

A Mortgage Insurer's Look at Basel II and Residential Mortgage Credit Risk

by Eric Klopfer

The proposed revisions by the Basel Committee to the Accord on regulatory capital requirements for banks (Basel II) will have profound direct effects on the global financial services industry. As the representative of a group of specialist providers of residential mortgage credit risk management services¹, I have a keen interest in how the Committee treats both residential mortgage credit risk and the mitigation of that risk.

This article will introduce our perspective on decisions taken to date and where we believe the Committee should end up on various matters. In summary, we believe Basel II should introduce greater risk sensitivity under its standardized approach, acknowledge "cycle risk" more adequately in the internal ratings-based approach, and preserve incentives for residential mortgage lenders to use third-party credit risk mitigation like mortgage insurance.

THE ACCORD'S UNIFORM APPROACH TO RESIDENTIAL MORTGAGES

Any effort to construct global standards for anything was (and is) bound to conclude in

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a series of compromises; and the contours of the original Accord are well known². Concerned with both competitive inequality and relative safety of national and international banking systems, the Committee established a minimum equity capital level of 4% and an overall 8% minimum capital level. Having fixed capital levels, the Committee ordered banking activities in terms of relative risk.

In general terms, the Committee considered lending to governments the safest activity, to be followed by banks and quasi-governmental entities, residential mortgages, and everything else. Further, the Committee chose simplicity over complexity in the establishment of uniform risk weights, inviting the inevitable arbitrage that comes from putting credits with different risk profiles in the same category. Finally, since the Accord predated meaningful movement toward financial convergence and the current fashion for financial regulatory systems with single regulators, the Accord did not recognize non-bank forms of credit risk mitigation (the unintended consequence, of course, being the stimulation of massive cross-sectoral credit risk transfers for the purpose of regulatory arbitrage).

For residential mortgages, this resulted in a 50% risk weight, or 4% capital charge. The

Committee's risk weighting reflected relative risk between asset categories, not within them, and there appears to have been very little empirical analysis to determine whether this risk weighting was appropriate. Equally, there was no recognition that the quality of mortgage process management (from underwriting to loan administration to default management) had any effect on the relative risk of the mortgage lending operations to the bank. Instead, the Committee's decision rested on simple common sense – residential mortgage lending was secured by mortgage collateral; lending practice required substantial borrower equity; lending activity was predominantly local, not national or international, so there was little risk of competitive inequality or contagion; and governments frequently intervened in property markets to soften market downturns³. As the English saying goes, the Committee assumed residential mortgage lending was "as safe as houses."

And the process for arriving at these standards reflected the tradition of bank supervision, not regulation, with an emphasis on a few simple rules and supervisory discretion filling in the rest⁴. There was no open consultative process or any effort to determine how the various parts of the financial system (bank, non-bank, insurer, capital markets investor) fit together, nor any recognition that

the Accord was likely to be adopted by policymakers for use beyond the original set of internationally active banks.

LTV AS A BUTTRESS TO UNIFORMITY

Formal Regulatory Use of LTV

On the residential mortgage front, some countries on the Committee (and others) took extra precautions that recognized relative risk within the residential mortgage asset category. These precautions used loan-to-value (LTV) ratios as an indicator of relative risk⁵.

Long before economists provided a theoretical construct for it, lending officers used LTV as a proxy for the "willingness to pay," with the assumption being that a person with a smaller equity investment in a property is more likely to default of his loan obligation than a person with a larger equity investment and some hope of recovering all or a portion of that investment. Economists routinely have confirmed LTV as an important explanatory variable in explaining default behavior⁶.

Indeed, the regulatory structure for residential mortgages in nearly every country represented on the Basel Committee employs LTV as an indicator of relative credit risk. Some countries, such as Germany, Luxembourg, the United States, Spain, Italy, and the Netherlands, use LTV as a means of establishing risk weights—mortgages above a certain LTV ratio (60% in Germany and Luxembourg, 75% in the Netherlands, 80% in Spain and Italy, and 90% in the United States) must have additional capital carried against them. In France, Switzerland, Germany, Spain, Luxembourg and Sweden, mortgage bond laws include specific LTV limits to manage the credit quality of bond issues. In Canada and Japan, the relative risk issue is handled differently. In Canada, all mortgages greater than 75% LTV must

have mortgage insurance, which recognizes and mitigates the additional risk; and in Japan, all mortgages greater than 70% LTV are required to have a "good guarantee."⁷ Likewise, in Sweden, mortgage banks have express LTV limits stated in their articles of association, which may be changed only with regulatory consent⁸. Even in markets like the United Kingdom, where LTV is used more informally by regulators as an indicator of relative risk, lenders effectively self-regulate through risk-based pricing—mortgage "best buys" require a substantial borrower downpayment, and low downpayment loans have higher interest rates or other special charges attached⁹.

Elsewhere in this issue, Achim Duebel contrasts the Anglo-Saxon approach of transferring credit risk on a high (generally greater than 80% on an original market value basis) LTV loan through the use of mortgage insurance with the continental European practice of synthetically splitting or using a junior loan to provide credit risk protection against the nonlinear increase of credit risk measured by the LTV ratio¹⁰. However the credit risk is managed, the underlying regulatory concern is clearly expressed: high LTV loans are riskier.

Rating Agency Use of LTV

Since one of the principal aims of Basel II lies in reducing incentives to keep "two sets of books" (one for economic capital, and another for regulatory capital), it is important to understand as well how private investors use LTV as an indicator of relative credit risk.

