

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

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

Holden Lewis - Bankrate.com

1 Introduction

The basic question of this paper is how Mortgage Guaranty Insurance (also labelled “Private Mortgage Insurance”, abbr. PMI) can help to cope with the default risk of mortgage credits. PMI is taken out by the debtor of a mortgage in favour of the lender. The insurance covers the loss risk of the creditor in case of a borrower's default. While PMI doesn't directly prevent defaults it protects the lenders and the economy from their often harmful consequences.

Starting from the U.S. where the first modern mortgage insurance was founded in 1957 this type of insurance is gradually spreading around the world. Although local affiliates of certain U.S. mortgage insurers have started to sign business in Europe through London-based affiliates the future importance of PMI outside the U.S. is hardly predictable today.

In certain European countries the market for risky credits – either loans with a high LTV or loans for borrowers with an uncertain credit rating (the so-called “sub-prime” segment of the market) – is underdeveloped or almost non-existent. From a consumer protection point of view developing these market segments might look like opening the Pandora's box at first sight. High LTV and sub-prime lending will surely bring along additional mortgage defaults. On the other hand serving the riskier target groups with mortgages is the only chance for them to become homeowners. When developing this risky business the financial industry and the regulators will have to draw the line between creditworthy mortgage clients and the rest very carefully.

In the U.S. PMI is an established risk management instrument enabling lenders to serve potential homebuyers low on equity. Even sub-prime credits with low down payments can be insured. In recent years the U.S. financial markets came up with competing instruments for the management of the kind of credit risks the mortgage insurers usually cover. For U.S. borrowers the so-called “*piggyback loans*” have developed into a serious alternative to mortgage insurance. Also credit risks can be transferred to the capital market by bundling and securitising risky credits (*securitisation*).

While PMI covers all kinds of default risks it pays out solely to the lender of the mortgage. In contrast *Mortgage Payment Protection Insurance* (abbr. MPPI) settles up to the borrower (different combinations of insured risks are possible here). Apart from these mortgage-specific insurances generic *personal insurances* covering single risks like premature death, unemployment and occupational disability can help preventing defaults resulting from the respective risks. Another instrument of mortgage credit risk management – often neglected in these days – is to have *savings*. Savings can be used to reduce absolute debt and LTV. When held as reserve assets (including money) they can help to bridge temporary income reductions. Last, but not least *derivatives* (to protect against rising interest rates and falling house prices) will play an important role as a hedge against the risks of homeownership in the near future.

The European mortgage markets “lacking behind” will almost inevitably start to develop the high-risk segments of the market as Anglo-Saxon countries already did. It will be of utmost

importance for future lenders and borrowers which instrumental mix will be used for risk management. PMI has the potential to become a cornerstone of this instrumental mix.

After having characterised the nature of the mortgage default risk in the first section an overview of the U.S. mortgage insurance business will be given. Special emphasis will be placed on the risk- / premium-differentiation policy of U.S. mortgage insurers. Finally private mortgage insurance will be compared with alternative instruments of mortgage credit risk management, i.e.:

- Piggyback loans
- Securitisation
- Mortgage Payment Protection Insurance
- Public Mortgage Insurance

2 The nature of the default risk

Defaulting is the decisive precondition for sanctioning a mortgagor by forcing the sale of the property he pledged as a security for the mortgage in default. Default is distinct from “*delinquency*” (“Zahlungsrückstand” in German), i.e. the failure to make mortgage payments (principal and / or interest) when they are due. Generally, if the payment is delinquent for thirty days after the due date, the mortgage is “*in default*” (“notleidend” in German). In the event of default, the mortgage may give the lender the right to accelerate payments, take possession of the property and receive rents and start the foreclosure process. “*Foreclosure*” (“Zwangsvollstreckung” in German) is the legal process by which the mortgagor is finally extinguished of all rights, title and interest on the underlying real property due to failure to comply with terms and conditions of the mortgage.

Mortgage default can have different reasons. It is important to know something about their respective empirical relevance because an efficient risk policy approach should allocate only limited resources to hedges against infrequent risks. On the other hand the frequent risks require more resources. The last Dollar spent for hedging against a certain default risk should equal the decrease in the probability of default caused by it times the individual cost of defaulting.

There are two alternative views of home mortgage default behaviour (Jackson and Kasserman, 1980). The *equity theory* of default holds that borrowers base their default decisions on a rational comparison of financial costs and returns involved in continuing or terminating mortgage payments. The alternative is the *ability-to-pay theory* of default. According to this approach, mortgagors refrain from loan default as long as income flows are sufficient to meet the periodic payment without undue financial burden.

Under the equity theory, the CLTV ratio, which measures the equity position of the borrower, is considered to be the most important factor in default decisions. By contrast, under the ability-to-pay model, the current debt servicing ratio (CDSR), defined as the monthly repayment obligations as a percentage of current monthly income, which captures the repayment capability of the borrower, plays a critical role in accounting for defaults.

Another factor relates to the lender’s influence on default decisions. Workout plans helping borrowers who are faced with financial hardships provide an alternative to default. Taking into account the financial health of the borrower, the lender may respond in different ways to

the threat of a possible default, such as loan restructuring, mortgage recourse, adoption of an extended repayment plan, or refinancing (Wong et al. 2004, S. 35 et seq.)

We will use secondary data from the 2005 Chicago Mortgage Default Counseling Survey to figure out the respective relevance of the different delinquency causes. The database is a total of 299 valid responses. Foreclosures in Chicago are concentrated in predominately minority neighbourhoods. More than two-thirds of the defaultees have some college education. The median household income of the group is \$ 25.000, with 55 percent of respondent’s incomes under \$ 30.000 and only 14 per cent of respondents indicating incomes over \$ 60.000. Twenty-two percent of defaulted borrowers in the survey are retired from the workforce. The mean ownership time was 11,6 years.

	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

Table 1: Causes of Delinquency of borrowers in default:
Source: 2005 Chicago Mortgage Default Counseling Survey

The survey of borrowers in default confirms the conventional wisdom that job loss, health crisis, and a death in family are most often the initial cause of a mortgage default. Rising interest rates and falling house prices however do not appear on the list.

The most important default reason is income reduction, in most cases a consequence of job loss. The importance of job loss as a default reason will vary between countries as different countries have different labour market regulation (influencing the duration of unemployment) and different social insurance schemes (influencing the level and the duration of unemployment benefit).

The important role of financial reasons independent of homeownership (credit card mismanagement, tax problems) is noteworthy. Another serious default risk is the additional credit taken for a home repairs / improvements. A lack of long term financial planning seems to go hand in hand with the unwillingness or inability to adapt spending habits to the necessities of homeownership.

	Mean	SD
Amount of Mortgage \$	112.481	55.259
Number of Refinance Loans Taken Out	1,5	1,26
Number of months delinquent	4,5	4,9
% Using Home Equity for Home Improvement	35%	0,48
% With Any Savings Account	11%	0,32
% Past Bankruptcy	58%	0,49
% Past Foreclosure	27%	0,44
% First Time Borrower or Refinance	54%	0,50
% "I should have been approved for this loan"	73%	0,45
% "Wish I shopped around more"	37%	0,48

Table 2: Financial and Credit Characteristics of Borrowers in Default
Source: 2005 Chicago Mortgage Default Counseling Survey

The financial and credit card characteristics of the defaultees are revealing. Believe it or not 58 per cent already experienced a personal bankruptcy and 27 per cent a foreclosure. These people are typical sub-prime borrowers. No wonder, 89 per cent of the defaultees had no financial reserves. Far from having any savings many households in the survey seem to have exhausted their bank lines completely. They were already sitting on a clockwork bomb. The majority of the defaulted households were simply not prepared for any extraordinary financial event. Without any reserves or adequate insurance even short term unemployment or tax arrears can cause insurmountable financial difficulties for households lacking creditworthiness. Many default cases thus seem to be caused by inadequate financial / risk management.

