



Sept. 14, 2012

To Basel Committee

via email baselcommittee@bis.org.

Please accept this letter and attachment as our response to the *Fundamental review of trading book capital requirements: consultation by the Basel Committee* dated 3 May 2012. We apologize for a late response.

Sincerely,

Allan D. Grody, President
Financial InterGroup Holdings Ltd

and on behalf of:

Professor Kiran J. Fernandes
Research Director &
Head of Operations Management Group
The York Management School
University of York

Steven Toms
Professor of Accounting
Leeds University Business School
University of Leeds

Peter J. Hughes
Visiting Research Fellow
The York Management School
University of York, and
Managing Director
Financial InterGroup – UK

THE UNIVERSITY *of York*  Financial InterGroup  Financial InterGroup UK



**Comments on Aspects of the BIS's Fundamental Review
of
Trading Book Risk Measurement Methods**

Introduction

In July 2009 the Basel Committee issued revisions to the market risk framework. At the same time, the Committee initiated a fundamental review of the trading book.¹ We understand that the review's intent is to comprehensively evaluate the overall design of the market risk amendment of 2004 and the update of 2009 including an assessment of identified weaknesses in the risk quantification techniques adopted within Basel's internal models-based and standardized approaches. The resulting document, the subject of the comments included in this paper, proposes extensions to the existing framework which, in our view, did not constitute the "fundamental review" announced by its authors.

The ten (10) summary questions prospective commenters were invited to consider concluded with, "Do commenters propose any amendments to these approaches?" We believe a more appropriate question would be to ask commenters whether they wish to propose any "alternative" approaches. In other words, the fundamental review should be considerate of proposed alternative risk quantification techniques given the limitations and inadequacies inherent in the prevailing market risk framework as evidenced by the Basel authors' own conclusions and observations. For example, the review document includes references such as "flaws in the overall design of the framework", "both the models-based and the standardized approaches proved wanting", "the models-based capital framework for market risk relied on a bank-specific perspective of risk, which might not be adequate from the perspective of the banking system as a whole", "reviewers also identified important shortcomings with the standardized approach" and "a lack of risk sensitivity, a very limited recognition of hedging and diversification benefits and an inability to sufficiently capture risks associated with more complex instruments". Most importantly, the document observes that weaknesses identified in the prevailing capital adequacy regime constituted a "provision of incentives for banks to take on tail risk" which is contrary to the very essence of a capital adequacy framework.

Given the foregoing it would seem shortsighted to build upon an evidently flawed regime in an incremental way, this "flawed" regime being the reported conclusion of the Basel review document's authors. In our view, more fundamental revisions must be considered. Accordingly,

¹ Fundamental review of trading book capital requirements: consultation by the Basel Committee, 3 May 2012 at <http://www.bis.org/press/p120503.htm>

our comments presented in this paper are more fundamental in nature and address two key aspects, (1) the need for change in the manner in which transactions are registered in firms' books of account to reflect the exposures to risk that transactions trigger rather than their notional value and (2) the need and subsequent consequence to risk management of global identification standards applied to legal entities and financial instruments.

Such directional change and shift of regulatory emphasis would appear to be consistent with views recently expressed by Andrew Haldane, Bank of England's Executive Director, Financial Stability, when he warned that the complexity of current regulation is preventing authorities from spotting and averting financial crises. He observed that "the Tower of Basel is at risk of over-fitting – and over-balancing" concluding that it may be time to rethink its architecture suggesting instead that regulatory bodies adopt simpler, more judgment-based supervisory approaches.²

In this same vein Karen Shaw Petrou, a managing partner at Federal Financial Analytics Inc. warned that Basel and other financial market regulators will become "equivalents of all of the United Nations agencies that issue lengthy protocols and proclamations ignored in form and substance around the world even as signatories dutifully pen their names."³ She believes regulators should codify global standards "not as hoped-for rules," but as "best practices" for the industry, which rely on clear quantitative standards and qualitative criteria to ensure that each country and every financial institution can be evaluated objectively.

