

**Coalition Greenwich**

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# Modernizing Risk Management Technology: Has the Game Changed?



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## METHODOLOGY

Between April and June 2022, Coalition Greenwich spoke to risk management professionals of 20 sell-side firms globally in a series of qualitative interviews to explore how sell-side risk is being impacted by current geopolitical and macroeconomic factors.

In June, the Cboe VIX spiked to **34.02**, as some markets saw their worst half-year returns since the 1970s

While market risk hasn't fundamentally changed, the factors feeding into it have

## Executive Summary

Market complexity is off the charts. While market risk hasn't fundamentally changed, the factors that are feeding into it have. This paper focuses on the recent macroeconomic alphabet soup of happenings and how sell-side risk is being impacted under the new regime.

In a series of qualitative interviews, Coalition Greenwich spoke with global risk professionals at banks and other sell-side institutions. Discussions were designed to achieve a better understanding of how they are thinking about the challenges tied to volatility, geopolitical conflict, the COVID aftermath, a changing rates and inflation regime, and other factors through the lens of market risk and credit risk tools.

## Introduction

As recently as mid-June, the Cboe VIX spiked into the mid-thirties (about half the peak observed in early March 2020), as equity volumes surged and some global markets realized their worst half-year performances since the 1970s. During this time, the price of crude oil again shot up to levels seen in the early days of the pandemic. All the while, central banks remained slow in attempting to tame inflation, and governments continued to be challenged by exogenous forces impacting supply chains.

With markets quickly changing and becoming harder to predict, both the sell side and their clients need access to timely, accurate data to create scenarios and look at risk in different ways. At the root of this exercise, firms must be able to readily define their data needs and have the ability to manipulate that data as necessary.

However, banks and dealers we spoke with have mixed experiences when it comes to data availability, data usage and the proper market risk and counterparty credit risk tools required to address marketplace risks faster.

# Importance of Data in the New Macroeconomic Regime

**Data has proven to be not only voluminous, but also difficult to piece together from one end of a firm to another.** One Canadian bank has invested in quantitative analysts over the last three to four years to address these issues by developing risk tools for the front office. The idea is to get information into traders' hands quickly by aggregating disparate data sets from around the organization. In the ongoing effort, this bank has created a data strategy and uses a data lake. While progress is happening, some asset classes—particularly those that are the most liquid—are further along than others. The timing of the transition has created some outstanding issues, as different instruments have different data protocols, thus misaligning best practices.

**Although there is keen awareness of data needs, some of the time series simply haven't been created yet.** By and large, the sell side is aware of the data that's needed; however, with new developments seemingly happening every day, there is the challenge of creating data sets that didn't exist before. As one risk professional at a European bank states, banks are quite aware of their data needs for scenario analysis and value-at-risk (VAR) metrics. They may not be as aware when it comes to broader types of analysis, such as sentiment or things that are not well quantifiable, as this is simply not the strength of the bank. In normal markets, the dynamic is less of an issue than it is in today's uncertain environment.

**Unprecedented markets raise the bar on data requirements.** A risk manager at a U.S. bank believes that, to a degree, they are able to define the data needed in terms of running deterministic stress tests, but there are new trials and tribulations. Against a backdrop of rising commodity prices, there is a lot of right-way risk with extraction from companies, for example. This bank doesn't have the ability to get their own data or specialize in some types of data—they can only turn to the data that's available for purchase from third parties. While the information provides great measures for regulatory commitments and reporting, this manager believes it doesn't always provide the right insights necessary to define trends and “go deep.”

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**A bank's structure, rather than recent events, is the driving force behind data success.**

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**Risk data is a function of the systems a bank uses and has access to.** In some cases, data is available in the market, but processing and storage capabilities will likely determine scale. According to a risk manager at a Japanese bank, larger shops may have an advantage in this regard, making structure the driving factor of data success rather than recent events.

