

**Case Study #5 – illustration of one exemplary Expense-Level Methodology that is used in order to determine how much a home would need to appreciate in value each year in order to offset the costs associated with owning the home.**

In order to illustrate the utilization of the expense-level methodology that is built into the Adkins Residential Home Valuation Analyzer, the following assumptions were utilized:

- The homeowner is single;
- The homeowner earns \$50,000 dollars per year;
- The homeowner is in the 28% federal income tax bracket;
- The homeowner is considering the purchase of the home for \$200,000 dollars;
- The homeowner is going to make a 5% down payment and obtain a 30-year fixed rate mortgage loan with an interest rate of 4.5%; and
- The homeowner will live in the home for seven years.

The assumptions used to conduct the expense-level analysis play a critical role in the analytical process. Therefore, the prospective home buyer must use assumptions that reflect his specific circumstances in order to be able to make a prudent home purchase decision.

### **Home Ownership Costs**

In order to facilitate the expense-level analysis, the Adkins Residential Home Valuation Analyzer allows the prospective home buyer to assess the following seven costs:

1. Home maintenance costs;
2. Homeowners insurance costs;
3. Private mortgage insurance costs;
4. Brokerage fees;
5. Closing costs;

6. Property taxes; and
7. Mortgage interest costs.

In order to incorporate these costs into the software application, the prospective home buyer needs to express each cost as a percentage of the home purchase price or in a specific currency amount. The Adkins Residential Home Valuation Analyzer provides narrative guidance in order to help the prospective home buyer determine the most accurate cost variables that he should utilize in order to facilitate the expense-level analysis. The assumptions used to conduct the expense-level analysis play a critical role in the residential real estate analysis. Therefore, the prospective home buyer must use assumptions that reflect his specific circumstances in order to be able to make a prudent home purchase decision.

### **Home Maintenance Costs**

Home maintenance costs include cash outlays for expenditures such as replacing the roof of the home, replacing the windows and doors, and replacing items such as the furnace, water tank, or air conditioner. In addition, home maintenance costs include ongoing expenditures for services such as pest control, lawn maintenance, home security, and house cleaning. In many cases, home maintenance costs are equivalent to 1% of the home purchase price. This expense amount equates into a cost of \$2,000 dollars. With this in mind, the price of the home would need to appreciate by 1.0% (\$2,000) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Homeowners Insurance Costs**

Homeowners insurance provides financial protection against potential fires, floods, hail, tornadoes, hurricanes, earthquakes, landslides, tsunamis, volcanoes, ice storms, and other events that the prospective home buyer may experience in his geographical locale. Homeowners insurance may cost 0.50% of the home purchase price. This expense amount equates into a cost of \$1,000 dollars. With this in mind, the price of the home would need to appreciate by 0.50% (1,000) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Private Mortgage Insurance Costs**

Homeowners typically have to purchase private mortgage insurance (PMI) when they do not make at least a 20% down payment to purchase the home. Homeowners pay the PMI insurance premium each year in order to help protect the mortgage lender against the potential of default on the outstanding debt service obligation. The cost for PMI insurance is not phased out until the homeowner has accumulated 20% equity in the home. In this analysis, it was assumed that the prospective home buyer would only make a 5% down payment and therefore would have to purchase PMI insurance at a rate that is equal to 0.55% of the home purchase price. This expense amount equates into a cost amount of \$1,100 dollars. With this in mind, the price of the home would need to appreciate by 0.55% (\$1,100) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Brokerage Fee Costs**

Brokerage costs are typically paid by the homeowner to a real estate agent for help associated with selling the home. In this analysis, it was assumed that the homeowner would pay the real estate agent a 6% brokerage commission and that this fee was built into the price in which the home is sold. Since this type of transaction cost is a one-time expenditure, the brokerage cost would need to be allocated over the estimated length of time the prospective home buyer is expected to own the home. For this analysis, the industry accepted time horizon of seven years was utilized. Therefore, by allocating the brokerage cost over this period of time, the cost for brokerage fees is equal to 0.86% of the home purchase price. This expense amount equates into a cost of \$1,714 dollars. With this in mind, the price of the home would need to appreciate by 0.86% (\$1,714) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Closing Costs**

Closing cost expenditures tend to be set as a fixed dollar amount. For this illustration, it was assumed that the prospective home buyer would pay a fee of \$3,000 dollars at the time the home is purchased. Assuming that the purchase price of the home was \$200,000 dollars,

closing costs would translate into an expenditure of 1.5%. Since this type of transaction cost is a one-time expenditure, closing costs would need to be allocated over the estimated length of time the prospective home buyer is expected to own the home. For this analysis, the time horizon of seven years was utilized. Therefore, by allocating closing costs over this period of time, the cost for this service is equal to 0.214% of the home purchase price. This amount equates into a cost of \$429 dollars. With this in mind, the price of the home would need to appreciate by 0.214% (\$429) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Property Tax Costs**

