Institute and Faculty of Actuaries

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

11 October 2013

Dear Sirs,

The regulatory framework: balancing risk sensitivity, simplicity and comparability

Introduction

The Institute and Faculty of Actuaries (IFoA) welcomes the opportunity to respond to the discussion paper 'The regulatory framework: balancing risk sensitivity, simplicity and comparability' issued by the Basel Committee on Banking Supervision in July 2013. This response has been provided by members of the IFoA who work in banking and risk management.

Executive Summary

The IFoA believes the main points for consideration are:

- Basel II/III calculations are not overly complex; the complexity arises from the contexts in which they are used.
- Internal statistical models for different banks will naturally show variation in tail risk metrics due to legitimate differences in how the models are calibrated.
- Models often fail in circumstances against which they were designed to safeguard i.e. in crises and extreme market movements. However, it should be noted that these failings are often due to wider risk management failures to correctly identify risks and/or to appreciate the extent of the risks.
- Internal models, although imperfect, encourage banks to identify, understand and monitor their risks. The capability of internal models for regulatory capital management encourages banks to invest in them, while regulatory scrutiny improves the rigour of the models. Better internal models should lead to a better understanding of risks and improved decision making, which better identify the key factors affecting solvency.
- Leverage ratios have been perceived as a useful additional measure and as a candidate for a regulatory metric. However, their value as a better *post hoc* predictor of the crisis may be due to changes in risk based figures in the run up to the current financial crisis.
- The IFoA has concerns that leverage ratios may impose excessive capital requirements on banks, the costs of which will ultimately be borne by consumers; there are consequences of too much capital as well as too little. The IFoA is also concerned that leverage ratios may inhibit risk management and distort pricing decisions, thus increasing risk in the banking system.
- Among the ideas offered in Section 5 of the discussion paper, the IFoA believes that increased disclosure of the results from using internal models for risk-weighted assets (RWA) would give the greatest potential benefit.

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- For capital requirements to have meaning, it is important that the asset and liability picture to which they relate is realistically assessed. The IFoA recognises that there is a certain amount of process requirement already in place for this, but would suggest that some form of expert sign off for bank provisions would be a good long term ambition.
- The IFoA would suggest using the alternative approach for internal models as used by insurers and the IFoA would welcome the opportunity to discuss with you how aspects of those models might be useful in addressing challenges encountered by banks in using internal models.
- The IFoA does not support the notion of abandoning internal models because of their complexity.

Detailed Response

The IFoA response has three sections: the first section addresses the IFoA's general remarks on complexity, model risk, internal models and leverage ratios; the second answers the specific questions asked in Section 6 of the discussion paper; and the final section comments in more detail on potential ideas to improve simplicity and comparability as set out in Section 5 of the discussion paper.

1. General remarks

1.1 Complexity vs. simplicity

In general, the IFoA is in favour of keeping regulatory capital requirements as simple as possible, provided these recognise the underlying risk profile of banks and other financial institutions. The IFoA recognises that banking operations can be intrinsically complex; complexity in regulatory requirements may be necessary to reflect the underlying business. Thus the IFoA does not believe simplicity should be pursued for simplicity's sake, rather one should seek *parsimony* in terms of basing requirements on the simplest models of risks that are a good approximation to the underlying risk profile. Often model complexity is spurious, but simple models that do not capture risks properly are dangerous, as they give rise to a misleading picture of risk profile. Regulatory requirements based on a misleading picture can frequently distort pricing and risk management decisions, as risk and capital requirements will not be fully aligned.

The IFoA notes that very simple calculations lie at the heart of the Basel II framework. Two specific examples of those calculations are:

- The standardised approach to credit risk is simply a percentage of assets times a risk weighting, varying by credit rating and asset type, with pro rata adjustments for risk mitigation; and
- The standardised approach for operational risk is a percentage of gross income varying for different business lines.

The IFoA believes that these are simple yet pragmatic calculations which broadly reflect risk, though given the diversity of assets, products, risk management techniques and countries covered by the Basel standards, it is inevitable that the standardised approach will be unsuited to some products and portfolios.

The complexity of the current framework comes from adapting these simple calculations to different product lines, asset structures and credit risk management techniques, for example securitisations. Qualitative and quantitative requirements for internal models also add to the complexity of the framework, though the option of using internal models may help address circumstances where the standardised approach would be unsuitable for a specific portfolio.

1.2 Model Risk – General

The Committee notes in paragraphs 30 and 61 that RWA figures from internal models display substantial variation. The IFoA considers that such variation is inevitable. A wide range of statistical models can be fitted to a given dataset, yet there is no specifically correct answer as to which model is best. A correspondingly wide range of model results could have equal validity. This is a common feature of the modelling of rare events. It is not a fault of the modellers; it arises because of the necessarily limited datasets.

The IFoA has conducted research into the wide range of results from different statistical models. The IFoA's Benchmarking Stochastic Models Working Party investigated the effects of fitting different statistical distributions to 40 years of MSCI UK equity return data. The 99.5th percentile of the fitted distributions ranged from under -35% for a Lognormal distribution to -75% for a Pearson IV distribution. The research also noted differences in results depending on the data used, and wide confidence intervals around the fitted parameters and corresponding distribution values[1].

