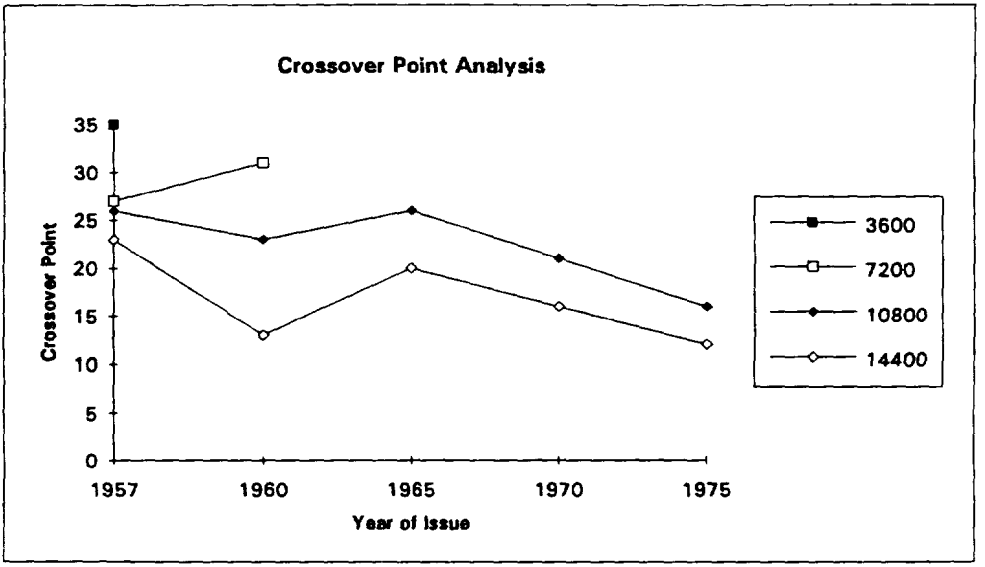
Forecasts Generated by ARIMA(1,1,0) Model

With 95% Confidence Limits

Year	Lower	House Price	Upper
1994	$135,855.97	$154,181.10	$174,978.10
1995	120,927.73	155,809.80	200,753.80
1996	106,985.56	157,018.70	230,450.40
1997	94,677.18	157,913.80	263,387.20
1998	84,072.98	158,575.30	299,099.00
1999	75,022.71	159,063.70	337,248.00
2000	67,312.25	159,423.90	377,583.10
2001	60,727.74	159,689.30	419,917.80
2002	55,079.02	159,884.80	464,117.50
2003	50,205.39	160,028.70	510,088.30

Appendix F
Progression of Hypothetical Reverse Mortgages With Various Issue Dates and Payment Amounts

The tables included in this appendix illustrate the progression of reverse mortgages had they been issued at the listed date. Both appreciation rates and mortgage lending rates correspond to those experienced from 1957 to 1992. Note that the listed mortgage lending rate, column 4 in the tables, is the semi-annual nominal interest rate which is fixed for a period of five years. The annuity factors are computed on a monthly basis and do not account for mortality. The annual amount of income derived from the reverse mortgage is listed in column 6, row 3 of each table. This amount is payable annually. The last column of each table lists the remaining equity. The first year it drops below zero coincides with the crossover point. In each case, the original house price is $150,000. These tables are graphically depicted in the Figure entitled *Crossover Point Analysis.*


Crossover Point Analysis
35
30
25
20
15
10
5
0
Crossover Point
1957
1960
1965
1970
1975
Year of Issue
3600
7200
10800
14400

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1957	0.066	$150,000	0.0323	0.000000000	$0	$150,000
1958	0.081	$159,900		1.014837201	$3,653	$156,247
1959	0.028	$172,852		2.062717950	$7,426	$165,426
1960	-0.002	$177,692		3.144718160	$11,321	$166,371
1961	-0.004	$177,336		4.261948777	$15,343	$161,993
1962	0.013	$176,627	0.0712	5.415556916	$19,496	$157,131
1963	0.008	$178,923		6.840803462	$24,627	$154,296
1964	0.045	$180,355		8.369334044	$30,130	$150,225
1965	0.057	$188,471		10.008634000	$36,031	$152,439
1966	0.102	$199,213		11.766728663	$42,360	$156,853
1967	0.090	$219,533	0.0221	13.652228674	$49,148	$170,385
1968	0.113	$239,291		14.965746986	$53,877	$185,414
1969	0.092	$266,331		16.308453728	$58,710	$207,621
1970	0.082	$290,833		17.680997510	$63,652	$227,182
1971	0.052	$314,682		19.084041359	$68,703	$245,979
1972	0.082	$331,045	0.0892	20.518263034	$73,866	$257,179
1973	0.215	$358,191		23.430429910	$84,350	$273,841
1974	0.271	$435,202		26.608153051	$95,789	$339,413
1975	0.117	$553,142		30.075648147	$108,272	$444,869
1976	0.119	$617,859		33.859339081	$121,894	$495,966
1977	0.049	$691,385	0.1462	37.988059293	$136,757	$554,628
1978	0.051	$725,262		44.812588343	$161,325	$563,937
1979	0.103	$762,251		52.671329899	$189,617	$572,634
1980	0.120	$840,763		61.721012069	$222,196	$618,567
1981	0.125	$941,654		72.142114070	$259,712	$681,942
1982	-0.076	$1,059,361	0.2915	84.142465563	$302,913	$756,448
1983	0.062	$978,849		111.593689689	$401,737	$577,112
1984	-0.001	$1,039,538		147.630075909	$531,468	$508,070
1985	0.066	$1,038,499		194.936568539	$701,772	$336,727
1986	0.172	$1,107,039		257.037807862	$925,336	$181,703
1987	0.173	$1,297,450	0.1026	338.560738668	$1,218,819	$78,632
1988	0.179	$1,521,909		375.235538530	$1,350,848	$171,061
1989	0.120	$1,794,331		425.722565907	$1,532,601	$261,730
1990	-0.055	$2,009,651		460.569359886	$1,658,050	$351,601
1991	0.039	$1,899,120		510.083376754	$1,836,300	$62,820
1992	0.007	$1,973,185	0.1125	564.807854991	$2,033,308	-$60,123

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1957	0.066	$150,000	0.0323	0.000000000	$0	$150,000
1958	0.081	$159,900		1.014837201	$7,307	$152,593
1959	0.028	$172,852		2.062717950	$14,852	$158,000
1960	-0.002	$177,692		3.144718160	$22,642	$155,050
1961	-0.004	$177,336		4.261948777	$30,686	$146,650
1962	0.013	$176,627	0.0712	5.415556916	$38,992	$137,635
1963	0.008	$178,923		6.840803462	$49,254	$129,669
1964	0.045	$180,355		8.369334044	$60,259	$120,095
1965	0.057	$188,471		10.008634000	$72,062	$116,408
1966	0.102	$199,213		11.766728663	$84,720	$114,493
1967	0.090	$219,533	0.0221	13.652228674	$98,296	$121,237
1968	0.113	$239,291		14.965746986	$107,753	$131,538
1969	0.092	$266,331		16.308453728	$117,421	$148,910
1970	0.082	$290,833		17.680997510	$127,303	$163,530
1971	0.052	$314,682		19.084041359	$137,405	$177,277
1972	0.082	$331,045	0.0892	20.518263034	$147,731	$183,314
1973	0.215	$358,191		23.430429910	$168,699	$189,492
1974	0.271	$435,202		26.608153051	$191,579	$243,623
1975	0.117	$553,142		30.075648147	$216,545	$336,597
1976	0.119	$617,859		33.859339081	$243,787	$374,072
1977	0.049	$691,385	0.1462	37.988059293	$273,514	$417,870
1978	0.051	$725,262		44.812588343	$322,651	$402,612
1979	0.103	$762,251		52.671329899	$379,234	$383,017
1980	0.120	$840,763		61.721012069	$444,391	$396,371
1981	0.125	$941,654		72.142114070	$519,423	$422,231
1982	-0.076	$1,059,361	0.2915	84.142465563	$605,826	$453,535
1983	0.062	$978,849		111.593689689	$803,475	$175,375
1984	-0.001	$1,039,538		147.630075909	$1,062,937	-$23,398
1985	0.066	$1,038,499		194.936568539	$1,403,543	-$365,045
1986	0.172	$1,107,039		257.037807862	$1,850,672	-$743,633
1987	0.173	$1,297,450	0.1026	338.560738668	$2,437,637	-$1,140,187
1988	0.179	$1,521,909		375.235538530	$2,701,696	-$1,179,787
1989	0.120	$1,794,331		425.722565907	$3,065,202	-$1,270,872
1990	-0.055	$2,009,651		460.569359886	$3,316,099	-$1,306,449
1991	0.039	$1,899,120		510.083376754	$3,672,600	-$1,773,481
1992	0.007	$1,973,185	0.1125	564.807854991	$4,066,617	-$2,093,431

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1957	0.066	$150,000	0.0323	0.000000000	$0	$150,000
1958	0.081	$159,900		1.014837201	$10,960	$148,940
1959	0.028	$172,852		2.062717950	$22,277	$150,575
1960	-0.002	$177,692		3.144718160	$33,963	$143,729
1961	-0.004	$177,336		4.261948777	$46,029	$131,307
1962	0.013	$176,627	0.0712	5.415556916	$58,488	$118,139
1963	0.008	$178,923		6.840803462	$73,881	$105,042
1964	0.045	$180,355		8.369334044	$90,389	$89,966
1965	0.057	$188,471		10.008634000	$108,093	$80,377
1966	0.102	$199,213		11.766728663	$127,081	$72,133
1967	0.090	$219,533	0.0221	13.652228674	$147,444	$72,089
1968	0.113	$239,291		14.965746986	$161,630	$77,661
1969	0.092	$266,331		16.308453728	$176,131	$90,200
1970	0.082	$290,833		17.680997510	$190,955	$99,879
1971	0.052	$314,682		19.084041359	$206,108	$108,574
1972	0.082	$331,045	0.0892	20.518263034	$221,597	$109,448
1973	0.215	$358,191		23.430429910	$253,049	$105,142
1974	0.271	$435,202		26.608153051	$287,368	$147,834
1975	0.117	$553,142		30.075648147	$324,817	$228,325
1976	0.119	$617,859		33.859339081	$365,681	$252,178
1977	0.049	$691,385	0.1462	37.988059293	$410,271	$281,113
1978	0.051	$725,262		44.812588343	$483,976	$241,286
1979	0.103	$762,251		52.671329899	$568,850	$193,400
1980	0.120	$840,763		61.721012069	$666,587	$174,176
1981	0.125	$941,654		72.142114070	$779,135	$162,519
1982	-0.076	$1,059,361	0.2915	84.142465563	$908,739	$150,622
1983	0.062	$978,849		111.593689689	$1,205,212	-$226,362
1984	-0.001	$1,039,538		147.630075909	$1,594,405	-$554,867
1985	0.066	$1,038,499		194.936568539	$2,105,315	-$1,066,816
1986	0.172	$1,107,039		257.037807862	$2,776,008	-$1,668,969
1987	0.173	$1,297,450	0.1026	338.560738668	$3,656,456	-$2,359,006
1988	0.179	$1,521,909		375.235538530	$4,052,544	-$2,530,635
1989	0.120	$1,794,331		425.722565907	$4,597,804	-$2,803,473
1990	-0.055	$2,009,651		460.569359886	$4,974,149	-$2,964,499
1991	0.039	$1,899,120		510.083376754	$5,508,900	-$3,609,781
1992	0.007	$1,973,185	0.1125	564.807854991	$6,099,925	-$4,126,739

