


## Chapter 10

### Residential Mortgage Types and Borrower Decisions



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## Mortgage Types and Borrower Decisions: Overview

- Role of the secondary market
- Mortgage types:
  - Conventional mortgages
  - FHA mortgages
  - VA mortgages
  - Home equity Loans
  - Other
- Role of mortgage insurance
- Mortgage decisions
  - Mortgage choice
  - Amount of leverage (loan size)
  - Refinancing
  - Default

## Primary Mortgage Market

- Where loans are created (originated)
- Players
  - Mortgage bankers
  - Mortgage brokers
  - Banks
  - Thrifts

## Secondary Mortgage Market

- Where existing home loans are resold
- Government-sponsored enterprises (GSEs)
  - Fannie Mae
  - Freddie Mac
- Government National Mortgage Association (GNMA or "Ginnie Mae")

## Conventional Mortgage Loans

- Oldest form
- Any standard home mortgage loan not insured by FHA or guaranteed by Department of Veterans Affairs
- Revolutionized in 1940s by private mortgage insurance

## The Language of Conventional Mortgage Loans

- Conforming conventional home loan: **Meets the requirements** for purchase by Freddie Mac or Fannie Mae:
  - Standard note
  - Standard mortgage
  - Standard appraisal
  - Standard Underwriting
  - Size limit: Currently \$417,000 (higher for high cost areas)
  - Interest rate advantage due to liquidity (at least .25%, over 1.00 percent since mid-2007)

## The Language of Conventional Mortgage Loans

- Nonconforming loan: Does not meet GSE requirements in some respect
  - Jumbo
  - Subprime

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## Private Mortgage Insurance (PMI)

- Protects lender against losses due to default
- Generally required for loans over 80% of value
- Protects lender for losses up to 25% - 35% of loan
- Example terms:
  - 2.5 percent of loan in single up-front premium, or
  - No up-front premium and 0.5 percent annual premium (0.041 per month)
  - See MGIC website for variation in PMI programs and terms: <http://www.mgic.com/rates/index.html>

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## Private Mortgage Insurance (continued)

- Insurer may allow termination if:
  - Loan falls below 80% of current value
  - And borrower is in good standing
- Must allow termination when:
  - loan falls to 80% of original value (Homeowner's Insurance Act of 1999)
  - And borrower is in good standing
- Must terminate when:
  - loan falls to 78% of original value
  - And borrower is in good standing

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## Private Mortgage Insurance: Example

- House price: \$200,000
- Loan amount: \$190,000
- PMI, insuring "top 30%": First \$57,000 in losses
- Borrower pays down loan to \$188,000
- Defaults: Foreclosure sale at \$180,000
- Lender's loss: \$188,000 - \$180,000 = \$8,000
- With loss less than \$57,000, PMI covers it completely

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## FHA Mortgages (Federal Housing Administration)

- Goals of the National Housing Act of 1949:
  - Decent home and suitable living environment
    - Implemented mainly through mortgage markets
- FHA is strictly a loan insurance program
  - Loans are from private lenders
  - FHA has had positive cash flow in most years
  - Through 2012 has never needed government funding
  - Set the precedent for PMI

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## How FHA Insurance Works

- Insures 100% of loan
- After foreclosure, title is transferred to Housing and Urban Development (HUD)

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## How FHA Insurance Works

- Premiums (as of end of 2012):
  - Up-front premium: 1.75%, which can be included in loan
  - Annual premium based on average balance:
    - 0.60% for loans of 15 years or less and under 95% of value
    - 0.55% for loans of 15 years or less and 95% of value
    - 1.20% for loans over 15 years but under 95% of value
    - **1.25% for loans over 15 years and 95% of value**

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## FHA Insurance

- Many FHA insurance programs
  - 203b: Standard LPM insurance
  - 245: Insurance for graduated payment mortgages
  - ARM insurance (“1 and 3” caps required)
  - 203k Rehab program for single family houses
  - Home equity conversion mortgage (HECM)
- Importance of FHA
  - Created the level payment mortgage
  - Influenced housing and subdivision standards
  - Continues to innovate: HECM program

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## FHA Loan Example

- House price: \$203,000
- Appraised value: \$200,000
- Non-FHA closing costs: \$5,000
- Implies “maximum” loan:
  - \$193,000 (200,000 x .965)
- UFMIP:  $0.0175 \times \$193,000 = \$3,377.50$
- Total loan:
  - $\$193,000 + \$3,377.50 = \$196,377.50$
- Actual down payment:
  - $\$203,000 - 193,000 = \$10,000$
- Cash required:  $\$5,000 + \$10,000 = \$15,000$
- **Why is this an unlikely scenario?**

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## More Realistic FHA Loan Example

- House price: \$200,000
- Appraised value: \$200,000
- Non-FHA closing costs: \$5,000
- Implies “maximum” loan:
  - \$193,000 (200,000 x .965)
- UFMIP:  $0.0175 \times \$193,000 = \$3,377.50$
- Total loan:
  - $\$193,000 + \$3,377.50 = \$196,377.50$
- Actual down payment:
  - $\$200,000 - 193,000 = \$7,000$
- Cash required:  $\$5,000 + \$7,000 = \$12,000$
- Starting loan balance is 196,377.50

