



Eighth IFC Conference on *“Statistical implications of the new financial landscape”*

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Data as a critical factor for central banks¹

Maciej Piechocki,
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¹ This paper was prepared for the meeting. The views expressed are those of the author and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

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„ ... it should also be clear to everyone that we are now standing only at the start of a long road in terms of data. The big challenge for statistics in the coming years is not only “many more numbers”, but perhaps much more so, the reconciliation of statistical information collected in support of monetary policy and financial stability with the up-to-now rather separate world of supervisory information. It is one thing to have information, which, like blood, flows through the veins of the system, it is another to ensure that everything beats at the same rhythm and all organs in the body get all they need from the same single flow.” (Mario Draghi President of the ECB, Seventh ECB Statistics Conference “Towards the banking Union. Opportunities and challenges for statistics”, Frankfurt am Main, 15 October 2014”)

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Introduction: Increasing requirements to central banks' data management due to regulatory trends and technological innovations

Data stay a critical factor for central banks. The financial crisis showed that some of the deepest fissures were caused by gaps in data and exposed the need for high quality, comparable and timely data on the global financial network. Since then, policymakers, supervisory authorities and standard-setters across the globe have been collaborating to greater harmonize and standardize regulatory data in financial services. According to a recent BearingPoint Institute paper, urgent debate is still needed on how the world's financial services industry could be better and less onerously supervised via a smarter approach to regulatory reporting and data exchange¹.

Financial supervision and central banks momentary statistics and financial stability functions are vastly driven by data. In the aftermath of the financial crisis, a "regulatory tsunami" flooded the financial services industry. Especially after the adoption of the Basel III framework, regulatory requirements have significantly increased. New regulations such as AnaCredit, BCBS 239, Solvency 2, Dodd Frank or IFRS 9 have posed new challenges to the banking and insurance sector on global, regional and local levels. Moreover, regulations like the EMIR (European Market Infrastructure Regulation), Money Market Statistical Reporting (MMSR), the Markets in Financial Instruments Regulation (MiFIR) and the Securities Financing Transaction Regulation (SFT) oblige the major Monetary Financial Institutions (MFIs) to report derivatives or money market data on a daily basis.

"Big data" is a common buzzword in this context. Due to new media and technologies, new data sources appeared like e.g. Internet-based data, data from Social Media, but also from official sources and internal public databases such as banking supervisory data². According to a BearingPoint Institute article on big data, the amount of information available in the world increased by a factor of 100 in last 20 years.

However, in the central banking area, while no single agreed definition exists, big data has already been heralded as offering a wide range of central banking applications: from nowcasting to modelling, to early warning systems and systemic risk indicators. For some it opens a new chapter in policymaking. In a recent study, the Institute of International Finance (IIF) stated that "'RegTech', defined as 'the use of new technologies to solve regulatory and compliance requirements more effectively and efficiently' has enormous potential to ... improve the quality and efficiency of supervision, and reduce risk in the system."³

¹ "Reforming Regulatory Reporting. From Templates to Cubes.", Dr. Maciej Piechocki, Tim Dabringhausen

² IFC report „Central banks' use of and interest in „big data“, October 2015, p. 19

³ Institute of International Finance, "RegTech in Financial Services: Technology Solutions for Compliance and Reporting.", March 2016, p. 3f

According to the 2015 IFC report on “Central banks’ use of and interest in ‘big data’” central banks have a strong interest in big data, but their actual involvement is still limited.⁴

BearingPoint is noticing two significant key trends worth looking at when discussing (big) data management in central banking in respect to financial services: the replacing of form-based collections with granular, micro-level data⁵ and the need to go beyond reporting data validation, i.e. to integrate regulatory Key Performance Indicators (KPIs) into the overall operational supervisory process. However a number of further developments at central banks is observable. For example from governance perspectives central banks recently started to appoint “chief data officers” and implement harmonised “data strategies”. Number of central banks are currently rethinking their data infrastructures which today are rather siloed and demonstrating the legacy of the past decades with no central approach to data handling.

Challenges for central banks

Notwithstanding the huge potential big data provides, decision making is now even harder than before, and business need adequate solutions to analyse this data.⁶ A crucial point is how to mine all this information from the different sources exhaustively and at reasonable cost. Despite innovative tools and technologies like blockchain, cloud computing and machine-learning, even today plans often fail because the required processing power outweighs the potential returns or computing time is too long.⁷

The specific challenge for central banks in the sense of an effective 360° risk-based supervision is to rapidly access, effectively manage and timely process and analyse the increasing amounts of supervisory, statistical and markets (big) data. Especially the near or real-time access and efficient processing are regarded as critical factors due to limitations in human and IT resources.⁸ According to the IIF report, some regulators still use outdated portal solutions and methods, which are inefficient and increase chances of introducing error.⁹ The IIF recommends automated secure data transfer mechanisms based on standards like XBRL (eXtensible Business Reporting Language). But even with use of standard such as XBRL or SMDX (Statistical Data and Metadata eXchange) central banks must abandon “paper-” or “document-oriented” world and think of data in integrated and interlinked manner.

