(14)

• Financial Structure
• Financial Intermediation

Financial Structure (M+BS)

Sources of funds:

1. Debt (Liabilities)
   Promised Return

   No control over firm unless default.

   "Creditors", bondholders, banks, etc.

2. Equity ("Capital", "NW")

   Gets residual return after creditors paid.

   Controls firm if not in default.

   "Owners" - Shareholders

Bankruptcy

Creditors get first claim on assets.

Limited Liability ("Corp. shield")

- Corporations, Ltd Liability Co's (LLCs) have Limited Liability
- Creditors have no claim on assets of owners beyond their equity in firm.

  ⇒ Equity owners share equally in losses; can separate personal finances from business interests.

- Creditors notified of limit by "Inc." or "LLC" in borrower's legal name.

→

Bankruptcy

Ch. 7 Liquidation

firm liquidated, creditors get first claim, equity may be wiped out.

Ch. 11 Reorganization

firm stays in business, debt marked down by court

if better for creditors than liquidation.

- Airlines, GM, etc.

Leverage

$$= \boxed{\frac{\text{Assets}}{\text{Equity}}} \geq 1$$

- Allows owners to control more assets
- Increases their expected rate of return
- Increases riskiness of their return
- Allows investors to specialize
  - Risk averse, unknowledgeable
    hold debt
  - Risk tolerant, knowledgeable
    hold equity
- Increases chance of default; losses to creditors in event of default.

Debt Seniority

Senior secured debt generally has prior claim over Junior debt

since Jr. debt increases Leverage, default risk.

- 1st mortgage = Sr. Debt.
- 2nd mortgage = Jr. Debt.

But new debt used to buy new asset may have first claim (lien) on that asset.

Debt Securitization

eg 1,000,000 bonds @ $1000 each.

- If borrower sells 1 at a time, 1st is Sr to 2nd, etc., so not equal claims.
- If borrower sells all 1,000,000 at once to single buyer or syndicate of buyers, all are co-equal, have better 2ndary mkt.
- → Investment Banks underwrite such offerings. Risky but profitable.

Preferred Stock (vs Common Stock)

- Intermediate between Debt, Equity
- Has promised return like Debt.

  Common Stock gets no dividends
  unless preferred paid.

- Ordinarily doesn't vote

  Unless promised payment not met.

- But failure to make promised return
  doesn't trigger Bankruptcy.

- Exact terms vary with issue.

Examples –

- Warren Buffett's Berkshire Hathaway
  made 35% in 2.5 yrs on $5 B 2008
  Preferred Stock investment in Goldman
  Sachs. (+ $1.6 B in Warrants)
- 2008 TARP program invested $245 B
  in Bank Holding Co. Pref. Stock.

Holding Companies

= corp whose purpose is to own stock of + control other corps.

May itself be leveraged.

⇒ double leverage

- H.C. stock controls many assets w/o impairing claims of creditors of underlying corps.
- H.C. debt riskier than ordinary debt, because assets are riskiest part of underlying investments.

"Junk Bonds" often HC Debt

- Used for Leveraged Buyouts
- Similar to Preferred Stock.

- H.C. failure gives subsidiaries new owners, does not affect their operations.

Commercial Banks

$$\frac{NW}{A} = \underline{11.1\ \%} \quad 12/2010$$

(6.8 % 12/2002)

Leverage Ratio

$$= \frac{A}{NW} = 9.0:1 \quad 12/10 \quad (14.7:1\ 12/02)$$

very high for ordinary corp.

But —

Bank assets almost all others' debt.

→ Assets safe from default if

- borrowers not excessively leveraged,
- loans well collateralized.

→ Deposit Liabilities safe if

- default risks well diversified
- A + L Durations not excessively mismatched
- Capital adequate to absorb residual losses.

Today, most US Commercial Banks owned by Holding Co's.

Eg Citibank, NA (Nat'l Assn)

= Commercial bank,

- well capitalized
- FDIC insured.
- Deposits safe, equity risky.

