A Case Study of Paying Extra Principal on a Mortgage
Activity 4D3: Great Idea or 'Height of Foolishness'?
Activity Instruction Sheet (Rev 0.0)

Introduction: This is a brief case study investigating some of the practical pros and cons of paying extra principal on a typical 30-year mortgage. Depending on the real estate market in your particular area, you may wish to refer to the Home Loan Amortization activities: Activity **4D1** and Activity **4D2**.

Estimated Time for Completion: The total amount of time spent on the activity is fairly variable, approximately 1 to 3 hours depending on student access to technology, and his .her percentage of completion of Activities 4D1 and 4D2

Objectives:

1. To quantify, to some degree, the various pros and cons of paying extra on a loan.
2. To use spreadsheet financial functions such as **fv, pmt,** and **nper** in a brief case study.

Materials Required:

- Access to Microsoft Excel software.
- This Activity Instruction sheet.
- The file "**Pros and Cons of Paying Extra Financial Toolboxes.xls**" that includes several financial mini calculators as well as some commentary and background on "**Why the Negative"**?

Download Spreadsheet

Download the file "**Financial Toolboxes.xls**" which provides you a collection of several mini financial calculators and a worksheet on the role of the negative.

Activity Overview: This activity is self-driven. One possible idea would be to make a table and make ideas on the realistic pros and cons. The activity analysis table lends some mathematical structure and makes for a great discussion on the two different investment strategies taken by the Thomas and Jefferson families. Also, it is beneficial to point out the advantages of refinance opportunities that offer lower APRs, rather than merely paying extra amounts on an original mortgage over the term of the loan.

Scenario	Pros	Cons
Thomas Family (doesn't pay extra , but instead, invests it over the 30 years of the mortgage)		
Jefferson Family (does pay extra, pays off loan sooner, and then investa the combined payment for the balance of the 30 years)		

Before you begin:

Review the loan basics in unit 4D of your textbook regarding the payment formula and the roles that interest and principal play in an amortization. Then carefully read the following pieces of advice written by two different nationally syndicated financial columnists: Sharon Epperson and Bruce Williams, regarding paying extra principal on a mortgage:

- **Sharon Epperson**   from Money Smart of USAWeekend.com

    Pay mortgage early?

    Q: My husband and I are 49 and 48 and are paying extra on our mortgage to have it paid off by the time we're 56. My friend says that will hurt us on our taxes; my husband says it is better to save the money in interest now than to worry about a mortgage tax deduction later. What is your take? S.R.Sheboygan,Wis.

    A: You married a smart man, paying off your mortgage early will save thousands of dollars, and you'll get a reliable rate of return on your investment (you save the interest you would have paid on your mortgage). Yes, you'll lose the mortgage interest tax deduction when that happens. But if you're in 25% tax bracket, for example, you'd only get back a quarter for each $1 in interest you pay—not such a big break. If you're debt-free and maxing out your 401 (k) and IRAs, which offer tax breaks, paying up early isn't a bad idea.

    Source: http://www. Usaweekend.com/08 issues/080511/ 080511 thinksma!1-mortgage-broadway-tickets.html   (Posted May 11, 2008).

- **Bruce Williams**   from Smart Money

Q: Dear Bruce. I have a friend who says that you often advise that is not wise to pay off a mortgage in advance. Could you tell me in one paragraph why this is a bad idea? It seems to me that being debt-free is a goal worth working toward. – L.H. Syracuse, N.Y

A: Dear L.H.: In a nutshell, the cheapest money that you can borrow is against a first mortgage on your primary residence. Generally speaking, it is in a sub-7 percent range today. It is not too difficult to earn substantially more than that in the marketplace, so why pay off the loan early and settle for an effective return of below 7 percent? You could invest this money elsewhere at a far better return. In addition, if you itemize the interest that you are paying on the home loan, it becomes a deductible item. To me, it's a no-brainer. For younger people to pay off a mortgage early is, in my opinion, the height of foolishness. When you get into your 60s and idea of having your home paid for outdistances the need for return, I have no objection.