Current systems do not meet today’s requirements when regulators have to deal with large amounts of data of various kinds - collected from supervised entities for statistical, prudential or stability purposes, provided by information providers or obtained from internal research and analysis. Such data span from granular micro information on single mortgage loans, securities traded and counterparties affected to macro-economic analysis of countries or regions to form-based collections of financial and risk data or ad-hoc supervisory exercises.

⁴ IFC report „Central banks’ use of and interest in „big data“, October 2015, p. 1

⁵ IFC Working Paper No. 14, “Big data: The hunt for timely insights and decision certainty”, February 2016, p. 15

⁶ BearingPoint Institute Issue 002, “Seeing beyond the big (data) picture, p.3-4

⁷ Ibid., p. 6

⁸ IFC report „Central banks’ use of and interest in „big data“, October 2015, p. 11

⁹ Institute of International Finance, “RegTech in Financial Services: Technology Solutions for Compliance and Reporting.”, March 2016, p. 22-23

Some of this data will remain only in the perimeter of the central bank some will be remitted to other stakeholders such as the European Supervisory Authorities (ESAs), country governments, the International Monetary Fund (IMF) or the Bank for International Settlements (BIS), some will be disseminated to the wider public or research community.

Therefore, it is mission-critical for regulators to

- effectively handle the large amounts of increasingly granular data from various sources, i.e. rethink existing IT system architectures and landscapes
- gain transparency on the status of the reporting agents in the collection and dissemination process
- consider interlinkages between micro and macro data sets in “going beyond the aggregates” from macro and financial stability perspectives
- get a timely overview of relevant micro and macro developments in the financial markets and
- execute reliable trend analyses on KPIs and Key Risk Indicators (KRIs) based on validated collected data

Essentially, it is a question of scalability in various dimensions across the usual value chain or “lifecycle” of processing supervisory data, as investigated in detail in an article published in Banque de France’s Financial Stability Review.¹⁰

The expanding requirements have proved to be a great challenge and cost driver for IT departments of regulators. IT infrastructure and processes have to be optimised in order to collect, process, analyse and disseminate supervisory and statistical data from different sources and in various formats. But process automation and innovative solutions are required to increase quality and efficiency of supervision, to reduce expenditures, operational burdens and time to market for new supervisory requirements.

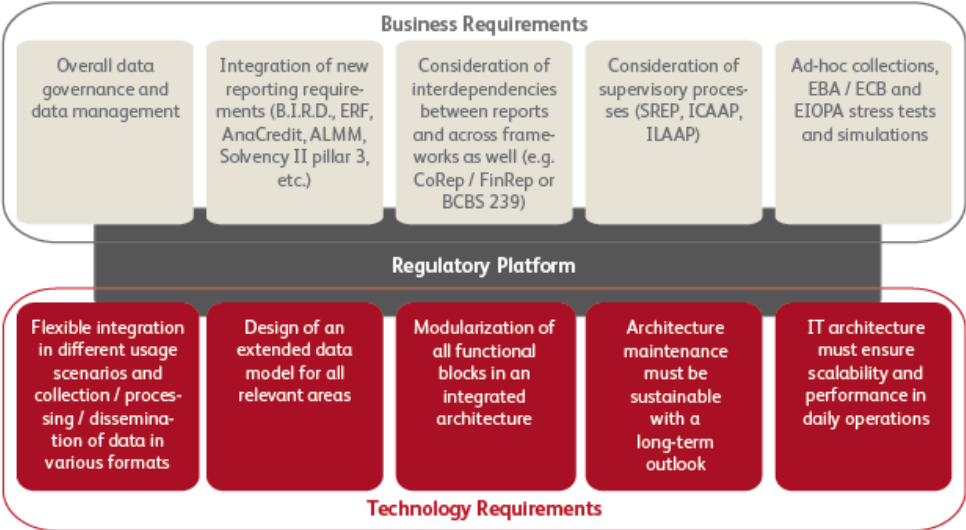


FIGURE 1: REQUIREMENTS FOR FUTURE-ORIENTED REGULATORY PLATFORMS

¹⁰ Mark d. Flood, H.V. Jagadish, Louiqa Raschid: “Big data challenges and opportunities in financial stability monitoring”, Banque de France Financial Stability Review, No. 20, April 2016.

Innovative approaches – shared utilities, integrated platforms for data management and analytics and Regulatory-as-a-Service (RaaS)

In view of the developments as described before, it is undisputable that it is mission-critical for central banks to reshape their data management and further automate industrialise processes of handling data. Automation helps to minimize risk, reduce errors, and increase transparency and thereby to deliver a better basis for decision-making.

According to a BearingPoint Institute article¹¹, a new information value chain is needed for reporting which helps to increase efficiency of supervisory processes, minimize risk, allocate resources effectively and improve the basis for decision-making by higher transparency and faster availability of data. We further notice a trend to shared utilities, Regulatory-as-a-Service.

A prominent example is the Austrian solution, where the national central bank, Oesterreichische Nationalbank (OeNB) and the supervised banks joined forces to stepwise replace the template-driven model and use innovative technologies to create a new regulatory value chain. The initiative is based on greater harmonization and integration of data within banks as well as greater integration of the IT systems of the supervisory authority and the supervised entities. The way it works is through a common data model (GMP) developed by central bank in cooperation with Austrian bank and a shared utility, called Austrian Reporting Services GmbH (AuRep), which is co-owned by the largest Austrian banking groups. This model allows cost-sharing of compliance as well as standardization of data collection.

