

Supervisory Accreditation Procedures for a Risk-Characteristic-Based
Regulatory Capital Framework

RMA – The Risk Management Association

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I. Introduction and overview.

It is expected that the Basel Committee will shortly issue a new consultative paper on a proposed “Internal-Ratings-Based” iteration of the Accord. This new process for setting regulatory capital minimums for banks will rest on a participating bank’s ability to “bucket” its risk positions into specific “cells” that are differentiated according to one or more risk characteristics. In early discussions of the new Accord it was widely assumed that, at least for commercial credits, the bucketing process would be one-dimensional -- based on a credit’s internal facility or obligor rating or grade. Several observers, including the RMA Capital Working Group, provided analysis to the Basel Committee in which it was argued that the bucketing process should be at least two-dimensional, segregating assets by measured EDF (or Expected Default Frequency) and LGD (or expected Loss-Given-Default)² – and it now appears that the new proposal will incorporate these suggestions. No matter the system upon which a bucket-based Accord is structured, it is clear that only those banks that have acceptable internal processes for segregating their assets according to risk characteristics will be permitted to participate in the new framework. “Non-accredited” banks will continue to be subject to some, perhaps improved, version of the standardized, “one-size-fits-all” version of the Accord. Thus, an important issue upon which this paper focuses is the set of accreditation procedures that will be used by supervisors in each of the G-10 countries to determine whether a bank may participate in a risk-bucket-based Accord.³

¹ RMA Capital Working Group. The names of institutions and staff participating in the preparation of this paper can be found in Appendix 1.

² See RMA, “Response to the Basel Committee’s Consultative Paper on a New Capital Adequacy Framework,” March 30, 2000.

³ As indicated in several earlier RMA position papers, we believe that a risk-characteristic-based Accord, no matter how well constructed, should constitute only an interim step in moving toward a full “models-based” Accord for advanced-practice banks. Only in such a system can the elements of portfolio construction (diversification) be properly considered.

The literature on possible accreditation procedures is quite sparse, with a recent paper by William Treacy of the Federal Reserve staff being the leading example.⁴ The purpose of the present paper is to provide comment on the Treacy paper and, going further, to suggest a range of possible advanced-practices that might be considered by supervisors when establishing the procedures for accreditation.⁵

The major points made in this paper can be summarized as follows.

1. For those advanced-practice banks using a ratings-based method for estimating EDFs and LGDs, it is reasonable for supervisors to review, for purposes of accrediting the bank to use the “IRB” approach, *both* the rating process and the process of extracting EDFs and LGDs from historical, ratings-based data. However, for those banks that do not rely on their internal ratings for estimating EDFs and LGDs, the supervisory accreditation process should focus only on the EDF-LGD estimation procedures of the bank. Review of the rating systems in such banks should be considered part of the ordinary safety and soundness examination process. See Section II below.
2. Some common standards and definitions need to be agreed upon if the EDFs and LGDs estimated by accredited banks are to have roughly similar meanings. Thus, for example, a common horizon and a common definition of default, for purposes of the Accord, seem appropriate. Similarly, for EDF-LGD estimation systems based on ratings, some minimum number of rating grades (e.g., 7-10 grades) would seem appropriate and would not be burdensome on the majority of advanced-practice banks.
3. “Concentration” limits (requirements that the number of assets within one or two grades be limited to no more than x% of the portfolio) do not appear to generate any benefits under modern portfolio theory. Clearly, the lower the average weighted grade, other things equal, the higher the portfolio risk (because of the

⁴ See William Treacy, “Supervisory Standards for Internal Rating Systems,” *The RMA Journal*, November, 2000, pp. 48-53. Also see William Treacy and Mark Carey, “Credit Risk Ratings at Large U.S. Banks,” *Federal Reserve Bulletin*, November, 1998; and “Range of Practice in Banks’ Internal Ratings Systems,” *Basel Committee*, BCBS 66, January 2000.

⁵ The discussion below relates primarily to what Treacy terms an “advanced IRB” approach in which internal estimates of LGD and exposure-at-default are provided by the bank, not the supervisor.

