Hedging mortgage default risk with mortgage guaranty insurance: A model for Europe?

Presentation for the
European Mortgage Federation / European Network of Housing Research
Joint Seminar on European Mortgage Markets, Brussels, Belgium
29th March 2007
Presenter: Stefan Kofner, TRAWOS Institute

The nature of the default risk

- Distinguish carefully: delinquency, default, foreclosure
- Two competing theories of mortgage default behaviour:
  - Equity theory: CLTV ratio
  - Ability-to-pay-theory: CDSR ratio

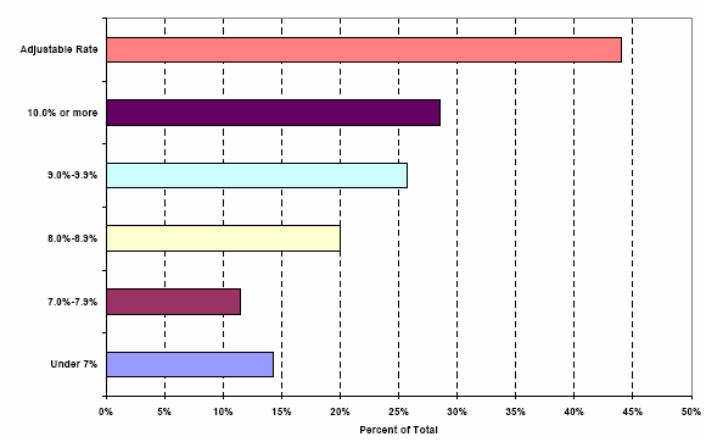
2005 Chicago Mortgage Default Counselling Survey

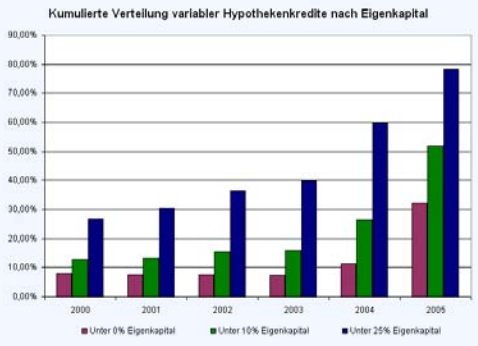
	Mean	SD
Loss of Job	47%	0.50
Income Reduction	20%	0.40
Unfair Loan Terms	20%	0.40
Credit Card Mismanagement	15%	0.36
Tax Problem	12%	0.32
Home Repair/Improvement	19%	0.39
Death in Family	18%	0.38
Divorce/Separation	9%	0.29
Injury/Accident	19%	0.40
Medical Problem	28%	0.45

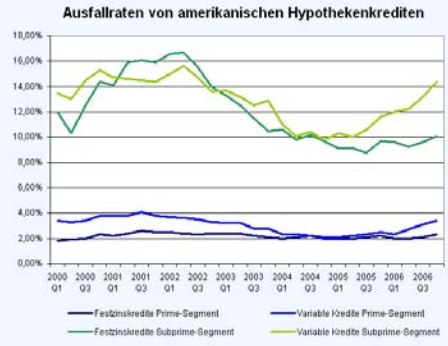
2005 Chicago Mortgage Default Counselling Survey

	Mean	SD
% With Any Savings Account	11%	0,32
% Past Bankruptcy	58%	0,49
% Past Foreclosure	27%	0,44

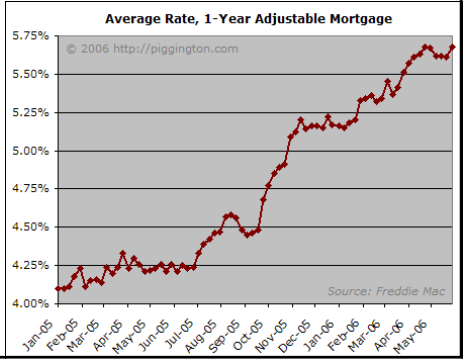
2005 Chicago Mortgage Default Counselling Survey







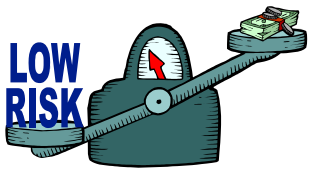
The critical role of ARMs



Sources: Frankfurter Allgemeine Zeitung, Freddie Mac

The most important default risks

- loss of job
- mismanagement of personal finance / tax situation
- lack of reserves, esp. for home repair / improvement
- Occupational disability
- Death
- Rising interest rates
- Falling house prices



