Modern financial risk calculation : from legacy to cloud

Abstract

The modern banking and financial services industry is aggressively pursuing technology to create competitive advantage, reduce costs and improve customer experience. New or incumbent, global or local – banks and financial institutions (FIs) of all kinds are thrusting their cloud strategies into hyper gear to cater to rapidly evolving customer and market dynamics. A recent survey of banks conducted by Accenture found that just 3% of respondents *didn't* have a cloud strategy and had not started to think about it.[1] But even as banks increasingly embrace the cloud to modernize workflows and business processes, taking financial risk computation to the cloud is an aspect that is still at a nascent stage. That's because moving sensitive trading/transaction data, and pricing and risk models to external facilities is fraught with security and compliance challenges. Thankfully, as cloud platforms beef up security measures and business pressures demand faster time to market and app modernization, banks are rethinking their approach to financial risk computation. The cloud is emerging as a suitable option for risk computation given the many benefits such as cost savings, efficiency gains, and innovation.

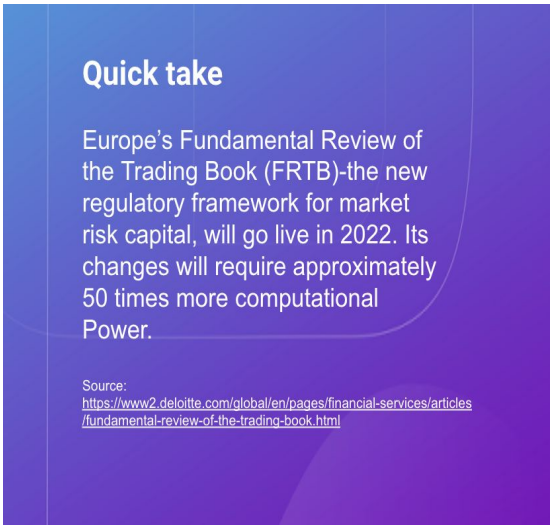
This paper highlights the need to embrace cloud-based risk computation for the banking and financial services industry, what it takes to get the cloud right and the way forward.

Financial risk computation: The current state of play

Risk management in financial services is no stranger to technology While tightening regulatory requirements have in part pushed for tech adoption in risk management, banks and FIs well realize the significance of analytical models in mitigating risk and driving competitive advantage. However, much of the risk computation infrastructure today is powered by on-premise systems, installed and maintained in company owned data centers. On-prem risk computation poses several challenges for banks, such as:

[1] Forbes, Banks' Inevitable Race to the Cloud, https://www.forbes.com/sites/ronshevlin/2019/07/22/banks-inevitable-race-to-the-cloud/#52f238601135

- **High costs:**
  Banks have to frequently add storage and computing power as operations scale, leading to limitations in the amount of burst computer power and storage that can be harnessed at a given point in time. Risk management being an area that is heavily dependent on high on-demand computing power, it is severely affected by these limitations.



- **Lack of responsiveness:**
  Flexible compute capabilities are essential to respond to market fluctuations on time and alter risk policies/management strategies. On-prem risk calculation lacks the agility and operational efficiency required today.

- **Inability to leverage machine learning models effectively:**
  The widespread adoption of machine learning to manage risk is also increasing the need for vast compute capability for training and running sophisticated ML models. ML models can ingest humongous volumes of data, creating a pressing need for flexible and expandable data architectures, and generating flexible data storage and processing requirements.

- **Compliance stress:**
  Ensuring adherence to ever changing multi-geo regulatory norms, data laws (such as GDPR), regulatory capital ratios, etc., requires massive ongoing effort in on-prem scenarios. New regulatory requirements such as the Current Expected Credit Losses (CECL) accounting standard have only increased these needs.

- **Inadequacies and backlogs:**
  Limited datacenter capacity can frequently lead to inadequate or inaccurate risk calculations as much of the computational power in risk management is attributed to calculating key risk measures such as value-at-risk (VaR) and valuation adjustments (such as CVA and xVA 1), measuring credit risk, running stress testing, risk simulations, and portfolio construction algorithms.

- **Silo-ed operations:**
  Inability to adhere to operational level agreements (OLA) between risk and other departments such as regulatory compliance and reporting.

- **Slow innovation:** Realizing the strategic value that risk management can bring to business can lend greater innovation-backed advantage to banks and FIs – an aspect where on-prem systems miserably fall short.

Risk is nearly perfectly oriented for the cloud

Calculating financial risk is a computationally intensive process and requires burst compute capacity. Effective risk management requires managing a lot of data, with elasticity - two things that cloud computing does extremely well. Other key drivers for banks and FIs to move risk to the cloud include cost savings, data security, compliance, and application performance.

Short-term cost savings come from substantial reduction in hardware costs due to more efficient usage of compute resources and elimination of huge/recurrent modernization costs. Moving to a development-and-operations-based framework to deploy new analytics and risk visualization capabilities also allows banks to reduce infrastructure support headcount by up to 50%. Take, for instance, UBS – the world's largest wealth management firm that moved its risk platform to Azure cloud.[2] The move accelerated risk calculation time by 100%, saved 40% in infrastructure costs, and enabled nearly infinite scale within minutes.