Citigroup, Inc.

= Holding Co.

- Owns Citibank stock, share in Morgan Stanley Smith Barney Investment Bank.

2008 TARP (Troubled Asset Relief Program)

- Bought $245 B preferred stock in Bank Holding Co's like Citigroup.
- Rescued H.C. shareholders, creditors
- Didn't help depositors, FDIC.

Ponzi Funds

- Chas Ponzi
  Boston N. End 1920's
- Bernie Madoff (BLM Investment Securities)
  Wall St → Collapsed 2008.
  $50B losses

- Pays high rate of return, attracts new investors,

  High return paid with new investments, not with profits

  → NW goes negative as assets sold to pay dividends.

  Balance sheet fraudulently claims NW > 0.

- Has gimmick to generate "profits"
  - Ponzi - Postal Rate Arbitrage
  - Madoff - Trading strategy to generate (moderately) high returns with little risk.

Enron Corp. – Ken Lay

- Traded positions in energy, paper, etc.
  $101 B Revenue 2000.
- Declared profits, paid dividends.
- Hid losses in "Black Box" subsidiaries
- Accountants Arthur Andersen collaborated
- Fraud exposed 2001-02

  Lay guilty on 10 charges

  died before sentencing

  20-30 yrs?

  Andersen firm ruined.

Fed now uses similar "Black Box" accounting

to hide losses in AIG, Bear Stearns etc:

- Maiden Lane I, II, III LLC.
- Fannie Mae, Freddie Mac

FINANCIAL INTERMEDIATION

M+B 27

Credit Market Assets of Households and Financial Intermediaries, 2008Q1.

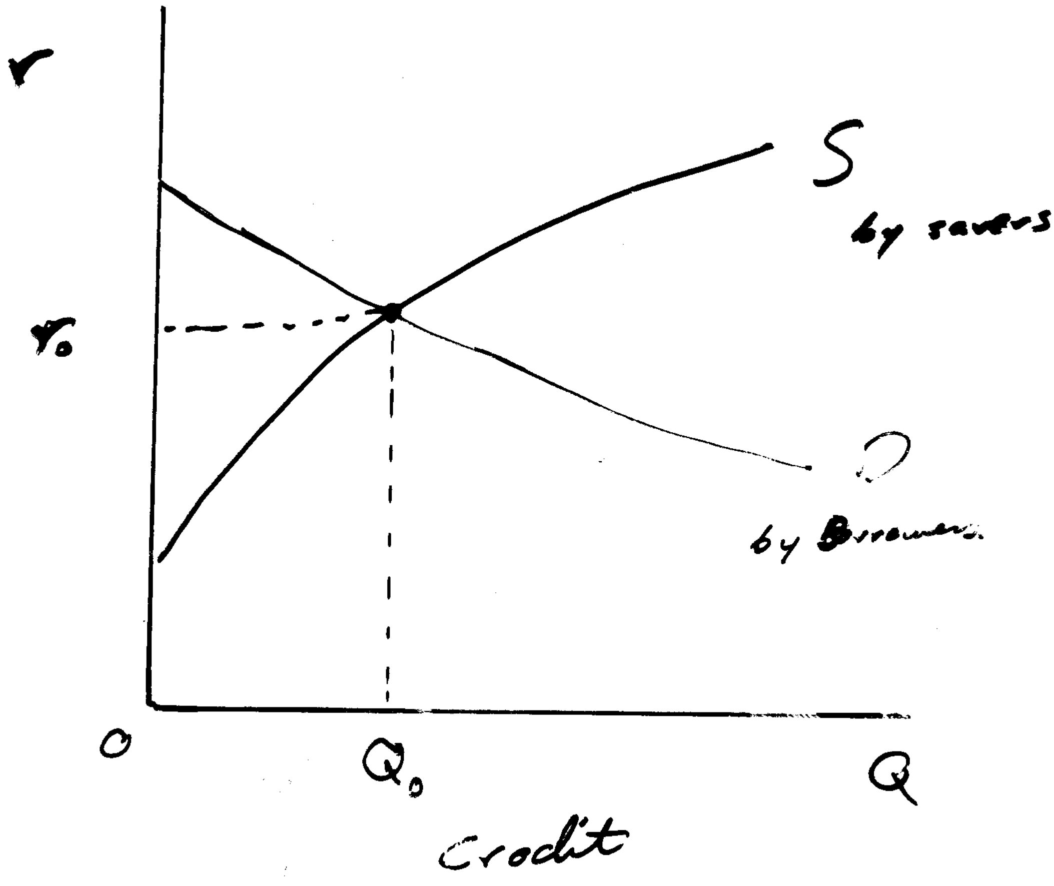
($ Trillions)

