

Response to the Basel Committee's Consultative
Paper on a New Capital Accord

By

RMA – The Risk Management Association

May 31, 2001



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Basel Committee on Banking Supervision
Bank for International Settlements
CH-4002
Basel Switzerland

Dear Members of the Basel Committee:

RMA - The Risk Management Association (formerly known as Robert Morris Associates) fully supports reform of the 1988 Basel Capital Accord and is pleased to respond to the Consultative Document released by the Committee on January 16, 2001. This paper responds, in large part, to the treatment of credit risk. By separate letter, RMA's Securities Lending Committee has submitted comments focusing on the Credit Mitigation aspects of the proposed New Accord.

The RMA Capital Working Group expects to continue working with members of the Committee to ensure that the final outcome of the reform process achieves its stated goal. As noted by the Chairman of the Basel Committee, William J. McDonough, "the new framework is intended to align regulatory capital requirements more closely with underlying risk, and to provide banks and their supervisors with several options for the assessment of capital adequacy." Mr. McDonough further added that the new Accord should provide for a flexible capital adequacy framework that has the capacity to adapt to changes in the financial system. RMA believes that the framework as outlined in the January 16, 2001 Consultative Document must change considerably to achieve these stated goals.

The banking industry has made enormous progress over the past decade toward quantifying risk exposures to absolute capital levels. And, indeed, the process by which banks assign "economic capital" on an enterprise-wide basis continues to evolve. Progress in this regard is not without significant cost, however, as risk modeling systems are expensive to develop as well as to maintain. It is for this reason that flexibility is essential for the new Accord. A regulatory capital framework that is overly rigid could discourage further development of best practice procedures at institutions with advanced risk management systems. Regulatory standards must be set to evolve over time as practices within the industry evolve.

RMA believes that it is possible to develop a capital framework that allows for continued industry innovation in best practice risk management procedures. We appreciate greatly the work the Committee has undertaken to move reform of the 1988 Accord forward and hope that the comments in this paper will be of assistance.

Sincerely,

A handwritten signature in black ink that reads "Maurice H. Hartigan, II". The signature is written in a cursive style with a large initial "M".

Maurice H. Hartigan, II
President and CEO
RMA - The Risk Management Association

Enclosure Attached

Executive Summary

The January 16, 2001 Consultative Document represents a milestone in the regulation of bank capital in that, for the first time, the concept of Economic Capital is embodied within specific proposals for establishing minimum capital requirements. In placing an emphasis on economic capital, the New Accord proposals appropriately highlight a desire to align *relative* regulatory capital allocations with those in use by Advanced Practice banks in the U.S. and abroad.

However, the New Accord also states as an objective keeping the overall regulatory capital levels (for the Standardized approach) at about the same amount as under the Old Accord (with minor reductions, as appropriate, for the IRB approaches). We believe that calibrating the Foundation and Advanced approaches in any fashion to the old Accord runs the risk of injecting significant arbitrariness into the New Accord, therefore subjecting it to the same difficulties as its predecessor. Only during an initial evaluation period, of no more than a few years, should the old Accord's capital requirements act as a floor for calibrating the New Accord. Rather, the main objective of the New Accord should be to bring regulatory capital minimums into the closest possible alignment with best-practice risk-measurement.

Measured against that objective, the New Accords start off on the right foot in the IRB approaches, by basing regulatory credit risk capital requirements on the economic capital (EC) output of a regulatory loss-distribution model built to reflect common industry advanced-practices. Moreover, the inputs into the regulatory model are those used by advanced-practice banks – probability of default (PD), loss-given-default (LGD), exposure-at-default (EAD), and maturity. But from that point forward, the new proposals depart, often in significant manner, from best-practices.

- The regulatory model measures economic capital at a specific confidence interval over a specific horizon. The chosen confidence interval, moreover, is appropriately set at a level (99.5% for a one-year horizon) consistent with asserting that regulated banks should operate at least at a BBB-minus level of “soundness” – an implicit objective with which we agree. But then, using the old

Accord's definition of Total Capital, such regulatory capital is set at a level that is significantly in excess of the economic capital estimated by the regulator's own model -- for the Benchmark Asset, the Total Capital requirement is approximately twice the median estimate provided by the RMA Capital Working Group.

Furthermore, all other assets are related to the Benchmark Asset in terms of each asset's [EC + EL] rather than the asset's economic capital. As a result of these regulatory choices, all the *relative* capital allocations are distorted from those of advanced-practice banks and from the EC estimates of the regulatory model itself. In general, loans to high PD obligors or loans with high LGD facilities receive capital allocations significantly higher than measured by best-practices (with implications for pricing of loans to lower-rated corporations).

- While the IRB approaches take into account maturities beyond one year, they provide *no* capital relief for very short-term facilities with maturities measured in weeks or months. As a result, the regulatory capital allocations for such facilities are often several times those measured by advanced practice risk measurement techniques.
- Moreover, preliminary results from the Quantitative Impact Survey (QIS) indicate that, while Total capital requirements under the Advanced approach tend to be lower absolutely than under the old Accord (for corporate loans, but not for retail products), those regulatory capital requirements still are significantly in excess of best-practice estimates of economic capital (because they are in excess of the regulators' own estimates of EC).
- For Retail products, the regulatory model for IRB banks produces Total Capital allocations that are both absolutely higher than the old Accord (for banks with credit card portfolios and/or sub-prime mortgage portfolios) and extremely distorted in terms of *relative* capital allocations. In general, high PD retail assets (such as sub-prime mortgages) or high LGD assets (such as cards) are assigned much higher capital ratios than those generated by advanced-practice EC techniques.
- Laudably, the Advanced IRB approach moves toward a goal of having Advanced banks use their own internal Exposure calculations – the same as used within

internal EC estimation procedures, pricing models, etc. However, such *internal* exposure estimates often have been much more conservative than under the old Accord (in part because banks, needing to engage in regulatory capital arbitrage to escape the arbitrary capital ratios of the old Accord, often structured transactions for which the regulatory exposure definitions were more liberal than indicated by economic analysis). Now that the new Accord is moving to exposure measurements based on proper economic analysis, it is doubly important that the regulatory capital ratios also move toward best-practices.

These concerns can be fairly easily treated by recalibrating the New Accord's "capital calculators" to more rigorously match the economic capital techniques of the advanced-practice institutions. For example, we understand that Basel economists are now working on new versions of the Retail model for the IRB approaches that would differentiate the economic capital outputs according to product, rather than have a one-size-fits-all Retail model. Also, assumptions embedded within the regulatory retail models could be changed to reflect industry views on such matters as default correlations for retail products (which we believe are very different than for corporate products).

More fundamental problems with the New Accord, however, go beyond the calibration of the corporate and retail capital calculators. First, there is the matter of the definitions of Tier1 Capital and Total Capital, and the arbitrary 2-to-1 relationship between Total Capital and Tier 1 Capital. In our view, the New Accord should be based on a (somewhat revised) Tier 1 definition. The subordinated debt included within the Total Capital definition, while useful for Pillar 3 purposes, does nothing to reduce the probability of insolvency. Only general reserves and equity can absorb losses that might lead to the bank's failure. In this regard, many advanced-practice banks treat tangible equity plus the general portion of reserves as being the balance sheet concepts "closest" to economic capital. This view is consistent with a mark-to-model (MTM) concept of economic capital. That is, EC should be compared with beginning-of-horizon MTM equity. For this comparison, banks might assume that loans have a market value that is close to their carrying values (i.e., close to their values before deducting general

reserves). Therefore, for economic capital purposes, the general reserve is just another form of equity.

Whether or not the Tier 1 definition is revised, we believe it is inappropriate to have Total Capital be set arbitrarily at twice the Tier 1 requirement. Suppose, for example, that the regulatory model was calibrated to set Tier 1 capital properly at the 99.5% confidence level (effectively setting the maximum insolvency probability for banks at 0.5% or roughly a BBB-minus soundness standard). If Total Capital were then set at twice this amount of capital, the effective confidence interval would be driven past the 99.9x% level. At this amount of capital, the probability of a bank failing is so low that the implied soundness level is the equivalent of AAA – a standard which, we believe, is too high for “minimum” bank capital rules. Conversely, setting the Total Capital requirement so that the effective confidence interval is 99.5% (or even 99.7%), then setting Tier 1 capital at one-half this amount, would result in the Tier 1 requirements being the equivalent of using *less than* a 99.5% confidence interval. The insolvency probability associated with Tier 1 requirements would then be too high (soundness would be too low) in our view. This conclusion is based on observing actual loss probability distributions measured for commercial loan portfolios at advanced-practice banks – see Graph 1 on p. 21 of the text.

The arbitrary doubling of the Tier 1 requirement to reach the Total Capital requirement also disadvantages banks with safe portfolios – those with “thin-tailed” loss distributions. That is, doubling Tier 1 capital for such banks may drive the effective confidence interval to 99.9x% while, for the bank with the fat-tailed distribution, doubling Tier 1 capital may drive the effective confidence interval to only, say, 99.8%. The RMA Capital Working Group has an alternative suggestion. We propose that Tier 1 Capital be calibrated at one particular confidence interval (say, 99.5%), while Total Capital is calibrated to a separate, higher confidence interval (say, 99.7%). That way, all banks will be subjected to the same confidence interval (the same soundness standard) rather than to the same “multiple” between Tier 1 and Total. See the discussion beginning on p. 20 of the text.

Still another fundamental problem with the old Accord is that, at least in the U.S., there are “well-capitalized” standards that effectively apply a multiple to the minimum

Basel standards. In the U.S., the well-capitalized Tier 1 standard is 6% instead of 4%, while the well-capitalized Total Capital standard is 10% instead of 8%. In the new proposals, under Pillar 2, it is suggested that all G-10 countries institute “well-capitalized” standards and see to it that banks adhere to them. While we don’t disagree with having well-capitalized standards, we wish to point out that such standards become the new, *de facto* minimums – as a practical matter a bank will have to meet “well-capitalized” standards or be ostracized by the market.

A significant problem arises when “well-capitalized” standards are constructed by applying an arbitrary multiple to rational, best-practices-based minimum regulatory capital requirements. No matter how well crafted the minimum requirements, the well-capitalized requirements then become arbitrary. For example, if the Tier 1 requirements are crafted to a 99.5% confidence interval (0.5% insolvency probability standard), multiplying these requirements by 1.5 (as is done in the U.S.) may push the resulting confidence interval past 99.92% (see Graph 1 again). Similarly, if Total Capital requirements are set to correspond to a 99.7% confidence interval, multiplying by 1.25 may push the “well-capitalized” standard to an effective 99.92% coverage level. In either case, the “well-capitalized” standard may leave little or no room for banks to operate above the new minimum. And in the worst case, the well-capitalized standard may force regulatory capital arbitrage – a result that regulators as well as the industry are trying to avoid. Indeed, if the generally conservative internal definitions of Exposure are used (as they would be in the Advanced approach), the “well-capitalized” standards, if imposed via arbitrary multiples, could drive banks from certain business lines, or out of the regulated sector entirely.

In addition to the foregoing “big picture” items, our response covers other issues as well.

- Incentives for banks to move from Standardized to Foundation to Advanced seem, in some instances, to be misaligned. Generally, absolute capital requirements for Foundation exceed those of the Standardized approach, at least for those RMA banks that have thus far submitted their QIS results to us. This may be due to a process in which each of the assumptions chosen by regulators under the Foundation approach is quite conservative. Cumulatively, these

assumptions appear to have a significant effect on regulatory capital minimums. For example, an LGD of 50% and a maturity of 3 years generally exceed typical-practice conditions. In another example, the credit conversion factors for unused committed lines are higher under the Foundation approach than under the Standardized approach.

- For securitizations, the treatment of first-dollar loss positions under the IRB approaches is more stringent than under the Standardized approach and at odds with best-practice. We believe that capital requirements for securitized assets should never exceed the capital requirements for holding those assets on the balance sheet. To do so creates a disincentive to securitize for legitimate business reasons – an exact opposite disincentive than exists for some types of asset under the old Accord. The estimated loss distribution for the underlying assets – whether estimated by the bank itself or by application of the regulatory model – should be the guiding factor behind setting securitization capital requirements.
- When choosing confidence intervals, risk-weights associated with PD estimates, etc., Basel should be guided by the knowledge that significant diversification benefits exist across asset-sub-portfolios and across risk types. These benefits are more than sufficient, we believe, to offset concerns over model error or imprecision in parameter estimation. Such benefits may even be sufficient to justify a downward adjustment in the effective confidence intervals used by the various regulatory models. As for parameter estimation, the internal processes used by the most-advanced-practice banks are nowhere near perfect, but they are clearly better, we believe, than arbitrary assumptions employed at various points in the Standardized and Foundation approaches.
- The RMA Capital Group provides no discussion on operating risk and risk mitigation issues, but rather supports the views appearing in the responses of others (Sections VIII and IX beginning on p. 51). As for Supervisory procedures under Pillar 2, we refer Basel to the attached RMA paper on the subject produced in December 2000.
- Concerning Pillar 3, the RMA Group is concerned that the volume and complexity of the disclosure recommendations and requirements outlined in the

Consultative Paper could prove misleading to market investors. We understand that an interim paper will be forthcoming this summer and will comment in greater detail at that time.

I. Introduction and Overview.

This paper represents RMA's response to the Consultative Document on a New Basel Capital Accord, dated January 16, 2001. The RMA Capital Working Group¹ consists of advanced-practice banking institutions that have made considerable investments in measuring risk, pricing risk, allocating economic capital to risk, and managing such risks. This response pertains primarily, but not solely, to the allocation of capital against credit risk, along with RMA views on Pillar 2 (Supervision) and Pillar 3 (Market Discipline).²

To begin, RMA wishes to extend its appreciation to the Basel Committee for the considerable conceptual progress embedded within the consultative document. The document represents a milestone in the regulation of bank capital in that, for the first time, the concept of "economic capital" is embodied within specific proposals for establishing minimum regulatory capital requirements.

In an Overview of the New Accord, the consultative document enunciates several objectives, two of which we highlight here:

- The New Accord should improve the relative allocation of capital across risk positions, in order to more closely reflect differences in risk.
- With respect to the Standardized approach, "the Committee desires neither to produce a net increase or a net decrease – on average – in minimum regulatory capital, after accounting for operational risk." With respect to the IRB approaches, "the Committee's ultimate goals are to ensure that the overall level of regulatory capital generated is sufficient to address the underlying credit risks and is such that it provides capital incentives relative to the standardized approach (e.g., for the foundation IRB approach in the aggregate, a reduction in risk-weighted assets of 2% to 3%)."

¹ The RMA Capital Working Group consists of the following institutions: Bank of America, Bank of Montreal, Bank of New York, Bank One, Citigroup, First Union, FleetBoston Financial, J.P.Morgan Chase, KeyCorp, PNC Financial Services Group, Provident Financial, Royal Bank of Canada, Union Bank of California, and Wells Fargo. Individual institutions within the Group may be submitting their own responses in which views may differ from the views expressed in this paper. Appendix 2 provides a list of the staff members within each institution contributing to this Response.

The RMA Group enthusiastically agrees with the first of these goals – no matter the overall level of minimum capital requirements, inappropriate calibrations in the *relative* requirements across risk positions can cause the bank to engage in expensive Regulatory Capital Arbitrage (or worse, structure credit portfolios that misallocate real resources). With respect to the absolute level of capital requirements, the RMA Group respectfully disagrees with the Committee’s objective. The old Accord, as is well understood by now, was arbitrary in nature and, thus, the absolute amount of the current minimum capital requirements cannot be aligned with best-practice measurements of true economic risk. Especially for the advanced-practice banks that would be subject to the IRB approaches, any targeted level of absolute capital requirements (such as having the Foundation approach produce a 2-3% reduction from the old Accord) is inappropriate, except perhaps during a phase-in period in which the new Accord is being evaluated. If we are to replace the old Accord with regulatory minimum capital allocations based on best-practice risk measurements, there should be no restrictions tying us to the past arbitrariness. We would prefer that the main Basel objective be expressed in terms of reaching “the closest possible alignment with best-practice risk measurement” rather than maintaining the status quo.

The RMA Group believes that the proposals within the consultative document make progress toward meeting these goals, as we have restated them, especially with regard to dealing with many of the conceptual issues surrounding the setting of regulatory minimum capital requirements. In certain critical aspects, however, significant additional work would be needed, in our view, to achieve approximate equality between best-practice estimation of economic capital and the regulatory capital requirements. In these instances, conceptual difficulties with the proposals, we believe, stem primarily from the proposed new Accord’s departure, at certain junctures, from the practice of economic capital estimation. That is, while paying nominal attention to advanced-practice economic capital processes, the proposals ultimately set capital

² The reader is referred to the response prepared by The Institute for International Finance (IIF) for a discussion of operating risk capital. See “Report of the Working Group on Operational Risk,” May 2001.

requirements based on largely subjective or traditional views of risk measurement. As a result:

- All three formats proposed – the Standardized approach, the Foundation Internal-Ratings-Based (IRB) approach, and the Advanced IRB approach – continue to contain, like the current Accord, largely arbitrary capital requirements.
- *Relative* capital allocations under each of the three formats, although directionally improved over the current Accord, are in some instances not close to best-practice estimates produced by the risk measurement departments of the advanced banks. For example, the IRB approaches for corporate assets assign relative capital weights that are too high for high default probability assets and/or assets with high loss-given-defaults (relative to low PD and/or low LGD assets). Also, corporate loan facilities under one-year in maturity are *not* assigned lower capital ratios than one-year facilities, as theory would dictate. Thus, while the new proposals are, in many respects, better than the old “one-size-fits-all” standard, they are still likely to contribute to resource misallocations, including the need to engage in Regulatory Capital Arbitrage.
- *Absolute* capital requirements under the new proposals are, for some “cells” (PD – LGD combinations), too high, so long as Basel continues to make progress in migrating toward the use of advanced-practice estimates of Exposures. Under the old Accord, regulatory capital requirements often were higher than implied by advanced-practice estimates of economic capital. As a result, banks needed to engage in regulatory capital arbitrage – that is, find ways around the arbitrary requirements. If exposures are to be measured using internal methods, but capital ratios (risk-weights) are set above internal best-practice economic capital estimates, banks may be forced to hold uneconomically high capital levels.
- The consultative document proposals provide insufficient incentives for banks to improve their internal risk measurement capabilities so as to “graduate” from the Standardized approach to the Foundation IRB approach to the Advanced IRB approach. In some instances, the new proposals contain disincentives. For example, under the Standardized approach, undrawn but committed lines are assigned a 20% / 50% exposure conversion (for lines under-one-year / over one-

year in maturity), while under the Foundation IRB approach, such undrawn lines are assigned a 75% exposure conversion for lines of all maturities.

