Financial Decisions Project

There are two main types of mortgages: fixed rate and adjustable rate. A fixed rate mortgage has the same interest rate for the whole duration of the loan. They normally come in 10, 15, and 30 year increments. Fixed rate mortgages are normally more predictable than adjustable rate mortgages. However, the beginning rates are usually higher. Adjustable rate loans are much more unstable, because the rate will float between years. Some years may be higher than others, resulting in stress for homeowners if they did not leave enough room in their budget for higher mortgage payments. Adjustable rates are usually fixed for the first couple years and then become adjusted for the remainder of the loan. Most experts in the industry recommend a fixed rate mortgage because of its stability and reliability.

In this scenario, a 30-year fixed rate loan is taken out. The interest rate is 3.88 percent. $225,000 is borrowed. The interest rate was the national rate for April 15, 2012. The monthly payment is$1,058.68. The interest rate adds $156,123.73 to make the total paid $381,123.73.The monthly payment was determined by using the formula in Appendix A.

In 2011, the national mortgage rate was 4.91 percent for a 30-year mortgage. Using that rate for a 30-year loan of $225,000, an extra $136.82 would be paid each month. The total amount paid would be $49,257.38 more than if the interest rate was 3.88 percent. In 2007, the national mortgage rate was 6.5 percent for a 30-year mortgage. Using that rate for a 30-year loan of $225,000, an extra $363.47 would be paid per month. The total amount paid would be $130,851.37 more than if the interest rate was 3.88 percent. See Appendix B for sample calculations for the spreadsheet used to determine these values. The Federal Open Market Committee decides the mortgage rates. If rates go down and you are “stuck” at a higher rate because you have a fixed mortgage from before rates went down, you have the option to refinance. Refinancing is when a new mortgage is created from the existing balance of the current mortgage.

In this scenario, an income tax refund of $3,000 was collected and applied to the twelfth payment of the mortgage. With this addition of money to the payment, the end result is a savings of $6,112.46. This savings takes eight months off of the total payment time. Also, the eighth to last payment is only $415.63. That is a very good use of tax return funds because the savings are over double what is put in.

There are many ways to fall into the trap of bad financial decision making. If you take out a adjustable-rate loan you could be stuck paying big bucks because you did not realize the risk and only saw the interest rate was lower than a fixed-rate for the first few years. The amount of interest that was paid was surprising because it was almost as much as the original loan and that was not expected at all. People would decide to take these loans because they do not have enough money to pay for the house in full right away and need this length of the mortgage because of income levels. However, it might be better to put off purchasing a house or to purchase a less expensive house so the financial burden is not as much. There is a great future application for this; buying our own homes. When that time occurs, this is great information to have in order to figure out which is the best type of loan.

Appendices

Appendix A: Payment Amount Sample Equation

Figure 1. Payment equation

Figure 1 shows the equation used to determine monthly payments. The amount borrowed is multiplied by the monthly rate and one plus the monthly rate to the power of the total number of payments. That total is then divided by one plus the monthly rate to the power of the total number of payments minus one.

Appendix B: Spreadsheets

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Payment # | Unpaid Balance | Interest on Unpaid Balance | Payment Amount | New Balance |
| 1 | $225,000.00 | $727.50 | $1,058.68 | $224,668.82 |
| 2 | $224,668.82 | $726.43 | $1,058.68 | $224,336.58 |
| 3 | $224,336.58 | $725.35 | $1,058.68 | $224,003.25 |
| 4 | =E4 | =B5\*(0.0388/12) | =((225000)\*(0.0388/12)\*(((1+(0.0388/12))^360)))/(((1+(0.0388/12))^360)-1) | =B5+C5-D5 |

Figure 2. Formulas and Results for Question 1

In the figure shown above, the formulas used in making the excel sheet are presented. The original interest rate, the rate used in this problem, was 3.88 percent. The figure above also shows the numbers that the students received from using these formulas.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Payment # | Unpaid Balance | Interest on Unpaid Balance | Payment Amount | New Balance |
| 1 | $225,000.00 | $920.63 | $1,195.50 | $224,725.12 |
| 2 | $224,725.12 | $919.50 | $1,195.50 | $224,449.12 |
| 3 | $224,449.12 | $918.37 | $1,195.50 | $224,171.99 |
| 4 | =E4 | =B5\*(0.0491/12) | =((225000)\*(0.0491/12)\*(((1+(0.0491/12))^360)))/(((1+(0.0491/12))^360)-1) | =(B5+C5-D5) |

Figure 3. Formulas and Results for Question 2 Part 1

In the figure shown above, the formulas used in making the excel sheet are presented. The change in this problem was a different interest rate of 4.91 percent. The figure above also shows the numbers that the students received from using these formulas and the new interest rate.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Payment # | Unpaid Balance | Interest on Unpaid Balance | Payment Amount | New Balance |
| 1 | $225,000.00 | $1,218.75 | $1,422.15 | $224,796.60 |
| 2 | $224,796.60 | $1,217.65 | $1,422.15 | $224,592.09 |
| 3 | $224,592.09 | $1,216.54 | $1,422.15 | $224,386.48 |
| 4 | =E4 | =B5\*(0.065/12) | =((225000)\*(0.065/12)\*(((1+(0.065/12))^360)))/(((1+(0.065/12))^360)-1) | =(B5+C5-D5) |

Figure 4. Formulas and Result for Question 2 Part 2

In the spread sheet above, the interest rate was changed to 6.5 percent. The formulas used to get these results are shown above. Also results from the first through third months are shown.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Payment # | Unpaid Balance | Interest on Unpaid Balance | Payment Amount | New Balance |
| 1 | 225000 | =B2\*(0.0388/12) | =((225000)\*(0.0388/12)\*(((1+(0.0388/12))^360)))/(((1+(0.0388/12))^360)-1) | =(B2+C2-D2) |
| 2 | $224,668.82 | $726.43 | $1,058.68 | $224,336.58 |
| 3 | $224,336.58 | $725.35 | $1,058.68 | $224,003.25 |
| 4 | $224,003.25 | $724.28 | $1,058.68 | $223,668.85 |
| 5 | $223,668.85 | $723.20 | $1,058.68 | $223,333.37 |
| 6 | $223,333.37 | $722.11 | $1,058.68 | $222,996.81 |
| 7 | $222,996.81 | $721.02 | $1,058.68 | $222,659.15 |
| 8 | $222,659.15 | $719.93 | $1,058.68 | $222,320.41 |
| 9 | $222,320.41 | $718.84 | $1,058.68 | $221,980.57 |
| 10 | $221,980.57 | $717.74 | $1,058.68 | $221,639.63 |
| 11 | $221,639.63 | $716.63 | $1,058.68 | $221,297.58 |
| 12 | $221,297.58 | $715.53 | $4,058.68 | $217,954.43 |

Figure 5. Formulas and Results for Question 3

In the excel sheet shown above, the students received a tax refund which was used on their payment in the twelfth month. The interest rate was the original 3.88 percent. The formulas used to get these results and the results of the formulas are all shown above.

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