



TEN YEARS LATER

WHAT WE LEARNED FROM THE QUANT LIQUIDITY CRUNCH

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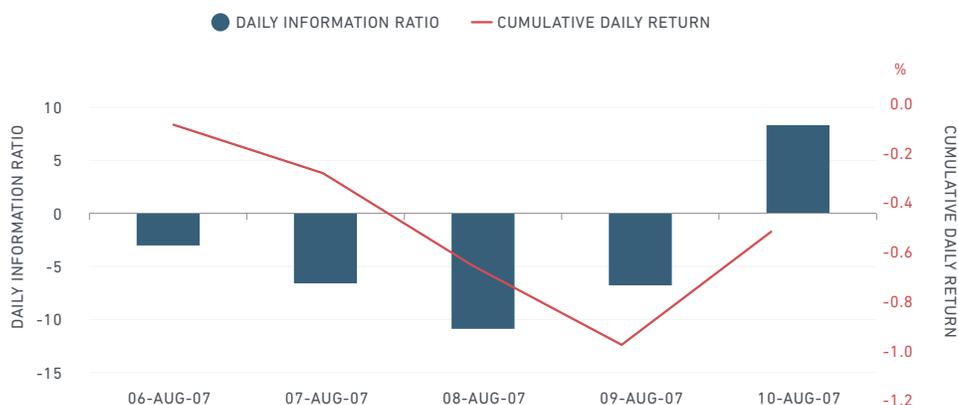
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Ten years ago, the so-called Quant Liquidity Crunch shook up the cloistered world of quantitatively managed equity funds. But that event, which was a precursor to the broader financial crisis which roiled markets about a year later, has had reverberations through the investment world that last to this day.

During Aug. 6-10, 2007, it is believed that some multi-strategy funds sold their more liquid equity positions from their quant strategies to boost the collateral for other, less liquid strategies that had plunged in value. This rapid liquidation of large quant equity positions spread to other quant managers — particularly those who managed highly levered long/short strategies. Many managers found themselves selling off the same stocks (mostly with strong Value, Momentum and Quality factor exposures), contributing to a “liquidity spiral.” While some managers were able to recover when the market reversed on Aug. 10, others missed out as they had reduced their exposure to these factors.

HOW THE QLC AFFECTED QUANT MANAGER PERFORMANCE: WEEK OF AUG. 6, 2007



Quant manager performance is proxied by eight equally weighted Systematic Equity Strategies: Price Momentum, Value, Earnings Yield, Long-term Reversal, Prospect, Profitability, Earnings Quality, Management Quality

This event initially spurred a fundamental change in the way that quant managers viewed portfolio risk. Subsequently, asset managers in general became more sensitized to risk. The Quant Liquidity Crunch (“QLC”) underscored the importance of understanding and managing risks associated with leverage, liquidity and crowded trades. It also drew attention to the importance of integrating risk management into the overall investment process and finding alternative sources of risk and return.

A couple of years after the QLC, I published a paper, “Managing through a Crisis: Practical Insights and Lessons Learned for Quantitatively Managed Equity Portfolios.”¹ From the vantage point of managing risk at a large institutional asset manager, I discussed lessons learned and shared thoughts on future directions for the investment community. Now, seven years later, I revisit the conclusions from that paper and see what else we have learned since the 2007 liquidity crunch, as well as the financial crisis more broadly.²

Market events such as the QLC expose weaknesses in investment operations and processes. When the crunch illuminated these weaknesses, they moved to the forefront of discussion. And when they did, risk management policies and practices were reconsidered.

Overall, investment risk management has evolved from passive risk monitoring, where it was, incorrectly, understood to be about risk minimization, to passive acceptance (driven by client demands and new industry standards) to today,

where it is seen as a required core competency of any best-in-class investment process.

On the following pages, I review and update findings from my earlier paper (quotes from the paper are highlighted in orange) and evaluate how the investment world’s approach to risk management and investing has evolved over the past decade.

¹ Berd, A. M., ed. (2010). *Lessons from the Financial Crisis: Insights from the Defining Economic Event of our Lifetime*. Risk Books, Incisive Media., pp. 515-544.

² Subsequent references to lessons learned from the QLC encompass the 2008 financial crisis.

KEY LESSONS LEARNED

01

Risk management has moved to center stage from an obscure corner of many organizations. Now, best-in-class risk management prizes a strong investment culture that puts a premium on transparency, and emphasizes integrating risk management into the overall investment process. This wasn't the case at the time of the QLC. We have observed that institutional investors now expect greater transparency and demand clearer alignment between the fiduciary promise and performance delivered. Meanwhile, an increasing number of asset managers portray their risk management capabilities as a competitive edge and part of their core investment value proposition.

02

Institutional investors continue to seek alternative, diversified sources of risk and return as well as low-cost exposure to common factors such as Minimum Volatility, Yield, Quality, Momentum, Value and Size. Alternative sources of risk and return can include private assets, such as private equity and real estate, and investment ideas emanating from new and emerging datasets, aided by advances in technology.

03

The QLC also contributed to greater awareness of other types of risk beyond volatility: crowded trades, contagion and liquidity management issues. Prior to the QLC, some quants did not understand how crowded some trades were, nor did they appreciate the speed and impact of the effect on prices when they were unwound. New metrics and analytics can help investors better appreciate risks associated with crowded positions.