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## Veterans Affairs Guarantees

- Limited to qualified veterans of military service.
- Guarantee:
  - Loans under \$45,000: 50 percent
  - Loans over \$144,000: 25 percent
  - Maximum guarantee: One-fourth of the GSE loan limit.
- Loan can be up to 100% of value
- Funding Fee is based on loan-to-value ratio and service:
  - Over 95% LTV: 2.15% for active duty, 2.4% for other
  - Over 90% - 95% LTV: 1.5% for active duty, 1.75% for other
  - Up to 90% LTV: 1.25% for active duty, 1.5% for other
- Loan covers funding fee, but not closing costs

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## Other Mortgage Types

- Purchase money mortgage: Mortgage given by a property buyer simultaneous with receipt of title
  - Among real estate brokers: refers to a second mortgage loan from a seller to reduce the buyer’s down payment
  - Among government agencies: any loan that finances a purchase
- Piggyback loan: A second mortgage paired with an underlying 1<sup>st</sup> mortgage to keep the 1<sup>st</sup> at or below 80 percent LTV, thus avoiding required mortgage insurance.

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### Other Mortgage Types: Home Equity Loans

- Some home equity loans are closed-end, fixed-term loans
- Mostly open-end or line-of-credit loans (HELOC)
- Tax deductible interest
- Strength of the house as security provides favorable rate and longer term
- Usually limited to total mortgage debt (sum of all mortgage loans) of 75% to 80% of value

### Other Mortgage Types: Reverse Mortgage

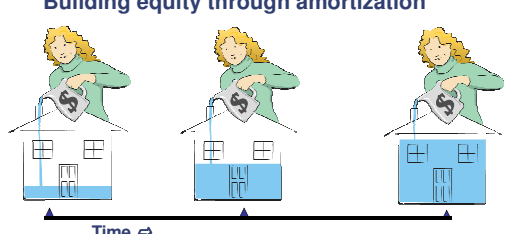
- Many older households are income constrained
- Over 80% own their home
- Most have little or no mortgage debt
- Most do not want to sell

### How the Reverse Mortgage Works

- Converts home equity to income without requiring borrower to move
- Requires no payment
  - Regular annuity disbursement
  - Lump sum disbursement
  - Credit line
- Mortality risk: Risk that loan will grow beyond value of mortgaged property
  - FHA's HECM program and private insurance protect lender
  - No foreclosure

### Traditional Mortgage

**Building equity through amortization**




Time ⇌

**Principal payments reduce loan balance**

### Reverse Mortgage

**Liquidating equity through regular disbursements**



Time ⇌

**Periodic loan draws plus accruing interest increase the loan, and reduce the owner's equity.**

### Recent Mortgage Forms

- Interest-only Mortgage
  - I-O with balloon* has interest-only payments for five to seven years, ending with a full repayment of principal.
  - I-O amortizing* has interest-only payments for up to fifteen years, then converts to a fully amortizing payment for the remainder of the term.

### Recent Mortgage Forms

- Hybrid ARM
  - Interest rate is fixed for some years, then becomes adjustable
  - Payment is set to be fully amortizing
  - Fixed rate period ranges from two to ten years
  - Fixed rate increases as the fixed portion term lengthens
- Successfully blends
  - Need of borrowers for predictable payments
  - Need of lenders for market level interest rates
- Became unfortunately tainted in recent years due to association with sub-prime lending

### Recent Mortgage Forms

- Options ARM Example
  - Borrower could select among three types of payments: fully amortizing, interest-only, and minimum
  - Minimum payment based on a very low rate: say, 1.5 percent
  - Minimum payment increases 7.5 percent per year
  - Interest rate charged was adjustable, usually deeply reduced for the first few months
  - With minimum payment, the loan balance grew due to “negative amortization”
  - At the end of five years, or when the balance reaches 125 percent of the original loan, the payment is recast to fully amortize the loan over its remaining term.
  - Most borrowers, unfortunately, chose the minimum payment

### Subprime Loans

- Not a unique design, but a high-risk use
- Mostly 2-28 hybrid, I-O, or option ARM
- Almost all were adjustable rate
- Low initial payment, large negative amortization
- Started at very high loan-to-value ratio
- Designed so that refinancing would become necessary due to severe payment increases
- Often had prepayment penalty to recoup upfront teaser
- Wide-spread abandonment of prudent underwriting

### Alt-A Loans

- Closer to “standard” in type than sub-prime
- Usually relaxed one standard loan underwriting requirement:
  - Low or no cash down payment
  - Weak credit score
  - No documentation of borrower’s finances
- Majority were “no-doc” or “low-doc” loans
  - Became referred to as “liar loans.”

