

Chapter 5

Adjustable and Floating Rate Mortgage Loans

Variable Payment Patterns

- Fixed Rate Mortgages
- Adjustable or Floating Rate Mortgages
- Price Level Adjusted Mortgage (PLAM)
 - Loan balance adjusted for inflation
 - New payment computed using adjusted balance

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 PLAM 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.

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

- CPI is not a perfect index for housing prices
- If borrower's incomes do not increase at CPI, this may make it challenging for the borrower to repay.

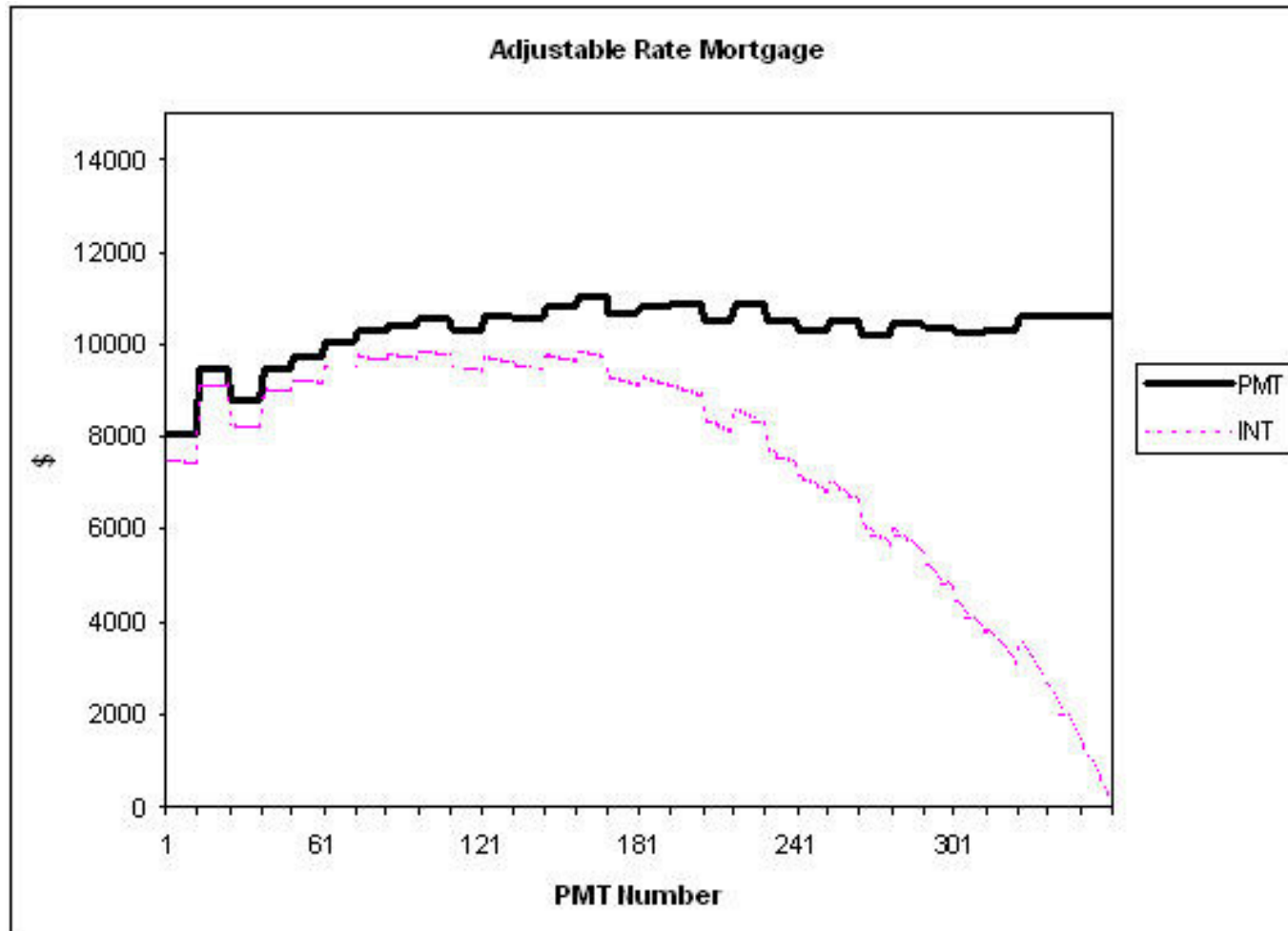
Basic Issues with Adjustable Rate Mortgages

- 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.

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

ARMs: An Overview Continued



ARMs: An Overview Continued



ing Risk

- As the lender assumes less interest rate risk, the borrower assumes more interest rate risk

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
- The full list is on page 126.

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:

$$\boxed{\text{PV}} = \$100,000$$

$$\boxed{\text{n}} = 360$$

$$\boxed{\text{FV}} = \$0$$

$$\boxed{\text{i}} = 5$$

$$\boxed{\text{CPT}} \quad \boxed{\text{PMT}} = \$536.82$$

Adjustable Rate Mortgages

- EOY1 Loan Balance
 - Change n and compute the present value of the remaining payments

$$\boxed{n} = 348$$

$$\boxed{\text{CPT}} \quad \boxed{\text{PV}} \quad \$98,524.63$$

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

Adjustable Rate Mortgages

- Initial Payment:

$$\text{PV} = \$100,000$$

$$n = 360$$

$$FV = \$0$$

$$i = 7$$

$$\text{CPT PMT} = \$665.30$$

Adjustable Rate Mortgages

- EOY1 Loan Balance:

$$\boxed{n} = 348$$

$$\boxed{CPT} \quad \boxed{PV} = \$98,984.19$$

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

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%.

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:

$$\boxed{\text{PV}} = \$100,000$$

$$\boxed{\text{n}} = 360$$

$$\boxed{\text{FV}} = \$0$$

$$\boxed{\text{i}} = 6$$

$$\boxed{\text{CPT}} \quad \boxed{\text{PMT}} = \$599.55$$

Adjustable Rate Mortgages

- EOY1 Loan Balance:

$$\boxed{n} = 348$$

$$\boxed{CPT} \quad \boxed{PV} = \$98,771.99$$

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 =
$$\$599.55 \times 1.05 = \$629.53$$

Adjustable Rate Mortgages

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

$$\text{PV} = \$98,771.99$$

$$n = 348$$

$$FV = \$0$$

$$i = 10$$

$$\text{CPT PMT} = \$871.64$$

Adjustable Rate Mortgages

- Since the capped payment is \$629.53, it would be used.
- If there is negative amortization,

$$\mathbf{PV} = \$98,771.99$$

$$\mathbf{n} = 12$$

$$\mathbf{PMT} = \$629.53$$

$$\mathbf{CPT} \quad \mathbf{FV} = \$101,204.32$$

would be the EOY2 Loan Balance