Meeting the Principles of Effective Risk Data Aggregation and Risk Reporting

Operationalizing BCBS 239 Principles Using an Agile, Flexible Technology Infrastructure

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Definition: Risk Data Aggregation

"Defining, gathering and processing risk data according to the bank's risk reporting requirements to enable the bank to measure its performance against its risk tolerance/appetite."[1]

Executive Summary

Compliance is no longer an issue faced only by industry giants. For financial institutions large or small, public or private, and global or domestic, regulatory pressures are intense and growing. The regulatory environment continues to evolve, with new mandates and guidance introduced each year.

One of the most critical regulatory challenges is the Basel Committee on Banking Supervision (BCBS) 239 principles. Created by the Basel Committee and the Financial Stability Board (FSB), BCBS 239 provides guidance on how banks should execute risk data aggregation and reporting.

Operationalizing BCBS 239 principles requires financial institutions to engage in careful planning and precise program execution. In order to realize maximum benefits and achieve full compliance, financial institutions should create an effective infrastructure that supports the governance of risk data aggregation, reporting, and IT. A centralized, data-centric approach to risk data management that minimizes data movement can serve as a sound foundation. Banks also need to deploy an agile risk data infrastructure that is open, flexible, and extensible. The benefits to financial service companies of this quality of data management will lower risk, reduced reconciliation time and cost across business entities for financial reporting, customer insight, and strategic business management such as portfolio limits and risk appetite metrics calibration.

To help solve for BCBS 239 and beyond, Teradata offers proven products, established industry expertise, and professional services. With a comprehensive approach to risk data aggregation as well as workshops that helps financial professionals develop a road map for best practices in risk data management, only Teradata has both the technology and expertise that financial institutions efficiently need to get—and stay—ahead of regulatory issues.

This document describes the challenges of operationalizing BCBS 239 principles and the components of an effective risk data management infrastructure. It also discusses how Teradata offerings can help financial institutions effectively embrace the BCBS 239 principles, for regulatory compliance while using the infrastructure to accelerate competitive business insight and agility.

1 "Supervisory Trends: 'Matters Requiring Board Attention' Highlight Evolving Risks in Banking," Supervisory Insights , Federal Deposit Insurance Corporation, Summer 2014

Understanding the Impact of BCBS 239 Regulations

Although BCBS 239 regulations have been the subject of expansive media coverage and industry discussion, there are still many aspects of compliance that are ambiguous or not well-understood. For example, most people believe that the regulations provide a guide for risk data aggregation and reporting for systemically important financial institutions (SIFIs). However, these requirements apply not only to global, systemically important banks (G-SIBs) but also to domestic, systemically important banks (D-SIBs).

In addition, the principles apply to all key internal risk management models, including advanced measurement approaches such as A-IRB for operational risk. BCBS 239 applies to both internal risk data-related processes as well as processes outsourced to third parties. The risk management framework must address not only data aggregation and reporting, but also data confidentiality, integrity, lineage, reusability, and availability. To meet the requirements, banks must employ risk data controls as robust as those applied to accounting data. In fact, risk data must be reconciled with bank sources, including accounting data, to ensure accuracy.

Banks must focus on data quality, which is the driving force behind the ability to meet the regulatory mandates. Additionally, firms need to move from end-of-day risk aggregation to real-time (or at least near real-time) practices. To meet this goal, banks must first learn to optimize the end-of-day process and then evolve those risk aggregation operations into a near real-time architecture to allow for inline analytics.

