The impacts of digital trasformation in risk management Synergies between "Big Data" and **Risk Data Aggregation: great** potential or lost opportunity?

Giovanni Paganini





Agenda

- Introduction
- Is it a matter of Big Data or simply 'Data'?
- Data Governance: a needed step forward





Introduction

Introduction and Background

BCBS 239 Principles for Risk Data Aggregation

- In January 2013 the Basel Committee on Banking Supervision issued the Principles for Effective Aggregation of Risk Data and Risk Reporting.
- Principles aim at rectifying the inadequacies in the IT systems and data architectures of many banks which came to light during the financial market crisis that began 2007.
- The objective is to enable global and domestic systemically important banks to provide timely, complete and accurate risk data at a consolidated level through more advanced analytics, aggregation and reporting capabilities.
- The 14 underlying principles are classified under the following 4 categories:

Principles for risk data aggregation

Governance & Infrastructure

- Governance
- 2. Data Architecture & IT Infrastructure

Risk Data Aggregation Capabilities

- 3. Accuracy & Integrity
- 4. Completeness
- 5. Timeliness
- 6. Adaptability

Risk Reporting Practices

- 7. Accuracy
- 8. Comprehensiveness
- 9. Clarity
- 10. Frequency
- 11. Distribution

Supervisory Review, Tools & Cooperation

- 12. Review
- Remedial actions & supervisory measures
- 14. Home/Host cooperation

2013 2013-2015 2016 2018

- Self-Assessment vs. BCBS Principles
- Assessment results and implementation plans shared with FSB
- Standards
 Implementation Group
 (SIG) to track G-SIB
 implementation of BCBS
 Principles
- Initially expected BCBS compliance of G-SIB
- Expected BCBS compliance of D-SIB



The principles, summarized

At a first glance, the 14 principles appear straightforward and basic. They can be summarized by the following sentence:

"Banks should generate accurately and reliable risk data. The risk 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 "

From the IT perspective, the second principle is crucial and not covered by the above sentence:

"A bank should design, build and maintain data architecture and IT infrastructure which fully supports its risk data aggregation capabilities and risk reporting practices not only in normal times but also during times of stresses or crisis, while still meeting the other Principles."

But the devil is in the details:

"Roles and responsibilities should be established" - The role of the business owner includes ensuring data is correctly entered by the relevant front office unit." (Tz. 34)

"Wherever a bank relies on manual processes and desktop applications (...) it should have effective mitigants (e.g., end-user computing policies and procedures) ." (Tz. 36b)

"Risk data should be reconciled with bank's sources (including accounting data where appropriate)" (Tz. 36c)

"A bank should strive towards a single authoritative source for risk data per each type of risk."

(Tz. 36d)



Introduction and Background

Potential areas of change due to the principles

Control Framework

 End-to-end control framework including end-to-end testing, business attestations, etc., to drive executive accountability and the need for high quality, forward-looking reporting.

Data Quality

- Understand the quality of key aggregated data which has the most significant impact.
- Ensure data issues are remediated via the wider governance process and individuals are clear on their data accountabilities

Organisational Structure

- Adjust organisational structure to data driven business -risk, IT & data strategy needs
- Setup & integration of group-wide CDO function



Foundational Data Architecture

- Enhance data architecture to integrate Risk and Finance data, not only to improve reconciliation between risk and accounting data, but also to inform decision making.
- Build infrastructure that scales to support the firm's response to ad-hoc requests in a timely manner.

Governance and Accountability

- Ensure the Board defines its own reporting requirements and have access to enterprise risk reports to support decision making.
- Confirm the CRO's ownership and responsibility of enterprise risk reporting, and that there are appropriate escalation mechanisms.
- Enhance Board and Senior
 Management focus on data quality resulting in increased accountability of the CDO/CIO.

Risk Reporting and Aggregation

 Enhance risk reporting and aggregation capabilities to support risk appetite, stress testing, concentration management and forward looking reporting across business lines and global legal entities.

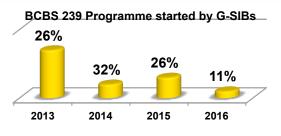


Introduction and Background

BCBS 239 Compliance - EY 'mini-survey' results

Hereafter an EY 'mini-survey' focused on initiatives in place to address BCBS 239 compliance. Benchmark is based on the current situation of 17 banks (11 of them G-SIBs).

Programme organisation and ambition



- 13 (9 G-SIBs) out of 17 banks started a **dedicated programme** to comply with BCBS 239 principles.
- Other banks have integrated BCBS 239 in existing Risk and Finance transformation programmes

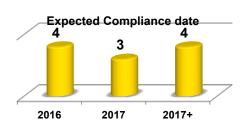
*Total number of responses: 13

Ambition given to BCBS 239 Programmes

- 29% 47% "Risk/Finance Transformation Compliance Global Transformation Projects
- Initially, compliance was the main objective of BCBS 239 Programmes
- Transformation of Risk and Finance architecture has become a significant purpose of these programmes
- Some of them now encompass a broader transformation ambition

*Total number of responses: 17

Compliance date and management involvement



- A majority of the banks are expected to be compliant in 2017 and beyond
- The banks expecting to be compliant in 2016 are US banks, based on CCAR compliance
- 6 banks did not answer on the expected compliance date
- BCBS 239 initiatives progress is reported to the CEO, ExCo and Board
- Senior management is highly involved in BCBS 239 Programmes
- CRO is often quoted as being the sponsor

*Total number of responses: 11



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Is it a matter of Big Data or simply 'Data'?

Is it a matter of Big Data or simply 'Data'?

The AQR exercise was the first of a long series of evidences that any "exercise" required by Central Banks or Regulators is a painful process for the banks. The trend continues with Stress Test exercises and Anacredit will be probably a painful exercise as well.

The current situation in terms of 'traditional Data' is still far from being perfect, with a lot of incoherence, data silos, lack of integration and proliferation or reconciliation procedures in place.

Lack of data integration

Despite of the fact that data warehouse concepts are around since decades, banks are still far from having integrated data across functions and departments

Business glossary

Banks are also far from having a common business glossary (the 'old' data dictionary concept), with unique and shared meaning of every data element. Things are worse in case of groups, with lack of integration between Legal Entities

Poor documentation

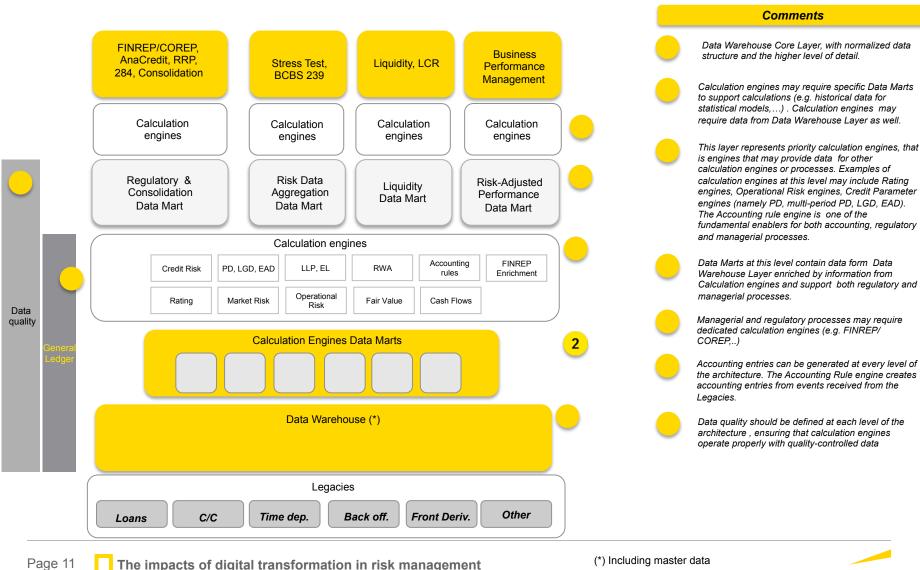
Documentation of IT architectures, entities, data models and transformation processes is poor, with banks often relying on individuals for getting information

Poor data quality and governance

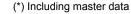
Data quality processes, operating models and procedures have never been fully implemented, but only partially and with a "by chance" approach



Integrated Finance and Risk architecture







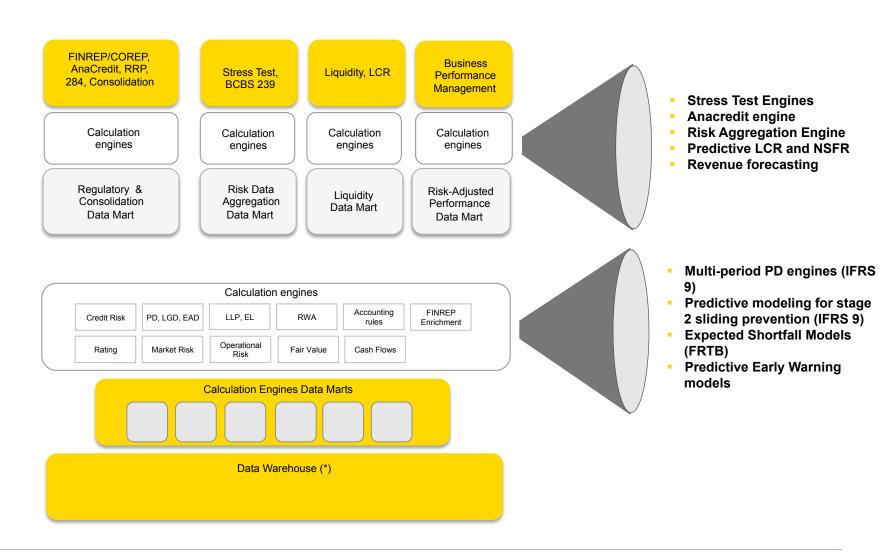






Integrated Finance and Risk architecture

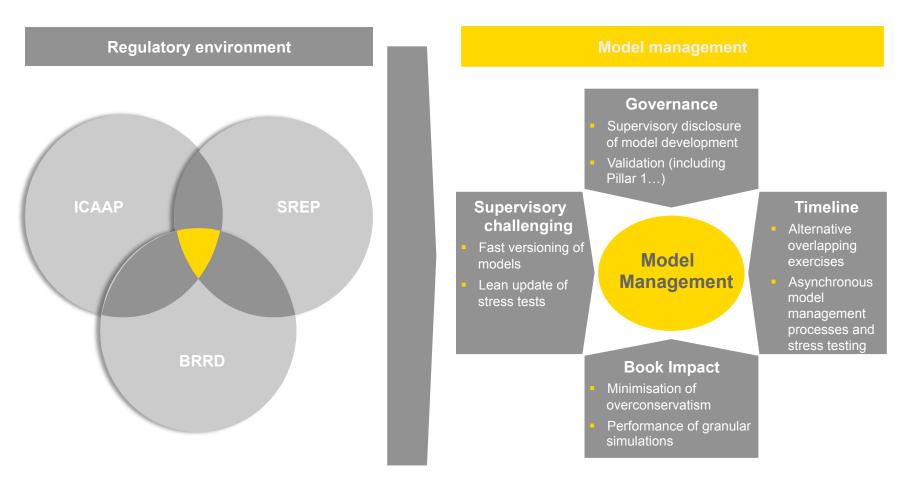
An example of new 'engines'



Model management

The need for an integrated approach and framework

Bank should be asked to run models in order to support regulatory needs (e.g. SREP, ICAAP). An integrated approach and an integrated framework for model management is an inescapabale need for banks.

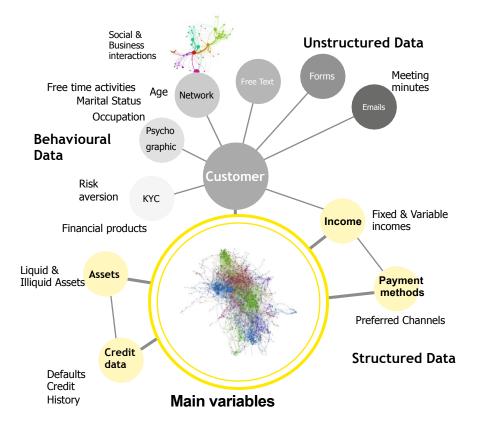




Big data, analytics and risk modeling

Why Big Data? Businesses waste ca. 80% € of customer data now generated*

Despite the large exposure in the media and management literature on the importance of big data most of the customer data are currently not used in an effective ways by banks.



Enriched datasets provide the analyst with the necessary flexibility to assign the optimal credit risk scoring to clients

*Source: B. Schultz "IDC: Tons of Customer Data going to Waste", All Analytics Website 2013



Big data, analytics and risk modeling

Why Big Data?

Identify core data Augment core data Models calibration Identify the key Identify the most variables to be used appropriate predictive in credit scoring models and calibrate modeling. The core them using bank data data contains and internal and 'traditional' structured external variables as variables takend from predictors. bank's internal data structures. Social & Unstructured Data Business interactions Meeting Free time activities Age minutes Network Marital Status Occupation Behavioural Data Customer Risk aversion KYC Fixed & Variable Income Financial products Payment Liquid & Illiquid Assets Preferred Channels Defaults Credit Structured Data data Credit History **Final Dataset**

Models merging

Combine the scores of the different models to obtain a more accurate probability of default.

Embedd the model in

Models usage

business processes such as underwriting, credit risk evaluation. credit monitoring.

Big data and analytics

Maturity level

The evolution towards an integrated framework of big data and analytics may be organized across the following three main steps.

Risk & Regulatory Compliance

- Key driver is Regulatory Compliance
- · Focus is centered on Risk Reporting
- Available resources are limited to fulfilling the requirements
- Regulatory Compliance already leads to partial efficiency improvements

Operational Effectiveness

- Key driver is a bank-wide Risk & Finance Transformation Programme beyond Regulatory Compliance
- Governance Execution through Risk
 & Finance Functions
- Among further operational efficiencies are the improvement of Reporting and cost reduction

Integrated Business Steering

- Key driver is data led Business Strategy - utilization of "Big Data" as a main factor in improving business competitiveness
- Governance Execution through business areas whose data requirements go beyond sheer Risk & Finance Reporting
- Major improvements of Data and Analytics create opportunities for individual analysis within the Central Data Repository

Integrated Risk & Finance Architecture

"Big Data"

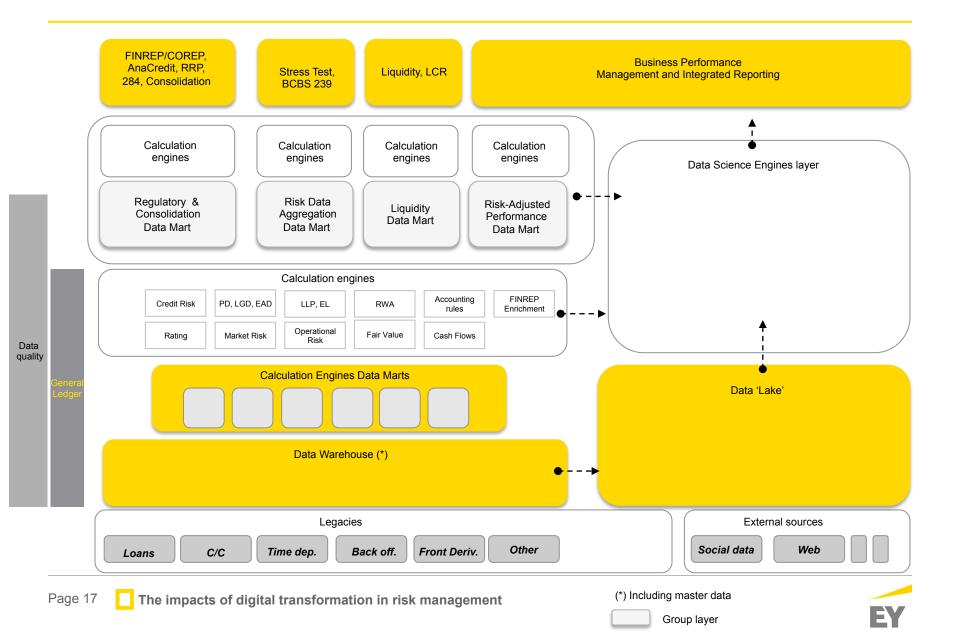
BCBS 239 Compliance

- + Fully integrated Risk & Finance Architecture
- + BCBS 239 Compliance w.r.t. the complete Reporting process (beyond Risk Reporting)
- + Overall operational optimization
- + ...

- + Central Data Repository expansion including all relevant data with respect to business strategy, governance, customers and products
- Well advanced Data Analytics tools and capabilities
- + Further involvement of business departments in the utilization of the Central Data Repository



Integrated Finance and Risk architecture



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Data Governance: a needed step forward

Data Governance

Framework

Organisational Model

Structure for making data-related decisions which defines roles/responsibilities, ownership/stewardship, and handles communication of data governance determinations.

Standards & Policies

Defines data definitions / taxonomies, enterprise data models, data usage patterns, and KPIS such as service levels and cost of ownership

Processes & Procedures

Defines monitoring methods, handles change management, defines rules of engagement between initiatives and data governance body, and provides guidance on data usage.

Data Governance

- Development and implementation of solutions for the process control of the sourcing, transport, usage, storage, retention and disposal of enterprise information.
- Development and enforcement of policies and standards
- Development and execution of processes and procedures around enterprise data.

Controls

Defines the control framework for data, both to support the organizations data quality objectives and to meet regulatory requirements.

Data Quality

Provides the framework for improvement of data quality across the enterprise, including oversight for the implementation of DQ projects, identification of priority data sets and KPIs.