Households		**3.89**
Financial Intermediaries:		**36.52**
Commercial Banks	8.88	
Thrifts*	1.60	
Life Insurance Companies	2.92	
Pension Funds	4.48	
Finance Companies	1.63	
Money Market Mutual Funds	2.25	
Other non-equity Mutual Funds	2.27	
Government-sponsored Agencies**	2.89	
Federally Related Mortgage Pools**	4.59	
Misc. Fin. Intermediaries	5.01	
Business and Government		**2.09**
Rest of World		**7.11**
Total all sectors		**49.61**

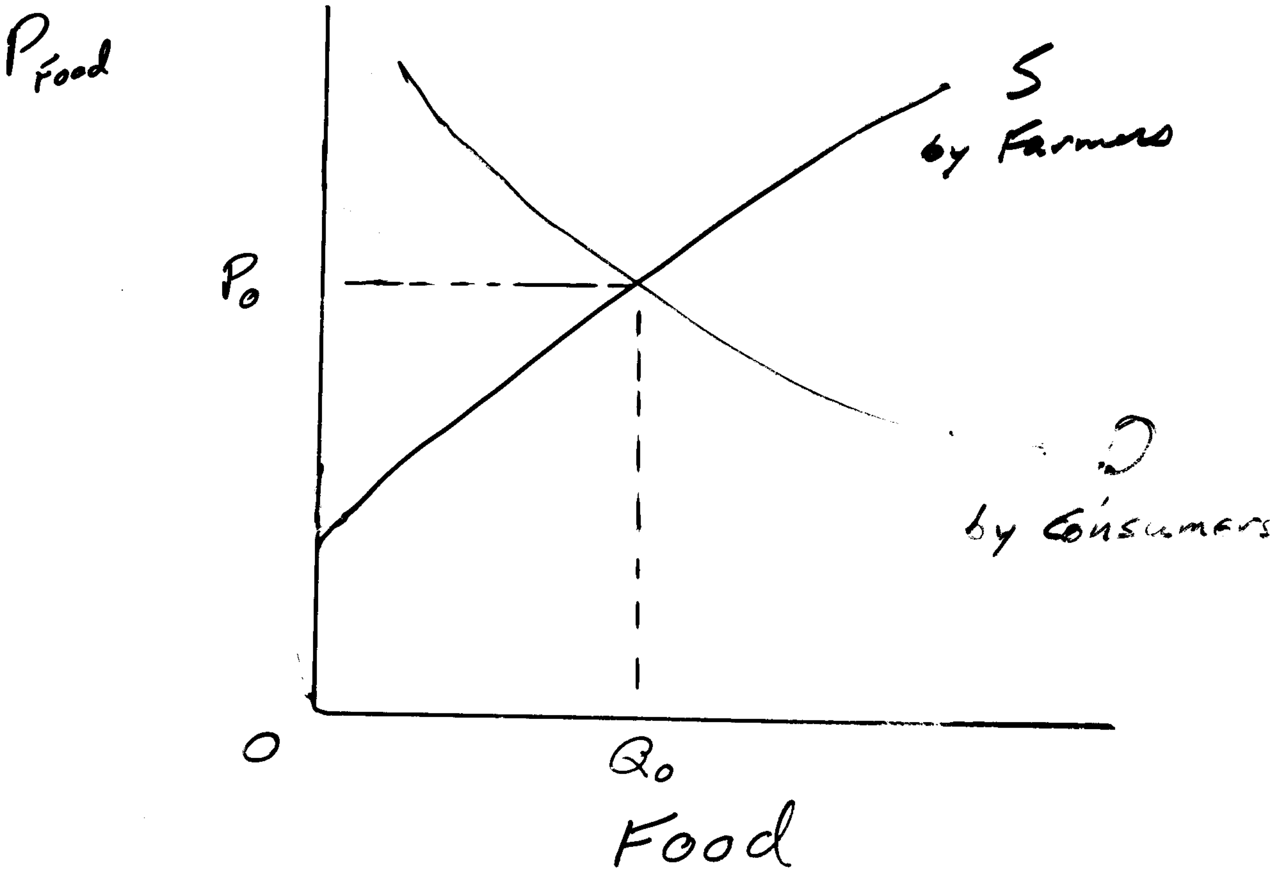
Data source: ***FR Bulletin*, 9/08, Table 1.60.**