In modelling risks, there is intrinsic uncertainty as to which type of model to use; the method of calibrating that model; and the dataset used in calibration. Subjective expert judgement in the choice of model and method is unavoidable, especially when the future experience might be judged to differ from that of the recent past[2]. It follows that different banks are likely to have different internal models and hence, capital requirements for the same risk. Yet the different models and capital figures could be equally valid. The use of expert judgement has to be supported by enhanced validation and governance, for example, by means of regular and explicit consideration of alternative assumptions and rigorous stress testing exercises.

1.3 Model risk and the financial crisis

With hindsight, it is clear that neither banks' risk models, nor regulatory capital requirements, properly reflected the risks building up in the financial system prior to the current financial crisis. In the context of risk sensitivity, it is worthwhile considering the key flaws in models exposed by the crisis.

Perhaps the most significant flaws relate to liquidity risk. While capital is generally not seen as a mitigant for liquidity risk, models used for economic and regulatory capital often make implicit assumptions regarding liquidity. Models may have been based on the flawed assumptions that financial markets would continue to be deep and liquid, enabling the trading away of exposure; or that short-term funding could always be rolled over. When markets seized up, banks often had to sell at "fire sale" prices to reduce exposure and/or raise cash to meet commitments. Even if not resulting in forced sales, wider market maker spreads will have added to trading costs. The resulting losses were generally not anticipated by models or regulatory capital requirements, but more importantly, it is clear there were wider liquidity risk management failings given the liquidity crisis experienced by banks. The losses were a manifestation of a wider liquidity crunch in the market.

In the case of CDOs, there has been criticism of the Gaussian copula typically used to model correlations between bond defaults. A more complex copula is usually prescribed to address this supposed failing, but the IFoA suggests that the key failing of models, was that they did not reflect increasing concentration in sub-prime bond issues. In 2000, sub-prime mortgage backed securities

[1] See section 6.6 of "Modelling Extreme Market Events" (Frankland et al, 2008) – http://www.actuaries.org.uk/research-and-resources/documents/modelling-extreme-market-events

[2] For a good discussion of model risk, we would recommend the IFoA's Extreme Events Working Party paper: "Difficult Risks and Capital Models" (Frankland et al, 2013) – http://www.actuaries.org.uk/sites/all/files/Difficult%20Risks%20and%20Capital%20Models%202013%20PRINT%20VERSION.pdf

comprised on average 5% of the reference portfolios of structured credit CDOs[3]. By 2007, this exposure had risen to 36% on average, with further implicit exposure through other CDOs within the reference portfolio; the average exposure masked some CDOs that were almost entirely comprised of sub-prime or related exposure. This highlights the importance of risk management, which should have identified such a material change in risk profile, and model governance which should have ensured that models were updated to reflect the increased correlation.

For market risk, aside from the "fire sales" previously mentioned, there may be two other reasons why trading book losses were far heavier than anticipated. Firstly, market risk models were calibrated to data from the benign market conditions that had existed prior to the onset of the crisis. Secondly, while the regulatory capital requirement was expressed in terms of a 10-day VaR, many banks had to retain their positions for longer than this period due to the seizure of markets, leaving them at the mercy of falling markets. Amendments to Basel II requiring calculation of VaR based on stressed market conditions may address the first issue, but there may be a case for considering a longer holding period to address the second[4].

In summary, the financial crisis exposed many failings in risk models and in regulatory capital. For the most part, the flaws were not due to risk models *per se*, but rather to more basic failings in risk identification and management. The IFoA believes that there is little justification for increased complexity in models and regulatory capital as a result of the crisis. Model flaws exposed by the crisis could be addressed by simple adjustments to existing formula (e.g. adjusting the timeframe of the VaR) and, more importantly, by ensuring robust risk management and model governance practices were in place to identify risks and update models accordingly.

1.4 Internal models and regulatory capital

The discussion paper notes a number of weaknesses of internal models. The IFoA suggests the additional idea that there is a "double jeopardy" from using the same model for regulatory capital and internal purposes, such as pricing and risk management. If the internal model misses, or underestimates risk, then not only will regulatory capital be too low, but the bank will also be likely to make poor decisions in terms of accepting and retaining that risk. The IFoA believes this double jeopardy to be the critical weakness of basing regulatory capital on internal models.

Conversely, the IFoA believes the alignment of regulatory capital with pricing, risk management and economic capital to be the greatest strength of the internal model approach. Permitting internal models to be used for regulatory capital provides an added incentive to invest in these models and keep them up to date. Subjecting the models to regulatory scrutiny as part of the internal model approval process will also help to put the models on a more robust footing. Both the investment and the scrutiny will provide benefits in terms of the quality of internal models and decision making based on them. Ultimately the best guard against insolvency is robust pricing and risk management practices (large capital buffers may count for nought if risk is not property understood and priced).

As well as fostering more robust internal models and helping to promote sound risk management and decision making, the IFoA believes that regulators would gain from a better understanding of the banks they regulate through the review of internal models. Examining internal models can give insights into a bank's business model; for example, an optimistic assumption about future house price growth used in an internal model for both pricing and regulatory capital may explain why a mortgage lender is undercutting its peers and has an aggressive mortgage lending strategy. This may be

[3] See Table 2, "The Story of the CDO Market Meltdown: An Empirical Analysis" (Barnett Hart, 2009).

[4] Multiples of VaR may implicitly address this but it may be simpler to consider a 3-month or 1-year VaR calculation than a multiple of the 10-day figure. Also, if all available historic data was used (e.g.FTSE100 date going back to 1984) as opposed to say just one year's worth, then there may not be a need for a separate stressed VaR calculation as the data would include stress periods.

justified, but if not, the regulators will not only be able to refuse an internal model application, but they will also know that the bank's business model is based on inappropriate assumptions.

