Chapter 4
History of Real Estate Finance and the Fixed-Rate Mortgage

Chapter 4
Learning Objectives
- Understand how residential lending evolved from the earliest of times through World War II
- Understand the mechanics of the standard fixed-rate mortgage

History Of Real Estate Finance

ROMAN LAW
- Fiducia: Lender held title and occupancy rights until loan fully paid
- Pigus: Borrower held title and possessed but lender could take title and possession under suspicion of default
- Hypotheca (pledged) Like pigus, but lender could take title and possession only under actual default

GERMAN LAW
- Gage Is A Deposit Made To Fulfill An Agreement (could be the actual good, if transportable, at a pawn shop)
- Mort Is French For Dead. Real Property (Not Transportable) Was A Dead Gage
- In Default The Lender Could Take Title But Could Not Look Further For Relief. In other words, transfer of the actual property, satisfied the debt.

ENGLISH LAW
- Concept Of Usury In That Charging Interest Was Sinful
- Might be allowed some of the fruits of the land
- In default, lender could take the land away, with nothing returned to the borrower – a problem of equity if due to temporary financial difficulties.
- Equitable Right Of Redemption Allows Borrower To Redeem The Property After Default
- All states now allow equitable right of redemption until foreclosure sale. Some allow a Statutory right for some additional period.

U.S. Law Is A Mix Of Roman, German, And English Law
EARLY EXPANSION
- Little Need For Lending (properties passed down in family)
- Some Building Societies Formed To Consolidate Funds For Home Buying
POST-CIVIL WAR
- Increased Mortgage Lending To Finance Westward Expansion
- Typical Loan Was Short-term, Interest Only
### History Of Real Estate Finance

**1920s BOOM**
- S&Ls Expanded Rapidly
- Real Estate Prices Rose Rapidly

**1930s DEPRESSION**
- Banking System Collapsed, Money Supply Plummeted
- Short-term, Non-Amortizing Loans Became A Problem
- A Number Of Federal Agencies Created Including FSLIC, FHA, And Fannie Mae

### Some new Agencies
- **FHA** (Federal Housing Administration) – Insured first mortgages against default. Required down payments (20%), interest rate ceilings, loan size limits, required appraisals. Started with 15-year and over time terms lengthened.
- **FNMA** – Federal National Mortgage Association – stood by to purchase FHA insured mortgages, at par. If interest rates up, would hold waiting to sell when rates fell.

### Fixed-rate Mortgages

**IMPORTANT VARIABLES**
- Amount Borrowed
- Contract Interest Rate
- Maturity (Term)
- Outstanding Balance
- Amortization
- Payment
- Financing Costs Including Discount Points
- Annual Percentage Rate (APR)

### Bullet Loan (Interest Only)
- Commonly used in commercial lending
- Balloon amount of balance due at end of period
- Example. What is the payment pattern on a 5 year bullet loan of $5,000,000 at 6 3/8%?
- $5,000,000 * 6.375/1200 = $26,562.50 monthly payment for 59 months
- Final payment of 5,026,562.50 at month 60
- Note: This is like the payment pattern for a bond

### Fixed-rate Mortgages

**Suppose You Borrow $100,000 @ 7.50% For 30 Years, Monthly Payments**

- What Is Your Monthly Payment To Fully Amortize The Loan Over Its Term?
- \( \text{P/YR}=12 \)
- \( \text{PMT(PV=-100,000, I/YR=7.5, N=360)} = 699.21 \)

### Fixed-rate Mortgages

**LOAN AMORTIZATION**
- Payment Consists Of Interest And Repayment Of Principal

**AMORTIZATION FOR MONTH ONE**
- Payment Is $699.21
- Interest Portion Is $100,000 * (.075/12) = $625
- Or Interest Portion = 100,000 * 7.5/1200 = $625
- Repayment Of Principal Portion Is Remainder, $699.21 - 625 = $74.21
- Each Month’s Interest Is Calculated As The Loan Balance At The Beginning Of The Month Times The Monthly Interest Rate
Fixed-rate Mortgages

- OUTSTANDING BALANCE
  - Present Value Of The Remaining Stream Of Payments Discounted At The Contract Rate
- FOR OUR EXAMPLE AT THE EOY 5:
  - $PV(PMT=699.21, 1/YR=7.5, N=300)$
  - Solve For Present Value (PV) ($94,617$)
- Or use the Amortization Function of the Calculator

FRM Fixed Rate Constant Payment Mortgage

- Constant payment mortgage (CPM)
- Constant monthly payment on original loan
- Fixed rate of interest for a specified term
- Amount of amortization varies each month
- Completely repaid over the term of the loan unless it is a balloon loan which is amortized over a given period, with a final large (balloon) payment. Example: 30 year amortization period with 5 year balloon pmt.