In 2014, the median property tax rate in the U.S. was approximately 0.93% of the home purchase price. Based on this amount, the home would need to appreciate by 0.93% in order to offset this expenditure. However, the current provisions set forth in the U.S. federal income tax code allow property tax payments to be deductible for the purpose of calculating taxable income. Assuming that the prospective home buyer is in the 28% federal income tax bracket, and that the purchase price of the home is \$200,000 dollars, the tax deduction provision would reduce the expense-level rate by 0.26%. The property tax deduction factor is determined by calculating the product of the amount paid for the home, the property tax rate, and the prospective home buyer's federal income tax rate, and then dividing the result by the purchase price of the home. Given this provision, the net impact associated with property taxes would require the home to appreciate by 0.93% less 0.26%. In this example, a 0.67% property tax cost equates into \$1,339 dollars. With this in mind, the price of the home would need to appreciate by 0.67% (\$1,339) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Interest Expense Costs**

For the purpose of this expense-level analysis, the assumption was made that a 30-year fixed rate mortgage loan was obtained with an interest rate of 4.5%, and that a loan in the amount of 95% of the home purchase price was borrowed by the prospective home buyer in order to

purchase the home. With this in mind, the cost of interest expense would require the home to appreciate by 4.24% in order to offset the cost of this expenditure as part of the expense-level analysis. This rate is determined by dividing the annual mortgage loan payment amount of \$8,487 by the home purchase price of \$200,000.

The interest expense on a mortgage loan is also tax deductible. This in turn would reduce the expense-level rate. With that said, the prospective home buyer should only include the portion of the income tax shield that is above the eligible federal income tax standard deduction amount. For this expense-level analysis, it was assumed that the prospective home buyer is single and eligible for a \$6,100 dollar federal standard income tax deduction. By factoring the standard deduction provision into the equation, the benefit of the interest tax shield would be reduced from \$8,487 dollars to \$2,387 dollars. This amount is simply determined by subtracting the standard deduction amount from the amount of interest expense that would be paid by the prospective home buyer in the first year. Based on this amount, the interest tax shield would reduce the expense-level rate by 0.33%. This amount is determined by multiplying the portion of the interest tax shield that is above the federal income tax deduction times the home owner's income tax rate of 28%, and then dividing this amount by the purchase price of the home. Given this provision, the net impact associated with interest expense would require the home to appreciate by 3.91%. With this in mind, the price of the home would need to appreciate by \$7,819 dollars (3.91%) in order to offset the cost of this expenditure as part of the expense-level analysis.

### **Total Impact of Home Ownership Costs**

Based on the expense-level methodology and assumptions that were utilized, the home would need to appreciate by 7.70% (\$15,402) during the first year after it is purchased in order to offset the costs associated with owning the home. Accordingly, total home ownership costs represent 31% of household income for the first year of a 30-year time horizon. This information is summarized in the table below.

<b>EXPENSE-LEVEL METHODOLOGY</b>		
<b>Home Expenditures</b>	<b>Cost As A Percent of Home Purchase Price</b>	<b>Dollar Cost Amount</b>
Maintenance Costs	1.00%	\$ 2,000
Homeowners Insurance	0.50%	\$ 1,000
Private Mortgage Insurance	0.55%	\$ 1,100
Transaction Costs (7 Yr. amortization)	0.86%	\$ 1,714
Closing Costs (7 Yr. amortization)	0.21%	\$ 429
Property Taxes (28% federal tax rate)	0.93%	\$ 1,860
Mortgage Interest Expense (fixed rate loan; 95% debt)	4.24%	\$ 8,487
<b>Subtotal</b>	<b>8.30%</b>	<b>\$ 16,590</b>
<i>Less</i>		
Mortgage Interest Tax Shield (single homeowner)	0.33%	\$ 668
Property Interest Tax Shield (28% federal tax rate)	0.26%	\$ 521
<b>Subtotal</b>	<b>0.59%</b>	<b>\$ 1,188</b>
<i>Results of Expense-Level Analysis</i>		
<b>Required Annual Home Appreciation Rate to Offset Home Ownership Costs</b>	<b>7.70%</b>	<b>\$ 15,402</b>
<b>Percent of Household Income (\$50,000)</b>	<b>31%</b>	

By utilizing the analytical methodology in the table above, the Adkins Residential Home Valuation Analyzer will generate the results of the expense-level analysis over a 30-year time horizon. The results of the comprehensive analysis are illustrated in the table below.