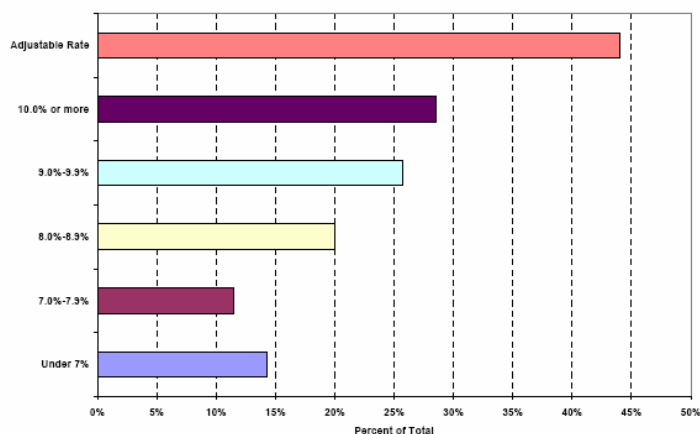


Figure 1: Interest rate structure of Borrowers in Default
Source: 2005 Chicago Mortgage Default Counseling Survey

The importance of the level and adaptiveness of mortgage interest rate as a default risk is obvious from figure 1. The borrowers in default apparently pay much higher interest rates than the average homeowner – reflecting their credit risk status and in some cases maybe their financial inexperience. Also abusive lending practices might have contributed to the high interest rate level since more than 70 per cent of U.S. sub-prime home loans contain prepayment penalties (Nassar 2006). It seems that an important part of the sub-prime borrowers are abused by depriving them of their prepayment option and hence of the possibility to refinance in case of falling interest rates. On the other hand one should expect that accepting prepayment penalties should be compensated by a lower interest rate from the beginning.

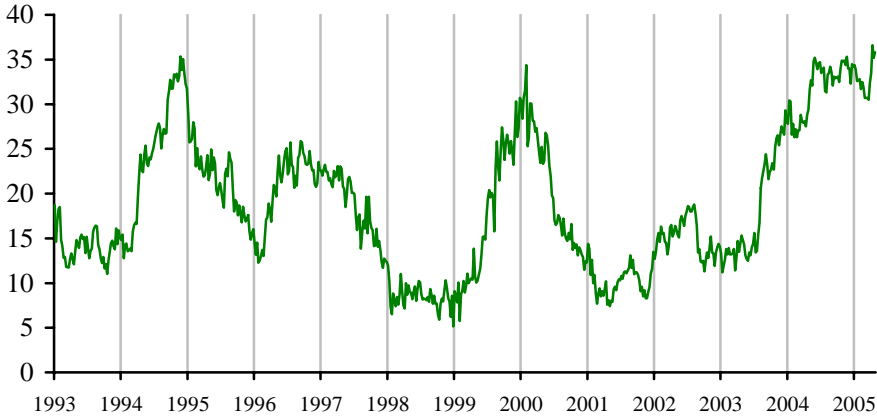


Figure 2: ARM Share of Mortgage Applications
Source: Mortgage Bankers Association

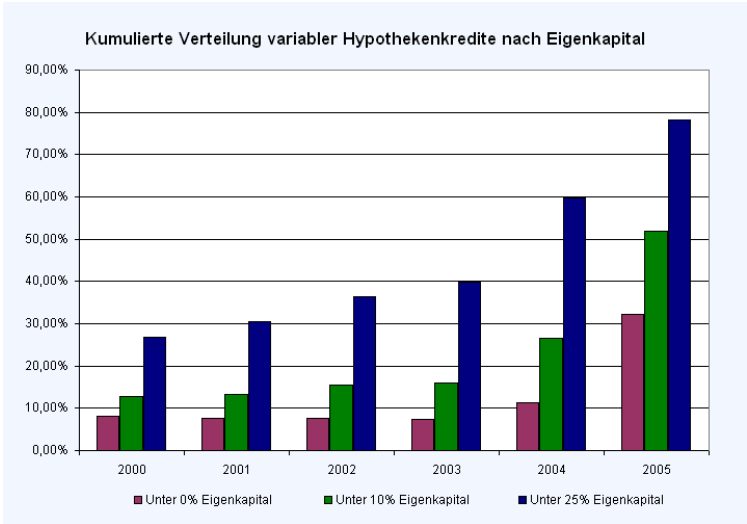


Figure 3: Cumulative distribution of ARM according to equity in per cent
Source: F.A.Z.

Also the ARM share of the Chicago defaultees’ mortgages outstanding is distinctly above the national average (see figures 1 and 2). On the national level the distribution of ARMs according to the percentage rate of down payments has changed dramatically (see figure 3). The share of ARMs allocated to borrowers with extra low equity (i.e. below 10 per cent) has al-

most quintupled between 2000 and 2005. In 2005 the share of ARMs among the Chicago defaultees was even lower than this share.

This exposes already vulnerable homeowners to the additional risk of rising interest rates. It is a one-sided deal: Most of them will be unable to benefit from falling rates due to prepayment penalties. Figure 4 shows that inside the sub-prime segment the recent acceleration of default rates was almost exclusively restricted to ARM-borrowers.

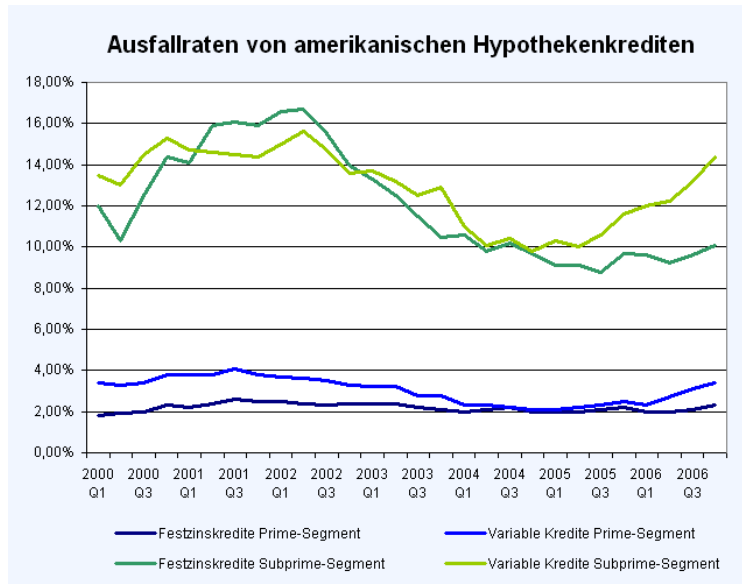


Figure 4: Default rates of U.S. mortgage credits
Source: F.A.Z.

It is surely not a coincidence that default rates on ARM mortgages began to rise at the very moment when ARM rates began to rise (see fig.).

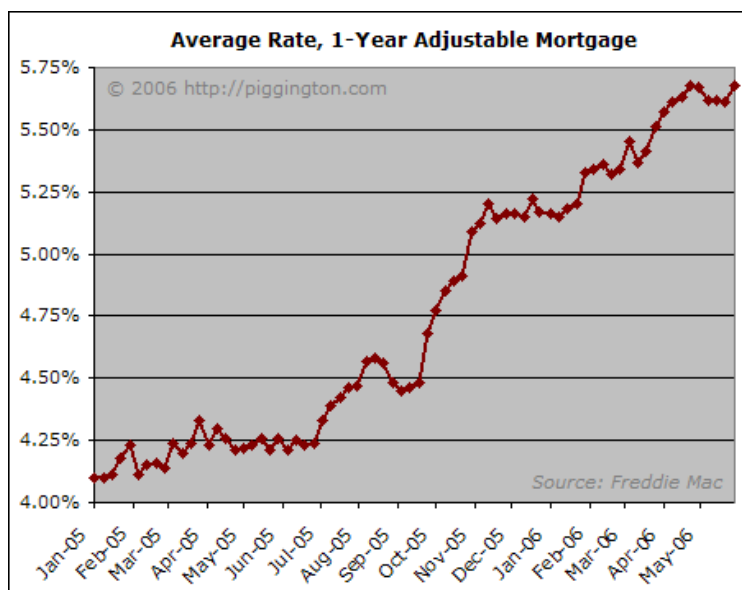


Figure 5: Average rate, 1-year adjustable mortgage
Source: Freddie Mac

The sub-prime state however has much more influence on the default risk than the type of loan (figure 6).