The RMA Group believes that the difficulties associated with the proposals can be rectified fairly easily if the Basel Committee rigorously and consistently applies advanced-practice economic capital measurement techniques. Indeed, each of the shortcomings of the new proposals generally can be traced to a choice *not* to apply such techniques as they are practiced within our largest, most advanced banks. In these institutions, the determination of capital adequacy follows well-established steps:

- A particular definition of “bank soundness” is employed. Generally, banks try to adhere to a AA/A soundness standard, which, expressed in terms of insolvency probability, means that banks try to hold enough capital to reduce to about 0.1% or less the probability that losses, over a one year horizon, will exceed capital. Put another way, once a loss distribution is estimated, capital should be sufficient to cover a confidence interval of about 99.9% or so. Some banks use slightly more than a 99.9% confidence interval, some use slightly less.
- Economic capital is defined as the difference between losses estimated at the 99.x% confidence level and mean losses (or expected losses or EL). Capital is thought of as covering this difference (often termed “unexpected losses”) while expected losses are covered by premiums embedded within asset yields. RAROC models, for example, are set up so that asset yields cover all net expenses, plus expected losses, plus a market return to allocated Economic Capital.
- Economic capital is estimated on a bank-wide basis, taking into consideration the diversification benefits associated with having many sub-portfolios and measuring several different types of risk for each of those sub-portfolios. That is, economic capital on a bank-wide basis is less than the simple sum of economic capital for credit risk for each individual sub-portfolio plus economic capital for operating risk, etc. Generally, the cross-sub-portfolio and cross-risk-type diversification benefits are measured as being on the order of 20% or more – i.e., enterprise wide economic capital is on the order of 80% or less of the capital

- obtained by simple addition of capital for each type of risk for each business line measured independently.
- Once a reasonable, well-vetted estimate of Economic Capital on a bank-wide basis is obtained, the advanced-practice bank makes an attempt to “translate” this amount into an appropriate balance-sheet level of capital. In doing so, the banks generally recognize that economic capital is not typically measured using GAAP measures of loss or of capital but rather mark-to-market or mark-to-model notions of loss and equity. For this reason, many advanced practice banks do not simply equate Economic Capital with, say, tangible balance sheet equity (see discussion below). That is, in practice, the regulatory definitions of capital (Tier 1 and Total Capital) do not easily comport with economic notions of capital.
 - Various forms of Regulatory Capital Arbitrage are used to help maintain arbitrary regulatory capital ratios – by managing the denominators of the ratios (Risk Weighted Assets). Moreover, the targeted regulatory capital ratios generally are well above the Basel minimums, because of the existence of “well-capitalized” standards (which, in the U.S., for example, require banks to maintain at least 10% Total capital to risk-weighted-assets). That is, if a bank, after deciding on the absolute level of economic capital it needs to maintain its targeted soundness level, finds that its Total Capital ratio is not above 10%, it must find more ways to engage in regulatory capital arbitrage. This arbitrage is costly, but does not change at all the probability of insolvency of the bank.³

The new Accord proposals begin at the right place in this sequence of steps – by using, within the IRB approaches, a regulatory economic capital model fashioned after those in widespread use by market participants. The Basel regulatory model (for corporates under the IRB approaches) even uses a 99.5% confidence level – roughly equivalent to a BBB-minus soundness standard -- so as to keep the implied minimum soundness level less than

³ Note further that many of our advanced-practice banks find that regulatory capital arbitrage cannot be “complete” because systematic use of such arbitrage might be prohibitively expensive. Thus, it is critically important to “get right” not only the *relative* regulatory capital allocations, but also the absolute requirements. In this regard, many of our members believe that the absolute level of the regulatory minimums are now significantly higher than implied by best-practice risk measurements.

that typically desired by advanced-practice institutions. Thus, the choice of a 99.5% confidence level is consistent with the long-held regulatory view that capital requirements should be minimums, not targets (i.e., all of our members use, for internal purposes, confidence intervals that are *higher than 99.5%*). But from this point forward, the new proposals, in some respects, abandon the concept of economic capital and revert to some of the same perspectives on capital that plagued the old Accord. The RMA Group believes that Basel must address these issues – issues pertaining to the basic differences between traditional ways of viewing regulatory capital versus the concepts embedded in Economic Capital practice – before further progress can be made in developing a new Accord that fully meets the objectives laid out by Basel.

- A particular soundness standard or set of soundness standards must be explicitly stated by Basel and employed in consistent fashion when crafting each of the elements of the new Accord. We believe that “insolvency probability of no more than x% over a one-year horizon” represents such a standard, because of the standard’s widespread acceptance among market participants. Furthermore, the 0.5% insolvency probability standard incorporated within the base regulatory economic capital model is a reasonable platform from which to build further refinements to the new Accord.
- The Total Capital versus Tier 1 Capital standards. We see at least two types of potential difficulty with maintaining the current definition of Tier 1 capital and the current two-to-one relationship between Total Capital and Tier 1 capital:
 - a) Tier 1 capital (defined as tangible equity) is the regulatory definition of capital that is “closest” to the concept of economic capital used within our advanced practice banks – but there still are significant differences between Tier 1 and the exact manner in which many of our banks translate estimated economic capital into balance sheet concepts of capital (see discussion below). In brief, many institutions view tangible equity *plus* the general or unallocated portion of the loan loss allowance as being the balance sheet items that most closely approximate “economic capital.”

b) If Tier 1 capital, appropriately defined, were set to be approximately equal to best-practice banks' own internal estimates of economic capital, then Total Capital, set at twice Tier 1 capital, would result in regulatory capital requirements that tended to be, for many PD-LGD cells, too high. Thus, many institutions still would be forced to engage in Regulatory Capital Arbitrage. To provide a concrete example, note that, for the "reference" corporate asset as defined within the IRB approach (3-year term, 0.70% PD, and 50% LGD), last year's survey of RMA Capital Working Group banks shows that the economic capital attribution (as a percent of exposure) is approximately 4%. Thus, for that asset, within a typical large bank's portfolio, the Total Capital regulatory requirement is approximately twice the economic capital our banks attribute to that asset. Of course, for banks that estimate economic capital above the median, this result will not be as onerous. Note too that some banks may estimate higher economic capital *ratios* than their peers, but systematically estimate lower exposures (EADs) than their peers. See Tables 1-3 below for a comparison of the RMA 2000 survey of economic capital ratios (at the 99.5% confidence interval) for corporate loans versus the Tier 1 and Total Capital requirements under the IRB approach.

Note also that, if the Tier 1 regulatory capital requirement, correctly estimated to cover 99.5% of the estimated credit loss distribution, were doubled to reach the Total Capital requirement, this implies a "coverage" of the loss distribution in excess of 99.9%. In other words, if the Tier 1 capital standard is set so as to assure banks meet a minimum soundness standard of BBB-minus, then the Total Capital standard (which represents a *minimum* standard) would be the equivalent of AA or better. Clearly, our banks could not compete under such a *minimum* capital standard in the absence of regulatory capital arbitrage. Conversely, if Basel were to set the Total Capital requirement so that it covers 99.5% of the (correctly) estimated loss

distribution, then one-half that amount of capital for the Tier 1 standard arguably would be too low. The discussion in Section II discusses this problem in detail and offers a specific solution.

- Maturity adjustments. The Advanced IRB proposal wisely includes a maturity adjustment to take into consideration the fact that longer-termed corporate facilities entail greater risk, all things equal. That is, a greater-than-one-year asset might not default over the one-year horizon, but it might lose market value during the year due to a “downgrade” (a lowered rating status), or due to a widening in credit spreads for its particular “grade” or for all grades. The longer the duration of the asset the greater the decline in market value (just as longer bonds suffer a greater market value decline than short bonds when bond rates rise).

Unfortunately, the Advanced IRB approach does not account for facility maturities that are less than one year. A 3-month facility, all things equal, exhibits lower risk, and should be assigned lower capital, than a 1-year facility. These very short-term facilities often involve a near-continual credit review process and are of great significance to some our largest, most advanced-practice institutions.

Additionally, Basel should critically consider how to define “well-capitalized” versus “adequately capitalized” in terms of the appropriate capital thresholds for meeting these standards. The consultative document suggests that all G-10 countries institute specific “well-capitalized” capital standards that exceed the Basel minimum standards. We agree with this concept – banks should clearly be “well-capitalized” both for business reasons and to avoid the potential resource misallocations that may be associated with “moral hazard” (the existence of a government safety net). However, it is also clear that, as a practical matter, any “well-capitalized” standard becomes the new, *de facto* minimum. No well-managed bank can hope to compete effectively unless it is deemed by the market to be “well-capitalized.” The problem we foresee is that many G-10 countries will follow the lead of the U.S. and impose well-capitalized standards that are simple multiples of the Basel minimum capital ratios. As we have discussed above, increasing a well-thought-out basic capital standard (one derived using a best practice

estimate of economic capital) by an arbitrary multiple, results in an arbitrary standard – one that may well result in the bank having to hold more capital than would be implied by a AAA+ soundness standard. Such a requirement, absent the ability to engage in regulatory capital arbitrage, would make regulated banks uncompetitive.

For example, in the U.S., the “well-capitalized” standard for Tier 1 capital is the Basel minimum times 1.5 (6% instead of 4%), while the “well-capitalized” standard for Total Capital is 10% instead of 8%. As shown in Graph 1 below (in Section II), if the Tier 1 minimum Basel standard were set appropriately to reduce insolvency probability to 0.5% over a one-year horizon (BBB-minus soundness standard), the U.S. Total Capital “well-capitalized” standard (which is 2.5 times this amount) would represent the equivalent of greater than a triple-A-plus soundness standard – a standard that could not be supported in the long run. In Section VIII below, the RMA Group offers a specific proposal for establishing “well-capitalized” standards under an IRB approach that would not employ simple multiples and thus would avoid overstating such standards (which leads inevitably to the need for more capital arbitrage).

The structure of this paper is as follows. Section II leads off with a discussion of the Advanced IRB approach, including implications of the regulatory economic capital model, the setting of Tier 1 and Total Capital requirements, maturity adjustments, and other details. We believe that achieving a best-practice solution to the Advanced IRB approach is crucial to structuring the other formats – the Foundation IRB approach and the Standardized approach – and therefore the bulk of our discussion is centered on the Advanced approach. In Section II we offer specific suggestions for dealing with some of the shortcomings of the proposals as they now stand. Sections III and IV follow with a discussion of the Foundation and Standardized approaches. Section V discusses the proposed treatment of Securitization, which brings into focus how the theory and practice of estimating Economic Capital can help to resolve issues over the appropriate treatment of various securitization tranches and synthetic securitizations. Section VI deals with the subject of “well-capitalized” standards, and in this section we offer a specific proposal to avoid the pitfalls of applying simple multiples to the minimum Basel standards. Section VII deals with supervisory standards (Pillar 2), while Sections VIII and IX touch briefly on capital for operational risk and risk mitigation issues, respectively. Section X

concludes with a brief discussion of Market Discipline (Pillar 3). Appendix 1 discusses the implications of the Quantitative Impact Survey as it relates to the banks in the RMA Group.

II. The Advanced IRB Approach.

A. Introductory Remarks. The Advanced (as well as the Foundation) approach is, in essence, a “regulatory model” approach in which capital charges are based on the economic capital output of a credit risk model developed by Basel staff. Under the approach, banks must estimate, via internal methods, several inputs into the regulatory model – probability of default over a one-year horizon (PD), loss-given-default (LGD), exposure-at-default (EAD), and maturity. Basel envisions that these inputs will be estimated within segments of the portfolio. For example, for the corporate portfolio, Basel recommends that the average weighted PD of a particular grade would be estimated, rather than the PD of each individual asset. Similarly, LGD estimates might vary according to grade and according to the facility characteristics, as might the estimate of EAD.

While the consultative document does not specifically say so, discussions with supervisory personnel suggest that an Advanced practice bank may be given permission to estimate PDs by individual obligor rather than by rating grade, if that is easier for the bank. For example, some advanced-practice institutions base their PD estimates *for capital purposes* directly on a commercial scoring model or on an equity-based procedure (e.g., KMV’s CreditMonitor™), without regard to internal ratings. The obligor-specific PDs are thought of as an alternative way of assessing an obligor’s riskiness – the internal ratings and the separately generated PDs together are used within asset management decisions as a kind of “belt and suspenders” approach. For purposes of calculating economic capital, however, the bank might use the obligor-specific PD, without regard to ratings, within the portfolio credit risk model. These institutions could meet the letter of the consultative document by using their PD-estimation process on each obligor within a grade, then computing the average-weighted PD for the grade. However, for some of these banks, it may prove easier (and possibly more accurate) to compute regulatory minimum capital requirements at the individual asset level.⁴

⁴ In any event, the concerns expressed within the consultative document (paragraph 67, p. 15, IRB Approach document) with regard to ratings-based PD approaches versus obligor-based PD approaches would not apply to many large, advanced practice banks. That is, a) the average PD for a grade, as discussed above, is not always used within internal models (many banks use the obligor-specific PD); b)

We raise this issue by way of introducing the notion that the specific rules for describing appropriate internal approaches to estimating PDs (as well as the other inputs to the “regulatory model”) should be broad enough to encompass a wide range of advanced-practices. Because of this wide range of practice, and the fact that many of our advanced-practice banks use more than one method to “triangulate” to estimates of risk-characteristics, we believe that strictly codified approaches, embodied within the capital regulations themselves, are a less attractive alternative than treating the internal estimation procedures under Pillar 2 (supervision). Such codification stands the risk of choking off innovation. That is, the codification reduces the chance that we will have different risk-measurement teams at different institutions experimenting with new processes. Rather than impose a sameness of practice on our risk measurement procedures, diversity of practice should be viewed as a healthy indicator of a continuing evolution in best-practices.

Moreover, the process for accrediting a bank to use the Advanced approach (or the Foundation approach for that matter) will necessarily be a complex process, which will differ across supervisory regimes. In some countries, for example, a higher percentage of banks might use scoring or equity-based processes for estimating individual obligor PDs and/or the banks in these countries might use these obligor-specific PDs, rather than ratings-based PDs, within their internal economic capital models. Since no widely acceptable evidence exists to show that ratings-based economic capital models are better than (or worse than) individual-obligor-PD-based models, it might be best to preserve great latitude in the accreditation process and, within that process, great latitude in the allowable methods for arriving at the inputs into the regulatory capital model. For these reasons, we prefer to view the new Advanced approach as an Advanced “risk-characteristic-based” approach rather than literally as an “internal-ratings-based” approach.

The construction of the underlying regulatory economic capital model should be applauded for providing the foundation for a best-practice method for assigning capital.

the ability to estimate an average PD is not necessarily greater than that for a specific obligor (e.g. many banks use a scoring approach or an equity-based method which the bank may believe has stronger predictive power); and c) the issue of overlapping bank/regulatory PD ranges does not come into play in the new IRB approaches, because a *continuous* PD is plugged into the regulatory capital calculator.

The choice of such an approach highlights our view that there is theoretically not that much difference between a regulatory model approach and a full, internal models approach. In the later case, the bank provides the assumptions regarding asset-value correlations, while in the former the regulator provides such assumptions. The regulatory model itself is thoroughly rooted within the range of best-practices. Granted, asset-value correlations are the most difficult input parameter to estimate and the diversity of opinion over proper methods is the widest in this arena. Basel has, in our view, taken an appropriate stand by relying initially on its own model, with its own assumption regarding correlation. We do wish to point out, however, that, by its nature, any regulatory model can stifle innovation. We therefore ask Basel to begin planning for an eventual internal models approach, perhaps by entering into a dialogue on needed research in the arena of correlation estimation. We believe that, especially given the long lead times associated with implementing any new version of the Accord, work on an internal models approach could and should proceed in parallel with work on introduction of the regulatory model approach.

B. The Advanced IRB Approach for Corporates. The RMA Group believes that the proposed Advanced IRB approach is based on sound fundamentals.

- The most important inputs into any reasonable model for estimating a credit loss distribution (and therefore economic capital) are PD, LGD, EAD, and maturity.
- Corporate, sovereign, and bank obligors should all be treated alike insofar as they exhibit the same risk characteristics. That is, within the confines of the regulatory model, a loan facility to a bank, with a given PD, LGD, EAD, and maturity, should have the same capital allocation as a similar facility to a corporation (within a particular bank's portfolio). Of course, in actual economic capital practice, still another risk-characteristic is important in determining the capital allocation – the estimated obligor asset-return correlation with the other loans in the portfolio. These correlations may differ depending on whether the obligor is a bank or a non-financial corporation.
- For an Advanced bank that has passed its country's accreditation standards, the specific risk-characteristics such as PD, LGD, EAD and maturity should be estimated using *internal* procedures, subject to continuing supervisory oversight.