If internal models are no longer to serve as a basis for determining regulatory capital, there will be less incentive to invest in internal models so that they better reflect risk. Regulators' scope to review and challenge internal models would also be reduced. This would restrict the insights they could gain from internal model review and would be more likely to have an adverse impact in terms of model scrutiny and rigour. For this reason, the IFoA believes breaking the link between regulatory capital and internal models would be an unhelpful step.

1.5 Leverage ratios and other capital floors

Capital can be split into two components:

(a) Economic capital required to absorb losses arising from risks crystallising at a desired confidence level; and

(b) Frictional capital, covering any excess of regulatory capital requirements over (a).

Capital has a cost and the cost of capital to cover (a) may be viewed as the economic cost of risks being run, with the latter a frictional cost.

The IFoA recognises that regulatory capital proved inadequate to absorb the losses of many banks during the crisis. With hindsight, it was insufficient to cover the risks banks were running. The IFoA recognises the benefits from increasing capital requirements. However, as noted, capital has a cost, and this cost is generally passed on to consumers in the form of poorer terms for financial products. Increased capital requirements should not be pursued for their own sake, but to provide better coverage of the risks being run. Excessive regulatory capital requirements relative to risks will impose an unnecessary frictional cost on consumers. Regulatory capital requirements that are not proportionate to risk could lead to distortions in risk management and pricing.

It is in this context that the IFoA expresses reservations over leverage ratios. They can be a blunt tool and may impose excessive capital requirements on low risk businesses. Alternatively, if the ratio is set too low, they may impose insufficient requirements relative to risk (although this should be addressed by the risk-based element of regulatory capital requirements).

Leverage ratios might also inhibit risk management; if for instance, risk mitigation would not bring any capital benefit due to the application of the ratio. Leverage ratios may also distort pricing decisions if they result in the same capital requirements for a low risk, low return product line compared to a higher risk, higher return line. The lower economic cost of risk on the former would be offset by a higher frictional cost as capital requirements are equalised to reach the leverage ratio. This may push banks towards higher risk, higher return product lines.

On this point, it is noteworthy that one of the drivers behind the growth in US sub-prime lending in the run up to the financial crisis was the higher margins available compared to prime lending[5]. With hindsight, it is clear that the extra risk associated with sub-prime was not factored in appropriately, but going forward, equal capital requirements could lead to a similar focus on high risk, high return products. Consequently, the response to the current crisis may lay the seeds for the next one.

Another objection to the leverage ratio is that it may act as a disincentive to adopt internal models, particularly for low risk lines, given that the internal model result is likely to be overridden by the

[5] See for example the example of Option Adjustable Rate Mortgages on pages 106-109 of the US Financial Crisis Inquiry Commission report, February 2011.

leverage ratio requirement. From section 1.4 of our response, the IFoA believes this would be a step in the wrong direction for both banks and regulators.

With regard to other capital floors (e.g. minima for LGD percentages), like leverage ratios, the IFoA believes that these could undermine the case for adopting internal models if regulators are going to over-write model parameters and, hence, restrict the capital benefits of internal models. If not properly calibrated, floors may result in excessive capital requirements to the detriment of consumers. They may also distort pricing and risk management decisions if the effect of the floors is to produce similar level of capital requirements for product lines with different risk and return profiles.

The IFoA does see a benefit of "soft" floors, where a bank adopting a weaker parameter than a certain benchmark should be challenged on how the parameter was determined. If the bank can justify the weaker parameter, it should be permitted to retain it, just as different models may be equally valid. A parameter, which may appear weak, may still be justifiable. The floor should only apply if the bank cannot supply a robust justification. Used in this way, floors would help regulators spot unduly weak internal models. In allowing justified exceptions to the floor, investment in internal models will not be discouraged.

2. Response to questions for feedback

2.1 "Does the current framework, with its reliance on the risk-based capital at its core, appropriately balance the objectives set out in paragraph 29?"

The IFoA believes that the current framework does appropriately balance the objectives. The Basel II capital requirements have been insufficient in the current financial crisis, but the strengthening of both the quantity and quality of capital in Basel III should help address this deficiency.

An important element of the framework is choice. Small institutions can choose to implement standardised approaches, while large and/or internationally active banks have the option of adopting more complex internal model approaches. The option to base regulatory capital requirements on internal models helps promote improved risk modelling and measurement, while qualitative standards for internal models and risk mitigation improves the quality of risk management.

The internal model option also adds flexibility. While the standardised approach is reasonable for a number of bank portfolios, given the diversity of assets, products, risk management techniques and countries covered by the Basel standard, it is inevitable that the standardised approach will prove unsuitable for some portfolios. The ability to use internal models to capture the bespoke nature of such portfolios helps address this limitation.

While not perfect, risk-based requirements do not unduly distort risk-taking incentives, as higher risk activities generally incur higher capital requirements and costs. With the benefit of hindsight, some activities, such as writing liquidity puts, did not incur sufficient capital charges. However, too much credit was given for risk mitigation without fully taking into account the residual risk. The IFoA would hope the Basel III amendments address these failings, though as noted in 1.5 of our response, the new leverage ratio may introduce fresh distortions into pricing.

The IFoA believes the core measure of capital adequacy, based on capital as a percentage of RWA, is well understood and broadly comparable across banks. As noted in 1.2, different internal models will lead to different capital requirements for the same risks, reducing comparability. Differences in RWAs will reflect, not just differences in risks, but also differences in models of risks. Regulatory scrutiny may limit divergence, but there is a case for increasing disclosure of internal model requirements for a standard set of risks, so that stakeholders can understand how much of the difference may be due to more optimistic/pessimistic models of risk.