- empirically observed positive relationship between default probability and default correlation). However, for any given average weighted portfolio EDF, there is no theoretical or empirical evidence that having “too many” assets in a particular rating grade (range of EDFs) is related to high portfolio risk (which is determined primarily by default and loss *correlations*).
4. Supervisory calls for having separate *obligor* ratings and *facility* ratings, which should reflect EDF and LGD, respectively, are not troublesome to the majority of advanced-practice banks, whose rating systems currently make this distinction.
 5. Allowable methods for estimating EDFs and LGDs, including the “model” being used and the number and nature of explanatory variables, should not be narrowly proscribed (see Section IV below). Further, we believe that no written “bright line” between acceptable and unacceptable estimation practices is likely to be equitable – both because of the complexity of the EDF-LGD estimation process and because of the pace of R&D in this arena. Only bank-by-bank examination procedures can readily exclude, or include, particular estimation practices.
 6. Advanced-practice banks should have in place, as part of the accreditation process, *validation* procedures for their risk-characteristic-estimation systems, some of which are discussed below.
 7. Supervisors themselves can participate in the overall validation process by running so-called “test-deck” exercises to measure the degree of dispersion across banks in their measurements of risk-characteristics. Such exercises would entail little marginal cost to advanced-practice banks *if* the statistical results, on an anonymous basis, are shared with the industry.

Section II below discusses the critical differences between internal rating systems and internal methods for estimating risk-characteristics such as EDFs and LGDs. Section III follows with a discussion of what might constitute the structure of an accredited internal ratings system, while Section IV concentrates on the range of practice in estimating risk characteristics, such as EDFs and LGDs, and assigning grades within a rating system. Section V deals with a range of validation

procedures and Section VI deals with remaining issues, including a “use” requirement and possible new disclosure requirements.

II. An Internal Ratings Based Approach versus a Risk-Characteristic-Based Approach.

Among the most important issues facing supervisors is whether to base the new Accord directly on internal ratings or on internally-measured risk-characteristics such as EDFs and LGDs. RMA has consistently argued that a “risk-characteristic-based” system for bucketing credits should be used, in which EDFs and LGDs are the two most important dimensions, followed by exposure (often measured by EAD or exposure-at-default) and term. We believe there are several important reasons for *not* basing the new bucket-based Accord directly on ratings.⁶

1. The issue of comparability across rating systems is raised. The RMA Group's view is that the best basis on which to gauge comparability is in terms of the rating's equivalent estimated expected default frequency (“EDF”)⁷, otherwise known as probability of default (“PD”). But why use the (obligor) rating as a *proxy* for EDF when advanced-practice (“AP”) institutions have in place a process for estimating the EDF of an asset in specific, *numerical* terms?
2. Any rating-based system, whether based on external or internal ratings, is one-dimensional -- the rating determines the capital allocation. Best-practice research, however, indicates that the determination of appropriate economic capital rests on a number of very important risk indicators; i.e., the determination of economic capital is *multi-dimensional*. We have argued that, at least initially, the new Accord should be two-dimensional, relying on the bucketing of assets into ranges of EDF and ranges of LGD. Of course, in many rating systems, the obligor rating is a proxy for EDF, while the facility rating is a proxy for LGD. Again, why use these ratings as proxies, when all AP banks assign specific numerical EDFs and LGDs to each commercial credit? Additionally, in the retail credit arena, ratings

⁶ See RMA's March, 2000 response to the June, 1999 Basle Consultative Paper.

⁷ In this paper, “EDF” refers to an expected default frequency estimated using any number of different estimation procedures. “EDF™” refers to an EDF estimated using KMV's proprietary equity-based method.

as such are not used, but, again, AP banks generally measure each credit's EDF and LGD.⁸

3. The major risk characteristics – EDF and LGD – are used by all AP banks within their credit risk models (models used to measure the credit loss probability distribution associated with the bank's portfolio of credit positions). These models, in turn, are used to estimate “economic capital” for credit risk, a statistic that is used within several important risk management functions such as pricing and profitability measurement. Indeed, differences between arbitrary regulatory capital requirements and the economic capital requirements estimated by the bank determine whether the bank needs to engage in expensive regulatory capital arbitrage – an activity that has been the impetus for the ongoing revisions to the Accord. Thus, if any bucket-based version of the Accord is to minimize the need for regulatory capital arbitrage, the buckets should be based on the same risk-differentiation practices used by those banks with the most advanced risk measurement practices. Implicit in this statement is the belief that the objectives of advanced-practice banks are aligned with those of regulators in one important aspect – measuring risk *accurately* is necessary to the pricing and management of risk, the appropriate setting of internally-desired capital levels, and the maximizing of shareholder-value-added. Regulatory capital rules, and supervisory accreditation procedures, should track the risk measurement practices at these most advanced institutions precisely because these practices are the best available.

