

Beyond quarterly stress testing: Continuous scenario analysis for portfolio resilience

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When numbers matter

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1. Introduction

In an era of macroeconomic volatility and complexity, financial institutions are challenged to rethink how they prepare for crises. With uncertainty elevated, the traditional cadence of quarterly or annual stress tests is increasingly seen as insufficient.

Major market disruptions over the past decades – from sudden liquidity crises to geopolitical shocks – have revealed that risks can emerge and evolve faster than a quarterly cycle.

Continuous scenario analysis is emerging as a proactive approach to risk management, enabling organizations to constantly war-game a range of potential situations and ensure they are prepared for the next surprise.

This white paper advocates for shifting from periodic stress tests to an "always-on" scenario analysis framework that can help firms maintain resilience when forecasts fail and chaos strikes.

> "Geopolitical conflicts, sudden policy shifts, technological upheavals, and unpredictable macroeconomic swings are testing the limits of traditional risk models."

2. The new normal of uncertainty

Financial markets and the global economy are facing a "new normal" characterized by rapid and overlapping disruptions. Geopolitical conflicts, sudden policy shifts, technological upheavals, and unpredictable macroeconomic swings are testing the limits of traditional risk models. What is different today is not only the magnitude of potential shocks but also the speed at which conditions change, making it difficult for standard forecasting or infrequent testing to keep up.

Risk management is shifting from prediction to preparation – recognizing that building resilience means planning for a range of plausible scenarios rather than betting on a single forecast.

Historic data alone cannot fully capture the range of future outcomes. Traditional risk measures like Value-at-Risk (VaR), while useful, are inherently backward-looking and may not anticipate novel crises. In particular, they are often calibrated to historical distributions, recent volatilities, and observed correlation structures that may shift sharply under stress[1].

When new tail events occur outside the bounds of recent experience, these models can offer little warning. The limitations of such backward-looking approaches became evident during episodes such as the 2008 Global Financial Crisis and the 2020 COVID-19 market shock, when losses and market dynamics exceeded what many standard models had anticipated.

In environments of relative uncertainty, financial institutions are compelled to adopt dynamic risk management techniques that continuously reassess potential threats.

[1] Investopedia. Backtesting Value-at-Risk (VaR): The Basics. Chiedza Musvosvi. February 11 2025

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3. Limitations of traditional stress testing

Conventional stress testing practices – often conducted annually or quarterly – suffer from several limitations in today's fast-moving risk landscape. Firstly, their infrequency means that emerging risks or rapidly changing conditions can go untested for months.

A scenario considered in an annual stress test may be rendered obsolete within weeks by new developments. The COVID-19 pandemic underscored this issue. The US Federal Reserve, for example, was prompted to introduce an extra mid-year stress test in 2020, recognizing that the situation had evolved dramatically since the initial yearly test[2].

Secondly, traditional stress tests typically focus on a small number of scenarios – often a baseline and a handful of adverse cases – which may not capture the full spectrum of risks. These scenarios are usually static, defined by regulators or risk committees in advance, and might miss unconventional or compounding events. Real-world crises, however, often involve cascading effects and combinations of factors that a handful of pre-set scenarios do not cover. If institutions only plan around a narrow set of anticipated shocks, they risk being blindsided by unmodeled events.

Thirdly, many legacy stress testing processes are manual and time-consuming, leading to results that come long after decisions need to be made. In the past, stress testing was performed largely through ad hoc, spreadsheet-based analyses. By the time the results were compiled and reviewed (a process that could take days or even weeks), market conditions might have already shifted. This lag makes it difficult for risk managers to use traditional stress tests for real-time decision support during fast-moving crises. Although technology has improved this (with advanced tools enabling faster computations), a mindset shift is needed to move from one-off exercises to ongoing monitoring[3].

