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Mortgage Payment Insurance and the Future of the Housing Finance System

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Executive Summary

This paper argues that a systemic weakness in the way the mortgage finance system currently deals with default risk has contributed greatly to the current mortgage crisis. The weakness is the prevailing system of risk-based interest rate pricing -- the practice of charging higher interest rates on loans that are perceived to be riskier than the best ("prime") mortgages.

With few exceptions, interest rate risk premium dollars not needed to cover current losses are realized as income by investors. They are not reserved and thus, unavailable to meet abnormally large losses when they occur. This makes the system more vulnerable to high-default-rate episodes.

In addition, because interest rate risk premiums reflect the return investors require to compensate for the danger of "going broke," they are substantially higher than premiums based on long-run actuarial loss experience. The borrowing cost to less-than-prime borrowers is higher than justified by expected losses. Yet in the absence of reserving, interest rate risk premiums are never high enough to meet the losses that occur in a crunch, such as the one we are in now.

A better way to manage mortgage default risk is through a new type of mortgage insurance called mortgage payment insurance, or MPI. Under MPI, the insurer would guarantee timely payments to investors after borrowers default. If the default is not corrected, payments from the insurer continue until the foreclosure process is completed. At that point the investor is reimbursed for the unpaid balance plus foreclosure costs up to an agreed upon cap similar to the cap on traditional

mortgage insurance. Caps on insurance coverage can be adjusted to equate expected losses with those of prime loans.

Under MPI, borrowers would pay mortgage insurance premiums based on default risk, but interest rates would not vary with risk. Unlike interest rate risk premiums, insurance premiums would be reserved for 10 years and available to pay for abnormally large losses if and when they occur, reducing the vulnerability of the system to future shocks. Also, unlike interest rate risk premiums, insurance premiums would reflect long-run actuarial loss experience which will reduce the overall financing cost to most borrowers. In addition, with MPI the party underwriting the risk (the PMI), owns the risk, eliminating an agency problem that weakens the system.

Although MPI provides greater coverage, it will actually cost insurers little more than the strictly collateral risk coverage they provide now, and in many cases will cost less. Insuring against cash flow risk and collateral risk in combination is incredibly efficient because all of the payments the insurer advances in its role as cash flow insurer reduce dollar for dollar the ultimate amount they must pay at foreclosure.

Further, the enhanced protection against loss that MPI provides to investors lowers interest rates, and lower rates reduce losses to both investors and insurers on loans that go to foreclosure. Despite the greater protection provided by MPI, the rate plus insurance premium paid by less-than-prime borrowers would be substantially lower than the rate plus insurance premium under the current system of interest rate risk-based pricing.

To make MPI work, however, the secondary market must price loans carrying MPI at prime. In 2008, this means the Federal agencies Fannie Mae and Freddie Mac.

The agencies should support MPI because it will sharply reduce the systemic vulnerability of the housing finance system. MPI extends the process of reserving against future default losses, and concentrates the risk of default in the hands of those who underwrite the risk. Since the agencies cannot separate their own fortunes from those of the system, they have a vital stake in how the system evolves in the future. Further, MPI aligns the interest of the agencies with those of borrowers. In

addition, MPI would eliminate the need for risk-based pricing by the agencies, which creates needless controversy. All risk-based pricing would be done by PMIs.

While this paper focuses on the mortgage insurance industry, the core principle of MPI has much wider applicability. The principle is one of "transaction-based reserving", or TBR. With TBR, a portion of the risk premium on every transaction must be reserved and cannot be withdrawn except in exigent circumstances.

In contrast to capital requirements, TBR is largely immune to cyclical swings in investor sentiment. Under existing requirements, during periods of euphoria when lenders are prone to making riskier loans, they can do it without increasing their required capital by shifting to riskier assets within the defined asset categories. With TBR, in contrast, because riskier assets carry higher premiums such a shift would result automatically in larger allocations to reserves.

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Mortgage Default Risk

Investors in mortgages face two kinds of risk from borrowers who default. Collateral risk is the risk that the investor who forecloses on a loan and sells the property will fail to recover the unpaid balance of the loan plus the foreclosure costs. On loans with small down payments on which the collateral risk is the highest, private mortgage insurance is available to protect investors.

Investors also face cash flow risk. While they ultimately may be made whole from their collateral and mortgage insurance, until that happens a loan in default is a non-performing asset which is not generating any income and is not saleable except at substantial loss. There is no insurance now available against cash flow risk on individual mortgages.