In terms of supporting a level playing field, different banks will have different views of risks which will affect how they participate in markets. A bank with a more optimistic view of a risk than its competitor may be willing to charge less to take on the risk. Internal models may reinforce such price differences if a bank can base regulatory capital requirements on its less pessimistic view, but only if the bank can justify these views as part of the internal model application.

However, banking markets are often upset by participants who underestimate risk and charge accordingly. If this is detected as part of the internal model approval process and the participants are encouraged to use the standardised approach, this may go some way to levelling the playing field with their more risk aware peers who may benefit from being able to use internal models.

2.2 "Are there other objectives that should be considered in reviewing the international capital adequacy framework?"

Firstly, regulatory capital requirements should have regard to the cost of capital that is likely to be passed on to consumers. Banks, and consequently regulators, should seek capital requirements to be proportionate to risks. Excessive capital requirements relative to risks should be avoided, as they would impose undue capital costs on banks and, ultimately, their consumers. An explicit objective to consider the cost of capital and its impact on consumers may temper the drive to increase requirements. It may also highlight that there can be too much, as well as too little, capital.

Secondly, regulatory capital requirements should have regard to their macroeconomic impact and ideally not amplify economic cycles. Proposals to introduce counter-cyclical buffers can help in this regard, but this could be extended to the pace of any change in capital requirements. The pre-crisis boom was fuelled in part by relaxation in regulatory capital requirements, but the economic recovery could be stalled by premature increases in requirements which might drive down lending.

2.3 "To what extent does the current capital framework strike the right balance between simplicity, comparability and risk sensitivity, given the costs and benefits that greater risk sensitivity brings ?"

Following 2.1, the IFoA believes the current framework strikes a good balance between simplicity and risk sensitivity. The underlying calculations are simple, yet are broadly risk sensitive. Provisions to address variations in products, asset types and risk mitigation techniques add considerably to the length of the framework, as do internal model requirements.

In terms of comparability, internal models mean that differences in RWAs will reflect, not just differences in risk profile, but also differences in risk models. Increased disclosure can help regulators and investors understand the extent of the latter.

2.4 "Which of the potential ideas outlined in Section 5 offer the greatest potential benefit in terms of improving the balance between the simplicity, comparability and risk sensitivity of the capital adequacy framework?"

The IFoA believes that the idea with the greatest potential benefit would be increased disclosure. This would help to address the issue of comparability between firms using internal models, allowing others to understand to what extent differences in RWAs relate to differences in models as opposed to risk profile. This would also offer a powerful insight into how banks view and model risks. For example, investors may subject a bank, with lower RWA values for risks than its peers, to greater scrutiny, as the models it is using for risk management and pricing are more optimistic. Alternatively, banks with higher RWA figures than their peers could be challenged on whether they are being

unduly pessimistic in their view of risks and whether this is inhibiting strategy. Overall, this could help reinforce Pillar III and market discipline.

The IFoA would also welcome improved accessibility in Basel Committee documents. As well as consolidating these into a single set of documents, the core text could be usefully rationalised with provisions bespoke to particular assets or risk mitigation techniques moved to annexes, or separate documents.

In terms of other proposals, the IFoA believes these would either have little impact, or may be counter-productive (see section 3 of our response).

2.5 "Are there other ideas and approaches that the Committee should consider?"

2.5.1 Professional sign-off of internal models, capital requirements and provisions

One idea the IFoA suggests could be explored, is whether internal models, capital requirements and provisions should be signed off by a suitably qualified risk professional. By professional, the IFoA does not only mean that they have appropriate technical knowledge, but that they are also bound by a code of ethics. The IFoA appreciates there are already sign-off requirements, but the obligation of a professional to abide by a code of ethics may increase integrity and help offset any senior management pressure for more palatable figures.

The IFoA considers the sign off as applying not just to internal models and Pillar I capital requirement calculations. The sign-off should also apply to balance sheet amounts and, in particular, provisions, such as those for bad debts where there may be subjectivity coupled with potential pressure from management for lower figures to reduce P&L impacts. However, any professional sign-off should not reduce the ultimate responsibility of the Board for balance sheet and regulatory capital figures. The sign-off would complement, rather than supplant, external audit reviews.

2.5.2 Learning from the experience of insurance companies

The current regime seems to be unnecessarily constrained to the use of accounting inputs and definitions to calculate the capital requirement. Although these inputs are broadly understood and largely comparable, they are formed from non-economic, legalistic conceptual frameworks. The inputs prioritise retrospective reconciliation over prospective realistic valuation (Accounting assets and Tier 1 capital) and may be unsuitable for risk management in complex financial institutions.

Insurance companies are faced with the same challenge. Some have failed in the past and face risks that are complex, large and more sporadic than most banks. Examples of the risk management challenges include:

- Exposed policy limits and sums insured exceeding total assets by several orders of magnitude;
- Natural catastrophes and their effect on reinsurers who have incomplete information on the millions of properties covered by the insurance companies they reinsure;
- Billions of dollars (for many individual companies) in asbestos, and other disease related liability insurance, arising from policies written many decades ago, where actual claims experience is driven by the current litigation climate in the USA rather than the original terms of the policy;
- Provisions for annuities with multiple complex guarantees; and
- A wide variety of asset classes invested in some cases to reduce interest rate and currency risk while increasing overall market risk.

