Housing

Be it ever so humble, there's no place like home.

John Howard Payne (1791–1852)

Property is desirable. It is a positive good in the world.

Abraham Lincoln (1809–1865)

Once the housing market begins to recover,
I would phase out the mortgage tax deduction.

Joshua A. Tucker

A strong housing market is the engine of economic recovery.

Ben Bernanke (1953–)

The American dream of owning a home turned into a nightmare for many in 2008 and 2009. Some households have been so severely hurt by the economic downturn that it will take years for them to recover and, perhaps, their retirement is now only a vague dream they once had. Yet, other households had their financial house in order and were able to weather the storm while prices stabilized. In many cases, those people took advantage of the downturn and purchased real estate as an investment. In many markets, prices now exceed what they were at the height of the bubble; while, in others, they still languish. One thing that we have learned from the Great Recession is that households need to better understand economics, markets, and financial products. We are also reminded of the toll taken when excess greed dominates sound financial principles.

It is interesting to observe how today's young adults were affected by the market downturn. We find them less likely than previous generations to want to purchase a home, even with low interest rates and a continuation of the tax deductibility of home mortgage interest. Coincidentally, we also find them less likely to buy a car as they are moving to multifamily housing in the core of many of America's cities. One thing is for certain, markets change and there are still many who want to own a home as a means of establishing their identity and to have an ownership interest in their communities. We will begin with trying to understand the reasons to help direct us through the home purchase versus rental housing decision.

RENTING VERSUS BUYING A HOME

Rental Housing

Advantages:

- More flexibility to move quickly, if the need arises
- If moving to a new area, renting allows you time to become familiar with the area before purchasing a home
- Costs are initially low
- Most unexpected repair expenses are paid by the landlord

Disadvantages:

- At the end of a lease, you may have to move
- At the end of a lease, you may face rent increases
- A neighborhood of rentals can be unstable
- Lack of freedom to remodel, as in major structural projects
- Less privacy
- Indirectly pay property taxes and mortgage interest with no tax benefit

Types of Leases

- Verbal lease—Month to month legal agreement. Either party can change the agreement with 30 days notice prior to the next anniversary of the agreement.
- Time lease—Most tenants prefer a time lease. A time lease prohibits price increases in rent during the time of the lease.
- Gross lease—Most rentals of houses and apartments use a gross lease. With a gross lease, the tenant pays monthly rent and the landlord pays property taxes, some utilities, repairs, and fire insurance.
  - Net lease—Tenant has to pay some of the above-mentioned landlord expenses.
  - Triple net—Tenant pays all expenses.
- Discount lease—Tenant receives a discount for performing some tasks, such as first $50 in repairs or by providing property management for a multifamily structure.

Buying a Home

Advantages:

- Mortgage payments are a form of forced savings (i.e., the house is viewed as an investment)
- Sociopsychological advantages of ownership
- Freedom to improve or modify the home
- Financial and geographic commitment
- Privacy

Disadvantages:

- High initial cost (closing costs + down payment)
- Commitment of time/money to maintain/repair the home/yard
- Cost to replace/repair appliances and other capital equipment
- Less flexibility to quickly relocate

STEPS OF BUYING A HOME

1. Carefully prepare and examine your monthly budget to determine how much you can spend on housing (principal + interest + taxes + insurance + maintenance).
2. Go to a lender (bank, credit union, savings and loan) and **prequalify** for a loan. In this process, the lender will help you determine how large of a loan you can reasonably expect to receive. This is a very healthy "reality check" and banks welcome working with you on this, as they want good customers. Once you have your budget figured out (step #1) and you are pre-qualified for a loan (step #2), you are ready to go house hunting in neighborhoods that you can afford!
3. Select the home you would like (and can afford) to purchase. Contact the seller of the home, either through a realtor or directly.
4. Make a written offer of purchase price to the seller, with a statement of your intent to make an earnest money deposit. It is often the case that a larger earnest money deposit will signal a greater desire to purchase the home. If the seller accepts the offer and all terms of the contract are met, and you "change your mind," you lose your earnest deposit. Obviously, you should not casually make an offer to purchase a home if you have no serious intention of actually buying the home.

   Important contract items:
   - If the buyer needs to move in before the settlement date, or the seller needs to remain after the settlement date, the typical rental agreement is a triple net lease.
   - Make the sale contingent on your ability to obtain a mortgage loan with terms (interest rate, length, amount of loan) that are acceptable to you.
   - State what items actually sell with the house (such as drapes, appliances, etc.). If it is not affixed with nails, screws, or glue, it may not be included.
   - Specify who pays for repairs if a structural inspection reveals defective construction (leaky basement, sagging roof, water damage) or mechanical equipment (e.g., furnace, water heater, appliances, etc.)
5. The seller may or may not accept your initial offer. If your offer is not accepted, the seller may counteroffer with a price that is greater than your offer but, perhaps, less than the original asking price. It is possible that you may want to offer more than the asking price, if markets are moving quickly or you perceive they are asking too little for the home. Of course, there may be a good reason they are asking less so do not forget one of the lessons of home buying, "If you buy in haste, you can repent at leisure." Negotiating the price is a process that may take two or three iterations. For example, you find a home you like and it is listed at a price of $179,000. You submit a written offer to the seller of $168,000. The seller counters with a price of $174,000. You "counter" with $171,500. Eventually you both agree on a price of $173,000.
6. Once the contract has been agreed on, both parties (buyer and seller) sign it. Along with the signed contract you now make an earnest money deposit. An earnest money deposit is held in escrow to be given to the seller if you back out of the contract. It is an indication of your seriousness to purchase the home. If you actually purchase the home, the earnest money is applied toward the purchase price. If you decide that you do not want to buy the home, you lose your earnest money unless the reasons for your change of heart are specified in the contract.
7. At this point, you (as the buyer) need to go mortgage loan shopping. Oftentimes, people shop for a loan before making an offer on a home. In this way, the period of time between signing a contract and "closing" is shortened. Closing refers to the actual transfer of property. This occurs when the seller and buyer, along with an attorney and/or loan officer, meet and sign all the necessary documents to seal the deal. Once you "close on a home," it becomes your legal property.