Finally, Ranjit Lall research fellow at Oxford University argues Basel II's failure lies in regulatory capture which he defines as, 'de facto control of the state and its regulatory agencies by the 'regulated' interests, enabling these interests to transfer wealth to themselves at the expense of society'.⁴ He further argues that "Large international banks were able to systematically manipulate outcomes in Basel II's regulatory process to their advantage, at the expense of their smaller and emerging market competitors and, above all, systemic financial stability". He goes on to assert that Basel III will suffer the same fate of regulatory capture, especially as the largest financial institutions are now deemed systemically important, are to be more "watched over" than before the financial crisis and, therefore, have more at stake in protecting their interests.

² The dog and the Frisbee, Andrew G Haldane and Vasileios Madouros, presented at the Federal Reserve Bank of Kansas City's 36th economic policy symposium, "The Changing Policy Landscape", Jackson Hole, Wyoming, 31 August 2012 at <http://www.kansascityfed.org/publicat/sympos/2012/ah.pdf>

³ Donna Borak, Can Basel III Be Saved?, American Banker, Sept. 7, 2012

⁴ Ranjit Lall, Why Basel II Failed and Why Basel III is Doomed, Global Economic Governance Programme, Centre for International Studies, Department for Politics and International Relations, Oxford University College, October, 2009, GEG Working paper 2009/52 at <http://www.globaleconomicgovernance.org/wp-content/uploads/GEG-Working-paper-Ranjit-Lall.pdf>.

Problems with current approaches to risk measurement

In this fundamental review Basel is proposing that Value-at-Risk (VaR) be replaced by the Expected Shortfall (ES) methodology. It is anticipated that this will increase the sensitivity of the risk regime to accommodate extreme events or “tail risk”. By looking through the ES lens beyond the 99th percentile of the extreme expected loss distribution a broader range of potential outcomes may be observable than those obtained through VaR. Indeed, it could be argued that ES constitutes a formalised incorporation of the stress tests typically applied to VaR outcomes.

Value at Risk (VaR) has become one of the most prominent risk measurement techniques following the development of first JP Morgan’s RiskMetrics™ and later CreditMetrics™ system. However, VaR derived methods suffer a number of limitations leading to misconceptions as to what its outcomes truly represent. For example, VaR is frequently, but incorrectly referred to as a maximum loss figure or “largest likely loss”. Perhaps a more appropriate interpretation is offered by GARP Risk Manager of the Year, Aaron Brown, “VaR can be measured better than alternatives, but what does it tell us? It’s not the worst-case loss: in fact, we expect to lose more than VaR two or three times a year”. And he concludes “VaR is a tool of risk management, not risk measurement”,⁵ which provides yet more evidence of the inappropriateness of VaR as a basis for the administration of enterprise level regulatory capital requirements.

A further limitation of VaR as a basis for the administration of regulatory capital requirements is a consequence of the inherent variations in modelling theories, beliefs and assumptions that may exist between functions within enterprises and between enterprises. The inability to identify the same counterparties and even products consistently throughout the many business silos within a firm, and across firms further compromises the enterprise value of VaR. In the absence of an ability to aggregate positions across business units at the enterprise level before applying VaR models, firms aggregate VaR values using various techniques, all of which are mathematically contrary to the non-additive nature of VaR.

Notwithstanding the aforementioned limitations of VaR, its implementation presents a number of operational challenges which, according to Andrew Haldane, cannot be resolved in the short term.⁶ He observes that “the parameter space of a large bank’s banking and trading books could easily run to several millions. These parameters are typically estimated from limited past samples. For example, a typical credit risk model might comprise 20-30 years of sample data – barely a crisis cycle. A market risk model might comprise less than five years of data – far less than a crisis cycle.” He further comments that the resulting operational complexity of such models and approaches give rise to “startling degrees of complexity and an over-reliance on probably unreliable models.... With thousands of parameters calibrated from short samples, these

⁵ Aaron Brown, ‘*Private Profits & Socialised Risk*’, Global Association of Risk Professionals, June / July 2008

⁶ Ibid

models are unlikely to be robust for many decades, perhaps centuries to come. It is close to impossible to tell whether results from them are prudent.”