For instance, the largest banks are more likely to rely on in-house processes tied to data, such as market activity, historical data and trading books. Smaller shops will mainly look to third-party vendors for their needs. While these sources are often adequate, there is heightened scrutiny from all the risk and a greater demand for stress testing, VAR and competing risk measures—variables risk managers are “looking into.”

**As markets move quickly and become more challenging, the risk process is still often run end-of-day.** The majority of sell-side risk professionals interviewed mentioned they aren't necessarily making predictions based on current data, but, instead, on what their batch close was the previous evening.

For example, a risk manager at a U.S. dealer subjects positions to shocks as a simplifying assumption, since there really isn't any allowance for actual activity in the portfolio. Whatever closed the previous night stays static for the period of the stress test. This practice has led this firm and others to justify lower-than-typical inventories and charge wider bid-offer spreads.



**Risk officers are choosing their real-time spots, as risk is still being viewed as a secondary line of defense following front-office activities.**



**Some banks that are able to create real-time risk analytics still have difficulty aggregating all the data.** There are a handful of banks we spoke with that get live, intraday risk data, allowing them to run VARs and develop other metrics well beyond DV01 and credit 01. However, this is often inconsistent, even across desks in the same firm. Take, for instance, a desk using many different applications. This would challenge risk managers to aggregate information and make it more difficult to get a consolidated view of intraday risk because it would be hard to generate all the snaps. As a result, there has generally been more internal appetite to consolidate and get the right views, although regulatory push tends to take precedence across the industry. Risk officers are choosing their real-time spots, as risk is still being viewed as a secondary line of defense following front-office activities.

## Dealing with Unprecedented Volatility of Macroeconomic Data

The volatility of economic data has been unprecedented since the start of the year. While the pandemic caused chaotic markets, the onset of the Russia-Ukraine conflict added fuel to an already burning fire of supply-chain disruptions and other macroeconomic anomalies—even when compared to past wars (e.g., Iran-Iraq war, Gulf war). Reports of five to nine standard-deviation moves materialized in U.S. and global economic indicator prints. Amid the turmoil, we asked risk professionals how they were managing these types of risks through the lens of scenario analysis, correlation of assets and other metrics.

**Blame turmoil of economic data on COVID... but not entirely.** The COVID period really dislocated traditional economic relationships, according to a risk manager at a U.S. regional bank, because of the unprecedented amount of economic support from central banks designed to insulate the economy from the worst outcomes. As a result, all of the modeling this bank would use had a fresh set of new problems in areas including payment and mortgage models, as relationships to unemployment decoupled.

From a credit perspective, it was also unclear how the bank predicted risk in its loan books, as the “worst case” environment didn't come to fruition in early 2020. Would COVID or pre-COVID assumptions be the right choice for a future recession? Deciding what was good and reasonable modeling for VAR for different rate and other scenarios and how to obtain meaningful risk numbers has also proven problematic with shocks.

**It's time to consider better modeling of risk over the weekends.** A risk professional at a Canadian bank noted the high number of exceptions in October 2021 and, more recently, in March 2022 when VAR had been backtested. While the anomalies were explainable because of rates, there had been some unusual movement in the shape of the curves and, more broadly, in market data. It turns out that weekends were jampacked with risk events—including Russia's invasion of Ukraine. This bank is considering developing a model to extract or extrapolate what market data would be on Saturdays because VAR is for a one-day period. They believe data tied to these types of weekend events will become a more serious issue at some point.

**“Everyone is feeling the heat of this market, and there's only so much risk analysis that can be done. It doesn't matter how good systems are—everyone gets hurt to some extent.”**

**There is more scrutiny in a risky environment.** Global banks are always adapting to changing risks. According to a risk professional at a Japanese bank, it's imperative to reassess risk measures and metrics and how effective they are. This bank encourages regular discussions between senior management and the chief risk officer to ensure that stress scenarios—such as the sensitivity base—are current. The goal is to make sure these tests are good enough and properly calibrated to COVID and to sort out whether they are actually relevant in the endemic phase.