*** Savings and Loan Assns, Savings Banks, Credit Unions.**
**** Includes Fannie Mae, Freddie Mac, and GNMA assets and guaranteed pools.**

Credit Market Equilibrium



Food Market Equilibrium



Food Intermediaries

- Grocery Stores
- Distributors
- Processors

Functions of FI's

- Absorb differences in timing.
- Absorb differences in quantity
- Repackage payment stream

  CDs → Amortized Loans.
- Improve quality of product

  → Credit information specialists

  → Diversification of default risks

  → Leveraging residual risk onto equity

Misfunction of F.I's:

- Transforming maturities

  Causes interest rate risk

Thrift Institutions

- Savings + Loan Assns (S+Ls)
- Savings Banks
- Credit Unions

Specialize in

- Non-M1 Deposits
  - Savings
  - MMDA since 80's.
  - CDs since 70's
- Long-Term Loans
  - S+Ls –
    - 30 yr Fixed Rate Mortgages
  - Savings Banks –
    - Bonds, Mortgages

Mortgage Intermediation

Pre-1930's

Some mortgages "balloon" loans

interest only for 3-5 yrs

than all due at once.

1929-32

30% Deflation, high U

→ Many defaults on home, business loans.

→ Many Bank, thrift failures.

Federal Home Loan Act of 1932

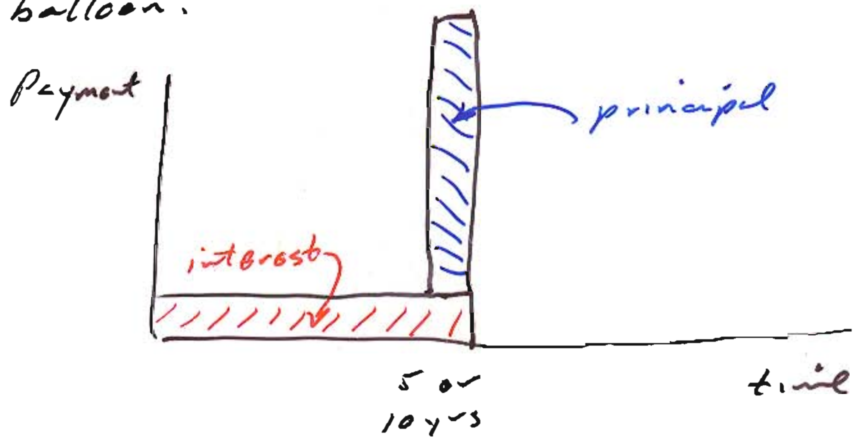
Created Federal Savings + Loan Assns (S+Ls)