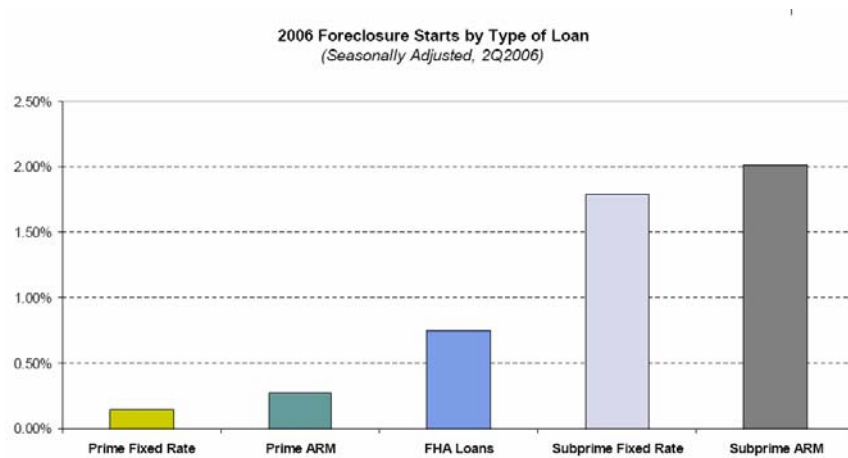


Figure 6: 2006 Foreclosure Starts by Type of Loan (Seasonally Adjusted, 2Q2006)

Source: National Delinquency Survey, Mortgage Bankers Association, n = 45 million loans serviced (22,6m, 5,9m, 3,2m, 2,0m, 2,9m)

In a nutshell: The most important default risks seem to be

- loss of job
- mismanagement of personal finance / tax situation
- lack of reserves, esp. for home repair / improvement
- health problems / death resulting in income reduction (if not insured)
- interest rate risk, esp. for ARM-borrowers

3 Mortgage guaranty insurance as an instrument of mortgage credit risk instrument

Private mortgage insurance (PMI) is taken out by the borrower of a mortgage credit in favour of the lender. The insurance covers the loss risk of the creditor in case of a borrower's default – independent of the reason of the default (all risk coverage). PMI impacts loss-given-default but not the probability of default. Mortgage insurance is especially important as an additional safeguard for “risky” credits, i.e. with loan to value ratios above 80 per cent. As a credit enhancement it is often a prerequisite for the securitisation of mortgage credits.

In some countries this type of insurance is a substantial element of the national system of real estate finance, e.g. in the U.S.¹ Some countries practising private mortgage insurance also

¹ The insurance of mortgage loans by private insurance companies is only available in a limited number of countries. All of them have developed financial markets: Canada, the U.S., Sweden, Ireland, Great Britain, the Netherlands, Spain, Italy, Israel, Japan, Taiwan, Hongkong, Australia and New Zealand (for a comparative treatise see Blood 1998, p. 89 et sqq.). The main field of use is without doubt in the Anglo-Saxon countries. Just recently mortgage insurance is also available on a small scale in countries like India, China, Algeria, Mali and Guatemala. Reliable and differentiated loan performance data are a prerequisite for the introduction of mortgage insurance.

have a public mortgage insurance for the encouragement of private homeownership. Mortgage insurance is an extremely cyclical business with a considerable catastrophic risk demanding large capital reserves, a broad diversification of risk and a lot of experience.

Given the catastrophic risk of PMI *sound regulation* is a necessary prerequisite for a sustainable development of this insurance line. The U.S. private insurance companies are subject to dense regulation, e.g. line separation, capital requirements, provisions against conflicts of interest in the relation between bank and insurer.

In Germany PMI never gained much ground (not least because of the lack of sound regulation, see Kofner 2007b), although this class of insurance was invented there in the middle of the 19th century already. The lack of insurance and securitisation markets for riskier mortgages is one of the reasons for the “underdevelopment” of the German market compared with Anglo-saxon countries. An important part of potential German mortgage clients is rationed by a generally still strict adherence to a LTV of 80 per cent. German potential homebuyers might be rationed for other reasons, too, e.g. self-employment.

3.1 Claims process and termination of mortgage insurance

Mortgage insurance is an instrument of risk-sharing (between lender and insurance) for mortgages granted to homeowners with a relatively low share of equity. It protects the creditor against losses in case of a debtor’s default. Only a part of the so-called “claim for loss” will be insured anyway (see table 3). To what extent the lender participates in the total loss depends on the proceeds from the sale of the property.

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

Table 3: Mortgage insurance „Claim for loss“ example
Source: Struyk / Whiteley 2002, p. 16.

After a lender has instituted foreclosure² and acquired title to the property, it can submit the claim to the insurance company. The insurer has two options to satisfy the claim:

- Pay the lender the entire claim amount and take title to the property.

² Private mortgage insurers have increasingly sought to intervene and help counsel delinquent borrowers in order to avoid foreclosure. The homebuyer and the insurer share a common interest in the mortgage financing transaction because they each stand to lose in the event of default (MICA 2007, p. 3).

- Pay the percentage of coverage of the total claim amount stated in the policy (generally 20 to 30 percent) and let the lender retain title to the property.

Before making a decision, the insurer will try to determine the potential resale price of the property and the expenses resulting from the resale, including the real estate agent's commission and other settlement costs (MICA 2007, S. 9).

Mortgage guaranty insurance can be terminated by the borrower if he conforms to certain requirements. The borrower however has no right to switch insurance providers or to be temporarily uninsured without terminating the existing mortgage loan. There is federal regulation on this matter, the Homeowners Protection Act of 1998.³ If the LTV has fallen below 80 per cent the lender can claim the termination of the insurance if the value of the property has not fallen. With a LTV below 78 per cent the insurance will terminate automatically provided that the lender is not in arrears with payments (MICA 2007, p. 14).

Mortgage insurers incur a long-term commitment to each insured mortgage credit. They are neither allowed to cancel the policy before maturity, nor to raise premium in case of risk deterioration. To stabilise their business they therefore need to take up a long-term stance on risk management (MICA 2007, p. 10).

Mortgage insurance is offered in different forms. Primary mortgage insurance (Chen, p. 16 et seq.) is the insurance of a single mortgage credit. Mortgage portfolio insurance (Chen, p. 17 et seq.) on the other hand covers whole pools of loans. It can be used to improve the risk structure of a given loan portfolio. Only a part of the total default risk of the pool will usually be insured (stop loss-limit or excess of loss cover).

The borrower will only pay the premium directly and fully in case of primary mortgage insurance. An incidence analysis of the cost bearance for secondary mortgage insurance would be difficult. It is however probable that at least a part of the cost will be levied from primary credit customers in the end.

3.2 The lender's perspective

For mortgage financiers mortgage insurance opens up the possibility of leaving behind the limits of a fixed LTV in favour of a flexible combination of individual LTV and mortgage insurance. By using private mortgage insurance mortgage financiers can expand their lending business to higher LTV ratios without incurring the related risks. If national bank supervisors relax equity requirements for insured loans, banks can hand out more mortgage credit on a given equity base or increase their individual engagements substantially. On top of that mortgage insurance has favourable effects on liquidity and on the predictability of earnings.

Mortgage insurance is of special interest for mortgage lenders with a regionally concentrated pool of loans. It is a perfect instrument for the interregional redistribution and rebalancing of credit risks (Chen, p. 9). It thus tends to lower risk premiums and interest rates (Struyk / Whitley 2002, p. 8 et seq.).

Last, but not least teamwork between bank and insurer can cause efficiency gains in the fields of credit evaluation and credit process management resulting in improved underwriting and quicker / more accurate credit decisions.

3.3 The borrower's perspective

³ The law applies only to mortgages made on or after July 29, 1999.

By taking mortgage insurance borrowers are enabled to buy a home with a relatively small amount of equity (usually between 5 and 20 per cent of the lending value, see figure 7).⁴ Even credit engagements above an LTV of 95 per cent are insurable for qualified borrowers.