It is important to note that one can think of the actual capital allocation as being the product of the regulatory capital ratio (e.g. the risk-weight times 8%) multiplied by the Exposure (EAD). This is, in fact, how banks themselves compute absolute economic capital -- by assigning an economic capital ratio to a facility and then multiplying this ratio by the estimated exposure associated with the facility (and aggregating these economic capital requirements for the credit portfolio as a whole).⁵ The new Accord attempts to improve both of these critical measurements – the regulatory capital ratio and the regulatory exposure. In the case of the latter, the Advanced approach generally takes the position that the best estimate of exposure is the bank’s own estimate (again, subject to continual supervisory oversight). We agree. However, it is the case that, for many types of credit product, the old Accord induced banks to structure positions so that the regulatory treatment of exposure was much more liberal than the bank’s internal, economics-driven estimate of exposure. For example, under the old Accord, unused but committed lines with less than one year maturity were assigned a zero exposure for regulatory purposes (and thus a zero capital allocation). Internally, banks estimate exposures for these undrawn lines at anywhere from, say, 20% to more than 90% -- but certainly not zero. When faced with regulatory capital ratios for certain kinds of credit products that were higher than internal economic capital ratios, a natural response was for banks to structure many commercial lending facilities as under-one-year facilities – so that the regulatory capital requirement against the unused portion of the line would be substantially less than the internally calculated economic capital. This form of regulatory capital arbitrage served a socially useful purpose in circumventing regulatory capital rules that, in the absence of such arbitrage, would have had significant resource misallocation effects.⁶

If the new Accord moves fully in the direction of using best-practice internal estimates of exposures – and we agree that it should – it follows that the Accord should also move fully in the direction of using best-practice estimates of economic capital

⁵ Of course, some banks estimate a distribution around expected exposure at default.

⁶ See, for example, Chairman Greenspan’s remarks on the beneficial aspects of capital arbitrage, "The Role of Capital in Optimal Banking Supervision and Regulation," Remarks by Alan Greenspan before the Conference on Capital Regulation in the 21st Century, Federal Reserve Bank of New York, 02/26/98.

ratios against which these exposures should be multiplied. If the exposures are measured correctly, but the Tier 1 and/or Total capital requirements (expressed as capital ratios for given PD, LGD, and maturity “cells”) are higher than best-practice estimates, even for portions of the portfolio, the need for regulatory capital arbitrage will still exist. Such arbitrage is costly, however, and we would prefer not to have to incur those costs.

With respect to the calibration of the regulatory risk-weights – which affect both the absolute and relative minimum capital requirements -- the proposed capital treatment under the Advanced approach (for the commercial portfolio) has some serious, although by no means fatal, deficiencies. To fully appreciate these difficulties, the procedures by which the capital ratios for corporates were derived under the Advanced approach are reviewed below. This description flows from the text of the consultative document as well as detailed discussions with U.S. regulatory agency personnel regarding the process.

- Basel economists first developed a credit risk measurement model (a model that estimates a credit loss probability density function) using methods in widespread use among the advanced-practice banks.
- The staff developed a closed form solution to the model that would relate economic capital as a percentage of EAD (at the 99.5% confidence level) to the important risk-characteristic inputs (PD, LGD, maturity).
- Basel chose a “reference asset” (Benchmark Asset) that was deemed to be representative of a commercial loan portfolio in the sense of approximating the average weighted risk characteristics of a typical portfolio. The reference asset was set as one with a PD of 0.7%, an LGD of 50% and a maturity of 3 years. The total capital requirement against this asset was set, arbitrarily, at 8 percent of exposure. Table 3 below indicates that, for the reference asset, the median economic capital computation among the RMA banks (at the 99.5% confidence level) is about one-half of the 8 percent Total Capital charge (one must interpolate due to the specific PD ranges for which the RMA banks reported internally computed economic capital).
- The modeling staff was instructed to set the Total Capital requirement for all other assets (those with risk characteristics that differed from the reference asset) in relation to the asset’s economic capital (EC) flowing from the regulatory model

plus its expected loss (EL). Note that basing the relative capital requirement on EC + EL, rather than on EC, is a major departure from the internal procedures at many advanced practice banks, where relative internal capital allocations are based strictly on an asset's EC.⁷

Effectively, the Total Capital requirement for the Benchmark Asset was set at approximately 1.5 - 1.6 times the sum of EC plus EL flowing from the regulatory economic capital model. This multiple then became effectively embedded within the Total Capital requirements for all other assets besides the Reference Asset. Thus, the absolute amount by which the regulatory Total capital requirement (as a ratio) exceeds internally estimated EC increases as EC increases. Moreover, the calibration process penalizes assets with high EL (such as assets with a high LGD and/or a high PD) because a) the calibration rests on the sum of EC plus EL, not on EC alone, and b) the 1.5 to 1.6 multiplier is assessed against EL as well as EC.

What does “Economic Capital” mean as a balance sheet concept? A further difficulty has to do with the way in which Basel chose to “translate” EC into balance sheet concepts such as “Total Capital” versus the way in which many advanced-practice banks conduct this exercise. For these banks, economic capital is thought of as “covering” unexpected losses on the credit portfolio, while the yields embedded in performing assets are thought of as “covering” expected losses. Put another way, a mark-to-market model of the credit loss distribution generates an estimate of economic capital that should be compared with actual mark-to-market equity at the bank at the beginning of the horizon over which the credit loss distribution is estimated. Balance sheet capital is too low if estimated EC is above this estimated mark-to-market equity. Rather than conduct a detailed estimate of what is “mark-to-market” equity on the balance sheet, the bank may simply assume that all assets and liabilities on the balance sheet are worth approximately their carrying values. In particular, performing loans are assumed to be

⁷ Apparently, Basel chose to set relative capital requirements based on EC plus EL because the chosen definition of capital (Total Capital) includes components, such as qualifying subordinated debt, that are not consistent with the theory of economic capital. Thus, Total Capital was thought to be “closer to” EC plus EL than it is to EC alone. Below we discuss how this view resulted in significant anomalies regarding the relative capital requirements.

worth their carrying values, rather than their carrying values less the unallocated portion of the loss reserve. Troubled assets, conversely, are assumed to be worth their carrying values net of any specific reserves attributed to these assets. Therefore, when translating EC into balance sheet capital, the bank would check to see if tangible equity plus the general portion of the loan loss reserve equaled or exceeded estimated economic capital. For the bank, the general reserve is just another form of equity (for internal capital adequacy purposes, not GAAP purposes), because losses at the expected level are already covered by the spreads embedded in performing assets. This particular view stands in contrast to the oft-stated regulatory view that “capital covers unexpected losses while the loss reserve covers expected losses.”⁸

Note that, under the theory of economic capital, the soundness definition is “insolvency probability” – capital is too low if the probability of losses exceeding that capital over the specified horizon is too high. In this view of the world, there is no room in the definition of capital for balance sheet items that cannot absorb losses and prevent the bank from failing. Subordinated debt in particular does not help to meet the soundness standard – a dollar of sub-debt substituted for a dollar of other liabilities, while keeping total assets the same, does not change the probability of insolvency. Thus, many advanced-practice banks are likely to treat the Tier 1 definition of capital as being closest to economic capital, if Tier 1 were defined to include the general reserve.⁹

To demonstrate how the calibration of regulatory capital for various assets can be influenced by capital definitions, note that *if* (for a particular bank) the general reserve were set equal to expected losses, and Tier 1 regulatory capital were defined as only tangible equity, the theory of economic capital would call for a comparison of Tier 1

⁸ The view held by many practitioners – that, for capital purposes, the general reserve is a form of equity -- is echoed in a recent Federal Reserve paper by David Jones, “Calibration of IRB Capital Charges Under Alternative Capital Definitions,” mimeograph, draft dated March 6, 2001. Jones goes on to say, however, that some assets should not be treated as having market values close to their carrying values, because they may have been “downgraded” since origination (so-called “fallen angels”). We agree, but wish to point out that some corporate loans have risk-based pricing clauses that increase the yield when the loan is downgraded, thus preserving market value. Also, many retail loans may have market values that are well above their carrying values (see Section II on retail credits, below).

⁹ It is important to note that, by including the general reserve in the Tier 1 definition, a troubled bank cannot escape being bound by the regulatory capital rules simply by under-reserving. That is, the bank cannot maintain inadequate general reserves while having “adequate” tangible equity.

capital with economic capital *less* expected losses.¹⁰ This comparison is carried out in Tables 1 through 3 attached at the end of the paper. Each table looks at a particular maturity, one through 3 years. The tables show, for the RMA banks, the median economic capital calculation for an asset of a given PD range and a given LGD range for the specified maturity. The tables, which contain a massive amount of information, are summarized, to emphasis key points, within Table A in the text below.

Table A compares, for a particular LGD range and for each of 11 PD ranges, the median RMA economic capital ratio with Tier 1 and Total Capital ratios generated under the new Advanced IRB approach for corporates. As indicated above, the most appropriate comparison with Tier 1 is EC - EL. Total capital should be compared with EC. Total Capital requirements are, of course, twice the Tier 1 requirement and, as such, are uniformly above median EC, except in the very lowest PD range. Note that, at the PD range of 0.64% to 1.28% -- and in higher PD ranges -- Total Capital is on the order of twice the median EC estimate.

¹⁰ If Economic Capital should be compared with tangible equity plus the general reserve, then this equation can be written as $EC = \text{Equity} + \text{Reserve}$. The equation can then be rewritten as $\text{Equity} = EC - \text{Reserve}$. Tables 1 through 3 conduct this comparison assuming that the general reserve equals EL. Some banks, however, keep the general reserve at levels exceeding expected losses.

Table A
Median EC at RMA banks versus Advanced IRB capital (1-year duration)

EDF Range	LGD range = 30-40%	
0-0.04%	0.21%	Econ. Cap.
	0.20%	Econ. Cap. less EL
	0.10%	Adv. IRB Tier 1
	0.21%	Adv. IRB Total Cap.
0.04-0.08	0.41%	Econ. Cap.
	0.39%	Econ. Cap. less EL
	0.27%	Adv. IRB Tier 1
	0.54%	Adv. IRB Total Cap.
0.08-0.16	0.67%	Econ. Cap.
	0.63%	Econ. Cap. less EL
	0.48%	Adv. IRB Tier 1
	0.96%	Adv. IRB Total Cap.
0.16-0.32	1.15%	Econ. Cap.
	1.07%	Econ. Cap. less EL
	0.85%	Adv. IRB Tier 1
	1.70%	Adv. IRB Total Cap.
0.32-0.64	1.91%	Econ. Cap.
	1.74%	Econ. Cap. less EL
	1.48%	Adv. IRB Tier 1
	2.95%	Adv. IRB Total Cap.
0.64-1.28	2.55%	Econ. Cap.
	2.21%	Econ. Cap. less EL
	2.51%	Adv. IRB Tier 1
	5.02%	Adv. IRB Total Cap.
1.28-2.56	4.33%	Econ. Cap.
	3.66%	Econ. Cap. less EL
	4.16%	Adv. IRB Tier 1
	8.32%	Adv. IRB Total Cap.
2.56-5.12	5.92%	Econ. Cap.
	4.58%	Econ. Cap. less EL
	6.70%	Adv. IRB Tier 1
	13.40%	Adv. IRB Total Cap.
5.12-10.0	9.57%	Econ. Cap.
	6.92%	Econ. Cap. less EL
	10.27%	Adv. IRB Tier 1
	20.55%	Adv. IRB Total Cap.
>10.0	18.80%	Econ. Cap.
	15.30%	Econ. Cap. less EL
	12.10%	Adv. IRB Tier 1
	24.19%	Adv. IRB Total Cap.
default	35.96%	Econ. Cap.
	n.a.	Econ. Cap. less EL
	n.a.	Adv. IRB Tier 1
	n.a.	Adv. IRB Total Cap.

- 1) Median economic capital for RMA banks is the EC (at the 99.5% confidence interval for credit risk as a % of exposure for bullet loans of the indicated term. Since RMA believes that EC should be set equal to tangible equity plus the general loss reserve, Tier 1 capital under the Advanced IRB approach is compared with EC less EL (assuming that the general reserve is equal to EL).
- 2) In calculating the implied EL, the table uses the mid-point of the EDF range and the mid-point of the LGD range.

One can see from Table A, and especially in the complete set of tables 1 through 3 at the end of the text, that, as economic capital rises, the disparity between Total regulatory capital and economic capital rises. Thus, in higher PD cells, higher LGD cells, and in the longer maturities, Total Capital is very high relative to economic capital. However, Tier 1 capital is quite close to median economic capital and is quite often below [EC less EL].

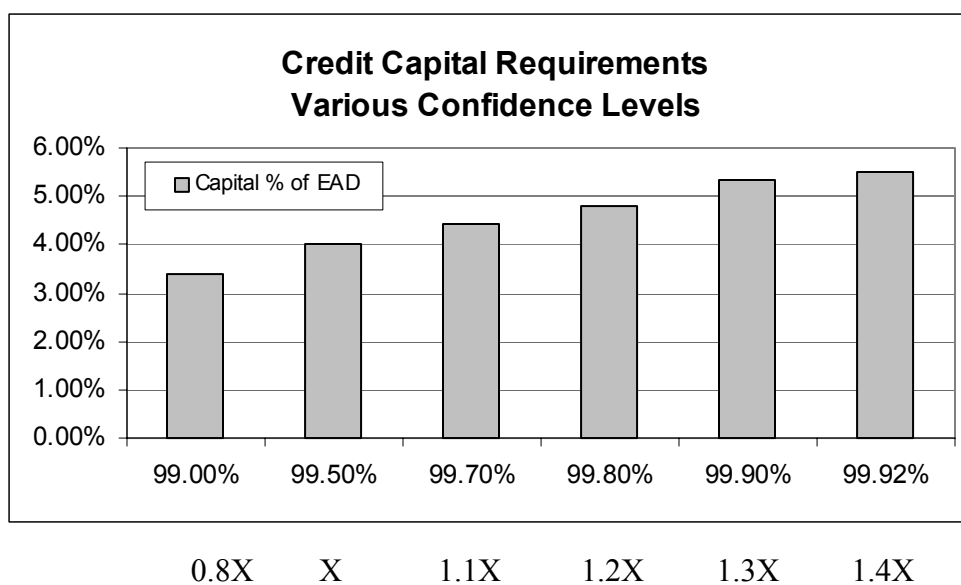
What does Total Capital mean and how might it be calibrated? The essential difficulties associated with “tying” the Advanced IRB approach to the Total Capital definition are twofold. First, it is difficult conceptually to compare economic capital with a balance sheet concept that includes subordinated debt as one of the capital elements. Second, the Total capital requirement is arbitrarily set at twice that of the Tier 1 requirement.

Analyze this second problem first – the doubling of Tier 1 capital requirements. Suppose that an advanced-practice banker appropriately estimates economic capital to be \$X using, say, a double-A soundness standard (implying roughly the use of a 99.92% confidence interval).¹¹ Suppose further that the Tier 1 requirement is set appropriately by regulators at something less than X (call this level of capital Y, obtained by using, say, a 99.5% confidence interval against a loss distribution estimated appropriately). What does it mean then to have the Total capital requirement set equal to 2Y? For the typical portfolio, setting the capital requirement at twice the level of capital required to meet a 99.5% confidence interval generally results in effective “coverage” of the loss distribution at a level well beyond 99.92%. In other words, if the Tier 1 requirement is appropriate to meet a BBB(-) soundness standard, twice this level of capital would drive the soundness level to well beyond the AA level. Graph 1 below shows, for the actual commercial portfolio of one of our RMA Group members, how the level of economic capital is related to the choice of confidence interval. The percentage capital allocations

¹¹ The one-year default rate for AA instruments depends on which historical database one uses. Using the Moody’s Corporate Bond Default Study of 2000 (involving data from 1920 through 1999), 0.08% is the average one-year default rate for Aa or A assets. Using these same data, Aaa assets have an immeasurably small PD, while Baa assets have PDs of about 30 bp, and Ba assets have PDs of about 143 bp. Thus, a PD of 0.5% (50 bp) represents roughly the dividing line between Baa and Ba, while, for practical purposes, an insolvency probability of something less than 10 basis points is representative of all the A grades. Other default studies by other rating agencies show somewhat different, but qualitatively similar, results.

are not those actually used by the bank, however the relative capital allocations at the various confidence levels are real. The 4% capital at the 99.5% confidence level was chosen arbitrarily; it is not the result of any particular portfolio level economic capital calculation (although it is approximately the median RMA Group capital allocation for the Benchmark Asset with PD of 0.7%, LGD of 50%, and 3-year term). On the graph, we have assumed that the level of capital for credit risk chosen by the bank is measured at the 99.92% confidence interval – members of the RMA group use internal confidence intervals that range around the 99.90% level. Regulatory capital should be below this internal standard (if we continue to view regulatory capital as a minimum, not a target).

Graph 1



In the graph, setting the 99.5% level of capital at X, the 99.92% level of capital is 1.4X while the 99.8% level of capital is 1.2X. For other members of our Group, these relationships could imply higher or lower multiples than those shown on the graph. Note also that the actual multiples of capital (when comparing, say, the 99.92% level of capital with the 99.5% of capital) are much lower when retail products are included within the whole portfolio. We believe that the Total capital to Tier 1 capital relationship should be

set somewhere in this range (1.2X to 1.4X or so). Moreover, the actual multiple should not be the same for all banks! This is because some banks have portfolios with thinner or fatter tailed loss distributions than other banks. That is, using the regulatory loss distribution model, a bank with higher average weighted PDs will generate a loss distribution with a fatter tail (since, at a constant asset value correlation, default correlations rise with PD). By requiring every bank to adhere to the same multiple of capital derived at the 99.5% confidence level, the result may be to force some banks to hold capital at the equivalent of a 99.9x% confidence level, while others are only holding capital at, say, a 99.7% confidence level. In effect, the constant multiple results in some banks being forced to achieve, say, AA soundness levels while others have their minimum soundness levels set at, say, BBB+. Moreover, the safer the bank's portfolio (the lower the average weighted PD), the more it is disadvantaged (relative to the bank with the truly fat-tailed loss distribution) through the use of a constant multiple. Rather, we believe that the Total capital requirement should be set so that all IRB banks adhere to what is effectively the same confidence interval rather than the same multiple of Tier 1 capital (see our discussion below regarding a proposed treatment of Total capital).