If the bucketing scheme of the new Accord is to focus on EDFs and LGDs, it follows that the accreditation process should focus on the bank's procedures for measuring these risk characteristics, not on the internal rating system per se. Yes, it is true that, in many AP banks (including many of the RMA Group's members), the EDF and LGD measuring systems, as well as the credit risk model itself, are based on the internal ratings system. In such circumstances, the supervisor cannot accredit the risk-

⁸ Some rating systems treat the rating as being an expression of the multiplication of EDF and LGD, namely expected loss (or EL). However, the RMA Group believes that, for purposes of capital requirements, EL

characteristic measuring system without accrediting the rating system. In many of these banks, portfolio risk measurement (the credit risk model) is based on rating grades and on an estimated ratings-change probability matrix that lays out the probabilities that a loan of a given grade will migrate from that grade to a lower, or higher, grade or to default. Vended credit risk models (such as CreditMetrics™), as well as internally-built models, have been developed to employ the bank's rating system. Clearly, if the rating system is biased or prone to large but unbiased error, the supervisor should be concerned and should act accordingly.

However, there is quite a diversity of practice among AP banks and, at the end of the spectrum, there are AP banks that do not use their internal rating system at all to establish, say, EDFs or loss correlations across credits. The credit risk models of these institutions may be "name"-based rather than ratings-based (such as KMV's PortfolioManager™). No one has suggested that a ratings-based credit risk model is clearly superior to a credit risk model based on EDF groupings, obligor names, or some other bucketing method and, indeed, some of our Group's banks use both ratings-based and name-based credit risk models to "triangulate" to estimates of economic capital for credit risk. In some banks, the rating system and the risk-characteristic-measurement system are intentionally kept separate to provide a sort of "belt and suspenders" view of risk for use by the bank's credit officers. For example, an individual credit might be assigned an obligor-rating from the rating system (which is relatively subjective) as well as an EDF™ from KMV's CreditMonitor™ (for publicly-traded obligors) or an EDF from a vended or internal commercial-credit-scoring model (for private obligors). If *either* the internal rating declines *or* the externally- or internally-obtained EDF rises, the bank's risk management policy might call for intervention on the credit. For purposes of loan pricing and portfolio management, however, the bank may feel that overall portfolio risk measurement and management is optimized by using, within the credit risk model, the specific EDF estimate coming from the external or internal EDF-generation source, rather than the EDF implied by the average historical performance of loans of a given internal rating.

should be deconstructed into its components, EDF and LGD, in order to avoid lumping assets with

The RMA Group believes that this diversity of practice is a healthy indicator of the research and development efforts of advanced-practice banks. Further, the accreditation procedures embodied within the new Accord should not strive to homogenize practice, so long as there is a defined set of acceptable practices. In particular, the accreditation procedures should not force AP banks, for purposes of the Accord, to change their ratings practices to incorporate in mechanical fashion separate EDF and LGD estimates used within credit risk models. Rather, the EDF and LGD estimates used for regulatory capital purposes should be the same as those used for credit risk measurement purposes within the bank (i.e., for purposes of measuring economic capital) no matter whether economic capital is estimated via a ratings-based process or via some other acceptable process. If the AP bank estimates these risk characteristics through a process based on internal ratings, then the accreditation procedures should, for capital purposes, encompass the ratings. If the AP bank does *not* base its EDF and LGD estimates on ratings, then review of the ratings process should be a supervisory issue (for safety and soundness purposes), not an issue of establishing compliance for purposes of using a bucket-based Accord.⁹ In such cases, for purposes of the Accord, the accreditation process should focus narrowly on the EDF, LGD estimation procedures within the bank.

III. Structure of an Accredited Rating System.

There is a general agreement that a rating system should be designed in such a way as to adequately differentiate assets by their degree of risk. Thus, supervisors have said that there should be meaningful differences across grades, which in turn suggests that there should be a minimum number of grades and that, in their view, there should not be “too much” of the portfolio concentrated within any one or two grades. Additionally,

somewhat dissimilar risk characteristics into the same capital slot.

⁹ In the lexicon of the banking agencies, there is a strong distinction between “regulation” and “supervision.” The former refers to written rules that apply to all banks, such as the Basel Accord. “Supervision,” on the other hand, relates to the bank-by-bank review process that incorporates, but is not limited to, the examination (CAMELS) process. We believe that the bulk of the accreditation process should be supervisory in nature, rather than codified in regulations that are part of the formal Accord.

supervisors have said that rating systems should have both an obligor and a facility rating.¹⁰ We comment on each of these points below.

