

ELENJICAL SOLUTIONS

Cloud based shared risk engine

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1 Introduction

Banking is now, and has always been, a risky business. The key to success in operating a bank and in supervising a banking system is management of risk

Financial institutions play a vital role in the functioning of a healthy global economy yet the business model of such institutions, although very complex, are fragile. Due to these factors alone, these institutions find themselves at the centre of global crises, financial or otherwise throughout history. For this reason, the financial and more specifically banking industry is one of the most heavily regulated industries globally. These regulations ensure that risk management in these institutions are sufficient to ensure that society can benefit from and not carry the burden of mishaps in the complex business that is banking.

The difficulty in banking regulation does not stem from the development of the regulatory requirements but lies in the implementation of these requirements. Implementation has direct cost such as IT infrastructure, staffing, consultants and software development costs. There are also indirect opportunity costs as key staff now use their skills for regulatory compliance instead of business development and innovation. These regulatory rules require each firm to individually carry these costly endeavours in addition to its risk management functions.

Barring each intuitions' own bespoke risk management models the majority of these models and methodologies are standard across the industry meaning costs and time can be saved by centralising these processes. This can be done by creating a cloudbased central risk management and regulatory reporting engine that each institution can use as it requires.

2 How would it work

A shared risk engine would entail creating a common platform to be shared by participating banks while maintaining privacy for each participant. A outline of such a platform is illustrated in Figure 1 and would in theory works as follows.

A repository of common regulatory and risk models are created and stored. This repository is publicly available to each participant for validation and oversight. Each participant can also submit a private risk model repository that will only the specific participant has access to. Furthermore, a third party can be employed to regularly validate the common risk model repository to ensure its accuracy. This repository can also be updated regularly with new regulatory requirements. This would save each participant the cost of individual model validation and maintenance.



Figure 1: Shared risk engine design outline

Data that is common to all participants is stored on the cloud. This would contain market data fed from exchanges and market data providers. The common data storage can also contain a predefined set of historical scenarios. Data specific to each participant can also be stored on the cloud. This could be for instance a bespoke rate curve and/or volatility surfaces and additional historical scenarios. As in the case with the risk model repository, the common storage would accessible to all participants. The common data storage would reduce storage costs for each participant as this cost is shared. Furthermore, a unified data feed and maintenance procedure also benefit regulators, as the monitoring for data quality can now be streamlined.

To trigger the risk engine calculation each participant will feed its position which would go through a data masking procedure to ensure data privacy. This could include various automated data validations and could be combined with machine learning techniques to improve validations over time.

Once the positions are fed a calculation instance is launched on the cloud using risk models, stored data and positions. The results from these calculations are aggregated and sent back to each participant after being unmasked. Furthermore, an additional layer of automated validation checks is added to ensure results are accurate. The cloud calculation engine can be scaled up as required. This ensures that sufficient calculation available to each participant on a pay per use basis.

3 Potential benefits

The most obvious benefit of such a platform is the economies of scale it would create as each participant would not need to focus on replicating similar processes. Having common risk models and data stored reduces the cost of storage and validation per participant. Furthermore, this enables each financial institution to use its resources on financial innovation instead of regulatory systems set up and maintenance. This cost-saving will add to shareholder value in an industry that is constrained by stringent capital requirements. Such a platform would also lead to growth in the financial industry as smaller startup participants can benefit from having access to state of the art risk management immediately. Finally, such a platform will strengthen the supervisory capability of regulators as it is easier to compare the regulatory reporting of institutions if they are using a common set of models and data. Also, it would be much faster for regulators to discuss and implement changes, as all would be implemented centrally.

4 Potential risk

It could be argued that having a common set of risk models would increase model risk as errors would be shared across many participants. However, this can be overcome easily through a regular rigorous model and data validation procedure that is already well established in the industry. Furthermore, larger participants who have more capacity for this task would not just benefit themselves but all market participants further ensuring the smooth functioning of the financial market.

Another concern would be that of data privacy as there is a risk that an institution data or internal models could be exposed thereby losing their competitive advantage. The platform must ensure that private model repository and data is only accessible by the participant using these through stringent security measures.

As with any system, there are many operational risks such as system crashes. For this case as with any operational risk, it can be overcome by ensuring the platform is securely backed up and ensuring a business continuity plan is in place.

5 Conclusion

This article only serves to describe only the outline of a cloud-based shared risk engine and is not a blueprint for how such a platform would work. Given the complexity of risk management in banking, many further aspects of such a platform must be investigated. What can be said is that there are many benefits such a platform can provide to an individual bank via cost saving and to the financial industry as a whole via shared knowledge. If such a platform proves to be viable it would not only make risk management more efficient at the institutional level but also at an industry level since all financial institutions are interconnected. It is important to mention that tools such as Traded Market Risk from IHS Markit have in recent years launched such solutions which would indicate that a cloud-based shared risk engine may indeed be the future of financial risk management.