In the second pillar of the Basel II capital accord the BCBS (2004)⁷ sets out its key principles for a supervisory review process. In particular, the first principle states that ‘banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels’. The term universally applied to this process is the Internal Capital Adequacy Assessment Process (ICAAP). The ICAAP has been widely adopted by national supervisors as the mechanism through which bank management demonstrates its process for ‘understanding the nature and level of risk being taken by the bank and how this risk relates to adequate capital levels’ and ‘ensuring that the formality and sophistication of the risk management processes are appropriate in light of the risk profile and business plan’.

National supervisors typically require their regulated banks to prepare and submit an ICAAP document. Whereas guidelines may be published for its preparation⁸ or a suggested format may be offered⁹ it is generally the case that the various forms of supervisory guidance do not constitute a request to submit risk related data and information to regulators in any standardised format. The UK Financial Services Authority, for example, introduces its suggested ICAAP submission format with the words, ‘firms are not required to adopt this format’. The Canadian Office of the Superintendent of Financial Institutions in its ICAAP guideline explains that while such fundamental features of an ICAAP are broadly prescribed, ‘there is no single ‘correct’ approach’ and it ‘should be as simple or complex as needed’.

In the third pillar (Pillar 3) of Basel II the BCBS sets out disclosure requirements which will allow market participants to assess key pieces of information on the scope of application, capital, risk exposures, risk assessment processes, and hence the capital adequacy of the institution. Such disclosures should be consistent with how senior management and the board of directors assess and manage the risks of the bank. It follows that there is a good deal of commonality between what banks report in their ICAAPs and related Pillar 3 disclosures.

It is unquestionably the case that ICAAPs and Pillar 3 disclosures provide important and valuable information for the board of a bank and its investors and other stakeholders. However, it is also the case that the value of such internal and external reporting mechanisms is inhibited by the absence of a common framework of risk exposure quantification and reporting. Whereas investors and regulators gain important insights into the methods adopted by banks to quantify their risks and how these are related to capital levels, the multiplicity and frequent complexity of

⁷ BCBS, 2004, *‘International Convergence of Capital Measurement and Capital Standards’*, Bank for International Settlements.

⁸ For example OSFI, 2010, *‘Internal Capital Adequacy Assessment Process (ICAAP) for Deposit-Taking Institutions (E-19)’*, Office of the Superintendent of Financial Institutions Canada

⁹ For example, FSA, 2007, *‘ICAAP Submission – Suggested Format (v2.0)’*, UK Financial Services Authority

such methods result in a limited ability to determine whether a bank is taking on too much risk and a virtual impossibility to determine how much risk has been taken on by one bank compared to others.

Effective bank regulation also suffers from the absence of standardised reporting formats that would support the routine, periodic and mechanised receipt of information relating to banks' accumulating risk exposures offered by a common risk quantification and reporting framework.

Accounting for Risk

An important response to perceived weaknesses of VaR based approaches is the call to develop accounting as an alternative base for the development of risk measures. Notwithstanding the aforementioned issues with risk quantification, and perhaps because of them, investors continue to rely primarily on accounting and the resulting audited financial statements to inform them of the financial performance and condition of the institutions in which they invest. Several years ago, Merton (1995)¹⁰ was predicting the likely consequences of systemic risk and observing the limitations of conventional accounting practices characterising them as “focused on valuation, which is inherently a static measure of financial conditions”. According to Merton, accounting needed to evolve a new branch called ‘Risk Accounting’ so that it might become focused on risk exposures allowing regulation to be made more effective. To do so, it needed inherently dynamic measures of financial condition to indicate the sensitivity of individual balance-sheet values to changes in the underlying financial-economic environment. Lo (2009) further observed that, with regard to the causes of the financial crisis, “The very fact that so many smart and experienced corporate leaders were all led astray suggests that the crisis can't be blamed on the mistakes of a few greedy CEOs”. He expressed the view that, “...there's something fundamentally wrong with current corporate-governance structures and the language of corporate management. We just don't have the proper lexicon to have a meaningful discussion about the kinds of risks that typical corporations face today, and we need to create a new field of ‘risk accounting’ to address this gap in GAAP (Generally Accepted Accounting Principles)¹¹”.