TYPES OF HOUSING

Single-family housing: One house on one lot. This is what most people envision, when they think about buying a home. Yet, there are many other options.

Duplex: Two dwellings under the same roof, but the two residences are considered to be one legal parcel of land. Two family units are in the structure but there is one owner for the lot. Many young people get their "start" in housing by owning a duplex and living in one side, while renting the other. This covers much of the mortgage costs and may allow them to save faster for a single-family home, while getting their start in real estate investing.

Split-lot duplex: A lot with two dwellings under the same roof, but the lot is legally divided (split) into two separate legal parcels.

Condominiums: You own your housing unit and you also own an undivided interest in the surrounding property to your housing unit, the common property. You are required to pay a fee for the maintenance of the surrounding property to the condominium owners' association.

Before you buy a condominium:

- Understand the rules regarding resale and renting of the condominium.Check the budget of the condominium owners' association. Make sure it is adequately managed to pay for known future repairs, such as paving the parking lot, as well as unknown issues.
- A sinking fund should exist for known maintenance repairs in the future. If not, you will be billed.
- Know the insurance policy of the association and share a copy with your insurance agent to ascertain it adequacy.

Cooperatives: Cooperatives often look like condominiums. The difference between the two is that the mortgage is with the cooperative, rather than with each unit. You also must "buy in" to the cooperative mortgage. Your share of assessments, operating costs, and property taxes are all paid to the cooperative. However, your portions of the cooperative's taxes and interest are tax deductible to you.

Mobile homes: Price is the attraction, but mobile homes have a history of depreciating. As such, they are often taxed by counties as personal property rather than real property. Moreover, lenders will typically charge higher rates on mobile home loans.

COST OF HOUSING

The monthly cost of housing, in the form of a mortgage payment, is typically 25%–40% of the household budget. The Federal Housing Administration (FHA) allows homeowners to pay up to 29% of their income toward their home mortgage and 41% toward the sum of their mortgage payment and other household debt.

The following table shows the costs of home ownership by region in America. In the next table, there is a summary list of the cost of housing in different U.S. cities during 2009 and 2013.

As can be seen from the tables on the following pages, the difference in the cost of housing is very large based on where you live. Consider the difference in the median-priced home between Lima, Ohio and San Francisco, California. The monthly mortgage payment for a home costing $779,000 in San Francisco (assuming a 20% down payment, 30-year loan, 5% interest rate) would be $3,345 per month. The monthly mortgage payment for a home in Lima costing $96,000 (assuming a 20% down payment, 30-year loan, 5% interest) would be $412. A monthly difference of nearly $2,933! (If Lima, Ohio was a good enough location for Ben Roethlisberger to be reared, it might be good enough for you!)

Median Prices of Existing Single-Family Homes

Year	U.S.	Northeast	Midwest	South	West
2000	139,100	139,500	123,600	128,200	183,400
2005	219,000	281,600	168,300	181,100	340,300
2006	221,900	280,300	164,800	183,700	350,300
2013	197,100	249,100	154,600	170,700	273,100
April 2014	201,700	244,000	157,2000	173,200	291,000
Percentage Change from 2013 to 2014	5.2%	−0.4%	5.8%	3.2%	9.7%

Source: National Association of Home Builders
New and Existing Single-Family Home Prices by Region: http://www.nahb.org and www.realtor.org

Cost of Housing in Various U.S. Cities as of December 2009 / 2013

Metro Area	2009 Percentage of Homes Affordable for Median Income	2009 Median Family Income ($)	2009 Median Home Sales Price ($)	2013 Percentage of Homes Affordable for Median Income	2013 Median Home Sales Price ($)
10 Most Affordable U.S. Cities in 2009				**2013 Data**	**2013 Data**
Kokomo, IN	98.0	61,800	73,000	96.9	95,000
Monroe, MI	97.1	70,300	102,000	90.6	120,000
Flint, MI	96.3	58,500	85,000	84.1	92,000
Lima, OH	96.3	56,400	78,000	89.7	96,000
Bay City, MI	96.1	56,500	77,000	92.4	79,000
Lansing-East Lansing, MI	95.8	67,000	90,000	89.3	100,000
Indianapolis-Carmel, IN	95.7	68,100	106,000	93.3	93,000
Elkhart-Goshen, IN	95.3	59,200	94,000	84.9	122,000
Battle Creek, MI	94.9	55,700	75,000	86.4	87,000
Canton-Massillon, OH	94.7	57,700	84,000	85.5	107,000

(*Continues*)

Cost of Housing in Various U.S. Cities as of December 2009 / 2013 (*Continued*)

Metro Area	2009 Percentage of Homes Affordable for Median Income	2009 Median Family Income ($)	2009 Median Home Sales Price ($)	2013 Percentage of Homes Affordable for Median Income	2013 Median Home Sales Price ($)
10 Least Affordable U.S. Cities in 2009				**2013 Data**	**2013 Data**
Napa, CA	44.4	81,800	360,000	31.4	448,000
Nassau-Suffolk, NY	42.7	101,800	380,000	51.8	395,000
Ocean City, NJ	37.8	67,200	330,000	51.3	303,000
Santa Cruz-Watsonville, CA	37.7	83,800	431,000	20.3	540,000
Los Angeles-Long Beach-Glendale, CA	36.8	62,100	320,000	21.1	425,000
Santa Ana-Anaheim-Irvine, CA	34.5	86,100	435,000	22.1	540,000
Honolulu, HI	33.8	79,300	450,000	45.2	442,000
San Luis Obispo-Paso Robles, CA	32.1	70,800	372,000	26.6	412,000
San Francisco-San Mateo-Redwood City, CA	22.3	96,800	625,000	16.0	779,000
New York-White Plains-Wayne, NY-NJ	19.7	64,800	425,000	23.0	464,000

Source: National Association of Home Builders: http://www.nahb.org/hoi

From the earlier tables, you might have observed the large increase in median home prices from 2009—in the midst of the recession—compared to 2013, a time when we all hope the recession is behind us. In 2009, median prices in the most affordable city—Kokomo, IN—rose 30.14% in 4 years. This is a 6.8% annual rate of return on housing in Kokomo. However, not all cities experienced a rise. Note that median home prices actually decreased in Indianapolis (−12.26%), Ocean City (−8.18%), and Honolulu (−1.78%).