To cope with the wide variety of risks, large EU insurers use internal models which are not based on accounting inputs. Fully stochastic internal models in insurance are created on a realistic and economic basis. Specialist software is used to aggregate all risks with allowances for extreme correlations in the tail (e.g. reinsurer credit risk and catastrophe risk, which are mostly independent, are highly correlated in extreme scenarios). Instead of an accounting capital ratio being regarded as the final key metric, a numerically expressed, bespoke probability distribution of surplus assets is the output.

The approach was designed by national insurance regulators. They require that firms who use internal models may deviate from the Standard Formula (up or down) and simply hold the level of capital needed to stay solvent with a high probability. The level is currently set at 99.5% though admittedly with just a one year horizon.

UK insurers have been using this kind of fully economic internal model alongside their independently calculated Standard Formula calculations since the FSA's Individual Capital Assessment regime was introduced in 2005.

The IFoA would be willing to present the workings of such a model with a view to researching its possible use in banks. The IFoA proposes that any such presentation would include:

- A technical summary of the workings in a typical example of such an approach;
- The treatment of items with analogies to banking (interest rate risk, aggregation of risks, valuation of assets and liabilities, liquidity over time, risks from new business taken on in the future, risks from developments in the "back book");
- The advantages and disadvantages the IFoA sees in this method compared with use of the Standardised Approach (called the Standard Formula in insurance);
- Experience in practical use of this approach under both the existing ICA regime in the UK and in preparation for Solvency II;
- The degree to which regulators and the boards can use and understand these models;
- The degree to which these models can be audited and independently validated; and
- Discussion of how the IFoA could jointly research the use of this approach for banks' risk management and regulation in the future.

The IFoA would welcome the opportunity to discuss this further with you.

2.5.3 Holistic modelling of risks and dependencies

One aspect of the current framework for banks, which suffers from over-simplicity, is in aggregating the impacts of different risk drivers, and even deriving a single risk driver across portfolios. For example; credit, market and operational risk capital requirements are calculated entirely independently and then simply added together. Other risks not dealt with in Pillar 1 (such as Interest Rate Risk in the Banking Book) are then likewise calculated independently under Pillar 2 and added on. Even within a single risk driver, the level of correlation, or diversification, within the various portfolios is not adequately addressed. The default assumption under Pillar 1 is that credit portfolios are adequately diversified and model calibrations reflect this (with only a potential add-on under Pillar 2 if the bank, or regulator, judges this not to be the case). This "silo"-based approach carries with it the perverse incentive of not pursuing genuine diversification of the business model across risk drivers and across the portfolios, since such diversification is not adequately rewarded by the capital framework.

As discussed in 2.5.2, the IFoA advocates holistic modelling that is common in insurance. An insurance single model is capable, not only of modelling the impact of all of the relevant risk drivers,

but also of taking account of the aggregation and diversification of risk across all drivers and across the entire asset and liability portfolios when quantifying the capital requirement.

3 Comments on potential ideas to improve simplicity and comparability

3.1 Explicitly recognising simplicity as an additional objective

As referenced in 1.1, the IFoA believes the objective should not be simplicity for simplicity's sake, but parsimony in terms of seeking to base requirements on the simplest model that is still an adequate representation of risks. As noted in 1.5, simple capital requirements, like leverage ratios, which do not take account of risk may lead to either excessive capital requirements, resulting in higher costs to consumers, or insufficient requirements relative to risks. Either would reduce the security of savers and increase the risk of taxpayers being asked to bail out a bank. Leverage ratios may also distort pricing and risk management decisions, as capital and risk are not aligned.

3.2 Enhancing disclosure

The IFoA is in favour of improved disclosure. This can address the comparability issue between banks using internal models, by allowing an understanding of the extent to which differences in RWAs between banks reflect differences in models, as opposed to risk profile. Improved disclosure would also enhance Pillar III, if investors can readily compare the internal models used for pricing and risk management. This would bring market discipline to bear on firms whose models may be out of line with their peers, forcing them to justify their models and their views of risk implicit in them.

The IFoA cautions against "information overload", as too much information could confuse investors and regulators. It may be better to separate detailed disclosures regarding internal models from other disclosures. The latter would not be cluttered with internal model details, which would be available in a separate document.

The IFoA remains unconvinced about the application of internal models to standardised hypothetical portfolios. This may indicate that internal models are weak relative to peers, but it would not highlight where the weakness lies. It would be beneficial to show risk weightings for sample products (e.g. prime mortgages, SME lending etc.). This would highlight where a bank's internal model may be particularly out of line with its peers.

The IFoA is also unconvinced that it would be necessary to disclose both internal model and standardised approach calculations, as this would involve considerable extra effort to produce capital requirements figures on two different bases.

3.3 Using additional metrics

The IFoA notes that while leverage ratios may have performed better than risk based measures in distinguishing surviving banks from failing banks during the recent financial crisis, this may be due to changes in risk based measures (see 3.4). This might only be a "one off" result and future leverage ratios may not give any further insight compared to risk-based measures.

Examining some of the metrics suggested, the IFoA has the following comments:

- RWA under the standardised approach (from 3.2) would involve additional computational effort. It may just as easily highlight how unsuitable the standardised approach is for a bank's business, as give any additional information on risk profile or the strength of its internal models;

- Risk measures derived from equity volatility could be quite volatile over time as both historic and implied volatility will fluctuate with market conditions (i.e. low in benign markets, rising sharply in times of stress);
- Historical profit volatility is a lagging indicator and may not pick up changes in risk profile. Like VaR, it will also be sensitive to how far back calculations go in assessing profit volatility, so it needs careful calibration; and
- Asset growth may highlight where a bank might be expanding beyond its capabilities. However, this would also be identified by the leverage ratio.