From an application performance standpoint, moving to the cloud enables banks to modernize apps and re-architect/re-engineer risk and pricing environments. The cloud's auto-scaling and open-source middleware for parallel computing and high-performance computing (HPC) enables banks to re-think grid distribution approaches and accelerate the process. Containerization enables faster hardware provisioning, superior application performance and drives overall business efficiencies.

The cloud also enables robust security and environment consistency for both data-at-rest (i.e. information stored on the cloud) and data-in-motion (i.e. transfer of information). Greater data security, integrity and privacy translates into superior compliance to ever tightening regulatory norms that the banking and capital markets industry is subject to. In addition to the Fundamental Review of the Trading Book (FRTB), the Large Exposure Framework (LEF), and Single Counterparty Credit Limit (SCCL), regulations to manage concentration risk will significantly increase computation requirements in future, making a stronger business case for moving risk to the cloud.

Essentially, the cloud enables risk computation to be seen in a new light by rethinking the way banks compute, store and consume risk data - and this is of strategic importance. Risk platforms are not isolated from the wider organization and therefore, taking a holistic approach to the risk lifecycle comes with several competitive advantages. Effective risk management can provide forecasting insights to drive informed decision making, positively impacting the entire financial organization.

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[2] Finextra, UBS Moves Risk Platform to Azure Cloud, https://www.finextra.com/newsarticle/30495/ubs-moves-risk-platform-to-microsoft-azure-cloud

However, even as the benefits of moving risk to the cloud are abundantly clear, getting it right requires a mix of expertise in HPC, multidimensional data analytics, Big Data and AI, and deep learning.

What it takes to move risk to the cloud – cost-effectively, securely and quickly

Banks and FIs need application modernization and architecture refactoring for making their risk calculation applications cloud ready. That's because lifting and shifting the risk calculation grid as-is could reveal multiple integration gaps between on-premises and cloud environments. At Fintops, we follow a **Build, Deploy, Run** approach to ensure cloud-readiness of clients' risk calculation applications. Our services:

Architecture consulting: Involves thorough requirements gathering from client teams to identify and assess applications that can be readily moved to the cloud and those that will require refactoring.

DevSecOps: Involves cloud shifting of the risk process by leveraging containers to build applications quickly and DevOps pipelines to automate deployments reliably at a faster pace. We hold vast domain expertise in Docker and Kubernetes technologies that help create portable application containers and then manage them across a set of nodes, either in a data center or in the cloud. Containers serve as lightweight alternatives to traditional virtual machines to perform typical Value at Risk (VaR) calculations/adjustments.

Fusion Summit migration: At Fintops, our cloud shifting methodology and SaaS risk compute platform also support moving Fusion Summit application to the cloud. Being a functionally rich core trading solution for capital markets that supports business growth, improves Straight-Through Processing (STP), and shortens time to market, moving Fusion Summit to the cloud enables banks to leverage their existing investments and add cloud capabilities for incremental benefits. More than 160 of the world's top banks rely on Fusion Summit to support their trading desk activity and moving this application to the cloud seamlessly is a key priority for them. One of the key benefits of packaging the Fusion

Summit application into risk calculation microservice deployable on the cloud is that it allows banks to keep the remaining usages of Fusion Summit on-prem. Further, the solution enables critical data encryption making the risk calculation on cloud even more secure (on top of cloud security features such as network and container runtime encryption) as the critical data is kept behind the bank's firewall and does not go out to the cloud.

Managed risk calculation as a service: Our SaaS based fully managed, secure and robust risk computation service in the cloud helps run and consistently manage clients' risk environments. The solution is agnostic of the cloud provider (AWS, Google, Azure or any other) and can manage all cloud environments - hybrid, on-prem, private, public clouds. Consolidated operations for all applications ensure reliability and faster problem resolution. With our fully managed risk calculation service, operations teams are offloaded of the heavy lifting, leaving them free to focus on managing applications rather than infrastructure. The best part is that the SaaS solution scales up based on smart partitioning so that the risk computation run fits exactly in the time window expected by banks (typically no more than two hours) at the lowest possible cost leading to significant OpEx reduction.

Taking risk front and center in decision making

Taking risk calculation to the cloud helps banks and FIs get a holistic view of their end-to-end risk and pricing environment as opposed to the disjointed view that they often have on-prem. Cloud-based risk infrastructure enables everyone across the organization - traders and risk managers as well as the C-suite to derive granular data and analytics insights. Going forward, as global market volatilities increase, margins shrink and competition in the banking industry intensifies, risk-adjusted performance will emerge as a key differentiator in driving tactical business decisions as well as strategy. Risk management will become a material input into financial planning and analysis activities in future. Partnering with an experienced service provider well versed with distributed calculation as well as legacy risk software will play a key role here as it will enable banks to seamlessly move risk to the cloud. The time is ripe for banks to unlock the benefits that unlimited compute offers – not only in creating an advanced risk management capability, but also in reimagining the operating model for risk.

About the Author

Youssef Allaoui - Fintops Founder

Youssef Allaoui has spent 15 years in the financial software industry. He was a cofounder of the Global Markets Solutions company, which was acquired in 2017. He has now founded Fintops with the ambition of being a recognized resource in the regtech market.