Lastly, regulatory-driven focus can constrain the scope of traditional stress tests. Banks subject to regulatory stress tests (such as the Fed's CCAR or the EBA stress tests in Europe) understandably align their internal efforts to those scenarios and metrics. While this ensures regulatory



[2] GARP. Putting Stress Tests in the Blender. Alla Gil. October 23 2020

[3] Traders Magazine. Tech Tuesday: Stress Testing in Focus. July 9 2024

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compliance, it can create a false sense of security. Passing a regulatory test does not guarantee resilience to all other forms of stress. The prescribed scenarios might not cover, say, a cyberattack-induced market shutdown or a simultaneous commodity price and interest rate shock outside the regulatory narrative.

Thus, institutions need to go beyond the minimum required scenarios and explore a wider array of risks in a continuous fashion.

4. The case for continuous scenario analysis

Continuous scenario analysis is a forward-looking, proactive approach that involves constantly war-gaming a range of potential crises and market conditions. Unlike static stress tests, continuous scenario analysis runs in an always-on mode, regularly evaluating portfolios against both moderate "what-if" situations and extreme tail risk events.

The goal is to ensure that at any given time, decision-makers have an up-to-date understanding of how their portfolios and strategies would fare under a wide spectrum of adverse circumstances.

Below, we outline the key elements that define this approach and why it strengthens organizational resilience.

> "By placing participants or systems in simulated crisis scenarios, war-gaming can reveal gaps, stress points, and unexpected outcomes, helping decision-makers plan smarter and respond faster when the real thing hits."

War-gaming "what-if" scenarios

The concept of war-gaming in risk management borrows from military and strategic simulations. It is essentially a structured "what-if" simulation of potential crises to reveal how an organization would respond and where vulnerabilities lie.

By placing participants or systems in simulated crisis scenarios, war-gaming can reveal gaps, stress points, and unexpected outcomes, helping decision-makers plan smarter and respond faster when the real thing hits.

In a financial context, war-gaming might involve simulating a major market shock or economic upheaval and observing how portfolio values, liquidity positions, and risk metrics react over time[4].

For example, a scenario might begin with an unexpected policy tightening and a geopolitical disruption but then extend into second-order effects: liquidity in key fixed-income markets deteriorates, funding spreads widen, margin calls accelerate, and cross-asset correlations shift abruptly. Risk teams would assess not only the immediate mark-to-market impact, but also whether hedges remain effective, collateral demands can be met, and positions can be rebalanced under stressed market conditions.

Such exercises encourage cross-disciplinary thinking, as traders, risk managers, treasury officers, and even business continuity teams might all take part to role-play their responses. The war-game can uncover whether risk limits would be breached, where liquidity buffers might run thin, how quickly teams

[4] RAND. Wargaming: The Surprisingly Effective Tool That Can Help Us Prepare for Modern Crises. November 21 2025

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could rebalance or hedge, and whether communication channels are clear under stress.

Crucially, war-gaming is not about predicting a specific event, but about preparation and insight for complex, dynamically changing stresses. It forces organizations to confront uncomfortable possibilities and ask, "How would we handle this?" rather than assume, "That will never happen." Over time, incorporating war-gaming into the risk culture builds muscle memory for crisis responses. It helps institutions develop playbooks for various contingencies, so that when a disruption (even if not identical to a rehearsed scenario) occurs, the organization is not starting from scratch.

In essence, continuous war-gaming of scenarios functions as a series of fire drills – so that when a real fire starts, everyone knows their role and the exits.



An "always-on" stress testing framework

To operationalize continuous scenario analysis, firms are adopting an "always-on" stress testing framework. This framework has several components:

Pre-emptive "always-on" monitoring

Rather than running stress tests only at set intervals, an always-on approach means stress tests are running continuously or at high frequency (e.g., intraday) across the portfolio[5]. Advances in risk technology now allow institutions to automatically revalue portfolios under a variety of scenarios on an intraday or even real-time basis.