Regulatory Timeline

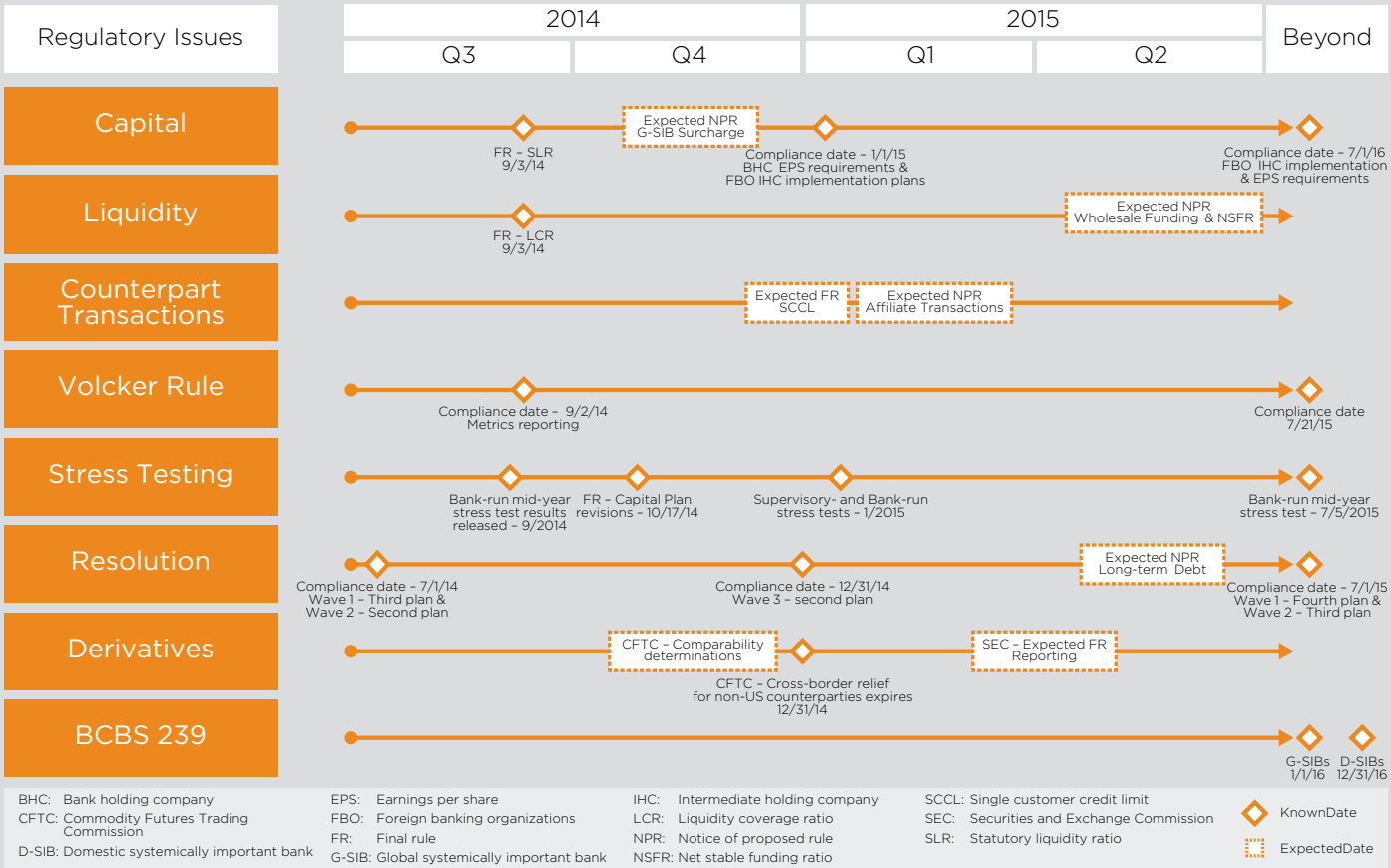


Figure 1.

Capital Ratios Timeline

Capital Ratios	Phase-Out Time Frames								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Leverage Ratio	Supervisory monitoring		Parallel run 1 Jan 2013 – 1 Jan 2017 Disclosure starts 1 Jan 2015					Migration to Pillar 1	
Minimum Common Equity Capital Ratio			3.5%	4.0%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital Conservation Buffer						0.625%	1.25%	1.875%	2.5%
Minimum Common Equity plus Capital Conservation Buffer			3.5%	4.0%	4.5%	5.125%	5.75%	6.375%	7.0%
Phase-in of deductions from Common Equity Tier 1 (including amounts exceeding the limit for deferred tax assets (DTAs), mortgage servicing rights (MSRs), and financials)				20%	40%	60%	80%	100%	100%
Minimum Tier 1 Capital			4.5%	5.5%	6.0%	6.0%	6.0%	6.0%	6.0%
Minimum Total Capital			8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Minimum Total Capital plus Conservation Buffer			8.0%	8.0%	8.0%	8.625%	9.25%	9.875%	10.5%
Liquidity Coverage Ratio	Observation period begins				Introduce minimum standard				
Net Stable Funding Ratio		Observation period begins						Introduce minimum standard	

Figure 2.

Although the committee was quite clear on many requirements, some areas of guidance are still somewhat vague and others continue to evolve. Definitions, standards, and ratios requirements—such as the rising minimum Common Equity Tier 1 risk-based capital ratio—will shift over time. Understanding and measuring adherence to the guidance requires interpretation and flexibility.

Yet the first compliance dates are approaching quickly. The deadline for final BCBS 239 compliance is January 1, 2016, but banks are expected to start making progress as soon as possible. Figure 1 shows the key regulatory compliance deadlines. Figure 2 illustrates the changing requirements for capital ratios over time.

80% increase in fines levied by regulators worldwide[2]

2 "The Rising Costs of Non-Compliance: From the End of a Career to the End of a Firm," Thomson Reuters Accelus, December 2014, http://accelus.thomsonreuters.com/special-report/rising-costs-non-compliance-end-career-end-firm#sthash.Itu1OQkY.dpuf

Building an Effective Risk Data Infrastructure

To meet these continuously evolving regulatory requirements, financial institutions must evaluate their current practices and solutions so they can identify where change is needed. The Federal Reserve Board had recommended seven key best practices for financial institutions. (See Figure 3.)