The table presented above points out that all investments are risky, including real estate. Due to the housing peak of 2008, many learned this lesson the hard way. Yet, this lesson provides us with a chance to mention the way **leverage** can work for you when markets are favorable. Leverage can also lay waste to your best laid plans if the market moves against you. To demonstrate this, read the following example.

For simplicity, we will assume that a $300,000 home was purchased both in Kokomo and in Indianapolis, with a 20% down, 5%, 30 year mortgage. For simplicity sake, we will also assume that all other factors are equal except for house price appreciation. Next, we will determine what the rate of return on the down payment will be for both cases.

An Example of Leverage in Two Indiana Markets 2009–2013

	Indianapolis	Kokomo
Purchase Price	$300,000	$300,000
Down payment (Purchase Equity)	$60,000	$60,000
4-Year Rate of Appreciation	−12.26%	30.14%
Sales Price	$263,220	$390,420
Mortgage after 48 Payments	$224,712	$224,712
Equity at Sale	$38,508	$165,708
Rate of Return on Purchase Equity	**−35.8%**	**176.2%**

Notice how the 30.14% positive return in housing was magnified to a 176.2% return by the use of leverage, borrowed money. During the same time period, a negative 12.26% return in median prices in Indianapolis was further decreased to a negative 35.8% return. Leverage can make the good times better, but it can also make the bad times worse. Had we assumed a lower down payment (less than 20%) these results would have been even more dramatic. On the other hand, if we had assumed no leverage, then the return would have been a negative 12.26% in Indianapolis and a positive 30.14% in Kokomo—due to the lack of leverage.

MORTGAGE FINANCING

Most of us do not have enough money initially to purchase a home by paying cash, so we must borrow money (i.e., use leverage). A **mortgage** is a loan from a lending institution (typically a bank or credit union) in which the home and/or property serves as the collateral for the loan. In the event the borrower does not make the payments on the loan, the collateral (home) is taken by the lender in an attempt to recover the money they have lent the borrower.

As of 2009, the total amount of residential mortgage debt in the United States was over $14.4 trillion. By the third quarter of 2013 it had shrunk to $13.8 trillion. With a current U.S. population of about 317.3 million people in 2013 this equates to over $45,446 of mortgage debt *per capita* (i.e., for every man, woman, and child).

Mortgage Loan Amortization

Amortization is simply the process of determining the equal, periodic payment that will repay a loan (principal and interest) over the stated length of the loan. The algebraic formula below is used to amortize a mortgage loan (i.e., calculate the ordinary annuity payment). Or, you can use your financial calculator.

$$PMTa = \frac{PVa}{\left(\frac{1-(1+i)^{-n}}{i}\right)}$$

Assumptions: Mortgage loan = $172,960
Loan length = 30 years
Interest rate = 5.00% annually

Using the algebraic formula:

$$\frac{\$172{,}960}{\left(\dfrac{1-(1+.05/12)^{-(30\times12)}}{.05/12}\right)} = \textbf{\$928.49 monthly payment}$$

Using a financial calculator:

PV = 172,960
I/YR = 5 / 12, or use 5% and change P/YR to 12
N = 30 × 12 = 360
PMT = 928.49 monthly payment

The **interest portion of the monthly payment** is calculated by multiplying the loan balance by the monthly rate of interest. In this scenario, the first month is calculated as follows (where the monthly interest rate = .05 / 12 = .00416667):

Loan Balance		Monthly Rate of Interest		Interest Portion of Payment
$172,960	×	.00416667	=	**$720.67**

The **principal portion of the monthly payment** is calculated by subtracting the interest portion from the monthly payment. The first month was calculated as follows:

Monthly Payment		Interest Portion		Principal Portion
$928.49	−	$720.67	=	**$207.82**

During the early years of a mortgage loan, the majority of the monthly payment goes to interest, and not to principal.

Question: How much will be paid to the lender over the life of this loan?

Multiply the monthly payment by the number of months of the loan.

Monthly payment		$928.49
Multiplied by number of months	×	360
Gross repayment to lender		**$334,256.40**

Question: How much interest will be paid to the lender over the life of the loan?

Subtract the original loan amount from the gross repayment—the difference is interest.

Gross repayment to lender		$334,256.40
Minus original loan amount	−	$172,960.00
Total interest paid		**$161,296.40**

As can be seen, if you repay this loan on schedule the amount of interest would be slightly less than the original loan amount. In essence, you pay for the mortgage on your house twice (one time for principal, and one more time for interest!).

During the life of your mortgage, you may want to calculate how much you still owe on your mortgage. You can ask the bank or they might print it on your monthly statement. On the other hand, you are empowered with a financial calculator! During the life of a loan (in this case a mortgage), you can always determine the remaining loan balance by use of the ordinary annuity formula to solve for PV.

Using the same information as above (PV = 172,960, n = 30 × 12, i = 5 / 12), the loan balance at the end of 2 years would be as follows:

The borrower would have 336 payments remaining (n = 360 minus 24) at a monthly rate of .004166667 (.05 / 12).

Thus, the remaining balance after making payments for 2 years would equal:

$$PV = PMT\left(\frac{1-(1+i)^{-n}}{i}\right)$$

$$PV = 928.49\left(\frac{1-(1+.004166667)^{-336}}{.004166667}\right) = \mathbf{\$167{,}726.46}$$

Using a financial calculator:

PMT = <928.49>
I/YR = 5/12, or use 5% and change your P/YR to 12
N = 28 × 12 (the number of months remaining after 2 years)
PV = 167,726.46 remaining balance on loan after 2 years

PAYMENT REDUCTION TECHNIQUES

You must repay the loan principal; therefore, the techniques described in what follows can be used to reduce the *interest portion* of the payments. Three common ways to reduce total interest paid to the bank over the life of the mortgage loan are:

Make a Larger Down Payment (Thereby Reducing the Loan Amount)

Obtain a Lower Interest Rate

The monthly principal and interest payment on a $172,960 loan over 30 years at 5% annual interest would be $928.49 (vs. $1,036.98 at 6%). This reduces total interest paid to $161,296.40 (vs. $200,354 total interest on a 6% loan). A lower rate is generally obtained by paying "points."

