



WHITE PAPER

RISK MANAGEMENT

**BCBS239 – THE \$8 BILLION
GAME CHANGER FOR FINANCIAL INSTITUTIONS**

INTRODUCTION – NEW RISK ARCHITECTURE VERSUS RISK ACCOUNTING

There are conflicting schools of thought on how banks should best incorporate the Basel Committee on Banking Supervision (BCBS) “Principles for effective risk data aggregation and risk reporting”, also known as BCBS 239¹. In the blue corner: extensive investment in new, dedicated risk systems and data architecture. And in the red: the less expensive adaptation of current accounting systems. Costs are clearly a concern and an accounting-based approach may seem to make economic sense, in the short-term at least. But is “risk accounting” also missing the point of BCBS 239 – not to mention key differences between risk management and financial reporting?

A previous FIS white paper² suggested that to comply with the principles of BCBS 239, the banking industry would need to invest around \$8 billion in upgrading risk systems and data architecture. Advocates of risk accounting disagree. Instead, they believe that banks could save time and money by integrating risk data and risk reporting with established accounting and general ledger control frameworks – making use of existing finance systems rather than building a whole new risk data infrastructure. As a qualified Chartered Accountant who has worked over 25 years in finance, risk, capital management and now risk technology, I can see both the logic and the flaws in this “risk accounting” ideology.

What is BCBS239?

In January 2013, the Basel Committee on Banking Supervision (BCBS) issued its “Principles for effective risk data aggregation and risk reporting” (BCBS 239), as a result of recommendations made by the Financial Stability Board (FSB) in November 2011 and subsequent initiatives. The Basel Committee states in the introduction of BCBS 239:

“One of the most significant lessons learned from the global financial crisis that began in 2007 was that banks’ information technology (IT) and data architectures were inadequate to support the broad management of financial risks.”

The regulator developed 11 principles to be observed by the risk management function of financial institutions and a further three principles, adherence to which will be reviewed by the supervisory body. Overall, the 11 principles sound both straightforward and basic. Seven, in fact, are covered by the following sentence: Banks should generate accurate and reliable risk data. The risks captured should be complete and up-to date. Risk reports should be validated, comprehensive, clear, useful, delivered in adequate frequency to the relevant (internal) parties.

The accounting-based argument

BCBS 239 states that “controls surrounding risk data should be as robust as those applicable to accounting data.” For BCBS, in other words, accounting has set the standards of control that risk data needs to achieve – neatly addressing principles 3 (accuracy and integrity) and 4 (completeness) of BCBS 239. According to this logic, it follows that banks could simply adapt accounting processes and controls for risk data.

In simple terms, this accounting-based approach to risk celebrates the (undeniable) fact that financial reporting already provides a complete, accurate, fully audited set of data. Consequently, all a bank would need to do, in theory, is apply a number of risk attributes to its financial reporting as a cost-effective means to report on risk and achieve BCBS 239 compliance.

Two ways to tackle BCBS 239

- The Blue Corner – A new risk architecture**
 Banks need to invest around \$8 billion in upgrading risk systems and data architecture, backward engineered from risk reporting data items.
- The Red Corner – The risk accounting approach**
 Banks could save time and money by integrating risk data and reporting with established accounting control frameworks – making use of existing finance systems.



1 BCBS – PRINCIPLES FOR EFFECTIVE DATA AGGREGATION AND RISK REPORTING (BCBS 239), JANUARY 2013
 2 WSVEN LUDWIG – BCBS 239: THE \$8 BILLION GAME CHANGER FOR FINANCIAL INSTITUTIONS, NOVEMBER 2014

The realities of financial reporting: a world away from risk management

In reality, however, and for sound reasons, finance and risk departments of a bank are generally organized very differently. Traditionally, finance has aligned to the structure and hierarchy of the wider business organization (see figure 1), with each local team (e.g. Singapore business unit) reporting its accounts up to the next level (i.e. Asia Pacific region), typically on a monthly basis. At each level, local finance directors, regional finance directors and so forth will review and consolidate the accounts reported to them, making month-end journals (manual adjustments) to ensure accuracy and completeness at every stage. Ultimately, this decentralized, consistent reporting framework will provide a single, global set of figures for head office, with the assurance that those figures are both complete and accurate.