The first practice, sound foundation, recommends that banks create an effective infrastructure that supports the governance of risk data aggregation, reporting, and IT. Unfortunately, most legacy IT solutions are not well-suited to this challenge. With siloed data sources, a lack of cross-enterprise system integration, limited visibility into business data, and multiple versions of the "truth," these solutions are unable to support effective risk data management.

To craft a sound foundation for risk management, financial institutions need to develop a centralized, data-centric approach to risk data management that complies with Basel principles and minimizes data movement. All source systems should feed into one platform, creating a comprehensive, centralized data set. In-database analytics can be used to perform analysis and generate business intelligence—without the effort of moving data into specialized data marts or sandboxes.

Banks also need to deploy an agile risk data infrastructure that is open yet secure, flexible, and extensible. This infrastructure should be able to adapt to evolving business and regulatory requirements, changing as the company changes, grows or contracts. Tools within this infrastructure should enable the financial institution to perform what-if analysis and run regulatory reports that consider the impact of the changing business landscape.

U.S. $900 million: Amount spent by the average bank on regulatory change-related programs in the last three years[3]

Users should be able to access all required data from a single authoritative source. Data must be reconciled with both the general ledger and transactional systems. All analytic applications should source and return enriched data to a common data warehouse. Key reports and analysis must be produced from the data warehouse with common portal, hierarchies, and delivery processes. The solution should employ end-to-end data lineage and governance to ensure quality, transparency, and traceability. Finally, governance processes must support data quality and consistent data use. These BCBS 239 requirements aligns well with Teradata's prescribed approach.

To meet these needs, financial institutions should choose a technology solution that includes:

- A central data warehouse to hold transactional data across all divisions and regions of the bank
- A single logical data model across all risk-related data
- Business user access to all risk aggregation and analytics data
- Shared comprehensive data for finance and risk, providing a single source of the truth
- High-performance analytics features across all risk types, business divisions, and locations
- Drill-down capabilities to help users gain insight into granular levels of data
- Business-driven ad-hoc queries and analyses, in addition to standard reporting features

Figure 3. U.S. Federal Reserve Board Best Practices for Effective Risk Data Aggregation.

3 "Top 10 Challenges for Investment Banks," Accenture, 2011

- Near-real-time, ad-hoc, business-driven aggregation and analytics features
- Near-real-time risk analytics functions for critical risks
- Predictive and interactive scenario analysis
- Multidimensional scalability, with the flexibility needed to quickly meet new and evolving regulatory requirements and support business change and growth

Solving for BCBS 239 and Beyond

Teradata offers proven products and established industry expertise and services that can help financial institutions effectively embrace BCBS 239 principles for effective risk data aggregation and risk reporting. With these offerings, banks can balance their need for regulatory compliance with stakeholder demand for profitable business practices.

Teradata Solutions for the Financial Services Industry

Based on decades of industry expertise, Teradata offers a risk data infrastructure designed to help financial institutions improve their risk management practices and realize valuable business benefits. With extensive, centralized data warehousing capabilities, a single version of the truth, massive parallel processing architecture, multidimensional scalability, in-database analytics, and a temporal database design, the Teradata solution matches the risk system architecture recommended by the BCBS 239 risk-reporting standards.

To help banks meet their BCBS 239 goals, the Teradata solution offers the following functionality:

Comprehensive Approach to Risk Data Aggregation

All financial source systems feed into the Teradata Integrated Data Warehouse. Separate acquisition, integration, and access layers render data in a clean, distinct format. It is then transformed it into an extensible integrated data model that permits almost limitless access layer representation. This lets users gain insight from the enterprise or portfolio level down to specific product or account detail across a rich set of dimensions. Scorecards enable management to review information on product performance and asset details, for example, creating a complete information source that supports audit activities and compliance goals, a foundation for treasury and finance management, as well as transactional customer behavior insight.

Changing Patterns in Financial Risk Management

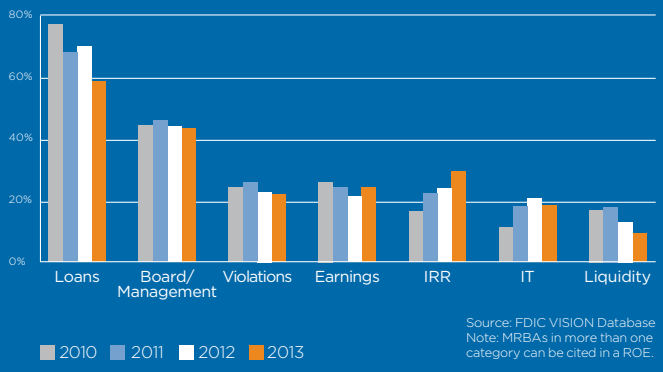
In the United States, the Federal Deposit Insurance Corporation (FDIC) Report of Examination summarizes findings of bank examinations in Matters Requiring Board Attention (MRBA). MRBAs are used to inform bank management and directors of undue risks.