FRM Constant Payment Mortgage Example

- Borrow $270,000 over 15 years (180 months)
- Assume 6% APR or 0.5% per month
- What is the 27th payment?
  - $P/YR=12$
  - $Pmt(PV=-270,000, I/Yr = 6, N=180) = 2278.41$
  - Interest Due is: 1221.45
  - Principal Payment is: 1056.96
- Monthly Pmt is the same every month

FRM CPM Amortization Loan

FRM Constant Payment Mortgage Example with Balloon Payment

- If the previous loan has a 5 year balloon payment, what will the final payment be (due at month 60)
- Amount due on the final date is the balance after the 60th payment, plus the amount of the 60th payment.
- To get balance, use 1 INPUT, 60 AMORT to get $Bal60 = 205,224.81$, then add the regular monthly payment of $2,278.41$ to get a final payment of $207,503.22$

Loan Closing Costs and Effective Borrowing Costs

1. **Statutory costs** - Legally mandated costs such as recording fees
2. **Third party charges** - money paid to third parties such as title insurance premiums
3. **Additional finance charges** - loan discount fees, points, loan underwriting fees. These fees are collected by the lender and add to lender profitability. They have the same effect as lending a smaller amount to the borrower.
Effective Cost of Loan
- It is costly to originate mortgages; thus, the originator must be compensated for this cost.
- For example, it is common to pay a loan officer a commission for finding the borrower – often 1% of the loan amount.
- If the loan officer draws a salary, that cost must be paid from business proceeds.
- Also, borrowers may pay "points" to buy down the note rate.
- A point, or discount point is 1/100 of the loan amount.
- The note amount is often higher than the amount of cash dispersed due to origination fees, points, and other fees.

Effective Interest Cost Example
- Contractual loan amount $120,000
- Less discount points (3%) $3,600
- Net cash disbursed by lender $116,400
- Interest rate= 7%
- Term 30 years
- Note amount is $120,000 which must be repaid, though only $116,400 is received by the borrower.
- The payment is based on the $120,000 note amount.

Fixed-rate Mortgages
- FTLAPR – Federal Truth in Lending APR
  - The Effective Cost Of The Loan Assuming It Is Held For Its Full Term
  - Some Items Included In APR Calculation:
    - Origination Fee, Lender Inspection Fee, Assumption Fee, Underwriting Fee, Tax Service Fee, Document Prep Fee, Prepaid Interest, Mortgage Insurance Premium, Discount Points
  - Not included – Statutory and Third Party Charges – e.g. recording fees, title insurance.

Effective Interest Cost Example (Cont)
- Calculator solution: P/Yr = 12
  - PMT(PV=-120,000, I/YR=7, N=360) = 798.36
  - However you only received $116,400
  - Compute Yield to Lender (IRR) who gets a payment of 798.36 for disbursing $116,400
  - I/YR(PV=-116,400, N=360, PMT= 798.36) = 7.30%
- Federal Truth in Lending will require reporting an APR=7.30% (may be rounded to closest 1/8%, or 7.25%)

Regulation Z- truth in lending (APR)
- RESPA- Real Estate Settlement Procedures Act
- FTLAPR – This APR computation adjusts measures the costs of funds as a percentage amount that makes it easier to compare among lenders of loans with differing fees and points. Assumes mortgage paid off over its stated term.
- As with other APR computations, it understates the cost of funds as the true cost is an EAR.
- Prepayment penalties increase the cost of borrowing without affecting the FTLAPR.
- Early repayment (with points) will increase borrowing cost without affecting the FTLAPR.

Fixed-rate Mortgages
- Contract Term | Disc. | APR | PMT @ 100,000
- Rate | Points | | 
- 5.50% | 30 yrs | 0.00 | 5.56% | $567.79
- 5.375% | 30 yrs | 1.00 | 5.705% | $559.97
- 5.25% | 30 yrs | 2.00 | 5.534% | $552.20
- 5.125% | 30 yrs | 2.50 | 5.42% | $544.49
Fixed-rate Mortgages

<table>
<thead>
<tr>
<th>Contract Rate</th>
<th>Disc. Points</th>
<th>APR</th>
<th>Pmt @ 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.875% 15 yrs</td>
<td>0.00</td>
<td>5.09%</td>
<td>$784.30</td>
</tr>
<tr>
<td>4.75% 15 yrs</td>
<td>1.00</td>
<td>5.302%</td>
<td>$777.83</td>
</tr>
<tr>
<td>4.625% 15 yrs</td>
<td>1.25</td>
<td>4.787%</td>
<td>$771.40</td>
</tr>
</tbody>
</table>