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1957	0.066	$150,000	0.0323	0.000000000	$0	$150,000
1958	0.081	$159,900		1.014837201	$14,614	$145,286
1959	0.028	$172,852		2.062717950	$29,703	$143,149
1960	-0.002	$177,692		3.144718160	$45,284	$132,408
1961	-0.004	$177,336		4.261948777	$61,372	$115,964
1962	0.013	$176,627	0.0712	5.415556916	$77,984	$98,643
1963	0.008	$178,923		6.840803462	$98,508	$80,416
1964	0.045	$180,355		8.369334044	$120,518	$59,836
1965	0.057	$188,471		10.008634000	$144,124	$44,346
1966	0.102	$199,213		11.766728663	$169,441	$29,772
1967	0.090	$219,533	0.0221	13.652228674	$196,592	$22,941
1968	0.113	$239,291		14.965746986	$215,507	$23,784
1969	0.092	$266,331		16.308453728	$234,842	$31,489
1970	0.082	$290,833		17.680997510	$254,606	$36,227
1971	0.052	$314,682		19.084041359	$274,810	$39,872
1972	0.082	$331,045	0.0892	20.518263034	$295,463	$35,582
1973	0.215	$358,191		23.430429910	$337,398	$20,793
1974	0.271	$435,202		26.608153051	$383,157	$52,045
1975	0.117	$553,142		30.075648147	$433,089	$120,052
1976	0.119	$617,859		33.859339081	$487,574	$130,285
1977	0.049	$691,385	0.1462	37.988059293	$547,028	$144,356
1978	0.051	$725,262		44.812588343	$645,301	$79,961
1979	0.103	$762,251		52.671329899	$758,467	$3,784
1980	0.120	$840,763		61.721012069	$888,783	-$48,020
1981	0.125	$941,654		72.142114070	$1,038,846	-$97,192
1982	-0.076	$1,059,361	0.2915	84.142465563	$1,211,652	-$152,291
1983	0.062	$978,849		111.593689689	$1,606,949	-$628,100
1984	-0.001	$1,039,538		147.630075909	$2,125,873	-$1,086,335
1985	0.066	$1,038,499		194.936568539	$2,807,087	-$1,768,588
1986	0.172	$1,107,039		257.037807862	$3,701,344	-$2,594,305
1987	0.173	$1,297,450	0.1026	338.560738668	$4,875,275	-$3,577,824
1988	0.179	$1,521,909		375.235538530	$5,403,392	-$3,881,483
1989	0.120	$1,794,331		425.722565907	$6,130,405	-$4,336,074
1990	-0.055	$2,009,651		460.569359886	$6,632,199	-$4,622,548
1991	0.039	$1,899,120		510.083376754	$7,345,201	-$5,446,081
1992	0.007	$1,973,185	0.1125	564.807854991	$8,133,233	-$6,160,048

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1960	-0.002	$150,000	0.1032	0	$0	$150,000
1961	-0.004	$149,700		1.047638799	$3,771	$145,929
1962	0.013	$149,101		2.206182971	$7,942	$141,159
1963	0.008	$151,040		3.487373207	$12,555	$138,485
1964	0.045	$152,248		4.904193091	$17,655	$134,593
1965	0.057	$159,099	0.0259	6.471000679	$23,296	$135,803
1966	0.102	$168,168		7.6515788	$27,546	$140,622
1967	0.09	$185,321		8.86293219	$31,907	$153,414
1968	0.113	$202,000		10.1058631	$36,381	$165,618
1969	0.092	$224,826		11.38119468	$40,972	$183,853
1970	0.082	$245,509	0.1187	12.68977157	$45,683	$199,826
1971	0.052	$265,641		15.29560415	$55,064	$210,577
1972	0.082	$279,455		18.21992897	$65,592	$213,863
1973	0.215	$302,370		21.50167306	$77,406	$224,964
1974	0.271	$367,379		33.81509137	$121,734	$245,645
1975	0.117	$466,939	0.122	29.31749749	$105,543	$361,396
1976	0.119	$521,571		34.05971336	$122,615	$398,956
1977	0.049	$583,638		39.39812542	$141,833	$441,805
1978	0.051	$612,236		45.40768806	$163,468	$448,769
1979	0.103	$643,460		52.17277901	$187,822	$455,638
1980	0.12	$709,737	0.081	59.78838406	$215,238	$494,499
1981	0.125	$794,905		65.76661807	$236,760	$558,145
1982	-0.076	$894,268		72.23889217	$260,060	$634,208
1983	0.062	$826,304		79.24603374	$285,286	$541,018
1984	-0.001	$877,535		86.83224413	$312,596	$564,939
1985	0.066	$876,657	0.1672	95.04537746	$342,163	$534,494
1986	0.172	$934,517		112.6787499	$405,643	$528,873
1987	0.173	$1,095,254		133.38366	$480,181	$615,072
1988	0.179	$1,284,732		157.6951356	$567,702	$717,030
1989	0.12	$1,514,700		186.2414004	$670,469	$844,231
1990	-0.055	$1,696,464	0.1063	219.7601075	$791,136	$905,327
1991	0.039	$1,603,158		244.790494	$881,246	$721,912
1992	0.007	$1,665,681		272.5523197	$981,188	$684,493

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1960	-0.002	$150,000	0.1032	0	$0	$150,000
1961	-0.004	$149,700		1.047638799	$7,543	$142,157
1962	0.013	$149,101		2.206182971	$15,885	$133,217
1963	0.008	$151,040		3.487373207	$25,109	$125,930
1964	0.045	$152,248		4.904193091	$35,310	$116,938
1965	0.057	$159,099	0.0259	6.471000679	$46,591	$112,508
1966	0.102	$168,168		7.6515788	$55,091	$113,076
1967	0.09	$185,321		8.86293219	$63,813	$121,508
1968	0.113	$202,000		10.1058631	$72,762	$129,237
1969	0.092	$224,826		11.38119468	$81,945	$142,881
1970	0.082	$245,509	0.1187	12.68977157	$91,366	$154,143
1971	0.052	$265,641		15.29560415	$110,128	$155,513
1972	0.082	$279,455		18.21992897	$131,183	$148,271
1973	0.215	$302,370		21.50167306	$154,812	$147,558
1974	0.271	$367,379		33.81509137	$243,469	$123,911
1975	0.117	$466,939	0.122	29.31749749	$211,086	$255,853
1976	0.119	$521,571		34.05971336	$245,230	$276,341
1977	0.049	$583,638		39.39812542	$283,667	$299,972
1978	0.051	$612,236		45.40768806	$326,935	$285,301
1979	0.103	$643,460		52.17277901	$375,644	$267,816
1980	0.12	$709,737	0.081	59.78838406	$430,476	$279,260
1981	0.125	$794,905		65.76661807	$473,520	$321,386
1982	-0.076	$894,268		72.23889217	$520,120	$374,148
1983	0.062	$826,304		79.24603374	$570,571	$255,733
1984	-0.001	$877,535		86.83224413	$625,192	$252,343
1985	0.066	$876,657	0.1672	95.04537746	$684,327	$192,331
1986	0.172	$934,517		112.6787499	$811,287	$123,230
1987	0.173	$1,095,254		133.38366	$960,362	$134,891
1988	0.179	$1,284,732		157.6951356	$1,135,405	$149,328
1989	0.12	$1,514,700		186.2414004	$1,340,938	$173,762
1990	-0.055	$1,696,464	0.1063	219.7601075	$1,582,273	$114,191
1991	0.039	$1,603,158		244.790494	$1,762,492	-$159,334
1992	0.007	$1,665,681		272.5523197	$1,962,377	-$296,695

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1960	-0.002	$150,000	0.1032	0	$0	$150,000
1961	-0.004	$149,700		1.047638799	$11,314	$138,386
1962	0.013	$149,101		2.206182971	$23,827	$125,274
1963	0.008	$151,040		3.487373207	$37,664	$113,376
1964	0.045	$152,248		4.904193091	$52,965	$99,283
1965	0.057	$159,099	0.0259	6.471000679	$69,887	$89,212
1966	0.102	$168,168		7.6515788	$82,637	$85,531
1967	0.09	$185,321		8.86293219	$95,720	$89,601
1968	0.113	$202,000		10.1058631	$109,143	$92,856
1969	0.092	$224,826		11.38119468	$122,917	$101,909
1970	0.082	$245,509	0.1187	12.68977157	$137,050	$108,460
1971	0.052	$265,641		15.29560415	$165,193	$100,449
1972	0.082	$279,455		18.21992897	$196,775	$82,679
1973	0.215	$302,370		21.50167306	$232,218	$70,152
1974	0.271	$367,379		33.81509137	$365,203	$2,176
1975	0.117	$466,939	0.122	29.31749749	$316,629	$150,310
1976	0.119	$521,571		34.05971336	$367,845	$153,726
1977	0.049	$583,638		39.39812542	$425,500	$158,138
1978	0.051	$612,236		45.40768806	$490,403	$121,833
1979	0.103	$643,460		52.17277901	$563,466	$79,994
1980	0.12	$709,737	0.081	59.78838406	$645,715	$64,022
1981	0.125	$794,905		65.76661807	$710,279	$84,626
1982	-0.076	$894,268		72.23889217	$780,180	$114,088
1983	0.062	$826,304		79.24603374	$855,857	-$29,553
1984	-0.001	$877,535		86.83224413	$937,788	-$60,253
1985	0.066	$876,657	0.1672	95.04537746	$1,026,490	-$149,833
1986	0.172	$934,517		112.6787499	$1,216,930	-$282,414
1987	0.173	$1,095,254		133.38366	$1,440,544	-$345,290
1988	0.179	$1,284,732		157.6951356	$1,703,107	-$418,375
1989	0.12	$1,514,700		186.2414004	$2,011,407	-$496,708
1990	-0.055	$1,696,464	0.1063	219.7601075	$2,373,409	-$676,946
1991	0.039	$1,603,158		244.790494	$2,643,737	-$1,040,579
1992	0.007	$1,665,681		272.5523197	$2,943,565	-$1,277,884