Private Mortgage Insurance PMI

- In favour of the lender
- Covers (part of) his loss risk in case of default
- Additional safeguard for high LTV loans
- extremely cyclical business with a considerable catastrophic risk

Claim for loss: example

Unpaid principal balance $	50.000
Delinquent interest from the point of default $	5.000
Property taxes due or paid by the servicer $	1.000
Property insurance premiums due or paid by the servicer $	200
Property maintenance, normal and customary costs $	500
Legal expenses to foreclosure and obtain clear and merchantable claim to the property $	1.500
Claim for loss $	**58.200**
Mortgage insurance coverage per cent	25
Claim amount payable by the mortgage insurer to the bank $	14.550
Bank exposure $	43.650
Proceeds from the sale of the property $	40.000
Gain / loss of the bank $	**-3.650**

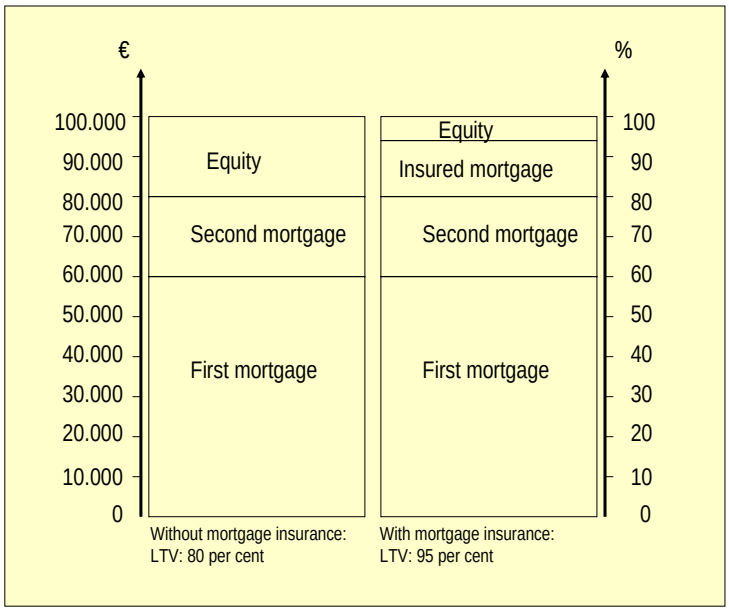
Source: Struyk / Whiteley 2002

PMI: Termination

- Borrower termination: depending on LTV
- Insurer termination: no cancellation, no raise of premium
- Termination in case of default

Lender‘s and borrower‘s perspectives

- The lender‘s perspective
  - Lending beyond 80 per cent LTV
  - Delegating the biggest part of the additional risk
  - Interregional risk re-distribution
  - Efficiency gains
- The borrower‘s perspective
  - Buy home earlier in household’s life-cycle
  - Typically as little as 3 per cent down
  - Higher credit charges
  - Pay insurance premium (tax-deductible)



U.S. Market structure

Rank	Company	Direct premiums written 1.000 $	Market share per cent
1	Mortgage Guaranty Insurance Corp.	1.415.767	28,1
2	Radian Guaranty Inc.	904.413	18,0
3	PMI Group	740.224	14,7
4	American International Group	667.435	13,3
5	General Electric Mortgage Ins. Group	586.583	11,7
6	Republic Mortgage Insurance Co.	479.420	9,5
7	Triad Guaranty Insurance Group	176.696	3,5
8	CMG Mortgage Ins. Co.	60.296	1,2
9	Aztec Insurance Company	69	0.0
10	Citigroup Affiliated Property & Casualty Ins.	60	0.0

Source: NAIC Annual Statement Database

Premium differentiation

- the loan to value ratio LTV (+)
- the coverage ratio: share of the claim for loss covered by the insurance (+)
- the creditworthiness of the potential borrower
  - credit rating of the borrower: FICO-score (-)
  - eventual temporary buydown (+)
- the type of home
  - second homes (+ 14 bps)
  - manufactured home (+ 20 bps)
  - investor (non-owner occupied) + 38 bps
- the type of mortgage
  - Fixed Rate Mortgage (FRM) (-) or Adjustable Rate Mortgage (ARM) (+)
  - amortization rate (-) resp. potential negative amortization (+ 5 bps at PMI)
  - eventual rate/term refinance (- 5 bps)
  - eventual annual cap on ARM (-)
  - eventual Cash-Out Refinance (+ 10 bps)
  - relocation loan (- 7 or - 10 bps depending on LTV)
  - limited documentation (+)

Premium calculation: example

LTV	coverage	credit period 30 years	credit period 25 years
95,01 per cent and above	35	0,96	0,85
	30	0,84	0,73
	25	0,71	0,60
	20	0,59	0,48
	18	0,55	0,44
95 - 90,01 per cent	35	0,90	0,79
	30	0,78	0,67
	25	0,67	0,56
	18	0,56	0,43
	16	0,54	0,37
90 - 85,01 per cent	25	0,52	0,41
	17	0,39	0,28
	12	0,34	0,23
85 per cent and below	17	0,37	0,26
	12	0,32	0,21
	6	0,26	0,18

Home worth $ 200.000
30 years FRM
Coverage 25 per cent

Down payment percentage	3,5	7,5	10,0	12,5
Initial down payment $	7.000	15.000	20.000	25.000
Monthly premium (Jahr 1-10) $	114,19	103,29	78,00	75,83

IRR / APR calculation including PMI

initial loan $ 180.000
fixed interest rate 6,0 per cent
initial principal 1,26 per cent
annuity of $ 13.077

IRR / APR: 6,34 per cent
Comparable classical loan:
6,0 per cent

t	principal bal. $	interest $	principal $	insurance premium $	total cost $	LTV
0					-180.000	
1	180.000	10.800	2.277	936,00	14.012,80	90,00%
2	177.723	10.663	2.413	924,16	14.000,96	88,86%
3	175.310	10.519	2.558	911,61	13.988,41	87,65%
4	172.752	10.365	2.712	898,31	13.975,11	86,38%
5	170.040	10.202	2.874	884,21	13.961,01	85,02%
6	167.165	10.030	3.047	869,26	13.946,06	83,58%
7	164.119	9.847	3.230	853,42	13.930,22	82,06%
8	160.889	9.653	3.423	836,62	13.913,42	80,44%
9	157.465	9.448	3.629	818,82	13.895,62	78,73%
10	153.837	9.230	3.847	0,00	13.076,80	
11	149.990	8.999	4.077	0,00	13.076,80	

IRR / APR calculation including PMI

Down payment percentage	3,5	7,5	10,0	12,5
Initial down payment $	7.000	15.000	20.000	25.000
APR per cent	6,52	6,44	6,32	6,26

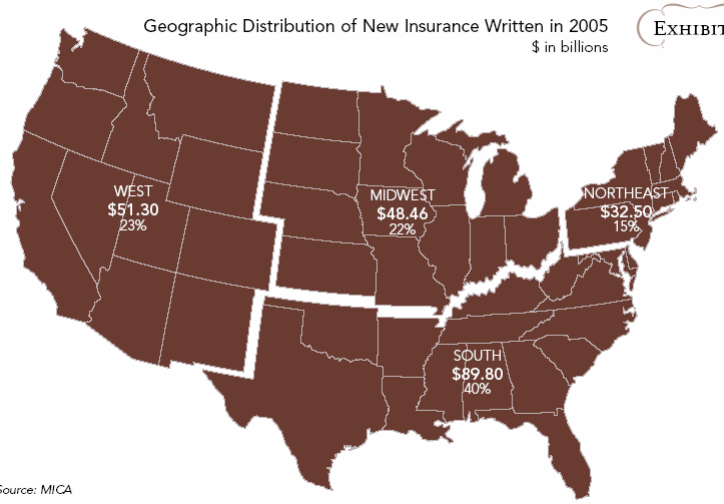
Homebuyer saves $ 33.000 on down payment compared with a classical non-insured 80 per cent LTV mortgage for an additional interest of little more than 50 bps.

The stability of U.S. PMI

- U.S. PMI matured by experience
- Sound regulation
  - monoline restriction
  - sensible reserve requirements
  - sensible capital requirements
  - provisions against conflicts of interest in relation to borrowers
- Underwriting and capital reserves
- Risk dispersion: geographic, temporal and LTV distribution
- Only AA and AAA ratings

Geographic Distribution of New Insurance Written in 2005
$ in billions

EXHIBIT 2

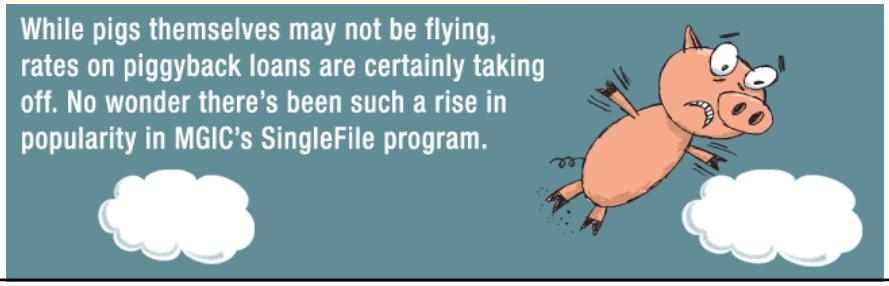


Source: MICA

80-10-10 Piggyback loan without PMI

Mortgage I	
initial prop. value $	200.000
initial equity plus sec. mortgage $	40.000
initial loan $	160.000
interest rate per cent	6,0
initial principal per cent	1,26
annuity $	11.624

Mortgage II	
initial loan $	20.000
interest rate per cent	8,9
initial principal per cent	0,75
annuity $	1.929



80-10-10 Piggyback loan without PMI

	Mortgage I			Mortgage II			
t	principal bal. $	interest $	principal $	principal bal. $	interest $	principal $	total cost
0							-180.000
1	160.000	9.600	2.024	20.000	1.780	149	13.553
2	157.976	9.479	2.145	19.851	1.767	163	13.553
3	155.831	9.350	2.274	19.688	1.752	177	13.553
4	153.557	9.213	2.410	19.510	1.736	193	13.553
5	151.147	9.069	2.555	19.317	1.719	210	13.553
6	148.592	8.915	2.708	19.107	1.701	229	13.553
7	145.883	8.753	2.871	18.878	1.680	249	13.553
8	143.012	8.581	3.043	18.629	1.658	272	13.553
9	139.969	8.398	3.226	18.357	1.634	296	13.553
10	136.744	8.205	3.419	18.062	1.607	322	13.553
11	133.324	7.999	3.624	17.740	1.579	351	13.553

Critical interest rate for the second mortgage: **8,9 per cent**

Piggyback financing: A dangerous practice?

- In comparison to a mortgage insurer the loss risk of a piggyback lender depends on:
  - capital and reserve requirements in mortgage banking as opposed to mortgage insuring
  - line separation / specialist bank principle versus universal bank / insurance principle
  - risk management abilities of the lender / insurer
- No clear-cut case of regulatory arbitrage

Securitisation

- ... of high LTV loans
- SPVs less densely regulated
- credit enhancements (including secondary mortgage insurance)
- rating agencies as “substitutive supervisors” on MBS transactions
- Open questions:
  - Are capital markets or mortgage insurers the better risk managers?
  - What if a high LTV loan crisis follows the sub-prime crisis?
  - Are primary and secondary interest rates for high LTV loans more volatile than mortgage insurance premiums?

Mortgage Payment Protection Insurance MPPI

- covers a mortgager's monthly mortgage repayments (interest payments and amortisation) if he or she is *unable to work* because of unemployment, accident, or sickness
- wait periods: 30 or 60 days
- maximum benefit period 12, 18 or 24 months

MPPI versus PMI

- PMI pays out to the lender whereas MPPI protects the borrower.
- PMI provides all-risk coverage.
- MPPI provides preventive coverage.
- MPPI is subject to moral hazard.
- Complementary products: lower PMI rates for applicants with MPPI

Assignment of risks and risk management instruments

Risk	Moral hazard	Instrument
unemployment	yes	transitional private insurance (single risk coverage or MPPI) on top of social insurance and housing allowances unemployment benefits for homeowners
mismanagement of personal finance / tax situation	yes	counselling
lack of reserves, esp. for home repair / improvement	yes	counselling, moral suasion, subsidies for Bausparen
accident / sickness not resulting in occupational disability	minimal	transitional private insurance (MPPI) on top of social insurance
occupational disability	minimal	permanent private insurance (IP) on top of social insurance
death	minimal	adequate risk life insurance
rising interest rates	yes	adequate interest rate risk management: FRM with different term structure, ARM with caps, public insurance
falling house prices	minimal	foreclosure regulation, lending regulation, real estate derivatives

Insights:
- **important role for the state**
- **The individual default risk is still important.**
- **100 per cent security is not attainable.**
- **Some risks require an instrumental mix.**

Role of PMI: safety net for the lenders taking into account as many aspects of personal risk management as possible

Don't break the piggy bank – you're living in it.