Borrower Payments For Default Risk

Borrowers are charged for default risk in two ways. The first and larger charge is to impose a risk premium in the interest rate. The risk premium is a rate increment above that charged on a "prime" transaction, which carries the lowest risk. The greater the perceived risk, the larger is the premium.

A weakness of the interest rate risk premium system is that, with few exceptions, risk premium dollars not needed to cover current losses are realized as income by investors. They are not reserved and available to

meet future losses. This is a serious limitation because losses tend to bunch.

For example, interest rate risk premiums collected on loans originated in 2000 had very low losses because of the marked appreciation in house prices in subsequent years. Most of the risk premiums collected on these loans became investor income. Loans originated in 2006, in contrast, had large losses but none of the excess premiums from the 2000 vintage were available to help meet those losses.

Another weakness of the interest rate risk premium system is that premiums are based not on long-run actuarial loss experience but on the return investors require to compensate for the risk of "going broke." These are substantially higher than premiums based on actuarial experience. Furthermore, interest rate risk-based premiums along with underwriting requirements can change markedly over short-periods with changes in market sentiment, easing during periods of euphoria such as 2000-2005, and then sharply reversing course when sentiment changes, as in 2006-2008.

The second method of charging borrowers for default risk is to charge a mortgage insurance premium. Borrowers may be required to purchase mortgage insurance if their down payment on a home purchase, or their equity in a refinance, is less than 20%.

In contrast to interest rate risk premiums, more than half of the mortgage insurance premiums collected from borrowers are placed in reserve accounts. The reserves that accumulate during long periods when losses are small are available when a foreclosure crunch comes – as right now.

The reserving process requires mortgage insurance companies to view expected losses over a long time horizon. While premium structures change over time, such changes are based on revised estimates of losses over long periods, rather than on short-term swings in market sentiment.

Furthermore, the premiums arising out of a reserving process are significantly lower than those charged when there is no reserving. This will be discussed further below.

The upshot is that a mortgage system in which borrower payments for risk are reserved is more stable, and the average premium paid by borrowers is much lower, than one in which borrower payments are divided between current losses and income. Unfortunately, for every risk-based dollar paid by borrowers that is subject to reserving, they pay ten or more risk-based dollars that are not subject to reserving

Introducing Mortgage Payment Insurance

Traditional mortgage insurance on individual mortgages, which we will call TMI, is insurance against collateral risk. It usually comes into play after foreclosure when the insurer pays for any shortfall (up to an agreed upon cap) between the net proceeds of the property sale and the loan balance (including accrued interest) plus expenses.

Our proposal is for a new type of mortgage insurance which we call mortgage payment insurance, or MPI, and it covers both collateral risk and cash flow risk. Under MPI, the insurer would guarantee timely receipt of the payments, so that from the investor's perspective the loan remains in good standing when the borrower defaults. This is the cash flow insurance part of the policy.

If the default is not corrected, the payments continue until the foreclosure process is completed, at which point the investor is reimbursed under the collateral risk insurance part of the policy. Any cure payments would go to the insurer to reimburse it for the advances made. To avoid the risk of loan servicers allowing MPI payments to run on indefinitely, PMIs would limit the period allowed the servicer to foreclose. The maximum period would depend on typical foreclosure timelines and vary by state.

The insurance premiums covering both types of risk would vary from loan to loan, but since the insurer assumes the default risk there would be no interest rate risk premiums. All borrowers would pay the prime interest rate on the type of mortgage they select. This assumes that the insurer's credit is not in question, an issue discussed below, and that the coverage cap is adjusted to the level required by investors to provide prime pricing.

Cost of MPI Versus TMI

It is natural to assume that since MPI covers both the cash flow risk and the collateral risk, the required mortgage insurance premiums would be substantially larger than those on TMI. In fact, more often than not they are smaller, and when they are larger, they are not much larger!

This astounding fact stems from two sources. The first is that insuring against cash flow risk and collateral risk in combination is incredibly efficient. All of the payments the insurer advances in its role as cash flow insurer are simply prepayments – dollar for dollar – of the ultimate amount they must pay at foreclosure in their role of collateral risk insurer.[1] The only net loss to the insurer is the interest opportunity cost on the funds advanced, which turns out to be small.

The second reason that MPI premiums are so small is that, by assuming all the default risk instead of just a piece of it, MPI eliminates interest rate risk premiums, and lower rates reduce losses on loans that default. A lower rate means more rapid amortization and therefore a lower balance, and it also means smaller accruals of unpaid interest.

