A Critique of the Advanced Measurement Approach to Regulatory Capital Against Operational Risk

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Abstract

The advanced measurement approach (AMA) proposed by the Basel Committee to calculate regulatory capital against operational risk is problematical because there is no consensus on what constitutes this approach, because its implementation is difficult, and because it is unlikely to pay off in terms of costs and benefits. It is argued that there is no obvious reason why the AMA would produce lower capital charges than the less sophisticated approaches, and that the development of internal models of operational risk should not be motivated by regulatory considerations.

Keywords: Advanced Measurement Approach, Operational Risk, Basel 2.

Introduction

One of the proclaimed innovations of the Basel II Accord is the advanced measurement approach (AMA) to the calculation of regulatory capital against operational risk. The underlying idea of the AMA is that banks use their internal models to estimate regulatory capital, which would align it with economic capital, thus eliminating any incentive for regulatory arbitrage. While the development of internal models and the implementation of the AMA require significant resources, it is typically suggested that the incentive for banks to use the AMA is that it produces lower capital charges than the much simpler basic indicators approach (BIA) and the standardised approach (STA).

The proposition that the AMA produces lower capital charges than the BIA and STA constitutes a debatable topic rather than an undisputed fact of life. Moreover, the views expressed by regulators, the financial institutions that are supposed to implement the approach, and observers (academics and otherwise) are so diverse that there does not seem to be a consensus on what the AMA is all about. While expressions and descriptions pertaining to the AMA like “let a thousand flowers bloom” and “the AMA is a laboratory” are meant to imply flexibility of the approach, it is more likely that they indicate a lack of consensus on what constitutes the AMA. But it is not only that the AMA is not well defined, because even if there were a consensus on what it was, serious problems are associated with its implementation. And even if these problems are circumvented in due course, it is not clear at all whether or not adopting the AMA for regulatory purposes is appropriate and whether or not it pays off in terms of costs and benefits from the perspectives of banks and customers.

The objective of this article is to present a critique of the AMA. To be in the spirit of the Basel II Accord, this critique is portrayed to hinge on three pillars: (i) the lack of consensus on what constitutes the AMA; (ii) the problems of using the AMA to measure regulatory capital; and (iii) the appropriateness, costs and benefits of the AMA. These pillars will be discussed in turn.

What Constitutes the AMA?

An examination of the literature reveals a wide range of views on what constitutes the AMA. Specifically, disagreements are apparent on the following points: (i) the listing of the techniques that appear under the banner of the AMA; (ii) whether these listed techniques are used separately or jointly to calculate regulatory capital (that is, whether they are independent alternatives or complementary procedures); and (iii) whether some techniques are different versions of the same procedure or completely different (that is, the extent of overlap amongst these techniques). The three points will be discussed in turn, starting with the first one.

Descriptions of the AMA differ considerably. Alexander (2003) and Peccia (2004) effectively consider the AMA to be the loss distribution approach (LDA), as Alexander views the internal measurement approach (IMA) as a different version of the LDA, whereas Peccia mentions scenario analysis as providing “ad hoc patches” to the LDA. The listing of three headings, by adding to the LDA the scenario-based approach (SBA) and the scorecard (or the risk drivers and controls) approach (SCA) is adopted by Andres

and van der Brink (2004), Davies (2005), and by Haubenstock and Hause (2006). The BCBS (2001a) lists only two headings: LDA and IMA, which is the view adopted by Bee (2006). But the BCBS (2001b) adds to the list the scorecard approach. In BCBS (2003) scenario analysis is added as a procedure that may "form the basis of operational analytical framework".