AuRep runs on a common platform, which works as the central interface between the banks and the OeNB. Granular bank data sets are captured automatically for supervisors to interrogate in whichever way they want, whilst the banks retain control over their commercially sensitive data, maintaining only the so-called 'passive data interface' on the AuRep platform.¹²

Other regulators are also aware of the limits of the template-based reporting and see the benefits of an input approach with granular datasets. While the Banca d'Italia has been providing such a shared data model named PUMA2 for some decades recently the European Central Bank (ECB) has also launched an initiative to evaluate a European "input approach". The Expert Group on Statistical and Banking Data Dictionary was established to develop a Banks' Integrated Reporting Dictionary (BIRD), which defines a harmonized model for input data as well as rules for the transformation of input data to reporting data. BIRD should be seen as a blueprint for the banks. It forms the conceptual basis of an input approach, i.e., a data model for the organization of the regulatory reporting process within the banks. The approach is similar to the Italian and Austrian model.

Besides harmonized data definitions, new and high-performing supervisory data management platforms are necessary allowing for timely and efficient collection, analysis and sharing of the data.

¹¹ BearingPoint Institute, "Reforming regulatory reporting: are we headed toward real-time?", 2015

¹² Ibid., p. 6

These platforms could be deployed for instance as a closed solution for the regulator, as an open solution also for firms providing them advanced portal functionality as a service (RaaS or Regulatory-as-a-Service) or even as a shared services platform like in the Austrian case.

With regards to functional scope, new generation platforms should provide functionality for highly automated processing of data and regulatory business intelligence including statistical analysis, monitoring and controlling supervisory Key Risk Indicators (KRIs).

Conclusion and outlook to the Central Banking Big Data Focus Report

Central banking statistical stability or supervisory function have been increasingly driven by (big) data, but little has changed in the methodology of supervisory data collection and management, which is still widely reliant on the document-oriented approach. This is intrinsically time-consuming, costly and complex. Data gaps still exist and so data remains a critical factor for central banks. Innovative solutions are necessary, to effectively handle "Big Data".

The Central Banking Big Data Focus Report is a joint initiative of the Central Banking Journal and BearingPoint. The report builds upon the results of the recent IFC survey and takes a closer look at how central banks actually handle the challenge of data collection and analytics with regard to technical platforms and standards, resources and data governance.

The report investigates the concrete action plans of central banks regarding data management challenges in light of FinTech/RegTech developments and the objective of transparent and effective risk-based supervision but also plans for central banks statistics for "going beyond the aggregates" especially for the micro-granular data handling. Finally, central banks are evaluated how the BCBS 239 principle in an adapted version would apply to them today.

The focus report will draw on views from central bankers, industry experts, academics and observers to look at:

- Financial stability and supervisory applications
- Direct uses in economics and modelling
- Who should 'own' big data?
- Resourcing and budgets
- Future developments
- Operational challenges – gathering, structuring, storing and processing data

The Central Banking Big Data Focus Report aims at giving a clear picture of where central banks stand today with supervisory data management and defining fields of action. The results will be publicly available in Q4 2016.



Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

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How to tackle regulatory management and analytics

Dr. Maciej Piechocki

8th IFC Conference in Basel, September 9, 2016



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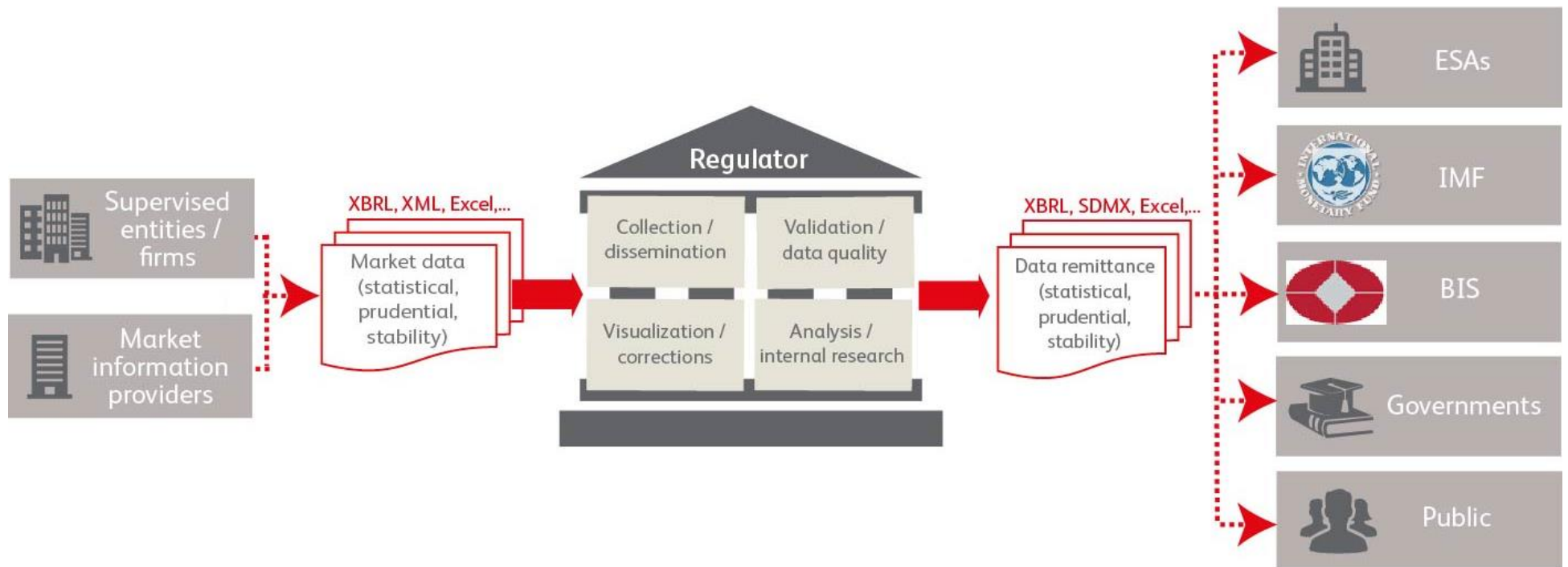
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IDC Financial Insights