We will illustrate with an example based on wholesale price quotes covering two loans as of November 27, 2007, when the market was less unsettled than it is today. The loans were the same except for a few critical differences that made one of them prime and the other Alt-A. The features of the loans are shown in Table 1.

[1] **Payments consist of interest plus principal. Interest payments reduce dollar-for-dollar the accrued interest for which the insurer is liable, while principal payments reduce dollar-for-dollar the outstanding balance .**

Table 1
Characteristics of Prime and Alt-A Loans

Loan Characteristic	Prime Loan	Alt-A Loan
Price or Value:	$444,444	$444,444
Loan ($) / (LTV):	$400,000 / 90%	$400,000 / 90%
TMI Coverage:	25%	25%
Borrower FICO:	700	700
Property Type:	Single Family	Single Family
Occupancy:	Primary Residence	Investment
Loan Purpose:	Purchase	Cash Out Refi
Documentation:	Full	None
Loan Rate:	6.000%	9.875%
TMI Premium:	.67%	1.29%

Note: Loan is 30-year fixed-rate, property is in California, and lock period is 30 days. Rates are wholesale at zero points as of November 21, 2007, insurance premiums are from the MGIC Rate Finder at that time. Note that rate risk and mortgage insurance premiums have both risen since the table was prepared in November, 2007. In attempting to update the table, we found that the Alt-A loan was no longer being priced, by the market or by MGIC. See the discussion under "Excessive Interest Rate Risk Premiums" below.

The prime loan was to purchase the home as a primary residence with full documentation, whereas the Alt-A loan was to take cash-out by refinancing an investment property with no documentation. The Alt-A loan carried a rate 3.875% higher, and a mortgage insurance premium .62% higher.

We assumed the Alt-A loan went into default followed by foreclosure and calculated losses with a TMI policy. We then used the same default/foreclosure scenario to calculate the losses on an MPI policy with the interest rate reduced to 6%, the prime rate in our example.

We found that the total losses were $21,111 lower with MPI, with the detail shown in Table 2 below. Both insurer and investor share in this loss reduction. The insurer's cap (maximum loss exposure) is reduced by $4,473 while the investor's losses are reduced by $16,638.

Table 2
Breakdown of Cost Savings on MPI at 6% Relative to TMI at 9.875%

Incremental Costs of MPI	
Payment Advances, Default to Foreclosure	**$28,778**
Interest Cost of Payment Advances to Insurer	**805**
Total	**29,583**
Cost Savings of MPI	
Interest Charges Due at Foreclosure	**39,025**
Larger Borrower Equity at Default	**5,327**
Larger Borrower Equity at Foreclosure	**5,537**
Interest Gained on Payment Advances by Investor	**805**
Total	**50,694**
Net Saving on MPI	**21,111**

Note: It is assumed that the loan defaults after 24 months, it takes 12 months after default to foreclose and another 9 months after foreclosure to sell the property to a third-party purchaser, house value at disposition is 20% lower than at origination, loss on cash flow advances is calculated at 6%, and foreclosure expenses are based on those developed by HUD in Providing Alternatives to Mortgage Foreclosure: A Report to Congress, March 1996.

Our example involved a relatively large rate reduction. Smaller rate reductions generate smaller savings, as shown in Table 3 below. The costs there are calculated in the same way as in Table 2, except that the interest rate on the Alt-A loan, and therefore the rate reduction associated with MPI, takes different values.

Table 3
Loss Reductions on MPI as a Function of Interest Rate Reduction

	Loss Reduction From Using MPI Rather Than TMI		
Interest Rate Reduction	**Total Loss Reduction**	**Loss Reduction to Insurer**	**Loss Reduction to Investor**
3.875%	**$21,111 (12.2%)**	**$4,473**	**$16,638**
3.000%	**$16,648 (9.9%)**	**$3,357**	**$13,291**
2.000%	**$11,368 (6.9%)**	**$2,037**	**$9,331**
1. 000%	**$5,876 (3.7%)**	**$664**	**$5,212**
0.500%	**$3,043 (2.0%)**	**-$44**	**$3,087**
0. 000%	**$151 (0.0%)**	**-$767**	**$918**

If there is no interest rate reduction, MPI will cost the insurer more than TMI, but not much more, and the investor will always incur a smaller loss with MPI.

