Professor Crocker H. Liu
Real Estate Finance

Revised: September 24, 2002

Problem Set 2: *Housing Affordability*

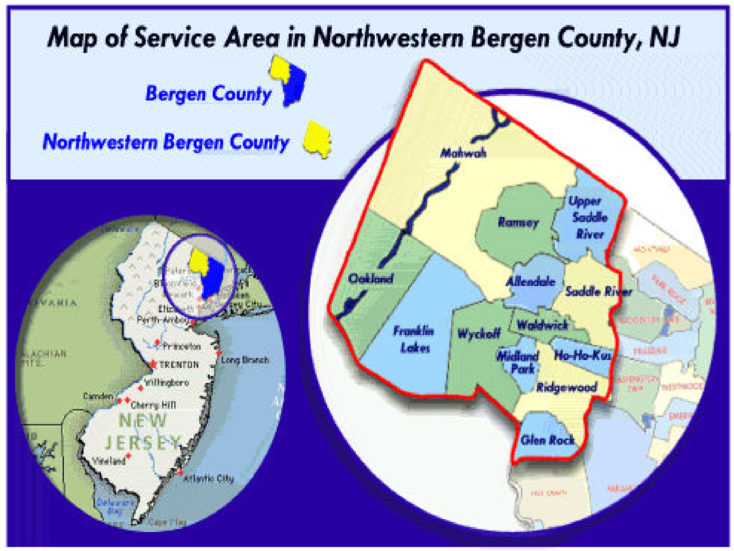
Objective: The objective of this assignment is to introduce students to the process of purchasing a home from a lender's perspective. This includes but is not limited to preparing amortization tables and qualifying the buyer.

Assignment: Please download the spreadsheet Affordability2003.xls from my website and answer the following questions. Please highlight your answers in yellow and turn in a hard copy of your results together with your spreadsheet on a disk. Please print your name clearly on the disk and scan the disk for viruses. ***This is an individual assignment***.

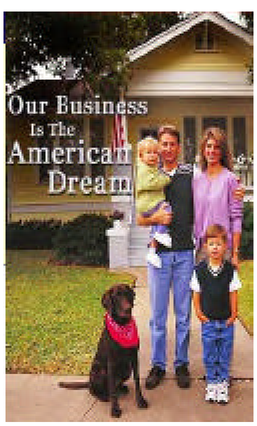
The Listing: The house is a center hall colonial located in Bergen county, NJ and has the following features

Address:	Oradell, NJ 07649
MLS#:	2221731
Asking Price:	$380,000
Property Size:	100 x 80 feet (8,000)
Taxes per Year:	2% of total assessed value
Insurance per Year:	$2 per $1000 of sale price
Bedrooms	3
Baths	1.5
Basement:	Full unfinished laundry area
Garage:	Two car, attached
Features:	Large level property. Great update and expansion potential. Features include new roof, newer windows, and central air conditioning (CAC)
Schools:	River Dell Regional High School

Description of Oradell: The of Oradell, located in Northern New Jersey, has a population of 8,024 and 57 miles of roads. Covering 2.4 square miles, there are 8 public parks. Oradell was one of Bergen County's Dutch settlements that still has some of its early stone houses, particularly along Kinderkamack and Paramus roads. The railroad station dates to 1890. In a converted late-19th-century firehouse, the Bergen County Players, a community group founded in the early 1930s, presents eight shows each season. Oradell is the hometown of Walter Schirra, the astronaut who orbited around the earth six times in 1962, Oradell is also the home of the Hiram Blauvelt Art Museum, an unusual museum devoted to a personal collection focusing on wildlife. Among the holdings is a rare Audobon edition. The median income of families living in Oradell is $111,658. Married Households comprise 71.7% of all households while there are 32.8% households have children.



Loan Information: Loan rates are found in the worksheet labeled "Loan Rates". These rates are current (as of September 20, 2002 when this case was constructed) and are the rates that you will use in this assignment. The current and historical loan limit on the size of single-family home mortgages that Fannie Mae and Freddie Mac buys from banks is located in the worksheet named "FNMA Conforming Loan Limits". Mortgages that fall within these government sponsored enterprises (GSE) purchase limits are called conforming loans and are cheaper for consumers[1] because banks and thrifts can readily sell them to Fannie Mae and Freddie Mac or swap them for mortgage-backed securities. The GSEs are able to provide a lower cost largely because their government affiliation allows them to borrow at a lower rate than other finance companies. Fannie Mae and Freddie Mac sell large amounts of bonds and other debt securities and use the proceeds to finance their purchases of home mortgages. Loans that exceed the Fannie Mae/Freddie Mac loan limits are known as non-conforming or Jumbo loans.