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Central banking business is a data business

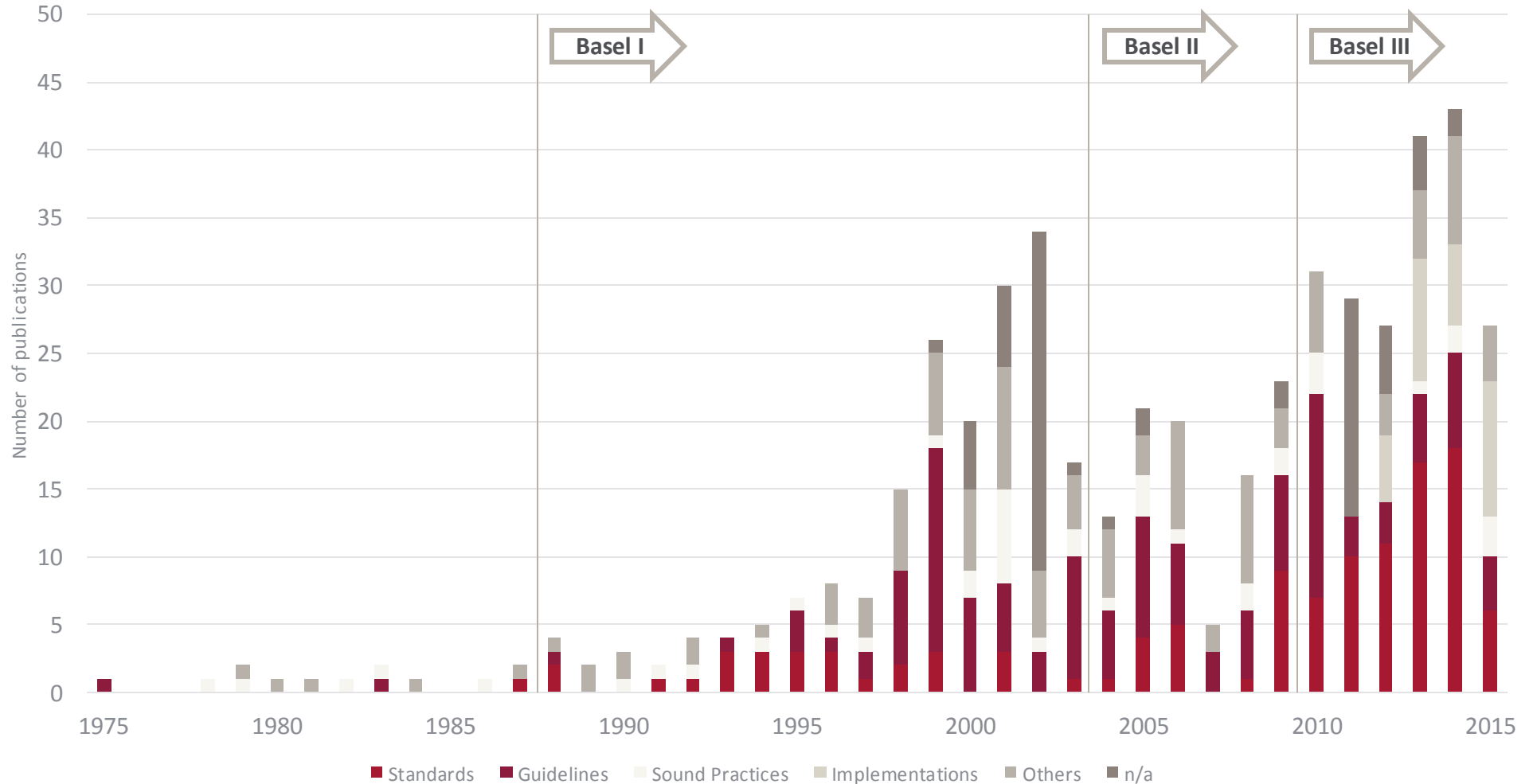
Collection, analysis and dissemination of supervisory and statistical data for central banks and regulatory authorities