Some authors, including Chernobai and Rachev (2004), Kalyvas et al (2006), Reynolds and Syer (2003) and Kuhn and Neu (2005) exclude the SBA from the listing, claiming that the AMA encompasses the LDA, IMA and SCA. Fujji (2005), on the other hand, talks about the LDA and SCA only. Finally, there is the view of "let a thousand flowers bloom", adopted by those who play it safe and argue that any internal methodology is part of the AMA, which makes one wonder about the inconsistency between the words "any" and "advanced". For example, Chapelle et al (2004) argue that the AMA encompasses all measurement techniques that lead to a precise measurement of the exposure to operational loss and that the AMA could encompass any proprietary model. One may, therefore, wonder about the "correct" listing of the items that constitute the AMA. No-one seems to know for sure, and this is why Nash (3003) describes the AMA as being "not a single approach that banks can take and adopt". "Felxibility" could be the name of the game here, but Nash (2003) correctly argues that treating the AMA as a "laboratory in which banks can test and develop approaches to operational risk quantification…. places a great burden on supervisors to verify and accept banks' approaches to operational risk".

Consider now the second point of whether the techniques listed under the AMA are treated as separate, independent and alternative methods for calculating regulatory capital or that they are used jointly as complementary procedures. One view is that the only AMA is the LDA, because the IMA is only a version of the LDA (Alexander, 2003) or because supplementing historical data with soft data from scenario analysis and scorecards is a futile exercise (Peccia, 2004). This view can be justified on the grounds that only the LDA has adequate level of sophistication and objectivity to deserve the characterisation of being “advanced”.

The second view is that the LDA (which depends on internal and perhaps external data) is the main AMA, whereas the other techniques are used to supplement the historical data required to implement it. This view is held by Haubenstock and Hardin (2003), who argue that the LDA utilises internal and external data but it involves additional steps, including the development of scenarios for stress testing and incorporating scorecards and risk indicators.

The third view is that the LDA, SBA and SCA are alternative independent techniques that can be used separately to estimate regulatory capital. The justification for this view rests on the proclaimed difference between the LDA (as a backward-looking approach) and the “forward-looking” SBA and SCA, which may provide viable alternatives to the LDA in the absence of adequate historical data. In this sense, both the SBA and SCA can be used to generate the total loss distribution as stipulated by Fujii (2005) and Kuhn and Neu (2005), respectively. The view that these are three alternatives seems to be held by

Andres and van der Brink (2004), Fujii (2005), Haubenstock and Hause (2006), Reynolds and Syer (2003), Kuhn and Neu (2005), and Kaiser and Kohne (2006). Andres and van der Brink (2004) list the three approaches then describe the SBA as a separate approach that has its own merits. Davies (2005) lists the three approaches, emphasising the importance of using a "forward-looking model", most likely implying the use of SBA and SCA as alternatives to the LDA. Fujii (2005) argues that the SBA provides solutions to some of the problems of the LDA. Hausebenstock and Hause (2005) suggest that the LDA may be used for the whole firm, whereas scorecards can be used for business lines (which they call a hybrid approach). Kuhn and Neu (2004) use "or" to indicate that the procedures are substitutes, stating that "the AMA depends on internal or external data or expert opinion", where expert opinion effectively implies the use of SBA and/or SCA. Kuhn and Neu (2005) argue that "the LDA and SCA are very similar as both approaches are based on a statistical VAR-model". Kaiser and Kohne (2006) list, as "three main types of approaches" the LDA, SBA and SCA.

The fourth view is that all of the techniques are used jointly to calculate regulatory capital without there being any "principal technique". This view seems to be held by Currie (2004), Alderweireld et al (2006), Kalyvas et al (2006), Nash (2003), Rao and Dev (2006), and Kaiser and Kohne (2006). The BCBS (2003) seems to hold both the views that the SBA and SCA can be used to supplement the data used by the LDA or that they can be used separately. Currie (2004) argues that the AMA involves the use of a combination of internal and external data, scenario analysis, and bank-specific environment and internal controls (the last two items refer to the SCA and SBA,

respectively). Alderweireld et al (2006) argue that using all of the techniques is necessary to meet the “supervisory soundness standards”. Kalyvas et al (2006) seem to share the same view, arguing that it is a “must” for firms to use all of the approaches. Nash (2003) describes the AMA as a “laboratory”, pointing out that “it is not a single approach that banks can take and adopt”. Rao and Dev (2006) list what they call the “four distinct components” that constitute the AMA: internal data, external data, scenario analysis and internal control and business environmental factors. However, they also state that “scenario analysis can be used as the predominant method of the quantitative computation of capital or to supplement data points in the LDA”. Kaiser and Kohne (2006) refer to the “AMA models”, which utilise internal data, external data and scenario analysis.