Enterprise-Wide Risk Management

The absence of standardised enterprise-wide risk measurement and accounting mechanisms causes risk and performance management tools to be dysfunctional. For example where Balanced Scorecards are used they are inconsistent in their structure, devoid of any consistent and comparable basis of measurement and excessively dependent on subjective assessments

¹⁰Merton R, 1995, ‘*Financial Innovation and the Management and Regulation of Financial Institutions*’, Journal of Banking and Finance 19 (1995) 461-481

¹¹ Lo A, 2009, quoted in ‘*Understanding Our Blind Spots*’, Wall Street Journal Mar 23, 2009

(Norreklit, 2000¹², Kasurinen, 2002¹³). Risk & Control Self Assessments (RSCAs) share similar limitations. Nevertheless, a high degree of reliance is being placed by financial firms in such management tools to assess and report on the condition of operating performance, risks and controls.

Grody and Hughes (2009)¹⁴ described how an enterprise's operating environment can be deconstructed into a simple model represented by three key operational pillars... People (manual processes), Systems (automated processes) and Data. They further observed that the flawless interaction of these three operational pillars produces a theoretical zero exposure to risk. Thus, the benchmark for zero risk can be represented as an operating environment with 100 percent straight-through-processing (STP) in a totally secure and reliable technology environment with flawless data. It is evident that this benchmark also represents a transaction processing environment that is operating at or close to optimal efficiency. It follows that the correlation coefficient between risk mitigation effectiveness and operational excellence is either '1' or close to '1'.

The operational implications of disbanding VaR as the pillar of the trading book risk regime are significant. It begs the question "are there other approaches that can be considered that would create better outcomes for risk management in general including the trading book as an integral part of enterprise risk management?"

Perhaps as significant as the operational considerations for firms to migrate to ES from VaR, are the cultural considerations in the way institutions monitor and manage risk. The pervasiveness of the use of VaR in financial firms, however extensive, is not the way they inherently manage their business, it is the way they manage the regulators' view of the risk of their business!

It is thus left to another view of the risk regime, one we offer below, that may align business's view of risk with that of regulators views through the alignment of accounting records with risk metrics thereby enabling a culture that respects performance incentives while allowing for risk adjusting the financial system.

In the spirit of the above comments and in recognition of a fundamental review of trading book risk measurement methods we would like to add our comments on:

¹² Norreklit Hanne, The Balance on the Balanced Scorecard: A Critical Analysis of Some of Its Assumptions. Management Accounting Research, Vol 11, No 1, March 2000. Available at SSRN: <http://ssrn.com/abstract=216952>

¹³ Kasurinen, Tommi, Exploring Management Accounting Change: The Case of Balanced Scorecard Implementation. Management Accounting Research, Vol. 13, No. 3, September 2002. Available at SSRN: <http://ssrn.com/abstract=360642>

¹⁴ Grody AD, Hughes P, 2009, *'Transaction-Based Cross-Enterprise Risk Management'*, Risk Management in Finance – Six Sigma and Other Next-Generation Techniques, John Wiley & Sons, pp 233-256

- Risk Aggregation: methods of aggregating risk exposures for both observing enterprise risk as well as the contagion of systemic risk; and
- Risk Accounting: a new method of bringing accounting and risk management together in ways that simplify the risk regime, making it more “user friendly” to boards, management, regulators and shareholders.

Risk Aggregation

The very first pillar of global financial reform is a standard for an automated coding scheme for identifying the same financial market participant to each regulator in the same way. The G20’s Financial Stability Board (FSB), operating with the BIS as its Secretariat, is an entity with a broad charter to risk adjust the financial system and has begun laying the foundation for such a regulatory capability.