- Collect Passbook savings
  0 maturity, 0 Duration
- Make Amortized home loans
  up to $m = 30$ yrs.
- Got tax advantage
- After 1934, insured by Fed. S+L Ins. Corp
  FSLIC "Fizzlik"

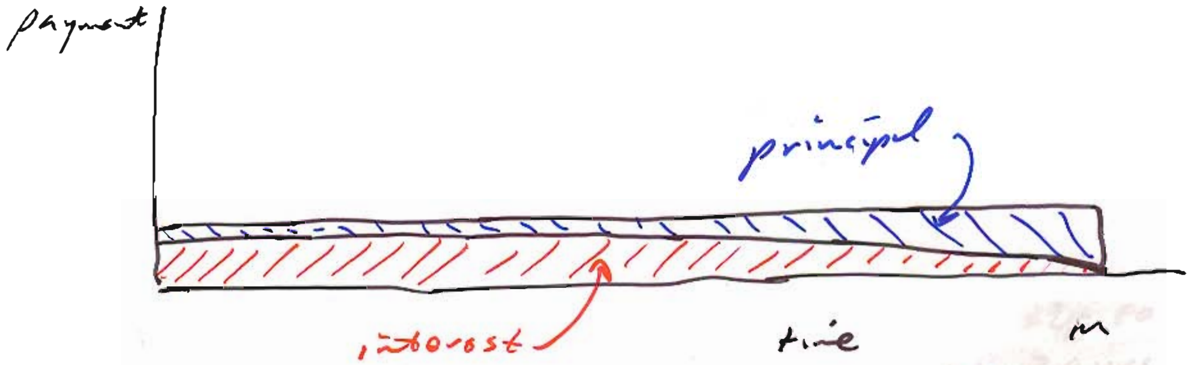
Amortized Loans

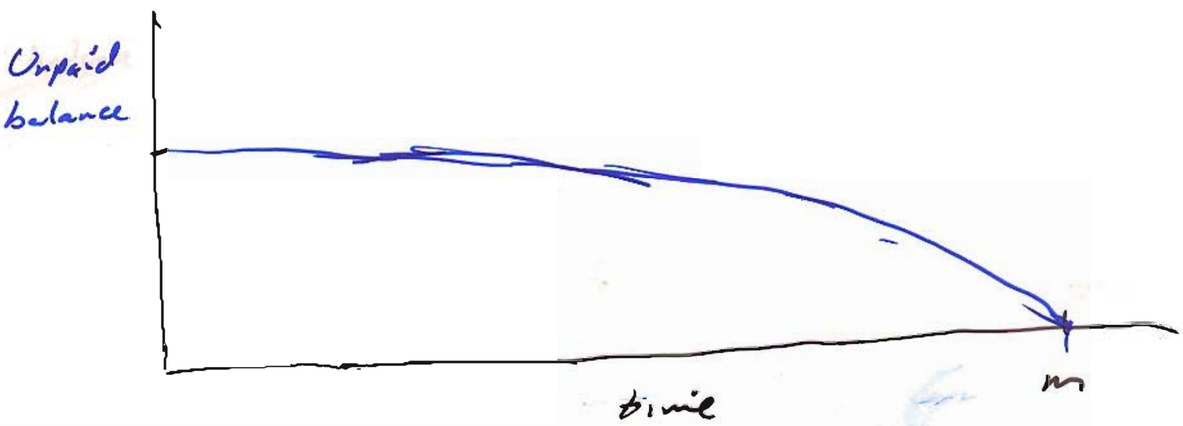
Constant monthly payments calculated to pay off loan at maturity m.

