Risk and Compliance in Banking: Data Management Best Practices
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Introduction

For banks, the importance of having high-quality data that’s readily available to guide risk measurement and reporting processes is supreme. And many people in banking – both business and technical – believe their hefty investments in data warehouses and data management technologies are sufficient to deliver the data that’s used in analytical processes. The fallacy in this belief often becomes apparent only when the budget for a data management project ends up exceeding its limits.

Why is this?

The systems that deliver risk information often operate in silos. They lack a common data source across the major risk measures in credit, market, liquidity, firmwide risk, and other functions such as stress testing and regulatory reporting. Despite this built-in system isolation, the data requirements for risk measurement and reporting processes across different types of risk measures overlap significantly. And the time required to identify, clean, transform and load this data into each individual solution’s data mart is substantial.

One effective way for financial organizations to overcome the limitations of data silos is to use SAS® Detail Data Store for banking – which serves as a single source of all information used to create a risk data warehouse.

At SAS, we believe that having this single source of information for the risk data warehouse brings major benefits to each risk project and to the bank as a whole. For example, this approach helps banks to operate more effectively at an enterprise risk management (ERM) level, because it reveals risks relevant to today and those that pertain to the future. It also improves analytical processes that need data enrichment – and helps lower the overall cost of providing data to the various banking activities that rely on analytics.

Managing Data to Support Critical Business Decisions

The SAS approach gives banks a solid foundation for the strong data management they need to report on all types of risk on an ad hoc basis, reflecting various types of stress testing and reporting measures. The Bank for International Settlements (BIS) describes a set of principles for effective risk data aggregation and risk reporting to improve the way risk data is provided and managed.²

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¹ SAS Detail Data Store for banking is included in SAS Banking Analytics Architecture and in vertical solutions, including SAS Risk Management for Banking, SAS Credit Scoring for Banking and SAS Customer Analytics for Banking.

The Overlap in Risk Processes

There is quite a bit of overlap among various risk processes. Consider a mortgage that gives rise to a stock estimate that’s used for assessing credit risk in the risk department. The cash flow from this same mortgage is managed in treasury and related systems. Imagine when you start to do stress testing. If the stock changes, the resulting cash flow changes, too – and consistency is important to be able to assess the full effect.

![Diagram of SAS Detail Data Store for Banking – Single Version of the Truth]

Figure 1: SAS Detail Data Store for banking coverage.

To support a comprehensive set of risk management, credit scoring, regulatory compliance and marketing analytics applications, SAS Detail Data Store for banking creates a single data store. This enables you to acquire, store and share data across all major risk measures and key operations, such as stress testing. Using this approach, banks can complete many processes faster while lowering the risks associated with multiple implementations.

The underlying value of the common data model stems from the way it’s designed to effectively manage data that feeds analytical processes. This type of solution:

- Ensures good performance by structuring data in a way that’s suitable for analytics.
- Addresses the requirements for stress and scenario analyses by flexibly adjusting input data and data reflecting estimated results without interrupting production data.
- Meets the high demands placed on sophisticated risk data marts.

Let’s take a closer look at how this works.
The Solution Architecture

SAS Detail Data Store for banking provides a comprehensive physical and logical data structure for banking – every table and column has a specific location and is described. This serves many applications that use the same kinds of data, including asset-liability management (ALM), credit risk, credit scoring, marketing campaigns and more. For example, you can calculate market values in the ALM analysis as well as in the credit risk analysis (e.g., exposure at default calculations). And you can use client data for both credit scoring and for other scoring applications, such as churn analysis.

Figure 2: SAS risk solutions cover the entire risk analysis process, from data storage to reporting.

Populating Solution Marts

As soon as SAS Detail Data Store is populated, the respective solution marts are populated by prebuilt extracted, transformed and loaded (ETL) code. This is done in a couple of steps where data is filtered and enriched. For example, you usually perform an analysis for a certain run date and a certain selection of entities. SAS stores historical data to use in the analysis, while metadata keeps track of the required data and parameter setups required for different run dates. This method allows you to trace and rerun calculations for historical dates based on an exact replica of the original calculation’s parameters. In turn, you can meet regulatory requests to rerun calculations for a selected period.

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3 A **physical data model** is a representation of a data design that takes into account the facilities and constraints of a given database management system. A **logical data model** is a representation of an organization’s data that’s organized in terms of entities and relationships, and is independent of any particular data management technology.