This might involve Monte Carlo simulations, scenario libraries, or factor shocks being applied to current positions as markets move. The key benefit is that risk managers can spot emerging vulnerabilities early. If market conditions begin to resemble a stress scenario, or if a portfolio drift causes a higher loss under a particular scenario, the system flags it immediately rather than waiting for the quarter-end report.

Real-time stress testing during crises

When a market disruption is underway, having real-time stress testing capabilities is invaluable. This means that as new data comes in (interest rates jumping, volatility spiking, credit spreads widening), the risk systems can compute the impact on portfolio values and key risk metrics "on-the-fly" under different scenarios.

[5] Traders Magazine. Tech Tuesday.: Stress Testing in Focus. July 9 2024.

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Real-time stress testing enables risk managers to make informed decisions and acting quickly during a crisis, such as adjusting positions or activating hedges, rather than reacting blindly[6]. For instance, during a sudden liquidity event, real-time scenario analysis might show how quickly cash buffers could be exhausted or which assets would likely experience the most severe price drops, guiding immediate actions to shore up liquidity or reduce leverage.

Post-crisis feedback and evolution

Continuous scenario analysis also involves learning from each shock and adjusting accordingly. After a crisis or stress event has passed, risk teams should conduct post-mortem scenario analysis – effectively treating the event as a scenario to replay and study. This helps in evolving models and assumptions over time.

In practice, this might mean that if a firm went through a stress like the March 2020 COVID selloff or a sudden interest rate spike, the risk team would incorporate the observed market moves from that event into their scenario library for future tests. They would also evaluate which contingency plans worked and which did not, updating their war-gaming playbooks.

> "Pre-emptive scenario monitoring identifies issues early, real-time analysis guides immediate mitigation during a stress, and post-crisis lessons refine the scenarios and responses for the future."

Through these components, an "always-on" approach creates a virtuous cycle of continual risk assessment and improvement. Pre-emptive scenario monitoring identifies issues early, real-time analysis guides immediate mitigation during a stress, and post-crisis lessons refine the scenarios and responses for the future.

All of this is enabled by modern risk infrastructures – high-speed computation, data integration, and flexible risk models – that were not broadly available in earlier decades. Firms that invest in such capabilities are effectively fitting their organization with an early-warning radar and agile response system for risk.

It's important to note that continuous scenario analysis does not mean indiscriminately panicking at every market twitch. Instead, it provides a richer information set and context to distinguish between noise and genuine threats. By running thousands of scenario simulations in the background and exploring the portfolio's reaction to many "what-ifs," risk managers gain a range of possible outcomes and can focus on the scenarios that matter[7]. This helps in avoiding complacency during calm periods and over-reaction during volatile periods.

Continuous testing, done properly, becomes a disciplined process of scanning the horizon for storms and steadying the ship's course accordingly.

[6] Traders Magazine. Tech Tuesday.: Stress Testing in Focus. July 9 2024.

[7] Confluence. Don't blame risk numbers for market crashes. What on earth went so wrong?

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5. Designing a spectrum of scenarios

A cornerstone of continuous scenario analysis is testing portfolios against a broad spectrum of scenarios. Resilience is not about withstanding one particular blow, but about withstanding many different kinds of blows. Thus, risk teams should develop and continuously update a diverse set of scenarios, ranging from macroeconomic stress to liquidity dislocations and market structure shocks.

These scenarios should be severe yet plausible and collectively span the key risk factors that could affect the institution[8].

In this section, we discuss several categories of scenarios that financial institutions should consider in their "always-on" testing repertoire, and why each is important.

Macro shocks and geopolitical upheavals

Macroeconomic shocks such as recessions, interest rate spikes, commodity price shocks, or inflation surges have always been a focus of stress testing. Continuous scenario analysis should include multiple macro-driven scenarios, not just a single recession case.

Geopolitical upheavals also warrant scenario planning. Geopolitical events can cause sudden market dislocations. Armed conflicts and wars can trigger spikes in oil and commodity prices and disrupt supply chains, while political instability can lead to capital flight or currency crises.