Although the BCBS (2003) seems to hold both the views that the SBA and SCA can be used to supplement the data used by the LDA or that they can be used separately, there is a different tone in the Basel II document (BCBS, 2004), which appears to reflect the view that all approaches should be used jointly. This is evident by the extensive use of the word “must” in relation to the user of internal data, external data, scenario analysis, and business environment and internal control factors. On page 147 of the document, it is stated that “in addition to using [internal and external] loss data, whether actual or scenario-based, a bank’s firm-wide risk assessment methodology must capture key business environment and internal control factors that can change its operational risk profile”.

The third of the three points raised earlier about what constitutes the AMA pertains to the distinction between the LDA and IMA and between the SBA and SCA. Bee (2006), for example, argues that the "AMA is subdivided into the IMA and LDA" on the grounds that they are two different procedures. It is arguable that the two procedures are different because the IMA, which is the extrapolation of the internal-ratings based (IRB) approach to the case of operational risk, is much easier to implement than the LDA. Another difference is that the IMA is used to estimate unexpected loss by relating it to expected loss, whereas the LDA is used to estimate unexpected loss from the total loss distribution. However, Alexander (2003) argues that the IMA is rooted in the LDA in the sense that it provides an analytical solution to a problem that is dealt with by using Monte Carlo simulations in the LDA. Likewise, Frachot et al (2001) view the IMA as "an attempt to mimic LDA through a simplified, easy-to-implement way". The BCBS (2001a), however, makes a distinction between the two approaches by stating that the LDA will not be available at the outset of the Basel II Accord, and that the AMA will be the IMA. The LDA is described by the BCBS as a "more advanced version of the internal methodology" and that if and when the LDA is used, some provisions will make it easier to implement (correlations will not be considered and the structure of the business lines and event types will be determined by the bank itself).

As far as the difference between the SBA and SCA is concerned, some authors mention the two approaches separately, either directly (for example, Andres and van der Brink, 2004; Davies, 2005) or indirectly by using the terms "scenario analysis" and "business environment and internal controls" (for example, Currie, 2004; Alderweireld et al, 2006;

Rao and Dev, 2006). Other authors mention one of the approaches only (for example, Chernobai and Rachev (2004) and Fujii (2005) mention the SCA only). But some authors, such as Kuhn and Neu (2004) lump the two approaches under “expert opinion” or “expert knowledge”. The underlying idea here is that both the SBA and SCA are used to generate (subjective) data by asking people (the experts) direct questions about what is likely to happen, the sources of risk and the effectiveness of controls. Since there is no reason why scenario analysis cannot incorporate information on the business environment and risk controls, there is no reason why the two approaches cannot be lumped under “expert opinion”.

The Problems of Implementing the AMA

Let us for the sake of the following discussion assume that there is an agreement on what constitutes the AMA, such that it comprises three separate approaches: the LDA (which depends on historical internal and external data), SCA and SBA (which depend on hypothetical data generated from “expert opinion”, either on the basis of scenarios or an evaluation of the risk drivers, indicators and controls).