RegTech data trends for central banks

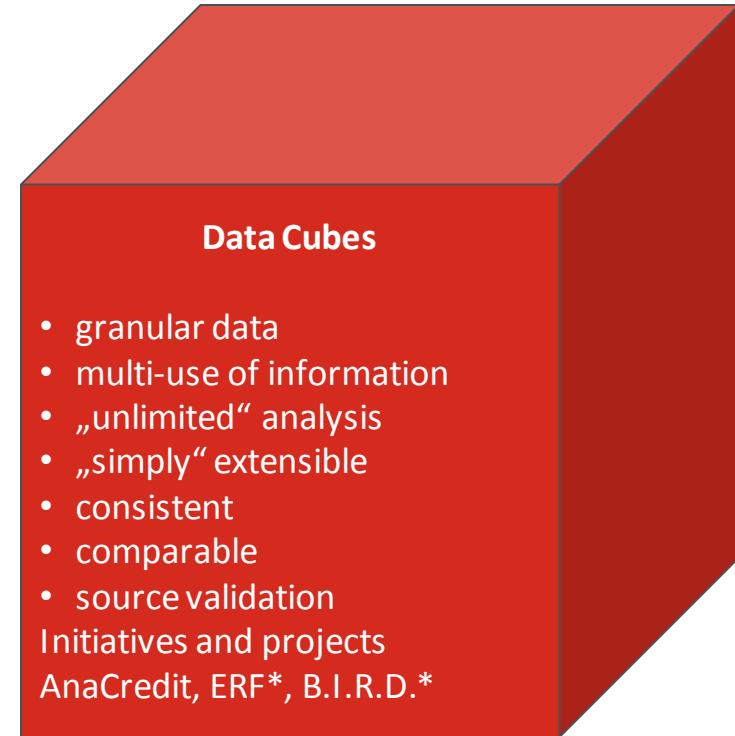
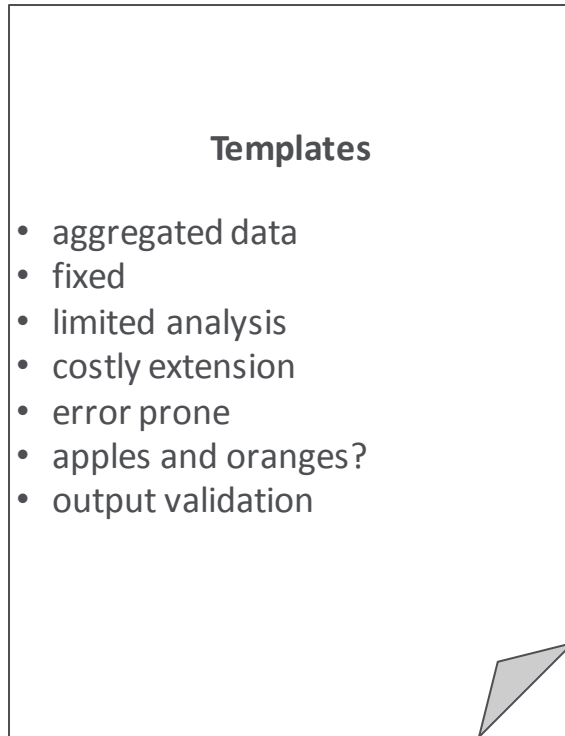
Trend 1: The global regulation is on the increase