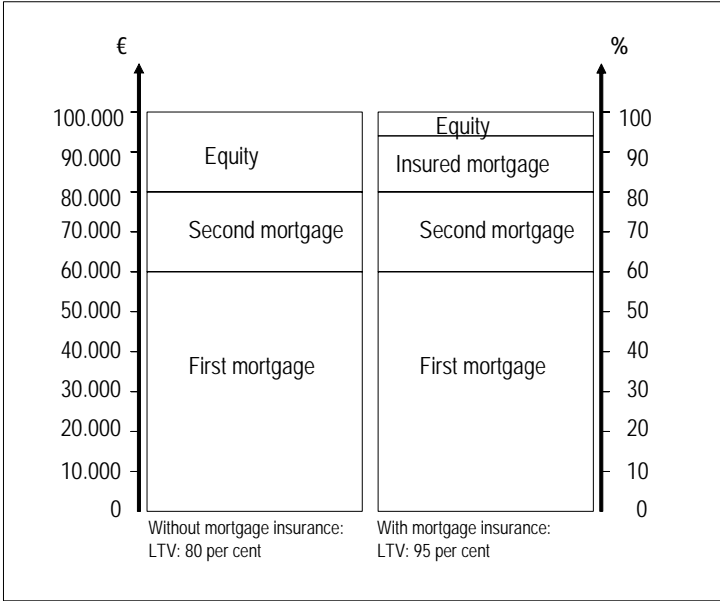


Figure 7: Mortgage insurance and LTV

On the other hand the borrower must be able to carry the higher credit charges due to the higher lending volume in the long run. Lenders must also be prepared for higher interest rate demands compared with clients fulfilling the classical rationing criteria. Finally they have to pay the insurance premium (now tax-deductible in the U.S.) which takes the individual default risk into account – at least until their equity share has fallen below certain limits (see above).

The standard argument of the PMI industry goes like this: “A home purchase can be made years sooner with PrivateMI, typically with as little as 3 percent down – even less for qualified borrowers.” But PMI doesn’t have a monopoly position in the low equity market segment any more. Substitutive products like piggyback loans have gained ground in recent years (see below).

3.4 U.S. Market structure

The degree of concentration of the U.S. mortgage insurance industry is very high. It is basically an oligopolistic market. Since MGIC has just bought its biggest competitor, the Radian Guaranty Inc., the largest player in the market now has a combined market share of more than a third. Only seven competitors with a noticeable market share are left at all. After the big merger the largest three insurers have a combined market share close to 75 per cent. Only the

⁴ Fannie Mae and Freddie Mac, financial institutions buying, bundling and securitising mortgage credits on a large scale in the U.S. on behalf of the government, usually demand mortgage insurance by an insurer with a first class rating as a prerequisite for buying loans beyond a LTV of 80 per cent. These two companies have told their lenders to allow homeowners to use the current value of their home to determine equity levels for PMI purposes. So appreciation or home improvements can help to get below the 80 per cent equity mark.

biggest five competitors do have market shares large enough to efficiently organise nation-wide risk distribution and to benefit from economies of scale.

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

Table 4: Top ten mortgage guarantee insurance companies by direct premiums written, 2004
Source: NAIC Annual Statement Database, via National Underwriter Insurance Data Services/Highline Data

The market power of the oligopolists is however limited. As we said above the insurance product they offer is subject to substitutive competition from non-traditional mortgage products.

3.5 Premium calculation: the cost of mortgage insurance

Mortgage insurance differs from other types of insurance in several respects (Dennis et al. 1997):

- The historical performance of a particular policy cannot be used in determining the premium to be charged in subsequent periods, because mortgage insurance covers multiple periods, and the premium for the life of the mortgage is defined at the beginning.
- In contrast to life insurance, mortgage insurance has a definite term and the claim risk normally decreases over time.
- Geographic diversification is a less effective tool to limit risk exposure due to the importance of the systematic risk (the prepayment and default rates being dependent on macroeconomic variables).
- Finally, as we said before, mandatory mortgage insurance covers the risk to the lender rather than the risk to the borrower.

Given these fundamental differences the design of premium structures for PMI is not an easy business. In fact the premium structure of PMI is extremely differentiated. The premium depends amongst other things on⁵:

- 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-score⁶ (-)
 - eventual temporary buydown⁷ (+)
- the type of mortgage
 - Fixed Rate Mortgage (FRM)⁸ (-) or Adjustable Rate Mortgage (ARM) (+)
 - amortization rate (-) resp. potential negative amortization (+ 5 bps at PMI)
 - eventual rate/term refinance⁹ (- 5 bps)
 - eventual annual cap on ARM¹⁰ (-)
 - eventual Cash-Out Refinance¹¹ (+ 10 bps)
 - relocation loan¹² (- 7 or - 10 bps depending on LTV)
 - limited documentation (+)
- the type of home
 - second homes (+ 14 bps)
 - manufactured home (+ 20 bps)¹³

⁵ The plus and minus-sign indicating the direction of the dependency.

⁶ The FICO personal credit rating ranges between 300 and 850. Prospective homebuyers with a FICO score lower than 620 can usually only acquire a loan from sub-prime market with a sensible add-on interest. Mortgage insurers have special rates for sub-prime borrowers (“A minus rates”). At PMI Mortgage Insurance the sub-prime borrowers are divided into three tiers according to their FICO score. The rates are very sensible on LTV and coverage ratio.

⁷ A temporary buydown allows borrowers with excess cash but low incomes, to qualify for loans that would otherwise be out of their reach. The extra cash is used to fund a temporary buydown, which reduces the payments made by the borrower.

⁸ At PMI mortgage insurance 5/1, 7/1, 10/1 ARMs (where the rate is fixed for a period of 5/7/10 years after which in the 6th year the loan becomes an ARM) count as fixed rate mortgages.

⁹ The purpose of a rate/term refinance is to change to a lower interest rate or to change the term of a loan.

¹⁰ An Annual Cap is a two-sided limit on the amount of adjustment in the interest rate on an ARM over a twelve-month period. If, for example an adjustable rate mortgage has a current interest rate of 7 per cent and an annual cap of 2 percentage points, then after one year, the highest interest rate can be 10 and the lowest 6 per cent.

¹¹ Cash-out refinancing is a replacement of the whole first mortgage by a new loan – but for more than the borrower currently owes. The difference is paid out to the borrower. It is not a separate loan on top of the first mortgage. The interest rate on a cash-out refinancing loan is usually lower than the old interest rate on the first mortgage.

¹² A relocation loan is a bridge loan enabling the borrower to buy a new property and to take his time with the sale of the old one. These facilities are offered at standard home loan rates and interest rates can be capitalised.

¹³ PMI Mortgage Insurance will not insure second homes in case of sub-prime borrowers with a FICO score below 620.

- investor (non-owner occupied) + 38 bps¹⁴

Not to forget the frequency of payments¹⁵ and the renewal scheme. In constant renewal programs, premium rates are multiplied by the original loan amount to calculate the payment, while in amortized renewal, premium rates are applied to the remaining balance. The amortized renewal rates typically remain the same through the life of the mortgage. The constant renewal rates are normally the same as the amortized renewal rates in the first ten years after the origination and adjusted downward for the period from the eleventh year to term.

3.5.1 Location of the collateral object

The location of the collateral object is seldom used as a criterion for premium differentiation, e.g. all PMI and AIG United Guarantee rates are “nationwide”. At MGIC “rates may vary from state to state and must be selected based upon the location of the property” (MGIC National Rate Card, February 2007). Extensive testing with the MGIC rate finder using low risk and high risk credit cases did not show any rate differences between states however.¹⁶ The three insurers do not practice any other kind of spatial differentiation of their rates either.¹⁷

On the other hand mortgage insurer PMI does extensive research on broad market indicators such as regional economic, affordability, employment and home price trends on the state and Metropolitan Statistical Area (MSA) level and calculates risk indices for metropolitan areas and states (see PMI 2007 and table 5) showing big differences between the different regions.