Before considering the drawbacks of the three approaches separately, there are problems associated with the implementation of AMA in general. To start with, both the LDA and SBA (and the SCA, as some would argue) can be used to calculate regulatory capital by constructing a total loss distribution (based on historical data and scenario analysis, respectively) and measuring value at risk (VAR) at a certain percentile. The VAR methodology has been criticised severely as a measure of risk in general terms and in

relation to operational risk in particular. For example, Daneilsson et al (2001) argue that VAR is a misleading measure of risk when the returns are not normally distributed, which is particularly the case with operational risk. Furthermore, VAR does not measure the distribution or the extent of risk in the tail, but only provides an estimate of a particular point in the distribution. In their criticism of the Basel II Accord, they also argue that the Basel Committee has chosen poor-quality measures of risk when better measures are available (clearly, this criticism refers to VAR). As far as operational risk is concerned, Hubner et al (2003) argue against using a "VAR-like figure" to measure operational risk, stipulating that although VAR models have been developed for operational risk, questions remain about the interpretation of the results. Another problem is that VAR figures provide an indication of the amount of risk but not of its form (for example, legal risk as opposed to technology risk).

Another general criticism of the AMA is directed at the notion of "internal models". Herring (2002) argues that internal models are insufficiently reliable to replicate the approach (initially designed for market risk) to operational risk. This point has been raised by the Shadow Financial Regulatory Committee (2001), Altman and Saunders (2001), and Llewellyn (2001). He also criticises the AMA on the grounds that the approach "requires multiple pages of preconditions that most institutions could not be expected to meet for years".

Let us now turn to the problems encountered in the implementation of the LDA. Aue and Kalkbrener (2007) argue that the application of the LDA to the quantification of

operational risk is a difficult task, listing the three problems of (i) shortage of data, (ii) the context-dependent nature of operational risk, and (iii) lack of a strongly risk-sensitive exposure measure in operational risk modelling. By far the most serious problem is that of data, with which we start the discussion.

Muzzy (2003) highlights the data problem by arguing that “anyone venturing into operational risk management has quickly learned that the process is doomed without robust data”. But then he describes the gathering of operational loss data as “a high-wire act with no safety net”. Danielsson et al (2001) argue that the nature of rare high-severity losses renders them very different from the loss data available on market risk and credit risk. Allen and Bali (2004) suggest that operational risk databases tend to suffer from under-representation of low-frequency, high-severity events. Haas and Kaiser (2004) note that low-frequency, high-severity events, which by definition are much less likely to occur, are often kept confidential (therefore, unreported or misclassified under credit or market risk losses). Pezier (2003) argues that the data that banks are asked to collect is defined in an arbitrary manner, one-sided and incomplete and therefore incapable of being assessable into a meaningful whole. In a survey, Raft International (2002) found out that only a minority of banks collect internal loss data in a systematic way and that subscription to external databases seems to be motivated solely by the desire to appear compliant with the Basel quantitative standards for using the AMA. Chernobai et al (2006) believe that all statistical approaches become ad hoc in the presence of incomplete data (because the estimation process will be affected) and that any density misspecification and/or incorrect estimation procedure would lead to biased estimates of

the distribution parameters, which in turn would result in misleading estimates of expected and unexpected losses. This is particularly the case in the presence of censored and/or truncated data.

One solution to the data availability problem is to augment internal data with external data on the operational losses incurred by other firms. This solution, however, is daunted by the problems of appropriateness (to account for differences in business structure) and scaling (to account for differences in size). Pezier (2003) casts considerable doubt on the usefulness of external operational loss data, arguing that that the mere recording of a loss amount in one firm cannot be translated mechanically into the probability and severity of loss in another firm. Likewise, Peccia (2004) argues by saying that pooling data should be done only for firms that share the same risk factors (business activity, size, business environment and control environment). Frachot and Roncalli (2002) put forward the view that mixing internal and external severity data is "almost an impossible task" because no one knows which data generating process is used to draw external severity data. They further argue that merging internal and external data gives spurious results that tend to be over-optimistic regarding the actual severity distribution. The scaling of external data is problematical because it is not clear if an increase in the scale of operations results in a proportional increase in operational risk, not to mention that it is not clear how to measure size. Shih et al (2000) have shown that little of the variability in operational losses can be explained by the size of a firm (revenue, assets, number of employees, etc).