One interesting metric to consider could be assets classed as "difficult to value" as a percentage of capital. This could highlight the significance of the uncertainty of asset values for a bank and indicate its vulnerability to the risk of a downward valuation of these assets[6]. Such a metric would complement other risk-based metrics which do not adequately address this risk.

3.4 Ensuring the effectiveness of the leverage ratio

The IFoA recognises that introducing the Basel III leverage ratio is inevitable, but the reaction of UK lenders to the recent introduction of the 3% leverage ratio is interesting. The ratio appears to require significantly more capital in respect of mortgage lending. It may be that the internal models of UK mortgage lenders are not sufficiently robust, but if they are robust, this additional capital will simply impose higher costs on borrowers, as lenders adjust their rates to cover the higher cost of capital. Mortgage lenders with internal models may consider their investment as less valuable, if the leverage ratio eliminates any capital benefits from internal models. Naturally, others may be discouraged from pursuing the internal model route. At a macro level, the leverage ratio is likely to lead to a reduction in lending, which may have a detrimental impact on the UK economy[7].

The leverage ratio may also lead to a shift in emphasis from low loan-to-value lending to higher risk, higher return lending, such as buy-to-let, if it results in similar capital requirements for both. It may also inhibit risk management if risk mitigation would not bring any capital benefit due to the application of the ratio. There is a risk that in introducing leverage ratios in response to the financial crisis, regulators may be sowing the seeds of the next crisis.

Higher leverage ratio requirements are likely to further increase costs to consumers and introduce further distortion to product pricing and risk management, and therefore the IFoA is cautious about increasing the ratio beyond the 3% currently proposed. The current risk based regime would be a better means of addressing those banks for which 3% of assets is inadequate relative to risks.

The IFoA acknowledges that leverage ratios appear to have been a better ex-post indicator of bank distress in the recent crisis than risk-based regulatory capital ratios[8]. However, the run-up to the crisis saw a relaxation of regulatory rules, which simultaneously encouraged and masked a sharp rise in bank assets[9]. The leverage ratio captured this rise which may be why it proved a better indicator in this case, but this may be due to exceptional circumstances (i.e. the relaxation of rules in the period). In the future, the IFoA is not certain the leverage ratio would prove to be as reliable an indicator as risk weighted calculations.

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[6] See pages 226-227, 234 & 281 of the February 2011 US Financial Crisis Inquiry Commission report.

[7] See for example:
http://www.eadt.co.uk/business/uk_nationwide_building_society_delays_its_launch_into_sme_lending_1_2354658

[8] Noting Andrew Haldane's observations on this in his 2012 speech "The dog and the frisbee" – http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech596.pdf

[9] A prime example would be top 5 US investment banks – Bear Stearns, Lehman Brothers, Merrill Lynch, Morgan Stanley and Goldman Sachs – whose assets quadrupled to $4trillion between 1998 and 2007, while the SEC relaxed capital requirements in 2004 (see pages 53 and 65 of the US Financial Crisis Inquiry Commission report, February 2011).

The IFoA would not support additional buffers to the leverage ratio, nor higher leverage ratios for G-SIBs. It would appear to be unwise to reduce the incentive for risk mitigation and increase the bias to higher risk, higher return products among systematically important banks.

3.5 Utilising added floors and benchmarks to mitigate the consequences of complexity

It would appear from paragraph 61 that the variation in RWA from internal models is a concern for the Committee, which is directing them to consider floors. With reference to Section1.2 of the discussion paper, the IFoA considers it reasonable to have a wide range of internal models and results. There is no perfect model and there can be a wide range of equally valid models fitted to data available. While acknowledging that this reduces comparability, this can be addressed by improved disclosure. The IFoA cautions against imposing conformity through the use of floors; in extremis, banks end up with a regulatory model, rather than a model of their own, which they might use for pricing and risk management, going against the intended purpose of utilising added floors. The IFoA strongly advises against trying to equalise requirements based on the most prudent models for the reasons set out in 1.2.

The IFoA is not supportive of a floor on market risk requirements equal to the standardised approach requirements. There would be no incentive to follow the internal model route unless regulators plan to force banks to do so (as they may require from insurers under Solvency II). The IFoA is unsure that the standardised approach can be calibrated to reflect the wide range of market risks by type (interest rate, equity etc.), market (FTSE100, SHIBOR, £:$ etc.) and purpose (e.g. held as part of a correlated trade) and the need to allow for dependencies between different market risks. Inevitably, capital requirements would either be too low, as they were in the financial crisis, or too high relative to risks. The latter could be damaging in terms of market liquidity (there has already been a significant reduction in bond market maker inventories since the crisis[10]) and higher capital requirements may lead to a further reduction. Higher capital costs for those inventories banks hold may also lead to higher bid/ask spreads.

Finally, a regulatory standard that tries to address the wide variances by type and market would be very complex, which is not in accordance with the Committee's desire for simplicity. The IFoA suggests that it would be preferable to deal with the complexity of market risks by leveraging banks' internal models for market risk.

In terms of the proposals in paragraph 62, the IFoA is not supportive of a floor based on the standardised approach, particularly if it is 100%, as there would no incentive to pursue the internal model route. Even at a level lower than 100%, the standardised approach would not be suitable for every portfolio and may still impose excessive capital requirements on some low risk portfolios.

The IFoA also has concerns about floors for individual parameters. The current floors mentioned in paragraph 60 are reasonable, but depending on how these are set, they may deter banks from the internal model route. If set too high, they could result in excessive capital requirements.

The IFoA favours "soft" benchmarks rather than "hard" floors. As noted in 1.5, the benchmarks would serve as a trigger for the review of a model which may be too weak, but the bank should be given the opportunity to justify its parameter before the floor is imposed. In this way, banks would not be discouraged from adopting an internal model approach - if the parameter was derived with appropriate rigour and was reasonable in light of the bank's risk profile, then management may still be able to adopt this even if it was below the floor.

[10] According to data compiled by the Federal Reserve Bank of New York, the inventory of corporate bonds held by primary dealers plunged from a high of $235 billion on October 17, 2007 to just $55.9 billion as of March 27, 2013 – see http://www.risk.net/digital_assets/6892/Risk_0813_cover_story.pdf

In response to the points raised in paragraph 64; if floors pushed every bank towards the standardised approach, there would be a comparable basis of preparation. As the standardised approach is not appropriate for every portfolio, this would not provide a perfect comparison of risk profile.

Rather than differences in RWAs partly reflecting differences in internal models, they would reflect in part the suitability, or otherwise, of the standardised approach for different portfolios.

For gaining reassurance as to adequate capitalisation, it is acceptable to add margins for prudence, but ultimately excessive capital requirements will impact on consumers.

Lastly, banks will still have to develop models for pricing and risk management. Enabling them to use these models for setting regulatory capital requirements provides an added incentive to invest in such models, while the internal model approval route adds to model rigour. Better models will lead to better decision making which is the ultimate safeguard of solvency.

3.6 Reconsidering the linkage between internal and regulatory models

Paragraphs 65 and 66 consider breaking the link between internal models and regulatory capital. The IFoA is not convinced by the reasons given and believes this would not be a beneficial step for either banks and/or regulators.

The IFoA disagrees with the assertion in paragraph 65 that bank risk management models differ in their objectives from regulatory capital models, with the former focussed on risk-adjusted returns and the latter more focussed on tail risks as they affect depositors, other creditors and the wider financial system. The IFoA questions the implication that shareholders may be less interested in tail risks, as when these crystallise, the banks often face additional funding requirements, with shareholders facing the possibility of losing most, if not all, of their holding. Banks may set risk appetite based on metrics with a lower confidence level than the regulatory standard (e.g. 95% 1-year VaR), but there is no reason why these figures cannot come from the same underlying model as that used for regulatory capital.

The IFoA agrees, however, with the point made in the same paragraph that internal models will reduce comparability, as banks may adopt different yet equally valid models of risk. Thus, differences in RWA will reflect not just differences in risk profile, but differences in risk models.

To the extent that banks are using these models for pricing and risk management, the differences will reflect different views of risk, which are to be expected in a market where no one has a perfect view of risk. Greater internal model disclosure (e.g. RWA figures for a standard set of risks) is required, in order to better understand the model differences in RWAs.

The IFoA also agrees with the assertion in paragraph 66 that internal models could be subject to “gaming” to reduce capital requirements. However, if the models satisfy the use test and are used for pricing and risk management, then banks would be misleading themselves, as well as regulators, by adopting a weak model.

Associated to this point, and following on from 1.4, the IFoA notes a more significant issue, the double jeopardy arising if internal models are inadequate, as not only are risks mis-priced, but regulatory capital is also inadequate.

However, the option to use internal models for regulatory capital gives an incentive to invest in models, while regulatory oversight should lead to greater rigour in their development. This should lead to better models and decision making. Ultimately the best guard against insolvency is sound pricing and risk management practices. Large capital buffers may have limited benefit, if risk is not property understood and priced.

Furthermore, the internal model gives regulators valuable insights into how a bank prices and manages risk. Overall, the IFoA believes these advantages outweigh the disadvantages of internal models.

Internal models also add flexibility to the capital framework. The standardised approach will not be appropriate for all portfolios - for example, even with a 30% risk weighting, the standard capital requirement might be too high for low loan-to-value mortgages to prime borrowers[11]. The ability to use internal models helps address this issue. The alternative is either to refine the standardised approach so that it is more appropriate to risks being run, or to set capital requirements which may not be properly aligned to risks. The former will increase the complexity of requirements; the latter will distort pricing and risk management decisions.

3.7 Limiting national discretion and improving supervisory consistency

The IFoA agrees that some national discretion may have served a purpose as a means of arriving at global standards and can now usefully be phased out. However, risks do vary by country. For example credit risk is affected by legal frameworks, which vary from country to country. "No recourse" laws in some US states limit a mortgage borrower's liability to the value of the house, while in Ireland until recently, it has proved nearly impossible to repossess a house in default. Regulations will also have an effect. For example, Canada's tighter restrictions on mortgage lending have helped it avoid the excesses of the US house price boom and bust.

Products and asset types have also evolved differently; most US mortgages are fixed rate, whereas most UK mortgages are variable. In Germany, securitisation takes the form of very safe Pfandbriefe, while in the US it helped give rise to the sub-prime crisis.

Given these differences, there may still be a need for national discretion to tailor requirements to different countries. While they reduce comparability, they also ensure regulatory capital is more closely aligned with the risks banks run in different countries.