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1960	-0.002	$150,000	0.1032	0	$0	$150,000
1961	-0.004	$149,700		1.047638799	$15,086	$134,614
1962	0.013	$149,101		2.206182971	$31,769	$117,332
1963	0.008	$151,040		3.487373207	$50,218	$100,821
1964	0.045	$152,248		4.904193091	$70,620	$81,627
1965	0.057	$159,099	0.0259	6.471000679	$93,182	$65,917
1966	0.102	$168,168		7.6515788	$110,183	$57,985
1967	0.09	$185,321		8.86293219	$127,626	$57,695
1968	0.113	$202,000		10.1058631	$145,524	$56,475
1969	0.092	$224,826		11.38119468	$163,889	$60,936
1970	0.082	$245,509	0.1187	12.68977157	$182,733	$62,777
1971	0.052	$265,641		15.29560415	$220,257	$45,385
1972	0.082	$279,455		18.21992897	$262,367	$17,088
1973	0.215	$302,370		21.50167306	$309,624	-$7,254
1974	0.271	$367,379		33.81509137	$486,937	-$119,558
1975	0.117	$466,939	0.122	29.31749749	$422,172	$44,767
1976	0.119	$521,571		34.05971336	$490,460	$31,111
1977	0.049	$583,638		39.39812542	$567,333	$16,305
1978	0.051	$612,236		45.40768806	$653,871	-$41,634
1979	0.103	$643,460		52.17277901	$751,288	-$107,828
1980	0.12	$709,737	0.081	59.78838406	$860,953	-$151,216
1981	0.125	$794,905		65.76661807	$947,039	-$152,134
1982	-0.076	$894,268		72.23889217	$1,040,240	-$145,972
1983	0.062	$826,304		79.24603374	$1,141,143	-$314,839
1984	-0.001	$877,535		86.83224413	$1,250,384	-$372,849
1985	0.066	$876,657	0.1672	95.04537746	$1,368,653	-$491,996
1986	0.172	$934,517		112.6787499	$1,622,574	-$688,057
1987	0.173	$1,095,254		133.38366	$1,920,725	-$825,471
1988	0.179	$1,284,732		157.6951356	$2,270,810	-$986,077
1989	0.12	$1,514,700		186.2414004	$2,681,876	-$1,167,177
1990	-0.055	$1,696,464	0.1063	219.7601075	$3,164,546	-$1,468,082
1991	0.039	$1,603,158		244.790494	$3,524,983	-$1,921,825
1992	0.007	$1,665,681		272.5523197	$3,924,753	-$2,259,072

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1965	0.057	$150,000	0.0259	0	$0	$150,000
1966	0.102	$158,550		1.011892303	$3,643	$154,907
1967	0.09	$174,722		2.050162579	$7,381	$167,342
1968	0.113	$190,447		3.115498449	$11,216	$179,231
1969	0.092	$211,968		4.208605456	$15,151	$196,817
1970	0.082	$231,469	0.1187	5.330207538	$19,189	$212,280
1971	0.052	$250,449		7.036533348	$25,332	$225,118
1972	0.082	$263,472		8.951411133	$32,225	$231,247
1973	0.215	$285,077		11.10033071	$39,961	$245,116
1974	0.271	$346,369		22.14246749	$79,713	$266,656
1975	0.117	$440,235	0.122	16.21821244	$58,386	$381,849
1976	0.119	$491,742		19.3135729	$69,529	$422,213
1977	0.049	$550,259		22.79808522	$82,073	$468,186
1978	0.051	$577,222		26.72067397	$96,194	$481,028
1979	0.103	$606,660		31.13641455	$112,091	$494,569
1980	0.12	$669,146	0.081	36.10730652	$129,986	$539,160
1981	0.125	$749,444		40.1285409	$144,463	$604,981
1982	-0.076	$843,125		44.48208931	$160,136	$682,989
1983	0.062	$779,047		49.19541411	$177,103	$601,944
1984	-0.001	$827,348		54.29824715	$195,474	$631,874
1985	0.066	$826,521	0.1672	59.82277732	$215,362	$611,159
1986	0.172	$881,071		71.32076383	$256,755	$624,316
1987	0.173	$1,032,615		84.82157195	$305,358	$727,258
1988	0.179	$1,211,258		100.674071	$362,427	$848,831
1989	0.12	$1,428,073		119.2878993	$429,436	$998,636
1990	-0.055	$1,599,442	0.1063	141.1440499	$508,119	$1,091,323
1991	0.039	$1,511,472		157.5954647	$567,344	$944,129
1992	0.007	$1,570,420		175.842139	$633,032	$937,388

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1965	0.057	$150,000	0.0259	0	$0	$150,000
1966	0.102	$158,550		1.011892303	$7,286	$151,264
1967	0.09	$174,722		2.050162579	$14,761	$159,961
1968	0.113	$190,447		3.115498449	$22,432	$168,016
1969	0.092	$211,968		4.208605456	$30,302	$181,666
1970	0.082	$231,469	0.1187	5.330207538	$38,377	$193,091
1971	0.052	$250,449		7.036533348	$50,663	$199,786
1972	0.082	$263,472		8.951411133	$64,450	$199,022
1973	0.215	$285,077		11.10033071	$79,922	$205,155
1974	0.271	$346,369		22.14246749	$159,426	$186,943
1975	0.117	$440,235	0.122	16.21821244	$116,771	$323,464
1976	0.119	$491,742		19.3135729	$139,058	$352,684
1977	0.049	$550,259		22.79808522	$164,146	$386,113
1978	0.051	$577,222		26.72067397	$192,389	$384,833
1979	0.103	$606,660		31.13641455	$224,182	$382,478
1980	0.12	$669,146	0.081	36.10730652	$259,973	$409,174
1981	0.125	$749,444		40.1285409	$288,925	$460,519
1982	-0.076	$843,125		44.48208931	$320,271	$522,854
1983	0.062	$779,047		49.19541411	$354,207	$424,840
1984	-0.001	$827,348		54.29824715	$390,947	$436,401
1985	0.066	$826,521	0.1672	59.82277732	$430,724	$395,797
1986	0.172	$881,071		71.32076383	$513,509	$367,562
1987	0.173	$1,032,615		84.82157195	$610,715	$421,900
1988	0.179	$1,211,258		100.674071	$724,853	$486,404
1989	0.12	$1,428,073		119.2878993	$858,873	$569,200
1990	-0.055	$1,599,442	0.1063	141.1440499	$1,016,237	$583,204
1991	0.039	$1,511,472		157.5954647	$1,134,687	$376,785
1992	0.007	$1,570,420		175.842139	$1,266,063	$304,356

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1965	0.057	$150,000	0.0259	0	$0	$150,000
1966	0.102	$158,550		1.011892303	$10,928	$147,622
1967	0.09	$174,722		2.050162579	$22,142	$152,580
1968	0.113	$190,447		3.115498449	$33,647	$156,800
1969	0.092	$211,968		4.208605456	$45,453	$166,515
1970	0.082	$231,469	0.1187	5.330207538	$57,566	$173,902
1971	0.052	$250,449		7.036533348	$75,995	$174,454
1972	0.082	$263,472		8.951411133	$96,675	$166,797
1973	0.215	$285,077		11.10033071	$119,884	$165,194
1974	0.271	$346,369		22.14246749	$239,139	$107,230
1975	0.117	$440,235	0.122	16.21821244	$175,157	$265,078
1976	0.119	$491,742		19.3135729	$208,587	$283,156
1977	0.049	$550,259		22.79808522	$246,219	$304,040
1978	0.051	$577,222		26.72067397	$288,583	$288,639
1979	0.103	$606,660		31.13641455	$336,273	$270,387
1980	0.12	$669,146	0.081	36.10730652	$389,959	$279,188
1981	0.125	$749,444		40.1285409	$433,388	$316,056
1982	-0.076	$843,125		44.48208931	$480,407	$362,718
1983	0.062	$779,047		49.19541411	$531,310	$247,737
1984	-0.001	$827,348		54.29824715	$586,421	$240,927
1985	0.066	$826,521	0.1672	59.82277732	$646,086	$180,435
1986	0.172	$881,071		71.32076383	$770,264	$110,807
1987	0.173	$1,032,615		84.82157195	$916,073	$116,542
1988	0.179	$1,211,258		100.674071	$1,087,280	$123,978
1989	0.12	$1,428,073		119.2878993	$1,288,309	$139,764
1990	-0.055	$1,599,442	0.1063	141.1440499	$1,524,356	$75,086
1991	0.039	$1,511,472		157.5954647	$1,702,031	-$190,559
1992	0.007	$1,570,420		175.842139	$1,899,095	-$328,675

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1965	0.057	$150,000	0.0259	0	$0	$150,000
1966	0.102	$158,550		1.011892303	$14,571	$143,979
1967	0.09	$174,722		2.050162579	$29,522	$145,200
1968	0.113	$190,447		3.115498449	$44,863	$145,584
1969	0.092	$211,968		4.208605456	$60,604	$151,364
1970	0.082	$231,469	0.1187	5.330207538	$76,755	$154,714
1971	0.052	$250,449		7.036533348	$101,326	$149,123
1972	0.082	$263,472		8.951411133	$128,900	$134,572
1973	0.215	$285,077		11.10033071	$159,845	$125,232
1974	0.271	$346,369		22.14246749	$318,852	$27,517
1975	0.117	$440,235	0.122	16.21821244	$233,542	$206,692
1976	0.119	$491,742		19.3135729	$278,115	$213,627
1977	0.049	$550,259		22.79808522	$328,292	$221,967
1978	0.051	$577,222		26.72067397	$384,778	$192,444
1979	0.103	$606,660		31.13641455	$448,364	$158,296
1980	0.12	$669,146	0.081	36.10730652	$519,945	$149,201
1981	0.125	$749,444		40.1285409	$577,851	$171,593
1982	-0.076	$843,125		44.48208931	$640,542	$202,582
1983	0.062	$779,047		49.19541411	$708,414	$70,633
1984	-0.001	$827,348		54.29824715	$781,895	$45,453
1985	0.066	$826,521	0.1672	59.82277732	$861,448	-$34,927
1986	0.172	$881,071		71.32076383	$1,027,019	-$145,948
1987	0.173	$1,032,615		84.82157195	$1,221,431	-$188,815
1988	0.179	$1,211,258		100.674071	$1,449,707	-$238,449
1989	0.12	$1,428,073		119.2878993	$1,717,746	-$289,673
1990	-0.055	$1,599,442	0.1063	141.1440499	$2,032,474	-$433,033
1991	0.039	$1,511,472		157.5954647	$2,269,375	-$757,902
1992	0.007	$1,570,420		175.842139	$2,532,127	-$961,707

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1970	0.082	$150,000	0.1187	0	$0	$150,000
1971	0.052	$162,300		1.054852741	$3,797	$158,503
1972	0.082	$170,740		2.238632573	$8,059	$162,681
1973	0.215	$184,740		3.567097331	$12,842	$171,899
1974	0.271	$224,459		13.68850099	$49,279	$175,181
1975	0.117	$285,288	0.122	6.730978193	$24,232	$261,056
1976	0.119	$318,667		8.633593942	$31,081	$287,586
1977	0.049	$356,588		10.77540847	$38,791	$317,796
1978	0.051	$374,061		13.1864941	$47,471	$326,589
1979	0.103	$393,138		15.90070386	$57,243	$335,895
1980	0.12	$433,631	0.081	18.95614682	$68,242	$365,389
1981	0.125	$485,667		21.56001271	$77,616	$408,051
1982	-0.076	$546,375		24.37906157	$87,765	$458,610
1983	0.062	$504,851		27.43107608	$98,752	$406,099
1984	-0.001	$536,151		30.73530847	$110,647	$425,504
1985	0.066	$535,615	0.1672	34.31260198	$123,525	$412,090
1986	0.172	$570,966		41.36699917	$148,921	$422,045
1987	0.173	$669,172		49.65019403	$178,741	$490,431
1988	0.179	$784,939		59.37622948	$213,754	$571,184
1989	0.12	$925,443		70.79643232	$254,867	$670,575
1990	-0.055	$1,036,496	0.1063	84.20590771	$303,141	$733,354
1991	0.039	$979,488		94.44395184	$339,998	$639,490
1992	0.007	$1,017,688		105.7992218	$380,877	$636,811