A related problem arises from the cyclicality of risk and loss events. Allen and Bali (2004) suggest that extrapolating the past to measure future risk may be flawed if there are cyclical factors that impact operational risk measures. Historical data on operational risk gathered during an economic expansion may not be relevant for a period of recession. Loss events incorporate cyclical components that are correlated with systematic risk factors such as macroeconomic fluctuations and regulatory shifts.

Yet another problem is the assumption to be made about the correlation of operational loss events. Frachot et al (2004) cast doubt on the validity of the proposition that operational risk losses occur simultaneously, describing it as being “rather dubious and hardly supported by empirical evidence”. They also argue that common sense suggests that operational risk events are uncorrelated. Kaiser and Kohne (2006) express the view that a simple summation of high percentile VARs implies that worst-case scenarios occur simultaneously. If the proposition of perfect correlation across risk types and business lines is accepted, the capital charges assigned to risk type and/or business lines should be summed, probably leading to a higher capital charge than what is produced by the BIA and STA. However, it is difficult to assess the level of correlation between different risk types and/or business units because of the lack of historical data. Powojowski et al (2002) put forward the view that although some correlation exists between operational losses, modelling this correlation is not an easy task. A further correlation-related problem is that the assumption to be made about correlation would invite subjectivity and bias to achieve the objective of minimising regulatory capital against operational risk. This last point will be discussed later on.

A particular data problem is the limited data points at the tail of the loss distribution, which makes the estimation of VAR at the 99.9^{th} percentile (as required by Basel II) impossible. Wei (2007) makes this point explicit, stating that "while many banks have adequate data for modelling the body of the distribution, few have sufficient internal data to estimate the tail distribution". The extreme value theory (EVT) has been suggested to deal with this problem as it can be used to predict the probability of events that have never happened, which can be done by extrapolating the stochastic behaviour of past events. EVT, according to Cruz (2003), is very useful for measuring operational risk when the experience with very large losses is limited or non-existent. This claim, however, does not seem to be supported by Embrechts et al (2004) who argue that EVT cannot predict exceptional operational losses. In Embrechts et al (1997), it is stated very clearly that EVT is not "a magical tool that could produce estimates out of thin air".

Further criticism of the EVT is due to Hubner et al (2003) who describe as a "myth" the ability of EVT to make an important contribution to the assessment of exceptional operational risk. While EVT has been successful in describing extremes of physical processes, where a theory gives some indication about the underlying distribution and the observations are iid, Hunber et al argue that any attempt to apply EVT to a small set of unrelated operational losses in different firms around the globe is "another triumph of wishful thinking over reason". Pezier (2003) describes what he calls "extreme value simulation" as a "blind approach", giving as an example the difficulty of extrapolating what happened to the Titanic (a combination of rare events) to a modern ocean liner.

Mignola and Ugoccioni (2006) tested the applicability of EVT to operational risk data and found that the use of EVT could lead to a substantial oversestimation of the risk figures.

Turning now to the “expert opinion”-basaed SBA and SCA, the main shortcoming of which is subjectivity. Rowe (2004) cites a risk management specialist arguing that psychological research reveals the existence of a number of systematic biases in people’s subjective attempts to evaluate probabilities”. Peccia (2004) argues that there is a problem here because the experts typically have little or no experience in the low-frequency, high-severity events. The “expert opinion”-based data tends to be subjective because it is provided by employees who are under scrutiny and have little incentive to be forthcoming. Rebonato (2007, p 45) argues that if an “expert” is held responsible when things go badly under his watch, but not correspondingly rewarded if things turn out to be better than expected, it is not difficult to imagine in which direction his predictions will be biased. There is simply nothing “advanced” about these “unadvanced” approaches.