A vivid historical example is the 1973 Arab-Israeli War which led to the OPEC oil embargo and a quadrupling of oil prices, plunging many economies into crisis. More recently, the 2022 Russia-Ukraine conflict roiled energy and grain markets and introduced new volatility in equities and foreign exchange.

By incorporating scenarios like “regional conflict escalates” or “major trade war” into continuous analysis, institutions can gauge potential impacts on their portfolios[9].

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Liquidity freezes and market crises

A particularly dangerous type of scenario for financial institutions is the liquidity freeze. These scenarios involve market conditions where normally liquid assets become hard to sell (or can only be sold at fire-sale prices) and financing markets seize up. One of the lessons of past crises is that liquidity can evaporate almost instantaneously when panic sets in.

In designing liquidity stress scenarios, risk teams should consider events like short-term funding markets drying up (e.g., repo or commercial paper market stress), market-maker withdrawals from key trading markets, or a surge of client redemptions for asset managers.

[8] GARP. Putting Stress Tests in the Blender. Alla Gil. October 23 2020

[9] Phoenix Strategy Group. 5 Scenarios to Stress Test Portfolio Volatility. February 1 2025

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Flash crashes and extreme events

Not all market crises play out over weeks or months. Some strike and resolve within minutes or hours. These sudden flash crashes or extreme events are another class of scenarios that continuous analysis should address.

A flash crash typically refers to an abrupt, deep plunge in asset prices followed by a quick rebound, often driven by a transient evaporation of liquidity or technical trading factors. One famous example is the May 6, 2010 Flash Crash, when the U.S. Dow Jones index dropped about 9% in minutes, only to recover most of the loss shortly after. During that event, certain stocks traded down to mere pennies before bouncing back – an indication that market liquidity completely vanished momentarily[10].

Why worry about something that happens so fast? For one, automated trading and algorithmic strategies can amplify these events, and portfolios could suffer outsized losses (or trigger stop-loss sales) in the blink of an eye. Continuous scenario analysis should thus include ultra-short-term stress scenarios, where multiple markets gap sharply in a matter of minutes. Even though such scenarios are hard to predict or prevent, being aware of the possibility is important for risk limits and for designing controls on trading (e.g., circuit breakers, volatility pause mechanisms, or kill-switches on algos).

Aside from flash crashes, risk teams should also consider extreme outlier events often dubbed “Black Swan” events – extremely rare and unexpected occurrences with massive impact. By definition, one cannot enumerate all imaginable Black Swans, but one can still test “generic” extreme scenarios.

A key lesson from recent Black Swan events like the 2020 pandemic market crash is that correlations spike and traditional hedges can fail when everyone is selling. Risk factors that were thought to be independent can suddenly move in unison (for example, equities and gold falling together in the mid-March 2020 liquidity scramble, defying the usual inverse relationship).

Continuous scenario analysis, by virtue of being always updated, can incorporate these learnings quickly.



[10] Confluence. Don’t blame risk numbers for market crashes. What on earth went so wrong?

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6. Building resilience through scenario analysis

Continuous scenario analysis is not an academic exercise. Its ultimate purpose is to build real financial resilience. Resilience in this context means the ability of an institution or portfolio to absorb shocks, adapt to changing conditions, and continue operating (and meeting obligations to clients or regulators) even under severe stress.

Identifying vulnerabilities and gaps

One of the immediate benefits of running a wide range of scenarios is that it illuminates where the cracks might form before they actually do. Each scenario is like a probe testing the defenses of the portfolio or the institution's balance sheet.

When you simulate, say, a counterparty default scenario, you might discover an outsized exposure to the counterparty that was not fully appreciated. Or a scenario might reveal that a certain hedging strategy is ineffective in some conditions (perhaps it works for small changes but not in the non-linear extremes).