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1970	0.082	$150,000	0.1187	0	$0	$150,000
1971	0.052	$162,300		1.054852741	$7,595	$154,705
1972	0.082	$170,740		2.238632573	$16,118	$154,621
1973	0.215	$184,740		3.567097331	$25,683	$159,057
1974	0.271	$224,459		13.68850099	$98,557	$125,902
1975	0.117	$285,288	0.122	6.730978193	$48,463	$236,825
1976	0.119	$318,667		8.633593942	$62,162	$256,505
1977	0.049	$356,588		10.77540847	$77,583	$279,005
1978	0.051	$374,061		13.1864941	$94,943	$279,118
1979	0.103	$393,138		15.90070386	$114,485	$278,653
1980	0.12	$433,631	0.081	18.95614682	$136,484	$297,147
1981	0.125	$485,667		21.56001271	$155,232	$330,435
1982	-0.076	$546,375		24.37906157	$175,529	$370,846
1983	0.062	$504,851		27.43107608	$197,504	$307,347
1984	-0.001	$536,151		30.73530847	$221,294	$314,857
1985	0.066	$535,615	0.1672	34.31260198	$247,051	$288,564
1986	0.172	$570,966		41.36699917	$297,842	$273,123
1987	0.173	$669,172		49.65019403	$357,481	$311,690
1988	0.179	$784,939		59.37622948	$427,509	$357,430
1989	0.12	$925,443		70.79643232	$509,734	$415,708
1990	-0.055	$1,036,496	0.1063	84.20590771	$606,283	$430,213
1991	0.039	$979,488		94.44395184	$679,996	$299,492
1992	0.007	$1,017,688		105.7992218	$761,754	$255,934

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1970	0.082	$150,000	0.1187	0	$0	$150,000
1971	0.052	$162,300		1.054852741	$11,392	$150,908
1972	0.082	$170,740		2.238632573	$24,177	$146,562
1973	0.215	$184,740		3.567097331	$38,525	$146,216
1974	0.271	$224,459		13.68850099	$147,836	$76,624
1975	0.117	$285,288	0.122	6.730978193	$72,695	$212,593
1976	0.119	$318,667		8.633593942	$93,243	$225,424
1977	0.049	$356,588		10.77540847	$116,374	$240,213
1978	0.051	$374,061		13.1864941	$142,414	$231,647
1979	0.103	$393,138		15.90070386	$171,728	$221,410
1980	0.12	$433,631	0.081	18.95614682	$204,726	$228,905
1981	0.125	$485,667		21.56001271	$232,848	$252,819
1982	-0.076	$546,375		24.37906157	$263,294	$283,081
1983	0.062	$504,851		27.43107608	$296,256	$208,595
1984	-0.001	$536,151		30.73530847	$331,941	$204,210
1985	0.066	$535,615	0.1672	34.31260198	$370,576	$165,039
1986	0.172	$570,966		41.36699917	$446,764	$124,202
1987	0.173	$669,172		49.65019403	$536,222	$132,950
1988	0.179	$784,939		59.37622948	$641,263	$143,675
1989	0.12	$925,443		70.79643232	$764,601	$160,841
1990	-0.055	$1,036,496	0.1063	84.20590771	$909,424	$127,072
1991	0.039	$979,488		94.44395184	$1,019,995	-$40,506
1992	0.007	$1,017,688		105.7992218	$1,142,632	-$124,943

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1970	0.082	$150,000	0.1187	0	$0	$150,000
1971	0.052	$162,300		1.054852741	$15,190	$147,110
1972	0.082	$170,740		2.238632573	$32,236	$138,503
1973	0.215	$184,740		3.567097331	$51,366	$133,374
1974	0.271	$224,459		13.68850099	$197,114	$27,345
1975	0.117	$285,288	0.122	6.730978193	$96,926	$188,362
1976	0.119	$318,667		8.633593942	$124,324	$194,343
1977	0.049	$356,588		10.77540847	$155,166	$201,422
1978	0.051	$374,061		13.1864941	$189,886	$184,175
1979	0.103	$393,138		15.90070386	$228,970	$164,168
1980	0.12	$433,631	0.081	18.95614682	$272,969	$160,662
1981	0.125	$485,667		21.56001271	$310,464	$175,203
1982	-0.076	$546,375		24.37906157	$351,058	$195,317
1983	0.062	$504,851		27.43107608	$395,007	$109,843
1984	-0.001	$536,151		30.73530847	$442,588	$93,563
1985	0.066	$535,615	0.1672	34.31260198	$494,101	$41,514
1986	0.172	$570,966		41.36699917	$595,685	-$24,719
1987	0.173	$669,172		49.65019403	$714,963	-$45,791
1988	0.179	$784,939		59.37622948	$855,018	-$70,079
1989	0.12	$925,443		70.79643232	$1,019,469	-$94,026
1990	-0.055	$1,036,496	0.1063	84.20590771	$1,212,565	-$176,069
1991	0.039	$979,488		94.44395184	$1,359,993	-$380,504
1992	0.007	$1,017,688		105.7992218	$1,523,509	-$505,820

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1975	0.117	$150,000	0.122	0	$0	$150,000
1976	0.119	$167,550		1.056390342	$3,803	$163,747
1977	0.049	$187,488		2.245591149	$8,084	$179,404
1978	0.051	$196,675		3.584299487	$12,903	$183,772
1979	0.103	$206,706		5.091311597	$18,329	$188,377
1980	0.12	$227,997	0.081	6.787786798	$24,436	$203,560
1981	0.125	$255,356		8.386061791	$30,190	$225,166
1982	-0.076	$287,276		10.11641792	$36,419	$250,857
1983	0.062	$265,443		11.98977034	$43,163	$222,280
1984	-0.001	$281,900		14.01793623	$50,465	$231,436
1985	0.066	$281,618	0.1672	16.21370937	$58,369	$223,249
1986	0.172	$300,205		20.11548039	$72,416	$227,789
1987	0.173	$351,840		24.69689662	$88,909	$262,931
1988	0.179	$412,709		30.07634469	$108,275	$304,434
1989	0.12	$486,584		36.39283289	$131,014	$355,569
1990	-0.055	$544,974	0.1063	43.80958321	$157,714	$387,259
1991	0.039	$515,000		49.6393813	$178,702	$336,298
1992	0.007	$535,085		56.1053557	$201,979	$333,106

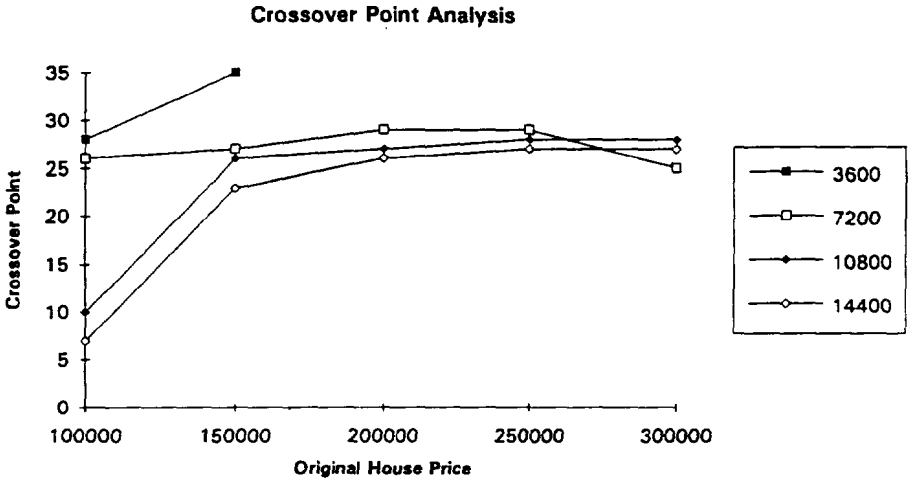
Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1975	0.117	$150,000	0.122	0	$0	$150,000
1976	0.119	$167,550		1.056390342	$7,606	$159,944
1977	0.049	$187,488		2.245591149	$16,168	$171,320
1978	0.051	$196,675		3.584299487	$25,807	$170,868
1979	0.103	$206,706		5.091311597	$36,657	$170,048
1980	0.12	$227,997	0.081	6.787786798	$48,872	$179,124
1981	0.125	$255,356		8.386061791	$60,380	$194,976
1982	-0.076	$287,276		10.11641792	$72,838	$214,437
1983	0.062	$265,443		11.98977034	$86,326	$179,116
1984	-0.001	$281,900		14.01793623	$100,929	$180,971
1985	0.066	$281,618	0.1672	16.21370937	$116,739	$164,880
1986	0.172	$300,205		20.11548039	$144,831	$155,374
1987	0.173	$351,840		24.69689662	$177,818	$174,023
1988	0.179	$412,709		30.07634469	$216,550	$196,159
1989	0.12	$486,584		36.39283289	$262,028	$224,555
1990	-0.055	$544,974	0.1063	43.80958321	$315,429	$229,545
1991	0.039	$515,000		49.6393813	$357,404	$157,596
1992	0.007	$535,085		56.1053557	$403,959	$131,126

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1975	0.117	$150,000	0.122	0	$0	$150,000
1976	0.119	$167,550		1.056390342	$11,409	$156,141
1977	0.049	$187,488		2.245591149	$24,252	$163,236
1978	0.051	$196,675		3.584299487	$38,710	$157,965
1979	0.103	$206,706		5.091311597	$54,986	$151,720
1980	0.12	$227,997	0.081	6.787786798	$73,308	$154,688
1981	0.125	$255,356		8.386061791	$90,569	$164,787
1982	-0.076	$287,276		10.11641792	$109,257	$178,018
1983	0.062	$265,443		11.98977034	$129,490	$135,953
1984	-0.001	$281,900		14.01793623	$151,394	$130,506
1985	0.066	$281,618	0.1672	16.21370937	$175,108	$106,510
1986	0.172	$300,205		20.11548039	$217,247	$82,958
1987	0.173	$351,840		24.69689662	$266,726	$85,114
1988	0.179	$412,709		30.07634469	$324,825	$87,884
1989	0.12	$486,584		36.39283289	$393,043	$93,541
1990	-0.055	$544,974	0.1063	43.80958321	$473,143	$71,830
1991	0.039	$515,000		49.6393813	$536,105	-$21,105
1992	0.007	$535,085		56.1053557	$605,938	-$70,853

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1975	0.117	$150,000	0.122	0	$0	$150,000
1976	0.119	$167,550		1.056390342	$15,212	$152,338
1977	0.049	$187,488		2.245591149	$32,337	$155,152
1978	0.051	$196,675		3.584299487	$51,614	$145,061
1979	0.103	$206,706		5.091311597	$73,315	$133,391
1980	0.12	$227,997	0.081	6.787786798	$97,744	$130,252
1981	0.125	$255,356		8.386061791	$120,759	$134,597
1982	-0.076	$287,276		10.11641792	$145,676	$141,599
1983	0.062	$265,443		11.98977034	$172,653	$92,790
1984	-0.001	$281,900		14.01793623	$201,858	$80,042
1985	0.066	$281,618	0.1672	16.21370937	$233,477	$48,141
1986	0.172	$300,205		20.11548039	$289,663	$10,542
1987	0.173	$351,840		24.69689662	$355,635	-$3,795
1988	0.179	$412,709		30.07634469	$433,099	-$20,391
1989	0.12	$486,584		36.39283289	$524,057	-$37,473
1990	-0.055	$544,974	0.1063	43.80958321	$630,858	-$85,884
1991	0.039	$515,000		49.6393813	$714,807	-$199,807
1992	0.007	$535,085		56.1053557	$807,917	-$272,832