“Expert opinion”-based data is not even useful when combined with internal and external data for the purpose of estimating the total loss distribution. For example, Rao and Dev (2006) describe as a “difficult task” any attempt to incorporate the effect of qualitative scores on the estimated capital or on the frequency and severity distributions in the LDA. They also argue that there is no valid means of adjusting capital for scorecard information except in an ad hoc manner because of the absence of any theoretical foundations for

such a procedure. A similar view is expressed by Peccia (2004) who describes scenario analysis in relation to the LDA as “ad hoc patches”.

Alexander (2003) makes it explicit that “scorecard data are very subjective”, listing a number of reasons why this is so. To start with, the industry standards for key risk indicators that should be used for each risk type have not been developed, which makes the choice subjective. The second reason is that given a set of risk indicators, frequency and severity scores are usually assigned by the “owner” of the risk, invariably leading to subjective bias. Furthermore, the scores are typically mapped in a subjective manner to monetary loss amounts, particularly in the case of human risks (inadequate or failed people or management processes). Finally, there is the problem of assessing expected frequency and expected severity quantitatively from scores that are typically qualitative. Haubenstock and Hause (2006) identify the source of subjectivity in scorecard data as the selection and weighting of the scoring factors. Apart from subjectivity, they argue that the SCA is not suitable for evaluating tail events, which the regulators are most worried about.

Similar problems are associated with scenario analysis. Haubenstock and Hause (2006) identify the problems of qualitative input, sensitivity to assumptions, and the difficulty of getting consistent and credible estimates across business lines. They further argue that using the SCA demands significant resources, as it requires the participation of a broad range of senior managers to understand the scenarios that could impact the firm. The last problem is equally applicable to the SBA.

The Costs and Benefits of the AMA

We have seen from the discussion in the last section that the implementation of the AMA, if at all possible, is rather difficult and expensive, particularly because there is more than one reason to believe that the output (the estimated capital charge) would be of suspicious quality. This view is expressed quite frequently in the operational risk literature by many authors. For example, Davis (2005, p 1) argues that the implementation of the AMA "could easily turn into a nightmare". Hughes (2005) expresses the view that "the challenge on the operational risk side has turned out to be vastly more complex and elusive than originally envisaged". So, the question that arises is the following: is the AMA viable in terms of costs and benefits?

To answer this question, let us list the proclaimed benefits of the AMA as suggested by Herring (2002), who himself is rather skeptical of the AMA (actually of Basel II as a whole). The anticipated benefits of the AMA are: (i) it would reduce or eliminate incentives for regulatory arbitrage since the capital charge would reflect the bank's own estimate of risk; (ii) it would deal in a more flexible manner with financial innovations, incorporating them in the regulatory framework as soon as they are incorporated in the bank's own risk management models; (iii) it would provide banks with an incentive to improve their risk management processes and procedures in order to qualify for the AMA; and (iv) compliance cost would be reduced to the extent that the business is regulated in the same way that it is managed. Moreover, The BCBS (2004) suggests that if banks move from the BIA along a continuum towards the AMA, they will be rewarded

with a lower capital charge. These perceived benefits of the AMA rest on the following propositions:

1. Aligning regulatory capital with economic capital is a good idea.
2. Internal models are relevant and conducive to sound risk management.
3. An incentive to use the AMA is that it produces a lower capital charge than the BIA and STA.

Let us discuss these propositions in turn. To start with, is it a good idea to align regulatory capital with economic capital? And is it another good idea to regulate banks in the same way as they are managed? Not necessarily, says Rebonato (2007) who argues against these ideas on the grounds of differences between regulators and risk managers. While regulators are concerned about catastrophic events (represented by the 99.9^{th} percentile of the loss distribution), managers are concerned about aspects of risk management other than the avoidance of rare events (for example, the daily risk-return trade-off). Risk mangers, he argues correctly, should not do things the same way as the regulators. If we accept the logic of this argument, then the proclaimed novelty of the AMA of aligning regulatory capital with economic capital is not novelty, but rather malpractice. Regulatory capital is supposed to protect banks from catastrophic events, whereas economic capital is what is needed to run banks efficiently.