By continuously performing such analysis, risk teams can compile a catalog of vulnerabilities – a list of "in scenario X, our biggest loss comes from Y" insights. Over time, patterns emerge. Perhaps several different scenarios all point to the same weak spot (for example, a particular sector or currency exposure consistently shows large drawdowns across many stress situations). This would signal the team to address that vulnerability, perhaps by reducing that position or adding a targeted hedge.

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In essence, scenario analysis acts as a forward-looking radar, identifying not just what risks exist, but under what conditions those risks become most severe.

Moreover, continuous scenario analysis encourages a holistic view of risk. Instead of looking at silos (credit risk team worrying about defaults, market risk team worrying about VaR, liquidity team worrying about cash buffers), scenarios tie them together. The continuous aspect ensures that emerging risks are caught.

For example, consider the rapid growth of a new asset class or strategy (perhaps a portfolio suddenly has a large allocation to something like leveraged loans or an exotic derivative strategy). If that growth happens in between annual stress tests, a traditional approach might not scrutinize it until much later. But continuous scenario analysis, by being engrained into regular risk reporting, would start testing that new exposure almost immediately. If that new asset class is, say, sensitive to liquidity, the scenarios will show how it behaves under liquidity stress – possibly alerting management that the exposure is riskier than it appears in benign conditions. Thus, new vulnerabilities do not get a free pass until the next scheduled review – they are tested and revealed in near-real-time.

When done properly, scenario analysis should broaden the imagination of the risk manager, preventing the oft-criticized "failure of imagination" that precedes many crises.

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A continuous approach also naturally leads to the practice of reverse stress testing, which is a powerful way to identify gaps. Instead of guessing scenarios, start with a failure condition (e.g., the portfolio loses 30% or the firm breaches its capital ratio) and work backward to figure out what combination of events could cause it[11].

Doing this regularly is almost like red-teaming your own institution – intentionally seeking scenarios that would break the bank. It can be uncomfortable, but it directly feeds resilience. Once you identify a hypothetical pathway to failure, you can take steps to block that path (e.g., by reducing leverage, diversifying assets, or buying insurance/hedges for that scenario).

Enhancing decision-making under stress

Resilience is not just about financial buffers. It is also about the quality and speed of decision-making during a crisis. Continuous scenario analysis hones this aspect by providing better information and practice for the people in charge when stress hits.

Firstly, as discussed, an "always-on" framework means that during a crisis, you have live scenario outputs at your disposal. Having this context in the moment is invaluable, as management can quickly grasp whether the firm is within the boundaries of scenarios that they have prepared for or if it is entering uncharted territory. It also helps to prioritize action. If the biggest driver of loss will likely arise from one business unit (say, credit derivatives) according to the scenario analysis, focus can be turned there promptly.

Secondly, the practice effect of war-gaming scenarios means that when something akin to a war-gamed scenario starts unfolding, the team has a reference for what to do. Without prior scenario planning, decisions in a crisis are more ad hoc and prone to mistakes or paralysis. With scenario planning, the decision-makers can move faster and more confidently, since stress points and required actions have been revealed in advance.

Moreover, continuously exercising scenario analysis can improve the judgment of risk managers and executives. Over time, they develop an intuitive feel for what combinations of events are most dangerous and what mitigations are effective. They get used to reading scenario outputs and translating them into business



[11] Phoenix Strategy Group. 5 Scenarios to Stress Test Portfolio Volatility. February 1 2025

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strategy (for example, knowing when to take risk off the table versus when to hold through volatility). This honed intuition is critical because no scenario will play out exactly as scripted.

Continuous scenario analysis also informs strategic decisions in calm times, which enhances long-term resilience. For example, capital allocation and contingency planning can be optimized by examining scenario results. A bank might decide how much capital to keep in reserve (above regulatory minimums) by looking at the worst losses shown across dozens of scenarios and adding an additional buffer. An asset manager might use scenarios to decide how much liquidity to maintain, ensuring that even in a severe scenario, they can meet redemptions without gating the fund, thereby preserving client trust. These decisions, made ex ante, can help an institution weather storms without taking desperate measures.