Data Enrichment

Structure for the data enrichment process including the definition of 'golden source' data, enrichment sources, and business objectives for enrichment



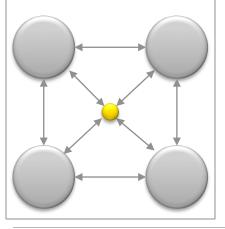
Data Governance

Execution models variety

- ► There are various Data Governance organisational models selection and implementation of the right one depends on the organisational structure and culture.
- ▶ The model can develop over time and incorporate features of different other models depending on the exact objectives of the organisation, data management maturity level and programmes of change.
- ▶ In addition, centralized capabilities are being developed to service federated data quality activities.

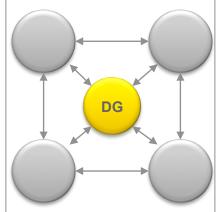
Limited

Functional areas operate with complete autonomy, while maintaining global standards to meet specific enterprise requirements.



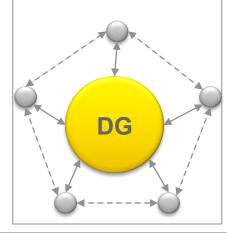
Balanced

Responsibility and ownership are shared equally among the different functional areas and the enterprise.



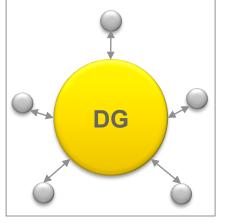
Central + Distributed

Data Governance provides a point of control and decision making but functional areas own selective decisions and activities.



Centralized

Data Governance provides a single point of control and decision making, with functional areas having little or no responsibility.

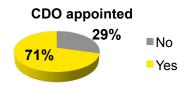




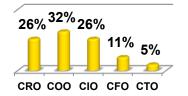
CDO Operating Model

Current EY Survey results

CDO appointment and reporting



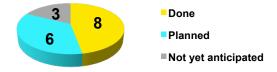
Benchmark performed by EY demonstrates **overall mobilization** of the industry: 12 banks out of 17 have appointed a CDO



- □CDO reporting line repartition
- CDO Reporting is heterogeneous:
 - ▶ CDOs in majority of US banks report to CIO
 - European banks show a trend to reporting to COO/CRO
 - Multiple reporting-lines possible

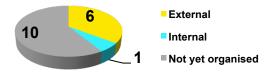
Supervisory visit and independent validation

Status of regulator's visit



- Local **supervision has strengthened in 2016** and will most likely stay on the same path (UK and US regulators have already performed on-site reviews)
- Supervisor may also perform local review at entity level
- Fines and capital add-ons could be expected

Independent validation type



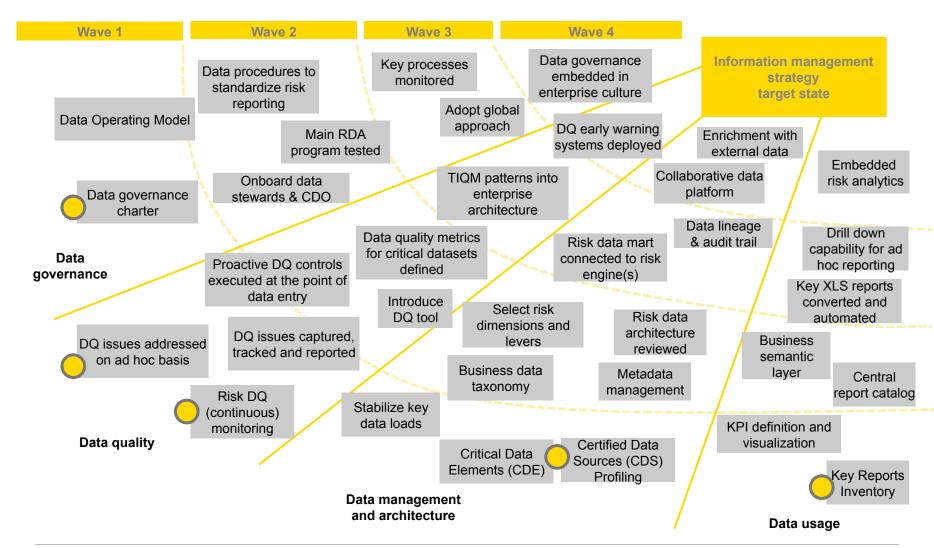
- Benchmark performed by EY shows that the organisation of independent review is slow
- The majority of banks which already performed one is opting for an **external** independent review

*Total number of responses: 17



Data Governance

Execution structure





Thank you!





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