Shorten the Length of the Mortgage

Select a 15-year mortgage instead of a 30-year mortgage:

> Using the same loan of $172,960 at 5% interest, a 15-year loan would cut total interest paid from $161,296.40 to $73,236.20. The monthly payment would, however, increase to $1,367.76. It is the case that a 15-year mortgage will almost always have a lower rate of interest than a 30-year mortgage. This will magnify the savings.

Self-determined acceleration of regular mortgage payments:

> If you choose to pay more than the normal monthly mortgage payment, every extra dollar paid goes directly to principal (loan) reduction which shortens the length of the loan and the total interest paid. If you paid $975 ($928.49 plus $46.51 extra) on the loan of $172,960, you would pay the loan off in 324 months, or 3 years sooner. You would save over $18,356 in interest, to use toward your other financial goals.

Select a biweekly mortgage where payments are made every 2 weeks, or a total of 26 payments per year:

> A biweekly payment of $464.24 on a 30 year, 5% loan of $172,960 would be paid off in 25.2 years. Total interest paid would equal $131,610.58 compared to $161,296.40—a savings of $29,685.82. This is calculated as follows.
>
> PV = 172,960
> I/YR = 5 / 26, or I/Y = 5, and P/YR = 26
> PMT = <464.24> every 2 weeks (which is $928.49 / 2)
> **N = 656.06 biweekly periods / 26 = 25.23 years**

INTEREST-ONLY OPTION ON A MORTGAGE LOAN

This type of mortgage loan "option" was extremely popular in the lead up to the Great Recession. It was very popular because it allowed for a smaller monthly payment. The downside should be obvious: you are not reducing the size of the loan unless you pay more than the stipulated payment.

For example, a 30-year fixed rate mortgage of $100,000 at 6% has a monthly payment of $599.55. This is the **fully amortizing payment—**the payment that, if maintained over the full term of the loan, will pay off the $100,000 loan.

In month 1, that payment divides into $500 of interest and $99.55 of principal. In month 2, the payment remains at $599.55 but the breakdown is $499.50 to interest and $100.05 to principal. Each month, the interest portion declines and the principal portion rises. After 5 years, the balance is $93,054. That is how mortgages amortize.

Now, attach an interest-only option to this mortgage, say, for the first 5 years. That means that the borrower needs to pay only $500 a month during the first 5 years. There is no payment to principal. If the borrower exercises this option, the loan balance after 5 years will still be $100,000. There is no amortization. Beginning in year 6, the borrower must begin paying $644.30. That is the fully amortizing payment for a 6%, $100,000 loan for the 25 years left to amortize the loan. (http://www.mtgprofessor.com/Default.htm)

Whether or not an interest-only option is a good idea is up to you. But, here is one thought: If your main goal is to be out of debt—rather than prolong it—you may want to avoid the interest-only option on a mortgage loan. Also, consider how unhappy you will be when your mortgage payment increases by $144.30 per month.

On the other hand, if you live in a time of house price appreciation and you do not plan to remain a resident in the home past the end of the interest-only period, this type of loan may work well. I know there are a bunch of ifs in the above statement, but the money you do not spend on housing can be invested in other ways, like your retirement plan. (Yes, you will need to pay for your retirement.)

Assignment 7.1 Home Mortgage Loan Calculations

Name _____

SHOW YOUR WORK

Scenario: Mortgage loan = $150,000
Loan length = 30 years
Interest rate = 6% annually

1. What will be the monthly mortgage payment?

2. Assuming you do not pay the loan off early, how much total interest will you pay the lender?

3. If you decide to amortize the loan over 15 years, what will be your monthly payment?

4. Compared to the 30-year mortgage, how much total interest will you save by going to a 15-year mortgage?

5. Assume you select a 15-year mortgage with an interest rate of 7.50%.
a. What will be your monthly payment?

b. How much total interest will you pay to the lender?

The Mortgage Menu

As we write this edition, mortgage interest rates are still very low compared to the double digits we saw earlier in life. When interest rates are low, you will find that almost all mortgages will be fixed rate mortgages, as consumers want to lock in the low rate of interest. The trouble is that when interest rates increase—and they will—the lender (bank) will have to borrow money due to the higher interest rate, while their assets (the loans they have made to borrowers) only pay them the lower rates of interest. This is not good for bank profits, which is not good for our banking system. Thus, we want to provide you a brief discussion of alternative mortgages that have been used, and can still be used, to meet the needs of borrowers and lenders.

Fixed Rate Mortgage

A fixed rate mortgage is where the **debiting rate** for the mortgage, the rate used to determine the interest owed the lender, is constant throughout the life of the contract. This allows the borrower to be certain of payments but the lender will be uncertain of the value of the payments as interest rates change.

If the fixed rate mortgage is a *first mortgage*, the home is collateral for the loan, and if the mortgage is for less than 80% of the appraised value, the home is the only collateral. For mortgages greater than 80% of the appraised value, **private mortgage insurance** (PMI) is required. PMI insures a maximum of 20% of the loan (if we assume a loan equal to the home purchase price). PMI protects the lender in the event that the homebuyer defaults. The PMI insurance premium is paid by the borrower. The law allows a homeowner to drop the PMI after 2 years of homeownership if:

1. Their home equity has risen to 20% or more because of home improvements or reductions in the mortgage loan principal
2. Their home equity is 25% or more because of market appreciation

The homeowner is able to drop PMI after 5 years if their equity is 20% or more due to appreciation.