Although governmental statistical bureaus sometimes gather loan performance data regarding residential mortgage lending, the development of secondary mortgage markets of private investors has encouraged international rating agencies to gather loan performance information to assist themselves (as well as educate investors) in de-

veloping sophisticated mortgage risk models to assess the relative risk of loans pooled to form mortgage-related securities. While lending markets are not identical (indeed, sub-markets within countries may be dramatically different), rating agency default probability assumptions demonstrate a consistent pattern of relative risk by LTV even after one considers differences in underwriting procedures, foreclosure processes and fluctuations in property values.

Figure 1 shows the foreclosure frequencies assumed by one rating agency's mortgage risk models for a BBB-rated mortgage-backed security in six different countries¹¹. The expected foreclosure rate varies from country to country, but the increase in relative frequency between loans with LTVs between 85%–90% averages 1.48 times higher than the frequency on 75%–80% LTV loans, 1.88 times higher for 90%–95% LTVs, and 2.69 times higher for 98%–100% LTVs. Thus, rating agency data indicate that LTV is a powerful predictor of default probability.

In addition to default probability, LTV also provides a reliable indication of expected loss severity (i.e., loss given default). Figure 2 shows a rating agency's loss severity assumptions for the same six countries as those shown in Figure 1. Again, severity levels differ from country to country, but the increase in relative severity between loans with LTVs between 85%-90% averages 1.29 times higher than the loss severity on 75%-80% LTV loans, 1.41 times higher for 90%-95% LTVs, and 1.52 times higher for 98%-100% LTVs. Thus, rating agency data indicate that LTV is a powerful predictor of loss severity as well.

Multiplying default probability times loss severity generates expected loss levels. Analyzing expected losses yields even more emphatic support for the use of LTV as an indicator of relative risk. Figure 3 shows a rating agency's expected loss levels for the

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Figure 1. Rating Agency Default Probability Assumptions by LTV by Country for BBB Rating

LTV Ranges	DEFAULT PROBABILITIES						Six Country Averages Relative to 75.01-80%
	Australia	Germany	Holland	Spain	U.K.	U.S.	
<= 40	2.0%	2.0%	3.0%	3.0%	2.0%	1.2%	0.39
40.01-50	3.0%	3.0%	3.0%	3.0%	3.0%	1.8%	0.49
50.01-60	3.0%	3.0%	3.0%	4.0%	4.0%	2.5%	0.56
60.01-65	4.0%	3.0%	3.0%	4.0%	5.0%	3.0%	0.62
65.01-70	4.0%	4.0%	4.0%	4.0%	6.0%	3.7%	0.73
70.01-75	6.0%	4.0%	4.0%	5.0%	6.0%	4.6%	0.84
75.01-80	6.0%	5.0%	5.0%	6.0%	7.0%	6.0%	1.00
80.01-85	7.0%	6.0%	6.0%	7.0%	8.0%	8.1%	1.20
85.01-90	9.0%	7.0%	7.0%	8.0%	10.0%	11.0%	1.48
90.01-95	11.0%	9.0%	8.0%	10.0%	13.0%	15.1%	1.88
95.01-98	14.0%	10.0%	9.0%	12.0%	16.0%	20.6%	2.31
98.01-100	16.0%	12.0%	10.0%	16.0%	18.0%	23.2%	2.69

Figure 2. Rating Agency Loss Severity Assumptions by LTV by Country for BBB Rating

LTV Ranges	LOSS SEVERITY						Six Country Average Relative to 75.01-80%
	Australia	Germany	Holland	Spain	U.K.	U.S.	
<= 40	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00
40.01-50	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%	0.00
50.01-60	7.5%	3.9%	10.1%	12.7%	0.00%	0.00%	0.15
60.01-65	16.5%	12.7%	18.0%	22.3%	8.54%	6.54%	0.40
65.01-70	24.3%	20.2%	24.8%	30.6%	16.29%	14.29%	0.63
70.01-75	31.0%	26.8%	30.6%	37.7%	23.00%	21.00%	0.83
75.01-80	36.9%	32.5%	35.8%	44.0%	28.88%	26.88%	1.00
80.01-85	42.1%	37.5%	40.3%	49.5%	34.06%	32.06%	1.15
85.01-90	46.7%	42.0%	44.4%	54.4%	38.67%	36.67%	1.29
90.01-95	50.8%	46.0%	48.0%	58.8%	42.79%	40.79%	1.41
95.01-98	52.3%	47.5%	49.3%	60.5%	44.32%	42.32%	1.46
98.01-100	54.5%	49.6%	51.2%	62.8%	46.50%	44.50%	1.52

same six countries shown in Figures 1 and 2. Expected loss levels differ from country to country, but the increase in expected loss between loans with LTVs between 85%-90% averages 1.92 times higher than the expected loss on 75%-80% LTV loans, 2.67 times higher for 90%-95% LTVs, and 4.14 times higher for 98%-100% LTVs. Thus, rating agency data indicate that LTV is a very powerful predictor of expected loss levels, a central concern under both the standardized and IRB approaches.

Extremely robust loan-level data available in the United States confirm the importance of LTV as a credit risk indicator even during periods of outstanding macroeconomic performance¹². Figure 4, which includes recent four-year average data on fixed-rate loans by LTV, shows increasing rates of expected one-year losses by LTV regardless of the age of the loan¹³. Indeed, even given some of the lowest unemployment rates in U.S. history as well as significant house price appreciation, expected losses for 81%-90% LTV loans still range between three to four times higher than 76%-80% LTV loans.

Finally, taking only the members of the Basel Committee, it is worth noting that LTV figures prominently as a determinant of a borrower's "willingness to pay" in every country's residential mortgage loan default model¹⁴. Thus, anticipating the Committee's efforts to update the Accord, especially with the stated intention of introducing greater risk sensitivity into capital regulation, one would have expected some suggested use of LTV as a means of better aligning economic risk and regulatory capital.

BASEL II AND THE PROPOSED TREATMENT OF RESIDENTIAL MORTGAGE CREDIT RISK

The Standardized Approach

Surprisingly, the Committee chose not to introduce the concept of relative risk in its

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Figure 3. Rating Agency Expected Losses by LTV by Country for BBB Ratings

LTV Ranges	EXPECTED LOSSES (DEFAULT FREQUENCY X LOSS SEVERITY)						Six Country Average Relative to 75.01-80%
	Australia	Germany	Holland	Spain	U.K.	U.S.	
<= 40	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00
40.01-50	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00
50.01-60	0.23%	0.12%	0.30%	0.51%	0.00%	0.00%	0.09
60.01-65	0.66%	0.38%	0.54%	0.89%	0.43%	0.20%	0.25
65.01-70	0.97%	0.81%	0.99%	1.22%	0.98%	0.53%	0.46
70.01-75	1.86%	1.07%	1.23%	1.89%	1.38%	0.97%	0.70
75.01-80	2.21%	1.62%	1.79%	2.64%	2.02%	1.61%	1.00
80.01-85	2.94%	2.25%	2.42%	3.47%	2.72%	2.60%	1.39
85.01-90	4.20%	2.94%	3.11%	4.36%	3.87%	4.03%	1.92
90.01-95	5.59%	4.14%	3.84%	5.88%	5.56%	6.16%	2.67
95.01-98	7.32%	4.75%	4.44%	7.26%	7.09%	8.72%	3.40
98.01-100	8.72%	5.95%	5.12%	10.05%	8.37%	10.31%	4.142

Figure 4. U.S. Recent Four-Year Average Expected Losses by LTV and Age of Loan

LTV Range Years	< 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-6 Years	6-7 Years
71-75	0.01%	0.02%	0.05%	0.07%	0.07%	0.06%	0.08%
76-80	0.01%	0.03%	0.06%	0.09%	0.10%	0.09%	0.11%
81-90	0.04%	0.13%	0.24%	0.33%	0.33%	0.30%	0.34%
91-95	0.05%	0.22%	0.44%	0.65%	0.67%	0.63%	0.61%
96-105	0.09%	0.42%	0.86%	1.25%	1.36%	1.16%	1.22%
<i>Ratio</i>							
81-90/76-80	4.07	3.80	3.69	3.53	3.39	3.39	2.94

treatment of residential mortgages under the standardized approach. Instead, the Committee proposed no change in its uniform 50% risk weighting. While the Committee did

not explain its reasoning in any detail, the absence of change appears to have been the product of two factors: first, the already lower risk weighting for mortgages, which

militated against a further reduction, and second, the need to preserve some incentive for banks to adopt the advanced internal ratings-based approach¹⁵. Since mortgages comprise one of the largest asset categories on bank balance sheets, narrowing the incentive initially would have reduced the scope for the eventual compromises that were bound to occur in order for a revised Accord to be accepted.

Banks severely criticized the Committee's stance on residential mortgages, and numerous commentators argued for more favorable risk treatment¹⁶. Although the sentiments were genuine, the comments reflected the asymmetry of any comment process. No regulated institution or its trade association is going to argue for higher capital charges! And the range of commentary provided a snapshot of which mortgage markets were (and are) performing well – the United States, Canada, Australia and Western Europe. Asian commentators outside Australia were largely absent¹⁷.

Few commentators argued for higher capital charges for mortgages. After all, the benign credit environment has not generated empirical support for higher charges, and a lower overall risk weighting preserves regulatory arbitrage opportunities for mortgage lenders – riskier borrowers willing to pay a higher price to obtain credit would be treated similarly to less risky borrowers. Thus, market shifts toward higher LTV borrowing, extension of credit to “sub-prime” borrowers formerly left to non-bank lenders, and the proliferation of mortgage product variety (e.g., investment-linked mortgages, interest-only mortgages, flexible repayment mortgages etc.) could be accommodated without compromising the simplicity of the standardized approach.

One group of commentators argued against the uniform risk weighting approach, how-

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ever¹⁸. Mortgage insurers, which provide risk protection against the additional risks associated with high LTV lending, noted that retaining the uniform risk weighting approach appeared inconsistent with the Committee's efforts to introduce additional risk sensitivity into the Accord, even under the standardized approach. Long familiar with the importance of LTV as an indicator of relative credit risk, mortgage insurers suggested using LTV to establish an additional high LTV risk category with a 100% risk weight—a practice consistent with regulatory best practices in the United States, Canada, and Australia, all markets characterized by regulatory encouragement of mortgage insurance as a means of managing high LTV risk exposure¹⁹.

One company (GE Capital Mortgage Corporation) synthesized the "high and low" risk weighting proposals around the LTV concept, proposing lower capital charges for low LTV mortgages and higher capital charges for higher LTV mortgages (20% risk weight for loans less than 60% LTV, 50% for loans between 60-80% LTV, and 100% risk weight for loans greater than 80% LTV)²⁰. In effect, the proposal mirrored the proposed treatment for corporate credits under the standardized approach, in which rating agency ratings indicate relative credit risk.

This suggested approach attempted to address the empirical insufficiency of having only one risk weight without creating the undesirable "cliff effects" of having two risk weights (i.e., the marginal capital applied to an 81% LTV loan compared to an 80% one, for example), which is a side effect of the standardized approach²¹. These cliff effects could be avoided by allowing the use of credit risk mitigation such as mortgage insurance to reduce the risk, and the risk weighting—in a more empirically realistic way than the Committee's proposed treatment of guarantees²².

The IRB Approach

The Committee may be forgiven for the hasty updating of the standardized approach, since its principal focus of attention was development of the IRB approach. The conceptual underpinning is elegant and powerful: banks would use their own data to help determine the appropriate amount of capital that needed to be held against the credit risk exposure. Further, incentives would be provided to ensure that banks progress toward customized capital standards, with supplementary insights provided by regulators and investors²³. However, from the perspective of a non-bank participant to the Basel II process, there have been three material shortcomings.

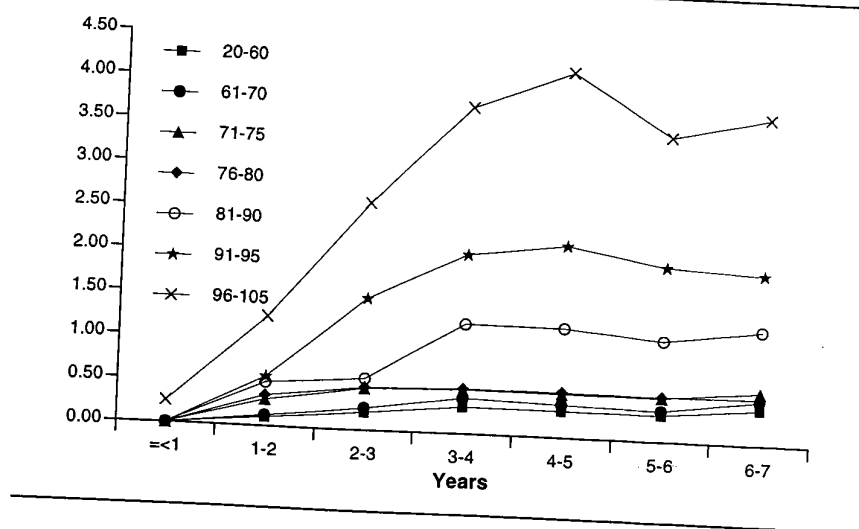
Unsuitability of a One-Year Time Horizon

First, although the Committee has done a commendable job creating a relatively open consultative process, conceptually the process still draws heavily from a bank

credit risk management vocabulary—especially the use of one-year time periods for loss estimates. Since mortgages tend to be long-dated assets, a longer time period may be more suitable for deriving loss estimates. Figure 5 demonstrates the unsuitability of using a one-year time period²⁴.

While differences by LTV appear almost immediately, peak loss years are not experienced until three to seven years after origination. Thus, at a minimum, a time period that reflects the loss pattern characteristic of residential mortgage loans might be more appropriate—which is why rating agencies, mortgage insurers and others experienced in mortgage credit risk modeling generally use a ten-year period to capture loss experience. To keep the risk weighting system simple and to account for the fact that new loans will eventually generate a particular rate of default, the highest average annual 90-plus-day delinquency rate for any given loan age for each individual LTV category over the ten-year period might be used. Otherwise, loan seasoning will cause capital levels to

Figure 5. Comparative Impact of LTV Ratios on Loss Estimates



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fluctuate and give a misleading impression of relative risk at any point of time in a bank's mortgage portfolio.

Beyond ordinary loan seasoning, the one-year time period either might miss a period of economic downturn or exaggerate its effects. Certainly, shorter time periods sometimes can fail to capture the long-term performance of a loan portfolio, as Figure 6 demonstrates, which compares differences between maximum four- and ten-year delinquency rates.

Although the results by LTV are noteworthy (with delinquencies over 3.6 times higher in some categories), the average ratio of ten-year delinquencies is 2.21 times higher than the four-year comparison, which underlines the importance of capturing general macro-economic cycles as an aspect of mortgage credit risk modeling. Simply put, the four-year averages reflect a period of robust economic growth, while the ten-year period includes at least one episode of economic non-growth or contraction.

Data Sufficiency

Second, the Committee's work still draws heavily on bank data, which is a hangover from the days when banks and insurers were separate "financial villages" with little consistent interaction. Reliance on bank data alone can have material effects on economic capital levels. For example, one recent study undertaken by a U.S. Federal Reserve Board economist generated strikingly low economic capital requirements based on a bank data set. When the study was replicated using high LTV mortgage data representing 85% of the U.S. mortgage insurance industry, materially higher economic capital requirements resulted²⁵.

The bank data also did not capture newly developed high LTV lending products (97% and 100% loans), which have exponentially

Figure 6. Delinquency Rates

Four-Year U.S. Average 90-Day-Plus Delinquency Rates (1997-2000)								
LTV Range	<= 1 year	1-2 years	2-3 years	3-4 years	4-5 years	5-6 years	6-7 years	Maximum Rates
20-60	0.04%	0.09%	0.14%	0.19%	0.18%	0.17%	0.22%	0.22%
61-70	0.05%	0.15%	0.28%	0.41%	0.41%	0.37%	0.51%	0.51%
71-75	0.07%	0.26%	0.54%	0.77%	0.78%	0.69%	0.89%	0.89%
76-80	0.06%	0.22%	0.43%	0.61%	0.65%	0.58%	0.76%	0.76%
81-90	0.14%	0.49%	0.91%	1.24%	1.26%	1.13%	1.28%	1.28%
91-95	0.17%	0.70%	1.42%	2.10%	2.17%	2.04%	1.97%	2.17%
96-105	0.29%	1.28%	2.62%	3.83%	4.17%	3.54%	3.74%	4.17%

Ten-Year U.S. Average 90-Day-Plus Delinquency Rates (1991-2000)								
LTV Range	<= 1 year	1-2 years	2-3 years	3-4 years	4-5 years	5-6 years	6-7 years	Maximum Rates
20-60	0.03%	0.10%	0.24%	0.47%	0.68%	0.80%	0.81%	0.81%
61-70	0.04%	0.20%	0.56%	1.07%	1.50%	1.67%	1.58%	1.67%
71-75	0.07%	0.36%	0.91%	1.59%	2.08%	2.23%	2.16%	2.23%
76-80	0.05%	0.27%	0.69%	1.25%	1.69%	1.75%	1.68%	1.75%
81-90	0.11%	0.46%	1.00%	1.68%	2.21%	2.33%	2.31%	2.33%
91-95	0.14%	0.63%	1.18%	1.76%	2.04%	2.24%	2.30%	2.30%
96-105	0.27%	1.55%	2.46%	3.13%	3.32%	3.20%	3.45%	3.45%

Ratio of Ten-Year Rates to Four-Year Rates		
LTV Range	Maximum Rates	
20-60	3.63	
61-70	3.28	
71-75	2.52	
76-80	2.32	
81-90	1.81	
91-95	1.06	
96-105	0.83	
Average Ratio on Equally Weighted LTV Groups		2.21

riskier performance histories but represent an increasingly larger portion of new purchase money originations. Beyond simple data, the study had some methodological shortcomings, including an implicit assumption of risk-based pricing for mortgages that did not reflect market practice, which also materially affects economic capital calculations.

This comparison occurred after considerable effort and expense initiated by the mortgage insurance industry, after bank regulators expressed surprise that such a rich data set existed—and after bank regulators circulated the original paper within the relevant Basel II subcommittees for extensive discussion. Similar high LTV data exist in Canada, Australia and the United Kingdom outside banks, but no companion studies have been undertaken, so it is worth wondering whether banks and bank regulators have drawn from the full range of descriptive statistics available. And, since the Committee has used bank data to undertake its calibration exercise between the IRB and standardized approaches, it is unclear whether the entire risk weighting effort for residential mortgages reflects best available data and techniques. Consequently, the failure to include non-bank specialists like mortgage insurers within the consultative circle of discussion might have resulted in erroneously low estimations of capital needed to support residential mortgage lending.

Indeed, this unintentional failure to reach outside bank circles for data and expertise compounds the other data issue facing the Committee—namely, the absence of “cycle” data that reflects a reasonably full range of macroeconomic possibilities. Residential mortgage credit losses have been on a downward trend since the early 1990s in most countries represented on the Committee, so probability of default (PD) and loss given default (LGD) data do not represent any significant economic stress, even on a

regional basis. When these data are used as a basis for setting, they give a misleading picture of the relative risk of residential mortgage lending, especially high LTV lending. Thus, an artificial economic stress component should be considered by the Committee for inclusion in the IRB approach. That is, in addition to using the highest annual default rate by any loan age for that group, that result might be at least doubled until the bank’s measurement period includes an actual stressed economic environment. Alternatively, if a “stress-like” capital standard is desired, for simplicity purposes the same highest annual default rates by group could be multiplied by a factor of three.

The “w” Factor—Moved, Not Eliminated

Third, the Committee’s work still reserves doubts about the role of non-banks within the Basel II framework, which is largely a product of unfamiliarity. This regulatory lack of knowledge occasionally deepens into open suspicion of non-bank entities, particularly those proposing to offer credit risk mitigation to banks. Originally, the Committee proposed use of a haircut factor denoted “w,” which would have distinguished between counter-party benefits provided by banks and securities firms and those provided by insurers.

As proposed, the credit risk mitigation provided by banks and securities firms would have carried with it a zero “w” factor, similar to the treatment of credit risk mitigation provided by a sovereign, while a 15% “w” would have been included for “corporate” guarantees or insurance from parties rated A or better. The rationale for this difference was that banks and securities firms are extensively regulated and supervised, in contrast to corporate guarantors and (apparently) insurers.

Although the Committee dropped an explicit reference to a “w” factor after much noisy

protest, the “w” factor was not eliminated, but merely committed to supervisory discretion. For this reason, the original concerns voiced are worth repeating briefly. The “w” factor embeds a preference for keeping economic risk within the bank regulatory system (since, *ceteris paribus*, a bank will enjoy a 15% advantage). A reading of financial history reveals very few, if any, instances of a banking collapse instigated by the failure of a guarantee or insurance issued by a non-bank or non-securities firm—but many instances of where one bank’s difficulties have caused wider effects within the banking system.

In addition, exempting securities firms from the “w” factor might export credit risk to an untested source of credit risk mitigation. The capital markets are a seemingly endless source of innovation and creativity, but also quick judgment and overreaction when available liquidity dries up due to economic or political uncertainty. In that respect, ordinary mortgage insurance can be contrasted favorably with emerging mortgage credit derivatives. More than self-interest causes one to press the comparison again. Mortgage insurance is a “flow” product used on a loan level basis, and priced for the long cycle (10 years) of gain and loss²⁶. Consequently, this pricing approach ensures that a steady flow of credit enhancement capacity and funds to pay claims are available to support mortgage finance in all market cycles—including periods of significant default and financial loss—which provides ballast when the capital market waters become choppy.

In contrast, the mortgage credit derivatives that we have seen to date are “transaction” specific products that appear as opportunistic as the capital markets that they represent. In good economic times, the pricing for such derivatives might be better than insurance alternatives, but this pricing (and even availability) might be worse in deteriorating economic conditions. Thus, in terms of

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macroeconomic public policy, it is unclear to us why the Committee would want to encourage a pro-cyclical form of credit risk mitigation at the expense of more durable alternatives.

Finally, the relative advantage conferred by "w" might cause a bank to choose a financially weaker counter-party (e.g., a lesser rated bank or securities firm could outbid a more highly rated insurer as a guarantor), which again raises the question of why the Committee would create incentives to diminish prudent use of credit risk mitigation.

Indeed, our understanding of global trends in financial services regulation suggests that distinctions based on different regulators or regulatory frameworks might be outmoded by the time home country regulators fully implement the Accord's successor. Denmark, Norway and Sweden long have integrated financial supervision of banks, investment firms and insurance companies. The United Kingdom has concentrated responsibility for "financial services regulation" under the aegis of a single regulator, the Financial Services Authority. Likewise, banks and insurance companies in Canada are supervised by the Office of the Superintendent of Financial Institutions (Canada), and similar efforts are afoot in Australia and other countries. So, in the U.K., Canada and Australia, for example, where GE offers mortgage guarantee insurance coverage to banks, we could find ourselves at a "w" disadvantage even when supervised by the same regulator!

Single regulators aside, it is theoretically possible to assess the strengths of various regulatory regimes on a comparative basis, but we think that ratings provided by rating agencies might provide a more consistent and easily implemented means of assessing counter-party risk. The Standardized Approach already incorporates the use of ratings, and financial strength ratings provide the "financial Esperanto" necessary to avoid

arbitrary judgments. After all, at its most basic, Basel II seeks to establish or suggest prudent levels of regulatory capital, and the Committee's recognition of credit risk mitigation allows regulatory capital to be reduced in proportion to the ability of the credit risk mitigation provider to substitute for that regulatory capital. Under those circumstances, an assessment based on a counter-party's individual attributes seems preferable to a more general judgment regarding the relative rigor of a regulatory system. In the United States, for example, we hold capital as an AAA-rated mortgage insurer that is substantially greater than that required by our regulator (or any U.S. bank or securities regulator, for that matter), and the same situation applies in other markets²⁷.

CURRENT STATUS AND PREDICTIONS

The Committee's efforts on residential mortgage credit risk and credit risk mitigation has been equivocal. On July 10, 2002, the Committee announced adoption of a reduced risk weighting for residential mortgages under the standardized approach. Mortgages will be reduced from 50% to 40%, or from a 4% capital charge to a 3.2% one. The Committee left unclear the question of which mortgages fell within this category, and whether political or empirical considerations were the key variable. In terms of political considerations, the Committee included its mortgage risk weighting decision with other announcements concerning SME lending designed to make Basel II more palatable to banks and certain members of the Committee. In terms of empirical considerations, the results from Quantitative Impact Study (QIS) 2.5 (which tested the effects of continuing tinkering with risk weighting curves and other matters) suggested sharply lower risk weights for retail lending portfolios, so the Committee simply might have been trying to recalibrate the standardized approach to the lower capital charges being generated by the IRB approach.

ESTABLISHING A HIGHER RISK LOAN CATEGORY BASED ON LTV

Either way, the Committee has unfinished business regarding the treatment of higher LTV loans. Faced with considerable evidence of LTV as a consistent indicator of relative credit risk and its widespread use in regulatory and capital markets practice, there has been some suggestion that the Committee felt sympathetic toward the argument that not all mortgages are alike, but struggled with how to implement this insight on a practical basis. This difficulty has two parts—first, deciding how to acknowledge relative risk, and second, then determining how prescriptive to be about that relative risk. Within the standardized approach, one approach worth considering is the existing regulatory practice of establishing a "higher risk" category of residential mortgage loans based on a LTV measure. Since there are several ways of applying the concept of LTV—market-based (the predominant approach, also favored by the rating agencies), or ones which apply a value deflator or discount to market value to "normalize" property values over time (the Dutch and German approaches)—the Committee perhaps thought it impolitic to favor one approach over another.

However, this difficulty is not insuperable—any more than the absence of globally accepted definitions for delinquency and default. Instead, the Committee could include some reference to "higher risk" mortgages in its implementing instructions, and transfer the debate over "which LTV" to the quieter confines of supervisory discretion (the so-called Pillar 2 of the revised Accord). Although the Committee would have missed a chance to make the standardized approach more risk-sensitive in a way that acknowledges its standard-setting role globally (adopted by more than 100 countries), a half-measure is better than none.

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Adopting a "high risk" loan category based on LTV for the standardized approach helps the Committee politically as well. The Committee restricted its scope for maneuver considerably by reducing the general risk weighting to 40%, since the Committee also wishes to preserve the incentive for banks to progress toward the advanced IRB approach. The need to preserve an incentive means lower capital charges than 3.2% will be required for all residential mortgage loans, or banks with riskier loan portfolios would have no incentive to adopt the advanced IRB approach. Since high LTV loans are likely to generate economic capital charges higher than 3.2% on a consistent basis, a higher risk loan category preserves relative risk and the incentive to move toward an IRB approach.

Further, unless a higher risk loan category is introduced, the Committee will have reintroduced an incentive for banks using the standardized approach to maximize returns on equity by concentrating on higher priced (i.e., riskier) loans. If one assumes that banks using the standardized approach will be smaller, have a less diversified asset base, be more geographically concentrated in their lending activity, and employ less sophisticated underwriting and risk management tools and techniques, the Committee unintentionally might be encouraging an increase in systemic risk—a "mix risk" that might belie the term "as safe as houses."

FINE-TUNING THE IRB APPROACH

The Committee's July 10 announcement suggested the difficulty of setting capital standards based on data that does not reflect a complete economic cycle. The Committee hinted at higher capital charges than the QIS process probably would generate based on recent data. If the unadjusted QIS results are used as a basis for calibrating capital charges for the standardized approach (as they are), they will give a mis-

leading picture of the relative risk of residential mortgage lending, especially high LTV lending.

Unless the Committee adds a stress-like component to the capital charge for residential mortgages, the risks will be understated. These lower capital charges raise the prospect of enhancing, not reducing, risk within the financial system, due to the inherent cyclical nature of mortgage lending. There are two distinct risks. First, for IRB banks, there is the procyclicality risk—as volumes mount and the cycle turns, regulators find out whether the larger banks have assessed their risks accurately—at the same time similar judgments are being made in different parts of the banks' operations. This end is undesirable and unnecessary.

PRESERVING A ROLE FOR CREDIT RISK MITIGATION LIKE MORTGAGE INSURANCE

Second, and finally, incentives to transfer mortgage credit risk will be reduced unless relative risk is acknowledged. The mortgage insurers' interest in this is frankly commercial, but also grounded in a specialist's understanding of high LTV credit risk and in the historical experience of having paid billions of dollars in losses that otherwise would have been absorbed by individual banks, deposit guarantee funds or the banking system in general. And, from the perspective of a risk specialist, the Committee should acknowledge the beneficial use of credit risk mitigation in managing high LTV mortgage credit risk through reduction of LGD associated with residential mortgage credit. This observation is driven by more than material self-interest²⁸—with mortgage insurers, for example, supervisors have an ally that, among other things:

- Acts as an early warning system on the riskiest portion of the residential mortgage loan book.

- Maintains the integrity of the property valuation process, since misstated property values affect LTV ratios.
- Reduces operational risk associated with mortgage lending through process focus and error tracking and measurement.
- Stimulates demand for high quality credit reporting to extend credit more appropriately on an objective basis.
- Introduces new methods of delinquency management, since mortgage insurers have first-loss exposure.
- Transfers credit risk outside the banking system to highly solvent, well-regulated third parties, distributing losses more widely if an economic downturn occurs.

Thus, given the existence of relative credit risk within residential mortgage lending, and the need to acknowledge this risk within the developing Basel II framework, it is hoped that the Committee would specifically encourage the use of credit risk mitigation that provides material risk reduction within the banking system and increases overall financial stability rather than forms of mitigation oriented toward simple capital arbitrage²⁹. With that goal in mind, the ability of a specialist mortgage insurer to provide better management of expected losses, reduction of operational risk through application of rigorous process management, or absorption of unexpected losses through the export of bank credit risk to a highly experienced and well-capitalized company outside the banking system is a difficult combination to beat.

NOTES

¹ GE is the current head of the Mortgage Insurance Trade Association (MITA), established in 2001 as the trade association to introduce private mortgage insurance and to

advance its uses within pan-European discussions on mortgage-related credit.

² See www.bis.org for text of the Accord and subsequent revision efforts. Another excellent collection of Basel-related materials may be found at www.erisk.com.

³ The European Mortgage Federation's contributions are a good example of this approach (see www.hypo.org), which is oriented heavily toward portfolio lenders (particularly those issuing mortgage bonds), whether large or small. Unfortunately, the Basel II emphasis on creating incentives for lenders to graduate toward the data-intensive IRB approach and the increasing sophistication of data analysis (and product development resulting from better and finer cuts of data) has exposed problems in the "all mortgage lending is safe" argument.

⁴ See, e.g., Skeel, "Testing Time for the Old Lady (Bank of England)," *Management Today* (Nov. 1, 1991) (contrasting traditional approach of prudential supervision with more rule-bound, due process approach).

⁵ LTV is used throughout this article as the simple expression of the amount borrowed in relation to the value of the property at time of purchase. LTVs may be adjusted dynamically to reflect increases and decreases in property value, as well as the amortization of the loan. For risk management purposes, the original LTV is used to establish a probability of default (and ultimately a loss given default), which may be adjusted as the loan "seasons" over time.

⁶ See, e.g., Deng, Quigley and Van Order, *Mortgage Terminations, Heterogeneity and the Exercise of Mortgage Options*, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=156828. Professor Quercia will release an updated literature review on residential mortgage default shortly. See Quercia and Stegman, "Residential Mortgage

Default: A Review of Literature," *Journal of Housing Research* 3(2) 1992.

⁷ In Japan, the Government Housing Loan Corporation also has a maximum purchase limit of 80% LTV.

⁸ The Swedish LTV limits generally are between 75% and 80%. In this respect, the Swedish approach is similar to the "charter restrictions" placed on Fannie Mae and Freddie Mac that require the use of credit enhancement (generally mortgage insurance) for the proposed purchase of any loan exceeding 80% LTV.

⁹ See, e.g., <http://mortgages.charcolonline.co.uk/bestbuys/bestbuytype.asp?bestbuy-type=1&linkfrom=moneytelegraph> (showing minimum deposit requirements for "best buys").

