Andrew G Haldane: Constraining discretion in bank regulation

Paper by Mr Andrew G Haldane, Executive Director, Financial Stability, Bank of England, given at the Federal Reserve Bank of Atlanta Conference on "Maintaining financial stability: holding a tiger by the tail(s)", Federal Reserve Bank of Atlanta, Atlanta, 9 April 2013.

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Marking your own exams is a perilous pursuit. Stephen Levitt of *Freakonomics* fame looked at abnormalities in tests scores in Chicago Public Schools, when these tests were marked by the schools' own teachers (Jacob and Levitt (2003)). He found systematic evidence of upgrading of scores in elementary schools by teachers marking, in effect, their own exams.

More recently, the LIBOR scandal has exposed many of the same self-regulatory problems. The incentives to shade their self-assessed LIBOR exam grades proved too much for too many for too long. As we now know, systematic misreporting resulted. The self-regulatory model was again found wanting.

Yet there is one area of finance where self-regulation continues to stage a last stand – bank capital standards. Since the mid-1990s, banking regulators globally have allowed banks the discretion to use their own models to calculate capital needs. Most large banks today use these models to scale their regulatory capital. In doing so they are, in essence, marking their own exams.

This self-regulatory shift was made with the best of intentions. Yet its consequences have been predictable. Self-assessment has created incentives to shade reported capital ratios. As elsewhere, a regulatory regime of constrained discretion has given way to one with too much unconstrained indiscretion.

This calls for regulatory repair. Without change, the current regulatory system risks suffering, like the Chicago teachers and the LIBOR fixers, reputational damage. Fortunately, there are early signs that regulatory change is afoot to place tighter constraints on this (in)discretion.

The emergence of self-regulation

To understand how we ended up here, it is useful to explore the historical contours of the regulatory debate. This is a history in roughly four chapters.

Chapter 1 covers the period prior to the agreement of the first Basel Accord in 1988. Until then, a patchwork of national regulatory frameworks for capital adequacy operated. Some countries set capital adequacy standards based on simple measures of bank equity to assets – a leverage ratio. Others, including in the US, used risk-based standards with risk weights set by regulators for a small set of asset categories.

Chapter 2 begins with the introduction of the Basel Accord. This was a landmark agreement: the first-ever genuinely international banking accord, based around an 8% bank capital ratio, with internationally-set risk-weights applied to a small set of banks' assets. The Accord was explicitly designed to lean against an international "race to the bottom" in capital adequacy standards (Goodhart (2011)). It also helped ensure a level international playing field.

Chapter 3 commences with the Market Risk Amendment to Basel I in 1996 and continues through to the Basel II agreement of 2004. These were a direct response to the perceived failings of Basel I. In particular, the lack of granularity in risk weights under Basel I was felt to have created arbitrage possibilities, with risk migrating to lower risk-weighted asset categories.

Permitting use of banks' own internal models to calculate risk weights provided such granularity. It also aligned regulatory capital with banks' own economic capital calculations, thereby prospectively reducing arbitrage incentives. By setting internal model-based capital

charges below those from simple standardised approaches, Basel II provided banks with strong incentives to upgrade their risk management technology.

The move from regulator-set to model-set capital charges had two significant side-effects. First, it added materially to complexity. For a large, complex bank, the numbers of calculated risk weights rose from five to hundreds of thousands, perhaps millions. Second, the use of models moved decision-making on risk weights from regulators to banks. Once a model was admitted, the system was essentially self-regulatory.

The final Chapter, Basel III, commences in 2010. Experience during the financial crisis demonstrated both that capital had been set too low and that it had been defined too broadly. Basel III raised the level, and narrowed the definition, of bank capital. In those respects, it was a very significant improvement over its predecessors. At the same time, the complexity and self-regulatory aspects of Basel II remained in Basel III.

Each of these historical chapters was a logical response to the perceived problems of the day. Even with the benefit of hindsight, these steps seem like sensible ones. In particular, there appear to have been three key objectives behind the evolution of international bank regulation over the period.

- First, to level the international playing field and prevent a race to the bottom in capital adequacy standards, in particular under Basel I.
- Second, to align regulatory capital with risk by improving the risk-sensitivity of capital standards, in particular under Basel II and III.
- And third, to reduce incentives to engage in regulatory arbitrage and create incentives to upgrade risk management, in particular under Basel II and III.

All of these responses were understandable and, in concept, laudable. The question is whether, with the benefit of hindsight, they have been successful.

Unfulfilled ambitions

(a) Levelling the Playing Field

The rationale for the original Basel Accord is that it would effectively defuse an international race to the bottom by setting a common, internationally-set capital standard. But the use of risk weights, in particular those based on internal models, in calculating banks' capital ratios has provided an alternative avenue through which this race can be run. And empirical evidence suggests this race may have continued apace.

Chart 1 plots the average risk weight applied to the assets of 17 major international banks over the period 1993 to 2011, together with a trend line. The trend is steeply and strikingly downward-sloped, falling on average by 2 percentage points each year. Banks' average risk weight (risk-weighted assets per unit of assets) has almost halved, falling from over 70% in 1993 to below 40% at end 2011 (see, also, Blundell-Wignall and Atkinson (2011)).