Adjustable Rate Mortgage (ARM) or Variable Rate Mortgage

An ARM allows the interest rate to rise or fall with changes in the money market. This effectively shifts the risks of the future from the lender to the borrower. As stated above, borrowers prefer the certainty of a fixed payment when interest rates are low. On the other hand, when interest rates are high the interest rate extended to the borrower can be substantially lower if the interest rate is allowed to change with the market for debt. At renewal, the interest rate can change according to a contractually stated index. The four most commonly used indices to determine a loans interest rate are:

1. Short-Term Treasury Securities Rate
2. Federal Reserve District Cost of Funds
3. National Average Mortgage Contract Rate published by the Federal Home Loan Bank
4. Prime Rate, as published in the *Wall Street Journal*

Typically, ARMs have **interest rate caps** that restrict how much the rate of interest (or payment) can increase each year, and over the life of the loan. An interest rate cap might restrict interest rate increases to 2% annually and 5% over the life of contract. Let us look at an example for a $100,000, 30-year mortgage with an initial interest rate of 6% where the maximum increase in interest rates occurs each year.

Year	Payments Remaining	Mortgage Balance ($)	Interest Rate (%)	Monthly Payment ($)	Payment Increase (%)
1	360	100,000	6.00	599.55	
2	348	98,772	8.00	730.86	22
3	336	97,871	10.00	869.06	19
4	324	97,199	11.00	939.87	8

Such a dramatic increase in payments (57%) is unlikely but it could occur. To help borrowers overcome this fear, lenders began to offer payment caps which often walk hand-in-hand with negative amortization.

Negative Amortization

You may encounter an ARM with **payment caps**. Payment caps limit the size of the payment but they allow interest rates to go where interest rates need to go to adjust to the current economic climate. Using the earlier example with a *payment cap of $850*, we would have the scenario shown on the next page. Notice that with the same interest rate scenario, but with a payment cap, the year 5 mortgage balance is greater than the year 4 mortgage balance. This occurs because the maximum payment of $850 is insufficient to amortize the loan. When the loan does not amortize, **negative amortization** occurs. Typically, negative amortization is limited to 125% of the original mortgage balance and if it reaches 125% of the original balance then the homeowner must either refinance or sell the home.

Year	Payments Remaining	Mortgage Balance ($)	Interest Rate (%)	Monthly Payment ($)	Payment Increase (%)
1	360	100,000	6.00	599.55	
2	348	98,772	8.00	730.86	22
3	336	97,871	10.00	850.00	16
4	324	97,438	11.00	**850.00**	0
5	312	**97,983**			

Other Mortgage Variations:
Balloon mortgages appear to be like a standard mortgage; however, there exists a due date 3, 5, or 10 years into the contract. At this time, all remaining principal is due. Some are selfamortizing, while some are interest-only mortgages. When the principal is due, the homeowner must either refinance or repay.

Graduated payment mortgages (GPMs) are designed to allow younger people and/or those with a growing income to qualify for a home mortgage by initially reducing mortgage payments with contractual increases in those payments. If payments are less than those implied by the debiting rate, negative amortization could occur.

Shared equity mortgage (SEM) grants the lender title to a portion of the property. For example, a home costing $200,000 could be bought for $160,000 if a lender buys $40,000. Then, if the home appreciates,

the lender receives his or her share of the appreciation realized at sale. Typically, the lender's share will be less than 30% to encourage the resident homeowner to maintain the home. The borrower pays all insurance, property taxes, and maintenance, and, if the lender believes that appreciation will be less (greater) than his or her cost of funds, they will require higher (lower) interest rates.

Growing equity mortgage (GEM) is similar to a GPM in the sense that payments increase each year. However, unlike a GPM, no negative amortization is allowed. This means that the growing payments reduce the mortgage principal at a faster rate. (Note: If you make sure that your mortgage does not have a penalty for prepayment, you can create your own GEM with the option of paying the contractual payment if events occur which prohibit you from making the larger, required payment in a contractual GEM.)

Reverse annuity mortgage will be increasingly seen in our mortgage marketplace, as elderly baby boomers attempt to fund their retirement from the equity in their home—without having to move! A reverse mortgage, as they are commonly called, allows elderly homeowners to have access to their housing equity without selling the home. Their equity is annuitized over either a fixed period or life, and their mortgage balance grows to be repaid from the other sources when they move or sell the home. The reverse mortgage is increasing in availability and popularity as a source of retirement income.

REFINANCING

If a homeowner has a high fixed rate loan and interest rates have decreased, the homeowner can refinance to a fixed rate loan with a lower rate of interest. In other words, a homeowner simply applies for a new loan (with a lower rate of interest) at the same bank, or a new bank, and pays off the original loan. Many borrowers will refinance for more than what they owe on the original loan and use the difference to finance other consumption, such as the purchase of a car or their children's education.

On the other hand, a consumer with an adjustable rate loan may want to lock in a low fixed rate loan. The benefits of a lower interest rate loan are lower payments every month as well as faster principal amortization. However, there are closing costs (loan origination, appraisal, and legal fees) and, possibly, a prepayment penalty and the payment of points on the new loan. Moreover, if the term of the new loan is greater than the number of years remaining on the original contract, those future payments are also a cost. In calculating the benefit of refinancing, the time value of money must be remembered. If one refinances for the remaining term of the original mortgage, then the sum of all costs of refinancing is a present value. The benefits occur over time, as each month the monthly payment is less.

A useful calculation is to sum all costs of refinancing as a present value (PV), enter the difference between the old and new payments as the payment (PMT), use the lower rate of mortgage interest as "I/YR" (entered as a monthly figure, or annually with your P/YR set to 12), and solve for "N."[1] This procedure will calculate the approximate time it will take to "break even," while accounting for the time value of money. That is, the time it takes for the monthly savings to equal the opportunity costs of refinancing. If your expected residency is as long as or longer than the number of months (N) it will take to recoup your costs on a present value basis, then refinancing is preferred.