The following charts show typical MRBA categories from 2010 to 2013, the last year for which data is available.

Most commonly cited MRBA categories:

Loans	69%
Board/management	45%
Violations	24%
Earnings	24%
Interest rate risk	24%

However, as the financial and regulatory environment has changed, so have the categories cited in the MRBAs. With an ongoing improvement in loan quality, the proportion of MRBAs related to loans and violations is shrinking, while MBBAs in the interest rate risk are rising. (See Figure.)



Source: FDIC VISION Database
Note: MRBAs in more than one category can be cited in a ROE.

Percent of all satisfactorily rated examination reports that cite MRBAs

Ability to Aggregate Risk Data Under One Umbrella

From pre-funding to post-funding data, the Teradata solution helps banks collect, manage, and analyze all risk data. With a centralized source of risk data, analysts can identify fraudulent practices, stratify asset performance, and understand the value of assets. The solution allows bankers to measure performance over time, recognize the impact of underwriting exceptions, and support audit activities with complete records.

Reporting Features that Translate Risk Information into Business Terms

The Teradata unified finance, risk, and compliance solution uses detailed enterprise views to help banks pinpoint risk, manage funds, and speed compliance fulfillment.

Flexible, Extensible Solution that Adapts to Evolving Regulatory Requirements

A robust, extensible data model allows banks to iteratively develop their data warehouse, but still adapt to changing regulatory requirements. It can also readily accommodate other compliance mandates, risk and capital functions beyond BCBS. By extending the Teradata solution to address other regulatory requirements as they arise, as well as other business initiatives that can use the same high quality data, banks can lower the total cost of ownership for their BCBS 239 solution.

Professional Services

Teradata experts have extensive experience and knowledge in the financial services industry to help clients maximize the value of their data while meeting their risk data aggregation goals and regulatory mandates.

Proven Products

Teradata's proven capabilities to deliver risk data aggregation can also help clients develop essential business insights in the financial services industry.

When comparing other solutions to Teradata's risk data aggregation approach, financial services professionals should seek:

- A comprehensive, functionally robust approach to risk data aggregation
- Proven industry expertise
- Deep technical knowledge
- Extensive analytics and reporting capabilities including support for in-database analytics
- A wide range of capabilities to handle evolving business requirements
- Design patterns and software tool kits to speed risk data aggregation
- Extensive experience deploying solutions to meet regulatory requirements

Questions an Agile Risk Data Infrastructure Can Answer:

- Will your products still be as profitable under changing financial risk rules?
- How might product design and investment strategies need to change?
- Could new rules open up opportunities to capture market share from competitors?
- Will operational and legacy entity structures that are designed for current regulations still be as efficient in the new environment, and how can you make them more favorable?
- How should the company respond to the myriad of changes taking place at a global level within international business?
- Are there overlaps in regulations that would allow the company to develop a common response to avoid duplication and needless cost?

Teradata Financial Reporting – Risk Data Management Workshop

Teradata offers a workshop that helps financial institutions develop a road map for best practices in risk data aggregation and risk reporting.

This workshop highlights current best practices, approaches, and peer examples of how firms are solving for regulatory reporting challenges. It addresses issues such as Comprehensive Capital Analysis and Review (CCAR) stress testing, as well as BSBC 239, Basel, and other regulatory reporting requirements. The workshop can be tailored to be focused more deeply on the issues of importance to each client.

Maturity Assessment Example

Dimension	Priority	Current Ranking	Goal State
Policies			
2. Disclose			
Data Integration	High	1.00	3
Data Quality	Medium	2.00	3
Completeness	Medium	2.00	3
Data Access	Low	3.00	3
Flexibility	Low	3.00	3
Timeliness	Medium	4.00	5
Traceability	Medium	4.00	5
Methodologies			
3. Risk Adjusted Performance Management			
Data Integration	High	1.00	3
Data Quality	Medium	2.00	4
Completeness	Medium	2.00	4
Data Access	Low	3.00	4
Flexibility	Low	3.00	4
Timeliness	Medium	4.00	5
Traceability	Low	3.00	3

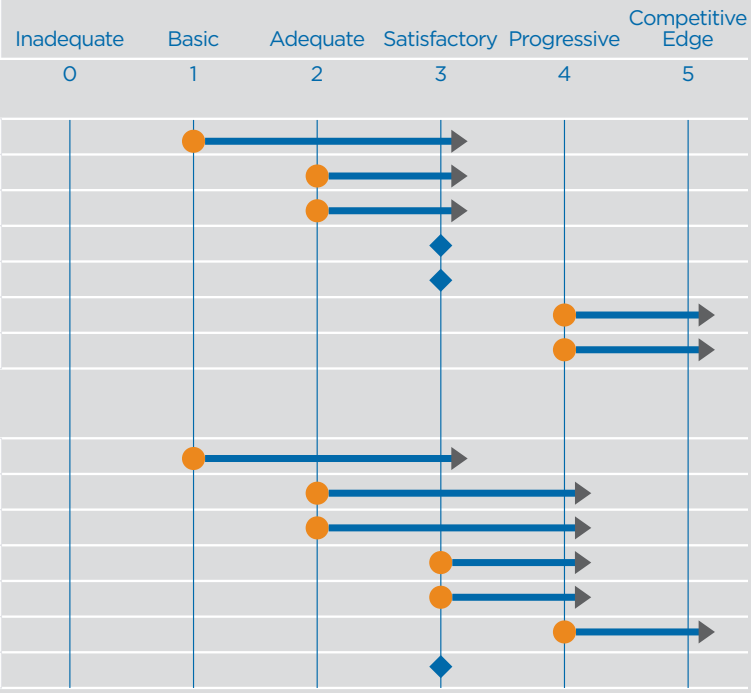


Figure 4. Sample Maturity Measures Illustration.

The objectives of the workshop include sharing best practices for risk management, describing and discussing the advantages of a data-centric architecture, and presenting deep-dive discussions into several current risk management requirements. To meet these goals, the workshop includes a maturity assessment of their risk, data, and risk reporting infrastructure. (See Figure 4.) This assessment analyzes overall maturity, using current, target, and industry insight scores.

After measuring maturity aspects, the workshop also helps banks analyze various dimensions of their risk management practices and assess performance gaps. (See Figure 5.)

The workshop concludes with a list of recommended next steps, including a prioritized assessment of source data, an end-to-end data flow (from source to reporting), and identification of the company's future state, including new capabilities and timelines.

Risk Adjusted Performance Management

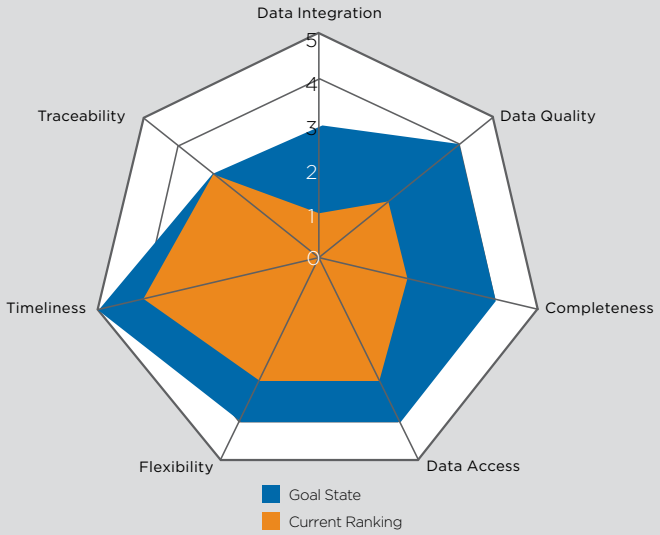


Figure 5. Sample Performance Gap Illustration.

Financial institutions that participate in this workshop typically realize the following benefits:

- A shared framework for organizing and aggregating regulatory and risk information
- An understanding of how peers are approaching reporting requirements and related data challenges
- A view into how the company can manage data to address immediate pain points while dealing with ongoing reporting changes

Moving Ahead

After completing the workshop, financial institutions may choose to partner with Teradata to strengthen their risk data aggregation capabilities. During this process, Teradata professionals help these companies identify gaps, develop remedial projects, and match required efforts with regulatory time frames. Figure 6 illustrates a sample risk data aggregation program. In this process, Teradata Professional Services can leverage design patterns, logical models, data maps, and access layer components to aid in the development of compliance reporting. By following a "factory approach," Teradata engages in continuous, overlapping development that helps the bank accelerate delivery timelines and becomes a strong foundation for agile business management and development.

Regulatory Deadlines and Sample Program Framework

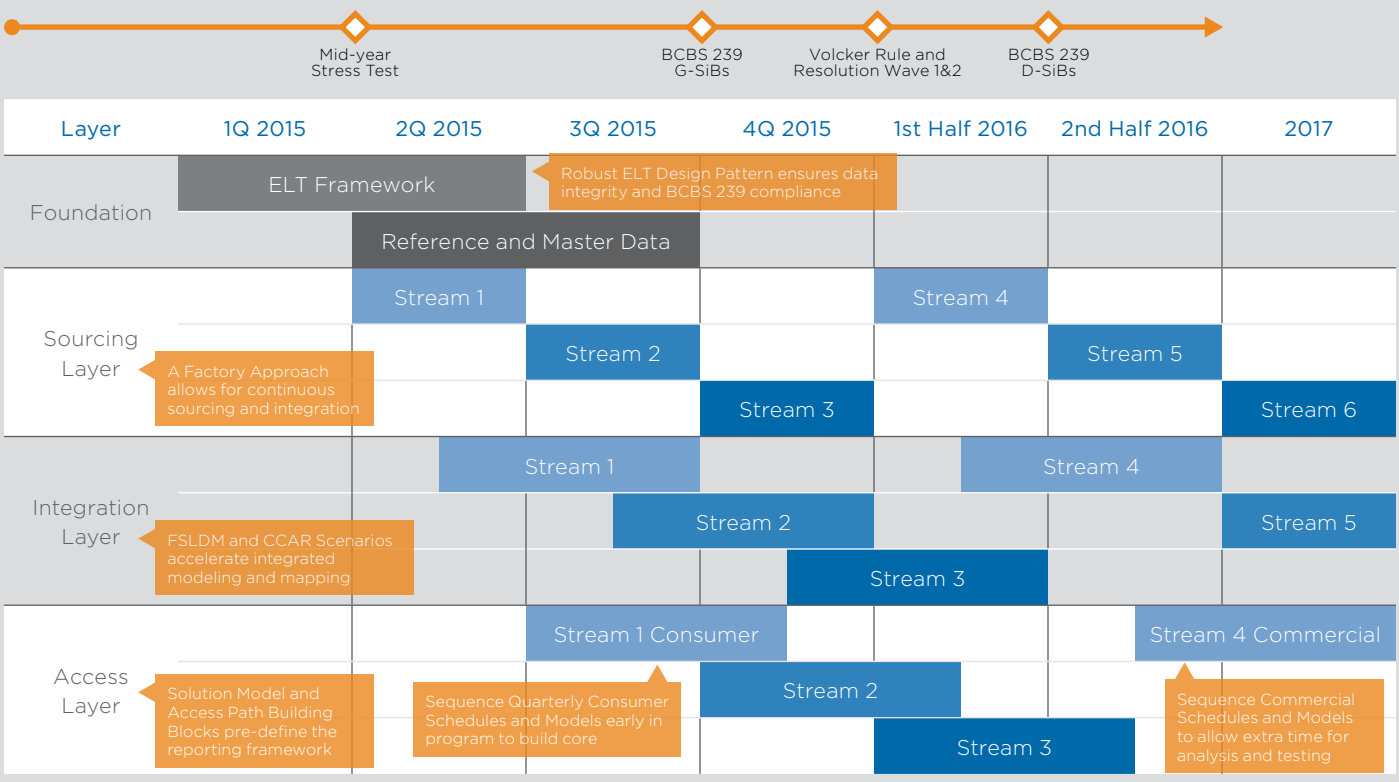


Figure 6. Program Framework for Risk Management and Regulatory Deadlines.

Principles for Effective Risk Data Aggregation and Risk Reporting

The BCBS 268 (update to BCBS 239 assessment) assessment result below illustrates the disconnects between the three key areas of IT infrastructure, Risk Data Aggregation, and Risk Reporting.

The Basel Committee and national supervisors agreed to monitor and assess banks' progress through the Basel Committee's Supervision and Implementation Group (SIG), which will share its findings with the FSB at least annually from the end of 2013. To facilitate consistent and effective implementation of the Principles among G-SIBs, the SIG decided to use a coordinated approach for national supervisors to monitor and assess banks' progress until 2016. The first step of this coordinated approach was to implement a "stocktaking" self-assessment questionnaire completed by G-SIBs during 2013.

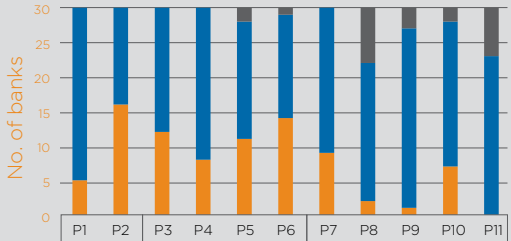
The Basel Committee's Working Group on SIB Supervision (WGSS) developed the questionnaire (87 questions/requirements for 11 principles), analyzed the results and set out several recommendations for 2014 to ensure that banks are able to meet the 2016 deadline.

As depicted in Figure 7, the average ratings of Principles 1 to 11 ranged from 2.5 to 3.2. The average rating of all 11 principles was 2.8, which indicates that banks' average reported compliance status stands between largely compliant and materially non-compliant.

All banks indicated that they are making efforts towards closing all significant gaps by the 2016 deadline, but in some cases the expected compliance dates set by some banks seem to be overly optimistic. More importantly, 10 banks, 33% of the population, mentioned that they currently expect to not fully comply with at least one principle by the deadline. Some of these banks noted that the reason is large, ongoing, multi-year, in-flight IT and data-related projects.

Supervisors agree that these Principles apply not only at the group level, but also to all material business units or entities within the group. Second, when rating themselves on risk reporting Principles, a number of banks only focused on the quality of risk reports to senior management and the boards (not including middle management). Third, there is evidence that many banks assessed only a few types of risk, such as credit risk and market risk, while not comprehensively covering other types of risk, such as liquidity risk, operational risk and other risks. Fourth, very few banks offered insights into their definitions of materiality or tolerance level for manual versus automated processes for risk data aggregation and reporting.

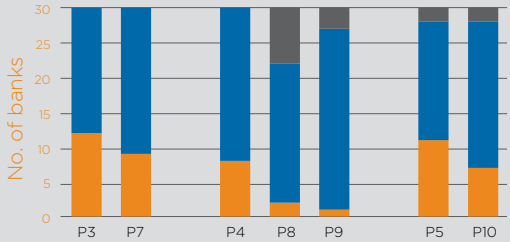
Self Assessment Ratings by Principles



	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Fully compliant	0	0	0	0	2	1	0	8	3	2	7
Largely compliant	25	14	18	22	17	15	21	20	26	21	23
Materially non-compliant	5	16	12	8	11	14	9	2	1	7	0
Non-compliant	0	0	0	0	0	0	0	0	0	0	0
Average rating	2.8	2.5	2.6	2.7	2.7	2.6	2.7	3.2	3.1	2.8	3.2
	Governance/ infrastructure		Risk data aggregation capabilities				Risk reporting practices				

Figure 7.

Comparison of Data Aggregation/Risk Reporting



	P3	P7	P4	P8	P9	P5	P10
Fully compliant	0	0	0	8	3	2	2
Largely compliant	18	21	22	20	26	17	21
Materially non-compliant	12	9	8	2	1	11	7
Non-compliant	0	0	0	0	0	0	0
Average rating	2.6	2.7	2.7	3.2	3.1	2.7	2.8

Definition of Principles: P3 = accuracy and integrity; P7 = accuracy; P4 = completeness; P8 = comprehensiveness; P9 = clarity and usefulness; P5 = timeliness; P10 = frequency.

Figure 8.

In order to fully comply with the Principles, banks need to significantly upgrade their risk IT systems and governance arrangements. Banks need to have in place: (i) formal and documented risk data aggregation frameworks; (ii) comprehensive data dictionaries that are used consistently by all group entities; (iii) a comprehensive policy governing data quality controls; and (iv) controls through the life cycle of data. Banks also need to ensure that the role of the "data owner" is clearly documented and to set out accountability for risk data quality. In order to effectively support risk data aggregation and risk reporting practices, banks also must resolve the significant limitations currently affecting their risk IT systems. Banks that have not yet established their plans for independent validation of their data aggregation and reporting must make concrete efforts towards these goals.

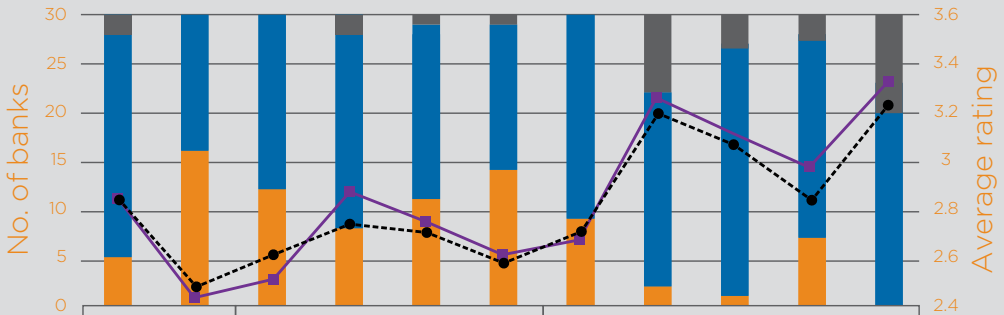
As shown in Figure 8, banks generally assigned themselves higher ratings on the risk reporting principles than they did on the corresponding data aggregation principles. This includes a few banks that rated themselves fully compliant on Principle 8 (comprehensiveness) and materially non-compliant on one or more data aggregation principles. This raises a question as to how reliable and useful risk reports can be when the data within these reports and the processes to produce them have significant shortcomings. In this regard, banks may have overstated their actual level of compliance with risk reporting principles with regard to: (i) ability to rapidly collect, analyze and report on risk exposures due to over-reliance on manual processes; (ii) frequency of ad hoc stress/scenario reporting; and (iii) formal procedures for rapid collection and analysis of risk data and timely dissemination of reports. In addition, banks rated themselves relatively low on: (i) automated and manual edit and reasonableness checks; (ii) use of an integrated procedure to identify data errors; and (iii) inventory and classification of risk data items.