BCBS PUBLICATIONS SINCE 1975



RegTech data trends for central banks

Trend 2: Need for micro granular data for macro prudential decision making



* ERF = European Reporting Framework

* B.I.R.D. = Bank's Integrated Reporting Dictionary

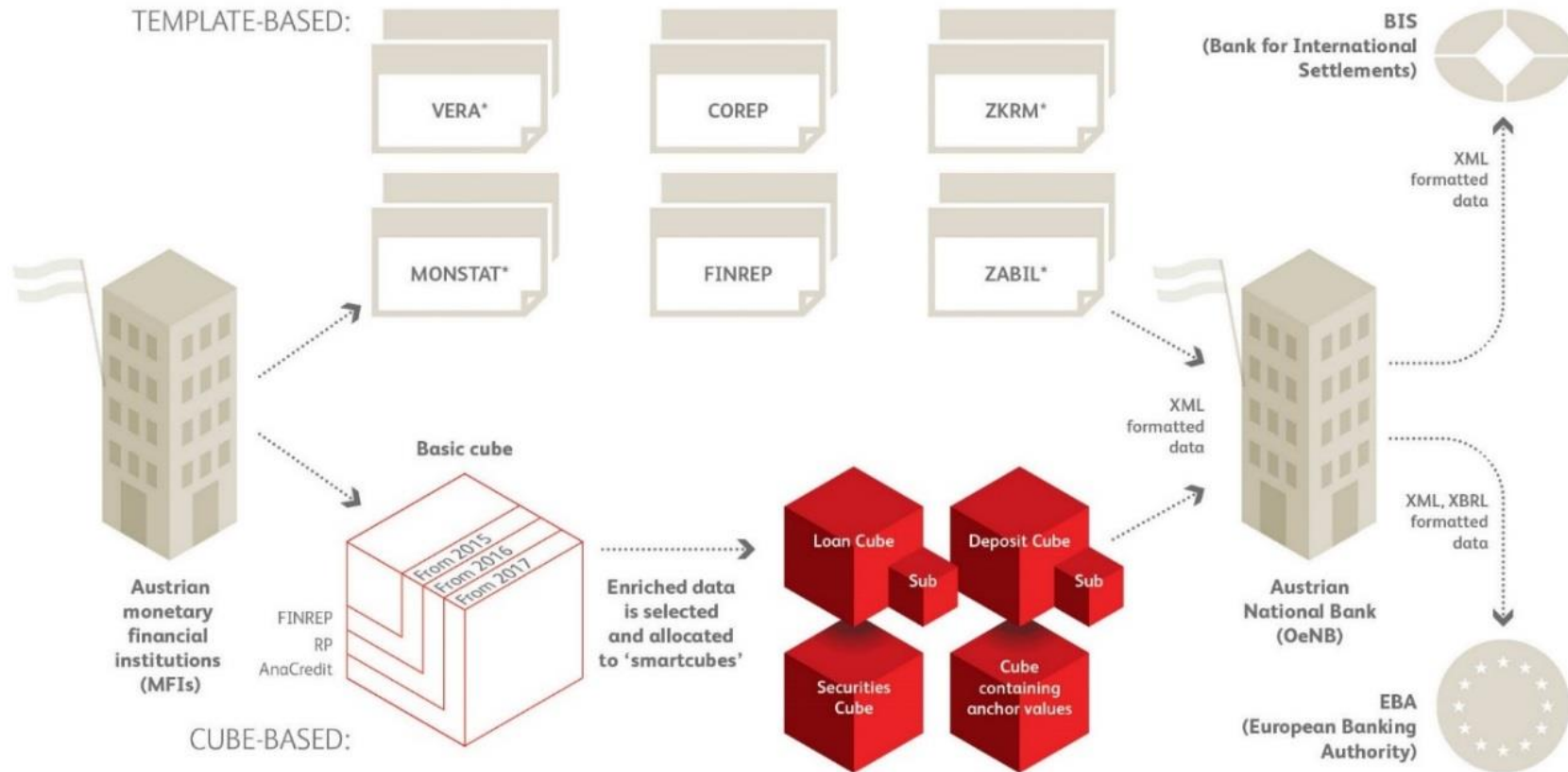
RegTech data trends for central banks

Trend 3: Central banks foster new competition models in financial services



RegTech data trends for central banks

Trend 3: The new input approach improves data transparency and availability



* Austrian frameworks, rather than European frameworks

Source: BearingPoint Institute

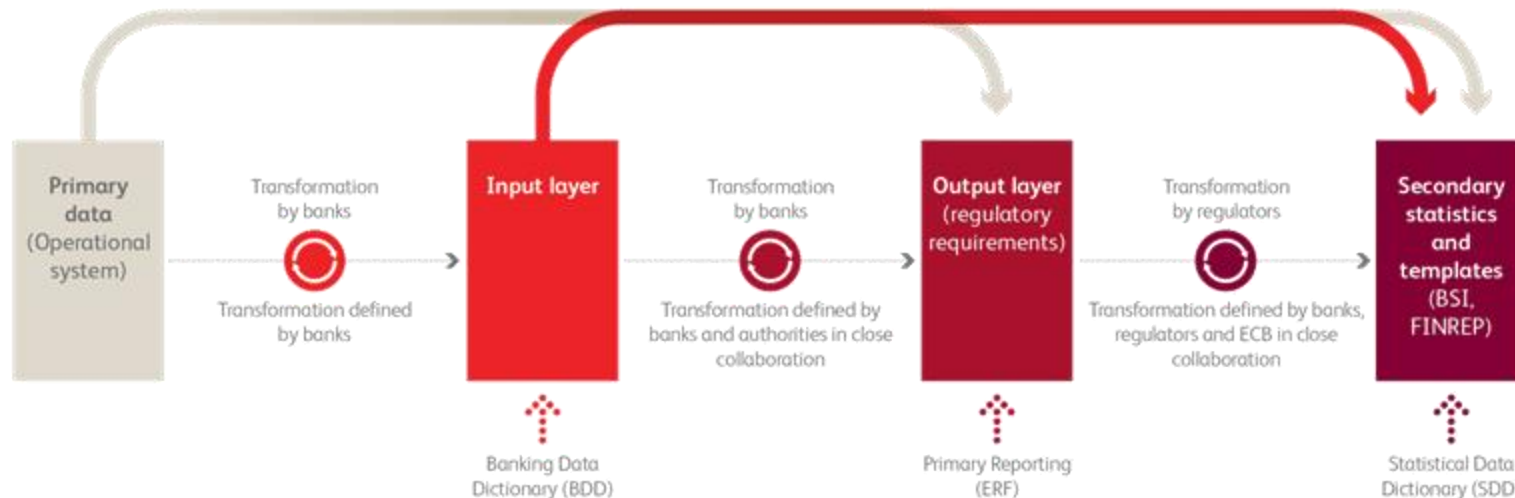
RegTech data trends for central banks

Trend 3: The introduction of a European input approach

- Based on the input-based models operated in Italy and Austria, ECB has started a discussion on a European input approach under the so-called **European Reporting Framework (ERF)**.
- The ERF consists of a **Banking Data Dictionary (BDD)**, similar to the Austrian basic cube, and a **Statistical Data Dictionary (SDD)** harmonizing reporting requirements from various domains on the output side.