Source: "Should 35-year-old save for down payment or retirement?" Post Register, July 19, 2003.

Procedure:
In our brief case study, we assume the Thomas and Jefferson families have identical mortgages (**30**-year term, fixed-rate **6%** APR, and a loan amount of **$175,000**). The Thomas family will not pay extra but the Jefferson will. Follow the steps below prior to your analysis.

1.   Using the Payment mini calculator of the Financial Toolboxes spreadsheet, calculate the mortgage payment (the same for both families).

            Required Monthly Payment = $_____

2.   Assume that the Thomas will make only the required mortgage payment. The Jeffersons, however, would like to pay off their loan early. They decide to make the equivalent of an extra payment each year by adding an extra **1/12** of the payment to the required amount. Complete the following calculations to find what they plan to pay each month:

(a)   **1/12 of the required monthly payment = $_____**

(b)   By adding this **1/12** to the required payments, the Jefferson's plan to pay:

            $ _____ of each month

3. The Thomas will take the full **30** years to pay off their loan, since they are making only the required payments. The Jefferson's extra payment amount, on the other hand, will allow them to pay off their loan more rapidly. Use the Years mini financial calculator of the Financial Toolbox spreadsheet to calculate the approximate number of years (nearest 10th) it would take the Jefferson's to pay off their loan.

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Number of years to payoff loan = _____

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Analysis:

For the **Thomas Family**:
Assume that they could afford to make the same extra payments as the Jeffersons, but instead they decide to put that money (#2a. from Procedures above) into a savings plan called an annuity. Use the Future Value mini financial calculator of the Financial Toolbox spreadsheet to calculate how much they will have in their savings plan at the end of **30** years at the various interest rates. Write your answers (to the nearest dollar) in the appropriate cells of the table below.

For the **Jefferson Family**:
Assume that they save nothing until their loan is paid off, but then after their debt is paid, they start putting their monthly payment and **1/12** (#2b. from Procedures above) into a saving plan. The time in months they invest is equal to **360** months minus the number of months needed to pay off the loan (#3 from Procedures above) multiplied by **12**. Use the Future Value mini financial calculator to calculate how much they will have in their savings plan at the various interest rates. Write your answers (to the nearest dollar) in the appropriate cells of the table below.

Thomas Family		Jefferson Family	
1/12th Of Monthly Payment _____		Monthly Payment + Extra 1/12th_____	
Rates	Annuity Amount in 360 Months:	Rates	Annuity Amount in _____ Months
0%		0%	
1%		1%	
2%		2%	
3%		3%	
4%		4%	
5%		5%	
6%		6%	
7%		7%	
8%		8%	

Discussion:

1.   What generalizations can you make from the annuity amounts reflected in the analysis table above with regards to the different strategies taken by the families? That is, from a purely financial aspect of the calculations in your table what generalizations could you make regarding the two different strategies?

2.   What assumptions may not necessarily be valid for a typical family regarding both the loan rate and savings plan rate?

3.   Discuss some basic pros and cons to these two very different approaches the Thomas and Jefferson families made with their extra monthly payment. Consider various ideas such as possible changes in the family's employment situation, market performance, tax deductions, etc.

4.   Comment on the merits of the advice you read from the two financial columnists.

5.   Note the dates of the advice columns. How might market performance figure in to their advice they gave at that time?

6.   Why do you think Sharon Epperson's advice at the end specifically calls attention to an assumption of whether you are "debt-free and maxing out your **401(k)** and **IRAs**?"

7.   If you were to pay extra principal on a mortgage, when is the best time to do it (early or later in the loan process) and why?

8.   When you pay extra principal on a loan, describe whether you feel you are actually earning interest on that money or not. That is, how does the old adage "**a penny saved is a penny earned**" apply in this context?

9.   Rework your calculations using a different starting interest rate for the mortgage and/or a different extra payment amount. Do these changes affect any of the generalizations you have made above? Explain.