Recalibration to the next possible shock: Fed rate increases, inflation, or something else geopolitical is always top of mind. Finally, the tweaking and review of metrics is paramount, as everyone is feeling the heat of this market and there's only so much risk analysis that can be done. In this manager's view, it doesn't matter how good systems are—everyone gets hurt to some extent.

The table below highlights some of the tactics sell-side firms have been using to battle the onslaught of volatility in data tethered to economic releases.



## TODAY'S RISK AWARENESS CHECKLIST

- ✓ Bolster communication across the firm to better understand risks in different areas/business units
- ✓ Reduce risk by reducing exposures; trade more riskless principal and stop taking positions
- ✓ Get past the shock of mark-to-market positions and begin doing business again
- ✓ Anticipate moves and have a risk profile ahead of economic data releases; aim to be rate agnostic
- ✓ Consider modeling and measuring weekend risk more granularly
- ✓ Update scenario analysis in a timely manner and have the necessary data and calculation power
- ✓ Determine if stress tests are current, e.g., whether tests calibrated to COVID still work in the endemic phase
- ✓ Try to anticipate and recalibrate stress tests for the next possible shock (e.g., Fed rate hikes, recession, inflation)
- ✓ The current volatility is the new normal and it's hard to mitigate; anticipate a greater degree of scrutiny of risk management practices

**Running historic stress tests is the preferred plan of attack in the current volatile environment.** The majority of risk managers look to pre-canned historical stress tests to bolster their risk practices and predictive analytics. In many cases, risk professionals are turning to the aftermath of the 2008 financial crisis to make assumptions about the COVID aftermath.

These types of tests are typically enhanced by rates up/down scenarios and credit spread shocks. Several risk managers indicated they are layering macro variables to P&L components. Different modeling is used for the various fixed-income products: mortgages, munis, rates, credit, etc. Across the firms we interviewed, the degree of granularity ranges from regions to sectors to books all the way down to the trader level.

**Correlations have changed ... for everything.** According to a Japanese risk manager, correlations that analysts would typically work with—for bonds, equities and derivatives—all point to unprecedented times. For instance, traditionally, equities and bonds have an inverse relationship. However, this has broken down in recent times with negative or very low rates in Europe, as central banks continue to buy assets and demand remains for high-quality liquid assets (HQLAs).

Meanwhile, according to another risk professional at a Mexican bank, correlations will continue to evolve, with new scenarios that behave differently than what's been predicted using historical correlation. Historical correlation is an important lag when trying to adjust and adapt to quickly changing conditions, although, most of the time, variables and risk factors aren't what's expected.

**“Almost all banks have imagination. Banks get into trouble with complex and resource-intensive calculations.”**

**While there is no shortage of creativity, capability to run effective scenarios may be lacking at some banks.**

According to one risk manager at a European bank, there are two issues that need to be considered when it comes to running scenarios for 100-year floods. The first is leveraging the intellectual capability necessary to transform some hypothesis about the market or some broad story about the future of the market in a sensitivity scenario—something big banks can do eloquently. More complex scenarios require more complex calculations, and this will be the bottleneck for some banks. Almost all banks have the imagination. This manager believes banks get into trouble with the calculations because they become increasingly complex and time and resource intense.

# Counterparty Credit Risk in a Volatile Macroeconomic Regime

In the past year, six U.S. banks experienced VAR breaches, as volatility became more unpredictable. As a result of the new economic regime, counterparty credit risk is top of mind at many banks. However, risk managers generally characterize themselves as “less involved” in counterparty credit risk. More often than not, systems used to monitor counterparty credit were separate from those used for market risk management. Individual teams are responsible for counterparty credit and market risk processes.

“The problem with counterparty credit systems lies in trying to coordinate different pockets of risk and siloes of businesses in large organizations.”

