

Response to Request for Input on LabCFTC Prize Competitions

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Introduction

Post-crisis financial risk management practices are at a strategic inflection point. Banks and asset managers have now largely restored and rationalized their risk infrastructure in response to market disruptions and heightened regulation; however, they now face the challenge of both *operationalizing and embedding* them in running their businesses and *optimizing against market and regulatory constraints* such as capital and liquidity. FinTech and RegTech initiatives – including high-performance and cloud computing, artificial intelligence, natural language processing, and machine learning – will create opportunities for transformational research that could lead to a new generation of risk analytics, if adequately nurtured in settings like the LabCFTC’s Prize Competitions.

Given the high cost of developing and implementing heightened risk management standards, compliance hurdles, regulatory oversight, and continued developments in data analytics, finding the right balance for effectiveness and efficiency in financial risk management is a constant challenge. As the founding Conveners of *the Columbia University Working Group on Evidence-based Financial Risk Management (the “Working Group”)*, we believe the CFTC’s Science Prize Competition Act (“SPCA”) is an important step in advancing the industry’s adoption of 21st century FinTech and RegTech innovation.

In this environment, continued advances in data analytics and technology will open the door to *standardization of risk measures* and offer the possibility for a new framework of *evidence-based financial risk management and regulation* with potentially significant systemic benefits. These benefits include the elimination of redundant model development work, enhanced dialogue about financial risk management, expedited dispute resolution, and perhaps most importantly, creating a framework for academic research that can better inform communication among banks, regulators and investors. The Working Group welcomes the CFTC’s Request for Input and is grateful for the opportunity to engage with LabCFTC.

Our commentary addresses three principal topics of the Request for Input:

1. Identification and facilitation of critical FinTech/RegTech initiatives
2. Structure and administration of SPCA prizes
3. Recommended research topics

Identification of Critical FinTech/RegTech Initiatives

Given the potential for technology to improve our understanding of the financial system, some of the most important FinTech and RegTech initiatives will be those that facilitate connectivity and transparency in the financial system: inter-dealer, inter-agency, and dealer-agency cooperation and communication. The exchange of transparent, accurate derivatives information at increased speed and frequency continues to trend in this direction, enabled by distributed ledger, cloud computing, and open source technologies, among others. The “tipping point” for dealer adoption will hinge on the identification of appropriate incentives for sharing internal data beyond the bare minimum required by law. We believe incentives related to internal cost reduction will be the most powerful; some examples include the reduction of internal model development or validation staff through the use of standardized open source tools, more efficient measurement and anticipation of collateral costs via fewer trading disputes, and finally, a lower regulatory compliance burden on both sides, provided by automated data exchange and “apples-to-apples” views of risk across institutions that reduce repetitive examination burdens.

Highlighted below are several recent examples of established FinTech/RegTech initiatives that focus on industry collaboration and cost mutualization. We suggest that the CFTC should aim to nurture and promote similar nascent initiatives through the LabCFTC Prize Competitions:

- International Swaps and Derivatives Association’s (ISDA) development of the *Common Domain Model (CDM)* is intended to digitally capture the entire post-trade lifecycle with accompanying product data. It builds on their highly successful OTC derivative information standard, Financial Products Markup Language (FpML), and extends its functionality, targeted at distributed ledgers. ISDA has just recently published a digital version of the CDM in collaboration with a RegTech start-up firm, REGnosys, laying the foundation for enhanced industry communication around standardized derivatives representation.
- *AcadiaSoft, Inc.* is an industry-owned FinTech utility that services the majority of swap dealers’ initial margin exchange for non-cleared derivatives with associated reconciliation and risk analytics. It serves as a prime example for industry collaboration in the pursuit of cost mutualization and increases trading efficiencies through communication of vital information on exposures, commitments, and adjustments between counterparties.
- *Selerity Corp.* uses artificial intelligence to deliver real-time event data to banks, asset managers, and electronic trading firms. Its flagship product, Context, dynamically recommends relevant data based on a deep understanding of importance and user intent, serving as a strong example for more efficient internal communication and workflow automation.