Excessive Interest Rate Risk Premiums

Note that in moving from the prime loan to the Alt-A loan, the TMI premium rose by only .62% while the interest rate premium rose by 3.875%.[2] The increase in risk premium charged by the lender was more than 6 times larger than the increase charged by the insurer, despite the fact that the increase in risk exposure was substantially higher for the insurer because the insurer is in the first loss position.

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[2] This actually understates the interest rate increase because the 9.875% rate is wholesale and does not include the retail markup, which on riskier loans includes an "opportunistic pricing premium" -- some would call it a "predatory pricing premium". This premium would largely disappear when the borrower's payment for default risk is embedded in the insurance premium.

Extending our model, loss to the insurer occurs if the property value *appreciates* by less than 30%, whereas loss to the investor doesn't occur unless the property value *declines* by more than 2.5%! The property value has to decline by 35% before the investor's loss equals the insurer's loss. In other words, both the incidence and severity of loss are expected to be greater for the insurer than the investor, yet the incremental charge by the investor is more than 6 times larger than the incremental charge by the insurer.

On the assumption that the mortgage insurance premium accurately reflected the losses expected over a long time horizon, the interest rate risk premium was grossly excessive.

Interest rate risk premiums are excessive mainly because they are not reserved and depend on investor sentiment that is heavily influenced by current market conditions – as opposed to long-term actuarial loss experience. When losses escalate, as they have during 2007-2008, the prevailing view is that the interest rate risk premiums charged borrowers in prior years must have been too small, which results in marked price adjustments. Interest rate risk premiums are now substantially larger than they were earlier, and eligibility cutoffs, where loans become unavailable at any price, occur at lower values of risk variables.

This reaction by the market is understandable, perhaps unavoidable in the current environment. But relative to what they would be in a reserving environment, interest rate risk premiums are grossly excessive. In a system in which insurers offer MPI and all borrowers pay the prime rate, the interest rate plus MPI insurance premium paid by non-prime borrowers would be substantially smaller than the interest rate plus TMI insurance premium they pay now.

A Gaming Analogy

Imagine a world where all home mortgages are placed in securities, of which there are two types. Both promise to pay the investor the prime rate, but protect them in different ways. On an RRP security, borrowers pay interest rate risk premiums, which are placed in a reserve fund. Each security has its own fund which cannot be co-mingled with any

other. The RRP security holder is thus protected only by the reserve fund for that security.

On an MPI security, borrowers pay insurance premiums to an insurer, who places an MPI policy on every mortgage in the pool. The MPI security holder is thus protected by the total capital and reserves of the insurer.

Make the following assumptions: Every security faces a market environment that is determined by a single twirl of a roulette wheel, which has 15 slots, 14 of them blue and one red. If blue comes up, as it will 93.3% of the time, the environment is one in which house prices increase, and credit losses to investors amount to 1/10 of 1% of loan balances. If red comes up, as it will 6.7% of the time, the environment will be one in which house prices decline, and credit losses will be 6% of loan balances.

In this world, the insurer will assume that it will experience 14 rising markets for every one declining market. The reserve needed by the insurers to cover losses of .10% on 93.3% of the loans they insure, and losses of 6% on 6.7% of them is about .50%. Their premium will be about twice this, or 1%. The investor is protected when the market declines and losses jump because the insurer has the reserves to meet the claims.

Investors in an RRP security, on the other hand, are protected only by the reserve established for that particular security. For the investor to accept a 1% risk premium (comparable to the insurance premium on the MPI security), he would have to diversify across many RRP securities over time, and avoid paying taxes on the risk premiums in excess of losses on all low-loss securities. In other words, the investor would have to act like (and be recognized legally as) an insurer. Acting as an investor, the risk premium would have to exceed 1%, probably by a considerable margin.[3]

[3] A more complete model would distinguish the investor and security issuer, with the latter positioned to pocket a major part of the excess premiums on the low-loss securities while allowing investors to take most of the loss on the high-loss security.

Full protection for the investor in RRP securities requires a risk premium reserve of 6% *on every security*. However, because any risk premium above 1% would be profitable 93.3% of the time, the market will settle somewhere between 1% and 6%, depending on investor attitudes towards the risk of very high losses that might put them out of business. Borrowers will pay more on the RRP security, and when the roulette wheel comes up red, the risk premium reserve will still not be adequate to cover the losses.

This gaming analogy illustrates very well why interest rate risk premiums are both too large and too small. They are too large in the sense that most of the time they far exceed what is needed to meet losses, and they are too small in the sense that they are inadequate to meet losses when a default crunch does occur.