**Some counterparty credit systems simply aren't robust enough.** According to a risk manager at a European bank, there needs to be significant improvement when it comes to the robustness of counterparty credit systems. The problem lies with trying to coordinate different pockets of risk and siloes of businesses in large organizations. Trying to put them on the same scale, adding up different types of risk, is difficult.

**Aligning counterparty credit risk and market risk will be a yearslong process.** A risk manager at a Mexican bank noted the organization's project for counterparty credit risk began four years ago while the version intended for the XVA desk commenced about a year and a half ago. The project included a robust infrastructure used to define sensitivity limits combined with an active hedging desk (XVA desk), so sensitivities of the portfolio are hedged. This process—part of a mandatory push in Mexico since January 2022—helped this bank control risk during periods of extreme market volatility. This manager notes that several banks that didn't start projects in a timely manner—or those not subject to the new rules—likely have volatility in their P&L and are still trying to implement the desks, methodologies, validation of methodologies, and so on.

**New modeling techniques are an important trend in the evolution of counterparty credit risk.** In the banking community, there has been a decadeslong march away from slower measures. Using historical views on where the path of rates will be and using internal risk ratings to calculate the probability of default from counterparties is “the way banks did it 10 years ago,” according to a risk professional at a U.S. regional bank.

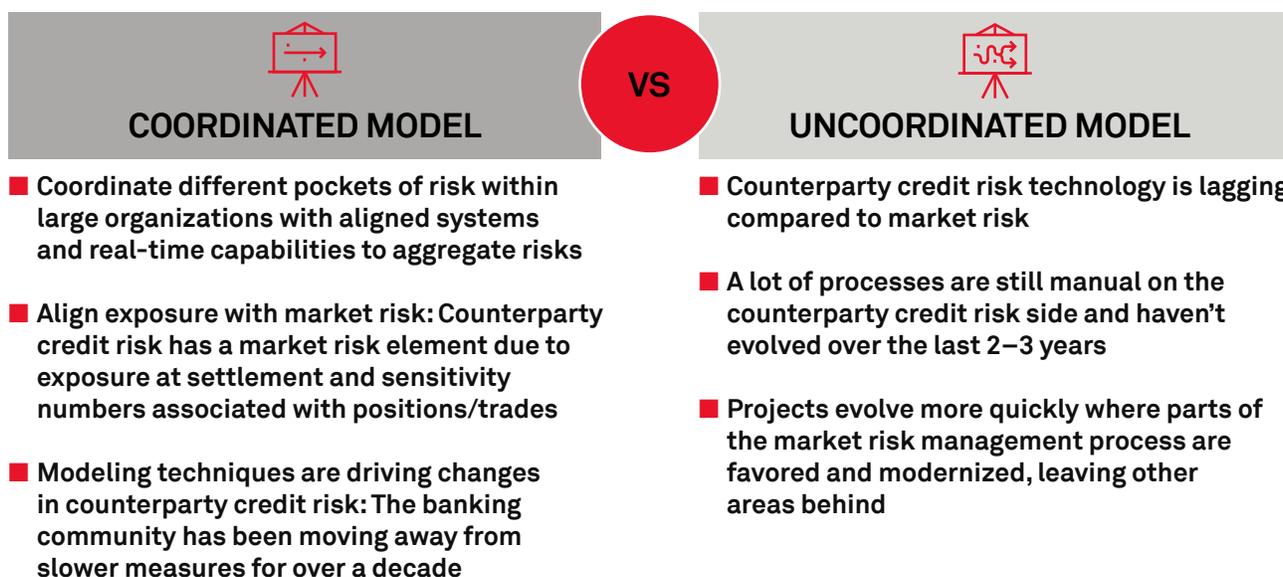
“Being able to see market risk factors quickly changing opens up a different type of dialogue in terms of what counterparty credit looks like and what banks are charging their customers.”

The practice has evolved into a risk-neutral framework, where the volatility and path of rates (relative to volatility in forwards) gets a much more rapid change in the rates outlook. The use of market-based measures (e.g., credit

default swaps) moves things in the right direction a lot faster, as banks adopt these techniques in a much different world. Being able to see that market risk factors are quickly changing opens up a new dialogue in terms of what counterparty credit looks like and what banks are charging their customers. The cost of managing risk is a big issue.