Immediately, two characteristics of financial reporting pose problems for BCBS 239 compliance. The first is the framework’s aforementioned, unavoidable reliance on manual adjustments. While absolutely key to data quality, this is clearly at odds with the “largely automated” processes that BCBS envisages for risk reporting. The second is the inherently staggered nature of financial reporting, which

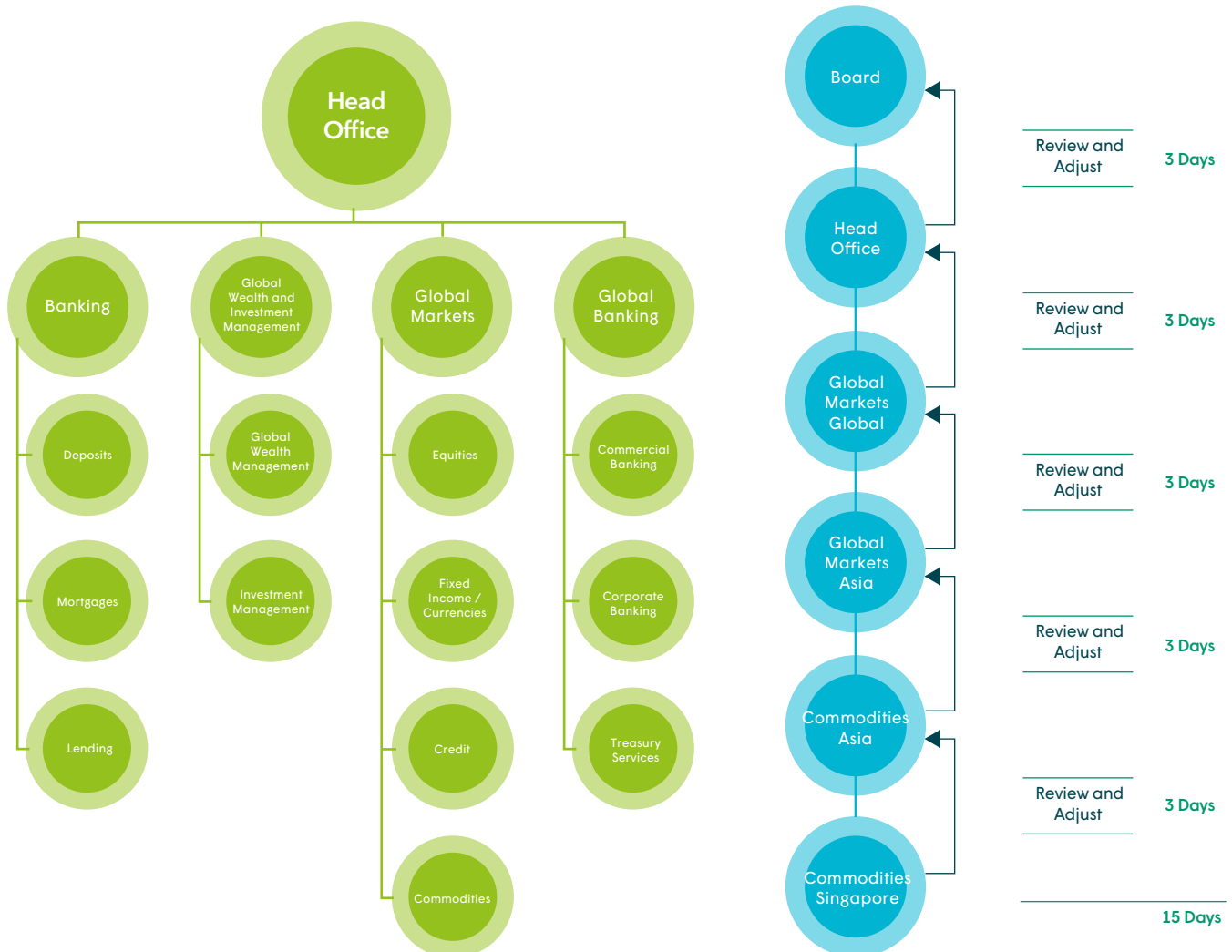
would fall somewhat short of principle 5 of BCBS 239: timeliness. If it takes, for example, just three days for each level of the finance organization to close its books, then five levels of consolidation would require 15 days to report a global set of figures. Therefore, while a local operating subsidiary may be able to report daily capital numbers by the close of the following day, a large international bank might need until the middle of the following month to generate month-end figures at enterprise level – and even later to complete the capital reporting that relies on the month-end finance data.