Fixing the System With MPI

With MPI, financing costs to non-prime borrowers would be substantially lower. Further, the system would be much less vulnerable to default crises such as the one we are in now.

Lower Costs to Borrowers: **Mortgage insurers assume almost 100% of the default risk under an MPI policy. A very small amount remains because of the cap on insurer liability.[4] Assuming the cap is adjusted to meet investor requirements, the only material risk remaining to the investor is the risk that the insurer itself will fail, as discussed below. Assuming that risk is nil, interest rate risk premiums disappear. Borrowers would pay different mortgage insurance premiums, but they would all pay the prime interest rate.**

MPI would cost insurers little more, and in many cases less than their traditional limited insurance. Hence, the total financing cost to borrowers would drop, with the cost imposed on riskier borrowers dropping the most.

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[4] **On MPI, the targeted expected loss on the non-prime loan will be the same as that of the prime loan. Because the incidence of default will be higher on the non-prime loan, the severity of loss must be correspondingly lower. This is accomplished by setting a higher insurance coverage ratio on the non-prime loan.**

The case in tables 1-3 above illustrate how large the savings can be. Assuming the TMI insurance premium of 1.29% in Table 1 is properly priced to meet losses under that policy, it is more than adequate to meet the lower losses under an MPI policy. Hence, the 3.875% rate premium, which investors require when they are protected only by TMI, is redundant if they have MPI.

Further, with all borrowers eligible for mortgage insurance paying prime rates, the potential for predatory practices would be sharply reduced. Elimination of risk-based pricing would eliminate opportunistic pricing of mortgages at the point of sale, which is one of the most important sources of abuse.

In addition, borrowers would have an important ally in the mortgage insurers, who have a financial interest in seeing that borrowers are not over-charged.[5] Higher rates mean greater risk exposure for the insurer. Insurers would have the clout and information needed to protect borrowers because insurer/lender relations would shift to a more level playing field.

Since the private mortgage insurance industry began, it has been beholden to the lenders because lenders select the insurers to whom they refer borrowers. With MPI, lenders and insurers (and by extension, borrowers) would be on a more equal footing because borrowers could go to insurers first knowing that MPI is a de facto loan approval that will allow them to borrow at the prime rate.

MPI Eliminates a Critical Agency Problem. **One of the features of the existing housing finance system that has been much commented upon in discussions of the current crisis is that the parties making risk decisions are not the parties that end up assuming the risk. This is what economists term an "agency" problem, where one party (the agent) is supposed to act in the interest of another (the principal), even though their interests are not the same.**

[5] Although the interest rate has an important effect on insurer losses, they have never recognized this in their premium structures. One executive explained this to us by saying that the premium-setting process began back in the days when rate dispersion was very small. However, the companies did not use FICO scores in premium-setting in the early days, either, but they use them now. A more plausible explanation is that basing premiums on the rate would mean that upward rate adjustments would mean an upward insurance premium adjustment, which lenders would not appreciate.

Various techniques have been developed to assure that the actions of the agent are consistent with the interests of the principal. For example, when loan originators sell loans, the purchaser often has the right to sell them back if they don't meet the principal's requirements. The problem is that these mechanisms don't always work the way they are supposed to, and during a period of euphoria in the market, such as we experienced during 2000-20005, they may not work at all.

MPI eliminates the agency problem in connection with default risk. The PMI underwrites the loan, and the PMI assumes all or virtually all of the risk.

Reduced Systemic Vulnerability: **With default risk covered by MPI, rather than by a combination of TMI and rate risk premiums, vulnerability to financial crises would be substantially reduced. Today, only TMI premiums are placed in reserve accounts to protect against future losses. With minor exceptions, interest rate risk premiums not needed to meet current losses become investor income. With MPI replacing rate risk premiums, the process of reserving for contingencies would be extended to cover all default risk, not just part of the collateral risk. As a rough order of magnitude, reserves available to meet losses might be ten times larger.**

In addition, risk underwriting would shift into more dependable hands. Mortgage insurance companies already offer underwriting to lenders as a service, but with MPI they will do it for all loans except those that don't qualify for MPI.