Consider the following; you are considering refinancing an 8.75% loan *1 year after* obtaining the loan. We will assume a loan for $84,869 for 20 years and your new loan rate will be 7.5%. The cost to

[1] For simplicity, we will ignore the tax-deductibility of mortgage interest in this example. Including it would lengthen the discounted payback period slightly.

refinance is $1,500. How long will it take for your monthly savings (due to a lower monthly payment with the lower rate loan) to equal the cost of refinancing?

Cost to refinance 1 year after original loan obtained = $ 1,500
Monthly payment on **original loan** = $750.00
($84,869 loan @ **8.75%** for 20 years)

Remaining balance on original loan:

PMT = <750>
I/YR = 8.75 / 12, or 8.75% with P/YR = 12
N = 19 × 12 = 228 (the number of years remaining × 12)
PV = $83,231 (remaining loan balance after 1 year)

Monthly payment on **new loan** = $685.89
($83,231 loan @ **7.5%** for 19 years)

Monthly savings = $ 64.11
($750 − $685.89 = $64.11)

Number of months to break even (i.e., recover the cost of refinancing):

PMT = 64.11 (monthly savings)
PV = <1,500> (cost to refinance)
I/YR = 7.5 / 12 (the lower interest rate loan, or 7.5% with P/YR=12)
N = 25.4 months

If you plan to live in the home for more than 2 years, it will be profitable to refinance. If you plan to move out of the home in 1 year, do not refinance.

Sometimes the goal of refinancing may not be to reduce the monthly payment, but rather to pay off the loan more rapidly. This would be accomplished by refinancing at a lower interest rate and reducing the length of the new loan. For example, using the same example as above, if the new loan (the "refinance loan") is amortized over 15 years instead of 19:

Monthly payment on **new loan** = $771.56
($83,231 loan @ 7.5% for *15 years*)

The new monthly payment of $771.56 is more than the original monthly payment of $750. The rationale for choosing this option is to retire the mortgage loan faster and, in doing so, reduce the total amount of interest paid.

POINTS

A **point** equals 1% of the mortgage loan. "Paying points" to the lender allows the borrower to obtain a lower rate of interest on the loan. For example, consider the following two loans.

Loan A: 30-year fixed rate of 9% with 0 points
Loan B: 30-year fixed rate of 8.25% with 1.5 points

Using a loan of $172,960, Loan B be could be obtained if the borrower were willing to pay points equal to $2,594.40 (calculation is $172,960 × .015). By doing so, the monthly payment would be reduced to $1,299.39 from $1,391.67 with Loan A—a monthly savings of $92.28.

Question: How long would it take for the monthly savings with Loan B to pay for the cost of the points? (often referred to as the "break-even period")

Monthly savings of Loan B: $92.28
Cost of points in Loan B: $2,594.40

To solve for the "break-even period" (n) use the following approach:

PMT = $92.28 (monthly savings)
PV = <2,594.40> (the cost of points)
I/YR = 8.25% / 12 (time value of money)
N = 31.35 months to "break even"

If the borrower lived in the home for at least 32 months paying the points to obtain a lower interest rate would be a wise choice. After 32 months, the monthly savings of $92.28 for the 8.25% loan would have fully reimbursed the owner for the initial cost of the 1.5 points. Every month after that, the home buyer would experience a savings of $92.28, which would hopefully be saved for other financial goals. Plus, the total amount of interest paid over the life of the 30-year loan would be reduced.

Loan A total interest paid = $1,391.67 × 360 = $501,001.20 − $172,960 = **$328,041.20**

Loan B total interest paid = $1,299.39 × 360 = $467,780.40 − $172,960 = **$294,820.40**

Paying points, to obtain a lower interest rate, is optional. Points make more sense when you plan to be in the home for a longer period of time.

Costs of Obtaining a Home Mortgage Loan

Closing costs and **mortgage insurance (MI)** are just two examples of a variety of costs incurred when originating a mortgage. Below is an example of common costs involved in buying a home, with and without mortgage insurance (assume 0.5% for 41 months).

	Without Mortgage Insurance	**With Mortgage Insurance**
Purchase Price of Home	$82,500	$82,500
LTV (loan-to-value) Ratio	.80	.95
Loan Amount	$66,000	$78,375
Number of Payments (15-year loan)	180	180
Down Payment	$16,500	$4,125
Annual Interest Rate	6%	6%
Estimated Loan Costs:		
Credit report	$40	$40
Appraisal	$250	$250
Recording fees	$45	$45
Loan fees (1 "point")	$660	$784
Owner's title policy		
Lender's title policy	$50	$50
Mortgage insurance (yearly amt)(PMI)		**$392**
Mortgage ins. (2 months escrow)(PMI)		**$66**
Property Insurance policy (1 year)	$300	$300
Property Insurance (escrow)	$50	$50
Taxes (escrow)	$154	$154
Legal fees	$45	$45
Prepaid interest		

	Without Mortgage Insurance	**With Mortgage Insurance**
Termite inspection	$48	$48
Survey		
Prorated taxes		
Total Estimated **Closing Costs**	**$1,642**	**$2,224**
Total Cash Required at Closing	$18,142	$6,763
Components of Monthly Payment (PITI & MI)		
Principal and interest (P and I)	$556.95	$661.37
Monthly property taxes (T)	$77	$77
Monthly homeowners insurance (I)	$25	$25
Mortgage insurance (PMI)		**$33**
Total Monthly Payment	**$658.95**	**$796.37**

The example on the previous page outlines many of the costs incurred when purchasing a home. *If* a person purchased a home by paying cash, some of the costs would be avoided, such as a credit report, loan fees, mortgage insurance, and prepaid interest. Yet, very few individuals have the ability to pay cash for a home.

MORTGAGE INSURANCE

The comparison on the previous page compares a mortgage loan with and without **mortgage insurance**. Simply put, mortgage insurance is required when the buyer of the home borrows more than 80% of purchase price (or in other words makes a down payment in cash of less than 20% of the purchase price). A lender (bank or credit union) takes greater risk in lending more than 80% of the purchase price to the home buyer, as homeowners with less equity are more likely to default on the loan.