Not only does setting Total Capital at 2X the Tier 1 standard result in the regulatory minimum approaching exceedingly high soundness standards (confidence intervals), this result occurs *before* one takes account of the additional capital required by “well-capitalized” standards in the U.S. and, potentially, in other G-10 countries (see discussion in Section VI below). Nor does the two-to-one ratio of Total to Tier 1 represent the desired relationship of the two “types” of capital standards in the marketplace. Most advanced-practice banks issue subordinated debt for various business reasons – for asset-liability management purposes, for particular funding purposes, or even to help meet their regulatory “well-capitalized” capital standards. But the level of *desired* capital is based on internal economic capital analysis, which, as indicated earlier, is “translated” into balance sheet items that include tangible equity and general loss reserves – but not subordinated debt. Table 4 below shows the relation between Tier 1 capital and Total capital for the RMA Group members that are considered Large, Complex Banking Organizations by the Federal Reserve; also shown are the top 50 banking companies in the U.S. In addition to comparing Total to Tier 1 capital, the table

compares a "Basic" capital ratio to the Tier 1 ratio – where Basic capital is defined as the balance sheet equivalent of Economic Capital (i.e., tangible equity plus the general loan loss reserve).¹²

Table 4
Total RBC versus Tier 1 RBC versus "Basic Capital" (Estimated) Ratios*

BHC Name	Equity to Assets	Tier 1 Leverage	Tier 1 RBC Ratio	Total RBC Ratio	Total/Tier 1	ALLL to RWA	"Basic" RBC Ratio	"Basic" to Tier 1**
Citigroup	7.34%	6.01%	8.44%	11.27%	133.53%	1.41%	9.85%	116.65%
JPMorgan Chase	5.92%	5.41%	8.47%	12.05%	142.27%	0.87%	9.34%	110.30%
Bank of Amerca	7.42%	6.10%	7.50%	11.03%	147.07%	1.32%	8.82%	117.57%
Wells Fargo	9.72%	6.49%	7.29%	10.42%	142.94%	1.53%	8.82%	121.03%
Bank One	6.92%	7.32%	7.38%	10.78%	146.07%	1.54%	8.92%	120.85%
First Union	6.04%	5.92%	7.02%	11.19%	159.40%	0.80%	7.82%	111.44%
FleetBoston	9.01%	8.18%	7.88%	12.07%	153.17%	1.28%	9.16%	116.19%
KeyCorp	7.59%	7.71%	7.72%	11.48%	148.70%	1.15%	8.87%	114.88%
Bank of New York	7.98%	7.49%	8.60%	12.92%	150.23%	0.92%	9.52%	110.66%
PNC	9.53%	8.04%	8.60%	12.58%	146.28%	1.03%	9.63%	112.00%
Median of RMA 10	7.51%	6.91%	7.80%	11.38%	146.67%	1.21%	9.04%	115.54%
U.S. LCBOs	7.08%	6.01%	7.78%	11.29%	145.12%	1.19%	8.97%	115.26%
Large Regionals	8.90%	8.04%	9.49%	11.96%	126.03%	1.10%	10.59%	111.55%
Top 50	7.40%	6.36%	8.10%	11.41%	140.86%	1.17%	9.27%	114.45%

* Data provided by FRB -- "BHC Focus Report, December 31, 2000"

**The "Basic" capital ratio is estimated as the sum of Tier 1 plus the ALLL. This overstates the "Basic" ratio because the entire ALLL exceeds the general loss reserve.

¹² The available data show only the complete Allowance for Loan and Lease Losses (ALLL); thus the Basic Capital ratio is overstated, because the ALLL always exceeds the general allowance.

Table 4 shows that the U.S. LCBOs hold Total capital at about 1.45 times Tier 1 capital, rather than the 2-to-1 relationship built into the regulations. This does not mean, of course, that meeting the Total capital requirement is cheaper via the issuance of equity instead of debt. Rather, it means that the advanced practice bank chooses to hold equity and debt in proportions that are dictated by business considerations and that the absolute level of equity is dictated by internal risk measurement procedures – i.e., by analysis of economic capital. The actual ratio of Total capital to Risk-Weighted Assets (the regulatory ratio) is an artifact of the old Accord’s standard of 8% (and in the U.S., the equally arbitrary “well-capitalized” standard of 10%). As indicated earlier, the denominator of the RBC ratio is managed to some extent (via regulatory capital arbitrage) in order to meet the regulatory ratio standard. Indeed, the major U.S. banks all hold more than a 10% Total capital ratio – the median Total capital ratio is in excess of 11% -- reflecting the need to maintain a cushion over the “well-capitalized” minimum.

Under the new Accord, the ability of banks to engage in regulatory capital arbitrage will be limited or non-existent – and this is as it should be (that is, banks should not *need* to engage in capital arbitrage). In such an environment it is critical for the Total capital requirement to be aligned with best-practice economic capital measurement. But how might this be accomplished, especially when the theory of economic capital is based on an insolvency probability standard? Put another way, equity and loan loss reserves serve a clear purpose of staving off insolvency. Losses must “eat through” reserves and equity before the bank becomes technically insolvent. Subordinated debt, however, does not constitute an additional layer of protection against insolvency. For a given level of assets and equity, substituting a dollar of sub-debt for a dollar of deposits does not change insolvency probability in the least bit. What sub-debt does is protect the insurer of the most senior claims on the bank, its deposits. Thus, if the regulators were to continue to use Total capital (including sub-debt) as the basis on which to set regulatory capital minimums, they would, in effect, be saying that their definition of “soundness” is not insolvency probability (reduced to some acceptable maximum level). Rather, they would be saying their definition of “soundness” is something like the following – reduce to an acceptable level the probability that the insurer (the FDIC in the U.S. or the

government in some other regimes) will incur a “hit” on a bank failure.¹³ This definition of soundness is not the one bankers use when computing economic capital, but, at least technically, this does not present a problem.

An Alternative Method for Setting the Relationship Between Tier 1 and Total Capital. RMA makes the following suggestion: Under an Advanced approach, which uses a regulatory loss distribution model, economic capital might be set at a particular confidence level (say, 99.5%) to correspond to Tier 1 or Basic capital, while a higher confidence interval, say 99.7% (applied against the same loss distribution), might be used to set the Total capital requirement. In the example given in Graph 1 above, for the particular portfolio in question, the difference between the 99.7% confidence interval and the 99.5% interval represents a difference in capital of approximately 20% -- that is, the Total capital requirement would be approximately 1.2 times the Basic capital requirement. The actual ratio would depend on the bank’s portfolio. Banks with higher average PDs (thicker-tailed loss distributions) would be subjected to a higher multiple (even though they would be subjected to the same confidence level). This relationship would be more in line with the actual market relationship between Total and Tier 1 capital.

The two confidence intervals – 99.5% for Tier 1 and 99.7% for Total Capital – could be used *without reference* to the 4% or 8% capital ratios used in the Advanced approach. That is, the capital calculators, one each for the two confidence intervals, could be used to compute *absolute* capital to meet the Tier 1 and Total requirements, respectively. However, we can see where it would be psychologically important to continue to express capital requirements as risk-weights based on the ratios of 4% and 8%. If so, then our suggestion would involve the Basel Committee choosing two different “Benchmark Assets.” The first Benchmark Asset (presumably the same 3-year, 0.7% PD, 50% LGD asset as is now set as the reference asset) would be assigned a Basic capital requirement of 4%, with all other assets’ Basic capital requirements related to the Benchmark Asset in relation to the regulatory model’s computation of economic capital

¹³ Subordinated debt also serves the purpose of imposing market discipline (Pillar 3) and we generally agree with the use of sub-debt to meet this purpose. However, very little sub-debt would be needed to provide market-based signals regarding bank soundness – far less than is currently held for business purposes.

for the asset. Then, a second asset – the Total Capital Benchmark Asset – would be chosen so that economic capital for that asset, at the 99.7% confidence interval, equaled approximately 8%. All other assets would be assigned a Total Capital allocation (a Total capital risk-weight) based, again, on the asset’s *economic capital* allocation flowing from the regulatory model for the loss distribution. Note that the choice of a confidence interval (for either the Basic capital standard or the Total capital standard) could be anywhere within a range from about 99.5% up to about 99.9%, depending on the comfort level of the Committee. However, the Committee, in setting these confidence levels, should be aware that a) cross-risk-type and cross-sub-portfolio diversification effects would argue for lower rather than higher confidence intervals, and b) if the effective confidence interval (taking into account these diversification effects) is set above the confidence levels used by the best-practice banks, the banks will again need to engage in capital arbitrage to remain competitive with the non-regulated sector.

To summarize, RMA believes the following changes to the new Accord would help meet the stated objectives of Basel, while permitting Basel to move to a framework in which the need for regulatory capital arbitrage is greatly reduced or eliminated.

- Tier 1 capital should be redefined to include tangible equity plus the general or unallocated portion of the loss reserve. This would bring the definition in line with advanced-practice notions of “translating” economic capital into balance sheet equivalents. If Basel did not wish to redefine Tier 1, a second-best approach would be to calibrate Tier 1 to be equal to [EC less EL] flowing from the regulatory loss distribution model (measured at a suitable confidence interval such as 99.5% over a one-year horizon). Thus, the Tier 1 Benchmark Asset would be one for which, using the regulatory model, estimated EC – EL was approximately 4%. All other assets would be calibrated to the Benchmark Asset using the assets’ relative ECs.
- Total capital, defined as it is now, should be set to reflect a higher confidence interval than that associated with Tier 1 capital,¹⁴ so long as this higher confidence interval did not reach as high as those used by advanced-practice

¹⁴ In effect, Basel would be saying that the probability of the deposit-insurer incurring a hit should be lower than the probability of a bank becoming insolvent.

banks (otherwise, the regulatory requirement could no longer be viewed as a *minimum* requirement). We suggest 99.7% as this higher confidence interval, which would correspond to roughly a high BBB soundness standard (assuming the horizon remains at one year). The Total Capital requirement would remain nominally at 8%, except that the appropriate Benchmark Asset for Total Capital purposes would be a different reference asset than that used for Tier 1 purposes. For both Tier 1 and Total Capital purposes, other assets should be related to the Reference Asset based on the asset's estimated economic capital (from the regulatory model).

RMA recognizes that, while these recommendations should guarantee fairly accurate relative capital requirements, the level of overall capital will be sensitive to the particular confidence intervals chosen by Basel. Thus, it would be possible for an initially chosen confidence interval to result in overall capital being *less than* the capital requirement under the current Accord. As indicated earlier, we believe that such a result is not, in and of itself, undesirable – so long as the regulatory capital requirements, for all three major types of risk, are based on sound advanced-practices. Nevertheless, the Committee may wish to include a “lower bound” rule, at least until Basel becomes comfortable with the new Advanced approach. Such a rule, however, should not be expressed in terms of one of the other new approaches (under the current proposal, Advanced IRB capital, for a period of 2 years, would be limited to no less than 90% of Foundation capital). This would require Advanced banks to calculate two new sets of capital minimums, Advanced and Foundation. Rather, a floor might be set such that capital under the Advanced approach would be no less than, say, 90% of the (bank-wide absolute) regulatory capital under the old Accord (using the old Accord's definitions of exposures, treatment of securitizations, etc.). This “floor” should be reduced each year – and eventually eliminated -- to provide banks with incentive to install advanced-practice risk-measurement methods and to migrate to the Advanced approach. By setting a temporary floor in relation to the old Accord, the Committee would be giving itself time to evaluate the performance of all three of the new proposed capital standards. Moreover, an Advanced bank would have to calculate only one *new* set of capital

requirements – given that the bank already knows how to calculate capital requirements under the *old* Accord.

Maturity. Assuming that the basic framework of the Advanced approach were altered to account for the concerns described above, there remain significant technical difficulties with the structure of the proposed approach. Chief among these is that the Advanced capital “calculator” does not allow for maturities of under one year. Yet, a very significant portion of the corporate portfolio may consist of such facilities – facilities that are short-term to begin with or longer-term facilities that have less than a year remaining. For some of the RMA banks, these short-term facilities represent such a significant portion of the portfolio that capital requirements under the Advanced approach would rise substantially from the old Accord. Moreover, many of these facilities were not formed solely for the purpose of regulatory capital arbitrage under the old Accord, but rather for business purposes (to reduce effective credit risk by incorporating continual monitoring with the legal ability to terminate the relationship upon short notice). Many of these facilities are under 3 months (even though, for regulatory capital purposes under the old Accord, undrawn lines for all under-one-year facilities – even 364-day facilities -- are assigned a zero credit conversion factor).

To demonstrate the scope of the effect of using very short-term facilities, Table 5 below compares short-term PDs with one-year PDs for a given obligor. The example is for an obligor with a 2% PD, but the results are proportional for any one-year PD.¹⁵

¹⁵ Table 5 derives the short-term PD using the transformation within KMV’s Portfolio Manager™ :
 $PD_T = 1 - e^{(-T)*PD}$, where PD is the one-year PD expressed as a decimal fraction; PD_T is the short-term PD; and T is the term of the short-term facility, expressed in years

Table 5
Under-One-Year PDs Given a One-Year PD of 2.00%

Months	Fraction of a year	Default Probability	Short PD as % of one-year PD
11	0.917	1.82%	90.83%
10	0.833	1.65%	82.64%
9	0.750	1.49%	74.44%
8	0.667	1.32%	66.22%
7	0.583	1.16%	57.99%
6	0.500	1.00%	49.75%
5	0.417	0.83%	41.49%
4	0.333	0.66%	33.22%
3	0.250	0.50%	24.94%
2	0.167	0.33%	16.64%
1	0.083	0.17%	8.33%

The table shows that for very short-term facilities, the effective PD is a small fraction of the one-year PD. For example, a 3-month facility has a PD that is one-quarter the one-year PD. Under the Advanced approach, however, the PD to be plugged into the Calculator is to be set as the one-year PD. To provide an example, an obligor with a one-year PD of 0.8%, but borrowing under a 3-month facility, would generate a Total capital allocation (as a percent of EAD) of 6.24% using the Advanced approach calculator. If the advanced-practice bank were permitted to use the implied 3-month PD of 0.2%, then, using the same IRB calculator, the Total capital allocation for the facility would decline to 2.10%.

The Floor to the PD. The Advanced and Foundation approaches employ a “floor” of 3 basis points to the allowable PD. The PD in question is the one-year PD which, corporate bond default experience shows, is less than 3 basis points for the highest rated obligors (AAA rated). Internal economic capital models typically may make such fine distinctions in PD’s and the associated EC’s, but the Advanced approach does not. Therefore, very high quality assets may be disadvantaged under the proposal. In Tables 1 through 3, for example, assets in the highest-quality PD range (0 to 4 basis points) have their associated regulatory capital requirements computed using a 2 basis point PD (the mid-point of the range). In Table 1, the 2 bp PD asset, at a 45% LGD, has a median EC allocation of 0.24%. For the same asset, the Advanced corporate calculator generates a

Total capital requirement of approximately 0.27% (as shown in Table 1 if the 3 bp PD floor were *not* in effect). However, the effective floor of 3 bp to the PD means that the true Total capital requirement under the proposal is approximately 38 bp – on the order of 50% higher than if the floor did not exist and somewhat more than 50% higher than the RMA median economic capital calculation for the highest quality (lowest PD) asset.

Model measurement error. U.S. banks have been asked by the Federal Reserve to comment on whether a model measurement-error adjustment (upward) should be incorporated into the Advanced and Foundation capital calculations.¹⁶ Apparently, one rationale for considering such an adjustment is that it would be consistent with the “multiple” applied by regulators to VaR estimates within market risk models. Our view is that such a multiple would be inappropriate, and could possibly lead to significant resource misallocation, for the following reasons:

- a) In the case of VaR models, the multiple is applied to market losses measured at the 99.0% confidence level, not the 99.5% confidence level embodied within the regulatory model for capital for corporate loans, nor the 99.7% confidence level for Total capital we are advocating. Much of the impact of employing a multiple is duplicated by choosing a higher confidence interval.
- b) Measurement error is important primarily if the parametric estimates used in a structural model are biased downward. While all known methods for estimating PDs, LGDs, etc. are imperfect, we are aware of no studies detecting systematic bias in commonly used methods among advanced-practice institutions.
- c) In the regulatory model being used for the IRB approaches, the assumption of an everywhere-equal obligor-asset-value correlation of 0.20 may be inappropriate for some banks – that is, the actual range around the 0.20 value is broad. Banks with large numbers of borrowers in the middle market may be disadvantaged if the systematic drivers of risk for this type of portfolio differ from the drivers of risk for large obligors.

¹⁶ This request was embodied within a memorandum distributed by FRB-NY to large, complex banking institutions, dated February 21, 2001.

d) The granularity adjustment embodied in the Advanced approach does not take account of the granularity benefits associated with having both a corporate portfolio and a retail portfolio. Put another way, granularity should be computed for the entire credit portfolio, not just the corporate sub-portfolio. Additionally, there are some outstanding questions regarding the Basel treatment of granularity (note that these questions may influence a particular bank's response to the QIS).

- Do the granularity adjustments include OTC derivatives? If so, what exposure amounts should be used within the granularity calculation?
- Are securitizations to be included within the granularity calculation?

Note also that banks that do a better job of managing credit risk by, for example, identifying multiple exposures to a single borrowers, may be penalized by having their granularity adjustments made worse by such measurements.

e) Finally, we reiterate that even small “multiples” applied to capital computed at the 99.5% confidence level can result in the effective confidence level being pushed past single-A to double-A standards (as shown in Graph 1). At the high confidence levels we are dealing with, it would be quite easy for regulators, in their desire to “cover all the bases,” to end up setting minimum capital requirements that would be the equivalent of setting AAA+ soundness standards – a result that would make the regulated sector uncompetitive with the unregulated sector.

Burden of Proof in Generating Risk-Characteristic Estimates. We are concerned that, given the existence of a Foundation approach in which regulators choose the level of risk-characteristics (other than PDs), there will be an excessive burden on Advanced practice banks to “prove” that their risk-characteristic-estimates are appropriate, if they disagree with those used in the Foundation approach. For example, for EADs involving unused but committed lines, the Foundation approach sets 75% of the unused line as the credit conversion factor. This amount is not justified empirically within the consultative document, yet might become the *de facto* standard for Advanced IRB banks to overcome. Perhaps after Basel has some more experience with internal advanced-practice methods,

it might set the Foundation approach at the conservative end of the range of advanced-practices, while not prejudicing the Pillar 2 process in any manner when it comes to accrediting a particular Advanced-approach bank's internal procedures.