Appendix G
Progression of Hypothetical Reverse Mortgages Issued in 1957 for Various Original House Prices

The tables included in this appendix correspond exactly to those in appendix F except that these are all issued in 1957. The original house price, listed in row 4 of column 3, varies from $100,000 to $300,000. These tables are graphically depicted in the Figure entitled *Crossover Point Analysis.*


Crossover Point Analysis
35
30
25
20
15
10
5
0
Crossover Point
100000
150000
200000
250000
300000
Original House Price
3600
7200
10800
14400

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1957	0.066	$100,000	0.0323	0.000000000	$0	$100,000
1958	0.081	$106,600		1.014837201	$3,653	$102,947
1959	0.028	$115,235		2.062717950	$7,426	$107,809
1960	-0.002	$118,461		3.144718160	$11,321	$107,140
1961	-0.004	$118,224		4.261948777	$15,343	$102,881
1962	0.013	$117,751	0.0712	5.415556916	$19,496	$98,255
1963	0.008	$119,282		6.840803462	$24,627	$94,655
1964	0.045	$120,236		8.369334044	$30,130	$90,107
1965	0.057	$125,647		10.008634000	$36,031	$89,616
1966	0.102	$132,809		11.766728663	$42,360	$90,449
1967	0.090	$146,355	0.0221	13.652228674	$49,148	$97,207
1968	0.113	$159,527		14.965746986	$53,877	$105,651
1969	0.092	$177,554		16.308453728	$58,710	$118,844
1970	0.082	$193,889		17.680997510	$63,652	$130,237
1971	0.052	$209,788		19.084041359	$68,703	$141,085
1972	0.082	$220,697	0.0892	20.518263034	$73,866	$146,831
1973	0.215	$238,794		23.430429910	$84,350	$154,444
1974	0.271	$290,135		26.608153051	$95,789	$194,345
1975	0.117	$368,761		30.075648147	$108,272	$260,489
1976	0.119	$411,906		33.859339081	$121,894	$290,013
1977	0.049	$460,923	0.1462	37.988059293	$136,757	$324,166
1978	0.051	$483,508		44.812588343	$161,325	$322,183
1979	0.103	$508,167		52.671329899	$189,617	$318,550
1980	0.120	$560,508		61.721012069	$222,196	$338,313
1981	0.125	$627,769		72.142114070	$259,712	$368,058
1982	-0.076	$706,241	0.2915	84.142465563	$302,913	$403,328
1983	0.062	$652,566		111.593689689	$401,737	$250,829
1984	-0.001	$693,025		147.630075909	$531,468	$161,557
1985	0.066	$692,332		194.936568539	$701,772	-$9,439
1986	0.172	$738,026		257.037807862	$925,336	-$187,310
1987	0.173	$864,967	0.1026	338.560738668	$1,218,819	-$353,852
1988	0.179	$1,014,606		375.235538530	$1,350,848	-$336,242
1989	0.120	$1,196,221		425.722565907	$1,532,601	-$336,381
1990	-0.055	$1,339,767		460.569359886	$1,658,050	-$318,283
1991	0.039	$1,266,080		510.083376754	$1,836,300	-$570,220
1992	0.007	$1,315,457	0.1125	564.807854991	$2,033,308	-$717,851

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1957	0.066	$100,000	0.0323	0.000000000	$0	$100,000
1958	0.081	$106,600		1.014837201	$7,307	$99,293
1959	0.028	$115,235		2.062717950	$14,852	$100,383
1960	-0.002	$118,461		3.144718160	$22,642	$95,819
1961	-0.004	$118,224		4.261948777	$30,686	$87,538
1962	0.013	$117,751	0.0712	5.415556916	$38,992	$78,759
1963	0.008	$119,282		6.840803462	$49,254	$70,028
1964	0.045	$120,236		8.369334044	$60,259	$59,977
1965	0.057	$125,647		10.008634000	$72,062	$53,585
1966	0.102	$132,809		11.766728663	$84,720	$48,088
1967	0.090	$146,355	0.0221	13.652228674	$98,296	$48,059
1968	0.113	$159,527		14.965746986	$107,753	$51,774
1969	0.092	$177,554		16.308453728	$117,421	$60,133
1970	0.082	$193,889		17.680997510	$127,303	$66,586
1971	0.052	$209,788		19.084041359	$137,405	$72,383
1972	0.082	$220,697	0.0892	20.518263034	$147,731	$72,965
1973	0.215	$238,794		23.430429910	$168,699	$70,095
1974	0.271	$290,135		26.608153051	$191,579	$98,556
1975	0.117	$368,761		30.075648147	$216,545	$152,216
1976	0.119	$411,906		33.859339081	$243,787	$168,119
1977	0.049	$460,923	0.1462	37.988059293	$273,514	$187,409
1978	0.051	$483,508		44.812588343	$322,651	$160,858
1979	0.103	$508,167		52.671329899	$379,234	$128,934
1980	0.120	$560,508		61.721012069	$444,391	$116,117
1981	0.125	$627,769		72.142114070	$519,423	$108,346
1982	-0.076	$706,241	0.2915	84.142465563	$605,826	$100,415
1983	0.062	$652,566		111.593689689	$803,475	-$150,908
1984	-0.001	$693,025		147.630075909	$1,062,937	-$369,911
1985	0.066	$692,332		194.936568539	$1,403,543	-$711,211
1986	0.172	$738,026		257.037807862	$1,850,672	-$1,112,646
1987	0.173	$864,967	0.1026	338.560738668	$2,437,637	-$1,572,671
1988	0.179	$1,014,606		375.235538530	$2,701,696	-$1,687,090
1989	0.120	$1,196,221		425.722565907	$3,065,202	-$1,868,982
1990	-0.055	$1,339,767		460.569359886	$3,316,099	-$1,976,332
1991	0.039	$1,266,080		510.083376754	$3,672,600	-$2,406,520
1992	0.007	$1,315,457	0.1125	564.807854991	$4,066,617	-$2,751,160

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1957	0.066	$100,000	0.0323	0.000000000	$0	$100,000
1958	0.081	$106,600		1.014837201	$10,960	$95,640
1959	0.028	$115,235		2.062717950	$22,277	$92,957
1960	-0.002	$118,461		3.144718160	$33,963	$84,498
1961	-0.004	$118,224		4.261948777	$46,029	$72,195
1962	0.013	$117,751	0.0712	5.415556916	$58,488	$59,263
1963	0.008	$119,282		6.840803462	$73,881	$45,401
1964	0.045	$120,236		8.369334044	$90,389	$29,848
1965	0.057	$125,647		10.008634000	$108,093	$17,554
1966	0.102	$132,809		11.766728663	$127,081	$5,728
1967	0.090	$146,355	0.0221	13.652228674	$147,444	-$1,089
1968	0.113	$159,527		14.965746986	$161,630	-$2,103
1969	0.092	$177,554		16.308453728	$176,131	$1,423
1970	0.082	$193,889		17.680997510	$190,955	$2,934
1971	0.052	$209,788		19.084041359	$206,108	$3,680
1972	0.082	$220,697	0.0892	20.518263034	$221,597	-$900
1973	0.215	$238,794		23.430429910	$253,049	-$14,255
1974	0.271	$290,135		26.608153051	$287,368	$2,767
1975	0.117	$368,761		30.075648147	$324,817	$43,944
1976	0.119	$411,906		33.859339081	$365,681	$46,225
1977	0.049	$460,923	0.1462	37.988059293	$410,271	$50,652
1978	0.051	$483,508		44.812588343	$483,976	-$468
1979	0.103	$508,167		52.671329899	$568,850	-$60,683
1980	0.120	$560,508		61.721012069	$666,587	-$106,079
1981	0.125	$627,769		72.142114070	$779,135	-$151,365
1982	-0.076	$706,241	0.2915	84.142465563	$908,739	-$202,498
1983	0.062	$652,566		111.593689689	$1,205,212	-$552,646
1984	-0.001	$693,025		147.630075909	$1,594,405	-$901,379
1985	0.066	$692,332		194.936568539	$2,105,315	-$1,412,983
1986	0.172	$738,026		257.037807862	$2,776,008	-$2,037,982
1987	0.173	$864,967	0.1026	338.560738668	$3,656,456	-$2,791,489
1988	0.179	$1,014,606		375.235538530	$4,052,544	-$3,037,938
1989	0.120	$1,196,221		425.722565907	$4,597,804	-$3,401,583
1990	-0.055	$1,339,767		460.569359886	$4,974,149	-$3,634,382
1991	0.039	$1,266,080		510.083376754	$5,508,900	-$4,242,821
1992	0.007	$1,315,457	0.1125	564.807854991	$6,099,925	-$4,784,468

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1957	0.066	$100,000	0.0323	0.000000000	$0	$100,000
1958	0.081	$106,600		1.014837201	$14,614	$91,986
1959	0.028	$115,235		2.062717950	$29,703	$85,531
1960	-0.002	$118,461		3.144718160	$45,284	$73,177
1961	-0.004	$118,224		4.261948777	$61,372	$56,852
1962	0.013	$117,751	0.0712	5.415556916	$77,984	$39,767
1963	0.008	$119,282		6.840803462	$98,508	$20,775
1964	0.045	$120,236		8.369334044	$120,518	-$282
1965	0.057	$125,647		10.008634000	$144,124	-$18,477
1966	0.102	$132,809		11.766728663	$169,441	-$36,632
1967	0.090	$146,355	0.0221	13.652228674	$196,592	-$50,237
1968	0.113	$159,527		14.965746986	$215,507	-$55,979
1969	0.092	$177,554		16.308453728	$234,842	-$57,288
1970	0.082	$193,889		17.680997510	$254,606	-$60,717
1971	0.052	$209,788		19.084041359	$274,810	-$65,022
1972	0.082	$220,697	0.0892	20.518263034	$295,463	-$74,766
1973	0.215	$238,794		23.430429910	$337,398	-$98,604
1974	0.271	$290,135		26.608153051	$383,157	-$93,023
1975	0.117	$368,761		30.075648147	$433,089	-$64,328
1976	0.119	$411,906		33.859339081	$487,574	-$75,668
1977	0.049	$460,923	0.1462	37.988059293	$547,028	-$86,105
1978	0.051	$483,508		44.812588343	$645,301	-$161,793
1979	0.103	$508,167		52.671329899	$758,467	-$250,300
1980	0.120	$560,508		61.721012069	$888,783	-$328,274
1981	0.125	$627,769		72.142114070	$1,038,846	-$411,077
1982	-0.076	$706,241	0.2915	84.142465563	$1,211,652	-$505,411
1983	0.062	$652,566		111.593689689	$1,606,949	-$954,383
1984	-0.001	$693,025		147.630075909	$2,125,873	-$1,432,848
1985	0.066	$692,332		194.936568539	$2,807,087	-$2,114,754
1986	0.172	$738,026		257.037807862	$3,701,344	-$2,963,318
1987	0.173	$864,967	0.1026	338.560738668	$4,875,275	-$4,010,308
1988	0.179	$1,014,606		375.235538530	$5,403,392	-$4,388,786
1989	0.120	$1,196,221		425.722565907	$6,130,405	-$4,934,184
1990	-0.055	$1,339,767		460.569359886	$6,632,199	-$5,292,432
1991	0.039	$1,266,080		510.083376754	$7,345,201	-$6,079,121
1992	0.007	$1,315,457	0.1125	564.807854991	$8,133,233	-$6,817,776