7. Implementation considerations

Adopting continuous scenario analysis is a significant undertaking. It requires changes in technology, processes, and mindset. In this section, we discuss some key considerations for firms looking to implement an "always-on" scenario approach.

> "At the heart of continuous scenario analysis is the ability to process large amounts of data and complex calculations on an ongoing basis."

Data and technology requirements

At the heart of continuous scenario analysis is the ability to process large amounts of data and complex calculations on an ongoing basis. Risk technology infrastructure is therefore a critical enabler. Firms need risk systems capable of fast portfolio revaluation under many scenarios.

This often means having a scalable compute engine (potentially leveraging cloud computing or grid computing) that can run thousands of scenario simulations across all positions and risk factors in a timely manner[12].

The system must handle a wide variety of instruments (from liquid stocks and bonds to complex derivatives) and produce consistent results that aggregate up to the firm-wide level.

Data management

Data is as critical as technology infrastructure. Each scenario is defined through shocks to key risk factors, including interest rates, credit spreads, equity prices, FX rates, commodity prices, inflation, and volatility surfaces. Historical scenarios require high-quality market data to replay past episodes consistently. Hypothetical scenarios, by contrast, require firms to specify coherent shock assumptions and apply them to current positions and market conditions. For example, equities down 30%, credit spreads wider by 500 bps, and volatility up 200%.

Managing these datasets and ensuring they are updated (for historical data) or vetted by experts is a continuous task. Some firms employ large scenario libraries – databases of defined scenarios that can be easily selected and run.

[12] Confluence. Don't blame risk numbers for market crashes. What on earth went so wrong?

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In an "always-on" approach, new scenarios might be added frequently (e.g., after each major market event, a scenario based on the event should be created).

Timeliness of data feeds

Intraday data is crucial for continuous stress testing. During slow-moving markets, end-of-day positions and market data might suffice for running scenarios overnight. But during volatile markets, intraday positions and data is needed to truly assess where things stand.

Implementing continuous scenario analysis might thus involve connecting to live data sources and conducting risk runs throughout the day. Some firms may institute multiple intraday risk snapshots, where they run three to five (or more) sets of stress tests each day, rather than just at end-of-day.

Intraday "always-on" stress tests are becoming more feasible and allow risk visibility even as positions change throughout the day. Key considerations include data latency, ensuring the latest trades are captured, and balancing computational loads (e.g., perhaps intraday runs focus on smaller scenario subsets to maintain speed).

Model consistency and revaluation

Another implementation consideration is ensuring that scenario shocks can be applied consistently across pricing and risk models. This is especially important for model-valued instruments such as complex options and structured products, where scenario results depend on how valuation models respond to changes in market inputs. If models interpret the same shocks differently, aggregated scenario results may be inconsistent or misleading.

Automation

Ideally, the process of running scenarios is not a manual, ad hoc task, but an automated activity that is either continuously running in the background or can be triggered with minimal effort when needed. Some advanced risk platforms continuously calculate scenario P&Ls alongside daily P&L, so that every day one can see, for example, “If scenario X happened today, our portfolio would lose Y%.” Such automation requires upfront investment but pays off by providing a constant stream of insight with little incremental effort.

8. Conclusion

Continuous scenario analysis is a vital element of modern risk management. It shifts the focus from passively reporting risk to actively anticipating and preparing for it. By moving beyond the old cadence of occasional stress tests to an "always-on", war-gaming mindset, firms can cultivate a deeper resilience.

We advocate that risk teams embrace a continuous scenario approach as a strategic necessity in today’s uncertain environment. By doing so, they will transform risk management from a periodic compliance exercise into a dynamic, value-adding function and one that not only safeguards the institution’s stability but enables it to act decisively in the face of turmoil.

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