The following figure describes differences in coordinated and uncoordinated market risk and counterparty credit risk processes.

## Differences in Coordinated and Uncoordinated Market Risk and Counterparty Credit Risk Processes



Source: Coalition Greenwich

**Counterparty credit risk systems and market risk systems are often technologically and generationally different.** Some risk managers describe their counterparty credit risk tools as a “hodgepodge of homegrown systems” compared to third-party solutions designed to measure market risk. On the other hand, one Latin American risk professional notes that market risk systems evolved in the 2000s, while counterparty credit risk solutions came with the aftermath of 2008, so they’re newer. Either way, differences in technology and methodology have misaligned market and counterparty credit risk solutions and processes, making it ultimately difficult to aggregate risks.

**Keeping systems separate likely makes sense.** Larger banks typically will have the ability to scale up systems and invest in the technology and people needed, according to a risk manager at a global bank. However, even then, the manager feels the construction of portfolios—relatively simple or complex/exotic products, regimes and markets—will still affect model complexity, simulations and so on.

While market risk and counterparty credit risk systems are separate most of the time, this manager believes banks can slightly leverage some of the metrics and functionality, although the approach of each is fundamentally

different. For instance, market risk looks at things on a shorter horizon, like 10-day VAR and 2008 scenarios, while counterparty risk measures will consider very long-dated future exposures. Banks are optimistic some metrics can be better leveraged and shared in the future.

## Regulatory Requirements Remain, but New Opportunities May Emerge

The current changes in the macro regime do not live in isolation. Ongoing regulatory shifts are also impacting markets, such as the interbank lending rate's (IBOR's) transition to risk-free rates (RFRs), as well as the swaths of new regulations proposed by the U.S. Securities and Exchange Commission (SEC) and other global regulatory bodies. These include computationally intense new rules involving adoption of the Fundamental Review of the Trading Book (FRTB). All said, banks are very busy minding different projects and aggregating the data they need to answer to many different masters while trying to deal with higher volatility.

**Investment in people and project management has been a key element of regulatory compliance.** At one Canadian bank, a risk professional spoke about investing in people and project management around the likes of shifting to the sterling overnight index average (SONIA), the secured overnight financing rate (SOFR) and other RFRs by process engineering the strategy they have. Although short-term funding markets have weathered well, there has been stress in the repo market that may have flown under the radar—a key consideration the risk team is keeping a close eye on.

**Players that rely more on market-funding sources are likely experiencing more difficulty and variability in their cost of funds (COFs).** The evolving situation in geopolitics and persistent, extreme volatility will ultimately make it more expensive for institutions to get funding, according to a risk manager at a Mexican bank.

“RFRs are still evolving and it isn't clear if there is any real consensus, as market participants continue to adopt RFRs. As more and more trading occurs, eventually there will be more maturity.

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While everyone knows the London interbank offered rate (LIBOR) is going away, there are still some question marks concerning whether SOFR should be a good proxy. Most of the same arguments come up: the secured versus unsecured nature of SOFR, lack of term structure and lack of history. A risk manager at a Japanese bank believes RFRs are still evolving and isn't sure if there is any real consensus, as market participants continue to adopt RFRs. As more and more trading occurs, eventually there will be more maturity.

**Beyond instruments tied to new RFRs, firms are addressing client needs when it comes to risk-managing new products developed in response to the new macro regime.** The majority of banks we spoke with point to a long timeline between client requests for new products and implementation. Although higher volatility is a recurring

theme, many risk managers say the culprit behind investment in different instruments has really been the sustained low rates environment—a dynamic that has only recently changed, as central banks try to ward off rampant inflation. As one risk manager at a U.S. dealer explains, in a rising risk environment, everything is for sale. Less-for-sale environments lead to the creation of more derivatives.