In setting underwriting requirements, lenders and investment banks have a short run orientation that can lead to sharp swings in how liberal or restrictive the requirements are. They become excessively liberal when market sentiment is euphoric, as it was during 2000-20006, and then excessively tight when pessimism reigns, as is the case now. As noted above, this tendency is encouraged by their ability to pass along most default risk to the next party in the chain. Insurers, in contrast, have a long-term orientation because they remain on the hook for a loan until it is repaid or the insurance is terminated.

In addition, by keeping defaulted mortgages performing until they are paid off, MPI would block the contagious erosion of investor confidence

that stems from increasing numbers of non-performing loans. This has been a central feature of the current crisis.

MPI Requires Secondary Market Support

MPI will not come about without support from either Fannie Mae or Freddie Mac. For it to work, loans with MPI must be priced at prime plus a competitive retail markup. Without a secondary market buyer paying prime, lenders will undervalue MPI for an indefinite period, and neither borrowers nor insurers will receive the benefits they deserve.

If the agency is willing to price a prime loan at 6% with TMI, it should be willing to take a riskier loan at 6% if it carried MPI and if the insurer's credit is beyond reproach. The insurer's credit is better than that of the prime borrower. Further, in the event of a default, the payments will continue to be made on the riskier loan but not on the prime loan. While the riskier loan will have a higher incidence of default, in the event of default the loss to the investor with MPI is lower. How these balance out is not clear, but if there is any added risk, the coverage can be adjusted to shift it to the insurer, with the borrower paying for it in a higher insurance premium. Any such adjustment would not materially reduce the borrower's cost saving.

And there are other advantages of MPI to the agencies.

Reduction in Systemic Vulnerability: **If there is one lesson that the agencies should have learned from the current crisis, it is that they cannot separate their own fortunes from those of the housing finance system as a whole. They have a vital stake in how the system evolves in the future, and in their own self-interest should be an active participant in the process.**

Elimination of Risk-based Pricing: **With MPI, all risk-based pricing would be done by PMIs. The agencies would only have to stipulate the amount of insurance coverage required. Community groups adamantly oppose risk-based pricing by Fannie and Freddie, so eliminating it removes a source of needless controversy.**

Stabilizing the PMIs: **MPI will open a new source of profitable business for existing PMIs, increasing their chances of surviving the crisis. The more premium income they can generate, the greater their chances.**

Existing PMIs are currently in a "hunker-down" mode, husbanding their reserves and tightening their underwriting requirements. With this mindset, they are strongly disinclined to initiate new programs. This is counterproductive and increases the likelihood that some of the PMIs will fail. They need a new mindset. The agencies could encourage (or even require) them to view MPI as a way out of their difficulties because lower borrowing costs will stimulate demand, increasing their premium income.

Alignment of Agency Interest With Borrower Interest: **Perhaps the most important reason for the agencies to support MPI is that it aligns Agency interests with those of borrowers. As already noted, MPI will reduce the financing costs of most borrowers, the potential for predatory practices would be sharply reduced, and borrowers would have an important ally in the mortgage insurers, who have a financial interest in seeing that they are not over-charged. This will help the agencies rebuild their political capital.**

Concluding Comment: The Reserving Principle

While this paper focuses on the mortgage insurance industry, the core principle of MPI has much wider applicability. The principle is one of "transaction-based reserving", or TBR. With TBR, a portion of the risk premium on every transaction must be reserved and cannot be withdrawn except in exigent circumstances.

TBR is an approach to regulating the safety and soundness of financial institutions generally. It can be viewed as an alternative (or perhaps a supplement) to capital requirements. As applied to a depository, the required allocation to a contingency reserve would be, say, 50% of the portion of any charge that is risk-based. If a prime mortgage was priced at 6% and zero points, for example, the reserve allocation for a 7% 2 point mortgage would be ½% plus 1 point. Of course, income allocated to reserves would not be taxed until it was withdrawn 10 years later.

The great advantage of TBR is that a shift to riskier loans during periods of euphoria automatically generates larger reserve allocations because riskier loans carry higher risk premiums,. Hence, TBR is largely immune to cyclical swings in investor sentiment.

This is in contrast to capital requirements, which allow lenders to increase their risk exposure without any increase in required capital. They do that by replacing less risky assets with more risky assets within any given asset class as defined by the regulator.

Another advantage of TBR is that it has universal applicability and does not leave destabilizing innovations uncovered. When so-called credit default swaps appeared, for example, the TBR regulator would immediately have realized that the premium was 100% risk-based, and sellers would have been obliged to reserve 50% of their premium income.

The bottom line is that every financial institution is, at least in part, in the insurance business and ought to be regulated as such.