### Comparing Cost of Loans Using FTLAPR

- APR: Annual Percentage Rate
- FTLAPR converts regular interest expense and up-front loan fees into a single measure of the IRR equivalent expense
- FTLAPR is an improvement note rate alone in comparing the cost of loans
- APR has a bias for most applications:
  - APR assumes that up-front fees are spread over the full maturity of the loan
  - Since most loans are prepaid before maturity, APR will tend to understate the true cost of borrowing when up-front fees are charged

### Using FLTAPR to Compare Loan Costs

	Loan A	Loan B
Loan amount	\$200,000	\$200,000
Maturity	30 years	30 years
Contract interest rate	6.5 percent	6.25 percent
Upfront fees	1.5 percent	4.0 percent
Upfront mortgage insurance fee	1.0 percent	1.0 percent
APR	6.75 percent	6.74 percent

- If loans A and B are never prepaid, FTLAPR accurately gives the cost of each.
- If loans A and B are prepaid before maturity, loan B, with higher fees, will be the more costly of the two

### If the loans prepay after 6 years, what are the yields to lender

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### Mortgage Decisions: Refinancing

- Refinancing is an investment decision, comparing benefits to cost.
- Net Benefit = Benefit of Payment Reductions  
– Cost of Refinancing
- First approximation of benefits: sum of all future monthly payment reductions, where:
  - New loan is at the current market rate
  - New loan has the same remaining life as the old loan

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### Mortgage Refinancing: Example

- Existing mortgage:
  - Amount: \$100,000
  - Remaining term: 15 years
  - Interest rate: 7.0 percent
  - Monthly payment: \$898.83
- New mortgage:
  - Amount: \$100,000
  - Term: 15 years
  - Interest rate: 5.5 percent
  - Monthly payment: \$817.08
- Expected time before paying off new loan: 6 years
- Cost of refinancing: 5 percent of loan amount

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### Mortgage Refinancing: Example (continued)

- Monthly payment reduction:  
= \$898.83 – 817.08 = \$81.75
- Number of months for reduction: six years, or 72 months
- Approximate benefit:  
 $72 \times \$81.75 = \$5,886.00$
- Cost of refinancing:  $0.05 \times \$100,000 = \$5,000$
- Approximate Net Benefit of refinancing  
=  $\$5,886 - 5,000 = \$886$
- **NOTE: No TVM in these computations**
- **What if we discount the savings (at 5.5%)?**

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### The Effect of Income Taxes on Refinancing

- Mortgage interest can be deductible for taxes
- Example:
  - Suppose tax rate on additional income is 25%
  - Then \$1.00 of mortgage interest lowers taxes \$.25
  - Net cost of borrowing is 25% lower
  - Interest at 10% costs only 7.5% after taxes
- Result: Benefit of refinancing is 25% less
- Example: Reduction from 10% interest to 9%:
 

Old interest cost:	$10\% - .25 \times 10\% = 7.50\%$
New interest cost:	$9\% - .25 \times 9\% = 6.75\%$
Interest reduction after tax:	$7.50\% - 6.75\% = 0.75\%$

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### Adjusting for Income Tax Effects on Refinancing

- Assume:
  - All interest saved by refinancing is tax deductible
  - Tax rate on additional income is 25 percent
  - 100 percent of payment reductions are interest savings
- Approximate after tax benefit of loan payment reductions for previous example:  
After tax benefit =  $0.75 \times \$5,886 = \$4,414.50$
- After tax approximate net benefit of refinancing:  
=  $\$4,414.50 - 5,000 = -\$585.50$

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## Caution about Income Tax Effects on Refinancing

- Two approaches to deductions under U.S. tax code:
  - Standard deduction (lump sum amount)
  - Itemized deductions
- Tax deductions only reduce interest costs to the extent that the taxpayer:
  - Itemizes deductions
  - Has total itemized deductions in excess of the standard deduction
- Otherwise, in computing benefits of refinancing, taxes should be ignored

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## Refinancing Rules of Thumb

- Interest rate spread rule: Refinance if “spread” between old loan interest rate and current rate is, for example, 2.0 percent
- Payback period rule: Divide cost of refinancing by monthly savings to find “payback period”; then decide if the payback period is short enough

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## Refinancing: Cost of Missing a Better Deal Later

- Suppose: 50% chance interest rates will fall
- Note: The bigger the fall, the lower the likelihood
- Note: Maximum loss = cost to refinance
- Thus: Expected cost of missed opportunity (probability × cost) < half the cost to refinance
- Conclusion: Waiting until benefit exceeds the cost to refinance by, say, one-third probably compensates for the risk of missing a better deal later
  - Example: If refinancing costs 6% of the loan amount, do not refinance until the savings is 8% of the loan amount

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## The Option to Default

- Historically, few borrowers have defaulted in the absence three conditions:
  - Monthly value of occupancy is less than its cost
  - Equity is zero or negative
  - “Trigger event”: Divorce, death in family, loss of job
- Borrowers regard cost of default as very high
- For most households the value of services from their house exceeds the cost of their mortgage payment.

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End of Chapter 10



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