Without global identification standards it is understood that regulators cannot view systemic risk across the interconnected financial system. That we came this far without such a global identification system is quite remarkable. It was only by rummaging through the records of the collapsed Lehman Brothers that regulators came to recognize what the industry had known for decades... regulators had no automated means to aggregate and monitor the global risk exposures of the same financial firm or trading counterparty across multiple financial firms.

The need for a standardized Legal Entity Identifier (LEI) was first identified in a letter signed by six Nobel laureates addressed to Sen. Jack Reed (D-RI), a member of the US Senate’s Finance Committee. The expectation for the LEI is for it to be a standard computer readable code assigned to those businesses that are financial market participants - issuers of securities, trading parties in financial contracts, exchanges and others that develop tradable contracts, reference entities in credit default swaps, originators of mortgages, and all manner of financial intermediaries and financial transaction processors.

The idea of the LEI became part of the new rules of the Dodd-Frank Act. The LEI and UPI (Unique Product Identifier) became the subject of solicitations of interest by the US Treasury’s new Office of Financial Research, the CFTC and the SEC in late 2010. A later solicitation, by the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS) and the International Organization of Securities Commissioners (IOSCO), ending in September, 2011 resulted in further views on what was required to implement a global LEI.

The FSB organized two panels, an Expert Regulatory Group and an Industry Advisory Panel. They convened in Basel, Switzerland at the end of March 2012, joined by industry experts and thought leaders, some 120 representatives in all. On June 19, 2012 the G20 endorsed the recommendations of the FSB for the Global LEI which led to the formation of the Global LEI

Implementation Group made up of regulators and market participants. Over 100 participants convened in NYC on July 25th to kick start the effort that has targeted a first implementation date of March 2013. A first progress report, issued on August 23 noted 20 regulatory jurisdictions and 30 private sector jurisdictions that are represented by over 200 members working on this truly global initiative.¹⁵

All the constituent groups seem to be around the table now, financial intermediaries, exchanges, users of the contract and capital markets including non-financial market participants – corporate users of derivatives, security and debt issuing main street corporations, and sponsors of pension funds to name but a few who will have to self-register their own LEIs.

Seeing what is happening through monitoring risk triggers, aggregating risk exposures in an enterprise and across enterprises, and viewing financial transactions in real-time should prove to be a better watchdog than past efforts. It should augment the forensic approaches taken by bank examiners, the look-back into loss history conducted by capital adequacy regulators, and the audits conducted around past transactional events. The LEI initiative and the subsequent UPI initiative will permit advanced real-time risk management technologies to watch out for danger signs that human eyes are incapable of seeing.

These global identification initiatives are a public good and worthwhile effort that should be incorporated into the thinking of those authors and commentators opining on the fundamental review of the trading book. With a capability to uniquely, unambiguously and universally identify the same market participant holding the same financial instrument or contract across business silos within a single firm and across multiple firms, fundamentally new views of aggregating and observing risk exposures is made possible.¹⁶

Risk Accounting

Risk measurement has been part of the regulatory agenda in financial services since the first Basel Capital Accord was introduced in 1988. This and subsequent capital accords presumed that the disciplines developed to report on regulatory capital through the Basel lens would, in turn, spawn innovation towards embedding a risk culture and engendering a thoughtful understanding of risk appetite in financial firms. However, these ambitions have remained largely unfulfilled as evidenced by the global financial crisis that materialized even though the evolved discipline of risk management was all about its prevention.

¹⁵ Financial Stability Board, Progress Note on the Global LEI Initiative, Aug. 23, 2012 at http://www.financialstabilityboard.org/publications/r_120823.pdf

¹⁶ Grody, A. D., Hughes, P.J, Reininger, D., Global Identification System for Counterparties and Other Financial Market Participants; in the Special Issue on Counterparty Risk of the Journal of Risk Management in Financial Institutions, Vol. 5, No. 2., July 2012 at <http://ssrn.com/abstract=2016874>

A fundamental principle of risk management is that the basic framework comprising the setting of an institution's risk appetite, the determination of its capital requirement and the pricing of risk inherent in its financial products should be derived from a common risk measurement framework. If it is to be meaningful and effective, such a framework also requires a common unit of risk measurement to ensure its consistency and comparability across and between diverse operating environments and enterprises. The debate of such a common risk measurement in this fundamental review of the trading book, currently VaR vs. ES, should be broadened to include other measures that not only allow extreme tail events to be analyzed but also to analyze and, more importantly, mitigate fundamental risks and risk appetite excesses that have gone unmeasured and undetected.