Financial reporting versus BCBS 239 compliance

Two characteristics of financial reporting pose problems for BCBS 239 compliance:

1. **Unavoidable reliance on manual adjustments versus the “largely automated” risk reporting processes recommended by BCBS.**
2. **The inherently staggered nature of financial reporting versus principle 5 of BCBS 239: timeliness.**

Figure 1 – Organizational Structure of a Bank



Why finance figures don't add up for risk

The fact is that however efficient the individual organization, financial reporting rarely takes place more frequently than once a month. As it will also always necessitate decentralized, local reviews, adjustments and sub-consolidations of data, even "fast close" initiatives will not meet timeliness requirements. This approach is at odds with the need to have risk reports available on the desk at 7.00am every day and demands for the real-time risk management of trading activities, which often take place on a 24/7 basis.

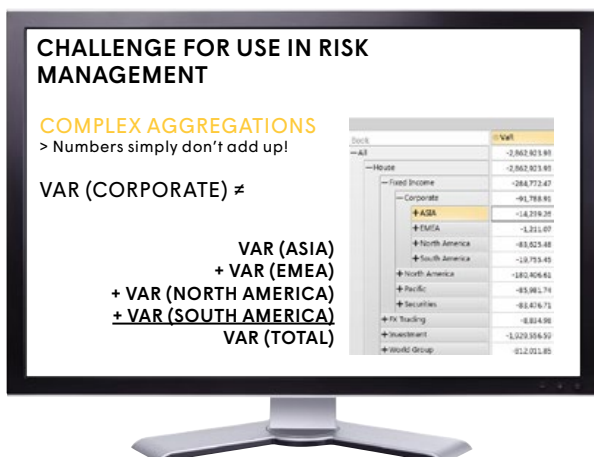
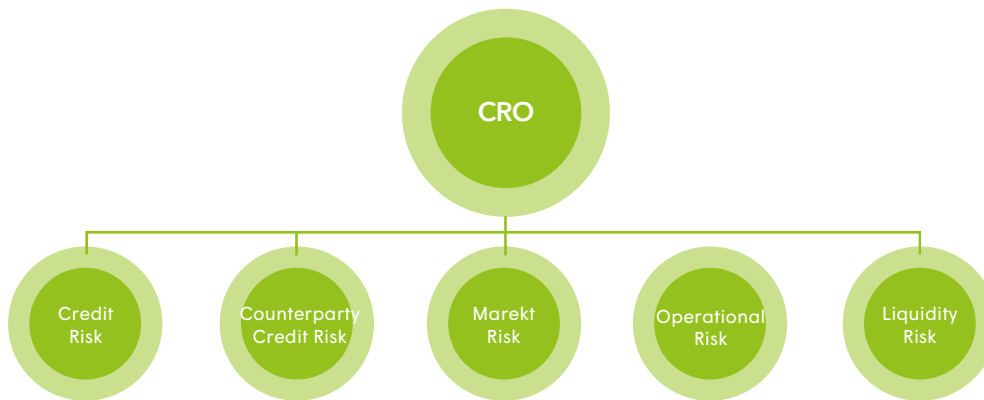
Risk management, quite simply, cannot and does not work in the same way as finance – and unlike finance, has been developed within banks according to a centralized model (see figure 2). This simultaneously consolidates data on all global transactions, bringing them together in a single data warehouse: no sub-consolidation – and no corrections applied until the final stage of reporting.

There is a very good reason for this. For a bank's finance department, calculating a global total is a (relatively)

straightforward matter of adding together the smaller totals of its business units and regions, layer by layer. Most risk calculations, by contrast, are not additive. In the world of risk, the positive performance of investments in one portfolio are set off against negative performance in another. This portfolio effect yields diversification benefits for the corporation as a whole. But crucially, it also means that risk calculations can only take place at the level at which a bank needs to report. In short, adding up regional risk figures does not produce an accurate global total (see figure 3).

As a result, banks have typically had little choice but to build global, highly complex risk architectures. Now, in the wake of BCBS 239, overhauling these risk architectures will require significant investment by banks in their global IT infrastructure. However, as FIS has already put it: "the majority of banks' business departments regard any expenditure on BCBS 239 as investment in competitive advantage: the ultimate result of faster, more efficient risk management...The solution is the bigger picture: using investments in IT to help steer the organization, with precision, towards greater profitability."²

Figure 2



3. BCBS – THE REGULATORY FRAMEWORK: BALANCING RISK SENSITIVITY, SIMPLICITY AND COMPARABILITY" (BCBS 258), JULY 2013
 4. BCBS CAPITAL FLOORS: THE DESIGN OF A FRAMEWORK BASED ON STANDARDISED APPROACHES", DECEMBER 2014
 5. BCBS THE STANDARDISED APPROACH FOR MEASURING COUNTERPARTY CREDIT RISK EXPOSURES, APRIL 2014
 6. BCBS – PROGRESS IN ADOPTING THE PRINCIPLES FOR EFFECTIVE RISK DATA AGGREGATION AND RISK REPORTING, JANUARY 2015

A lack of risk sensitivity?