Division	Risk Index
New England	525
Pacific	508
Middle Atlantic	385
South Atlantic	357
Mountain	264
West North Central	173
East North Central	144
East South Central	78
West South Central	75
West	444
Northeast	421
South	232
Midwest	152

Table 5: Census Region Risk Index
Source: PMI 2007

The question is what for. Let’s quote Josh Wozman, spokesperson for The PMI Group, Inc on the role of the PMI risk index (Evans 2005):

¹⁴ Insurers are reluctant to insure credits collateralized with large multi-family residential buildings. As a consequence of bad experiences in the 70s commercial mortgages will not be insured at all (Johnstone 2005, p. 8).

¹⁵ In the so-called “single plans” and “super single programs”, premiums are paid up front. Super single programs insure against default until the loan is paid in full.

¹⁶ No general rates are available for New York because of special requirements for the use of credit scoring in this state.

¹⁷ Geographic rate differentiation according to neighbourhoods can be a dangerous business in the U.S. because of fair lending laws.

“It’s not about loans – this is about home price appreciation and depreciation, not about risk in our business (underwriting and insuring loans), but this speaks to a number of factors in certain MSAs and those factors are employment data, home price appreciation, etc. The Group uses the data to determine which MSAs are more risky to insure loans. The Index gives our credit risk analysis professionals a sense of where the likelihood of home price depreciation will be in the next two years, so they account for that in their pricing models. It doesn’t mean PMI will be more expensive, a lot will depend on what a buyer can put down, whether they need mortgage insurance, if home prices are coming down, then the opposite might happen. We can’t project whether we will have more or less people needing PMI, or if insurance would be higher because there are so many variables like employment growth and the economy as a whole.”

It seems that mortgage insurers are convinced of the overwhelming importance of systematic risk for their business. Presumably geographic risk plays a role for their (discretionary¹⁸) underwriting policy. It is however possible that they will switch to a geographic premium differentiation regime in the future.

3.5.2 Excursus: Interest rate differentiation of U.S. mortgage lenders

How about interest rate differentiation of mortgage lenders? If they were highly differentiated the non-differentiating rates of the PMI industry couldn’t be held up.

In 1890 the Census Bureau reported that interest rates in the western Mountain States exceeded those in New England by 380 basis points. While differentials have narrowed since then, they have not completely disappeared. Morrell and Saba found an average difference of approximately 40 basis points in contract rates and 50 basis points in effective rates on conventional loans between Northeastern SMSAs and those in the West for the period 1963-1978. Regional differences are considered necessary to allow capital to flow from one area to the other to allow borrowers in the capital-short areas to secure credit (McNulty 1984).

Interest rate differences in the U.S. seem to have narrowed even more since then. For an owner-occupied primary single family detached residence purchased for \$ 200,000 by an applicant with a credit history in good standing able to down-pay \$ 40,000 the Bank of America rate finder delivered the following rates for a 30 years fixed mortgage by state on March 22nd 2007.

¹⁸ Risk management by discretionary underwriting is possible. The Radian Master Policy, Condition Two says: “Approval of any Application for Insurance shall be at the discretion of the Company and shall be communicated to the Insured in the form of a Commitment of Insurance.”

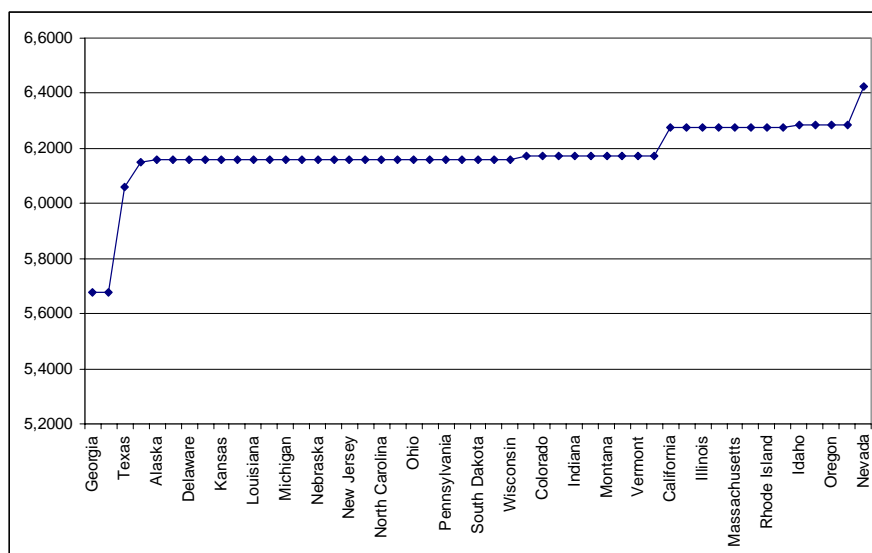


Figure 8: BoA rates for 30 years fixed mortgages with 80 per cent LTV
Source: Bank of America rate finder

The lowest rates were specified for Georgia and Virginia with 5,679 per cent. The highest interest rate is charged in Nevada (6,425 per cent). The (unweighted) average rate was 6,1754 per cent with a standard deviation of 0,1198.¹⁹

3.5.3 Loan to value ratio

The loan to value ratio is one of the most important dimensions of premium differentiation. Table 6 exhibits the default risk relative to an LTV of 80 per cent for different countries. In all countries except for the U.K. an LTV of 85 per cent at least doubles the default risk compared with an 80 per cent LTV. The marginal default risk generally rises for a given percentage point increase of LTV. In the U.K. the borrowers with a 95 per cent LTV face a default risk five times higher than the ones with a 90 per cent LTV.

Data Source	80% LTV	85% LTV	90% LTV	95% LTV
US Mortgage Info. Corp.	1.0	2.53	2.30	4.38
UK: GE Mortgage Insurance	1.0	1.30	2.02	10.07
Australia: GE Mortgage Insurance	1.0	1.92	2.34	10.63
Canada: GE Mortgage Insurance	1.0	n.a.	4.08	10.63
Canada: Mortgage Insurance Corporation	1.0	1.99	3.45	7.69

Table 6: Default Risk Relative to 80 per cent LTV (80 per cent = 1,0)
Source: Merrill 2004

¹⁹ 3/1 ARM mortgages showed the same order with an average 7,2569 per cent and a standard deviation of 0,0618.

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

Table 7: Insurance premiums in per cent on insured credit for borrowers with a FICO score above 620 depending on LTV and coverage ratio
Source: PMI U.S.

Table 7 shows the premium structure of U.S. insurer PMI for creditworthy borrowers. Amongst other things the premium structure depends on the LTV and on the share of the claim for loss covered by the insurance. The higher the LTV and the coverage ratio the higher the risk is for the insurer. Also premiums for new insurance can vary over time depending on the loss and risk development. For a home worth \$ 200.000 financed with a 30 years fixed-rate mortgage and a coverage ratio of 25 per cent the following initial premiums will result for different down payments:

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

Table 8: Monthly insurance premium depending on down payment percentage
Source: PMI U.S. and own calculations

The premium structure reflects the higher default probabilities mortgages with a lower down payment ceteris paribus empirically exhibit. It also reflects the higher costs of each default for the insurer in case of a higher coverage ratio.

There is thus no distortion of incentives on the borrowers' side. Borrowers with lower down payments are not subsidised by the whole credit collective. Premium differentiation of this

kind is necessary to pre-empt any adverse selection appearing whenever interest rates / insurance premiums are not calculated in accordance with individual risk.