The lack of a common measurement framework for the determination of an institution's risk appetite represents a major problem for financial firms and their investors and regulators. It is arguably the most significant unsolved challenge, a need for a clear definition of risk appetite and a basis of common measurement. As recently commented by KPMG "organizations of all kinds and sizes are grappling with the concept of risk appetite... Thinking about risk appetite is often unclear, definitions are vague and contradictory and the gap between theory and practice is wide. Efforts to quantify risk appetite can sometimes produce an illusion of precision."¹⁷

Risk appetite setting is analogous to a firm's financial planning and budgeting whereby related processes are connected through a common understanding of core methodologies, i.e. transfer pricing, unit costing, net-present-value of future costs and earnings, etc. and a common unit of measurement, that being a monetary value in the firm's base currency. The absence of a similar set of core methodologies and common unit of measurement applied to risk appetite means that investors and regulators have no readily accessible, understandable and comparable set of measurement-based metrics through which they can determine whether a firm is taking on too much risk or how much risk has been taken on by one firm compared to others.

To address these issues we propose the introduction of an abstract unit of measure, the Risk Unit (RU). The RU is a unitized valuation metric that is unique to the Risk Accounting method described below. Unlike VaR or ES, Risk Accounting does not rely on past monetary losses or the probability of future losses. Rather, by reference to a set of standardised tables, it calculates risk weighted transaction values denominated in RUs reflecting both internal (operating) risks as well as external (credit, market, interest rate and liquidity) risks.¹⁸ It is expected that the RU will evolve into a monetized equivalent over time as an increasingly robust set of data points evolves.

¹⁷ *'Understanding and Articulating Risk Appetite'*, KPMG 2008

¹⁸ Kiran A. Fernandes, Allan D. Grody, Peter J. Hughes, Oliver Phillips, J. Steven Toms, "Risk Accounting: A Method of Measuring Enterprise Risk and Risk Appetite through Risk Exposure and Risk Attribution Management", presented at the 13th Annual Risk Management Conference of the Global Association of Risk Professionals, New York, NY, Feb. 28, 2012

This process represents a fundamental principle of abstracting risk management metrics from progressive patterns of financial behaviour. FICO scores for retail credit measurement or credit ratings for determining institutional default probability, are such abstract units of risk measurement already established as best practices.

This same abstraction concept, embedded in such a Risk Unit metric can be deployed as a tool for both enterprise risk management and risk appetite measurement. By reference to organisational, product and customer codes risk metrics expressed in RUs are applied to processes and products. In this way, risk reports are produced that complement the performance and profitability reports produced by management accounting. The resulting metrics, aggregated through the standard measure of RUs, can then be mapped against risk mitigation actions to reduce risk exposure and correlated against loss history data. The data can then be used to iterate the predictive value of these risk exposure metrics. Management can be updated in near real-time on the status of their exposure to risks and, through disclosure of the process, investors and regulators can be assured of the consistent application of risk measurement methods.

Standardised RU values would emerge across firms with each firm understanding and explaining its deviations from norms consistent with its appetite for risk and risk culture biases. This is not unlike the impact different grades and distances from storage facilities have on commodity prices. Over time, as risk mitigation reduces RUs in each firm, a benchmark 'price' expressed in RUs and its accepted deviations will emerge. Risk committees will have the ability to analyze and document deviations from the benchmark, both at the firm and individual product levels. Using this awareness firms will adjust plans and projects to add certainty that targeted RU reductions will be achieved.