Linking the development of internal models to improved risk management is a dubious proposition. Peizer (2003) casts doubt on the proposition that the AMA is conducive to better operational risk management. Rebonato (2007, p xvi) argues that “although the

quantitative approach remains the high route to risk management, a lot of very effective risk management can be done with a much simpler approach", describing the latter as being "a measurable and meaningful approximation to the quantitatively correct answer". In particular, Rebonato is skeptical about the ability of risk managers to move from the probabilistic assessment of risk to decisions. He also argues against the use of internal models for the purpose of meeting regulatory requirements. Even more important, the argument goes, regulators should not force banks to devote resources to the development of internal models to calculate "numbers of dubious meaning" for regulatory purposes. The recommendation is: keep it simple or let banks decide whether or not they want to develop internal models.

Now we examine the proposition that the use of the AMA leads to a lower capital charge. To start with, this is indeed a problematical feature of Basel II because only large, internationally-active banks will be allowed to use the AMA. This means that the perception that the AMA produces lower capital charges leads to the belief that Basel II will boost the competitive advantage of big banks relative to that of small banks. This is indeed one reason why the U.S. has decided to delay the implementation of Basel II, as small U.S. banks complained that the Accord would put them in a weak competitive position relative to large banks.

But then, why would the AMA produce a lower capital charge than the BIA and STA? One suggested reason is that relaxing the assumption of perfect correlation among business lines and event types will reduce the capital charge. This reduction, however,

will be relative to the capital charges produced under the assumption of perfect correlation, and not necessarily relative to the capital charge produced under the BIA and STA. Moreover, the assumption of less-than-perfect correlation will not be allowed initially, even under the LDA. In BCBS (2001a) it is suggested that “current industry practice and data availability do not permit the empirical measurement of correlation across business lines and risk types”. However, the Basel document (BCBS, 2004) allows, subject to supervisory approval, “the incorporation of a well-reasoned estimate of diversification benefits”, which would be “factored in at the group-wide level or at the banking subsidiary level”. This is hardly a guarantee that the AMA will produce a lower capital charge than the BIA or STA.

Another suggested reason is that the AMA takes into account risk mitigation such as insurance. However, there are stringent conditions that have to be satisfied before the effect of insurance can be incorporated in the calculation of the capital charge. Furthermore, many problems are associated with the use of insurance to mitigate operational risk that curb the tendency to use it for this purpose. It could be that the AMA would produce a lower capital charge because the latter is calculated on the basis of the unexpected loss only. But this is not clear, and what is clear is that the capital charge is calculated as the basis of the unexpected loss if the underlying banks can demonstrate that the expected loss is adequately captured in the internal business practices, in which case regulatory capital is meant to cover the unexpected loss only (BCBS, 2004, p 144).

Finally, a lower capital charge would result under the IMA if the gamma factors (relating unexpected to expected loss) are calibrated in such a way as to "ensure that there is a systematic reduction in capital required by the Internal Measurement Approach compared to the Standardised Approach" (BCBS, 2001a). This sounds so subjective because it means that calibration is carried out to reduce capital requirements as opposed to coming up with an accurate representation of the true relation. It will also put banks using the STA at a disadvantage because the calibration of the betas is not motivated by the desire to reduce capital charges. But then calibrating gammas in such a way as to ensure lower capital charges does not work with the other "advanced approaches" that have no gammas (that is, approaches other than the IMA).

Yet another reason why the AMA would produce lower capital charges is that if it takes into account risk controls and the quality of the risk management systems in the construction of internal models, banks using this approach will have proportionately lower capital requirements. But this is not necessarily the case. Pezier (2003) casts doubt on the assumption of linearity between size and exposure to operational risk but in the opposite sense, questioning the proposition that larger firms are expected to have better operational risk management and hence they should be subject to less operational risk.