3.6 Cost and profitability of taking PMI

For the assessment of the cost and profitability of taking PMI for the lender further calculations have been done. For the home worth \$ 200.000 to be financed with a 30 years fixed-rate mortgage six cases have been compared:

1. finance without PMI and a down payment of \$ 40.000
2. finance with PMI and a down payment of \$ 7.000, coverage ratio of 25 per cent
3. finance with PMI and a down payment of \$ 15.000, same coverage ratio
4. finance with PMI and a down payment of \$ 20.000, same coverage ratio
5. finance with PMI and a down payment of \$ 25.000, same coverage ratio
6. 80-10-10 “piggyback” finance without PMI

For the first case we assume:

- an initial loan of \$ 160.000
- a fixed interest rate of 6,0 per cent
- an initial principal of 1,26 per cent
- an annuity of \$ 11.624

Under these assumptions the principal balance will develop as shown in table 9.

t	principal bal. \$	interest \$	principal \$	total cost
0				-160.000
1	160.000	9.600	2.024	11.624
2	157.976	9.479	2.145	11.624
3	155.831	9.350	2.274	11.624
4	153.557	9.213	2.410	11.624
5	151.147	9.069	2.555	11.624
6	148.592	8.915	2.708	11.624
7	145.883	8.753	2.871	11.624
8	143.012	8.581	3.043	11.624
9	139.969	8.398	3.226	11.624
10	136.744	8.205	3.419	11.624
11	133.324	7.999	3.624	11.624
12	129.700	7.782	3.842	11.624
13	125.858	7.551	4.072	11.624
14	121.786	7.307	4.317	11.624
15	117.469	7.048	4.576	11.624
16	112.894	6.774	4.850	11.624
17	108.043	6.483	5.141	11.624
18	102.902	6.174	5.450	11.624
19	97.452	5.847	5.777	11.624
20	91.676	5.501	6.123	11.624
21	85.552	5.133	6.491	11.624
22	79.062	4.744	6.880	11.624
23	72.182	4.331	7.293	11.624
24	64.889	3.893	7.731	11.624
25	57.158	3.429	8.194	11.624
26	48.964	2.938	8.686	11.624
27	40.278	2.417	9.207	11.624
28	31.071	1.864	9.760	11.624
29	21.311	1.279	10.345	11.624
30	10.966	658	10.966	11.624

Table 9: development of principal balance without PMI
Source: own calculations

This classical finance structure obviously is characterised by an IRR / APR of 6 per cent per year. Since a lower down payment always increases the default risk reflected in interest rate or insurance premium it is also the cheapest of all variants discussed here.

We will only treat one of the variants with PMI in detail, i.e. variant 4. For this case we assume:

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

Under these assumptions an initial insurance premium of \$ 936 per year will result.²⁰ We assume that the insurance will be held / premium will be paid until the LTV falls below 80 per cent (here: for nine years). The total cost of the loan thus consists of interest, principal and insurance premium (see table 10).

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	
12	145.913	8.755	4.322	0,00	13.076,80	
13	141.590	8.495	4.581	0,00	13.076,80	
14	137.009	8.221	4.856	0,00	13.076,80	
15	132.153	7.929	5.148	0,00	13.076,80	
16	127.005	7.620	5.456	0,00	13.076,80	
17	121.549	7.293	5.784	0,00	13.076,80	
18	115.765	6.946	6.131	0,00	13.076,80	
19	109.634	6.578	6.499	0,00	13.076,80	
20	103.135	6.188	6.889	0,00	13.076,80	
21	96.246	5.775	7.302	0,00	13.076,80	
22	88.944	5.337	7.740	0,00	13.076,80	
23	81.204	4.872	8.205	0,00	13.076,80	
24	73.000	4.380	8.697	0,00	13.076,80	
25	64.303	3.858	9.219	0,00	13.076,80	
26	55.084	3.305	9.772	0,00	13.076,80	
27	45.313	2.719	10.358	0,00	13.076,80	
28	34.955	2.097	10.980	0,00	13.076,80	
29	23.975	1.439	11.638	0,00	13.076,80	
30	12.337	740	12.337	0,00	13.076,80	

Table 10: development of principal balance and total cost with PMI, down payment 10 per cent
Source: own calculations using rates from PMI Mortgage Insurance Co. 2006

The IRR / APR of this investment / credit including mortgage insurance premium is 6,34 per cent per year – slightly above the classical loan's with its equity share of 20 per cent.²¹ The APR of the different variants with mortgage insurance show the following correlation: The higher the LTV, the higher the APR (i.e. the more expensive the credit, see table 11).

²⁰ We assume an amortized renewal rate applied to the outstanding loan balance for the life of the policy.

²¹ Comparing the IRRs for the two investments we assume that alternative investments will generate the respective IRR.

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

Table 11: APR with mortgage insurance depending on down payment
Source: own calculations using rates from PMI Mortgage Insurance Co. 2006

Given that saving \$ 33.000 on down payment can mean to become a homeowner much earlier than by saving for a classical non-insured 80 per cent LTV mortgage an additional interest of little more than 50 bps seems rather modest anyway. The surcharge will however be much higher if the loan is subject to other risk increasing traits than just a LTV above 80 per cent (which is more and more frequently the case in the U.S.).

3.7 The stability of the U.S. mortgage insurance system

The modern U.S. mortgage insurance system is matured by the experience of the financial crises of the 30s and 80s. Both the industry and its regulators have proven themselves as capable of learning from mistakes.

The collapse of the whole branch in the early 30s was not only due to an unfavourable macro-economic environment. It was also a consequence of undercapitalisation and under-regulation of the mortgage insurance industry (Canner / Passmore / Mittal 1994, p. 884 and Liu 2000, p. 38). Also experience was lacking in the field of qualitative selection of credit risks.

As a reaction the governor of the state of New York commissioned the so-called “Alger Report” to investigate the causes and effects of the mortgage market breakdown. For the private mortgage insurance sector the report recommended provisions against conflict of interest, sensible minimum capital and reserve requirements and sound regulation for appraisal, investment and accounting. The Alger report served as a blueprint for the recovery of PMI in the U.S. in the 50s (Liu 2000, p. 38).

Private mortgage insurers were henceforth subject to tight regulation taking into account the catastrophic character of the underlying risk. Modern mortgage insurance is characterised by sound regulation in the following fields:

- monoline restriction
- sensible reserve requirements
- sensible capital requirements
- provisions against conflicts of interest in relation to borrowers

The monoline restriction is of special importance since it prevents the access of other insurance branches to the reserves of mortgage insurance (Jaffee 2003, p. 4).

The business principles and regulation of modern mortgage insurance are much less on the speculative and risky side than they were in the 30s and 80s. Also the insurers are continuously working to improve their risk management and their key financial figures. The insolvency risk thus seems to be rather limited (Johnstone 2004, S. 126, see also table 12 showing the Fitch ratings for the insurers).

Company Name	Rating
ACE Capital Mortgage Reinsurance Co.	AA ²²
CMG Mortgage Insurance Company	AA ²²
General Electric Mortgage Insurance Co.	AAA ²³
Mortgage Guaranty Insurance Corp.	AA+ ²²
New York City Residential Mortgage Insurance Corp. (NY)	AA ²²
PMI Mortgage Insurance Co.	AA+ ²²
Republic Mortgage Insurance Co.	AA ²²
Triad Guaranty Insurance Corporation	AA ²²
United Guaranty Residential Insurance Co.	AAA ²³

Table 12: Fitch ratings of U.S. mortgage insurers
Source: <http://info.insure.com/ratings/fitch/index.cfm>, 18.3.2007

In the last 12 years the combined share of losses and expenses in total premiums earned never exceeded 100 per cent. In the year 2005 this share was only 60,44 per cent. In fact PMI is extremely profitable in “normal” years. Due to the highly volatile loss behaviour there is however always a catastrophic risk of several loss years in a row at the horizon – the periodic litmus tests of the sector. With the underwriting and capital reserves built up in the good years as a consequence of regulation and improved risk management most of the insurers should be able to endure even a loss period lasting over several years. The contingency and underwriting reserves of the sector accounted for \$ 13,8 billion in 2005. In relation to net risk exposure (credit volume covered by insurance, normally between 20 and 30 per cent of insured credit volume) the share of capital reserves was close to 9 per cent in 2005 (MICA 2007, S. 17-19).

The core competence of mortgage insurance is risk dispersion. The default risk contained in their insurance portfolios is spread across three dimensions: geographic, temporal (i.e. reserve policy) and loan-to-value (LTV mix) distribution. Mortgage insurers offer a degree of risk dispersion and pooling of risk that even the biggest and most diversified individual mortgage lenders could not accomplish on their own.

3.8 Résumé on Mortgage Guaranty Insurance

Private mortgage insurance is an important element of a fully developed national system of real estate finance. Without PMI borrowers unable to make sensible down payment are either excluded from the access to mortgage credit or suffer from unfair lending practices. Mortgage insurers help lenders to improve their risk management. Also with PMI smaller, regionally-oriented lenders can survive in the long run.