“The ECB has every interest to facilitate and promote integration and standardisation also on the ‘input side’, in the internal systems of the banks, for only this will ensure coherent information.”

Mario Draghi, President of the ECB, Seventh ECB Statistics Conference “Towards the banking Union. Opportunities and challenges for statistics”, Frankfurt am Main, 15 October 2014

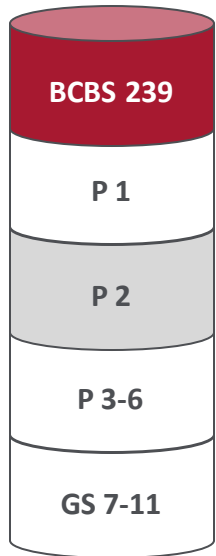


Source: BearingPoint Institute

RegTech data trends for central banks

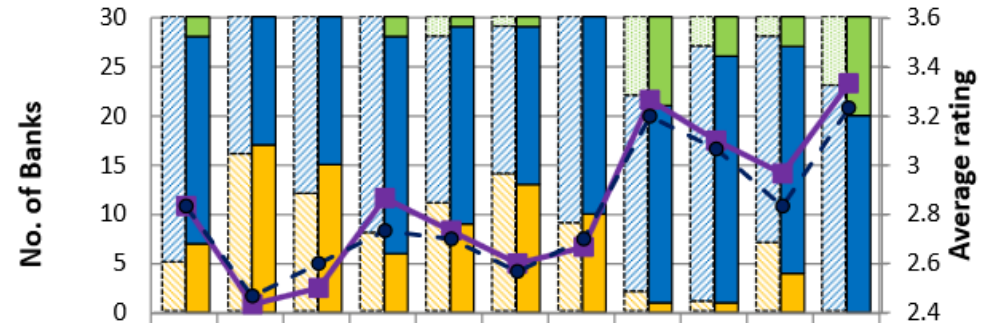
Trend 4: Integration of IT landscapes and data governance

BCBS 239, Principles for effective risk data aggregation and risk reporting



- Corporate Governance
- Data architecture and IT infrastructure
- Risk data aggregation capabilities
- Risk reporting

Self-assessment ratings by Principles (31 G-SIBs/D-SIBs, BCBS 307)

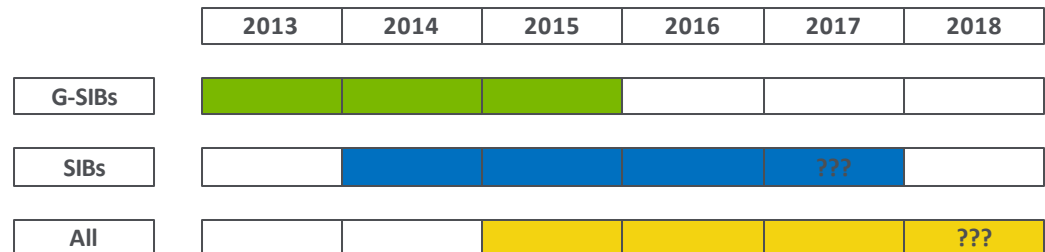


	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11
Fully compliant	2	0	0	2	1	1	0	9	4	3	10
Largely compliant	21	13	15	22	20	16	20	20	25	23	20
Materially non-compliant	7	17	15	6	9	13	10	1	1	4	0
Non compliant	0	0	0	0	0	0	0	0	0	0	0
2014 average rating	2.8333	2.4333	2.5	2.8667	2.7333	2.6	2.6667	3.2667	3.1	2.9667	3.3333
2013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