Mortgage insurance may be obtained from several organizations such as: PMI companies, Federal Housing Administration, or Veterans Administration (VA) Mortgage Insurance. PMI is obtained through a private company instead of a governmental agency. In the example on the previous page, PMI was estimated at 0.5%, although the cost usually varies from 0.25% to 2.0%. The Federal Housing Administration under the U.S. Department of Housing and Urban Development (HUD) insures houses where the home purchaser meets specific standards. VA Mortgage Insurances promotes homeownership amongst military veterans. Borrowers can drop PMI when the equity in their home or the principal balance falls below the 80% threshold; however, this may take several years.

For example, consider a home selling for $100,000. Joe Dokes wants to buy the home. He obtains a mortgage loan for $95,000 (or 95% of the purchase price). Two months later, Joe Dokes disappears and so do his monthly mortgage payments to Union Bank. Union Bank now takes possession of the home (this is commonly referred to as **foreclosure**) and attempts to sell it on the open market. If the home sells for only $90,000, the bank would have lost roughly $5,000. Had Union Bank required Joe Dokes to purchase mortgage insurance, the loss of $5,000 would have been reimbursed to Union Bank by the mortgage insurance company.

Mortgage insurance insures the lender against loss down to 80% of the purchase price of the home. So, using the same example, if Union Bank sold the home for $80,000, they would have their loss of $15,000 reimbursed (loss = loan amount − foreclosure selling price).

In the prior example, the home loan with a LTV ratio of .80 does not require mortgage insurance. When the buyer makes a larger down payment, the lender is taking less risk of losing money if the buyer defaults. Compared to the 95% LTV loan (requiring MI), the 80% LTV loan has a:

- larger down payment ($16,500 vs. $4,125)
- smaller monthly payment ($658.95 vs. $808.37) and
- fewer closing costs (other than down payment) ($1,642 vs. $2,638)

To compare your cost with and without mortgage insurance, check out http://www.mortgageloan.com/calculator.

HOW MUCH HOME CAN YOU AFFORD?

There is a generally accepted rule that states that you can afford a house that costs 2.5 times your annual income. Or, stated differently, your annual income should at least equal 40% of the house price. Such rules are designed to get you in the "ballpark." But, we can do better than that.

Another method for determining how much house you can afford is to use debt ratios. We can calculate several debt ratios using the data from the previous pages. The total housing payment or PITI (principal, interest, taxes, and insurance) with a large down payment (and therefore no mortgage insurance) was $658.95. Assuming you want your total housing payment (PITI) of $658.95 to equal 25% of your gross income, how much monthly gross income would you need to earn?

$$\frac{\text{Monthly housing payment}}{\text{Housing debt ratio}} = \text{Needed monthly income}$$

$$\frac{\$659}{.25} = \textbf{\$2,636 monthly gross income needed}$$

A monthly gross income of $2,636 equals an annual gross income of $31,632. Using 25% as your housing debt ratio is fairly conservative. If you use a ratio of .30, you would need only a monthly income of $2,197. But are you really wise to use a higher ratio? It depends on how much other debt you have. If you have a lot of debt payments (such as an auto loan, student loans, credit card payments, etc.), you are wise to use a lower housing debt ratio—otherwise you will end up *house rich and cash poor*.

For example, assume you have the following monthly debt payments:

Student loan		$112
Auto loan	+	$143
Credit card payment	+	$63
Total non-housing debt payments	=	$318
Total housing debt payment	+	$659
Total monthly debt payments	=	$977

How much income will be needed to make total debt payments of $977 per month? Lenders will commonly allow a borrower to allocate from 30% to 35% of their monthly gross income to total monthly debt payments.

Using the more conservative ratio of 30%:

$977 / .30 = **$3,257 needed monthly gross income or $39,084 annual gross income.**

Using the more liberal ratio of 35%:

$977 / .35 = **$2,791 needed monthly gross income or $33,492 annual gross income.**

There is a great temptation for homebuyers to use the more liberal ratio. The problem is this:

> **As you allocate a higher percentage of your income to debt, you have less money left over for everything else (recreation, entertainment, saving, investing, landscaping, furniture, food, charitable giving, gifts to your university, etc.)**
>
> Repeat after me: ***Avoid being house rich and cash poor.***

Assume you graduate and get a job which pays you $52,000 annually, or $4,333 monthly gross income. How much home can you afford?

$4,333 × .30 = $1,300 available for total debt payments

	$1,300	available for total monthly debt payments
−	$ 112	monthly student loan payment
−	$ 143	monthly auto loan payment
−	$ 63	monthly credit card payment
	$ 982	**available for monthly housing payment**

How much home can you buy for $982 per month? We recognize this may not be the home of your dreams. To find out, we will first subtract the taxes and insurance (T&I) component out of $982. We will assume that monthly T&I equals $182. That leaves $900 available for payment on principal and interest (P&I). Assume a 30-year mortgage loan at 5% annual interest. Now we can solve for PV, or in other words, the amount of mortgage loan that a monthly payment of $900 would qualify for.

PMT = <900>
N = 30 × 12 = 360
I/YR = .05 / 12 = .005 (or I/YR = 5, if P/YR = 12 on a financial calculator)
PV = 167,653.45 mortgage loan

Assuming you have a 10% down payment, what is the most you could pay for a home? (Recall the following: (1) a 10% down payment equates to a 90% loan-to-value ratio, and (2) the PV in a housing scenario equals the loan amount.)

$$\frac{\text{PV}}{\text{Loan-to-value ratio}} = \text{Maximum home price}$$

$$\frac{\$167{,}653}{.90} = \textbf{\$186,281}$$

Just for comparison, the median price of an existing single-family home in the United States, in November of 2013, was about $271,000. What does all this mean? Three things:

1. You must not expect to leave school and promptly buy the house of your dreams. The home you remember leaving as an 18-year-old is often quite different than the one your parents started out in. Young home buyers have a tendency to base their expectations on the home of their teenage years. Before you go out looking for your first home, take a few minutes and look at pictures of the home your parents bought when they were first-time home buyers! That will help you "recalibrate" your housing expectations. People living in bigger homes are not necessarily happier.
2. Leaving school with debt (student loans, auto debt, and big credit card balances) makes it more difficult to qualify for a home loan. Do yourself a favor: *minimize your debt load now*.