There are three possible interpretations of this trend. One is that banks' assets, in aggregate, are around half as risky today as they were 20 years ago. A second is that banks are twice as good at managing these risks as they were 20 years ago. In the light of the crisis, which unearthed huge risks on banks' balance sheets accumulated over this period, neither proposition rings especially true.

To see why, consider the evolution of an alternative measure of risk – simple bank leverage. In the pre-crisis boom, bank leverage rose steadily to reach historically unprecedented levels. This signalled high and rising bank risk (Chart 2). Indeed, bank leverage and bank risk weights moved in opposite directions over this period, with a correlation coefficient of minus 0.6. While the risk traffic lights were flashing bright red for leverage, for risk weights they were signalling ever-deeper green.

The subsequent financial crisis has made clear which traffic light signal was at fault.[1] The boom was leverage-fuelled and so too has been the subsequent bust. At least at an aggregate level, bank risk weights appear to have borne, at best, a tenuous relationship with risk. At worst, they were a contrarian indicator.

That takes us to a third potential explanation for the downward trend in risk weights, one familiar from every other field of self-regulation – the system has been gamed or arbitraged (Blum (2008), Masera (2012)). Under a self-assessed standard, banks may have both the incentive and the ability to shade downwards risk weights, or to switch to lower risk-weighted asset categories, thereby boosting reported capital ratios. The aggregate evidence is consistent with this having occurred secularly and on a significant scale.

Firm-specific evidence is also consistent with this hypothesis. A survey by McKinsey in 2012 found that 65% of firms were engaged in "RWA optimisation" of some form (Babel *et al* (2012)). And the recent US Senate investigation of the J P Morgan "whale" incident is the latest in a long line of identified misdemeanours sourced in model manipulation. In short, while one of the original aims of the Basel Accord was to prevent a race to the bottom, the move to risk-based capital adequacy standards may in fact have accelerated it. What, then, of the second objective of the original Basel Accord - levelling the international playing field? From an economic perspective, a level playing field would imply that banks with equivalent portfolios should hold a broadly equivalent amount of capital. The most compelling test of this hypothesis comes from the hypothetical portfolio exercises (HPE) recently conducted in the UK and internationally. These take a set of common portfolios and ask how much capital banks' internal models would set against them.

Three UK exercises have been undertaken, in 2007, 2009 and 2011, for a subset of banking assets – corporate exposures, sovereign exposures and banking exposures. Chart 3 demonstrates the range of variation in default probabilities for these three sets of asset across UK banks, while Chart 4 shows differences in risk weights across these portfolios in 2011, the most recent estimates.

The range of cross-bank variation is enormous. Default probabilities differ by factors of between five and ten. Risk weights differ by a factor of between three and five. There is no sign of this range having shrunk over time. The Basel III reforms will raise banks' capital standards by a factor of between three and four. These cross-bank differences would be sufficient to absorb fully those reforms.

The Basel Committee has recently undertaken its own HPE on a wider range of international banks, focussing on the trading book (BCBS (2013)). Chart 5 summarises the range of variability in capital requirements for certain of the trading book metrics (VaR, stressed VaR (sVaR) and the Incremental Risk Charge (IRC)), while Chart 6 focuses on the IRC charges for a set of particularly complex models.[2]

The variation is again enormous. Calculated trading book risk weights differ by factors of three to five, even for simple metrics such as VaR. For some of the more complex, such as IRC, the range of variation needs to be shown on a log scale. For some portfolios, it runs to three figures. For one, it runs to four, with one bank's model suggesting $1 of capital, another's over $1000, for an identical exposure.

These inconsistencies are likely to be an under-statement of the true problem. Because they cover only a sub-set of the banks using internal models, these exercises may significantly under-estimate variability across the bank population. The portfolios covered by existing HPE

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[1] Market-based measures of bank riskiness, such as CDS spreads or credit ratings, are also consistent with this interpretation. If anything, these suggest the panel of banks is as risky or riskier today than 20 years ago.

[2] The European Banking Authority (EBA) has also looked at the degree of consistency of European banks' risk weights, though not using a HPE methodology. It too found large cross-bank discrepancies.

exercises have also tended to be relatively simple. More complex portfolios would probably result in wider cross-bank variability. The Basel Committee is currently undertaking an equivalent exercise for banking book assets.

There is a delicate line to tread between useful diversity in model outputs on the one hand and useless inconsistency on the other. It is clear we are currently on the wrong side of this line. If a regulatory regime can generate capital ratios of 5%, 10% and 20% for three identical banks, it is not a robust basis for assessing capital adequacy. In short, the objectives of the original Basel Accord are at risk. Complex, self-regulation has added speed to the race to the bottom and incline to the international playing field.

(b) Complexity and risk-sensitivity

One of the conceptual lynchpins of the model-based, self-regulatory approach was the desire for risk-sensitivity. As a matter of principle, it is difficult to question risk-based regulation. The practical question is whether that has been achieved.

On the face of it, the very act of risk-weighting assets would appear to guarantee a greater degree of risk-sensitivity than, say, using a risk un-weighted leverage ratio. Yet this intuition is wrong on two counts. Wrong empirically because it ignores the risks which come from modelling. And wrong theoretically because risk across banks' whole portfolio may bear little relationship to the aggregated risk of each of its parts.

Take model risk. This pollutes the signals from a risk-based capital ratio. In work at the Bank, we have explored this trade-off between model risk and risk-sensitivity. If model risk is sufficiently large, a risk-based capital ratio may in fact perform worse in predicting bank default than a leverage ratio. That is because the noise associated with imprecise risk weights can drown out the signal. A leverage ratio, unpolluted by model risk, may provide clearer risk signals.

While slightly counter-intuitive, this result is well-understood in many fields outside of finance (Gigerenzer (2007)). It is why complex, risk-weighted algorithms have been found to perform poorly out-of-sample when predicting everything from sports events to medical diagnoses, from shopping habits to portfolio choices (Haldane and Madouros (2012)). Over-fitting the past makes for fragile predictions about the future. Unweighted measures, without noise pollution, have often been shown to do better.

Whether they do so in bank regulation is, ultimately, an empirical question. The noise around estimated risk weights cannot be observed directly, but empirical evidence is illustrative. For example, if estimated risk weights can differ across banks by factors ranging from three to a thousand, this suggests a high, sometimes deafening, amount of model noise. Historical errors in estimated risk weights are also illuminating. For example, trading book risk weights during the crisis were found to be mis-calibrated by factors of up to 50.

A common driver behind these fragilities may be the shortness of the samples used for model estimation. It is well-known that small sample problems are especially acute when the underlying distribution of outcomes is tail-heavy, as with financial time-series. The Basel regime imposes constraints on so-called "look back" periods. For example, the minimum sample period for VaR models in the trading book is one year, though most models in practice use between one and two years. For the banking book, the minimum look-back period is between five and seven years, with actual samples lying between five and twenty years.

From a robustness perspective, samples this short are, quite literally, a recipe for disaster. At most, they would encompass one cycle or extreme event. Some would fail to cover even that. This would leave the tail of the risk distribution empirically under-fitted and the body over-fitted. In other words, estimated risk weights are very likely to be least reliable when regulators are most reliant on them. By construction, when it matters most, risk weights are likely to be long noise and short signal.

Theoretical objections to risk weighting are no less deep-seated. One key issue is aggregation (Masera (2012)). Regulation has focussed on ever-more granular and precise risk estimates for individual assets. Fewer attempts have been made to consider correlations across broad asset classes, other than in parts of the trading book. Yet it is these correlations which fundamentally determine risk across a banking portfolio. Indeed, this is perhaps the key lesson finance theory has taught us over the past half-century.

There is a cruel irony here. One of the great pre-crisis mistakes was to look at risk in the financial system institution by institution, atom by atom. Doing so resulted in regulators missing the systemic crisis of a lifetime. Yet an asset by asset, atom by atom approach to risk measurement still lies at the heart of the post-crisis regulatory framework.

A second conceptual problem with risk-weighting is that it takes no account of the collective consequences of banks' asset allocation decisions. For example, no account is taken of the externalities, positive or negative, that banks' portfolio choices may give rise to. This may lead to risk weights being mis-calibrated from the perspective of the financial system as a whole and the wider economy.

As an example, take lending to the real economy – for example, to finance infrastructure, SMEs or trade. These asset choices are likely to be positive for medium-term growth and hence, indirectly, for credit risk in the financial system. In other words, this portfolio allocation is likely to deliver *positive* externalities for the wider economy.

By contrast, lending within the financial system may have the opposite effect. It raises interconnectivity in the system, thereby amplifying systemic risk (Haldane (2009)). In other words, this portfolio choice may drive *negative* externalities for the financial system and wider economy.

In an ideal world, these risk externalities would be taken into account in the setting of risk weights – for example, by raising risk weights on intra-financial system lending and lowering it on growth-positive lending. In practice, there is scant evidence of this having happened. Indeed, if anything the current risk-weighting system appears to generate the opposite set of incentives.

Chart 7 looks at the average risk weight assigned by UK banks to different counter-parties, some in the financial system, others in the wider economy. The differences are stark. Mortgage risk weights are double those on lending to financial institutions. For large companies, risk weights are treble those on lending within the financial system. For SMEs, they are quadruple. Those are probably not the risk weights a benevolent dictator, charged with supporting the economy and armed with a PhD in welfare economics, would choose.

The acid test of whether these empirical and theoretical concerns about risk-weighting have merit comes from assessing the evidence. Do risk weights help in signalling bank failure? There have been a number of recent studies comparing the predictive performance of Basel risk-based capital ratios and simple leverage ratios for bank failure. The results are both striking and surprising.

Studies by IMF (2009), Demirguc-Kunt *et al* (2010), Haldane and Madouros (2012), Mayes and Stremmel (2012), Brealey et al (2011), Berger and Bouwman (2013), Blundell-Wignall and Roulet (2013) and Hogan *et al* (2013) perform a horse-race between different bank solvency measures, using a variety of techniques, samples and controls. Despite these differences, the conclusion they draw is broadly consistent: leverage ratios perform as well, and in most cases better, than risk-weighted alternatives in predicting bank failure.

These results appear to be stronger for large banks, often using internal models, than for smaller banks typically using standardised approaches (Haldane and Madouros (2012)). This is not altogether surprising given that model risk is largest among banks making greatest use of models and with the largest portfolios. It is also the case that no measure of bank capital adequacy, by itself, provides a full-proof forecast of impending bank failure: the predictive power of all solvency metrics, leverage or otherwise, is fairly low.

Nonetheless, these results send a sobering message. Even on risk-sensitivity grounds, risk-based capital measures may often be trumped by risk-insensitive alternatives. The noise in risk weights may be drowning-out the signal. Granularity may not improve risk-sensitivity; it could even worsen it by amplifying model risk. And given that uncertainty, simpler metrics may often provide a more robust signal of solvency.

(c) Risk-shifting and robustness

A third argument used to justify risk-based frameworks is that they help defuse incentives to engage in "risk-shifting" or other types of regulatory arbitrage (Kahane (1977), Kim and Santomero (1988)). Risk-shifting refers to incentives to shift portfolios towards higher-risk, higher-return assets. These incentives are likely to be strongest when risk is not well aligned with return – for example, under an equally-weighted leverage ratio. Indeed, this powerful logic justified moving to risk-based capital standards in the first place.

Historically, there have certainly been episodes when risk-shifting appears to have been important. For example, the movement by banks into Latin American debt in the 1980s; the loading-up on zero risk-weighted OECD sovereign debt in the 1990s; and the extension of zero-weighted 364-day lines of credit in the 2000s. Yet in these cases, the problems seem to have been generic - mis-calibration of risk weights.

A few studies have looked at the evidence on risk-shifting more systematically. For example, Furlong (1988) looked at the behaviour of around 100 US bank holding companies after the introduction of the leverage ratio in 1981. While banks' average riskiness increased, there was no difference in behaviour between regulatory-constrained and unconstrained banks. This suggests risk-shifting was not too potent a factor. Sheldon (1996) reaches the same conclusion when considering the move by international banks to Basel I.

One possible reason why risk-shifting may have been difficult to detect is that risk-based capital standards coincided with the shift to a much more complex regulatory framework. Complexity has an important impact on risk-shifting incentives - and not in the ways some have suggested. For example, some have argued that simpler rules are easier to arbitrage. The evidence suggests the exact opposite.

Take the tax system. Simple linear tax schedules are typically found to be more robust to problems of tax arbitrage than complex rules (Hindriks, Keen and Muthoo (1999)). Why? Because complexity increases the number of loopholes through which the tax-avoider can slip. Indeed, evidence suggests that complexity of the tax system may be the single largest determinant of tax avoidance across countries (Richardson (2006)).

The same logic carries across to financial regulation. Regulatory complexity creates wormholes. At a macro level, cross-country studies suggest that regulatory complexity, in particular the use of internal models, appears to have had an important bearing on bank failure (Cihak et al (2012)). At a micro level, the parts of the regulatory framework which have been most prone to arbitrage are those where complexity and opacity has been greatest – for example, the trading book.

Incentives will always exist to shift risk to where it is cheapest. No tax or regulatory system can fully avoid those incentives. But some regimes may be better at constraining those incentives than others. The current mix of complexity and self-regulation may provide too few constraints. Complexity has meant that avoidance and arbitrage can flourish behind a curtain of opacity. And self-regulation has meant that even as one wormhole is closed, others can be created in their place.

Taken together, this evidence does not paint an especially encouraging picture. Many of the intended aims and purported advantages of a complex, risk-based regulatory approach may not have materialised in practice. Worse, some of the assets of the risk-based approach may even have become liabilities.

Unintended consequences

So much for the intended consequences of the shift to self-regulatory standards. What of the unintended consequences? Three are worth noting.

(a) Cost and compliance

First, regulatory complexity comes at a cost – the cost of compliance. These costs are borne, in the first instance, by the regulator and regulated firms. The costs of moving to Basel II, and the emergence of internal models, are difficult to calculate. But external estimates put it at tens of billions of dollars.

For European banks, the costs of implementing Basel III are estimated at over 70,000 jobs per year (Harle et al (2010)). For US banks, the costs of Dodd-Frank are also estimated to be tens of thousands of jobs. The costs of Solvency II, the new capital standard for European insurance companies, have been put at tens of billions of euros – and it is unclear even whether this standard will be implemented. At the same time, regulators have continued to bulk-up their own resources in the face of a rising tide of regulatory rules.

Ultimately, these costs are borne not by regulators or regulated firms, but by general taxpayers and bank customers. These come in the form of higher taxes, lower savings rates and higher lending rates. If system stability can be achieved in simpler ways, these are deadweight costs to society.

(b) The unlevel playing field

A second unintended consequence of the move to a model-based regulatory framework is that it has tended to work in quasi-discriminatory ways. In particular, it has tended to discriminate both between small and large banks and between new entrants and existing incumbents in the amounts of capital they are required to hold even against identical exposures.

The reason for this is that small or new entrant banks will generally adhere to Basel I or simple standardised approaches for measuring risk. In general, they will have neither the data nor the technology to support internal model approaches. But simpler, standardised approaches tend to require much higher amounts of capital than internal model approaches. Indeed, this was a design feature of Basel II.

Chart 8 demonstrates those differences among the major UK banks for a selection of portfolios. For an identical corporate exposure, a small bank on Basel I or a standardised Basel II approach holds, on average, twice as much capital as a large bank using models. For retail mortgages, these differences are larger still. Some internal model-based banks attach a risk weight to mortgages of as little as 5%. A standardised-approach bank would need to hold at least nine times that amount in capital.

These design features of Basel II were intended to provide incentives to banks to move to internal models and thereby improve their risk management. The link from use of models to improved risk management is at best tenuous. But more fundamentally, this design feature may also have potentially perverse consequences for systemic risk and competition.

Under the existing approach, capital charges will tend to be highest for those small, simple banks posing least risk to the financial system as a whole. The systemic risk tax is regressive. This regressivity will tend to worsen the too-big-to-fail problem, by providing regulatory incentives for the large to become larger still. The capital surcharges recently agreed for systemically important institutions, while helpful, are unlikely to retilt this balance. Capital regulation may also have acted as a barrier to banking entry, raising the bar for new entrants. Neither outcome (higher risk and lower competition) are desirable from a societal perspective.

(c) Transparency and market discipline

A final unintended consequence is lack of transparency. A large bank may have literally thousands of models, hundreds of thousands of outputs and several million inputs. The height of this information mountain makes scrutiny and aggregation of regulatory capital calculations near-impossible for either investors or regulators.

The combination of complexity and manipulation has led to a loss of faith by investors in model outputs, and in particular risk weights, over the past few years. Surveys of investors suggest a fairly deep-seated scepticism about risk weights, with only a small fraction believing them trustworthy (Chart 9). From a low base, investor faith in these risk weights has continued to fall fast (Chart 10).

These concerns appear to be reflected in the pricing of bank risk. Bank investors appear to have moved towards using simpler metrics, such as leverage ratios, when assessing capital adequacy. There is a positive correlation between banks' leverage ratios and their market price-to-book ratios (Hoenig (2013)). No such correlation exists for banks' regulatory capital ratios. Investors seem to have begun pricing the solvency risk they best understand.

The lack of transparency about, and investor trust in, risk weights has important implications. For regulators, a lack of transparency can damage the power of market discipline in constraining risk-taking – so-called Pillar III of Basel. Or, put differently, the complexity of Pillar I of the Basel Tower (regulatory rules) risks emasculating Pillar III (market discipline). Pillar I has become Popeye's forearm, Pillar III his bicep.[3]

For investors, uncertainty about banks' true capital adequacy is priced. Where there is uncertainty, they will factor a premium into banks' cost of capital. That may be one of the reasons many of the world's largest banks have continued to trade at a discount to their equity book value. Until the fog around banks' capital adequacy is reduced, including regulatory-induced fog, banks' cost of capital may remain high.

Where next?

Taken together, it is difficult to escape the conclusion that the current regulatory system, however well-intentioned, needs root-and-branch repair. The good news is that regulators internationally are increasingly coming to recognise that fact and have slowly begun the process of repair. In the past year, the Basel Committee has begun work to improve the "Simplicity and Comparability" of the regulatory framework. And earlier this year, the G20 Finance Ministers and Central Bank Governors committed the regulatory authorities to improve comparability of regulatory standards.

The practical question is what might be done to improve the credibility of the framework? In the spirit of moving forward the debate, some possible practical ingredients include:

(a) Greater transparency

One simple way of alleviating some of the uncertainty around the existing regulatory framework would be through improved transparency, in particular around models and risk weights. Some encouraging progress has been made on this front recently. In 2012, the Enhanced Disclosure Task Force (EDTF) of the Financial Stability Board produced a set of recommendations for improved bank transparency. This included greater disclosure around the models used to calculate risk weights.

At present, banks are at various stages of progress in implementing these EDTF recommendations. For example, a number of UK banks made good progress towards compliance in their end-2012 accounts. A firm future commitment by global banks to meet

[3] With thanks to Jason Kravitt.

the EDTF recommendations would be a material step in the direction of improving transparency about regulatory capital ratios.

What the EDTF recommendations, by themselves, cannot achieve is an assurance of prudence in risk weights. This would require disclosure of alternative capital adequacy benchmarks. For example, last year the Swiss National Bank requested that Swiss banks publish standardised measures of credit risk as a benchmark alongside model-based measures. This would provide information on how prudent different banks were being in their model-based estimates. This, too, might usefully be thought through globally.

A more valuable set of disclosures still would come from conducting HPE on a systematic and comprehensive basis internationally - systematic in the coverage of different assets, comprehensive in the coverage of institutions. Making the results of those exercises available to bank supervisors would enable actions to be targeted at banks deviating materially from the pack. Going one step further, making those HPE results available to investors would enable them better to price (im)prudence.

Any or all of these disclosure initiatives would help reduce uncertainty. At the same time, disclosure can only ever be a partial solution. For example, by itself it can do nothing to streamline regulatory complexities. In some instances, disclosure could even accelerate the race to the bottom – for example, if naming resulted not in shaming but cloning.

(b) Imposing floors

A second, more intrusive, regulatory intervention would be to place greater regulatory constraints on banks' internal models. Tightening up the process around supervisory model approval might be one element of that. One practical step would be to impose much longer look-back periods than the current minima. Another would be to require an extended period of out-of-sample testing prior to model approval.

A third would be imposing direct restrictions on models - for example, by introducing floors on risk weights. Prompted by concerns about imprudently-low risk weights, a number of regulators internationally have imposed floors in the past year – for example, in the UK, Hong Kong, Sweden, Norway and Switzerland. In the US, the Collins Amendment to the Dodd-Frank Act requires banks using internal models to meet a 100% floor based on a simple, standardised approach.

The imposition of floors can usefully help cut off the tail of firms, or portfolios, where low risk weights are being set. In that way, it can help prevent capital falling to imprudently low levels. But setting floors also poses some difficult calibration questions. At what level, and level of granularity, should floors be set? And based on what benchmark?

Answers to those questions can fundamentally reshape incentives. For example, if a floor is set at 100% of the standardised approach, this will effectively remove incentives to move to models in the first place. Anything short of a 100% floor, while improving prudence, would not curtail complexity and inconsistency in capital adequacy standards.

(c) Prioritising leverage ratios

One, more radical, way of doing so would be to place a greater emphasis on measures which rely neither on models nor on risk weights – for example, through a simple leverage ratio. Basel III made significant headway in this regard. Once implemented, it will introduce for the first time an internationally-agreed 3% leverage ratio as a backstop to risk-based capital measures.

The question is whether this formulation goes sufficiently far in tackling the consistency, incentives and uncertainty problems affecting risk-based standards. Is 3% inadequate? And, relatedly, should the backstop instead be a front stop? A widening array of officials and academics have recently opined on both questions, often answering yes to both (Admati and Hellwig (2013), Systemic Risk Council (2012), Johnson (2013), Haldane (2012),

Hoenig (2013), Fisher (2013), Norton (2013), King (2013), Stein (2013), Brown and Vitter (2013)).

The recent legislative proposal by US Senators Sherrod Brown and David Vitter is one of the most radical proposals to date. It advocates a tiered set of leverage ratio standards, rising to 15% for banks with assets in excess of $500 billion. Risk-based standards would be jettisoned entirely. From a simplicity and robustness perspective, it has attractions.

At the same time, the Brown-Vitter proposals clearly raise a host of practical questions. They are sufficiently far north of existing capital standards that they are perhaps at best seen as a (possibly distant) long-term resting place, not a practical near-term objective. There is also a question of whether removing risk-based standards is necessary or desirable. Placing leverage and risk-based standards on a more equal footing might give us the best of both worlds, with them acting jointly as regulatory bookends.

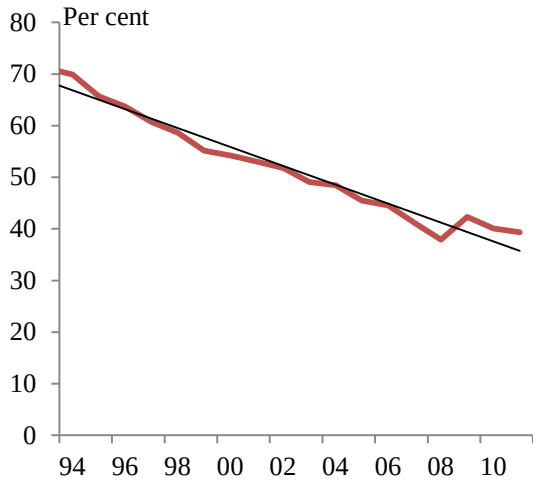
Whatever the merits of particular proposals, it is entirely right that the official sector should continuously assess whether the financial system has adequate capital insurance to deal with too-big-to-fail problems. The emerging consensus, within academia, officialdom and among market participants, is that it has not. Despite enormous progress in developing policy proposals, too big to fail is an itch that remains unscratched.

Were this debate to conclude that greater capital insurance was necessary, this would pose challenges to the world's largest banks – but also opportunities. A more prudent capital rule could, over time, give regulators greater assurance. Too-big-to-fail could, over time, be removed from our lexicon. Over-complex regulation could, over time, be streamlined from our legislatures. Supervisors and compliance officers could, over time, be reemployed as brain surgeons. And banks, over time, could be left to run themselves, albeit within pre-defined constraints. This is a deal a foresighted CEO, or indeed official, might wish to strike.

Conclusion

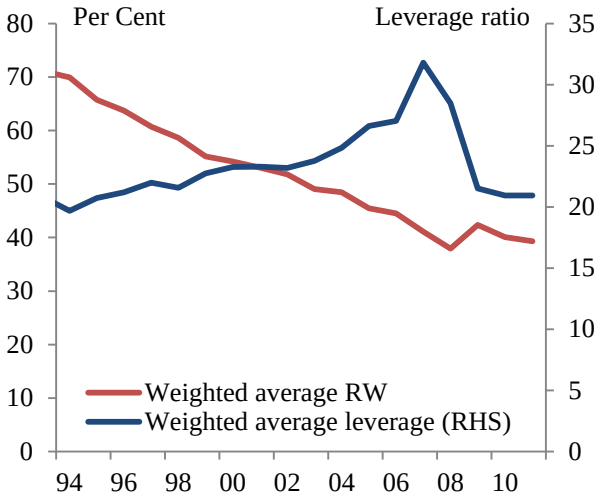
Over the course of the past 20 years, banking regulation has edged in a self-regulatory direction for understandable, but self-defeating, reasons. The regulatory regime has tilted from constrained discretion to unconstrained indiscretion. It will be a long journey home, but that journey has started. Making greater use of simple, prudent regulatory metrics could restore faith, hope and clarity to the financial system to the benefit of banks, investors and regulators alike.

Chart 1: Average risk weights[(a)]



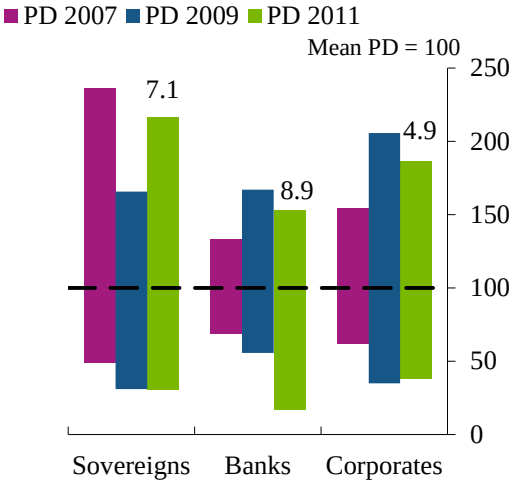
Source: The Banker and Bank calculations.
(a) Weighted average risk weights of Deutsche Bank, HSBC, BNP Paribas, Barclays, Citigroup, UBS, BAML, BONY, Commerzbank, ING, JPM, LBG, RBS, Santander, State Street, UniCredit, Wells Fargo. Data are not available for the remaining G-SIBs.

Chart 2: Average risk weights and leverage[(a)(b)]



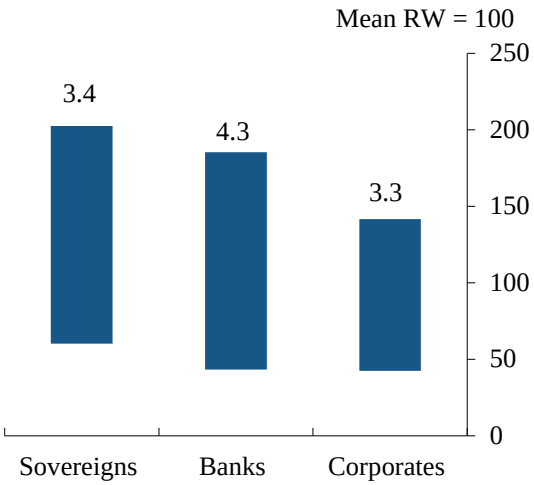
Source: The Banker and Bank calculations
(a) Sample consists of Deutsche Bank, HSBC, BNP Paribas, Barclays, Citigroup, UBS, BAML, BONY, Commerzbank, ING, JPM, LBG, RBS, Santander, State Street, UniCredit, Wells Fargo. Data are not available for the remaining G-SIBs.
(b) Leverage ratio is defined as Total assets / Tier 1 capital.

Chart 3: Variability of default probability estimates[(a)(b)(c)(d)(e)]



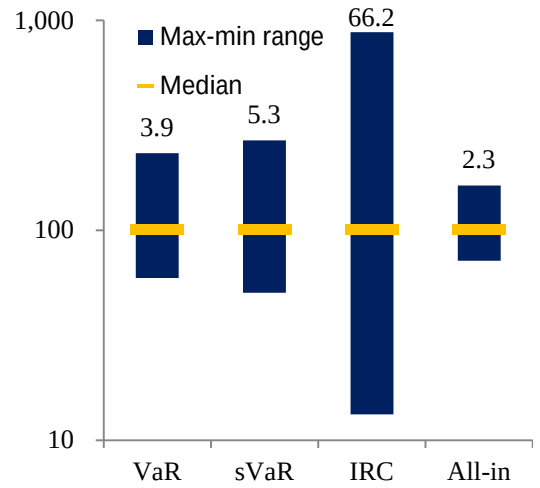
Source: FSA, and Bank calculations
(a) Based on the results of the FSA's hypothetical portfolio exercises for 2007, 2009 and 2011.
(b) Results are based on portfolios comprising assets rated by all respondents in the sample (co-rated).
(c) Portfolios differ between the exercises in 2007, 2009 and 2011. Results have been normalised by the mean.
(d) Sample sizes differ: six to twelve in 2007 and seven to thirteen in 2009, depending on portfolio; and eight in 2011.
(e) The bars show the maximum – minimum ranges. The values on top of the 2011 results indicate the maximum – minimum ratio.

Chart 4: Risk Weight variability in 2011[(a)(b)(c)(d)]



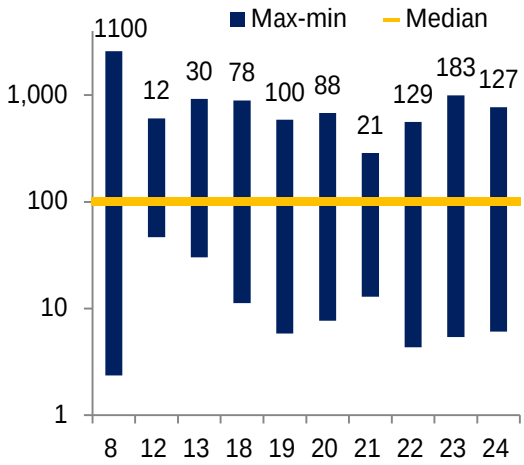
Source: FSA, and Bank calculations
(a) Based in the results of the FSA's hypothetical portfolio exercise for 2011.
(b) Results are based on portfolios comprising assets rated by all respondents in the sample (co-rated).
(c) The sample includes six banks.
(d) The bars show the maximum – minimum ranges. The values on top of the 2011 results indicate the maximum – minimum ratio.

Chart 5: Risk weight variability in the trading book[(a)(b)(c)(d)]



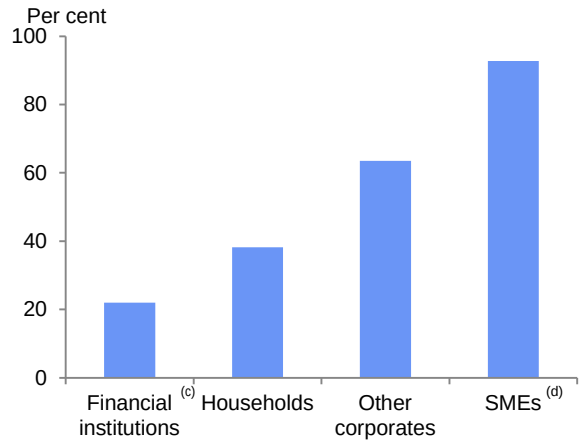
Source: BCBS
(a) From the BCBS hypothetical portfolio exercise for the trading book.
(b) Sample consists of 15 banks.
(c) Values have been normalised by the median. For each model, the ranges represent the simple average of the normalised minima and maxima for all portfolios the model was applied to. For the all-in portfolio, the supervisory multiplier was held constant.
(d) Numbers on bars indicate maximum - minimum ratios.

Chart 6: Risk weight variability in the IRC model[(a)]



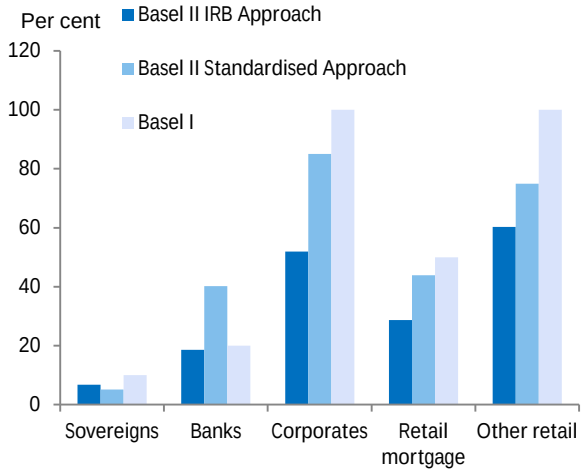
Source: BCBS
(a) From the BCBS hypothetical portfolio exercise for the trading book.
(b) Sample consists of 15 banks.
(c) Values have been normalised by the median.
(d) Numbers on bars indicate maximum-minimum ratios.

Chart 7: Average risk weights for major UK banks by counterparty[(a)(b)]



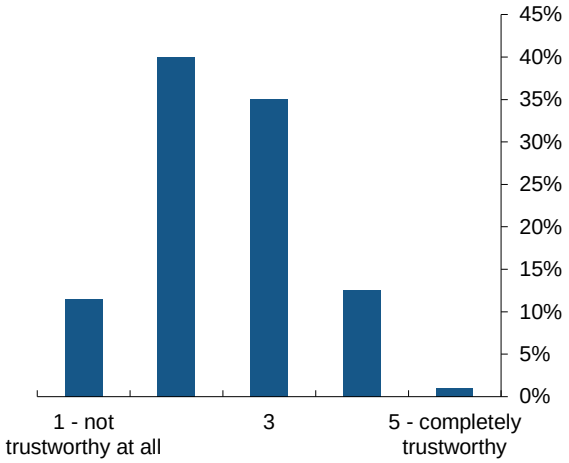
Sources: Bank of England, FSA regulatory returns and Bank calculations.
(a) Based on June 2011 data for Barclays, HSBC, LBG, Nationwide, RBS and Santander UK.
(b) Cover credit and counterparty credit exposures.
(c) Financial firms other than regulated banks and investment firms are included within 'Other corporates'.
(d) Only includes data on SME credit exposures from internal ratings based portfolios.

Chart 8: Average risk weights for major UK banks under different approaches [(a)]



Source: Pillar 3 disclosures, Bank calculations
(a) As of end-2011. Weighted average.

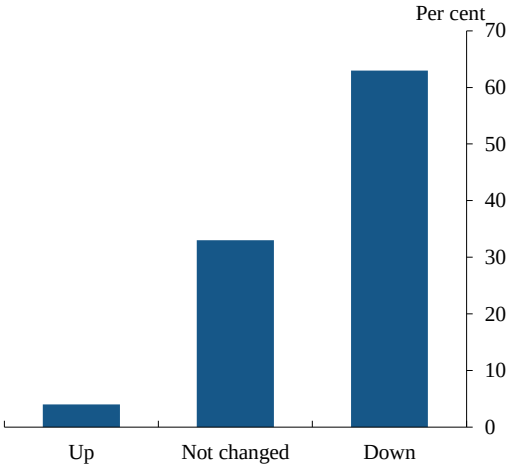
Chart 9: Survey responses to "How much do you trust risk weights?"[(a)]



Source: Barclays Capital.

(a) Based on survey responses of over 130 investors carried out in H1 2012, of perceptions over the previous year.

Chart 10: Survey responses to "Has your confidence in risk-weighted assets gone up or down?"[(a)]



Source: Barclays Capital.

(a) Based on survey responses of over 130 investors carried out in H1 2012, of perceptions over the previous year.

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