Given the systematic risk which is due to macro-economic factors like interest and unemployment rates worldwide risk dispersion across different economic cycles would make much

²² Fitch AA: Very strong. Insurers are viewed as possessing very strong capacity to meet policyholder and contract obligations. Risk factors are modest, and the impact of any adverse business and economic factors is expected to be very small.

²³ Fitch AAA: Exceptionally strong. Insurers assigned this highest rating are viewed as possessing exceptionally strong capacity to meet policyholder and contract obligations. For such companies, risk factors are minimal and the impact of any adverse business and economic factors is expected to be extremely small.

sense. The more countries are covered by mortgage insurance, the better the international risk dispersion will work – despite the currency risks incurred with worldwide mortgage insurance. If necessary regulations need to be redesigned in order to enable worldwide risk dispersion. The development of corresponding reinsurance capacities could further enhance the global dispersion of default risks.

Mortgage insurance however needs sound regulation – not only in its own field. National bank supervisors should relax equity requirements for insured mortgage loans only if the insurers are subject to sound regulation (the U.S. regulatory regime serving as a model).

From a housing policy perspective the idea of private mortgage insurance is convincing because of its potential to shorten the savings phase before homeownership. It could bring young families into their first own home many years earlier. A wide substitutive competition with the German Bausparsystem cannot be denied here. Mortgage insurance allows for higher LTV lending and can be regarded as a substitute for equity capital. Mortgage insurance surely has the potential to raise the homeownership rate in countries like Germany dramatically by considerably reducing the average entry age of homeownership.

4 Alternative instruments of mortgage credit risk management

While the methods of credit rationing used in Germany seem suitable to avoid sensible losses for the mortgage financiers they exclude them from the profit and revenue potential of potential homeowners with low equity. Also they exclude young families and other low equity households from founding a home of their own.

Other non-rationing alternatives to PMI are available, i.e.:

- piggyback loans
- securitisation of risky credits
- Mortgage Payment Protection Insurance
- Public Mortgage Insurance

4.1 Piggyback loans

Piggyback financing consists of two loans. The first is for 80 per cent of the purchase price. The second “piggyback” loan is needed for the rest of the purchase price, minus the down payment. An 80-10-10 mortgage has a 10 per cent down payment and a 10 per cent piggyback loan; an 80-15-5 has a 5 per cent down payment and a 15 per cent piggyback loan; and an 80-20 doesn’t have a down payment at all. The piggyback loan will always have a substantially higher rate than the primary mortgage.

Compared with PMI the piggyback loan repayments had the advantage of tax deductibility until lately. With the deductibility of PMI premiums this particular competitive advantage has disappeared.²⁴ If mortgage interest is deductible mortgage insurance premium should be deductible, too. Otherwise it would be a clear case of unfair competition. And that goes for any country where homeowners’ mortgage interest payments are deductible.

Variant 6 from above is an 80-10-10 finance without PMI. The 80-10-10 finance structure is made up of the following two mortgages:

²⁴ Possibly taking out PMI does have lower transaction costs than taking a second loan.

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

We assume an interest rate for the primary mortgage at the same level as for the insured mortgages in the other cases. The interest rate for the second mortgage rate is the critical interest rate resulting in an APR for the whole package equal to a 90 per cent LTV insured mortgage (i.e. 6,34 per cent) Under these assumptions the principal balances and the total cost of the two loans will develop as shown in table 13.

t	Mortgage I			Mortgage II			total cost
	principal bal. \$	interest \$	principal \$	principal bal. \$	interest \$	principal \$	
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
12	129.700	7.782	3.842	17.389	1.548	382	13.553
13	125.858	7.551	4.072	17.007	1.514	416	13.553
14	121.786	7.307	4.317	16.591	1.477	453	13.553
15	117.469	7.048	4.576	16.138	1.436	493	13.553
16	112.894	6.774	4.850	15.645	1.392	537	13.553
17	108.043	6.483	5.141	15.108	1.345	585	13.553
18	102.902	6.174	5.450	14.523	1.293	637	13.553
19	97.452	5.847	5.777	13.886	1.236	694	13.553
20	91.676	5.501	6.123	13.193	1.174	755	13.553
21	85.552	5.133	6.491	12.437	1.107	823	13.553
22	79.062	4.744	6.880	11.615	1.034	896	13.553
23	72.182	4.331	7.293	10.719	954	975	13.553
24	64.889	3.893	7.731	9.744	867	1.062	13.553
25	57.158	3.429	8.194	8.681	773	1.157	13.553
26	48.964	2.938	8.686	7.525	670	1.260	13.553
27	40.278	2.417	9.207	6.265	558	1.372	13.553
28	31.071	1.864	9.760	4.893	435	1.494	13.553
29	21.311	1.279	10.345	3.399	302	1.627	13.553
30	10.966	658	10.966	1.772	158	1.772	13.553

Table 13: Development of principal balance and total cost for the 80-10-10 loan
Source: own calculations

Now the critical interest for the second mortgage is 8,9 per cent. If the interest rate offered is higher taking mortgage insurance is the better deal (disregarding potential differences in transaction costs). Market rates for piggybacks are difficult to research, but for borrowers with good credit they seem to range between 8,0 and 8,5 per cent at the moment. If competition works smoothly the APRs for comparable credit packages with and without PMI should converge.

If piggyback financing is a good thing for the stability of the financial system is an open question. While there is no reason identifiable why piggyback financing should have a negative effect on the default risk (in comparison to a matchable insured loan), the piggyback lenders might be more vulnerable to the catastrophic risk associated with high LTV lending than the mortgage insurers. If that were true, piggyback lending would be a danger for the continuous provision of mortgage credit. 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

As we said before the U.S. mortgage insurers are heavily regulated and should be able to withstand even a period of several years with heavy losses. Because of monoline regulation they resemble more to a specialist mortgage bank than to a universal bank. The basic question is thus if specialising in high LTV mortgage lending or insurance is less or more risky than mixing such kind of mortgage credit resp. mortgage credit insurance with all kinds of other bank businesses including businesses outside mortgage lending. Another matter of interest is the credit / insured risk portfolio structure. A bank specialised in high LTV lending with an extreme geographical risk dispersion of its mortgage credits (requiring extensive partnerships with primary lenders) would basically be in the same business the mortgage insurers are in. Do such banks exist at all?

All in all as long as banks keep the credits in their books we don't have a clear-cut case of regulatory arbitrage here (piggyback lenders circumventing insurance regulation by offering substitutive less regulated banking products). Further investigation on the matter is needed anyway.

4.2 Securitisation

It might however be regarded as a case of regulatory arbitrage if banks engaged in the high LTV loan business securitise these loans. The special purpose vehicles holding these credit bundles are less densely regulated than universal banks, mortgage banks or mortgage insurers. On the other hand the loan bundles transferred to SPVs usually have credit enhancements (including secondary mortgage insurance) in order to get a reasonable rating. Acting as agents of the investors the rating agencies exert a kind of substitutive supervision on MBS transactions. Are capital markets or mortgage insurers the better risk managers? What if a high LTV loan crisis follows the sub-prime crisis? Investors might overreact and as a consequence interest rates could overshoot in this market segment. The question if primary and secondary interest rates for high LTV loans are more volatile than mortgage insurance premiums needs further empirical investigation.

4.3 Mortgage Payment Protection Insurance

Mortgage Payment Protection Insurance ("MPPI") is a mortgage insurance product that can protect both the borrower and the lender after a mortgage transaction is made, by guaranteeing the regular payments that ensure repayment.²⁵ In contrast to U.S. style PMI it pays out to the borrower. In an environment where populations are under-saved MPPI is an important safety net for mortgage borrowers, especially in times of need when the consumer suffers from illness or involuntary unemployment.

MPPI covers a range of default relevant risks, i.e. accident, sickness and unemployment. Usually all three risks are insured, but it is possible to insure against a subset, particularly where other insurance is already in place (Whitehead / Holmans 1999, p. 3).