1. The minimum number of grades. As noted earlier, our discussion regarding rating systems is based on the premise that, for the bank in question, EDF and LGD estimates are based on internal ratings. In such circumstances, we have no problem with setting a minimum number of grades (e.g., 7-10 including default). However, we believe that the internal rating system must not be required to encompass, on a one-for-one basis, the supervisory classified “grades” of special mention, substandard, and doubtful – because, for many of our advanced-practice banks, the internal grading process cuts across these supervisory definitions. Requiring that the internal grading system, for purposes of the Accord, incorporate the classified buckets would therefore require that some of our banks *either* change their rating system to suit the supervisory categories *or* manage two separate rating systems, one for internal use and one specifically for the Accord.
2. “Concentration” of assets within one or two grades. We would oppose a hard and fast rule defining such concentration – e.g., one in which no more than x% of the portfolio’s exposures reside within any two grades. The issue is the granularity of the risk-characteristic system and that is a major reason why we recommend that internal ratings per se not be used, but rather that numerical EDF and LGD estimates be used. Such numerical estimates are inherently continuous, and therefore, perfectly granular. “Concentration” results only from the observer (the supervisor) defining, say, too broad a range of EDFs (cell-width) for purposes of the Accord. Furthermore, there is no theoretical or empirical evidence that high portfolio risk is associated with high numbers of assets within a particular range of EDFs. Of course, the higher the average-weighted EDF of the portfolio the thicker is the tail of the loss distribution (because of the positive relationship between default correlation and EDF). But, for a given average EDF, portfolio risk is high only when too many assets have high default or loss correlations – an issue not addressed at all by a bucket-based Accord as opposed to a models-based

¹⁰ See Treacy, *op. cit.*

- Accord. Thus, a rule-of-thumb regarding percentages of assets held in a particular grade or grades should be used, at best, as a flag requiring further analysis, rather than conclusive evidence of poor risk management or poor risk measurement.
3. Separate obligor and facility ratings. We do not see this as a major issue since most of our advanced-practice banks currently rate both the obligor and the facility. The issue, rather, is that the bank should estimate separately EDFs and LGDs rather than just an expected loss rate (EL) for each asset. The original RMA response to the June, 1999 Consultative Paper provided a discussion on this subject in which it was pointed out that two assets with identical ELs could have different economic capital allocations. This might occur, for example, because the asset with the higher LGD could have a higher attributed LGD volatility.¹¹ But while all might agree on having separate EDF and LGD characteristics measured for each loan, does this mean that the rating system *must* have a separate rating for obligor and facility. Again, the focus should be on the EDF-LGD estimation process, not the ratings system, per se. For example, an AP bank might have only an obligor rating, meant to convey an EDF range, while assigning a specific numerical LGD to each asset regardless of its obligor rating (EDF). What purpose would be served by requiring such banks to group LGD estimates into specific ranges associated with (new) facility ratings?

The discussion above highlights our major concern – that regulators will require advanced-practice banks to make significant changes to their rating systems in an attempt to achieve a certain homogenization – without having any real benefit with regard to an equitable application of a new bucket-based Accord. By focusing on the bank’s EDF-LGD estimation processes, rather than the rating system itself, this concern can be alleviated.¹²

¹¹ As noted in the March, 2000 RMA response, this phenomenon holds only within certain ranges of LGD. At very high LGD levels, LGD volatility might be very low (e.g. at a 100% LGD, volatility is zero).

¹² We presume further that the Basle Committee would not wish to have a formal regulation regarding, say, the estimation of LGDs in which facility characteristics (such as collateral, seniority, etc.) would predetermine the LGD estimate. Each AP bank should be permitted to use its own experience (i.e. its own track record on the work-outs of defaulted loans) when estimating LGDs.

IV. Methods for Assigning Grades and/or Measuring Risk Characteristics.

There are many issues the risk analyst must consider when designing and implementing either an internal rating system or a system for assigning numerical EDFs and LGDs to credits, or both. In order for a bucket-based Accord to provide comparability across institutions, it is understandable that certain features of the EDF-LGD measurement system need to be homogenized – such as a common horizon and a common definition of default. This should not be confused, however, with requiring that these same common features be found in all internal rating systems. Below we list the important structural elements of ratings systems and discuss how each type of element – horizon, explanatory variables, etc. – might reasonably differ between a rating system and a system for estimating EDFs and LGDs. As always, we argue that, for purposes of setting minimum capital requirements, it is the EDF and LGD estimation process that is critical, not the rating system per se.

1. Horizon. The word “horizon” as it applies to ratings may generate some confusion, and it is important to make a clear distinction, when using the term, between the ratings process and the EDF-estimation process. With regard to ratings, advanced-practice banks use a variety of effective “horizons” within their rating systems. Some banks use a “point-in-time” horizon in which the rating, at any point, is set to reflect, say, a one-year horizon (i.e., the probability that the obligor will default over the next 12 months). Others use a “through-the-cycle” or “cycle-neutral” rating in which, although EDFs may rise and fall over the cycle, the rating remains constant over the cycle. For such banks, the “horizon” of the rating has little or no meaning. Still other banks use a “modified through-the-cycle” system in which “highly-cyclical” obligors are assigned a “through-the-cycle” rating while cycle-insensitive credits are assigned a rating that is meant to imply a fixed, short-to-medium-term horizon.