Where, then, does this leave a risk accounting approach? According to its exponents, adapting accounting data controls to the requirements of risk data would require transactions to be tagged with a new value representing their exposure to risk. At the point of transaction registration, this would involve applying a standardized calculation of exposure to risk by principal risk type.

BCBS addresses the issue of standardized calculations in its publication “The regulatory framework: balancing risk sensitivity, simplicity and comparability”³, and developed it further in its most recent consultative document “Capital floors: the design of a framework based on standardised approaches”⁴. BCBS has left the calibration of the floor until the end of the year and the discussion of the merits of such a floor justifies a separate paper. However, even supporters of a capital floor of 100% of the standardized approaches would have difficulty with the risk accounting proposal to design standardized tables and templates that would translate risk factors into weightings as a means to calculate risk exposure.

For example, in the “Standardised approach for measuring counterparty credit risk exposures”⁵ BCBS recognized that in the existing current exposure method “the recognition of netting benefits was too simplistic and not reflective of economically meaningful relationships between derivatives positions” and thus allows partial or full offsetting within a so-called “hedging set”. As a simple example, if the Singapore branch of a bank was net long USD versus EUR, and the London branch was net short USD versus EUR with a given counterparty, then the counterparty credit risk for each of location (Singapore, London), region (Asia, Europe) and head office would be materially different. It is simply not practical to design templates in advance which would allow calculations of all the weightings necessary. This would also seem to be in direct contradiction to principle 6 of BCBS 239: “Adaptability – A bank should be able to generate aggregate risk data to meet a broad range of on-demand, ad hoc risk management reporting requests, including requests during stress/crisis situations, requests due to changing internal needs and requests to meet supervisory queries”.

Furthermore, in its third consultative document on “the Fundamental Review of the Trading Book: outstanding issues”, BCBS proposes that banks use a net sensitivity in

STANDARDIZED APPROACHES STILL HAVE PORTFOLIO EFFECTS

Even supporters of a capital floor of 100% of the standardized approaches would have difficulty with the risk accounting proposal to translate risk factors into weightings to calculate risk exposure, using standardized tables and templates.

ALIGNMENT VERSUS INTEGRATION

While the BCBS recommends data alignment between risk and finance⁶, it stops short of endorsing the integration of risk and finance infrastructures – and with good reason. For example, if an overnight batch fails at the month end, finance and regulatory reporting might require it to be re-run overnight with the month-end data. For risk management, the batch must be run with data from the current close of business.

a sensitivity based approach to the standardized approach for market risk. Calculation of these net sensitivities will, by definition, be subject to the ad hoc risk management reporting needs of a bank.

Risk and finance alignment

Although it is important to align risk and finance, they are far from identical and have very different scopes: the former large and dynamic, the latter relatively small and static. Finance accounting is designed to accurately reflect the state of a bank at the point in time of reporting – usually at the end of the month when journals have been passed, often creating a host of problems with risk back testing. Risk management, in contrast, focuses on risks that may materialize in the future. This substantial difference is a key element of BCBS 239, which states: “Banks should develop forward looking reporting capabilities to provide early warnings of any potential breaches of risk limits that may exceed the bank’s tolerance/appetite.”¹

In my experience, this difference has most starkly manifested itself in the reaction to failures in the overnight batch process for risk systems. Let us say, for example, that the problems occur at the month end and cannot be resolved in a timely manner, necessitating a complete re-run of the batch. In this instance, finance and regulatory reporting would require that the batch be re-run overnight with the month-end data. For risk management, that is history and the clock cannot be wound back. Risk needs the batch to be run as normal with data from the current close of business. This requirement often leads to the need for a separate month-end risk environment, where the batch can be run and re-run if necessary for finance and regulatory reporting.

It is also worth noting that the BCBS report on “Progress in adopting the principles for effective risk data aggregation and risk reporting”⁶ recommends that banks promote data alignment between risk and finance, using common data dictionaries and appropriate governance structure, but stops well short of recommending banks create integrated risk and finance infrastructures.