MPPI has been available in the UK since the late 1970s. The insurance covers a mortgager's monthly mortgage repayments (interest payments and amortisation) if he or she is *unable to*

²⁵ This section draws on information provided by Michelle Gabay from Genworth Financial London.

work because of unemployment, accident, or sickness. MPPI payouts are independent of a household’s financial resources (Song 2005, p. 6).

MPPI shouldn’t be mixed up with Income Protection Insurance (IP), a kind of occupational disability insurance with indefinite term (see table 14).

	Mortgage Payment Protection	Income Protection
Max Cover	Mortgage repayments & related expenditure only.	Normally 60% of gross earnings.
Max Payout	12 or 24 months depending on provider.	Indefinite cover until you return to work, reach chosen retirement age or die.
Tax Treatment	Benefit paid tax free.	Benefit paid tax free.
Waiting Period	30 or 60 days depending on provider.	You choose from 1, 2, 3, 6, 12 or 24 months.
Definition of Disability	Inability to perform any occupation.	Inability to perform own occupation.
What is covered as standard	Disability as a result of accident or sickness including unemployment option.	Disability as a result of any accident or illness, no unemployment option.
What is not covered as standard.	Pre-existing medical conditions, pregnancy, back & stress conditions, involuntary unemployment, seasonal & contract work, dismissal as a result of misconduct, fraud etc (see provider literature for full details which we will send you in the post if you request a quote).	Unemployment
Application process	Short application, no medical details required.	Detailed application, full medical and occupation details will be required.
Summary	Short term 'one size fits all' cover with restrictions, very quick & easy to arrange.	Long-term cover with few restrictions, no unemployment option.

Table 14: Comparison table MPPI / IP
Source: Torquil Clark Life Insurance

Eligibility requires the borrower to fall between age specific categories of normally between 18 and 65, be resident in the country which they purchase the insurance, be working full time and not aware of pending unemployment or illness which may preclude them from work. Policies vary from member state to member state of the EU and allow for certain flexibilities, but generally speaking there are certain standard exclusions. As with all insurance policies there are exclusions for each section of cover which are set out within terms and conditions of the policy document.

Sophisticated markets such as the United Kingdom have extended standard policies to cater for carers, self-employed and temporary workers, fixed-term contractors, providing diverse and flexible covers.

MPPI can be purchased alongside the primary mortgage through the lender, or independently. Typically the period of cover remains in force until the borrower dies, reaches 65 years of age

(or the limit specified), the mortgage ends or the borrower fails to make a number of monthly premium amounts (normally three).

MPPI commences, usually direct to the lender during the first month. However there are some exclusions or wait periods within some policies for covers such as unemployment (usually 30 or 60 days). The maximum benefit period is restricted to 12 months by most providers (in some cases the term is 18 or 24 months).

Company	Contract	30 day, cost per £100	30 day, cost per £500	30 day, cost per £1000	30 day, cost per £1500
Axa	Accident Sickness and Unemployment Cover	5.88	29.40	58.80	88.20
Bright Grey	Income Cover For Sickness	N/A	N/A	N/A	N/A
British Insurance	Mortgage Protection	2.95	14.75	29.50	44.25
Centrepoin Insurance Services Limited	Total ASU Comprehensive 12 Months Cover	4.45	22.25	44.52	66.78
Centrepoin Insurance Services Limited	Total ASU Comprehensive 18 Months Cover	5.20	25.99	51.98	77.96
Centrepoin Insurance Services Limited	Total ASU Free & Easy 12 Months Cover	5.78	28.08	57.75	86.63
HSBC Life (UK) Ltd	Mortgage Repayment Protector	5.94	29.70	59.40	89.10
Jackson Lee Underwriting	Loan Star Credit Mortgage Protector	N/A	N/A	N/A	N/A
Legal & General	Mortgage Payment Protection Insurance	4.45	22.25	44.50	66.75
Millennium Insurance	Millennium Multi-Guardian	6.41	28.69	56.54	84.39
Millennium Insurance	Payment Protection	N/A	24.59	48.34	72.09
Universal Provident	Mortgage Care	3.95	19.75	39.50	59.25
Yorkshire Building Society - NIC	Mortgage Payment Insurance	5.19	25.95	51.90	77.85

Table 15: ASU premium 30 days

Source: Synaptic www.synaptic.co.uk (All data correct as at 11/09/2006)

In the United Kingdom, around 25 per cent of existing mortgages and over 35 per cent of new mortgages have MPPI to protect the mortgage repayments. In 1997 the UK industry and government pioneered an initiative to achieve 55 per cent take-up of Mortgage Payment Protection Insurance by 2004. This initiative is managed by a Partnership Steering Group (“PSG”) which is comprised of trade associations and government departments, with the objective:

“to enhance the ability of home-owners, particularly those in high risk groups, to sustain their tenure of choice over the economic cycle by creating a capacity to maintain their mortgage payments regardless of their personal circumstances, i.e. through insurance and savings.”

The original target of 55 per cent take up was not met and in 2004 the objectives were realigned. Take-up rates seem to have fallen in recent years (Cockburn 2006, p.33).

There are important differences between MPPI and PMI:

- PMI pays out to the lender whereas MPPI protects the borrower.
- PMI provides all-risk coverage. Default-related losses of the lender are insured absolutely independent of the reasons for defaulting. MPPI on the other hand covers the risk of a temporary loss of earned income with respect to mortgage repayments.
- MPPI provides preventive coverage. It helps to avoid defaults by replacing missing income. At PMI the insured event is the mortgagor’s default. We should not however overlook the fact that mortgage guaranty insurers also have an interest to avoid insured credits from defaulting (e.g. by counselling the mortgagor).
- MPPI is subject to moral hazard whereas the moral hazard problem is non-existent at PMI because it pays out to the borrower. Regarding the coverage range (omitting important causes of default) and the types of risks insured by MPPI the moral hazard risk should be limited however (Whitehead / Holmans 1999, p. 9). Taking MPPI of this

type will probably not have the effect of a general relaxation of budget discipline. Also households will usually not incur bigger financial risks when equipped with MPPI.

All in all MPPI and PMI do not directly compete. In a way they are complementary products. If MPPI decreases the probability of default, then PMI rates could be lowered for applicants having MPPI.

4.4 Public Mortgage Insurance

Public mortgage insurance might be suitable to ensure equal access to mortgage credit independent of regional or societal rationing criteria. On the other hand a public insurance system is always in danger to be pawn in the hands of the powerful political interests. Considerations of political opportunity might lead to demands for lower underwriting standards or less risk-adequate premium differentiation. Because of its cyclical profile public mortgage insurance is also a budget risk not to be underestimated, especially when politicians have influence on underwriting standards and premium design. There is a danger that public mortgage insurance grows into the role of a lender of last resort distorting the risk calculus of lenders. Furthermore public mortgage insurance might distort competition with private insurers. It needs to have a clear mission and target group. It is doubtful if mortgage insurance is a public good at all. On the other hand historical experience tells us that sometimes a public insurer is needed as avant-garde for the development of this line of insurance.

5 Conclusion and policy implications

For the design of an optimal default risk management approach the best suited risk management instrument needs to be assigned to each potential reason for defaulting. The most important default risks seem to be:

- unemployment
- mismanagement of personal finance / tax situation
- lack of reserves, esp. for home repair / improvement
- occupational disability
- death
- rising interest rates
- falling house prices

A proposal for the assignment of risks and risk managements instrument is presented in table 16.

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

Table 16: assignment of risks and risk managements instrument

The assignment proposal beholds the following insights:

- There is an important role for the state in risk management: social insurance design, counselling, subsidies for Bausparen, foreclosure and lending regulation
- The individual default risk is still important.
- 100 per cent security is not attainable.
- Some risks require an instrumental mix.

The role of private mortgage insurance is to be a safety net for the lenders. The premium structure for this insurance should take into account as many aspects of personal risk management as possible, e.g. insurance coverage, assets like the Bausparvertrag, use of derivatives. Effective default risk management requires

- an intelligent mix of risk management instruments,
- state intervention and subsidization where necessary, and last but not least
- responsible and informed financial behaviour,

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