Regardless of their treatment of “horizon” within ratings, each advanced-practice bank can be expected to produce an EDF estimate over a 1-year horizon for purposes of its economic capital measurements. Indeed, almost all vended and

internal credit risk models are set up to use a one-year horizon. Thus, applying a one-year horizon for purposes of the Accord would not force AP banks to change their credit risk models or run parallel models when the Accord migrates to a full-models framework. Moreover, one year seems to be an adequate horizon over which to assess capital adequacy, since banks could make strategic changes, including raising new equity if necessary, over a one-year time period. Forcing all rating systems, however, to adhere to a one-year horizon, as suggested by Treacy,¹³ could be costly, since most such systems have evolved over time and the banks have become quite comfortable with the ratings in that each loan officer knows exactly what is meant when one obligor is rated, say, a “3” and another a “4.” Moreover, changing the rating system to mirror exactly the process for estimating EDFs, in those banks in which the two processes differ, would dilute or eliminate the “belt and suspenders” aspect of risk measurement mentioned earlier.

2. Definition of default. Here again it makes sense, for purposes of estimating EDFs and LGDs, to use a common definition of default for capital adequacy purposes. Some observers have expressed concern that a too narrow definition of default would bias downward the estimated EDFs and we are sensitive to this concern. However, each of our member banks uses a fairly expansive definition -- and it should not prove insurmountable to achieve industry/regulatory agreement on an appropriate definition.¹⁴
3. Independent variables to be considered in estimating EDFs. Internal rating systems, despite the diversity of practice, tend to use similar, long lists of variables that the rating officer must assess when arriving at the rating. These variables can be grouped into several categories, including obligor financials (earnings, leverage or coverage, etc.), management quality and other qualitative factors, industry and tier position of the obligor, financial statement quality

¹³ See Treacy, *op. cit.*, p. 50. To be fair, Treacy says only that “the rating should thus be *consistent* with a one-year view of the borrower’s risk of default based on currently available information” (emphasis ours).

¹⁴ Moreover, we should note that, although individual banks may use a less expansive definition of default (thus resulting in lower EDFs, in general, for its assets), such banks may also compute higher LGDs than other banks. That is, the more expansive the definition of default, the greater the chance that assets defined as “defaulted” will not incur significant economic losses in default.

(especially for private companies), country factors (if country risk is not separately measured and assigned economic capital), etc. Similarly, facility ratings all tend to use the same set of variables, including collateral, subordination, etc. Where rating systems might differ substantially is in the ranges of acceptable values associated with each variable to be consistent with a particular rating. Put another way, banks may differ in the “weighting” of each variable when arriving at the ratings.

Similarly, EDF estimation processes, when they are based on processes other than the ratings, often are similar across banks and use similar independent variables. Nevertheless, there is sufficient diversity to warrant a caution that “forced homogenization,” in the context of a new bucket-based Accord, could stifle ongoing research in the arena of estimating risk characteristics such as EDFs. In particular, we do not believe that, as part of the Accord, regulators should proscribe any particular list of “acceptable” *variables* for inclusion within either ratings systems or EDF-LGD estimation systems. It is much more effective, in our view, to require that advanced-practice banks be eligible for a bucket-based Accord only if their risk-characteristic estimation processes fall within a *range* of acceptable practices and if the banks have instituted an ongoing research and validation program that assures that risk measurement processes remain “advanced.” See discussion immediately below.

4. Acceptable methods for setting ratings. It is reasonable for supervisors, in the context of the new Accord, to define a range of acceptable practices for estimating EDFs and LGDs. It is also reasonable for supervisors to define a range of practices for establishing internal ratings – although, as mentioned earlier, we do not believe that this latter set of restrictions needs to be applied for purposes of the Accord so much as for general supervisory purposes. We begin with a listing of acceptable practices for establishing ratings. Following that is a discussion of acceptable practices for measuring EDFs, LGDs, and exposures.

Ratings systems can be grouped into four major categories:

- “Spreading” systems in which well-documented guidelines are established for evaluating each type of independent variable (e.g., obligor financials), but in which the rating officer has some discretion in arriving at the final obligor rating. All of our Group’s members use such systems when establishing internal ratings, either alone or in combination with the other methods in the list.
- Statistical scoring models (internal or vended) in which the “weights” given each variable are fixed and determined by statistical analysis of historical default data.
- Equity-based methods (for public obligors) such as KMV’s CreditMonitor™.
- Combinations of the three methods above.