Alignment of Incentives to Migrate to the Advanced Approach. The RMA Group agrees with the general thrust of the Advanced approach, which is to utilize the advanced internal practices of qualifying banks to estimate PDs, LGDs, and EADs. We also agree with the need to align incentives so that a bank naturally will wish to improve its internal risk measurement processes to be able to migrate from Standardized to Foundation to Advanced. In this regard, the current proposal calls for a credit-conversion factor for unused lines under the Foundation approach that is significantly higher than under the Standardized approach – 75% for both over-one-year and under-one-year lines, compared with 20%/50% under the Standardized approach. Thus, the EAD assumption being used in the Foundation approach may be too conservative relative to the assumption used in the Standardized approach. On the other hand, for some types of facility, an Advanced approach bank might very well estimate an EAD for an unused line that is above the assumption used within the Foundation approach. Because of this possibility it is extremely important, as indicated earlier, that the corresponding regulatory capital ratio to be applied to the internal EAD estimate be closely aligned with best-practice economic capital estimates.

C. The Advanced IRB Approach for Retail Credits. The Advanced IRB capital allocations for retail credits are several times those embodied within best-practice economic capital estimates of advanced-practice banks. We fully recognize that the retail capital “calculator” within the consultative document is a “place-holder” – not intended to be representative of a final Basel treatment for retail credits. However, we are concerned that the capital allocations within the placeholder calculator serve to confirm the view that high yielding assets necessarily should be assigned high capital levels. Economic capital, of course, critically depends on the correlation of defaults across loans. For many retail credits, such correlations are estimated to be quite low, even though the expected loss rates (and thus the yields) on these assets are high relative to corporate loans.

The very high capital allocations in the consultative document are also an artifact of the particular regulatory model being used to generate the economic capital outputs to assign the relative regulatory capital amounts. Like the corporate regulatory model, the retail model assumes a constant correlation of asset-values (the value of the consumer's assets, including the present value of the worker's income stream). As PD rises, this implies a rising default correlation across obligors. This may be a reasonable assumption regarding corporate obligors. In the retail arena, however, default is likely to be more idiosyncratic in nature. Moreover, asset value correlations for consumers may decline as wealth declines. For example, while lower income level obligors may be more likely to lose their jobs during a recession, they are also more likely to be able to quickly find another job than the high income/high wealth obligor. Thus, if anything, defaults may be *less* correlated among low income/low wealth (i.e., high PD) obligors. At a minimum, default correlations do not rise with PD anywhere near as rapidly as suggested by the constant obligor-asset-value correlations used within the placeholder retail regulatory model.

For reasons such as these, most banks, within their retail portfolios, estimate economic capital using correlation assumptions that can be grouped within two broad categories. One group of analysts might assume constant default correlations across PD ranges for retail credits. This is tantamount to assuming continuously declining obligor-asset-value correlations as PD rises. Another group of analysts might assume constant obligor-asset-value correlations within each *cohort* of a retail product portfolio, but the asset correlations might be assumed to decline as the average PD of a cohort rises. For example, the retail product might be grouped into one or more "prime" cohorts and one or more "sub-prime" cohorts, with a lower asset-value correlation assigned to the cohorts with the higher average PDs. Thus, in practice, the higher expected-loss assets (including so-called "sub-prime" loans) are not assigned geometrically increasing economic capital within retail credit models (even though expected losses are higher than for prime loans) as might be the case for corporate loans.

Not only does the typical advanced-practice economic capital model (for retail) differ from that used within the consultative document, but also the regulatory capital allocations (for retail) in the consultative document are based on the same traditional

views of capital as within the corporate arena. That is, Total capital is set at twice Tier 1 capital; and the relative capital requirements across assets are based on EC plus EL rather than on relative EC alone. For these reasons, high EL retail assets are especially penalized under the “placeholder” retail capital calculator within the consultative document.

Tables 6a through 6c, at the back of the text, show the median economic capital estimates for the RMA Group banks responding to our 2000 survey on capital for retail products.¹⁷ As in the corporate tables, economic capital for credit risk is calculated internally at a common 99.5% confidence interval. Furthermore, since default correlations generally are thought to differ by product type, the RMA survey presents economic capital within each of several product types. Because of the large amount of data shown in Tables 6a through 6b, Table B below summarizes the results only for 1st mortgages and credit cards.

¹⁷ See “Credit Risk Capital for Retail Credit Products: A Survey of Sound Practices”, December 2000, The Risk Management Association.

Table B
Median EC (99.5% conf. interval) vs. Advanced Retail IRB

EDF range	Retail Product					
	1 st Mortgages			Cards		
	EC	Tier 1	Total C.	EC	Tier 1	Total C.
0-0.16%	0.27%	0.14%	0.28%	0.79%	0.85%	1.69%
0.16-0.32	0.46%	0.29%	0.58%	1.36%	1.73%	3.47%
0.32-0.64	0.65%	0.46%	0.92%	1.84%	2.77%	5.55%
0.64-1.28	0.94%	0.75%	1.49%	2.38%	4.48%	8.95%
1.28-1.92	1.33%	1.06%	2.13%	3.04%	6.39%	12.8%
1.92-2.56	1.59%	1.35%	2.69%	3.57%	8.07%	16.1%
2.56-3.84	1.13%	1.72%	3.45%	3.95%	10.3%	20.7%
3.84-5.12	2.21%	2.17%	4.34%	4.76%	13.0%	26.1%
5.12-7.68	2.68%	2.77%	5.53%	5.47%	16.6%	33.2%
7.68-10.0	3.97%	3.46%	6.92%	6.32%	20.8%	41.5%
10.0-20.0	4.07%	4.82%	9.63%	7.71%	28.9%	57.8%
>20.0%	5.42%	5.74%	11.5%	10.5%	34.5%	68.9%

LGD mid-pt. 15.0%

90.0%

Note that only for low EL retail credits, such as prime mortgages, are the Tier 1 requirements “close” to the median economic capital measurements. As the PD range increases, or as the LGD of the product increases (such as when going from mortgages to cards), Tier 1 capital rises above economic capital, and is, in many cases, well above. Moreover, Total capital requirements, because they are twice the Tier 1 requirement, are in all cases above median economic capital, and in many PD ranges the Total capital requirement is several times the advanced-practice estimate of economic capital.¹⁸

It is of even greater importance than in the corporate arena that regulatory capital ratios for retail products track closely the economic capital ratios produced by the best-practice risk measurement processes. This is so because, for some retail products, regulatory capital arbitrage via securitization is currently a necessity. As a result, there is often a great disparity between exposures as they are currently calculated under the old

¹⁸ Note that, in Table 6c, home equity loans and HELOC are treated identically by the “median” RMA bank, in terms of assigned EC, with a distinction made only for high LGD loans (those in which the first mortgage has a high LTV) versus low LGD loans.

Accord versus exposures as they might be calculated by best-practice procedures. For example, all major credit card banks securitize a significant portion of card outstandings. Under the current Accord, only the on-balance-sheet amounts of card outstandings are recognized as an “exposure” for purposes of the Accord. Internally, however, an advanced-practice bank might recognize as an exposure a high percentage (80 or 90%) of all lines for all managed assets, whether on or off the balance sheet. Such internal exposure treatments might be 4 or 5 times the exposure treatment under the current Accord. It is fortunate that the current Accord treats card exposures so liberally, because as can be seen in Table B, the current Accord’s 8% Total capital *ratio* requirement for cards is a high multiple of economic capital for prime card accounts, and is on the order of twice the median EC even for “sub-prime” cards. As indicated earlier, advanced-practice banks would have no objection to a rationalization of exposures under the new Accord, so long as the regulatory capital ratios applied to those exposures also are based on best-practice estimation procedures.¹⁹

An additional concern with some retail credit products has to do with the “translation” of economic capital into the regulatory concepts of capital. As in the corporate arena, we believe that a first approximation of economic capital (for balance sheet purposes) is the sum of tangible equity plus the unallocated portion of the loss reserve. However, some retail products with especially high yields have these yields as an additional source of protection. Spreads on card assets, for example, are sufficiently high to cover not only all net non-interest expenses, plus expected losses, plus a reasonable return on allocated economic capital, but also embody an excess yield of several percentage points. The excess yield on the performing assets represents an additional cushion against unexpectedly high losses. Put another way, the typical market value of originated card assets is significantly above their carrying value – card portfolio transactions often entail premiums of 15 percent or more above carrying values. These

¹⁹ Paragraph 276, p. 58 of the IRB section of the consultative document states that “no conversion factors need to be applied for uncommitted lines or for facilities (such as credit cards)...” We are concerned that such treatment of exposures is *so liberal* when compared with typical internal practice for cards that it will distort the Committee’s choice of a capital ratio to be applied to cards. Moreover, such a treatment is inconsistent with the general philosophy behind the Advanced approach that banks use their own internal, advanced-practice procedures for setting EADs – the same procedures that they would use for business purposes.

premiums may be related to production efficiencies in the servicing of card assets (and in the costs of prospecting for and originating such assets). Whatever their source, the premiums (or rather the excess spreads underlying the premiums) represent a form of protection against insolvency.

It is not clear how excess yields could be incorporated within a regulatory capital standard. One suggestion is to include one-year's worth of excess yield within the Basic capital definition for certain retail products (i.e., the Basic capital requirement could be reduced by the yield over a market return to estimated economic capital). Still another approach is to treat the existence of excess or deficit spreads, relative to a par asset (in both the retail and commercial portfolios) as a factor to be considered under Pillar 2. Absent such accounting for the excess spread in certain retail products, it is important that an even greater than normal gap be present between the effective confidence interval used for the "well-capitalized" Total Capital standard (for retail) and the (higher) confidence levels used by advanced-practice banks when measuring economic credit risk capital for retail products.

Construction of best-practice regulatory model(s) for retail credits. The RMA Group stands ready to assist Basel economists in the construction of credit loss distribution models for retail credits. As indicated earlier, we believe that several such models should be constructed, differentiated by product type. Each such product would contain a different explicit correlation assumption than that used for the other product types.²⁰ Individual RMA banks may be contacting regulatory agencies to discuss specific retail models or classes of retail model that may generate capital allocations that more closely mimic the results of advanced-practice models in common use in the industry.

Regarding retail economic capital model construction, several other points are worth mentioning:

1) Cohorting or segmentation. The current proposal calls for Advanced banks to segment their retail portfolios according to at least 4 segment types: product type,

²⁰ We should note that a natural step forward in the construction of the regulatory model(s) would be to permit Advanced IRB banks to provide, for each product and perhaps for each cohort, their own correlation assumptions (and this could also be done for corporate portfolios as well). Such a step would remove the burden on the regulator to justify the correlation assumptions and would place it instead on the advanced practice bank.

borrower risk/credit score, delinquency status, and vintage. Segmentation by product type and borrower risk/credit score is mandatory. In broad terms, we agree with the importance placed upon segmenting the retail portfolio, assuming that a separate calculator (incorporating an appropriate correlation assumption) is provided for each product type. However, significant flexibility should be given to the IRB banks to determine how to segment their individual portfolios. Today, banks segment their portfolios on a regular basis to understand risk/reward tradeoffs, build pricing models, and forecast credit losses – in other words, to “run the business”. And there are numerous tools used in the industry to help accomplish this – custom scores, bureau scores, bankruptcy scores, behavior scores, etc. As an example, a certain portfolio may have behavior scores that are refreshed monthly to incorporate the most recent customer payment and usage patterns. In such circumstances, it may be redundant and distortive to require the inclusion of “delinquency status” as a cohorting variable (since it is embedded into the score itself).

2) Definition of Default. Another important issue regarding retail products is that the definition of default – for purposes of estimating PDs – should not necessarily be set equal to the definition used within the corporate portfolio (90-days past due). Indeed, common internal practice as well as regulatory reporting requirements for retail products may differ from the 90-days past-due definition used in the corporate arena. For example, credit card accounts are considered defaulted if 180-days past due. It should also be noted that when a bank uses a definition of default considered to be “lenient” in and of itself, the appropriately estimated LGD should tend to be higher than when using a conservative definition of default. This is because, when using a conservative definition of default, there is a higher probability that the account will come back from delinquency status into compliance. In terms of estimated economic capital, the two effects tend to cancel each other out, so that EC is not greatly different if one bank uses a conservative default definition/liberal LGD estimate while another bank uses a liberal default definition/conservative LGD estimate. This is still another reason why Advanced banks ought to be able to provide their own PD and separate LGD estimates for each retail product. Conversely, requiring Advanced banks to measure default for retail products via

a different definition than is now in common use would increase compliance costs without resulting in necessarily more accurate EC and regulatory capital measurements.

D. Cross-business and Cross-risk-type diversification. When setting the confidence intervals for measuring credit risk for corporates and retail products under the Advanced approach, Basel should be cognizant of the fact that credit losses across the various sub-portfolios are not perfectly correlated. Furthermore, credit risk losses, market risk losses, and operating risk losses – as separate risk types – are not perfectly correlated. Therefore, simply adding up the economic capital associated with each sub-portfolio and for each risk type would overstate bank-wide capital requirements. Some of the RMA Group members are just now beginning to attempt estimates of these cross-business and cross-risk-category diversification benefits. Early indications are that the diversification benefits of having less-than-perfectly-correlated losses are on the order of 20% or more of aggregated economic capital. Put another way, the confidence interval used to measure EC for one type of credit sub-portfolio or for one type of risk (operating versus credit risk) should be set at somewhat *less than* 99.5% over a one-year horizon – if Basel intends to set minimum capital requirements to be the equivalent of a BBB-minus soundness standard.

III. The Foundation IRB Approach.

The Foundation approach is based on the same capital calculator (for corporates) as the Advanced approach, except that the bank inputs only the PD estimate, while the LGD, EAD, and maturity estimates are established by the regulator. We agree that the general approach ought to be a) to limit the flexibility of the Foundation bank relative to the Advanced bank and b) to provide for somewhat higher capital requirements for the Foundation approach than in the Advanced approach. Both of these factors will serve to provide incentive for the Foundation bank to improve internal risk measurement procedures sufficiently to “graduate” to Advanced status. Several improvements to the Foundation approach, however, would appear to be warranted.

A. Maturity adjustments. By assigning all corporate assets under the Foundation approach a 3-year maturity (regardless of actual maturities), the resulting regulatory capital ratios are set at significantly higher levels than under the

Advanced approach. Moreover, the resulting portfolio-wide capital charges under the Foundation approach tend to be significantly higher than under either the Standardized approach or the current Accord – see Appendix 1. Absent a maturity adjustment, Foundation banks either would have incentive to never progress from Standardized at all, or would have incentive to make longer-than-three-year loans (and, conversely, would not have incentive to make short-term loans). Resource misallocation problems under the Foundation approach would therefore be severe.

Our view is that any bank that can measure the PD of an asset should be able to measure maturity of the facility. If such maturities are factored into the capital calculator – and if appropriate treatment of under-one-year facilities is granted – incentives to incorporate maturity into pricing and other business decisions would be improved. Indeed, maturity is so important to proper economic capital estimation and to business decisions in general that one could argue for the supervisory approach (Pillar 2) to include a check that the IRB bank is in fact factoring maturity into pricing and other decisions. If the Committee wished to make sure that the Foundation bank was somewhat “handicapped” relative to the Advanced bank, the corporate calculators for Foundation could be calibrated at a higher confidence level than for the Advanced approach. Also, LGDs and EADs could be set at the upper end of the ranges used in practice by Advanced banks.

- B. Conversion factors for unused, committed lines. The 75% conversion factor for unused lines is quite high when compared with the Standardized approach – which uses a 20% conversion factor for unused lines under-a-year and a 50% conversion factor for over-a-year lines. The problem here may be that the conversions factors for the Standardized approach are too low. The Foundation approach conversion factor might also be lowered somewhat and/or made sensitive to maturity. Finally, the Committee may wish to readjust the Standardized and Foundation conversion factors after gaining experience with the range of EAD procedures used by Advanced banks for unused lines. That is, the EADs for unused lines for the Foundation approach

might be set at the upper end of the actual best-practice range, with the Standardized approach equal to or slightly above the conversion factors used in the Foundation approach.²¹

- C. LGD assumption. The LGD assumption being used for the Foundation approach (50%) is approximately one-quarter higher than typically used by advanced-practice banks (and does not vary according to the nature of the facility). Perhaps a 40% LGD assumption would be closer to standard practice while still affording an advantage to the Advanced approach.²²
- D. Calibration of the capital calculator. To avoid significant regulatory capital arbitrage incentives under the Foundation approach, the capital calculator should undergo the same improvements we are suggesting for the Advanced approach. That is, Basic capital should be set at near equality with economic capital (using a 99.5% confidence interval), while Total capital should be calculated using a higher confidence interval (i.e., the 2-to-1 relationship between Tier 1 and Total capital should be replaced with a relationship couched in terms of lower versus higher confidence intervals). As indicated above, the Foundation capital calculator(s) could be made somewhat more conservative than the Advanced approach calculator(s), perhaps by using slightly higher confidence intervals than under the Advanced approach (in addition to using somewhat more conservative inputs regarding EADs and LGDs).

²¹ See Michel Araten and Michael Jacobs, Jr., “Loan Equivalents for Revolving Credits and Advised Lines,” The RMA Journal, May 2001.

²² See Elliot Asarnow and David Edwards, “Measuring Loss on Defaulted Bank Loans: a 24-year Study,” Journal of Commercial Lending, March 1995.

IV. The Standardized Approach.

The proportion of commercial loans with rated obligors will be low for many of the smaller banks using the Standardized approach. However, the regulatory treatment of exposures is more conservative than under the old Accord (EADs for unused lines are set at 20% of the unused line for facilities under a year, compared with 0% under the old Accord). Therefore it is quite possible that community banks would have their capital requirements increased under the Standardized approach. This possibility could be offset by a more rigorous approach to the setting of capital requirements for rated obligors. Currently, the Standardized proposal calls for AAA/AA rated obligors to receive a 1.6% Total capital requirement. This is considerably higher than the economic capital allocated to the lowest two PD ranges within the RMA corporate loan economic capital survey (Tables 1 through 3 above), which are 41 bp and 21 basis points respectively (for facilities with a one-year maturity and an LGD of 35%). Similarly, the RMA Group banks assign a median economic capital charge to BBB/BB assets on the order of one-half the 8% Total capital charge under the Standardized approach. Perhaps the Committee could reduce the capital charges for the rated assets of investment grade quality to be more in line with best-practice EC estimates, while still being more conservative than either the Foundation or Advanced approaches. In this fashion, regulatory capital arbitrage incentives (as between rated and non-rated assets) would be reduced for the Standardized approach.

Additionally, at least for the rated portion of the Standardized bank's portfolio, it is inconsistent with best practices to distinguish between and among bank obligors, sovereign obligors, and corporate obligors. In particular, why should a BBB-rated bank obligor be assigned twice the capital as that of a BBB-rated sovereign (under the first option for bank obligors)? Or, why should a BBB-rated corporate obligor be assigned twice the capital of a BBB-rated bank obligor? These distinctions may be appropriate for the un-rated obligors, but the whole purpose of the external rating approach is to relate capital charges to externally-estimated default probabilities.

Finally, the current version of the Standardized approach may be missing an opportunity to make capital distinctions across maturity buckets. Even the smallest of

community banks, we believe, should be able to measure the maturity of an asset (subject to Pillar 2 oversight). Therefore, the Standardized approach might include a maturity differentiation, perhaps across only 3 maturity buckets (and with somewhat greater penalties associated with longer term maturities than under the IRB approaches).²³

V. Securitization and Synthetic Securitization.

The RMA Group's views on the treatment of securitization have been broadly outlined in an earlier document sent to the U.S. agencies.²⁴ While our views have been outlined in that paper, we wish to address several specific issues raised in the context of the new proposals within the consultative document.

A. First-dollar loss positions. Under the Standardized approach, the treatment of credit enhancements provided by securitization sponsors is as follows: “origination and loan servicers that provide credit enhancement to a securitization transaction, must deduct the full amount of the enhancement from capital, taking into account the risk-based capital charge that would have been assessed if the assets were held on the balance sheet.” We are informed by U.S. regulators that this is, in effect, the low-level recourse rule currently in effect at the U.S. agencies – the capital requirement is the lower of the amount of the legal recourse (or other first-dollar loss position) or the capital against the underlying assets as if they were on the balance sheet.²⁵ However, under the IRB approach, all first-dollar positions would be subtracted from equity – a 100% capital requirement – even if the capital charge for the underlying assets (if the assets were on the balance sheet) is less than the amount of the legal recourse obligation. To provide an example, suppose, under the securitization, the sponsoring bank has an obligation to cover losses up to the first 10% of assets, but the capital requirement for the underlying

²³ As now constructed, the Standardized approach also contains a curious anomaly – under the second option for rated bank obligors, borrowers rated A/BBB under a 3-month facility are allocated less than half the capital allocated for a one-year obligation – while no such maturity break is given under the IRB approaches.

²⁴ See, “Response to U.S. Agencies’ Joint Notice of Proposed Rulemaking: Risk-Based Capital Standards; Recourse and Direct Credit Substitutes,” June 7, 2000, RMA (formerly Robert Morris Associates).

²⁵ Effectively, this rule under the Standardized approach would apply as well to second-dollar positions, even if the sponsoring bank held no first-dollar position.

assets is 8%. Under the proposed rule for the IRB approach, the bank must deduct a full 10% of the underlying assets from its capital.²⁶

This proposed rule results in a misaligning of incentives. Regulators should prefer, in the example above, a bank to hold capital in the amount of 8% (of underlying) against a 10% first dollar position, rather than hold the assets on its books while holding 8% capital against the assets. This is because, when the assets are on the books, the bank is exposed not only to losses in the 8-10 percent range, but all losses (even those farther out in the tail of the loss distribution). The securitization, however, transfers the risk of losses far out in the tail of the loss distribution to a 3rd party.²⁷ Furthermore, it is important to note that, if Basel is successful in defining capital requirements that approximate those at the 99.5% confidence level, then market requirements for first-dollar loss positions would *naturally* be higher than the Basel requirements. That is, senior and subordinated tranches of securitizations generally are BBB-rated and higher – implying higher prior-loss protection (“capital”) than that required at the 99.5% confidence-interval-coverage of the underlying loss distribution. Thus, if the IRB approaches were designed to reflect a BBB-*minus* soundness standard, we would expect most securitizations to require first-dollar loss positions from the originators that exceed the Basel minimum capital requirements. Put another way, the fact that the first-dollar market requirement exceeded the regulatory capital charge on the underlying could not provide “evidence” that the regulatory capital charge for the underlying assets was somehow too low.

²⁶ Under a rule being considered by the Basel Sub-Group on Securitization, a “sliding scale” method would be applied rather than a full dollar for dollar capital charge. That is, an arbitrary multiple would be applied to the IRB capital for the underlying assets (1.2X, say). Then, when the first-dollar position exceeds regulatory capital for the underlying, the amount of the first-dollar position in excess of the on-balance-sheet regulatory capital would be subjected to a sliding scale capital charge based on a curvilinear function of the 0.2X add-on. Thus, first-dollar positions up to the underlying assets’ regulatory requirement would receive a dollar for dollar capital charge; first-dollar positions equal to or more than 1.x times the underlying assets’ capital charge would receive a capital charge equal to 1.x times the underlying capital charge; while first-dollar positions in between these two extremes would receive proportionally lower marginal capital charges, up to the 1.x maximum. Needless to say, we believe that such arbitrary methods have no place in a new Accord that purports to mirror best-practice economic capital procedures.

²⁷ Note also that, when holding capital of 8% (of underlying) against a 10% first-dollar position, the bank is exposed to exactly the same probability of losses exceeding capital as if it held 8% capital against the same assets on the balance sheet. Conversely, if the capital requirements for the on-balance-sheet assets were, say, 6%, and the first-dollar loss position were, say, 5%, since the bank is not legally responsible for losses beyond 5%, its capital requirement should be limited to no more than the full amount of the recourse.

In short, we believe that securitization treatment under the IRB approaches should mirror those used internally by advanced-practice banks. Generally, a sponsoring bank reviews the underlying assets being securitized, then calculates internal EC for the entire pool (by, for example, estimating the credit loss distribution for the entire pool). Any first-dollar position the bank holds is then assessed dollar for dollar economic capital up to and including the estimated EC for the entire pool. If the first-dollar loss position exceeds EC, there is no need to assess further capital beyond EC, because the probability of losses exceeding economic capital already has been reduced to the bank's targeted insolvency probability (e.g., 0.08% as per the example in Graph 1 earlier). To add on a capital amount above this level, as proposed by the Securitization Sub-Group, would be inconsistent with best practice. Moreover, as we understand the proposal, this penalty would be assessed against first-dollar holders that are IRB banks, whereas Standardized banks would continue to be subject to the low-level recourse rule – clearly a disincentive to move from Standardized to one of the IRB approaches.

Finally, we would note that when the IRB capital requirement is “too low” (was set not following best-practice techniques), typically there would be no need to engage in securitization for Regulatory Capital Arbitrage purposes. Therefore, if the IRB bank were to engage in securitization it must be for purely business purposes. By setting the regulatory capital requirement on the first-dollar piece higher than capital for the assets held on the balance sheet, the New Accord would be creating a *disincentive* to securitize, thus affecting resource allocation (just as the old Accord did in the opposite direction).

Second-dollar loss positions (mezzanine tranches). Under the unpublished April, 2001 proposal of the Sub-Group, the sliding-scale method (footnote 23, preceding page) would also be used for second-dollar mezzanine pieces of securitizations. The Sub-Group is concerned that a PD-based estimate of capital for “thin” mezzanine positions may be inappropriate. To see how PD-based capital allocations may be misleading, consider the following example. Suppose that EC for a \$100 pool of commercial loans (at the 99.5% confidence level) is 5%, while EC at the 99.92% confidence level is 7%. Suppose further that some institution (not the bank in question) sponsors a CLO securitization of the pool, providing first-dollar loss protection equal to losses up to the first \$5 of the pool. Suppose further that the first-dollar loss protection is fully

collateralized with government securities so that there is no credit risk associated with the first-dollar protection provider. Now suppose that the bank in question purchases a second-dollar loss tranche in the amount of \$2 (2% of pool assets). There are two broad ways in which capital against this second-dollar position could be assessed.

- a) Via a PD estimate. The bank purchasing the second-dollar position could note that, since, the first-loss position of \$5 “covers” the underlying loss distribution up to 99.5%, there is only a 0.50% chance that the next piece would incur a loss – the PD of the piece is about 0.50%. Thus, the mezzanine piece could be “rated” at around BBB(-). The bank could then “conservatively” assume that LGD on the piece is 100%. If the maturity of the underlying pool were around 3 years, then from Table 2 at the end of the text, the median RMA economic capital for an asset with a 0.5% PD and 100% LGD is on the order of 7.0% (the mid-point of the PD range [0.32% - 0.64%] is 0.48%, for which the EC at 100% LGD is 6.59%).
- b) Via use of the underlying loss distribution. The bank purchasing the second dollar piece could note, however, that its own internal insolvency probability target is 99.92%. Under the example, loss protection of \$7 against the underlying pool is needed before the probability of incurring a loss in excess of prior protection (i.e., in excess of “capital”) is reduced to 0.08%. Thus, the bank would allocate a full 100% capital to the second-dollar position, because anything less than \$7 capital – the \$5 in first-dollar loss protection, plus full dollar-for-dollar capital against the second-dollar position -- would not meet the bank’s own soundness standard.

Within this example, the two methods provide capital estimates in which the higher number is 14 times the lower number. Analytically, the truth may be found somewhere between the two approaches. That is, the internal capital assignment associated with a corporate bond of a given rating assumes that the bond exhibits a “typical” correlation with the rest of the bank’s portfolio. However, a mezzanine tranche of the same rating, since it represents the performance of what is an entire underlying portfolio, may exhibit a higher performance correlation with the bank’s own portfolio. For example, suppose a bank buys or retains a tranche of a commercial loan

securitization whose underlying assets are as diversified as the bank's own commercial portfolio. The two pools will be affected by systemic events in near perfect correlation. Thus, extreme tail losses on the securitization pool will mirror those on the bank's own portfolio. In practice, when a bank purchases a mezzanine piece of a pool originated by another financial institution, there is likely to be less than perfect correlation between the performance of the ABS pool and that of the purchasing bank's overall portfolio.

The RMA Group understands that, in the case of mezzanine tranches, it may be inappropriate, in certain instances, to assign capital based solely on a mezzanine piece's rating or PD. Nevertheless, the solution is not to assign capital based on an arbitrary sliding scale as in the Sub-Group's proposal. Rather, regulatory capital on the underlying might be set at the higher of a) the capital requirement based on the PD or rating of the mezzanine piece, or b) the amount of difference, if any, between the regulatory capital requirement on the full amount of the underlying assets and the amount of the first-dollar or other prior protection. In neither case, of course, should the amount of the capital requirement on the mezzanine piece exceed the maximum legal exposure of the bank.

B. Synthetic securitization. Thinking about securitization capital requirements in terms of the underlying assets' loss distribution can also be applied to synthetic securitizations ("SS"). In a common form of SS, the sponsoring bank keeps the assets on its books and continues to fund them with its own liabilities.²⁸ However, the bank receives a guarantee against losses (beyond a reserve established by the bank) from a securitization trust vehicle. The trust, in turn, issues securities (that have a senior claim on the spreads on the underlying assets) and uses the proceeds to invest in Governments that secure its guarantee to the bank. If all goes well, the trust does not need to pay off on the guarantee and, because it has a claim on the spreads from the underlying assets, the trust's securities can pay yields approximating those of the underlying assets (even though the only assets of the trust are Governments). If some portion or all of the guarantee needs to be honored, the ultimate return to the trust securities holder is lessened by the amount of any losses on the underlying assets (less the bank's reserve). Thus, most of the credit risk on the underlying assets is effectively transferred to the trust securities holders. Nevertheless, the originating bank continues to be exposed to some

risk if losses on the underlying assets exceed the trust's guarantee on the assets (losses out in the tail of the loss distribution).

The consultative document states that the Committee “is considering whether the senior risk should be *required* to be transferred....(emphasis ours).²⁹ Alternatively, and more “liberally,” the Committee is considering attaching a 20% risk weight (1.6% capital requirement) against the residual risk (measured as the amount of the underlying assets net of the reserve and net of the secured guarantee), provided that the guarantee equals or exceeds regulatory capital on the underlying assets. Such a treatment would be exceedingly stringent and would severely hamper or even eliminate this form of SS as an efficient device for transferring credit risk from the bank. To provide an example, suppose that the bank would establish a 1% reserve for the underlying assets whether or not the SS trust is established. Suppose further that regulatory capital for the assets is 8%, and that, if the trust is established, the Government-secured guarantee is in the amount of the first 8% of losses (beyond the reserve). We would observe that, in such a case, if the new Accord were to assess *zero* capital against the residual interest held by the bank, regulators should be indifferent between, on the one hand, holding the assets on the books, versus, on the other hand, establishing the synthetic securitization. In both cases, the probability of the bank incurring losses beyond the fully guaranteed first losses of 9% (the 8% guarantee plus the 1% reserve) are the same whether or not the securitization trust is established. Moreover, expected losses beyond capital are the same in both cases (the tail of the underlying loss distribution has not changed and the bank's exposure to the tail of the loss distribution has not changed due to the securitization). The additional 1.6% capital charge (on almost the full amount of the underlying assets) therefore seems excessive.

We might also point out that such transactions typically are structured so that the amount of the trust's “coverage” of the bank's losses on the pool of loans typically would exceed a regulatory capital requirement on the underlying assets that was set at the 99.5% confidence level. That is, to the bank conducting the synthetic securitization, the remaining most senior risk position may be on the order of AAA/AA quality – a position

²⁸ JPMorgan's BISTRO transactions first established this type of SS for commercial loans.

²⁹ “Senior risk” in this context refers to the risk retained by the bank beyond the trust's guarantee.

for which a 1.6% capital allocation is on the order of 4 times best-practice capital. Perhaps regulators could gain comfort on such transactions by requiring that the guarantee issued to the bank cover not only regulatory capital but also the level of economic capital estimated internally by the bank (at a confidence level that would imply a AA or higher soundness standard).

Finally, it should be noted that this particular form of synthetic securitization potentially could play an important role in saving a commercial bank that, for whatever reason, incurs a huge hit and, post-hit, has inadequate capital for its existing credit risk. Rather than raise additional capital in its time of trouble, the bank could bring its capital ratios (and its true soundness level) back into compliance by using this type of transaction to effectively shed credit risk. Moreover, it would be transactionally much simpler to continue to fund the underlying assets on its balance sheet rather than have to sell or traditionally securitize (without recourse) those assets. In either a sale or traditional securitization, the counterparty must raise cash to buy the assets in the full amount of their value. In a synthetic securitization, new cash must be raised only in the amount of the (secured) guarantee provided by the trust vehicle.

VI. “Well-Capitalized” Standards.

The RMA Group agrees generally with the principle that “well-capitalized” standards (above the minimum capital requirements) should be developed for each of the G-10 participants. In the U.S., for example, such requirements are encompassed within the Prompt Corrective Action standards of the FDICIA legislation. It is important to point out, however, that any well-capitalized standards above the regulatory minimums become, in effect, *the new regulatory minimums*. That is why the vast majority of banks in the U.S. must hold at least 6% Tier 1 equity and 10% Total Capital – the regulatory well-capitalized minimums.

As indicated earlier, if exposures under the IRB approach are to be completely conformed to internal best-practice measurements, and if the minimum Basel capital ratios to be multiplied by such exposures are conformed to a reasonable confidence interval (such as 99.5% or 99.7%), the multiplication of the Basel Tier 1 standard by 1.5, and the multiplication of the Basel Total Capital requirement by 1.25, would imply capital levels well beyond the equivalent of a 99.99% coverage of a properly estimated loss distribution. In other words, the application of a simple multiple to a properly-designed Basel minimum capital standard might easily convert the Basel standard into the equivalent of requiring that banks maintain a AAA++ soundness standard. This point was brought up in our earlier discussion of the setting of the Total capital requirement – as shown in Graph 1 in Section II above. That is, if the Tier 1 requirement is set in reasonable relation to best-practice economic capital estimates, then setting the Total capital requirement at twice the Tier 1 level may drive the effective soundness standard to a level that would not permit regulated banks to be competitive with the unregulated sector. Similarly, if properly constructed Tier 1 and Total capital requirements are multiplied by 1.5 and 1.25, respectively, as they are in the U.S., the resulting well-capitalized standard will also be unsustainable.

The RMA Group proposes that a solution to this problem – the setting of “well-capitalized” standards – can be found by using the same sort of treatment we are proposing for the Basel minimums themselves (under the IRB approaches). That is, whatever is the regulatory economic capital estimate for the *minimum* capital standard,

the *well-capitalized* standard could simply be calculated using a higher confidence interval than that used in establishing the minimum capital standard. For example, if the Basel Total Capital standard were developed using a 99.7% confidence interval, the “well-capitalized” Total Capital standard could be developed by using, say, a 99.8% confidence interval applied against the same underlying (regulatory-model-based) loss distribution. As discussed earlier, if the U.S. wished to use a nominal 10% Total Capital *ratio* standard for this purpose, the regulatory model would need to be run at the higher confidence interval, then a new Benchmark Asset would need to be chosen -- one for which economic capital was 10% using the higher confidence interval. All other assets would be calibrated to this “well-capitalized” Benchmark Asset by virtue of the asset’s EC as estimated by the regulatory model. In this fashion, the well-capitalized standard, even though nominally 25% higher than the minimum standard (and still absolutely higher than the minimum) could be kept to a level that was below the equivalent of, say, a double-A soundness standard.

VII. Pillar 2 – Supervisory Accreditation Procedures.

The RMA Group has already supplied Basel with its views on the important elements of the supervisory process that would be needed to accredit banks for acceptance into a Foundation or Advanced approach (see attached document).³⁰ We stand ready to assist Basel further in establishing the range of acceptable, advanced-practice techniques for estimating the inputs into the Foundation and Advanced capital calculators.

VIII. Operational Risk .

The RMA Capital Working Group does not wish to comment specifically on the issue of capital for operating risk. However, we endorse the analysis within the IIF Report of the Working Group on Operational Risk, May 2001, as well as ISDA’s “Response to the Basel Committee on Banking Supervision’s Consultation on the New

³⁰ See, “Supervisory Accreditation Procedures for a Risk-Characteristic-Based Regulatory Capital Framework,” December 2000, RMA.

Capital Accord”, May 2001. In particular, we agree with the following summary from the ISDA response:

- 1) A level of 20% of capital allocated to operational risk will generally be too high for firms, and the empirical evidence from a number of major firms is that this will be considerably too high. ISDA would suggest that this figure be used as a basis for discussion, rather than as a conclusion, and that the effects on all types of firm potentially affected by the rules be analyzed before any such conclusion is made.
- 2) The negative effect of any charge calibrated at this level is compounded by the fact that, through mechanisms such as the ‘W’ factor for certain credit risk mitigation techniques and the operational requirements embedded in the Accord, firms are effectively being asked to pay twice for operational risk.
- 3) At the same time on the issue of allocation, by charging firms in 1:1 linear proportion to the size of an underlying activity, larger firms are significantly overcharged with respect to levels of risk, with no justification given.
- 4) Nor is any allowance made for risk diversification, either within operational risk or between operational risk and market/credit risk. This too will typically hit large firms especially hard. Both forms of diversification are a significant benefit to individual firms and the financial system as a whole and in ISDA’s view it is appropriate that they should be recognized and encouraged.
- 5) Finally, it is widely recognized within financial services that many forms of operational loss will be absorbed by earnings or otherwise costed. ISDA welcomes the reference to this debate contained in the second Basel consultative paper and encourages the Committee to pursue this line of discussion.

IX. Risk Mitigation.

The RMA Capital Working Group agrees with the major recommendations within the IIF Report of the Working Group on Capital Adequacy regarding risk mitigation, as well as ISDA's response to Basel II.³¹ In particular,

- The w factor should be eliminated in that it is arbitrary and decreases incentives for banks to take on collateral.
- The range of allowable financial and physical collateral should be expanded, again to provide incentive for the use of collateral as a risk mitigation technique.

Additional views on risk mitigation, especially in the context of securities lending, can be found in a response to Basel of the RMA's Committee on Securities Lending, dated May 31, 2001.

X. Pillar 3 – Market Discipline

The RMA Group agrees with the principal of requiring increased disclosure of risk positions and risk management practices and methodologies to help promote effective market discipline in banking and capital markets. Indeed, many institutions currently disclose meaningful information, on both a quantitative and qualitative basis, about their internal processes for assessing risk and assigning capital. The RMA Group understands the need to require increased disclosure if regulatory capital requirements are based on an institution's own internal systems as has been proposed under the Advanced IRB Approach. However, the volume and complexity of the disclosures required and recommended in the Pillar 3 (Market Discipline) section of the Consultative Document could prove misleading to market investors. This is particularly the case given the wide diversity of risk measurement and management techniques in practice across the industry. As such, meaningful comparisons across firms will be difficult to achieve. The disclosure

³¹ The RMA Group nevertheless does not agree with IIF that a granularity adjustment should be eliminated, since many observers grant at least the theoretical importance of such an adjustment (even if there might arise disagreement over how such an adjustment should be made). Moreover, we do not believe that a MTM maturity adjustment should be eliminated (in favor of retaining only a Default Mode maturity adjustment) at this stage in the New Accord's development, since MTM maturity adjustments are used at several RMA Group banks.

requirements and recommendations would also be extremely burdensome for regulated banks.

Much work is underway to develop meaningful and effective disclosure standards for financial institutions. In the U.S., the Working Group on Public Disclosure, established in April 2000 by the Board of Governors of the Federal Reserve System, released recommendations on January 11, 2001. On April 26, 2001, the Multidisciplinary Working Group on Enhanced Disclosure issued a report making a number of recommendations concerning disclosures by financial intermediaries. However, both groups recognized that additional work must be done to achieve a useful set of disclosure guidelines to enhance market discipline of financial institutions. Moreover, both groups recommended that the public and private sectors work together to produce these guidelines.

The RMA Group understands that the Basel Committee will issue an interim paper outlining further its views on disclosure principals for Pillar 3 this summer. We look forward to reviewing that paper and will comment in more detail at that time.

Appendix 1

Discussion of Quantitative Impact Survey Results

This Appendix provides a perspective on the likely impact, on individual banks, of the New Accord. Seven (7) of the RMA Capital Working Group member banks provided RMA, on a confidential basis, with preliminary results of the Quantitative Impact Survey (QIS) being conducted by the Basel Committee. Several caveats are in order before reviewing the results.

- The QIS is an exceedingly complex document. As of this writing (late May 2001), there remain outstanding questions regarding the proper method for filling in some of the “cells” in the Survey. For example, data limitations (within the time frame associated with the QIS) may have prevented some banks from applying external ratings for all commercial credits when computing the capital required under the Standardized approach. Or, data on LTVs for some real estate loans may not have been available within the time frame accorded for completing the QIS. As a result, any individual bank’s response to the Survey may not be truly comparable to the responses of other banks. Furthermore, the very small sample available to us implies that statistics such as means and medians may have little meaning.
- The seven banks have credit risk portfolios that differ substantially one from the other. In part, these differences are due to differing business strategies. In part, the differences are due to the particular manner in which each bank reacted to the old Accord. It is extremely important to realize that, like the old Accord, the New Accord contains arbitrary features that are likely to influence resource-allocation decisions. Thus, the actual impact of the New Accord on absolute regulatory capital requirements will change over time as portfolios change under the influence of the less-than-best-practice features of the New Accord.

For corporate loan portfolios, the impact of the proposals on absolute regulatory capital requirements can be summarized as follows. Total Capital requirements for credit risk under the Standardized approach are higher than Total Capital requirements under

the old Accord. Total Capital requirements under the Foundation approach are significantly higher than under the Standardized approach. Total Capital requirements for credit risk under the Advanced approach are lower than Total Capital requirements under the old Accord. Finally, Total Capital requirements for credit risk under the Advanced approach are significantly higher than internal Economic Capital (computed for all three categories of risk -- credit risk, market risk, and operational risk). Individual bank results vary widely. One of the seven banks has the Advanced Total Capital requirement for credit risk being significantly higher than the Total Capital requirement under the old Accord.

For retail credits, the results also vary widely by bank. Only 4 of the 7 banks presented data to The Risk Management Association that could form the basis for comparisons of the new with the old in the retail arena. Three of the four banks have no credit card operations. For these three banks, the Standardized approach yielded about the same Total Capital requirements for credit risk as the old Accord requirements. For these three, the IRB approaches yield lower Total Capital requirements for credit risk than the old Total Capital requirements for retail products. The fourth bank, having a major credit card operation, found Total Capital for credit risk for retail products to be on the order of 8 times the level for Total Capital requirements under the old Accord! The actual amounts by which the Old and the two IRB approaches differ varies extremely widely across the four banks, making even averages essentially useless. Finally, some confusion over the proper treatment of securitization for retail products under the IRB products appears to have influenced these preliminary results (since the Securitization Sub-Committee's piece on IRB securitization treatment was not distributed to select institutions until late April).

In summary, we advise the Committee that extreme caution should be exercised when attempting to compare QIS results across institutions. We imagine that cross-bank comparisons may be even more suspect if made in the context of differing regulatory regimes.

Appendix 2

Institutions in the RMA Working Capital Group

Bank of America	Bank of Montreal
Bank of New York	Bank One
Citigroup	First Union
FleetBoston Financial	JPMorganChase & Co.
KeyCorp	PNC Financial Services Group
Providian Financial	Royal Bank of Canada
Union Bank of California	Wells Fargo

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Table 1
Corporate Credits
Median Econ. Capital at RMA banks versus Advanced IRB approach (% of exposure) -- 1 yr duration

EDF Range	LGD Intervals										
	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	
0-0.04%	0.03%	0.10%	0.17%	0.21%	0.24%	0.28%	0.32%	0.36%	0.41%	0.45%	Econ. Cap.
	0.03%	0.10%	0.17%	0.20%	0.23%	0.27%	0.31%	0.35%	0.39%	0.43%	Econ. Cap. less EL
	0.01%	0.04%	0.07%	0.10%	0.13%	0.16%	0.19%	0.22%	0.25%	0.28%	Adv. IRB Tier 1
	0.03%	0.09%	0.15%	0.21%	0.27%	0.33%	0.39%	0.44%	0.50%	0.56%	Adv. IRB Total Cap.
0.04-0.08	0.07%	0.18%	0.29%	0.41%	0.53%	0.62%	0.72%	0.82%	0.92%	1.04%	Econ. Cap.
	0.07%	0.17%	0.28%	0.39%	0.50%	0.59%	0.68%	0.78%	0.87%	0.98%	Econ. Cap. less EL
	0.04%	0.12%	0.19%	0.27%	0.35%	0.42%	0.50%	0.58%	0.65%	0.73%	Adv. IRB Tier 1
	0.08%	0.23%	0.38%	0.54%	0.69%	0.84%	1.00%	1.15%	1.30%	1.46%	Adv. IRB Total Cap.
0.08-0.16	0.13%	0.39%	0.51%	0.67%	0.85%	1.04%	1.22%	1.40%	1.59%	1.77%	Econ. Cap.
	0.12%	0.37%	0.48%	0.63%	0.80%	0.97%	1.14%	1.31%	1.49%	1.66%	Econ. Cap. less EL
	0.07%	0.21%	0.34%	0.48%	0.62%	0.76%	0.89%	1.03%	1.17%	1.31%	Adv. IRB Tier 1
	0.14%	0.41%	0.69%	0.96%	1.24%	1.51%	1.79%	2.06%	2.34%	2.61%	Adv. IRB Total Cap.
0.16-0.32	0.20%	0.58%	0.84%	1.15%	1.45%	1.77%	2.09%	2.40%	2.71%	2.95%	Econ. Cap.
	0.19%	0.54%	0.78%	1.07%	1.34%	1.64%	1.93%	2.22%	2.51%	2.72%	Econ. Cap. less EL
	0.12%	0.36%	0.61%	0.85%	1.09%	1.34%	1.58%	1.82%	2.06%	2.31%	Adv. IRB Tier 1
	0.24%	0.73%	1.21%	1.70%	2.19%	2.67%	3.16%	3.64%	4.13%	4.62%	Adv. IRB Total Cap.
0.32-0.64	0.33%	0.82%	1.36%	1.91%	2.46%	3.00%	3.55%	3.95%	4.30%	4.35%	Econ. Cap.
	0.31%	0.75%	1.24%	1.74%	2.24%	2.74%	3.24%	3.59%	3.89%	3.89%	Econ. Cap. less EL
	0.21%	0.63%	1.05%	1.48%	1.90%	2.32%	2.74%	3.16%	3.58%	4.01%	Adv. IRB Tier 1
	0.42%	1.26%	2.11%	2.95%	3.79%	4.64%	5.48%	6.32%	7.17%	8.01%	Adv. IRB Total Cap.
0.64-1.28	0.41%	1.17%	1.85%	2.55%	3.25%	4.00%	4.65%	5.15%	5.55%	5.65%	Econ. Cap.
	0.36%	1.03%	1.61%	2.21%	2.82%	3.47%	4.03%	4.43%	4.73%	4.74%	Econ. Cap. less EL
	0.36%	1.08%	1.79%	2.51%	3.23%	3.94%	4.66%	5.38%	6.09%	6.81%	Adv. IRB Tier 1
	0.72%	2.15%	3.58%	5.02%	6.45%	7.89%	9.32%	10.75%	12.19%	13.62%	Adv. IRB Total Cap.
1.28-2.56	0.70%	1.86%	3.09%	4.33%	5.57%	6.81%	8.05%	9.28%	10.30%	10.40%	Econ. Cap.
	0.60%	1.57%	2.61%	3.66%	4.71%	5.75%	6.80%	7.84%	8.67%	8.58%	Econ. Cap. less EL
	0.59%	1.78%	2.97%	4.16%	5.35%	6.54%	7.73%	8.92%	10.11%	11.30%	Adv. IRB Tier 1
	1.19%	3.57%	5.95%	8.32%	10.70%	13.08%	15.46%	17.84%	20.22%	22.60%	Adv. IRB Total Cap.

Table 1 (Continued)

2.56-5.12	1.25%	2.70%	4.23%	5.92%	7.61%	9.31%	11.00%	12.65%	13.60%	14.33%	Econ. Cap.
	1.06%	2.12%	3.27%	4.58%	5.88%	7.20%	8.50%	9.77%	10.34%	10.68%	Econ. Cap. less EL
	0.96%	2.87%	4.78%	6.70%	8.61%	10.53%	12.44%	14.35%	16.27%	18.18%	Adv. IRB Tier 1
	1.91%	5.74%	9.57%	13.40%	17.22%	21.05%	24.88%	28.71%	32.53%	36.36%	Adv. IRB Total Cap.
5.12-10.0	2.31%	4.54%	7.11%	9.57%	12.00%	14.52%	17.05%	19.00%	20.90%	23.05%	Econ. Cap.
	1.93%	3.41%	5.22%	6.92%	8.60%	10.36%	12.14%	13.33%	14.47%	15.87%	Econ. Cap. less EL
	1.47%	4.40%	7.34%	10.27%	13.21%	16.14%	19.08%	22.01%	24.95%	27.89%	Adv. IRB Tier 1
	2.94%	8.81%	14.68%	20.55%	26.42%	32.29%	38.16%	44.03%	49.90%	55.77%	Adv. IRB Total Cap.
>10.0	3.48%	8.63%	13.45%	18.80%	24.15%	28.54%	30.38%	34.46%	39.18%	44.27%	Econ. Cap.
	2.98%	7.13%	10.95%	15.30%	19.65%	23.04%	23.88%	26.96%	30.68%	34.77%	Econ. Cap. less EL
	1.73%	5.18%	8.64%	12.10%	15.55%	19.01%	22.47%	25.92%	29.38%	32.84%	Adv. IRB Tier 1
	3.46%	10.37%	17.28%	24.19%	31.11%	38.02%	44.93%	51.85%	58.76%	65.67%	Adv. IRB Total Cap.
default	7.30%	17.81%	26.52%	35.96%	45.54%	48.29%	42.48%	43.35%	42.81%	39.28%	Econ. Cap.
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Econ. Cap. less EL
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Tier 1
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Total Cap.

- 1) Median economic capital for RMA banks is the EC (at a 99.5% confidence interval) for credit risk as a % of exposure for bullet loans of the indicated term. Since RMA believes that EC should be set equal to tangible equity plus the general loss reserve, Tier 1 capital under the Advanced IRB approach is compared with EC less EL (assuming that the general reserve is equal to EL).
- 2) In calculating the implied EL, the table uses the mid-point of the EDF range and the midpoint of the LGD range.

Table 2
Corporate Credits
Median Econ. Capital at RMA banks versus Advanced IRB approach (% of exposure) -- 3 yr duration

EDF Range	LGD Intervals										
	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	
0-0.04%	0.05%	0.16%	0.27%	0.37%	0.48%	0.58%	0.67%	0.77%	0.86%	0.96%	Econ. Cap.
	0.05%	0.16%	0.27%	0.36%	0.47%	0.57%	0.66%	0.76%	0.84%	0.94%	Econ. Cap. less EL
	0.04%	0.13%	0.22%	0.31%	0.40%	0.49%	0.58%	0.67%	0.75%	0.84%	Adv. IRB Tier 1
	0.09%	0.27%	0.44%	0.62%	0.80%	0.98%	1.15%	1.33%	1.51%	1.69%	Adv. IRB Total Cap.
0.04-0.08	0.12%	0.37%	0.55%	0.76%	0.98%	1.20%	1.42%	1.63%	1.85%	2.07%	Econ. Cap.
	0.12%	0.36%	0.54%	0.74%	0.95%	1.17%	1.38%	1.59%	1.80%	2.01%	Econ. Cap. less EL
	0.09%	0.26%	0.43%	0.60%	0.77%	0.94%	1.11%	1.28%	1.45%	1.62%	Adv. IRB Tier 1
	0.17%	0.51%	0.85%	1.20%	1.54%	1.88%	2.22%	2.56%	2.91%	3.25%	Adv. IRB Total Cap.
0.08-0.16	0.27%	0.60%	0.91%	1.28%	1.65%	2.01%	2.38%	2.74%	3.11%	3.48%	Econ. Cap.
	0.26%	0.58%	0.88%	1.24%	1.60%	1.94%	2.30%	2.65%	3.01%	3.37%	Econ. Cap. less EL
	0.13%	0.39%	0.66%	0.92%	1.18%	1.44%	1.70%	1.97%	2.23%	2.49%	Adv. IRB Tier 1
	0.26%	0.79%	1.31%	1.83%	2.36%	2.88%	3.41%	3.93%	4.45%	4.98%	Adv. IRB Total Cap.
0.16-0.32	0.35%	0.85%	1.27%	1.78%	2.29%	2.80%	3.31%	3.82%	4.33%	4.84%	Econ. Cap.
	0.34%	0.81%	1.21%	1.70%	2.18%	2.67%	3.15%	3.64%	4.13%	4.61%	Econ. Cap. less EL
	0.20%	0.61%	1.01%	1.42%	1.82%	2.23%	2.63%	3.04%	3.44%	3.85%	Adv. IRB Tier 1
	0.40%	1.21%	2.02%	2.83%	3.64%	4.45%	5.26%	6.07%	6.88%	7.69%	Adv. IRB Total Cap.
0.32-0.64	0.50%	1.19%	1.84%	2.48%	3.12%	3.81%	4.51%	5.20%	5.89%	6.59%	Econ. Cap.
	0.48%	1.12%	1.72%	2.31%	2.90%	3.55%	4.20%	4.84%	5.48%	6.13%	Econ. Cap. less EL
	0.31%	0.94%	1.57%	2.20%	2.83%	3.46%	4.08%	4.71%	5.34%	5.97%	Adv. IRB Tier 1
	0.63%	1.88%	3.14%	4.40%	5.65%	6.91%	8.17%	9.42%	10.68%	11.94%	Adv. IRB Total Cap.
0.64-1.28	0.81%	1.67%	2.65%	3.75%	4.75%	5.80%	6.85%	7.60%	8.62%	9.63%	Econ. Cap.
	0.76%	1.53%	2.41%	3.41%	4.32%	5.27%	6.23%	6.88%	7.80%	8.72%	Econ. Cap. less EL
	0.49%	1.46%	2.44%	3.41%	4.39%	5.36%	6.34%	7.31%	8.28%	9.26%	Adv. IRB Tier 1
	0.97%	2.92%	4.87%	6.82%	8.77%	10.72%	12.67%	14.62%	16.57%	18.52%	Adv. IRB Total Cap.
1.28-2.56	1.49%	2.65%	4.40%	6.15%	7.90%	9.65%	11.40%	12.55%	13.55%	13.65%	Econ. Cap.
	1.39%	2.36%	3.92%	5.48%	7.04%	8.59%	10.15%	11.11%	11.92%	11.83%	Econ. Cap. less EL
	0.75%	2.25%	3.75%	5.25%	6.76%	8.26%	9.76%	11.26%	12.76%	14.26%	Adv. IRB Tier 1
	1.50%	4.50%	7.51%	10.51%	13.51%	16.52%	19.52%	22.52%	25.52%	28.53%	Adv. IRB Total Cap.