Progress in Adapting BCBS 239 Principles – Key Conclusions

The key observations were the average ratings of Principles 1 to 11 ranged from 2.43 to 3.33. Overall, there were only minor improvements in average ratings.

The three Principles with the lowest reported compliance were Principle 2 (data architecture/IT infrastructure), Principle 6 (adaptability) and Principle 3 (accuracy/integrity) as nearly half of banks reported material non-compliance on these Principles.

Self Assessment Ratings by Principles

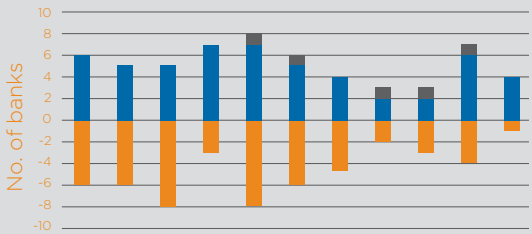


	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Fully compliant	2	0	0	2	1	1	0	9	4	3	10
Largely compliant	21	13	15	22	20	16	20	20	25	23	20
Materially non-compliant	7	17	15	6	9	13	10	1	1	4	0
Non-compliant	0	0	0	0	0	0	0	0	0	0	0
2014 Average rating	2.8333	2.4333	2.5	2.8667	2.7333	2.6	2.6667	3.2667	3.1	2.9667	3.3333
2013 Average rating	2.8333	2.4667	2.6	2.7333	2.7	2.5667	2.7	3.2	3.0667	2.8333	3.2333
	Governance/ infrastructure		Risk data aggregation capabilities				Risk reporting practices				

Figure 9.

The three Principles with the highest reported compliance for both 2013 and 2014 were Principle 8 (comprehensiveness), Principle 9 (clarity/usefulness), and Principle 11 (report distribution).

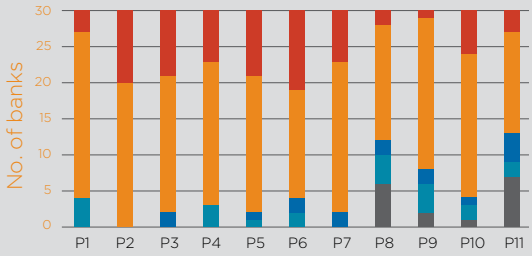
Number of Changed Ratings



	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
2 notches upgrade	0	0	0	0	1	1	0	1	1	1	0
1 notch upgrade	6	5	5	7	7	5	4	2	2	6	4
1 notch downgrade	-6	-6	-8	-3	-8	-6	-5	-2	-3	-4	-1

Figure 10. Ratings changes and downgrade were noted in at least one principle.

Expected Date of Compliance



	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
After the deadline	3	10	9	7	9	11	7	2	1	6	3
Dec 2015/Jan 2016	23	20	19	20	19	15	21	16	21	18	14
2015	0	0	2	0	1	2	2	2	2	3	4
2014	4	0	0	3	1	2	0	4	4	2	2
2013	0	0	0	0	0	0	0	6	2	1	7

Figure 11.

Source: http://www.bis.org/publ/bcbs268.pdf

For More Information

To learn more about how Teradata helps financial institutions address risk data aggregation and risk reporting, visit us at **Teradata.com/industry-expertise/financial-services.**

Shelly Biggs (Shagufta Jafry-Biggs)
Shelly has over 30 years of financial industry expertise and risk analytics in banking systems. Shelly has provided leadership and achieved production goals through risk management experience in a broad range of credit topics, including loan underwriting (consumer and commercial), due diligence, appraisal review, portfolio analysis, loan loss modeling, organization of the credit department, development of credit policies and procedures, credit management reporting, and management of complex projects. Shelly has successfully developed over 12 data warehouses in large financial institutions. Her focus is to establish new relationships by growing our existing bank partnerships as well as developing risk analytics opportunities to support of our financial services teams.

Shelly's expertise include: Allowance for Lease and Loan Losses (ALLL), BCBS 239, Credit Risk Analytics, Comprehensive Capital Analysis and Review (CCAR), Dodd Frank Stress Testing (DFAST), Commercial Lending (Specialized Lending/Wholesale) work flow, Enterprise Risk Management, Capital Markets Analytics, Risk Rating Models, Counterparty Risk and ad-hoc regulatory reporting.

Before joining Teradata as Industry Consultant, Shelly worked for OneWest as senior officer of Credit Risk Analytics, where she implemented risk framework and achieved a successful regulatory audits as it related to risk management. Shelly has attended UCLA Anderson Business School and lives in Southern California.

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