None of our members use statistical scoring models or equity-based methods exclusively when arriving at ratings. However, some of our members use such statistical methods exclusively when arriving at EDF estimates. The use of a combination of methods for arriving at ratings is consistent with supervisory admonitions to use “all relevant information” when setting ratings.¹⁵ The issue of EDF estimation, however, is somewhat more complex than the issue of setting ratings – see below.

5. EDF estimation. Like the rating systems, EDF-estimation processes can be grouped into several categories:
 - Based on the internal ratings, in which historical default (migration) databases are used to establish the mean default rate for obligors of a given rating.
 - Based on the internal ratings, in which historical mean default rates of bonds of a given rating (mapped to the internal ratings) are used.

¹⁵ See Treacy, op. cit., p. 50.

- Estimated by scoring models (including internal models or vended models such as Moody's RiskCalc™ or KMV's PrivateFirmModel™).
- Estimated via equity-based methods.
- Combinations of the methods above.

EDF estimation represents one of the most active research areas within advanced-practice banks and within the financial consulting firms that service these banks. Despite the fact that risk-measurement as a discipline has existed for more than two decades, new procedures and new databases are being developed more or less continually. For this reason, it would be unwise for regulators to restrict the range of practice, so long as each bank's practice is acceptably robust. Further, we do not believe that a written regulation can define a "bright-line" between acceptable and unacceptable practice in this arena – both because of the complexity of the EDF estimation process and because of ongoing R&D that will continuously expand the frontiers of acceptable practice. Only bank-by-bank examination procedures can reasonably exclude or include practices.¹⁶ For example, as discussed in Section V below, supervisors can use benchmarking exercises to help them gain comfort with how each institution fits within the spectrum of acceptable practices.

6. LGD estimation. Within the commercial lending arena, LGD estimation can take on fairly simple forms, such as a calculation of mean loss rates for defaulted loans of a given set of facility characteristics, or more complicated procedures such as formal LGD estimation ("scoring") equations. Data on which these calculations are made can include internal, historical LGD data as well as industry data such as are found within certain oft-quoted studies.¹⁷ Often, the choice of internal LGD data, as opposed to the use of industry statistics, is driven by how long the bank

¹⁶ As we have noted in the RMA response to the original Basel Consultative Paper, the differences among G-10 countries with respect to the bank-by-bank examination process are problematic. In the context of a bucket-based Accord, in which a bank-by-bank accreditation process is necessary, these examination differences become paramount. We would not wish to see a set of accreditation procedures that constituted a "least-common-denominator."

has had in place an historical data collection effort for commercial loan losses. In this regard, we agree with Treacy's view that "banks need to enhance their data-collection efforts on their historical loss experience."¹⁸ However, it should be perfectly acceptable for a bank to rely primarily on industry data, perhaps "tying" such data to less-than-perfect internal data, while the institution is "waiting" for more years of loss performance to accumulate within the internal database.

LGD estimation within the retail credit arena, like EDF estimation, within that arena is limited by data availability. On the one hand, retail credit default and loss databases may contain many thousands of defaulted accounts. On the other hand, the historical default and loss data may not be available in a machine-readable format back through a long period of time (i.e., back through the last recession).¹⁹ Again, industry-wide data, perhaps used in conjunction with limited internal data, should suffice, until longer-dated, and more comprehensive, internal databases are developed.

As in the estimation of EDFs, a "one-size-fits-all" written accreditation standard is less desirable than a flexible, supervision-based process. However, certain broad parameters can certainly be agreed upon. For example, we agree with Treacy that LGD should be measured as economic loss -- not necessarily accounting loss -- taking explicit account of discounting (cost of carry), administrative and workout costs, etc.

7. Exposure estimation. Like LGD estimates, exposure-at-default (EAD) estimates may vary according to the databases of the individual banks.²⁰ Such differences may reflect, moreover, differences in the way in which credit lines are managed by the banks or differences in the nature of the contracts that underlie credit lines.

Within the commercial credit arena, a typical assumption is that EAD is a constant

¹⁷ See Elliot Asarnow and David Edwards, "Measuring Loss on Defaulted Bank Loans: a 24-Year Study," *Journal of Commercial Lending*, March, 1995; also see a proprietary study by PMD, a risk consulting firm.

¹⁸ Treacy, *op. cit.*, p. 51.

¹⁹ See RMA's "Credit Risk Capital for Retail Credit Products: A Survey of Sound Practices," December, 2000.