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1957	0.066	$200,000	0.0323	0.000000000	$0	$200,000
1958	0.081	$213,200		1.014837201	$3,653	$209,547
1959	0.028	$230,469		2.062717950	$7,426	$223,043
1960	-0.002	$236,922		3.144718160	$11,321	$225,601
1961	-0.004	$236,448		4.261948777	$15,343	$221,105
1962	0.013	$235,503	0.0712	5.415556916	$19,496	$216,007
1963	0.008	$238,564		6.840803462	$24,627	$213,937
1964	0.045	$240,473		8.369334044	$30,130	$210,343
1965	0.057	$251,294		10.008634000	$36,031	$215,263
1966	0.102	$265,618		11.766728663	$42,360	$223,258
1967	0.090	$292,711	0.0221	13.652228674	$49,148	$243,563
1968	0.113	$319,055		14.965746986	$53,877	$265,178
1969	0.092	$355,108		16.308453728	$58,710	$296,398
1970	0.082	$387,778		17.680997510	$63,652	$324,126
1971	0.052	$419,576		19.084041359	$68,703	$350,873
1972	0.082	$441,394	0.0892	20.518263034	$73,866	$367,528
1973	0.215	$477,588		23.430429910	$84,350	$393,238
1974	0.271	$580,269		26.608153051	$95,789	$484,480
1975	0.117	$737,522		30.075648147	$108,272	$629,250
1976	0.119	$823,812		33.859339081	$121,894	$701,919
1977	0.049	$921,846	0.1462	37.988059293	$136,757	$785,089
1978	0.051	$967,016		44.812588343	$161,325	$805,691
1979	0.103	$1,016,334		52.671329899	$189,617	$826,718
1980	0.120	$1,121,017		61.721012069	$222,196	$898,821
1981	0.125	$1,255,539		72.142114070	$259,712	$995,827
1982	-0.076	$1,412,481	0.2915	84.142465563	$302,913	$1,109,568
1983	0.062	$1,305,133		111.593689689	$401,737	$903,395
1984	-0.001	$1,386,051		147.630075909	$531,468	$854,582
1985	0.066	$1,384,665		194.936568539	$701,772	$682,893
1986	0.172	$1,476,053		257.037807862	$925,336	$550,716
1987	0.173	$1,729,934	0.1026	338.560738668	$1,218,819	$511,115
1988	0.179	$2,029,212		375.235538530	$1,350,848	$678,364
1989	0.120	$2,392,441		425.722565907	$1,532,601	$859,840
1990	-0.055	$2,679,534		460.569359886	$1,658,050	$1,021,484
1991	0.039	$2,532,160		510.083376754	$1,836,300	$695,860
1992	0.007	$2,630,914	0.1125	564.807854991	$2,033,308	$597,606

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1957	0.066	$200,000	0.0323	0.000000000	$0	$200,000
1958	0.081	$213,200		1.014837201	$7,307	$205,893
1959	0.028	$230,469		2.062717950	$14,852	$215,618
1960	-0.002	$236,922		3.144718160	$22,642	$214,280
1961	-0.004	$236,448		4.261948777	$30,686	$205,762
1962	0.013	$235,503	0.0712	5.415556916	$38,992	$196,511
1963	0.008	$238,564		6.840803462	$49,254	$189,310
1964	0.045	$240,473		8.369334044	$60,259	$180,214
1965	0.057	$251,294		10.008634000	$72,062	$179,232
1966	0.102	$265,618		11.766728663	$84,720	$180,897
1967	0.090	$292,711	0.0221	13.652228674	$98,296	$194,415
1968	0.113	$319,055		14.965746986	$107,753	$211,301
1969	0.092	$355,108		16.308453728	$117,421	$237,687
1970	0.082	$387,778		17.680997510	$127,303	$260,475
1971	0.052	$419,576		19.084041359	$137,405	$282,171
1972	0.082	$441,394	0.0892	20.518263034	$147,731	$293,662
1973	0.215	$477,588		23.430429910	$168,699	$308,889
1974	0.271	$580,269		26.608153051	$191,579	$388,691
1975	0.117	$737,522		30.075648147	$216,545	$520,978
1976	0.119	$823,812		33.859339081	$243,787	$580,025
1977	0.049	$921,846	0.1462	37.988059293	$273,514	$648,332
1978	0.051	$967,016		44.812588343	$322,651	$644,366
1979	0.103	$1,016,334		52.671329899	$379,234	$637,101
1980	0.120	$1,121,017		61.721012069	$444,391	$676,625
1981	0.125	$1,255,539		72.142114070	$519,423	$736,116
1982	-0.076	$1,412,481	0.2915	84.142465563	$605,826	$806,655
1983	0.062	$1,305,133		111.593689689	$803,475	$501,658
1984	-0.001	$1,386,051		147.630075909	$1,062,937	$323,114
1985	0.066	$1,384,665		194.936568539	$1,403,543	-$18,879
1986	0.172	$1,476,053		257.037807862	$1,850,672	-$374,620
1987	0.173	$1,729,934	0.1026	338.560738668	$2,437,637	-$707,704
1988	0.179	$2,029,212		375.235538530	$2,701,696	-$672,484
1989	0.120	$2,392,441		425.722565907	$3,065,202	-$672,761
1990	-0.055	$2,679,534		460.569359886	$3,316,099	-$636,565
1991	0.039	$2,532,160		510.083376754	$3,672,600	-$1,140,441
1992	0.007	$2,630,914	0.1125	564.807854991	$4,066,617	-$1,435,703

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (slb)		Equity
				accumulation factor	$10,800	
1957	0.066	$200,000	0.0323	0.000000000	$0	$200,000
1958	0.081	$213,200		1.014837201	$10,960	$202,240
1959	0.028	$230,469		2.062717950	$22,277	$208,192
1960	-0.002	$236,922		3.144718160	$33,963	$202,959
1961	-0.004	$236,448		4.261948777	$46,029	$190,419
1962	0.013	$235,503	0.0712	5.415556916	$58,488	$177,015
1963	0.008	$238,564		6.840803462	$73,881	$164,684
1964	0.045	$240,473		8.369334044	$90,389	$150,084
1965	0.057	$251,294		10.008634000	$108,093	$143,201
1966	0.102	$265,618		11.766728663	$127,081	$138,537
1967	0.090	$292,711	0.0221	13.652228674	$147,444	$145,267
1968	0.113	$319,055		14.965746986	$161,630	$157,425
1969	0.092	$355,108		16.308453728	$176,131	$178,977
1970	0.082	$387,778		17.680997510	$190,955	$196,823
1971	0.052	$419,576		19.084041359	$206,108	$213,468
1972	0.082	$441,394	0.0892	20.518263034	$221,597	$219,796
1973	0.215	$477,588		23.430429910	$253,049	$224,539
1974	0.271	$580,269		26.608153051	$287,368	$292,901
1975	0.117	$737,522		30.075648147	$324,817	$412,705
1976	0.119	$823,812		33.859339081	$365,681	$458,131
1977	0.049	$921,846	0.1462	37.988059293	$410,271	$511,575
1978	0.051	$967,016		44.812588343	$483,976	$483,041
1979	0.103	$1,016,334		52.671329899	$568,850	$447,484
1980	0.120	$1,121,017		61.721012069	$666,587	$454,430
1981	0.125	$1,255,539		72.142114070	$779,135	$476,404
1982	-0.076	$1,412,481	0.2915	84.142465563	$908,739	$503,742
1983	0.062	$1,305,133		111.593689689	$1,205,212	$99,921
1984	-0.001	$1,386,051		147.630075909	$1,594,405	-$208,354
1985	0.066	$1,384,665		194.936568539	$2,105,315	-$720,650
1986	0.172	$1,476,053		257.037807862	$2,776,008	-$1,299,956
1987	0.173	$1,729,934	0.1026	338.560738668	$3,656,456	-$1,926,522
1988	0.179	$2,029,212		375.235538530	$4,052,544	-$2,023,332
1989	0.120	$2,392,441		425.722565907	$4,597,804	-$2,205,363
1990	-0.055	$2,679,534		460.569359886	$4,974,149	-$2,294,615
1991	0.039	$2,532,160		510.083376754	$5,508,900	-$2,976,741
1992	0.007	$2,630,914	0.1125	564.807854991	$6,099,925	-$3,469,011

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1957	0.066	$200,000	0.0323	0.000000000	$0	$200,000
1958	0.081	$213,200		1.014837201	$14,614	$198,586
1959	0.028	$230,469		2.062717950	$29,703	$200,766
1960	-0.002	$236,922		3.144718160	$45,284	$191,638
1961	-0.004	$236,448		4.261948777	$61,372	$175,076
1962	0.013	$235,503	0.0712	5.415556916	$77,984	$157,519
1963	0.008	$238,564		6.840803462	$98,508	$140,057
1964	0.045	$240,473		8.369334044	$120,518	$119,954
1965	0.057	$251,294		10.008634000	$144,124	$107,170
1966	0.102	$265,618		11.766728663	$169,441	$96,177
1967	0.090	$292,711	0.0221	13.652228674	$196,592	$96,119
1968	0.113	$319,055		14.965746986	$215,507	$103,548
1969	0.092	$355,108		16.308453728	$234,842	$120,266
1970	0.082	$387,778		17.680997510	$254,606	$133,172
1971	0.052	$419,576		19.084041359	$274,810	$144,765
1972	0.082	$441,394	0.0892	20.518263034	$295,463	$145,931
1973	0.215	$477,588		23.430429910	$337,398	$140,190
1974	0.271	$580,269		26.608153051	$383,157	$197,112
1975	0.117	$737,522		30.075648147	$433,089	$304,433
1976	0.119	$823,812		33.859339081	$487,574	$336,238
1977	0.049	$921,846	0.1462	37.988059293	$547,028	$374,818
1978	0.051	$967,016		44.812588343	$645,301	$321,715
1979	0.103	$1,016,334		52.671329899	$758,467	$257,867
1980	0.120	$1,121,017		61.721012069	$888,783	$232,234
1981	0.125	$1,255,539		72.142114070	$1,038,846	$216,692
1982	-0.076	$1,412,481	0.2915	84.142465563	$1,211,652	$200,830
1983	0.062	$1,305,133		111.593689689	$1,606,949	-$301,817
1984	-0.001	$1,386,051		147.630075909	$2,125,873	-$739,822
1985	0.066	$1,384,665		194.936568539	$2,807,087	-$1,422,422
1986	0.172	$1,476,053		257.037807862	$3,701,344	-$2,225,292
1987	0.173	$1,729,934	0.1026	338.560738668	$4,875,275	-$3,145,341
1988	0.179	$2,029,212		375.235538530	$5,403,392	-$3,374,180
1989	0.120	$2,392,441		425.722565907	$6,130,405	-$3,737,964
1990	-0.055	$2,679,534		460.569359886	$6,632,199	-$3,952,665
1991	0.039	$2,532,160		510.083376754	$7,345,201	-$4,813,041
1992	0.007	$2,630,914	0.1125	564.807854991	$8,133,233	-$5,502,319

