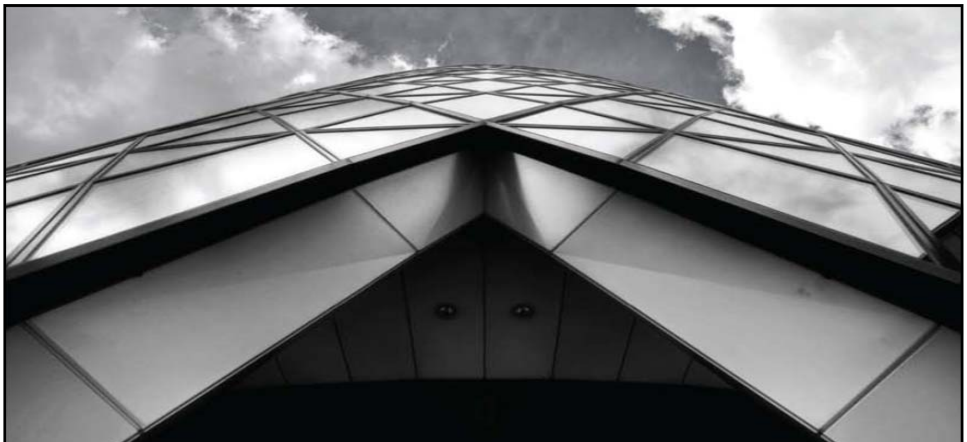


Chapter 05: Adjustable and Floating Rate Mortgage Loans

McGraw-Hill/Irwin

Variable Payment Patterns

- Fixed Rate Mortgages
- Adjustable or Floating Rate Mortgages
- Price Level Adjusted Mortgage

Fixed Rate and Price Level Adjusted Mortgage

- Fixed rate mortgages can lose substantial value if an unanticipated rise in inflation occurs after the mortgages have been made.
- The Price Level Adjusted Mortgage is designed to avoid the loss that would otherwise occur due to unanticipated inflation.
- As you might expect, the popularity of fixed rate mortgages ebbs and flows with the state of the market and the participants' perception of the stability of inflation rates.

5-3

Definition of 'Price Level Adjusted Mortgage - PLAM

The interest rate of a price level adjusted mortgage (PLAM) does not change, but the outstanding principal is changed periodically based on the inflation rate. These adjustments are made based on the movements of an appropriate price index, such as the Consumer Price Index (CPI).

The unpaid principal of a PLAM is adjusted periodically, based upon the rate of inflation or deflation. The payments are then revised based on the new outstanding principal. These adjustments are made at intervals agreed upon by the borrower and lender. This type of mortgage allows the lender to be paid back principal and interest plus an amount to cover inflation.

5-4

Price Level Adjusted Mortgage

- i = mortgage interest rates, r = expected real rate of interest, p = risk premium, f = expected inflation

  $i = r + p + f$

PLAM balances adjust with changes in inflation.

Two problems:

1. CPI is not a perfect index for housing prices
2. If borrower's incomes do not increase at CPI, this may lead to the borrower's inability to repay.

5-5

Basic Issues with Adjustable Rate Mortgages

- ARMs do not eliminate interest rate risk
- The longer the adjustment interval, the more interest rate risk the lender will take on
- As the lender assumes less interest rate risk by putting it onto the borrower, the lender should expect to receive a lower rate of interest than it would otherwise receive with a fixed rate mortgage.

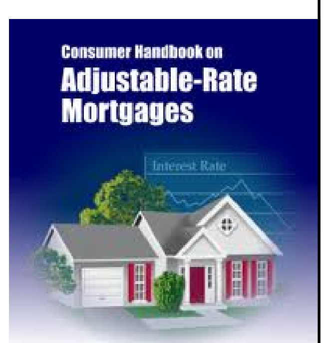
5-6

Adjustable Rate Mortgages

- A new loan payment is computed at each reset date
  - Composite Rate = index + margin
  - Index
    - Interest rate that the lender does not control
      - Treasury securities
      - Cost Of Funds Index (COFI)
      - London Interbank Offered Rate (LIBOR)
  - Margin (or spread)
    - Premium added to the index

Adjustable Rate Mortgages

- Reset Date
  - When mortgage payment is readjusted
- Negative Amortization
  - Payment does not cover the interest due
- Caps
- Floors
- Assumability
- Points
- Prepayment
- Conversion



Adjustable Rate Mortgages

- Hybrid Loans
  - Longer initial reset period, 3/1, 5/1, and 7/1
- Interest Only ARM and Floating Rate
  - I.O. for initial period
  - Then, depending on what has been negotiated
    - Pay interest only
    - Pay interest & some principal
    - Sometimes negative amortization
    - Fully amortizing payments required in future

Adjustable Rate Mortgages

- For residential loans, the teaser rate is important
  - Initial rate below market composite rate
  - Market Competition
  - Accrual Rate
  - Negative Amortization
  - Payment Shock
  - It is not clear whether all residential borrowers comprehend or appropriately price the inherent risks in adjustable rate mortgages.