²⁰ Banks without acceptable EAD data might rely, in the commercial credit arena, on proprietary work by PMD or the study by Elliott Asarnow and James Marker, "Historical Performance of the U.S. Corporate Loan Market - 1988-1993", *Journal of Commercial Lending*, Vol. 10, no. 2, Spring 1995, pp. 13-32.

percentage of the line, regardless of initial rating, although this constant percentage may vary across banks. This assumption, while simple, may be quite acceptable (i.e., internal or external studies may have borne out the assumption). Thus, like the estimation of the other risk characteristics, EAD estimation should be acceptable under a fairly wide range of practice, provided that the bank can document the estimation procedure and the underlying database.

V. Validation procedures.

A. Internal validation procedures. Quite apart from the supervisory accreditation procedures associated with the Accord, advanced-practice banks should have in place ongoing validation procedures for their own risk-characteristic-estimation processes. We see these validation procedures rising in importance as the Accord moves from fairly simple bucket-based processes, through more complex bucket-based processes, to a series of models-based iterations. Moreover, we believe that appropriate internal validation procedures – regarding the estimation of risk characteristics – should be the primary process through which advanced-practice banks satisfy their standing as an “accredited” institution for purposes of any advanced bucket based Accord. Having such procedures in place is not only good business practice but also can help avoid having regulators establish “one-size-fits-all” accreditation procedures.

Many AP banks are just now beginning to devote significant resources to the validation process, but such procedures are relatively straightforward and one can expect that within, say, a year or so, such procedures will be commonplace among the larger, more complex institutions. Validation procedures can cover both the risk-parameter estimation process – the process of estimating EDFs, LGDs, etc. – as well as the estimation of economic capital (the output of credit risk and other risk models). Several examples are given below.

1. Out of sample testing. If a formal scoring model is being used to establish EDFs, for example, the predictive power of the model can be tested by applying it to a sample of defaults and non-defaults not used to estimate the parameters of the model (a so-called “hold-out” sample).

2. Model comparisons. A model or equation used to estimate risk characteristics can be compared with an alternative model. For example, “cumulative accuracy profiles” (power curves) may be used to compare a spread-the-numbers ratings method with a pure scoring model.²¹ In the credit risk model arena, two or more models can be run using the same parametric inputs, with the resulting loss probability distributions compared side by side. Differences between the two models (in terms of the thickness of the bad tail) should be explainable in terms of the construction differences between the two models. At a minimum, this type of analysis helps the risk measurement team understand model differences. Going further, such “horse-races” can be helpful in triangulating to a solution for economic capital allocations.
3. Benchmarking surveys. Advanced-practice banks may conduct “test-deck” exercises (on an anonymous basis) to see how each institution’s EDF, or other risk-characteristic, estimates compare with those of its peers. Recent work by the RMA Capital Working Group indicates that such test-deck exercises are valuable and can be made to work, even if the common pool of credits being tested contain credits that are not held within the portfolios of the participating institutions.²²
4. Pricing tests. One useful method for testing the economic capital model of the bank, as well as the risk-characteristic inputs to the capital model, is to see how market yields on assets match up with those suggested by the internal pricing models that employ the economic capital estimate (RAROC-based pricing models). Pricing models that produce yields well above (below) market yields suggest too high (low) economic capital estimates, which in turn may suggest too high (low) EDF estimates.
5. Development of new, shared databases. Various statistical tests, including those discussed above, can prove more robust the more extensive and diverse is the database on which the statistical tests are conducted. RMA members, for example, are participating in the development of a shared database on LGD and

²¹ See Moody’s, “Benchmarking Quantitative Default Models,” 2000.

²² See, RMA, “EDF Estimation: A Test-Deck Exercise,” The RMA Journal, November, 2000.

EAD. Over time, as more defaults are added to this database, industry best-practice estimates of LGD and EAD will become more refined.²³

B. Supervisory validation procedures. No matter how much work the industry does to validate its internal risk-characteristic-measuring systems, supervisors will wish to conduct their own validations. So long as such supervisory validations are conducted in the spirit of finding better and best practices, we do not oppose such work. We are opposed, however, to using the results of such research to impose homogenization of industry practice for purposes of the Accord. As stated above, a dispersion of practice among banks, all of which are meeting *acceptable practice* standards, is a healthy indicator that individual banks are conducting R&D that will expand the frontiers of practice.

Earlier RMA research makes clear that “test-deck” exercises, especially, can perform a useful role in validating risk measurement practice. Supervisors could conduct such exercises, perhaps in the context of Shared National Credits, to satisfy their own needs to establish the range of acceptable practice. We would ask only that the results of test-deck exercises (in terms of median, means, and quartile-break-points) be shared with the participants so that, from the point of view of good business practice, the banks do not have to bear the expense of replicating supervisory surveys.