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1957	0.066	$250,000	0.0323	0.000000000	$0	$250,000
1958	0.081	$266,500		1.014837201	$3,653	$262,847
1959	0.028	$288,087		2.062717950	$7,426	$280,661
1960	-0.002	$296,153		3.144718160	$11,321	$284,832
1961	-0.004	$295,561		4.261948777	$15,343	$280,218
1962	0.013	$294,378	0.0712	5.415556916	$19,496	$274,882
1963	0.008	$298,205		6.840803462	$24,627	$273,578
1964	0.045	$300,591		8.369334044	$30,130	$270,461
1965	0.057	$314,118		10.008634000	$36,031	$278,086
1966	0.102	$332,022		11.766728663	$42,360	$289,662
1967	0.090	$365,888	0.0221	13.652228674	$49,148	$316,740
1968	0.113	$398,818		14.965746986	$53,877	$344,942
1969	0.092	$443,885		16.308453728	$58,710	$385,175
1970	0.082	$484,722		17.680997510	$63,652	$421,071
1971	0.052	$524,470		19.084041359	$68,703	$455,767
1972	0.082	$551,742	0.0892	20.518263034	$73,866	$477,876
1973	0.215	$596,985		23.430429910	$84,350	$512,635
1974	0.271	$725,337		26.608153051	$95,789	$629,547
1975	0.117	$921,903		30.075648147	$108,272	$813,630
1976	0.119	$1,029,765		33.859339081	$121,894	$907,872
1977	0.049	$1,152,308	0.1462	37.988059293	$136,757	$1,015,551
1978	0.051	$1,208,771		44.812588343	$161,325	$1,047,445
1979	0.103	$1,270,418		52.671329899	$189,617	$1,080,801
1980	0.120	$1,401,271		61.721012069	$222,196	$1,179,075
1981	0.125	$1,569,423		72.142114070	$259,712	$1,309,712
1982	-0.076	$1,765,601	0.2915	84.142465563	$302,913	$1,462,689
1983	0.062	$1,631,416		111.593689689	$401,737	$1,229,678
1984	-0.001	$1,732,563		147.630075909	$531,468	$1,201,095
1985	0.066	$1,730,831		194.936568539	$701,772	$1,029,059
1986	0.172	$1,845,066		257.037807862	$925,336	$919,730
1987	0.173	$2,162,417	0.1026	338.560738668	$1,218,819	$943,598
1988	0.179	$2,536,515		375.235538530	$1,350,848	$1,185,667
1989	0.120	$2,990,551		425.722565907	$1,532,601	$1,457,950
1990	-0.055	$3,349,418		460.569359886	$1,658,050	$1,691,368
1991	0.039	$3,165,200		510.083376754	$1,836,300	$1,328,899
1992	0.007	$3,288,642	0.1125	564.807854991	$2,033,308	$1,255,334

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1957	0.066	$250,000	0.0323	0.000000000	$0	$250,000
1958	0.081	$266,500		1.014837201	$7,307	$259,193
1959	0.028	$288,087		2.062717950	$14,852	$273,235
1960	-0.002	$296,153		3.144718160	$22,642	$273,511
1961	-0.004	$295,561		4.261948777	$30,686	$264,875
1962	0.013	$294,378	0.0712	5.415556916	$38,992	$255,386
1963	0.008	$298,205		6.840803462	$49,254	$248,952
1964	0.045	$300,591		8.369334044	$60,259	$240,332
1965	0.057	$314,118		10.008634000	$72,062	$242,055
1966	0.102	$332,022		11.766728663	$84,720	$247,302
1967	0.090	$365,888	0.0221	13.652228674	$98,296	$267,592
1968	0.113	$398,818		14.965746986	$107,753	$291,065
1969	0.092	$443,885		16.308453728	$117,421	$326,464
1970	0.082	$484,722		17.680997510	$127,303	$357,419
1971	0.052	$524,470		19.084041359	$137,405	$387,064
1972	0.082	$551,742	0.0892	20.518263034	$147,731	$404,011
1973	0.215	$596,985		23.430429910	$168,699	$428,286
1974	0.271	$725,337		26.608153051	$191,579	$533,758
1975	0.117	$921,903		30.075648147	$216,545	$705,358
1976	0.119	$1,029,765		33.859339081	$243,787	$785,978
1977	0.049	$1,152,308	0.1462	37.988059293	$273,514	$878,794
1978	0.051	$1,208,771		44.812588343	$322,651	$886,120
1979	0.103	$1,270,418		52.671329899	$379,234	$891,184
1980	0.120	$1,401,271		61.721012069	$444,391	$956,880
1981	0.125	$1,569,423		72.142114070	$519,423	$1,050,000
1982	-0.076	$1,765,601	0.2915	84.142465563	$605,826	$1,159,776
1983	0.062	$1,631,416		111.593689689	$803,475	$827,941
1984	-0.001	$1,732,563		147.630075909	$1,062,937	$669,627
1985	0.066	$1,730,831		194.936568539	$1,403,543	$327,288
1986	0.172	$1,845,066		257.037807862	$1,850,672	-$5,606
1987	0.173	$2,162,417	0.1026	338.560738668	$2,437,637	-$275,220
1988	0.179	$2,536,515		375.235538530	$2,701,696	-$165,181
1989	0.120	$2,990,551		425.722565907	$3,065,202	-$74,651
1990	-0.055	$3,349,418		460.569359886	$3,316,099	$33,318
1991	0.039	$3,165,200		510.083376754	$3,672,600	-$507,401
1992	0.007	$3,288,642	0.1125	564.807854991	$4,066,617	-$777,974

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1957	0.066	$250,000	0.0323	0.000000000	$0	$250,000
1958	0.081	$266,500		1.014837201	$10,960	$255,540
1959	0.028	$288,087		2.062717950	$22,277	$265,809
1960	-0.002	$296,153		3.144718160	$33,963	$262,190
1961	-0.004	$295,561		4.261948777	$46,029	$249,532
1962	0.013	$294,378	0.0712	5.415556916	$58,488	$235,890
1963	0.008	$298,205		6.840803462	$73,881	$224,325
1964	0.045	$300,591		8.369334044	$90,389	$210,202
1965	0.057	$314,118		10.008634000	$108,093	$206,024
1966	0.102	$332,022		11.766728663	$127,081	$204,942
1967	0.090	$365,888	0.0221	13.652228674	$147,444	$218,444
1968	0.113	$398,818		14.965746986	$161,630	$237,188
1969	0.092	$443,885		16.308453728	$176,131	$267,754
1970	0.082	$484,722		17.680997510	$190,955	$293,768
1971	0.052	$524,470		19.084041359	$206,108	$318,362
1972	0.082	$551,742	0.0892	20.518263034	$221,597	$330,145
1973	0.215	$596,985		23.430429910	$253,049	$343,936
1974	0.271	$725,337		26.608153051	$287,368	$437,969
1975	0.117	$921,903		30.075648147	$324,817	$597,086
1976	0.119	$1,029,765		33.859339081	$365,681	$664,085
1977	0.049	$1,152,308	0.1462	37.988059293	$410,271	$742,036
1978	0.051	$1,208,771		44.812588343	$483,976	$724,795
1979	0.103	$1,270,418		52.671329899	$568,850	$701,568
1980	0.120	$1,401,271		61.721012069	$666,587	$734,684
1981	0.125	$1,569,423		72.142114070	$779,135	$790,289
1982	-0.076	$1,765,601	0.2915	84.142465563	$908,739	$856,863
1983	0.062	$1,631,416		111.593689689	$1,205,212	$426,204
1984	-0.001	$1,732,563		147.630075909	$1,594,405	$138,159
1985	0.066	$1,730,831		194.936568539	$2,105,315	-$374,484
1986	0.172	$1,845,066		257.037807862	$2,776,008	-$930,943
1987	0.173	$2,162,417	0.1026	338.560738668	$3,656,456	-$1,494,039
1988	0.179	$2,536,515		375.235538530	$4,052,544	-$1,516,029
1989	0.120	$2,990,551		425.722565907	$4,597,804	-$1,607,252
1990	-0.055	$3,349,418		460.569359886	$4,974,149	-$1,624,732
1991	0.039	$3,165,200		510.083376754	$5,508,900	-$2,343,701
1992	0.007	$3,288,642	0.1125	564.807854991	$6,099,925	-$2,811,282

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1957	0.066	$250,000	0.0323	0.000000000	$0	$250,000
1958	0.081	$266,500		1.014837201	$14,614	$251,886
1959	0.028	$288,087		2.062717950	$29,703	$258,383
1960	-0.002	$296,153		3.144718160	$45,284	$250,869
1961	-0.004	$295,561		4.261948777	$61,372	$234,189
1962	0.013	$294,378	0.0712	5.415556916	$77,984	$216,394
1963	0.008	$298,205		6.840803462	$98,508	$199,698
1964	0.045	$300,591		8.369334044	$120,518	$180,073
1965	0.057	$314,118		10.008634000	$144,124	$169,993
1966	0.102	$332,022		11.766728663	$169,441	$162,581
1967	0.090	$365,888	0.0221	13.652228674	$196,592	$169,296
1968	0.113	$398,818		14.965746986	$215,507	$183,312
1969	0.092	$443,885		16.308453728	$234,842	$209,043
1970	0.082	$484,722		17.680997510	$254,606	$230,116
1971	0.052	$524,470		19.084041359	$274,810	$249,659
1972	0.082	$551,742	0.0892	20.518263034	$295,463	$256,279
1973	0.215	$596,985		23.430429910	$337,398	$259,587
1974	0.271	$725,337		26.608153051	$383,157	$342,179
1975	0.117	$921,903		30.075648147	$433,089	$488,813
1976	0.119	$1,029,765		33.859339081	$487,574	$542,191
1977	0.049	$1,152,308	0.1462	37.988059293	$547,028	$605,279
1978	0.051	$1,208,771		44.812588343	$645,301	$563,469
1979	0.103	$1,270,418		52.671329899	$758,467	$511,951
1980	0.120	$1,401,271		61.721012069	$888,783	$512,488
1981	0.125	$1,569,423		72.142114070	$1,038,846	$530,577
1982	-0.076	$1,765,601	0.2915	84.142465563	$1,211,652	$553,950
1983	0.062	$1,631,416		111.593689689	$1,606,949	$24,467
1984	-0.001	$1,732,563		147.630075909	$2,125,873	-$393,310
1985	0.066	$1,730,831		194.936568539	$2,807,087	-$1,076,256
1986	0.172	$1,845,066		257.037807862	$3,701,344	-$1,856,279
1987	0.173	$2,162,417	0.1026	338.560738668	$4,875,275	-$2,712,858
1988	0.179	$2,536,515		375.235538530	$5,403,392	-$2,866,877
1989	0.120	$2,990,551		425.722565907	$6,130,405	-$3,139,854
1990	-0.055	$3,349,418		460.569359886	$6,632,199	-$3,282,781
1991	0.039	$3,165,200		510.083376754	$7,345,201	-$4,180,001
1992	0.007	$3,288,642	0.1125	564.807854991	$8,133,233	-$4,844,591