Other Loan Criteria of the Lender: Like other lenders, your financial institution requires that buyers must purchase private mortgage insurance (PMI)[2] if they put down less than 20% of

[1]Mortgages bought by Fannie Mae and Freddie Mac typically have a rate about 0.30 percentage points lower than loans they are not eligible to buy.
[2]For more information on private mortgage insurance, please visit the industry's website at http://www.privatemi.com/

the purchase price of the home. Currently PMI is .0050 or ½ of 1% of the outstanding loan balance. The buyers are required to maintain their PMI until their loan balance is less than 80% of the contract sales price of the home. (Note: Unless the borrower terminates PMI when the 80% balance is reached, the borrower continues to pay PMI). Any loan whose contract loan amount exceeds the Fannie Mae/Freddie Mac loan limits is considered a Jumbo loan. Borrowers are required to set up an escrow account, which includes principal, interest, property taxes, and insurance, for 3 months.[3] This escrow amount is included in the total closing costs, which is discussed below. The bank requires that all points and fees be paid in cash (this is part of the total closing costs) rather than rolled into the mortgage e.g., the bank will not finance the points and fees by increasing the mortgage amount. The bank uses the following ratios in qualifying the homebuyer:

Housing Expense-to-Gross Income Ratio: 28%
Long Term Debt-to-Gross Income Ratio: 36%

where

Monthly housing expenses: The sum of monthly payments for principal, interest, property taxes, hazard insurance, private mortgage insurance (if required), and condo or homeowner's fees (if required).

Monthly Debt Payments: The sum of monthly payments on long-term debt, including car payments, student loan payments, and other personal loans requiring a periodic payment. Include your minimum monthly payment required on credit card balances carried over from month-to-month; but do not include credit card balances that you pay off entirely each month. Also, do not include your current mortgage payment if you are selling that property.

Gross Income: household's total monthly income before taxes. Alimony and child support payments, whether incoming or outgoing, should be reflected in the estimate.

In evaluating the income/salary of the borrower(s), the bank you work for WILL NOT count any bonus money due to its uncertain nature and frequency of payment (usually a lump sum payment rather than monthly payments).[4] In terms of necessary documentation, the bank requires 3 years of income tax returns, together with one year of receipts for the payment of utilities (phone, water, and electric/gas).

[3]The rationale for this escrow account is in the event that a homebuyer loses his or her job. Time is required to find a new job.

[4]Lenders typically include the bonus in the household income if: 1) The bonus is part of a collective bargaining agreement and must be paid; or 2) The bonus is included in the computation of income by the employer or if there is a history of bonuses. If there is a history of bonuses but the applicant does not know if a bonus is planned, nor does the employer divulge its plans for a bonus nor the projected bonus amount, the lender typically uses an average of past two years' bonuses to calculate income. A bonus history for compliance purposes is to be considered one year or more. However, the bonus is NOT included in household income if the bonus is totally discretionary by the employer, there is no previous bonus history, and the wages of the applicant are the basic source of income.

Closing costs: Closing costs are one-time fees paid at closing for the loan and expressed as a percentage of the mortgage amount. This *includes* points and origination fees paid to the lender and transfer fees required to complete the transaction. Assume that the total closing costs (including points and origination fees) are 3% of the contract loan amount. Note: You should ask your lender for a copy of the "Good Faith Estimate of Closing Costs" which itemizes fees commonly charged in your area. These fees include but are not limited to appraisal fees ($305 average), credit report ($37), application fee ($288), document preparation fee ($186), and flood certification ($18) among others. Closing costs to the buyer typically do not include the realtor's commission, which is paid by the seller, in general.

The Homebuyers: John Peterson and his wife, Penelope, are recent graduates of the Stern School of Business at New York University. Both have an undergraduate degree in Finance. John has been employed as an equity analyst at Moody's for 3 years and earns $80,000 per year of which his base pay is $55,000 and the rest constitutes his bonus. Penelope works for J.P. Morgan and earns $125,000 a year of which $60,000 represents her base pay. She has worked at JPM for 3 years. The couple has no children. They have $90,000 in savings of which they wish to spend no more than $75,000 for a downpayment + closing costs on a house. The couple has one car, a Saturn, which they just purchased on a 4-year lease. Lease payments are $150 per month. They also have a $2000 balance on their credit card on average that they carry over from month to month and for which they typically make payments of $50 per month. In addition to this, they both have student loans outstanding. Payment on the student loans is $1,000 per month of which John and Penelope each pay $500. The outstanding balance on their student loans combined is $20,000. Each has an outstanding balance of $10,000 on their student loan. This is the first marriage for both of them. They have no other debts outstanding.