¹⁰ Duebel also notes the continental European use of non-market, value-based valuation techniques such as "sustainable mortgageable" value, which in effect lowers the effective market value LTV, thus reducing the risk further.

¹¹ BBB-rated securities are considered investment grade securities and are given a 100% risk weighting in the standardized approach guidelines. This assumption is held constant in Figures 1–3, and only one rating agency's data are used—Fitch IBCA, a major European rating agency. I have limited presentation of data from other sources in order to keep this article brief, but similar patterns can be observed in the data and models used by other rating agencies.

¹² The data are provided by Loan Performance, formerly the Mortgage Information Corporation of America (MIC), the preeminent source of loan-level mortgage data in the U.S., with a database that includes nearly 28 million loans. Among other things, MIC accumulates delinquency data for resi-

dential mortgage loans at various stages of delinquency by product types, LTV, age of loan, and other borrower and loan characteristics.

¹³ This Figure uses the Committee's definition of one-year defaults as equal to 90-day-plus delinquency rates, and also includes all elements of the Committee's definition of loss severity.

¹⁴ Residential mortgage loan default models and rating criteria are available for Canada, the U.S., France, Germany, Italy, Spain, Japan, the Netherlands, Sweden, Switzerland, and the United Kingdom. With Luxembourg, the use of a LTV limit as a credit risk mitigant in the *lettres du gage*, the Luxembourg mortgage bond, is noted.

¹⁵ The Basel II revisions propose two approaches—standardized and internal ratings-based—with the IRB approach further subdivided into the foundation and advanced. The approaches are intended to apply across the bank's entire lending activities, but mortgages do not have a "foundation" module. Lenders are assumed to be capable of moving from the standardized to advanced IRB approach, even in areas like high LTV lending, which may be a new market opportunity without rich data available.

¹⁶ See Ischenko and Samuels, "Time to Catch Up: Basel II—Modern Capital Rules for Modern Banks," Schroder Salomon Smith Barney Industry Report (Sept. 2001) (collecting bank commentary on mortgage risk weighting).

¹⁷ Asian economies are in a different point in the credit cycle, with relatively un- or underdeveloped residential mortgage markets. Following the collapse of the Japanese bubble economy and other Asian economies following the 1997 Russian debt crisis, the few comments submitted by Asian entities are interesting: in Japan, where house prices

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have declined more than 60% from their peak in some areas, more concern was expressed regarding the Committee's efforts to create a uniform definition of "default" than actual credit losses experienced. In Hong Kong, where house prices also have declined sharply, the Hong Kong Monetary Authority noted the low levels of write-offs for residential mortgages, but also sponsored a mortgage insurance program administered by the Hong Kong Mortgage Corporation, which will help protect HK against a negative equity problem affecting over 23% of all borrowers.

¹⁸ See, e.g., comments submitted by GE Capital Mortgage Corporation and the Mortgage Insurance Companies of America.

¹⁹ Roger Blood provided a survey of regulatory treatment of mortgage insurance, and the desirability of establishing an incentive for its use, in a prior issue. See "Mortgage Default Insurance: Credit Enhancement for Homeownership," *Housing Finance International*, September 2001.

²⁰ *Ibid.* (GE Capital Mortgage Corporation).

²¹ The IRB approach avoids cliff effects through a continuous function.

²² Under the standardized approach, the credit given for a guarantee to mitigate risk

is expressed in terms of the counterparty's credit rating and the percentage of the obligation guaranteed, so even a partial guarantee given by a highly rated counterparty may provide comparatively little value. In the case of residential mortgages, this treatment ignores the powerful combination of first loss protection provided by private mortgage insurance combined with the mortgage security, which reduces lender exposure to loss significantly. This risk reduction has been confirmed by the rating agencies, which require very little additional capital for 100% coverage versus partial coverage down to a level that covers asset value declines assumed under an "AAA" stress scenario.

²³ Basel II is organized in three "pillars" (credit and operational risks; supervisory discretion regarding risk management systems; and disclosure to investors).

²⁴ Figure 6 uses MIC data for U.S. "prudently underwritten" fixed-rate loans, and shows four-year (1997–2000) average default rates by LTV and age of loans. "Defaults" are loans greater than 90 days delinquent.

²⁵ See Calem and LaCour-Little, *Risk-Based Capital Requirements for Mortgage Loans* (Nov. 2001). Dr. Calem is in the process of revising the paper to reflect the mortgage insurers' data and methodological

suggestions. When the revision process is complete, the paper will be shared with members of the Basel Committee responsible for mortgage credit risk under the IRB approach.

²⁶ The losses can be substantial. U.S. mortgage insurers paid out more than US\$14 billion in claims in the last 20 years.

²⁷ Again, our suggestion is motivated by a desire to retain the Accord's simplicity and universality. Alternatives can be devised, particularly in countries where capital markets have not encouraged the spread of external ratings.

²⁸ Duebel's brief presentation of an option-theoretic model of default posits an increased LGD as LTV increases, which has been confirmed by the economic capital models of numerous lenders. Since mortgage insurance offers first loss default protection, it reduces LGD, the principal driver of economic capital.

²⁹ The Financial Services Authority in the U.K. has attempted to stimulate discussion on the topic of appropriate cross-sector risk transfer generally, but unfortunately has overlooked the role of private mortgage insurance in the residential mortgage finance market. See www.fsa.uk.uk/pubs/discussion/index-2002.html.