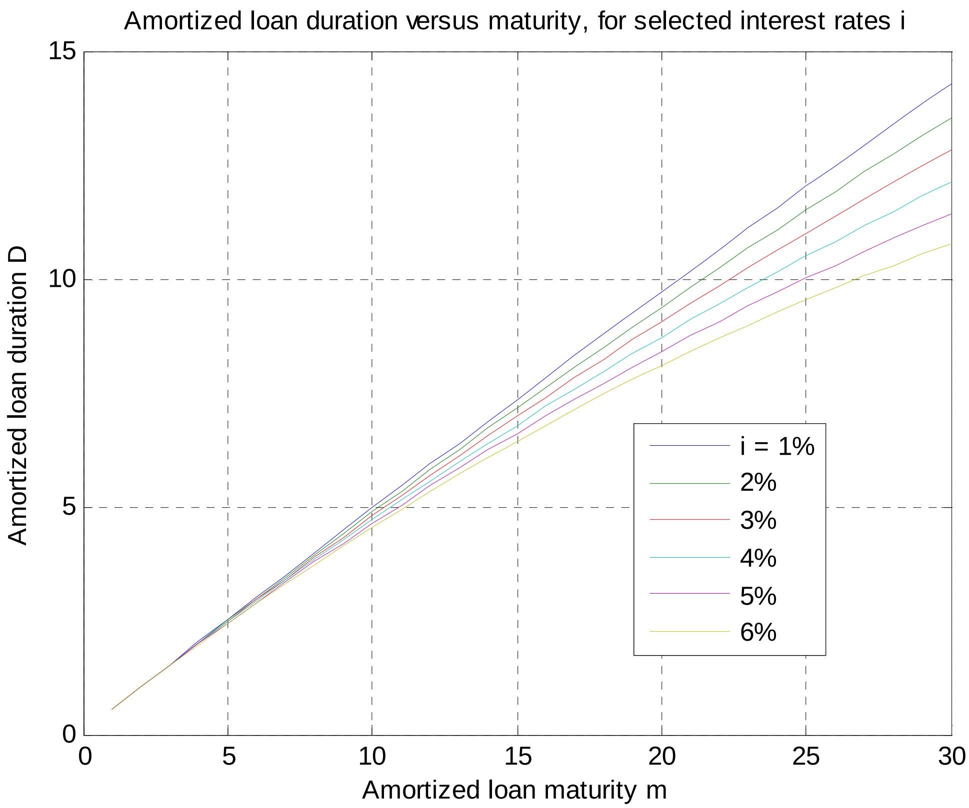
balloon:



amortized:







Amortized loan Duration is always less than m/2,
but generally is greater than m/3.

Amortized Loans (cont'd)

Note collateralized by lien (mortgage) on house

- Due on sale of house (usually)
- May be repaid early (eg to refinance @ lower i)
- But may charge points up front to compensate for prepayment option.

Relatively safe from Credit Risk if

- 20% down (buyer's equity)
- 20% max payment (P+I)/income ratio
- Matches life of loan to life of collateral

But long term, so PV fluctuates with i

$D < \frac{1}{2} m$, but $D > 10$ for $m = 30$

(see graph)

$\Rightarrow$ S+L's prone to interest rate risk if $i \uparrow$

Since Passbook Savings Duration = 0

"Maturity Transformation"

1950 – 1980

$i \uparrow\uparrow$ as $\pi, \pi^e \uparrow\uparrow$

- S+L Assets $\downarrow\downarrow$ in P.V.
- S+L Liabilities $\downarrow$ only slightly if at all.
  (Some CDs after 1971, but still short m)

$\Rightarrow$ Economic NW $\downarrow\downarrow$

- Most S+Ls economically insolvent by 1980.

Even if Assets carried at book value, profits < 0 since $i^D \uparrow$ while i^L fixed.

$\rightarrow$ Accounting NW inexorably eroded, industry doomed to fail.