4 Each SAS application maintains its own enriched data store referred to as a solution mart.
SAS Data Management is used to set up ETL jobs – including several features that improve the quality and understanding of data and create data transparency. For example, you can follow a certain element of SAS Detail Data Store forward to see which type of analysis table it will appear in. Or you can do the reverse – that is, follow a data element in an analysis table backwards to see which data elements in SAS Detail Data Store it originates from.

**Preparing the Data for Analysis**

Prebuilt SAS processes are used in the next step, which is to prepare data for analysis. With SAS Risk Management for Banking, this analysis is performed in the built-in risk engine, SAS® Risk Dimensions®. To accomplish this analysis, the data must be set up in a certain type of environment. This environment typically consists of data structured into risk factors, instrument types, price methods, parameters, portfolio data and cross-classifications.

**Reporting on the Data**

Cross-classifications are important in the post-analysis phase. Consider the example of a credit risk analysis. To be able to display and analyze data – such as data for different industry segments, different regions or other segments – we need to specify the segmentation structure. SAS Risk Dimensions uses cross-classifications to perform this step. After the analysis, analysis data and output data are joined in a highly flexible post-analysis and reporting repository that supports activities such as advanced OLAP drill-down.

**Why It Matters**

The integrity of risk management data is extremely important when you’re building an integrated enterprise risk management system. SAS provides an appropriate level of integrity for this task. It helps banks to:

- **Speed calculations, implement parallel processing** and more – because data integration procedures built on top of SAS Detail Data Store incorporate SAS optimization techniques.
- **Ease upgrades and migrations** with predefined solution marts that are fully compatible with the structure of SAS Detail Data Store.
- **Enhance flexibility and performance for reporting and modeling activities** through predefined reporting and stress-testing data structures.
- **Simplify reconciliation** with general ledger and risk management systems.

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**Using the Best Information to Make the Best Decisions**

SAS Detail Data Store for banking supports many different kinds of calculations, including counterparty exposure, liquidity risk measures and data used for CVA calculations. For example, it ensures that both legs in a swap never get separated. It permits collaterals that are connected to different loans to be of different types and to have one-to-many or many-to-many relationships. It also allows you to use netting set agreements when calculating exposures and, eventually, RWA.

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5 SAS Risk Dimensions is the SAS risk engine that supports a wide range of risk analysis methods. It provides a user interface for quantitative risk analysts and model builders who need to configure models and risk analyses for market risk, credit risk, asset and liability management, and risk aggregation.
Conclusion

SAS Detail Data Store for banking is an industry data model that provides an integrated data backbone for a variety of SAS banking solutions. It contains data elements for:

- SAS® Asset and Liability Management for banking.
- SAS® Market Risk for Banking.
- SAS® Credit Risk for Banking.
- SAS® Firmwide Risk for Banking.
- SAS® Credit Scoring for Banking.
- SAS® OpRisk VaR.

The SAS data model supports several types of applications, including Basel II/III compliance, economic capital, ALM, market risk, marketing campaigns, credit scoring and more. Because the same data is used in many of these applications, our approach can unite multiple workgroups and processes.

SAS has combined years of analytics expertise with the practical experience of many banks to develop and enhance SAS Detail Data Store for banking. The result is a solution that provides a comprehensive, stable environment for banking along with advanced flexibility for reporting and other activities.

Home Trust Cuts Reporting Time by More than Half with SAS®

Challenge:
Home Trust had to pull together data from different sources to measure and monitor risk, so reporting was a time-consuming, laborious process.

Solution:
Using SAS Detail Data Store, all data associated with credit risk is now accessible in one spot, which has reduced the company’s reporting time from up to 15 business days down to five.

Benefits:
Home Trust is better able to manage its customers’ credit profiles and can now spend more time on analysis instead of basic reporting – making risk more relevant.

For More Information

SAS banking solutions combine analytical and data management technologies to quickly bring together and reveal insight from huge volumes of siloed data. With SAS Detail Data Store, banks can calculate measures of risk – such as market, credit and ALM, as well as firmwide risk measures – using proven models and correlated aggregation techniques. Learn more about SAS solutions for banking at: sas.com/industry/financial-services/banking.

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“Our forecasts are tighter, and our regulators are happier with the strength behind those forecasts.”

Kerry Reinke
Chief Risk Officer at Home Trust Company

6 Read the full story at: sas.com/success/Home-Trust2010.html
About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 65,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®. For more information on SAS® Business Analytics software and services, visit sas.com.