Table 2 (Continued)

2.56-5.12	2.31%	3.70%	6.15%	8.65%	11.10%	13.55%	16.00%	17.65%	19.05%	19.15%	Econ. Cap.
	2.12%	3.12%	5.19%	7.31%	9.37%	11.44%	13.50%	14.77%	15.79%	15.50%	Econ. Cap. less EL
	1.14%	3.42%	5.69%	7.97%	10.25%	12.52%	14.80%	17.08%	19.35%	21.63%	Adv. IRB Tier 1
	2.28%	6.83%	11.38%	15.94%	20.49%	25.04%	29.60%	34.15%	38.70%	43.26%	Adv. IRB Total Cap.
5.12-10.0	3.21%	6.14%	9.14%	12.40%	15.95%	19.50%	23.05%	25.30%	27.25%	30.19%	Econ. Cap.
	2.83%	5.01%	7.25%	9.75%	12.55%	15.34%	18.14%	19.63%	20.82%	23.01%	Econ. Cap. less EL
	1.67%	5.00%	8.33%	11.66%	15.00%	18.33%	21.66%	24.99%	28.33%	31.66%	Adv. IRB Tier 1
	3.33%	10.00%	16.66%	23.33%	29.99%	36.66%	43.32%	49.99%	56.65%	63.32%	Adv. IRB Total Cap.
>10.0	4.70%	10.58%	16.49%	23.09%	29.69%	30.86%	36.33%	40.43%	45.60%	51.00%	Econ. Cap.
	4.20%	9.08%	13.99%	19.59%	25.19%	25.36%	29.83%	32.93%	37.10%	41.50%	Econ. Cap. less EL
	1.93%	5.79%	9.65%	13.51%	17.37%	21.22%	25.08%	28.94%	32.80%	36.66%	Adv. IRB Tier 1
	3.86%	11.58%	19.30%	27.01%	34.73%	42.45%	50.17%	57.89%	65.60%	73.32%	Adv. IRB Total Cap.
default	7.30%	17.89%	29.15%	40.82%	49.23%	49.23%	45.75%	47.12%	47.10%	43.95%	Econ. Cap.
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Econ. Cap. less EL
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Tier 1
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Total Cap.

- 1) Median economic capital for RMA banks is the EC (at a 99.5% confidence interval) for credit risk as a % of exposure for bullet loans of the indicated term. Since RMA believes that EC should be set equal to tangible equity plus the general loss reserve, Tier 1 capital under the Advanced IRB approach is compared with EC less EL (assuming that the general reserve is equal to EL).
- 2) In calculating the implied EL, the table uses the mid-point of the EDF range and the midpoint of the LGD range.

Table 3
Corporate Credits
Median Econ. Capital at RMA banks versus Advanced IRB approach (% of exposure) -- 5 yr duration

EDF Range	LGD Intervals										
	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	
0-0.04%	0.07%	0.19%	0.32%	0.45%	0.57%	0.70%	0.83%	0.95%	1.06%	1.18%	Econ. Cap.
	0.07%	0.19%	0.32%	0.44%	0.56%	0.69%	0.82%	0.94%	1.04%	1.16%	Econ. Cap. less EL
	0.07%	0.22%	0.37%	0.52%	0.66%	0.81%	0.96%	1.11%	1.26%	1.40%	Adv. IRB Tier 1
	0.15%	0.44%	0.74%	1.03%	1.33%	1.63%	1.92%	2.22%	2.51%	2.81%	Adv. IRB Total Cap.
0.04-0.08	0.18%	0.53%	0.73%	1.02%	1.31%	1.60%	1.90%	2.19%	2.48%	2.77%	Econ. Cap.
	0.18%	0.52%	0.72%	1.00%	1.28%	1.57%	1.86%	2.15%	2.43%	2.71%	Econ. Cap. less EL
	0.13%	0.40%	0.66%	0.93%	1.19%	1.46%	1.72%	1.99%	2.25%	2.52%	Adv. IRB Tier 1
	0.27%	0.80%	1.33%	1.86%	2.39%	2.92%	3.45%	3.98%	4.51%	5.04%	Adv. IRB Total Cap.
0.08-0.16	0.35%	0.74%	1.06%	1.48%	1.90%	2.33%	2.75%	3.17%	3.59%	4.02%	Econ. Cap.
	0.34%	0.72%	1.03%	1.44%	1.85%	2.26%	2.67%	3.08%	3.49%	3.91%	Econ. Cap. less EL
	0.19%	0.58%	0.97%	1.35%	1.74%	2.13%	2.51%	2.90%	3.29%	3.67%	Adv. IRB Tier 1
	0.39%	1.16%	1.93%	2.71%	3.48%	4.25%	5.03%	5.80%	6.57%	7.34%	Adv. IRB Total Cap.
0.16-0.32	0.50%	1.05%	1.45%	2.03%	2.61%	3.19%	3.77%	4.35%	4.93%	5.51%	Econ. Cap.
	0.49%	1.01%	1.39%	1.95%	2.50%	3.06%	3.61%	4.17%	4.73%	5.28%	Econ. Cap. less EL
	0.28%	0.85%	1.42%	1.98%	2.55%	3.12%	3.68%	4.25%	4.82%	5.38%	Adv. IRB Tier 1
	0.57%	1.70%	2.83%	3.97%	5.10%	6.23%	7.37%	8.50%	9.63%	10.77%	Adv. IRB Total Cap.
0.32-0.64	0.65%	1.47%	2.12%	2.85%	3.55%	4.29%	5.07%	5.86%	6.64%	7.42%	Econ. Cap.
	0.63%	1.40%	2.00%	2.68%	3.33%	4.03%	4.76%	5.50%	6.23%	6.96%	Econ. Cap. less EL
	0.42%	1.25%	2.09%	2.92%	3.76%	4.59%	5.43%	6.26%	7.10%	7.93%	Adv. IRB Tier 1
	0.83%	2.50%	4.17%	5.84%	7.51%	9.18%	10.85%	12.52%	14.19%	15.86%	Adv. IRB Total Cap.
0.64-1.28	0.86%	2.25%	3.53%	4.75%	5.92%	7.07%	8.19%	9.28%	10.37%	11.43%	Econ. Cap.
	0.81%	2.11%	3.29%	4.41%	5.49%	6.54%	7.57%	8.56%	9.55%	10.52%	Econ. Cap. less EL
	0.62%	1.85%	3.08%	4.31%	5.55%	6.78%	8.01%	9.24%	10.48%	11.71%	Adv. IRB Tier 1
	1.23%	3.70%	6.16%	8.63%	11.09%	13.56%	16.02%	18.49%	20.95%	23.42%	Adv. IRB Total Cap.
1.28-2.56	1.62%	3.40%	5.65%	7.90%	10.15%	12.40%	14.60%	16.20%	17.50%	17.60%	Econ. Cap.
	1.52%	3.11%	5.17%	7.23%	9.29%	11.34%	13.35%	14.76%	15.87%	15.78%	Econ. Cap. less EL
	0.91%	2.72%	4.53%	6.35%	8.16%	9.97%	11.79%	13.60%	15.41%	17.23%	Adv. IRB Tier 1
	1.81%	5.44%	9.07%	12.69%	16.32%	19.95%	23.58%	27.20%	30.83%	34.46%	Adv. IRB Total Cap.

Table 3 (Continued)

2.56-5.12	2.97%	3.88%	6.15%	8.65%	11.10%	13.55%	16.00%	17.65%	19.05%	19.59%	Econ. Cap.
	2.78%	3.30%	5.19%	7.31%	9.37%	11.44%	13.50%	14.77%	15.79%	15.94%	Econ. Cap. less EL
	1.32%	3.96%	6.60%	9.24%	11.88%	14.52%	17.16%	19.80%	22.44%	25.08%	Adv. IRB Tier 1
	2.64%	7.92%	13.20%	18.48%	23.76%	29.04%	34.32%	39.60%	44.88%	50.16%	Adv. IRB Total Cap.
5.12-10.0	3.21%	6.63%	9.95%	13.23%	16.55%	19.92%	23.36%	26.86%	30.38%	33.76%	Econ. Cap.
	2.83%	5.50%	8.06%	10.58%	13.15%	15.76%	18.45%	21.19%	23.95%	26.58%	Econ. Cap. less EL
	1.86%	5.59%	9.32%	13.05%	16.78%	20.51%	24.24%	27.97%	31.70%	35.43%	Adv. IRB Tier 1
	3.73%	11.19%	18.65%	26.11%	33.57%	41.03%	48.49%	55.95%	63.41%	70.87%	Adv. IRB Total Cap.
>10.0	5.00%	11.15%	17.13%	23.98%	30.83%	33.47%	39.67%	40.43%	45.60%	51.00%	Econ. Cap.
	4.50%	9.65%	14.63%	20.48%	26.33%	27.97%	33.17%	32.93%	37.10%	41.50%	Econ. Cap. less EL
	2.13%	6.39%	10.65%	14.92%	19.18%	23.44%	27.70%	31.96%	36.22%	40.49%	Adv. IRB Tier 1
	4.26%	12.79%	21.31%	29.83%	38.36%	46.88%	55.40%	63.93%	72.45%	80.97%	Adv. IRB Total Cap.
default	7.30%	17.89%	29.42%	39.83%	50.16%	50.16%	47.16%	48.94%	49.40%	46.77%	Econ. Cap.
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Econ. Cap. less EL
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Tier 1
	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	Adv. IRB Total Cap.

- 1) Median economic capital for RMA banks is the EC (at a 99.5% confidence interval) for credit risk as a % of exposure for bullet loans of the indicated term. Since RMA believes that EC should be set equal to tangible equity plus the general loss reserve, Tier 1 capital under the Advanced IRB approach is compared with EC less EL (assuming that the general reserve is equal to EL).
- 2) In calculating the implied EL, the table uses the mid-point of the EDF range and the midpoint of the LGD range.

Table 6a
 Economic Capital for Credit Risk versus New Accord
 Median allocations, at 99.5 percent confidence level
 Retail Product

EDF range	1st Mortgages			Cards			Leasing			Student		
	EC	Tier 1	Total C.	EC	Tier 1	Total C.	EC	Tier 1	Total C.	EC	Tier 1	Total C.
0-0.16%	0.27%	0.14%	0.28%	0.79%	0.85%	1.69%	0.62%	0.69%	1.39%	0.97%	0.77%	1.53%
0.16-0.32	0.46%	0.29%	0.58%	1.36%	1.73%	3.47%	1.07%	1.43%	2.85%	1.67%	1.57%	3.14%
0.32-0.64	0.65%	0.46%	0.92%	1.84%	2.77%	5.55%	1.51%	2.28%	4.56%	2.36%	2.51%	5.02%
0.64-1.28	0.94%	0.75%	1.49%	2.38%	4.48%	8.95%	2.13%	3.68%	7.36%	3.33%	4.05%	8.11%
1.28-1.92	1.33%	1.06%	2.13%	3.04%	6.39%	12.8%	2.74%	5.25%	10.5%	4.19%	5.79%	11.6%
1.92-2.56	1.59%	1.35%	2.69%	3.57%	8.07%	16.1%	3.23%	6.64%	13.3%	4.49%	7.31%	14.6%
2.56-3.84	1.13%	1.72%	3.45%	3.95%	10.3%	20.7%	3.85%	8.50%	17.0%	4.87%	9.36%	18.7%
3.84-5.12	2.21%	2.17%	4.34%	4.76%	13.0%	26.1%	4.53%	10.7%	21.4%	5.21%	11.8%	23.6%
5.12-7.68	2.68%	2.77%	5.53%	5.47%	16.6%	33.2%	5.15%	13.6%	27.3%	5.54%	15.0%	30.1%
7.68-10.0	3.97%	3.46%	6.92%	6.32%	20.8%	41.5%	5.76%	17.1%	34.1%	5.91%	18.8%	37.6%
10.0-20.0	4.07%	4.82%	9.63%	7.71%	28.9%	57.8%	6.36%	23.8%	47.5%	6.46%	26.2%	52.3%
>20.0%	5.42%	5.74%	11.5%	10.5%	34.5%	68.9%	9.79%	28.3%	56.7%	9.33%	31.2%	62.4%

LGD mid-pt.

15.0%

90.0%

74.0%

81.5%

- 1) EC is the median economic capital calculation (at the 99.5% confidence interval) for the RMA banks responding to the December, 2000 RMA survey on retail credits.

Table 6b
Economic Capital for Credit Risk versus New Accord
 Median allocations, at 99.5 percent confidence level
 Retail Product

EDF range	Other Secured			Other Unsecured		
	EC	Tier 1	Total C.	EC	Tier 1	Total C.
0-0.16%	0.63%	0.60%	1.19%	0.90%	0.79%	1.59%
0.16-0.32	1.09%	1.22%	2.45%	1.55%	1.63%	3.26%
0.32-0.64	1.54%	1.96%	3.91%	2.19%	2.60%	5.21%
0.64-1.28	2.17%	3.16%	6.32%	3.09%	4.20%	8.41%
1.28-1.92	2.31%	4.51%	9.02%	3.67%	6.00%	12.0%
1.92-2.56	3.29%	5.70%	11.39%	4.53%	7.58%	15.2%
2.56-3.84	3.24%	7.29%	14.59%	5.14%	9.7%	19.4%
3.84-5.12	4.32%	9.19%	18.38%	5.78%	12.2%	24.5%
5.12-7.68	4.50%	11.71%	23.42%	6.30%	15.6%	31.2%
7.68-10.0	5.35%	14.64%	29.29%	6.26%	19.5%	39.0%
10.0-20.0	6.29%	20.39%	40.78%	9.75%	27.1%	54.3%
>20.0%	8.41%	24.32%	48.6%	12.35%	32.4%	64.7%

LGD mid-
point

63.5%

84.5%

- 1) EC is the median economic capital calculation (at the 99.5% confidence interval) for the RMA banks responding to the December, 2000 RMA survey on retail credits.

Table 6c
Economic Capital for Credit Risk versus New Accord
Median allocations, at 99.5 percent confidence level
Retail Product

EDF range	Home Equity low LGD			Home Equity high LGD			HELOC low LGD			HELOC high LGD		
	EC	Tier 1	Total C.	EC	Tier 1	Total C.	EC	Tier 1	Total C.	EC	Tier 1	Total C.
0-0.16%	0.45%	0.28%	0.56%	0.73%	0.70%	1.41%	0.45%	0.28%	0.56%	1.33%	0.75%	1.49%
0.16-0.32	0.77%	0.58%	1.16%	1.27%	1.44%	2.89%	0.77%	0.58%	1.16%	2.12%	1.53%	3.06%
0.32-0.64	1.06%	0.92%	1.85%	1.80%	2.31%	4.62%	1.06%	0.92%	1.85%	2.71%	2.45%	4.90%
0.64-1.28	1.33%	1.49%	2.98%	2.54%	3.73%	7.46%	1.33%	1.49%	2.98%	3.40%	3.95%	7.91%
1.28-1.92	1.52%	2.13%	4.26%	3.27%	5.32%	10.6%	1.52%	2.13%	4.3%	3.87%	5.64%	11.3%
1.92-2.56	1.63%	2.69%	5.38%	3.86%	6.73%	13.5%	1.63%	2.69%	5.4%	4.15%	7.13%	14.3%
2.56-3.84	1.87%	3.45%	6.89%	4.60%	8.6%	17.2%	1.87%	3.45%	6.9%	5.00%	9.13%	18.3%
3.84-5.12	2.34%	4.34%	8.69%	5.42%	10.9%	21.7%	2.34%	4.3%	8.7%	6.25%	11.5%	23.0%
5.12-7.68	2.93%	5.53%	11.1%	6.43%	13.8%	27.7%	2.93%	5.5%	11.1%	7.80%	14.7%	29.3%
7.68-10.0	3.53%	6.92%	13.8%	7.49%	17.3%	34.6%	3.53%	6.9%	13.8%	9.41%	18.3%	36.7%
10.0-20.0	4.60%	9.63%	19.3%	9.55%	24.1%	48.2%	4.60%	9.6%	19.3%	9.42%	25.5%	51.1%
>20.0%	5.75%	11.5%	23.0%	12.2%	28.7%	57.4%	5.75%	11.5%	23.0%	12.2%	30.4%	60.9%

LGD mid-
point

30.0%

75.0%

30.0%

79.5%

1) EC is the median economic capital calculation (at the 99.5% confidence interval) for the RMA banks responding to the December, 2000 RMA survey on retail credits.