   Now, let us run the numbers again without other monthly debt payments (student loan, credit card, auto loan). Assuming that your monthly T&I equals $200, your maximum monthly P&I would be $1,182.

   PMT = <1,182>
   n = 30 × 12 = 360
   i = .05 / 12 = (or I/YR = 5%, with P/YR = 12; financial calculator)
   PV = 220,185 mortgage loan

   Max home price = 220,185 / .90 = $244,650

   Do yourself a favor. Borrow little, while going to school. Doing so will make it more feasible to purchase a home when the time is right.
3. You may be tempted to use a higher debt ratio so as to qualify for a greater mortgage loan. Try to resist the temptation to go beyond a total monthly debt payment of 35%. Reputable lenders will help you restrain yourself. Lenders do not want you to over-extend yourself on total debt payments. They want you to be able to make your monthly payments for years and years.

Assignment 7.2 Home Affordability

Name _____

SHOW YOUR WORK

You have just graduated from State University with a degree in Diesel Technology. Your new job takes you to Toledo, Ohio. You are now earning $35,000 per year. Your take-home pay is 70% of that gross total. You are anxious to purchase a home. You have the following monthly expenses:

Food	$275
Utilities	$145
Phone	$75
Medical	$30
Insurance	$130 (including auto, health, and life)
Clothing	$70
Student loan payment	$145
VISA payment	$65
MasterCard payment	$48
Car payment	$211
Miscellaneous	$100
Total	$_____

1. First calculate your monthly take-home pay. Next, add up the budgeted monthly expenses shown above. How much remains for a monthly mortgage PITI payment?

2. Assume that taxes and insurance (T&I) amount to $70 per month. How much remains to pay monthly mortgage principal and interest (P&I)?

3. Using the answer to question #2 calculate the size of mortgage loan you could obtain. Assume a 30-year loan at 5% annual interest.

4. Using the answer from question #3, and assuming you have 10% of the purchase price, what is the most you could pay for a home?

5. Assuming you do not pay the mortgage off early, how much interest will you pay the lender over the life of the loan?

Section Seven Extra Practice Problems

1. Assume a $170,000 mortgage loan over 30 years with a 7% annual interest rate.

a. What will be the monthly mortgage payment?

b. On your first payment, what portion of the monthly payment goes toward interest?

c. On your first payment, what portion of the monthly payment goes toward principal?

d. How much will you end up paying back to the lender over the life of the loan? How much of this is interest?

2. Assume a mortgage loan of $80,500 and 7% annual interest.

a. If you pay the loan off over 30 years, how much interest will you pay?

b. How much interest will you pay after 20 years?

c. How much interest will you pay after 15 years?

d. Compared to the 30-year mortgage, how much interest will you save by going to a 15-year mortgage?

3. Use the following information for the remaining problems:

You earn $57,800 per year and take home 70% of that gross amount. Your monthly expenses are as follows:

Food	$325
Utilities	$120
Phone	$75
Medical	$45
All insurance	$120
Clothing	$60
Student loan payment	$200
VISA payment	$140
Car payment	$249
Miscellaneous	$120

a. What are your total monthly expenses?

b. What is your monthly take-home pay?

c. After monthly expenses, how much do you have left over for a monthly mortgage PITI payment?

d. Assuming taxes and insurance (T&I) are $90 per month. How much remains for monthly mortgage principal and interest (P&I)?

e. Calculate the size of a mortgage loan you can afford. Use a 30year loan at 6.5% annual interest.

f. If you have 10% of the purchase price for a down payment, what is the most you can pay for a home?

4. You are considering a 30-year mortgage loan of $195,000. You have been offered a rate of 6.5% with no points or 6% at 2 points.

a. What would be the cost of the 2 points?

b. What would your monthly savings be if you paid the points?

c. How long would it take for the monthly savings to break even?

Section Seven Practice Problem Answers

1. PV = 127,000
N = 30 × 12 = 360
I/YR = 7 / 12, or I/YR = 7, and P/YR = 12

a. PMT = **<1,131.01>**

b. 170,000 × (.07/12) = $991.67 goes toward interest

c. 1,131.01 − 991.67 = $139.34 goes toward principal

d. $1,131.01 × 360 months = $407,163.60 total gross payments $407,163.60 – 170,000 = **$3,237,163.60 total interest paid**

2. a. PV = 80,500
n = 30 × 12
i = 7 / 12
PMT = <535.57>
$535.57 × 360 = $192,805.20
$192,805.20 − $80,500 = **$112,305.20**

b. PV = 80,500
n = 20 × 12
i = 7 / 12
PMT = <624.12>
$624.12 × 240 = $149,788.80
$149,788.80 − $80,500 = **$69,288.80**

c. PV = 80,500
n = 15 × 12
i = 7 / 12
PMT = <723.56>
$723.56 × 180 = $130,240.80
$130,240.80 − $80,500 = **$49,740.80**

d. $112,305.20 − $49,740.80 = **$62,564.40**

3. a. (add all amounts) = **$1,454.00**

b. (37,800 × .7) / 12 = **$2,205.00**

c. $2,205 − $1,454 = **$751**

d. 751 − 90 = **$661**

e. PMT = <661>
n = 30 × 12
i = 6.5 / 12
PV = **104,577.35**

f. 104,577.35 / .90 = **$116,197.06**

4. a. 195,000 × .02 = **3,900**

b.

PV	=	195,000	PV	=	195,000
n	=	30 × 12	n	=	30 × 12
i	=	6.5 / 12	i	=	6 / 12
PMT	=	<1,232.53>	PMT	=	<1,169.12>

1,232.53 − 1,169.12 = **$63.41**

c.

PMT	=	<63.41>
PV	=	3,900
i	=	6 / 12
n	=	**71.21 months**

Notes: