

# Real-Time Risk Management for Banking

How High-Performance Technologies Are Enabling Major Advances in Risk Management



## Why Real-Time Risk Management – and Why Now?

Does a “regular” bank that does *not* deal in complex instruments still need real-time risk management? To date, banks have generally accepted having risk analyses available one or two days after the fact. And for years, they have made ends meet with this delayed risk insight. So why invest in something new? Why rock the boat?

That’s one way of looking at the value of real-time risk management.

The bigger question is, how much value is being left on the table if you *don’t* use real-time risk management? Sometimes, what you don’t know is hurting you – especially when it comes to risk for banks.

The good news is, real-time risk management is both technically possible and more cost-effective than ever before to implement thanks to huge advances in data processing performance and efficiency. SAS refers to these advances as high-performance technologies. In risk management, high-performance technologies are enabling **real-time** data integration, data quality processes, reporting, evaluations, analyses and decisions *on demand* – all capabilities that are critical to effective risk management.

The time has never been better for banks to employ real-time risk management. Today, financial institutions face challenges

such as higher volatility, increasing interdependence of markets, growing margin pressure and increasingly complex regulatory requirements. So out of sheer economic self-interest, many banks are being forced to rethink – and industrialize – how they create and process risk-related knowledge. At the same time, in the paper BCBS 239, the Basel Committee has already defined concrete requirements for banks so they can enhance risk management and decision-making processes.

So it’s time to rethink your bank’s approach to managing risk.

▶ The Basel Committee made it clear that there is considerable pent-up demand from all banks in this area. Will your bank be left behind? Or will you be ahead of the pack, realizing the competitive advantages afforded by real-time risk insight?

# Where's the Biggest Opportunity for Benefit?

Many banks are starting to see the need for change in how they create knowledge about risk and use this knowledge to make decisions. And increasingly, they regard high-performance technologies as a source of significant competitive advantage. The industrialization and acceleration of the knowledge creation process can eliminate the countless and often error-prone workarounds and deliver significant benefits across organizations.

The following sections overview five areas where industrializing knowledge management about risk can add significant value. Every bank will likely need to address all of these areas over the next decade - even if they have already completed a large Basel II project. But Basel II projects do not necessarily cover all five areas because 1) current risk practices, with their patchwork of outdated and insular solutions, show room for improvement, and 2) Basel II solutions are a decade old and don't include the latest advances afforded by today's high-performance technologies.

## 1. Real-Time Data Integration: Using Data Streaming to Capture All Risk-Related Costs

In today's batch process-oriented banking IT, data is collected and sent once a day from operational systems through the data warehouse into risk management for processing. In some cases (for example, when monitoring limits), the result is performance that's close to real-time processing. In other cases, the operational front-office systems perform the calculations. Either way, processing is usually inaccurate, and important risk-related costs, such as liquidity costs, are not fully taken into account.

As long as all banks operate this way, these issues will be ignored. But a "do nothing" approach is too shortsighted. Key stakeholders such as the public, regulators and shareholders now expect banks to perform "commercially clean" work and achieve the best price for a product or transaction. For example, in Europe, firms should have policies and procedures in place to ensure compliance across the firm, including its managers, employees and tied agents, as outlined in Markets in Financial Instruments Directive (MiFID) - Article 13(2) of the Level 1 Directive. In addition, the real costs of operating this way are only apparent when they start affecting bank profitability.

What's the solution? Moving from batch-oriented processing to transaction-oriented, continuous processing enabled by real-time data integration. In this scenario, planned transactions are sent directly to risk control and are evaluated holistically under the portfolio conditions. As deals come through the system, they are correctly identified and linked to related data - both old and new - including influencing factors (such as currency rates). All of this happens in real time, as data comes in.

This type of continuous data streaming is now possible. It requires the intelligent merging of data and the orchestration of data resources, as well as high-performance technology that can drive a fast, efficient integration process. With this approach, the portfolio view always remains up to date. The result is a data stream that never stops and distributes processing throughout the entire day.

## 2. Real-Time Data Quality Processes: Preventing Data Errors Right From the Start

Data quality is a never-ending topic for banks. In many data warehouse projects, the first step is usually data cleanup. Ideally, data quality assurance processes should be performed directly at the data collection source, but this is not always feasible. It's complicated because data gets changed and entered into operational systems, and it's constantly modified and adjusted throughout system production processes. These changes are all opportunities to introduce data errors.

True data quality can only be achieved when there is proper interaction between IT and business departments. To achieve this, banks can use data quality dashboards and data quality measures. Data quality indicators, which are required by Basel, must be collected to indicate data correctness, completeness, consistency and staleness. If these indicators fall below a certain level - usually 95 percent - then consumers of reports can insist on a new, more accurate report.

To support this process, business departments can determine possible field characteristics using profiling, which helps identify incorrect values and recognize error patterns. Furthermore, lines of business can create business rules that IT can apply to the data. For example, a business rule may be created to define when a deposit is "stable" or "less stable" according to the Basel liquidity standards. Establishing this type of business rule requires that all data is understood uniformly, bankwide.



To achieve this, a business glossary must be created that describes what each data field is used for in business terms (functionally – for example, for booking dates or contract dates), not just from a technical metadata perspective (for instance, the format convention used for dates in the database). Business departments should be responsible for defining the functional definitions of fields, as only they have the necessary business knowledge to understand how they use data.

### 3. Real-Time Reporting: Creating Flexible Views Optimized for Risk Management

Standard, static reports are not suitable for the ever-changing requirements of today's business departments. This has driven the innovation and adoption of OLAP cubes, which enable users to view data from different viewpoints with ease.

But to manage risk effectively, banks also need to take into account non-additive indicators that cannot be aggregated via OLAP technology. It should be noted that in the case of non-additive indicators, they may be numerical, but it does not make sense from a business perspective to sum them. For example, it makes no sense to sum ratios, which are non-additive indicators.

In addition, banks need access to all relevant data, such as counterparty and deal data, in order for reports to shed light on specific situations, such as exposure estimates. They should also use applicable statistical methods and visualizations of relationships so that even non-IT people and non-statisticians can quickly understand the relationships between underlying data and what they reveal about risk. (All too often, an incorrect evaluation of – and decision regarding – a risk situation is not caused by an inaccurate risk model, but rather because data relationships are only understood by a few specialists.) Data visualizations, for example, can help make risk-related data immediately understandable for a broad base of bank employees, allowing them to take risk insights into account when engaged in everyday workflows and decision making.

High-performance reporting solutions provide tremendous added value when it comes to visualizing data, as they can make visible important connections between millions or even billions of individual bits of data. For example, using in-memory technologies and parallelizations of arithmetic operations over a computer network (in conjunction with visualization and statistics), users can play with complex data in seconds, understand and interpret them, and report on them almost instantly.

### 4. Real-Time Evaluations: Completing Stress Testing in Seconds Instead of Hours

To account for the uncertainty of future value fluctuations of transactions and predict cash flow changes, a bank must be able to run through possible scenarios quickly. Scenario analyses, as well as stress tests, concern the evaluation of transactions and their risks given uncertain general conditions. Scenario assumptions must be formulated in a brief and focused way for groups of transactions with shared characteristics. Both future transactions and changing evaluations and cash flows must be simulated in line with flexible, clear rules – and ideally be available in real time.

For virtually all of the risks that banks face, real-time evaluations can offer tremendous added value. And thanks to high-performance technologies, they are available to all banks. There's no need to be satisfied with approximations and workarounds anymore. What-if scenarios for as-yet incomplete transactions are now possible, and as a result, decision makers can simulate the effects of new transactions on risk and understand the influence of various market developments and their implications for risk strategies. Equally important, the results of analyses are available rapidly – in time to influence the daily decisions of risk managers.

### 5. Real-Time Decisions: Validating Decisions Before They Are Implemented

Industrialized knowledge generation processes – when powered by high-performance technologies – enable banks to validate the correctness of decisions before they are carried out. Simulations can help them forecast, describe and visualize the probable effects of a decision (for instance, how the conclusion of a hedging transaction, directly after the deal is closed, affects the risk profile of the overall portfolio).

Simulation results should be readily available early in the decision-making process so they can influence final decisions. When banks can do this faster than their competitors, they have a clear competitive advantage: Their decisions are more objective, informed and timely.



## What's Your Next Step?

The value of high-performance technology applied to risk management isn't just about removing manual activities from risk management processes. It's about creating fundamentally better processes and enabling faster, better decisions that result in optimal business outcomes. The opportunities described in this paper are just the beginning. For example, real-time risk management can be used to retrieve key risk results within the short time window during which people make everyday decisions so they can make better choices that deliver better business outcomes. Risk monitoring also helps banks comply with regulatory requirements more effectively.

So how can you get started? SAS offers the high-performance technology you need to realize the benefits of real-time risk management. For example, our powerful and versatile risk engine supports a wide range of risk analysis methods and provides a configuration and exploration user interface for both quantitative risk analysts and model builders. This risk engine can run in high-performance mode using in-memory grid computing technology that supports both single-node and distributed processing modes. As a result, you can use it to revalue portfolios quickly for use in trading or hedging.

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