Accurate AND timely solutions: the in-memory opportunity

To put the risk data management challenge in context, consider the number of calculations required to analyze 100,000 trades. In financial reporting, you would simply have to complete 100,000 present value calculations. For risk management, on the other hand, 2 million present value calculations would be required to assess market risk sensitivities on the same number of trades. That figure rises to 50 billion for potential future exposure (PFE) stress tests and 2,500 billion to assess credit valuation adjustment (CVA) sensitivities.

With PFE and CVA calculations for 100,000 trades taking up around 3,815 gigabytes and 19 terabytes of memory respectively, risk management clearly takes a bank into “big data” territory, placing enormous performance demands on its infrastructure (see figure 4). In turn, these demands are compounded by those of BCBS 239 – and in particular its requirements for both timely and accurate risk management that demonstrates not only speed but also flexibility.

Initially the industry saw these dual requirements as contradictory. Are timeliness and accuracy not mutually exclusive: speed and flexibility almost impossible to achieve at once? But on closer inspection of the guidelines, a timely yet accurate, fast but flexible approach to risk is exactly what BCBS 239 is asking of banks, along with the ability to handle vast quantities of data.

Furthermore, there is already something of an answer – in the form of in-memory technology, which can both load and query big data in a highly efficient way. Risk solutions with in-memory technology combine complex data aggregation with pricing and simulation algorithms, allowing users to more easily respond to evolving demands for risk intelligence by seamlessly interweaving the solutions pricing and analytics assets with fast, flexible data manipulation.

Solutions that leverage in-memory technology are able to calculate both advanced simulation and standardized measures in a single framework. They also offer intimate integration of analytics into the data fabric, which provides increased agility in responding to new regulatory demands such as the upcoming Sensitivity Based Approach (SBA) for measuring market risk capital under the Fundamental Review of Trading Book. Use of in-memory is also leading to advances in the presentation of reports such as interactive dashboards on which risk reports can be manipulated and subjected to ‘what-if’ scenarios. From a high-level report, you can delve into questions such as, ‘Where are my top 10 exposures? What are they? What risk categories are they in? Which business unit is that particular transaction in?’ This is only possible if you’re using in-memory, rather than simply relying on a traditional client server and a data warehouse structure.

As the earlier FIS paper elaborates: “It may be lucky timing that in-memory technologies are now becoming more established, as they specifically address the speed and flexibility challenges of BCBS 239 compliance... A new architecture is not the silver bullet per se, it is the crucial enabler.”

Figure 4

Performance demands: number of calculations



Performance demands: size of data



Conclusion – complexity costs but proactive risk management pays

Bearing in mind the complexities and challenging requirements of risk management, it seems inevitable that, as already suggested, banks will have to invest heavily in the risk systems and data architecture that supports and enables it. Adapting existing finance systems which rely on existing, well proven, sub-consolidation processes, but often work on a monthly cycle and cannot handle complex non-additive risk calculations, is not the answer to the issues that lie at the heart of BCBS 239.

In fact, investing in finance systems to solve BCBS 239, and creating enhanced risk and finance data warehouses and reporting solutions, may create more problems than it answers. For ultimately it would reduce the resources devoted to preventing financial failure, proactively managing risk and thus delivering competitive advantage. By contrast, with in-memory technology enabling timely, accurate, fast and flexible risk systems, banks will be in a stronger position to manage their business effectively and more profitably, not merely report on it.

In conclusion, it is improved risk management (as opposed to risk and regulatory reporting) that I believe is the fundamental objective of the Basel Committee in publishing BCBS 239 – and where banks should really concentrate their investment.

ABOUT THE AUTHOR

Jonathan Berryman is senior vice president, risk strategy, for FIS' capital markets business. In this role, Jonathan is responsible for leading the company's go-to-market strategy for its Adaptiv risk solution suite and advising clients on how to solve their critical risk management business challenges.

Before joining FIS in September 2014, Jonathan held a number of line management and consultancy roles in risk departments in major banks. These include heading up capital policy and advisory for international entities at Bank of America Merrill Lynch, consultancy to Standard Chartered Bank on its Internal Model Method (IMM) program and implementing Nordea Bank's global counterparty risk system and completing its IMM waiver application. Prior to this, Jonathan worked for Standard Bank where he headed up the bank's credit analytics and portfolio reporting business.

Jonathan has a degree in Electronic Engineering and qualified as a chartered accountant with KPMG in London. After qualification he spent some years working internationally with Schlumberger, the oilfield services company. He has since worked in financial services, specializing in risk and capital, first at WestLB, then in various roles in both project and line management at ING Bank, based in London, before moving to Standard Bank.

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