- *Quaternion Risk Management*, a FinTech risk analytics firm, recently sponsored the release of the industry’s first fully open source framework for derivatives risk analytics. Building on the foundational open source library for derivatives pricing, QuantLib, the [Open Source Risk Engine \(ORE\)](#) extends functionality to include a stochastic risk factor simulation framework for counterparty credit exposure measurement, xVA pricing, value-at-risk, stress testing, trade sensitivities (“Greeks”), liquidity planning, and other risk metrics for vanilla and complex derivatives. Collaboration amongst the active open source community promotes shared best practices and reduces model development costs through evidence-based practice and a strong governance framework.

Structure and Administration of SPCA Prizes

We recommend “non-cash prizes” take the form of something even more valuable: data. Access to critical data inputs is something most small companies and research organizations (including the Working Group) struggle to obtain, either due to prohibitive costs and/or lack of appropriate market contacts. In the Working Group’s experience, four primary types of data input are required for basic analyses of derivatives markets:

1. Transaction/trade data
2. Market data
3. Security metadata
4. Standardized security definitions

Progress is being made to build the pool of standardized financial data - a necessary first step to broader sharing of fit-for-purpose data suitable for serious research. However, creating safe environments for sharing market *and* trade data for academic research continues to be an elusive goal.

While the CFTC may have access to transactional data, through Swap Data Repositories or other similar “hubs”, these may be restricted due to legal or privacy concerns. However, advances in large data anonymization may enable the sharing of this data in a controlled fashion. Or, as an alternative, analysis of this data could take place in a physical or virtual “clean room” at the CFTC.

Sponsorship of market data feeds from vendors such as Bloomberg or Thomson Reuters could be another potential reward, including the ability to search for and obtain associated security metadata.

Recommended Research Topics

In line with the CFTC’s identification of data standardization as an important goal for the derivatives market – “forms and processes, simplified reporting mechanisms, shared, comprehensive data ontologies, and new modes of reporting” – the potential for research applications with standardized tools allows for a common, replicable view of market interaction and dependencies. For example, the promotion of open source analytic tools not only has the

ability to bring shared best practices and modeling capabilities to all levels of the market but also allows both industry practitioners and regulators to speak a common language about pricing and risk management. This serves as a natural extension to Vikram Pandit's "Common Portfolio" approach, though perhaps better interpreted as the inverse: using common (open source) risk models to value and stress test industry portfolios. The Working Group anticipates critical future research in this area as all derivatives stakeholders combat potentially dangerous "black-box" models.

Other research topics of interest that the Working Group recommend the CFTC promote include the combination of classical risk management frameworks, such as Monte Carlo simulation and historical regression-based techniques, with artificial intelligence or machine learning to account for trader behavior. The Working Group observes that many commonly used financial risk management tools have not evolved substantially since the 1980s and 1990s, and sees large potential for FinTech and RegTech firms to complement more classical approaches with technologies like blockchain, artificial intelligence, and high performance and/or cloud computing. Additionally, stress testing the financial stability impacts of EONIA and EURIBOR compliance with new Euro-area regulations, set to phase out by 2020, is a particularly time-sensitive topic.

[About to the Columbia University Working Group on Evidence-based Risk](#)

Established in early 2018, the Working Group creates a forum for interdisciplinary exchange of best practices in current financial risk model development and implementation. Its goals are to challenge, test, and document commonly held risk management principles and publish research that demonstrates which approaches should prevail into the future. Borrowing a commonly used practice in the medical community, "evidence-based" approaches in finance have the potential to transform the way effective risk management techniques are developed, validated, implemented, regulated, shared, and improved upon across a global community of practitioners. By identifying and aligning development incentives across these stakeholders, the financial services sector can more effectively eliminate unsound or excessively risky methodologies in favor of those that have better outcomes, and then facilitate widespread adoption of such techniques in a global effort to increase stability across the financial system.

Respectfully Submitted,

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