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$3,600	
1957	0.066	$300,000	0.0323	0.000000000	$0	$300,000
1958	0.081	$319,800		1.014837201	$3,653	$316,147
1959	0.028	$345,704		2.062717950	$7,426	$338,278
1960	-0.002	$355,384		3.144718160	$11,321	$344,063
1961	-0.004	$354,673		4.261948777	$15,343	$339,330
1962	0.013	$353,254	0.0712	5.415556916	$19,496	$333,758
1963	0.008	$357,846		6.840803462	$24,627	$333,219
1964	0.045	$360,709		8.369334044	$30,130	$330,580
1965	0.057	$376,941		10.008634000	$36,031	$340,910
1966	0.102	$398,427		11.766728663	$42,360	$356,066
1967	0.090	$439,066	0.0221	13.652228674	$49,148	$389,918
1968	0.113	$478,582		14.965746986	$53,877	$424,705
1969	0.092	$532,662		16.308453728	$58,710	$473,951
1970	0.082	$581,667		17.680997510	$63,652	$518,015
1971	0.052	$629,364		19.084041359	$68,703	$560,661
1972	0.082	$662,090	0.0892	20.518263034	$73,866	$588,225
1973	0.215	$716,382		23.430429910	$84,350	$632,032
1974	0.271	$870,404		26.608153051	$95,789	$774,615
1975	0.117	$1,106,283		30.075648147	$108,272	$998,011
1976	0.119	$1,235,719		33.859339081	$121,894	$1,113,825
1977	0.049	$1,382,769	0.1462	37.988059293	$136,757	$1,246,012
1978	0.051	$1,450,525		44.812588343	$161,325	$1,289,199
1979	0.103	$1,524,501		52.671329899	$189,617	$1,334,885
1980	0.120	$1,681,525		61.721012069	$222,196	$1,459,329
1981	0.125	$1,883,308		72.142114070	$259,712	$1,623,597
1982	-0.076	$2,118,722	0.2915	84.142465563	$302,913	$1,815,809
1983	0.062	$1,957,699		111.593689689	$401,737	$1,555,962
1984	-0.001	$2,079,076		147.630075909	$531,468	$1,547,608
1985	0.066	$2,076,997		194.936568539	$701,772	$1,375,225
1986	0.172	$2,214,079		257.037807862	$925,336	$1,288,743
1987	0.173	$2,594,900	0.1026	338.560738668	$1,218,819	$1,376,082
1988	0.179	$3,043,818		375.235538530	$1,350,848	$1,692,970
1989	0.120	$3,588,662		425.722565907	$1,532,601	$2,056,060
1990	-0.055	$4,019,301		460.569359886	$1,658,050	$2,361,251
1991	0.039	$3,798,240		510.083376754	$1,836,300	$1,961,939
1992	0.007	$3,946,371	0.1125	564.807854991	$2,033,308	$1,913,063

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$7,200	
1957	0.066	$300,000	0.0323	0.000000000	$0	$300,000
1958	0.081	$319,800		1.014837201	$7,307	$312,493
1959	0.028	$345,704		2.062717950	$14,852	$330,852
1960	-0.002	$355,384		3.144718160	$22,642	$332,742
1961	-0.004	$354,673		4.261948777	$30,686	$323,987
1962	0.013	$353,254	0.0712	5.415556916	$38,992	$314,262
1963	0.008	$357,846		6.840803462	$49,254	$308,593
1964	0.045	$360,709		8.369334044	$60,259	$300,450
1965	0.057	$376,941		10.008634000	$72,062	$304,879
1966	0.102	$398,427		11.766728663	$84,720	$313,706
1967	0.090	$439,066	0.0221	13.652228674	$98,296	$340,770
1968	0.113	$478,582		14.965746986	$107,753	$370,829
1969	0.092	$532,662		16.308453728	$117,421	$415,241
1970	0.082	$581,667		17.680997510	$127,303	$454,364
1971	0.052	$629,364		19.084041359	$137,405	$491,958
1972	0.082	$662,090	0.0892	20.518263034	$147,731	$514,359
1973	0.215	$716,382		23.430429910	$168,699	$547,683
1974	0.271	$870,404		26.608153051	$191,579	$678,825
1975	0.117	$1,106,283		30.075648147	$216,545	$889,739
1976	0.119	$1,235,719		33.859339081	$243,787	$991,931
1977	0.049	$1,382,769	0.1462	37.988059293	$273,514	$1,109,255
1978	0.051	$1,450,525		44.812588343	$322,651	$1,127,874
1979	0.103	$1,524,501		52.671329899	$379,234	$1,145,268
1980	0.120	$1,681,525		61.721012069	$444,391	$1,237,134
1981	0.125	$1,883,308		72.142114070	$519,423	$1,363,885
1982	-0.076	$2,118,722	0.2915	84.142465563	$605,826	$1,512,896
1983	0.062	$1,957,699		111.593689689	$803,475	$1,154,224
1984	-0.001	$2,079,076		147.630075909	$1,062,937	$1,016,140
1985	0.066	$2,076,997		194.936568539	$1,403,543	$673,454
1986	0.172	$2,214,079		257.037807862	$1,850,672	$363,407
1987	0.173	$2,594,900	0.1026	338.560738668	$2,437,637	$157,263
1988	0.179	$3,043,818		375.235538530	$2,701,696	$342,122
1989	0.120	$3,588,662		425.722565907	$3,065,202	$523,459
1990	-0.055	$4,019,301		460.569359886	$3,316,099	$703,202
1991	0.039	$3,798,240		510.083376754	$3,672,600	$125,639
1992	0.007	$3,946,371	0.1125	564.807854991	$4,066,617	-$120,246

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$10,800	
1957	0.066	$300,000	0.0323	0.000000000	$0	$300,000
1958	0.081	$319,800		1.014837201	$10,960	$308,840
1959	0.028	$345,704		2.062717950	$22,277	$323,426
1960	-0.002	$355,384		3.144718160	$33,963	$321,421
1961	-0.004	$354,673		4.261948777	$46,029	$308,644
1962	0.013	$353,254	0.0712	5.415556916	$58,488	$294,766
1963	0.008	$357,846		6.840803462	$73,881	$283,966
1964	0.045	$360,709		8.369334044	$90,389	$270,320
1965	0.057	$376,941		10.008634000	$108,093	$268,848
1966	0.102	$398,427		11.766728663	$127,081	$271,346
1967	0.090	$439,066	0.0221	13.652228674	$147,444	$291,622
1968	0.113	$478,582		14.965746986	$161,630	$316,952
1969	0.092	$532,662		16.308453728	$176,131	$356,531
1970	0.082	$581,667		17.680997510	$190,955	$390,712
1971	0.052	$629,364		19.084041359	$206,108	$423,256
1972	0.082	$662,090	0.0892	20.518263034	$221,597	$440,493
1973	0.215	$716,382		23.430429910	$253,049	$463,333
1974	0.271	$870,404		26.608153051	$287,368	$583,036
1975	0.117	$1,106,283		30.075648147	$324,817	$781,466
1976	0.119	$1,235,719		33.859339081	$365,681	$870,038
1977	0.049	$1,382,769	0.1462	37.988059293	$410,271	$972,498
1978	0.051	$1,450,525		44.812588343	$483,976	$966,549
1979	0.103	$1,524,501		52.671329899	$568,850	$955,651
1980	0.120	$1,681,525		61.721012069	$666,587	$1,014,938
1981	0.125	$1,883,308		72.142114070	$779,135	$1,104,173
1982	-0.076	$2,118,722	0.2915	84.142465563	$908,739	$1,209,983
1983	0.062	$1,957,699		111.593689689	$1,205,212	$752,487
1984	-0.001	$2,079,076		147.630075909	$1,594,405	$484,671
1985	0.066	$2,076,997		194.936568539	$2,105,315	-$28,318
1986	0.172	$2,214,079		257.037807862	$2,776,008	-$561,929
1987	0.173	$2,594,900	0.1026	338.560738668	$3,656,456	-$1,061,556
1988	0.179	$3,043,818		375.235538530	$4,052,544	-$1,008,726
1989	0.120	$3,588,662		425.722565907	$4,597,804	-$1,009,142
1990	-0.055	$4,019,301		460.569359886	$4,974,149	-$954,848
1991	0.039	$3,798,240		510.083376754	$5,508,900	-$1,710,661
1992	0.007	$3,946,371	0.1125	564.807854991	$6,099,925	-$2,153,554

Year	Appr.	House	Mortgage	Accumulated		Remaining
		Price (hp)	Rate	Loan Balance (alb)		Equity
				accumulation factor	$14,400	
1957	0.066	$300,000	0.0323	0.000000000	$0	$300,000
1958	0.081	$319,800		1.014837201	$14,614	$305,186
1959	0.028	$345,704		2.062717950	$29,703	$316,001
1960	-0.002	$355,384		3.144718160	$45,284	$310,100
1961	-0.004	$354,673		4.261948777	$61,372	$293,301
1962	0.013	$353,254	0.0712	5.415556916	$77,984	$275,270
1963	0.008	$357,846		6.840803462	$98,508	$259,339
1964	0.045	$360,709		8.369334044	$120,518	$240,191
1965	0.057	$376,941		10.008634000	$144,124	$232,817
1966	0.102	$398,427		11.766728663	$169,441	$228,986
1967	0.090	$439,066	0.0221	13.652228674	$196,592	$242,474
1968	0.113	$478,582		14.965746986	$215,507	$263,075
1969	0.092	$532,662		16.308453728	$234,842	$297,820
1970	0.082	$581,667		17.680997510	$254,606	$327,060
1971	0.052	$629,364		19.084041359	$274,810	$354,553
1972	0.082	$662,090	0.0892	20.518263034	$295,463	$366,627
1973	0.215	$716,382		23.430429910	$337,398	$378,984
1974	0.271	$870,404		26.608153051	$383,157	$487,247
1975	0.117	$1,106,283		30.075648147	$433,089	$673,194
1976	0.119	$1,235,719		33.859339081	$487,574	$748,144
1977	0.049	$1,382,769	0.1462	37.988059293	$547,028	$835,741
1978	0.051	$1,450,525		44.812588343	$645,301	$805,223
1979	0.103	$1,524,501		52.671329899	$758,467	$766,034
1980	0.120	$1,681,525		61.721012069	$888,783	$792,743
1981	0.125	$1,883,308		72.142114070	$1,038,846	$844,462
1982	-0.076	$2,118,722	0.2915	84.142465563	$1,211,652	$907,070
1983	0.062	$1,957,699		111.593689689	$1,606,949	$350,750
1984	-0.001	$2,079,076		147.630075909	$2,125,873	-$46,797
1985	0.066	$2,076,997		194.936568539	$2,807,087	-$730,090
1986	0.172	$2,214,079		257.037807862	$3,701,344	-$1,487,266
1987	0.173	$2,594,900	0.1026	338.560738668	$4,875,275	-$2,280,374
1988	0.179	$3,043,818		375.235538530	$5,403,392	-$2,359,574
1989	0.120	$3,588,662		425.722565907	$6,130,405	-$2,541,743
1990	-0.055	$4,019,301		460.569359886	$6,632,199	-$2,612,898
1991	0.039	$3,798,240		510.083376754	$7,345,201	-$3,546,961
1992	0.007	$3,946,371	0.1125	564.807854991	$8,133,233	-$4,186,862