Adjustable Rate Mortgages
Yield & Rates

- Yields are a function of:
  – Initial interest rate
  – Index & margin
  – Any points charged
  – Frequency of payment adjustments
  – Inclusion of caps or floors on the interest rate, payments, or loan balances

Adjustable Rate Mortgages
Yield & Risks

- Default Risk
  – Can borrower afford new payments?
  – Impact of negative amortization
- Pricing Risk
  – Allocation of interest rate risk
  – Impact on default risk of specific borrowers

Adjustable Rate Mortgages Yield & Risks

- Basic Relationships:
  - – FRM vs. ARM yield at origination
  - – Short-term vs. Long-term indices
  - – Shorter vs. Longer time intervals between adjustments
  - – Impact of caps & floors
  - – Negative amortization

Adjustable Rate Mortgages

- Example 5-1
  - – Unrestricted ARM
  - – Loan Amount = $100,000
  - – Starting Rate = 5%
  - – Term = 30 Years
  - – Adjustment Interval = 1 Year

Adjustable Rate Mortgages

- Initial Payment:

PV = $100,000

n = 360

FV = $0

i = 5

CPT PMT = $536.82

FOURTEENTH EDITION

Adjustable Rate Mortgages

- The new payment is based on loan balance of $98,524.63.
- If the composite rate = 7%,

PV = $98,524.63

n = 348

FV = $0

i = 7

CPT PMT = $662.21

Adjustable Rate Mortgages

- Note the payment increase:

  \$662.21 - \$536.82 = \$125.39
- This could be a problem for a borrower on a tight budget.

Adjustable Rate Mortgages

- Example 5-2: Interest Rate Caps
  – Loan Amount = \$100,000
  – Starting Rate = 7%
  – Term = 30 Years
  – Adjustment Interval = 1 Year
  – 2% Annual Rate Cap

FOURTEENTH EDITION

Adjustable Rate Mortgages

- Initial Payment:

  PV = $100,000

  n = 360

  FV = $0

  i = 7

  CPT PMT = $665.30

5-19

FOURTEENTH EDITION

Adjustable Rate Mortgages

- EOY1 Loan Balance:

  n = 348

  CPT PV = $98,984.19

- New payment is based on loan balance of $98,984.19

5-20

FOURTEENTH EDITION

Adjustable Rate Mortgages

- The new interest rate cannot be higher than 9% due to the interest rate cap.
- If the Composite Rate = 10%, the 2% cap applies and the interest rate is 9%.
- If the Composite Rate = 8%, the 2% cap does not apply and the interest rate is 8%.

5-21

FOURTEENTH EDITION

Adjustable Rate Mortgages

- Example 5-3: Payment Caps
  - – Loan Amount = $100,000
  - – Starting Rate = 6%
  - – Term = 30 Years
  - – Adjustment Interval = 1 Year
  - – Payment Cap = 5%

Adjustable Rate Mortgages

- Initial Payment:

PV = $100,000

n = 360

FV = $0

i = 6

CPT PMT = $599.55

Adjustable Rate Mortgages

- EOY1 Loan Balance:

n = 348 **360 months – 12 months = 348**

CPT PV = $98,771.99 **Loan Balance at the End of year 1**

Adjustable Rate Mortgages

- New payment is based on loan balance of $98,771.99
- The dollar increase in the payment cannot exceed the capped payment.
- Capped Payment =

  $599.55 x 1.05 = $629.53

Adjustable Rate Mortgages

- If the Composite Rate = 10%, the unrestricted payment would be:

PV = $98,771.99

n = 348

FV = $0

i = 10

CPT **PMT** = $871.64

Since the capped payment is $629.53, it would be used

Adjustable Rate Mortgages

- If there is negative amortization,

  PV = \$98,771.99

  n = 12

  PMT = \$629.53

  CPT **FV** = \$101,204.32

  would be the EOY2 Loan Balance