1980s

- "Zombie Thrifts" = Living Dead
- End Game Strategies
  S+L's took increasing risks to recover losses,

1987 –

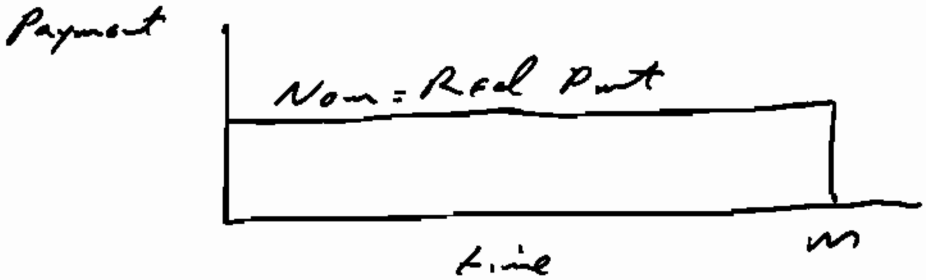
- FSLIC fails, depositors bailed out by taxpayers.
- Banks, GSEs become primary Mort. Intermediaries.

Affordability, Tilt Effect

- $\pi = 0 \Rightarrow i = r$

  eg $r = 4\% \Rightarrow i = \underline{4}\%$

  $\Rightarrow$ Const nom. pmts have const real value



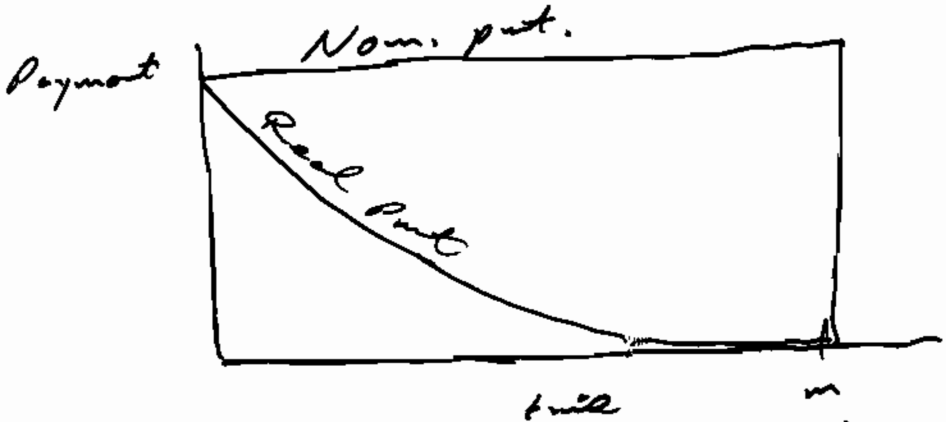
Traditional 20% max P+I (Principal + Int) to Income ratio works well.
or ~ 25% P+I+Taxes+Insurance (PITI)

- $\underline{\pi > 0 \Rightarrow i = r_0 + \pi}$

  eg $r = 4\%, \underline{\pi = 5\%} \Rightarrow i = \underline{9}\%$

  $\underline{\pi = 10\%} \Rightarrow i = \underline{14}\%$

  $\Rightarrow$ amortized <u>const. nom. pmt much higher</u>



But <u>real pmt falls @ π each yr.</u>

⇒ Same loan wouldn't qualify @ 5% or 10% π as at 0%

⇒ Traditional 20% max P+I raised to 25%, 28% as π ↑ in 60's, 70's.

° Borrowers couldn't really afford initial pmts, counted on π to relieve burden.

Currently

° FHA max PITI 31%

° Conforming (F+F) " 33%

even the π = 1.7% (10/07–10/09 avg)

Adjustable Rate Mortgages (ARMs)

- i adjusted to index (eg Prime Rate) periodically (eg every 5 yrs), Pmt adjusted to amortize over original life.
- Like Balloon, except
  - amortization reduces principal some,
  - borrower prequalified.
- Shortens Effective Duration to less than reset period.
- ⇒ Reduces Interest Rate Risk for trad. Thrift
  Increasing portion of loans in 1980's
  But too late to save S+L's.
- But shifts Int. Rate Risk to Borrowers
  May not afford new pmt if r_0 ↑
  2006 i high, many reset ↑.
- Teaser Rates
  Initial rate set below reset rate @ initial index
  ⇒ Improves initial affordability, qualification
  but not after reset!