## POSSIBLE PATHWAYS TO TRADING NEW INSTRUMENTS



- Most desks have shifted to more vanilla offerings, limiting their ability to trade new instruments to clients
- New transactions start with lower limits and low-risk appetite; as they prove to be reliable and safe, banks relax these a bit (e.g., start with a pilot period)
- Facilitate rather than develop on balance sheet



- Science and real-world connection (data scientists, AI, ML to include people that know the business); staffing requirements
- Pricing groups and system requirements
- Need for banks to act more quickly



- Is data sufficient?
- Is the market mature enough to trade? (e.g., carbon taxes/ESG investing)
- Is the market stable enough to trade? (e.g., crypto)



- Seeing more use of CDX and ETFs for both hedging and investment
- Extension of existing products easier to get over the line
- Approval process to trade and risk-manage new products is much more stringent/longer, as balance sheets contract

Source: Coalition Greenwich

**Although stringent regulatory and internal approval requirements exist, banks still believe there are ways to create opportunities today.** Getting up to speed with compliance standards almost always involves time, effort and expense. A European risk officer believes banks need to seek out ways they can leverage an opportunity. For instance, banks should try to lead the market in RFRs, rather than just being compliant. This professional stresses

sell-side to buy-side partnerships having good relationships and better business connections will lead the way. But as much gusto as there is in that statement, the building blocks of trading and risk management—data and a mature market—are still holding back clients from expressing their views in many instances.

## Key Findings

As markets continue to grow in complexity, the sell side's ability to predict how the risk environment evolves has become more challenging. Firms must be able to readily define their data needs and have the ability to manipulate that data as necessary. However, banks and dealers we spoke with have mixed experiences when it comes to data use, availability and the proper market risk and counterparty credit risk tools required to address marketplace risks faster. Key findings in this study include:

- **The importance of data in the current macroeconomic regime of higher rates, inflation and volatility can't be understated.** Although there is more data than ever, piecing it together has proven to be difficult for the sell side, particularly in less-liquid asset classes. In some cases, while there is an awareness of data needs, time series just don't exist. In this environment, unprecedented markets have raised the bar of data requirements and analytical tools. More sell-side firms are still running end-of-day risk processes. The handful that are looking at intraday risk metrics are still having trouble aggregating the right information.
- **While many market participants blame COVID for the volatility of recent economic data, the pandemic shouldn't be blamed entirely.** For instance, recent geopolitical happenings have pushed sell-side firms to consider better modeling of risks over weekends, since VAR only spans a one-day period, and data tied to these events are set to become more problematic. According to risk managers, running historic stress tests is the preferred plan of attack in the current volatile environment. However, correlations have changed in numerous ways. Additionally, while there is no shortage of creativity, the capability to run effective scenarios is lacking at some banks.
- **Some counterparty credit systems simply aren't robust enough and require a "ton of improvement."** Findings reveal that the problem with counterparty credit systems lies with trying to coordinate different pockets of risk and siloes of businesses in large organizations. Trying to put them on the same scale, adding up different types of risk, is difficult. Further, aligning counterparty credit risk and market risk is a yearslong process. Systems are generationally different. Some sell-side firms have started to focus on new modeling techniques, which are an important trend in the evolution of counterparty credit risk. In the banking community, there has been a decadeslong march away from slower measures toward market-based measures overall.
- **Although regulations aren't going away, new opportunities are emerging—and are also presenting new challenges to risk management.** The current changes in the economy do not live in isolation. Investment in people and project management has been a key element of regulatory compliance—particularly as RFRs are still evolving. Risk managers feel players that rely more on market funding sources are likely experiencing more difficulty and variability in their COFs, a trend that is set to continue. However, there are some opportunities. Beyond instruments tied to the new RFRs, firms are cautiously addressing some client needs when it comes to risk-managing new products developed in response to the new macro regime—albeit with very stringent regulatory and internal approval requirements.

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