BCBS 239, Key requirements

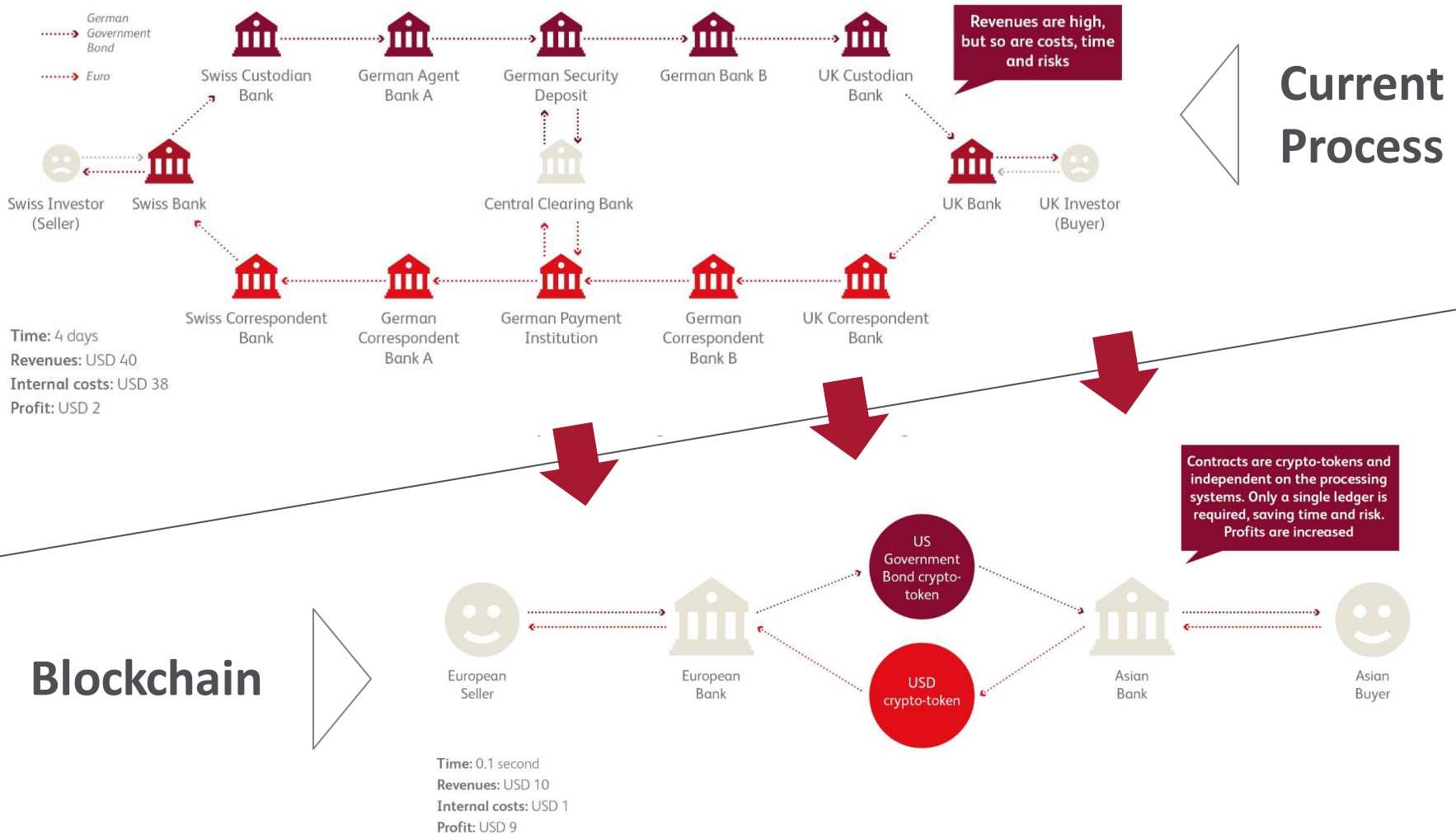
- Data governance
- Data consistency
- Adaptability
- Agility

BCBS 239 Deadlines



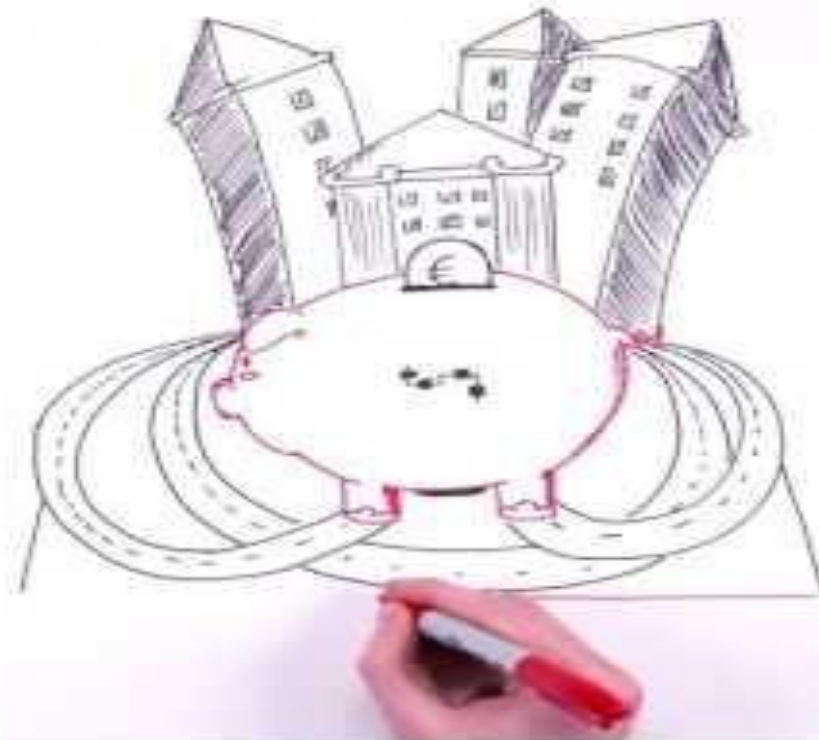
RegTech data trends for central banks

Trend 5: New technologies disrupt value chains in financial services



RegTech data trends for central banks

Trend 5: New technologies disrupt value chains in financial services



Central Banking and BearingPoint Study 2016

Big Data in Central Banking

- Big Data has already been heralded as offering a wide range of central banking applications: from nowcasting to modelling, to early warning systems and systemic risk indicators
- Yet questions remain around where Big Data can add value to central banking in the near term, and the usefulness of what is undoubtedly exciting and revolutionary work must be balanced against potential pitfalls
- This focus report will draw on views from central bankers, industry experts, academics and observers to look at:
 - Financial stability and supervisory applications
 - Direct uses in economics and modelling
 - Who should ‘own’ big data
 - Resourcing and budgets
 - Future developments
 - Operational challenges – gathering, structuring, storing and processing data

➔ First results will be discussed in a webinar on Wednesday, 28th September, 2016 - Live at 11am BST

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