Month-Ending Period	Cumulative Home Ownership Cost	Annual Home Ownership Cost	Cost As A Percent of Home Price	Cost As A Percent of Household Income	Month-Ending Period	Cumulative Home Ownership Cost	Annual Home Ownership Cost	Cost As A Percent of Home Price	Cost As A Percent of Household Income
12	\$ 15,402	\$ 15,402	7.7%	31%	192	\$ 203,138	\$ 9,879	4.9%	20%
24	\$ 30,700	\$ 15,298	7.6%	31%	204	\$ 212,741	\$ 9,603	4.8%	19%
36	\$ 45,894	\$ 15,194	7.6%	30%	216	\$ 222,055	\$ 9,314	4.7%	19%
48	\$ 60,976	\$ 15,082	7.5%	30%	228	\$ 231,067	\$ 9,012	4.5%	18%
60	\$ 75,943	\$ 14,967	7.5%	30%	240	\$ 239,763	\$ 8,696	4.3%	17%
72	\$ 90,788	\$ 14,845	7.4%	30%	252	\$ 248,128	\$ 8,365	4.2%	17%
84	\$ 105,507	\$ 14,719	7.4%	29%	264	\$ 256,148	\$ 8,020	4.0%	16%
96	\$ 117,949	\$ 12,442	6.2%	25%	276	\$ 263,805	\$ 7,657	3.8%	15%
108	\$ 129,428	\$ 11,479	5.7%	23%	288	\$ 271,085	\$ 7,280	3.6%	15%
120	\$ 140,487	\$ 11,059	5.5%	22%	300	\$ 277,969	\$ 6,884	3.4%	14%
132	\$ 151,394	\$ 10,907	5.5%	22%	312	\$ 284,439	\$ 6,470	3.2%	13%
144	\$ 162,141	\$ 10,747	5.4%	21%	324	\$ 290,477	\$ 6,038	3.0%	12%
156	\$ 172,723	\$ 10,582	5.3%	21%	336	\$ 296,061	\$ 5,584	2.8%	11%
168	\$ 183,115	\$ 10,392	5.2%	21%	348	\$ 301,173	\$ 5,112	2.6%	10%
180	\$ 193,259	\$ 10,144	5.1%	20%	360	\$ 305,788	\$ 4,615	2.3%	9%

### Application of the Expense-level Methodology

Given the results of the expense-level analysis, the first two questions that the prospective home buyer should contemplate are:

- "What is the likelihood that the home will appreciate in monetary value at a rate that will offset the estimated costs associated with owning the home?"
- "What is the likelihood that the home will appreciate by the interest rate amount that is required to offset the estimated costs associated with owning the home?"

In order to answer these questions, the prospective home buyer should visit the Internet site for the Federal Housing Finance Agency in order to determine the historical home appreciation rates in his geographic locale. By analyzing historical home appreciation rates in his

community, the prospective home buyer can accurately assess the likelihood of the home appreciating in a manner that will offset the costs associated with owning the home.

In order to illustrate how to apply the expense-level methodology, assume that the prospective home buyer determines that homes in his community do not appreciate in value by 7.7% per year. With this information in mind, the prospective home buyer has numerous options that may allow him to make a prudent home purchase decision. First, if financially viable, he can make a larger down payment in order to negotiate with his mortgage lender a lower mortgage loan interest rate amount. Second, he can consider making a 20% down payment in order to eliminate the requirement of carrying private mortgage insurance. Third, he can undertake the real estate transaction without the assistance of a real estate agent. Fourth, he can find another mortgage lending institution that charges lower closing cost fees. By utilizing the analytical results derived by the Adkins Residential Home Valuation Analyzer, in conjunction with this methodology, the prospective home buyer will be in a much better position to make a prudent home purchase decision.

After the prospective home buyer has contemplated the answer to the first two questions above, the third question that he should consider is:

- “What is a prudent percentage of household income that should be spent each year in order to offset the seven costs associated with owning the home?”

In order to answer this question, the prospective home buyer should consider the traditional view that it is not prudent to spend more than 30% of household income. In this example, the calculated percentage of household income amount for the first year after the home is purchased is 31%. Therefore, given the expenses associated with this home purchase opportunity, the prospective home buyer should be very cautious about undertaking a home purchase agreement, because undertaking such a financial commitment will limit the amount of discretionary income that he has available for non-housing related expenses. Moreover, according to the results of the expense-level analysis, home expenses will be at or above the



maximum level of household income for six years, and these expenses will not decrease to 25% of household income until the eighth year after the home is purchased. Therefore, the prospective home buyer will likely want to undertake one of the four recommendations above in order to reduce his annual home ownership costs, or plan on living in the home for more than eight years. Nevertheless, by utilizing the Adkins Residential Home Valuation Analyzer, the prospective home buyer will be in a much better position to make a prudent home purchase decision.