The fundamental method of determining RUs is based on an analysis of risk weights performed by using the enterprise's personnel and documentation in a structured process that allows for the understanding of the exposures inherent in the operating environment in which the business exists. It is this knowledge that is translated into risk weights. In similar fashion but on an industry-wide basis risk weighting of assets in the Basel internal ratings based method is determined for use in external financial risk weightings. More importantly, the risk weights in both the internal and external environments are built from the ground up, allowing for the long standing inherent and intuitive intellectual property of managements' risk understanding to be embedded in the very fabric of the risk measurement system. Here, a lesson is taken from credit risk modeling.

Credit reporting was born more than a century ago when small retail merchants banded together to trade financial information about their customers. The merchant associations then turned into small credit bureaus, which later consolidated into larger ones with the advent of computerization.

Credit analysis uses well defined sets of inputs from the historical accumulation of a set of Key Risk Indicators (KRIs) gathered over many years of refining intuition into predictors of loss. KRIs such as payment history; amounts owed; length of credit history; new credits and types of credit are input into credit scores.

Armed with this intelligence, specific credit data are used to calculate individual retail credit scores that, when applied to large and diverse populations can produce categorizations according to risk criteria such as creditworthiness. If we also explore the commercial credit side of credit ratings we get a similar history and methodology, this time not from three major credit bureaus but three major credit rating agencies. Their methods, also refined over a century, categorize credit scores into an A - B - C rating system, each with its own assessment methodology, i.e. KRIs refined over many years through their correlation with actual loss experience.

In similar fashion, institutionalizing long standing corporate awareness of drivers of risk into the risk activity analysis of the Risk Accounting method creates credibility amongst management as to the intrinsic value of the RU as it is their inputs that are recorded by the method to produce risk weightings. Given the granularity of the analysis and its causal tie back to three levers of change management - people, systems and data - it is also actionable given that credibility and risk avoidance are the two most critical components in enabling a risk culture to evolve and continual risk mitigation to be its outcome.

However, while benchmarking across different business silos within a single firm can show biases in the risk weightings within and across departments it still would suffer from 'culture' bias if not for benchmarking across firms. Here we look to a metaphor in the way prices trade in surrogate form on exchanges and how they are transformed into an objective measure.

For example, in commodity futures' trading each buyer and seller makes his or her own dynamic and subjective choices as to what will be a fair price now to pay for the commodity in the future when the contract term expires and the seller has to deliver the commodity to the buyer. As the date of delivery approaches, contracts for the commodity are unwound as the remaining futures contract prices diverge to the separately determined physical commodity price given the available supply when these futures contracts expire. The 'benchmark' physical commodity price keeps all the subjective prices previously agreed in check, much like the benchmarking of RUs would across similar departments and processes and across firms.

Standardised RU values would emerge across firms with each firm understanding and explaining its deviations from norms consistent with its appetite for risk and risk culture biases. This is not unlike the impact different grades and distances from storage facilities have on commodity prices. Over time, as risk mitigation reduces RUs in each firm, a benchmark 'price' expressed in RUs and its accepted deviations will emerge. Risk committees will have the ability to analyze and document deviations from the benchmark, both at the firm and individual product levels.

Using this awareness firms will adjust plans and projects to add certainty that targeted RU reductions will be achieved.

Risk Accounting takes into account the following types of risk: operational (sub-divided into manual process, automated process and data); and the internal components of credit, market, liquidity and interest rate risk, and similar external financial risks. Here, in the latter category we look to the work done in product related capital haircuts, asset risk weightings and credit default probabilities as proxies for risk-weights to be used in Risk Accounting.

In summary, the direct alignment of financial metrics and risk exposure metrics proposed by Grody, Hughes, et al in their forthcoming paper *Risk Accounting: An Accounting Based Approach to Measuring Enterprise Risk and Risk Appetite* enables the risk appetite setting process to be metricized and become an integral part of the financial planning and budgeting cycle. Such risk exposure metrics can also be used to compute capital requirements, risk adjusted returns on capital and, further, to risk adjust the betas in the capital asset pricing model thus bridging economic theory with risk management concepts.

We thank you for your attention to our comments and hope we have added to the debate on the fundamental review of trading book risk measurement methods and beyond.