It seems, therefore, that the AMA would produce a lower capital charge only because any internal model can be manipulated in a large number of ways to produces the lowest possible capital charge. It is subjectivity rather than anything else that may produce lower capital charges. Banks adopting the AMA will strive to construct an internal model that

produces the lowest possible capital charge by letting “one thousand flowers bloom” and by experimenting extensively in the “laboratory” of the AMA. For example, Kalyvas and Sfetsos (2006), who consider the issue of whether the application of “innovative internal models” reduces regulatory capital, find that the use of extreme value theory produces a lower estimate of VAR than the variance-covariance, historical simulation and conditional historical simulation methods. Banks not eligible to use the AMA will not have this luxury, and this is why they will not be happy. It is true that the internal models have to be approved by the regulators. With respect to correlations, for example, the BCBC will allow the use of certain correlation assumptions (which will reduce regulatory capital) if it can be demonstrated that these assumptions are “soundly determined and implemented with integrity”. However, it is not that difficult (by employing top-notch statisticians) to make the internal model that produces the lowest regulatory capital acceptable to the regulators.

Concluding Remarks

Whether or not operational risk should be regulated, as required by the Basel II Accord and otherwise, is a controversial issue, as there is significant skepticism about the role of regulation as a means of achieving financial stability. For example, Kaufman and Scott (2000) argue that regulatory actions have been double-edged, if not counterproductive. Koehn and Santomero (1980) suggest that regulation does not necessarily accomplish the declared objective of reducing the probability of bank failure and that a case could be argued for the proposition that the opposite result can be expected. In a particular reference to Basel II, Danielsson (2003) argues that while the notion of the sensitivity of

bank capital to risk is intuitively appealing, the actual implementation of the Basel II Accord may boost financial risk for individual banks and the banking system as a whole.

But given the special importance of banks, some sort of regulation may be warranted, and holding capital against operational risk is a proposition that has some merits. What is not a good idea is the use of the AMA for this purpose, the idea of requiring banks to develop internal models to align regulatory capital with economic capital. We have seen why this is a bad idea: not only that the implementation of the AMA is problematical, regulating banks in the same way as they are managed is not right because regulators and managers have different objectives. The AMA has already brought complaints from small banks, but this does not mean that large banks are happy about it either, despite the carrot of lower capital charges. There are reports that large (particularly U.S.) banks are not happy about the AMA because it is too complex and expensive. They have also expressed dismay that they should be told what to do by the Basel Committee, complaining that small banks will be in a better position because they will not have to allocate resources to the development of internal models.

It could be that banks view the development of internal models less favourably when the objective is regulatory compliance (when they are told what to do and how to do it) as opposed to risk management. Pezier (2003) argues that banks have natural incentives to improve the quality of their risk management, which means that they will develop internal models if they feel that these models are conducive to better risk management (which is a debatable issue, anyway). In a particular reference to the AMA, Davis (2006)

conveys a message from several executives (whose firms are at the forefront of the development of the operational risk discipline) who insist that implementing the AMA should never be a mere compliance exercise.

If banks themselves believe that modelling operational risk is useful for non-regulatory purposes, they would strive to develop operational risk models, just like they develop exchange rate forecasting models and model-based trading rules. What is important in this case is that banks should not be told to develop these models in a way that is acceptable to the regulators. If banks want to allocate resources to the development of these models, because they believe that these models are useful for the running of their business, then this means that the banks believe that the models are effective in terms of costs and benefits. Banks would not complain about the development of models if it is their choice, but they would if they are told that this is something that must do and that they should do it in a certain way. This is precisely the attitude of some large American banks, which is understandable.

Some may be justified to think that the Basel Committee is probably telling us that, without sophisticated internal models, banks will fail and we (as bank customers) will lose our money. As a bank customers, I think that I will be better off taking that chance than having banks passing to me (and other customers) the costs of developing internal models, which will do nothing better than any basic method to determine the amount of regulatory capital. It is doubtful if the AMA, which is a great intellectual exercise, is feasible in terms of costs and benefits.

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