Effect of Early Repayment on Yield to Lender (No affect on FTLAPR)

- For the previous example, that you prepay the loan on the 2nd anniversary. What is the yield to lender?
- First compute the loan balance after 2 years
- 1 INPUT 24 AMORT Bal = 117,474.02
- I/YR(PV=-116,400, PMT=798.36, N=24, FV=117,474.02) = 8.65%
- Note: FTLAPR is still 7.25%

Effect of Prepayment Penalty on Yield to Lender

- For the previous example, assume the lender charges a 2% prepayment penalty if the loan is paid off during the first 5 years, and that you prepay the loan on the 2nd anniversary. What is the yield to lender?
- First compute the loan balance after 2 years
- 1 INPUT 24 AMORT Bal = 117,474.02
- Increase balance by 2% for prepay penalty
- I/YR(PV=-116,400, PMT=798.36, N=24, FV=119,823.50) = 9.57%
- Note: FTLAPR remains at 7.25%

Ex. Points to achieve a target yield

- How many points must a lender charge for a 6 percent, 15-year note to achieve a yield of 6.5%? (Though the loan amount does not matter, assume a $100,000 loan for computations)
  - A. Assume the borrower holds the note for the entire term
  - B. Assume the borrower holds the note for 3-years

Trade Off Between Contract Rate and Discount Points

<table>
<thead>
<tr>
<th>Contract Rate</th>
<th>Discount Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>7%</td>
<td>0</td>
</tr>
<tr>
<td>6.75%</td>
<td>1.00</td>
</tr>
<tr>
<td>6.50%</td>
<td>2.875</td>
</tr>
<tr>
<td>6.25%</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Summary of Effective Costs

<table>
<thead>
<tr>
<th>Option</th>
<th>APR</th>
<th>5 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>7% &amp; 0 pts</td>
<td>6.85%</td>
<td>6.99%</td>
</tr>
<tr>
<td>6.75% &amp; 1 pt</td>
<td>6.78%</td>
<td>7.21%</td>
</tr>
<tr>
<td>6.50% &amp; 2.875 pts</td>
<td>6.54%</td>
<td>6.98%</td>
</tr>
<tr>
<td>6.25% &amp; 3 pts</td>
<td>6.54%</td>
<td>6.98%</td>
</tr>
</tbody>
</table>
An Alternate View

- What if the loan was originated at 6%, which was a fair rate on the day the loan rate was "locked" but interest rates had increased to 6.5% when the lender wanted to sell the loan?
  - How much could the lender sell this loan for?
- What if interest rates had fallen to 5.5%? What could the lender sell this loan for?
- How does the prepayment assumption affect the selling price of a loan?

Fifteen Year Mortgage

- Borrow $100,000 at 7.50% for 30 or 15 years, monthly payments
  - PMT(PV=100,000, I/YR=7.5, N=360) = $699.21
  - PMT(PV=100,000, I/YR=7.5, N=180) = $927.01
- Total interest over 30 year term
  - $699.21(360) - $100,000 = $151,716
- Total interest over 15 year term
  - $927.01(180) - $100,000 = $66,862
- Difference in Interest Paid
  - $151,716 - $66,862 = $84,854
- Typically have a lower interest rate for 15 year mortgage so savings are higher than this example shows

Extra Principal Payment Monthly

- PMT(PV=-100,000, I/YR=7.5, N=360) = $699.21
  - $699.21/12 = $58.27 Extra Paid Monthly
  - New PMT = $699.21 + $58.27 = $757.48
- Number of Payments at New Payment Amount
  - N(PMT=757.48, I/YR = , PV=-100,000) = 279.84 mo
  - 360 - 279.84 = 81.16 fewer payments
- Amount Saved
  - $699.21 * 81.16 = $56,049 - $58.27 * 279.84
  - $56,049 - $16,306 = $39,743

Extra Payment-Lump Sum

- PMT(PV=-100,000, I/YR=7.5, N=360) = $699.21
- $10,000 Extra Paid at the end of year 3
  - BAL$_ {EOY3}$ : $97,014
  - Minus Extra Payment: $10,000
  - New Balance$_ {EOY3}$ : $87,014
- Number of Payments Remaining After Extra Payment
  - N(PV=-87,014, I/YR=7.5, PMT=$699.21) = 241.41
  - 360 – 241.41 = 82.59 fewer payments
- Amount Saved:
  - $699.21 (82.59) - $10,000 = $47,748

Example: Construction Finance

- You are offered a bullet loan at Prime plus 3 for 6 months, with 3 points. Prime is currently at 6% and we will assume it will remain stable. What is your expected cost of construction financing expressed as an EAR?