The IFoA is not surprised that there are variations in supervisory practice between regulators, just as banks may have differing views on risks. The IFoA agrees with the Committee's suggestion that national regulatory bodies retain some discretion over internal model approval, but that further work should be undertaken to share views to improve consistency and also the quality of the regulatory review.

3.8 Improving the accessibility of Basel Committee documents

The IFoA agrees that the documents should be consolidated and, if possible, rationalised. Bespoke elements (e.g. additional requirements for credit derivatives) should be moved to annexes or stand-alone documents to make the key requirements more accessible.

[11] 30% standard risk weight x 8% gives a 2.4% credit risk requirement, but if loan-to-value was 50% or less, then an appropriate LGD assumption may be the 10% minimum so a 2.4% loss would equate to 24% of borrowers defaulting which does not look plausible for borrowers with prime credit histories.

3.9 Addressing factors driving complexity in a more fundamental manner

Considering the approaches to capital adequacy set out in paragraph 75, the IFoA agrees that the *Tangible leverage approach* would significantly reduce *ex ante* risk sensitivity and doubts whether it would be improved *ex post*. Regarding the leverage ratio, it will either result in inadequate, or excessive, capital requirements and will distort risk management and pricing decisions.

With regard to the second proposal to abandon internal models, the IFoA believes this would be an unhelpful step for both banks and regulators. The benefit gained from improved transparency and comparability is likely to be offset by: reduced regulatory insight into internal models; excessive or inadequate capital requirements due to limitations of the standardised and leverage ratio approaches; and the distortions these may introduce into pricing and risk management.

The IFoA is not convinced on the *pre-commitment* approach based on measured income volatility. This is a lagging indicator and may not reflect any increase in risk profile until after the risk has crystallised, in which case the capital is likely to prove inadequate.

Finally, paragraph 77 considers more radical measures to reduce complexity, including placing restrictions on the development of innovative financial instruments. This follows the argument noted in paragraph 43; by adapting the regulatory framework to allow for the complexity that such innovations bring, regulators may subsidise increasing complexity of business models. One way of limiting the development of innovative financial instruments might be not to allow any capital benefits to accrue from novel credit enhancements to assets, or innovative risk mitigation techniques.

However, this approach ignores the benefits such instruments can bring. Structured credit has helped companies tap into bond markets, often on attractive terms. While it is true that securitisation lay at the heart of the US sub-prime mortgage bubble, it is still a useful technique to reduce reliance on short-term funding and help address the fundamental liquidity mismatch from which most banks suffer. Sub-prime mortgages themselves are an example of an innovation in finance. While they have given rise to increased credit risk, with the combination of sub-prime and securitisation proving particularly toxic in the recent financial crisis, they have also allowed individuals to buy a home which they could not have done if traditional lending standards had applied.

The IFoA acknowledges some innovations in finance may not contribute much to the greater good, and the complexity of some banking operations is a concern, but stifling innovation may be counterproductive in terms of how banks serve society.

Concluding Remarks

In general, the IFoA supports the drive to simpler requirements, provided they remain broadly aligned with risk. However, the IFoA believes the existing framework has a lot of strengths in this regard by combining a simple risk based standardised approach with the flexibility for firms to opt for internal models where the standardised approach does not properly reflect risk.

Actuaries have extensive experience of risk modelling and are acutely aware of the limitations of models. It is important to understand that models are only approximations to reality and there is no perfect model. Different firms can calibrate different yet equally valid internal models, and the IFoA is positive about the variance in internal model results mentioned in the report. The IFoA acknowledges there are issues of comparability, but this can be addressed through improved disclosure.

This lack of comparability, along with potential gaming of models and requirements, seems to be challenging the Committee's support for internal models. However, the IFoA believes abandoning the internal model approach to regulatory capital could be a detrimental step. The ability to use internal models for regulatory purposes encourages investment in risk models, while the approval process adds rigour, which should ultimately lead to better models and decision making. Internal models should also be a useful source of insight into how banks view risks and how that view informs pricing and risk management.

While simple, the IFoA has concerns about leverage ratios, as there are not really aligned to risk and may impose excessive capital requirements on banks, the cost of which will be passed on to consumers. They may also distort risk management and pricing decisions. The IFoA cautions against any increase in the current 3% proposed ratio.

Floors to internal model calculations and parameters could have a similar effect to the leverage ratio in terms of excessive requirements and distorted decisions. They may also discourage banks from adopting the internal model approach. The IFoA believes however, that there is a case for benchmarks which would act as a trigger for review of internal models and their parameters.

The IFoA proposes three ideas for further consideration. Firstly, there may be a case for sign-off of internal models, capital requirements and provisions by risk professionals bound by a code of ethics in order to increase the integrity of these figures. Secondly, it would be fruitful to consider the experience of insurance companies and their economic capital internal models. On this point, the IFoA would be happy to present to the Committee on the workings of such models to see if these could be used by banks. Lastly, the current approach of assessing capital requirements in individual "silos" does not incentivise banks to pursue diversification across risks. The IFoA believes a holistic approach to risks should be considered allowing for the dependencies between different risks.

The IFoA would be willing to address further any questions you have about our comments on risk sensitivity, simplicity and comparability. Should you wish to discuss any of the points raised, or wish to meet with members of the IFoA who could present an alternative approach, please contact Philip Doggart, Policy Manager in the first instance (Philip.doggart@actuaries.org.uk/ 0131 240 1 319).

Yours faithfully,

David Hare
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