VI. Risk Management and Other Issues.

In any internal rating system, as well as in the process for estimating EDFs, LGDs, and other risk characteristics, the advanced-practice banks should follow well-established procedures for documenting the risk measurement process, maintaining the integrity of the ratings and risk-characteristic-estimation processes, and providing for a system of checks and balances. We therefore agree with Treacy’s assessment regarding the need for

²³ We should note that supervisors are in a unique position to collect comprehensive, anonymous data regarding loss experience at regulated entities on a voluntary basis. Thus, it may prove advantageous for supervisors to work with industry groups to build on the data collection efforts undertaken so far.

strong internal controls. These controls are well documented within supervisory manuals and within recent supervisory papers, and do not need to be repeated here.²⁴

Treacy and other observers, however, have brought up two additional issues on which we feel the need to comment.

1. A “use” requirement for ratings and risk-characteristic estimates. In this view, an important element of the “validation” process is to be assured that the bank is actively using its risk measurements within its business practices, thereby resting the bank’s fortunes, at least to some extent, upon its own internal risk measurement process. We find such a requirement, within the context of the Accord, to be quite acceptable, because it is in line with best-practice maximization of shareholder-value-added. We would go further to say that the major reason for investing in improvements in risk measurement is to achieve the value-maximization of the banking firm – more accurate measurement of risk is tantamount to a reduction in risk. For this very reason, however, supervisors, when deciding on acceptable risk measurement practices should err on the side of including a full range of practices ratified by the market, including everything ranging from spread-the-numbers ratings-based EDF measurement systems to pure equity-based EDF measurement systems.
2. Increased disclosure associated with a bucket-based Accord. Treacy and others have suggested that another requirement for participation in an “advanced” bucket-based Accord is increased disclosure regarding risk measurement systems. We can see that, at a minimum, banks participating in such a regulatory system would have to disclose the percentages of their portfolio within each of the regulatory buckets, much as is now done for the relatively few buckets within the current Accord. We can also see that the bank would need to provide some description of its risk-characteristic-measurement system – the process it uses to bucket its assets within the cells prescribed by the new Accord. However, the issue of increased disclosure of risk positions and risk measurement techniques in

²⁴ See, for example, SR-98-25, “Sound Credit Risk Management and the Use of Internal Credit Risk Ratings at Large Banking Organizations,” Federal Reserve, September 21, 1998, and BCBS 75, “Principles for the Management of Credit Risk,” Basle Committee, September, 2000.

order to improve *market discipline* is a separate concern from that of the disclosure necessary to implement a new Accord.

While we agree that increased market discipline is desirable, advanced practice banks have concerns over the potential costs of the expanded disclosure associated with such increased discipline. In particular, we would want to minimize the potential for competitive harm stemming from new disclosures, as well as the potential for misuse or misinterpretation of additional risk data. Additionally, advanced-practice banks must be able to retain the competitive advantage associated with R&D breakthroughs in the field of risk measurement – for such competitive advantage constitutes a major incentive for engaging in risk measurement research. We await the deliberations of the Shipley Committee before providing additional comment in this regard.

Appendix 1
Participants in this RMA paper

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Citigroup: James Marker, Vice President, GCIB Risk Architecture; Jay Newberry, Vice President, GCIB Risk Architecture; Phillipp Burroughs, Vice President, GCIB Risk Architecture.

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FleetBoston Financial: Lori Deane, Risk Manager, Portfolio Management; James Gertie, Executive Vice President, Debt & Equity Capital Markets; Rob McDougall, Managing Director, Office of the Senior Lending Officer; Ranga Rangarajan, Managing Director-Mgt. Sciences, Corporate Strategies; Joseph Loughane, Risk Manager, Portfolio Management.

KeyCorp: Ashish K. Dev; Senior Vice President, Head of Capital Allocation & RAROC; Robert Kula, Vice President, Head of Consumer Capital Allocation.

PNC Financial Services Group: Shaheen Dil, Senior Vice President, Portfolio Development Group; Terry Jewell, Vice President & Manager, RAROC and Profitability.

Royal Bank of Canada: Lyn McGowan, Senior Manager, Portfolio Management Methodology; David McKay, Vice President, Portfolio Management.

Union Bank of California: Peter R. Butcher, Executive Vice President & Chief Credit Officer; David I. Matson, Executive Vice President & Chief Financial Officer; Richard P. Kozlow, Executive Vice President, Corporate Risk Management; Paul C. Ross, Senior Vice President, Portfolio Risk Management; Edward J. Chittenden, Vice President, Financial Planning & Analysis.

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