The Petersons have already seen the house in Oradell and want to make an offer on the house. They have come to your firm for financing.

1. Amortization Table (Base Case): If the Petersons put down a 20% of the purchase price (1 - Loan to Value Ratio) and want a 30 year fixed rate mortgage, what will their monthly payments be?

   a. Using Excel, construct a 360-month amortization table showing the beginning balance, debt service payment, interest payment, principal payment, and ending balance.

   b. Next, graph the interest payments and principal payments using the charting function in Excel. Explain why interest is declining and principal is increasing over time.

   c. On another graph, plot the outstanding mortgage balance over time. Explain why the outstanding mortgage balance is declining over time.

2. Annual Percentage Rate (APR): Given the facts in question #1, what is the true borrowing cost? Recall that the lender's IRR is equal to the true borrowing cost. Hint: you might have to put in a guess value such as .001 in order to calculate the IRR. Remember that this IRR is a monthly IRR and as such, you will need to multiply it by 12 in order to obtain the APR. Since there are points and loan origination fees, your APR should *exceed* the contract interest rate.

3. Amount of Money Required by Borrowers (Base Case): What is the total amount of money including closing costs that the Petersons must come up with given the facts in question #1?

4. Qualification of Buyers: What are the total long-term debt payments per month for the Petersons given the facts in question #1 above? What is the monthly housing expense e.g., principal, interest, property taxes, and property & casualty insurance per month given the facts in question #1 above? Assume that total assessed value will initially equal the purchase price of the property. Based on your bank's housing expense-to-total gross income ratio and the long-term debt-to-total gross income ratio, do John and Penelope Peterson qualify for the mortgage?

5. Alternative Strategy: John's cousin, Norm Peterson, suggests that the Petersons bargain with the seller on the purchase price since the price is negotiable. Based on his talks with the seller (he is a drinking buddy of the husband), the seller would be willing to let the house go for $375,000. In addition to this, Norm recommends that John and Penelope put down 10% instead of 20%, they pay off Penelope's student loan and they pay in full the outstanding credit card balance of $2,000. What is the total mortgage payment per month under this scenario? Does the monthly mortgage payment remain constant over time or does it fluctuate? Please discuss. Using Excel, construct a 360-month amortization table showing the revised payment schedule. Hint: There should be an extra column in your amortization schedule. Would the Petersons qualify for the loan under this scenario? Why or why not?

6. Creative Financing: Their realtor, Robin Reese, upon hearing about Norm's suggestion, agrees that the Petersons put in an offer for $375,000. She also agrees that they put 10% down, pay off Penelope's student loan, and pay off their VISA balance of $2,000. However, she suggests that the Petersons should consider taking out a 5/1 hybrid loan. She explains that under this type of loan, the contract rate of interest is fixed for the first 5 years. It is "as if" they have a fixed rate loan (with the monthly payment calculations the same as taking out a 30 year fixed rate loan) for 5 years. After five years, the loan converts to an adjustable rate mortgage wherein the rate adjusts annually based either on the COFI or treasury rate depending on the index that they choose. She argues that not only would the interest rate be relatively lower but also the Petersons can refinance/rollover the mortgage at the end of 5 years into a fixed rate mortgage. Given the trend in current interest rates (as of September 23, 2002) she feels that this is a

reasonable strategy. What is the total mortgage payment per month for the first 5 years under this scenario? What are the total long-term debt payments per month? What is the monthly housing expense? What are the total housing expense-to-gross income ratio and the long-term debt-to-gross income ratio if the Petersons follow the realtor's suggestion? Do the Petersons qualify for the mortgage? Please discuss.

7. Buying Down the Loan: John and Penelope let both sets of parents know about their plans to buy a house as well as the financing suggestions by Norm and Robin. The parents propose a third alternative. They like all of the realtor's ideas except taking out a 5/1-hybrid loan. Both fathers claim that the more creative the financing, the more creative the default. As such, they suggest that John and Penelope buy down the loan for 5 years to a contract interest rate of 5%. Their rationale is that at the end of 5 years, both John and Penelope should be earning a higher salary and should thus be in a better position to cover the mortgage payments. This is essentially a graduated payment mortgage with one step or gradation. How much must John and Penelope pay to the lender in order to buy down the loan[5]? Do the Petersons qualify for the mortgage based on the initial payments from the buydown? In particular, what is the total housing expense-to-gross income ratio and the long-term debt-to-gross income ratio based on the initial payments from the buydown?

Reminder: This is an individual assignment. Please turn in a hardcopy of your printout with the answers highlighted in yellow. Also, turn in your disk with your name printed clearly on the disk. Please scan your disk for viruses.

[5] The tax law currently allows an individual to gift up to $10,000 per individual per year.