

IBM and data-driven systemic risk analytics



Highlights

Technological advances now make it viable to create a systemic risk utility for the financial system.

IBM is working with regulators, central banks, supervisors and market participants around the globe to increase transparency and certainty in the data that could be used to monitor systemic risk, while keeping this data anonymous and secure.

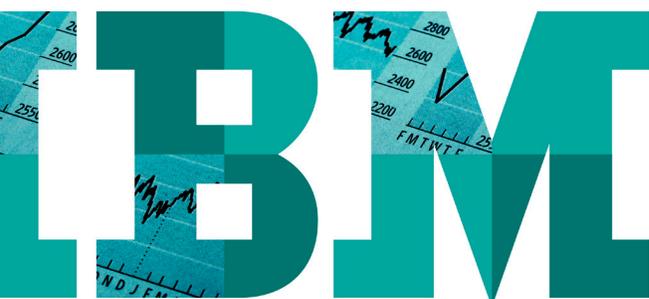
Banks that act now to simplify and streamline their data can significantly reduce operational costs and increase their market insight, as well as prepare for future regulatory requirements.

In a global financial system that is characterized by a high degree of interdependency, systemic risk can be defined as the inherent risk of cascading failures that combine to significantly damage or even completely destroy the entire system. The development in recent years of sophisticated financial instruments that ‘package’ multiple risks in a relatively opaque manner has increased systemic risk in the financial system.

Advances in computing power, data storage and analytical techniques mean that the creation of a “systemic risk utility” for the entire financial system is now a viable proposition. Systemic risk (macro) analytics aim to quantify risks relating to the broad-scope, long-term dynamics and dependencies of major markets and players, and are associated with significant shifts in market state. By contrast, market and credit risk (micro) analytics have a narrower scope, make linear extrapolations from recent market trends, and assume localized shifts in aggregated market parameters.

IBM proposes that the availability of high-quality, fine-grained data on the financial system will play a key role in enabling analytics to detect and assess the impact of systemic risk. To aggregate and maintain such a collection of data requires a comprehensive data model that describes the unique identification of assets, instruments and legal entities. Logically, this would include some formalization of business and product terms. With a common framework for defining and managing data, it will be possible to assess the build-up of leverage and monitor the health of other aspects of the financial system.

IBM Research contributes to this debate through an ongoing dialog with regulators, central banks, supervisors and market participants on the use of standardized data models and semantics that would enable the modeling and analysis of systemic risk.



To help develop macro-prudential regulatory tools, IBM is focusing on:

1. Data management – assessing the information that is already available to develop better analysis and insight from existing consolidated data and systems. This will help define the minimum set of data standards and requirements to allow cross-firm and cross-market analysis, together with the analytics that regulators and supervisors could perform to increase the level of transparency and understanding.

2. Data models – working on an analysis of the data gaps currently impeding systemic risk measurement. This will require the aggregation and linking of data across a large number of financial institutions and markets, and the identification of important data that is currently inaccessible. Consistent data ‘tags and identifiers’ for securities attributes and legal entities are an imperative.

3. Analytics – measuring different dimensions of systemic risk to develop automated processes for continual stress testing. A standardized approach can be defined for gathering data from multiple institutions, then normalizing and analyzing it. The data can be used to develop forensic and ‘what if’ scenarios and simulations

4. Macro-prudential regulatory tools – developing systemic risk tools and updating them iteratively over time. This includes development scenarios, simulation techniques and models to further support the transparent monitoring of the financial system.

Conclusion

In order to create a systemic risk utility, all parties need to agree on common models for collating and formatting their data. IBM Research is working with industry bodies and market participants to contribute to the development of standardized data models and semantics. In the near future, it is likely that data standardization to enable systemic risk analysis will become a regulatory requirement.

The use of standard data models will drive down the cost, complexity and risk of integrating data from multiple sources, and the re-use of standardized data benefits all organizations with proprietary systems that use fine-grained data as input. Banks that move early to simplify and streamline their data and data management methods therefore stand to make significant reductions in operational costs while gaining new market insights, as well as smoothing the path to future regulatory compliance.



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