Federal + Fed. Sponsored Mortgage Intermediaries

	Assets	2008 Q2 Guaranteed Pools + MBS ***
Fannie Mae FNMA = Fed. Nat'l Mortgage Assn.	$1,021 B *	$2,444 B
Freddie Mac FHLMC = Fed. Home Loan Mort. Corp.	$813 B **	$1,802 B
Ginnie Mae GNMA = Gov't Nat'l Mort. Assn. (Packages FHA, VA loans.)	$14 B ***	$570 B

* Latest figure for 2004 in latest (2007) OFHEO Report to Congress!

** As of 2006 in latest (2007) OFHEO Report to Congress.

*** As of 2007 per GNMA annual Report.

**** Per Federal Reserve Bulletin 9/08 Table 1.54

MBS = Mort. Backed Security

Gov't Sponsored Enterprises (GSE's)

Freddie & Fannie
Mac Mae

- Private corps w/ shareholders

- Sell bonds, buy mortgages
  can match maturities,
  avoid int. rate risk.

- Unique Federal Charters from Congress

  "Government Sponsored Enterprises"

  Like 1st, 2nd Banks of US in 19c.

- FNMA exempt from state, local
  income taxes.

- $2.25 B Line of Credit with Treasury.

- Assumed Federal Guarantee on debt.
  ~~Not explicit so far.~~ until 9/7/2008

  ⇒ Private Profit, Public Risk

- Exempt from SEC
  "Regulated" by Office of Federal
  Housing Enterprise Oversight (OFHEO)
  Replaced by Fed. Housing Finance Agency,
  7/30/08

GSE Equity (WSJ 11/15/08)

End 3Q 2008 (read off graph)

	Fannie Mae	Freddie Mac
GAAP	+9 B	-14 B
Fair-Value	-46 B	-42 B

- GAAP - Mix of Historical, Market value.
- Fair Value Value if sold (est.)

- Fed has become a major mortgage intermediary

11/17/10:

Mort. Backed Securities	$1046 B
Fannie + Freddie Debt	$ 149 B
Total	$1195 B

- Primary Sources of these funds:

Bank Excess Reserves	$984B
Treasury Deposits	$222 B
Total	$1206 B

- Position like 1970's S+L:

  Long-term mortgages financed by 0-maturity savings accts.

- Now Fed, not banks, bears Interest Rate Risk from these mortgages, as well as default risk?

- Meanwhile banks collect fees to service these loans!

Sound Mortgage Intermediation

- Buyer Equity
  - 20% down norm – as pre-2000.
- Predictable, affordable payments
  - 20-30 yr fixed rate
  - 20% PI norm (as '50's, '60's)
    (Principal + Interest to income ratio)
    verified by pay stubs!
- Balanced Intermediation
  - Match A, L Durations
    with bonds, long CDs.
    - like Fannie/Freddie
    - unlike trad. Thrifts.
- Well capitalized, Free to Fail
  - Unlike Fannie/Freddie
  - > 5% capital, SEC oversight.

Fannie + Freddie resolution (IMHO)

- Ch. 11 reorganization
  - Write down debt 10-20% until solvent.
  - Shred old stock, give creditors new stock.
- End GSE status
- Don't close – just reorganize w/ "haircut"

US Tax Code encourages excessive Home Leverage, intermediation

- Home Mortgage Interest Deductible by Itemizers   1st Mortgage and HELOC!

  → Incentive to borrow as much as possible, Repay as slow as possible

  Invest savings in stocks etc, not home equity.

  → ° Too little home equity
  ° Housing, stock bubbles
  ° Too much intermediation.

11/10 Pres. Comm. Proposal!

- Repeal Deduction, with compensating cut in tax rates

  → ° More home equity
  ° More stable housing, stock market
  ° Fewer mortgage intermediation problems.
  ° More incentive to work

Phase in over 10 yrs?