04

As systematic factor exposures become more easily accessible through indexed strategies, quant managers also have turned to machine-learning techniques ("Big Data") to find new, proprietary sources of alpha. This development has important implications for model design and construction, consumption of risk and performance information, and other areas.

INTEGRATING RISK MANAGEMENT INTO THE INVESTMENT PROCESS

Effective risk management cannot be done independently of the investment process. Rather, it should be integrated and take place at various stages within the investment process including model development, i.e., research, testing, portfolio construction and trading.”

At the time of the QLC and at the subsequent onset of the Financial Crisis, the integration of so-called middle and front office functions was a nascent development. Today, such integration is not only a best practice but has been broadened to allow for customizable and flexible system workflows. Managers are solving two challenges here. First, they seek a cost-effective³ and an integrated view of return and risk to support their investment process. Second, given client demands to enhance and communicate investment performance, they need an infrastructure architecture that supports rapid development, testing and deployment of investment strategies.

The ability to share data and technology across disparate functions that serve the risk management enterprise (e.g., the central risk function and trading desk) is an important best practice today. In part, it enables managers to spend their time interpreting and acting on risk information rather than unnecessarily reconciling numbers that are produced by different systems.

Timely and accurate reporting is critical... We should expect to see developments in infrastructure that supports such reporting.”

A pillar of effective risk management is the infrastructure upon which it is built. This infrastructure, which, among other things, covers data management and technology, supports activities such as portfolio analysis and construction, cash and collateral management, and scenario analysis and stress-testing. The challenge with developing and managing this infrastructure grows with the size and complexity of the enterprise. As the demands on risk management change and grow over time, it is important to consistently review and evaluate the efficacy of its supporting infrastructure.

Finally, the value of the information that risk and portfolio management systems provide depends heavily on whether it is possible to act on that information. For example, analytics may suggest the need to de-risk a selected number of portfolios over a specific period of time. The supporting infrastructure must be in place to act accordingly.

When it comes to mission-critical investment solutions, which consist of products and services, and supporting infrastructure, I reiterate my comment from my earlier paper:

Knowing what you ‘can’ do is just as important as knowing what you ‘should’ do.”

FACTOR INVESTING AND ALTERNATIVE ASSET CLASSES

The QLC and the financial crisis, more broadly, spurred institutional investors to question managers’ abilities to find and deliver alpha in a cost-effective manner. Among other dynamics, such concerns led to the growth in interest and implementation of factor investing strategies. Today, investors can gain access to investment styles such as Minimum Volatility, Yield, Quality, Momentum, Value and Size through various exchange-traded vehicles or other index-linked products, at very competitive pricing. At the time of my earlier paper, access to such factors was only available from funds managed by institutional quantitative managers.

³ In other words, they seek to lower their total cost of ownership.

More importantly, index-based systematic strategies are transparent. A factor framework can provide much better understanding and control of risk and return management for such rules-based strategies. Factor investing, implemented through replication of simple and transparent indexes, now offers a third option to long-term investors, in addition to passive investing and active management.

In addition, institutional investors increasingly have turned to multi-asset class (MAC) strategies that include alternative asset classes such as real estate and private equity, because they historically have offered diversified sources of risk and return.

ADDITIONAL RISKS: CROWDING, CONTAGION AND LIQUIDITY

CROWDING



...Managers should pay much closer attention to their specific positions and try to ascertain which are deemed to be crowded."

Ten years after the QLC, the industry is actively discussing the potential risks associated with crowded trades. In addition to debates as to which strategies, if any, are crowded, metrics and "scorecards" have been developed to help investors better understand and appreciate risks and opportunities associated with crowded trades.

Incorporating factor investing in portfolio strategies necessarily raises questions as to whether one is entering crowded trades. Our approach is intended to help investors understand how factors fit into their core investment objectives, risk/return profile, cost considerations and associated constraints, rather than selecting one investment style over the other, e.g., active versus passive approaches. These criteria help determine how asset managers understand the trade-offs between different types of exposures and how best to incorporate factors into their strategies.

CONTAGION



Contagion risk occurs when what were previously thought to be uncorrelated events become highly correlated... The crisis will lead to a greater focus on contagion risk. There will be a need for tools to help managers assess and interpret the cross-effects of a large number of factors which span multiple asset classes."

In the QLC, quant equity managers needed to raise cash to meet margin requirements, leading them to sell stocks that were heavily exposed to the Value, Momentum and Quality factors, which historically were uncorrelated. As a result, stocks exposed to these factors fell sharply in value. What were previously thought to be uncorrelated risks across factors became highly correlated in a very short period of time because of the sudden demand for liquidity. This is an example of financial contagion.

Combining models that span multiple-asset classes with the capability to stress test different potential scenarios provides a way to evaluate contagion risk. With apologies to John Donne, no asset class is an island.⁴

LIQUIDITY MANAGEMENT



Managers should employ a more formal framework for measuring and assessing liquidity risk."

The QLC brought a new focus on liquidity management, revealing how unwinding large positions quickly could wreak havoc with portfolios, particularly ones that are leveraged. In addition, increased scrutiny by regulators, particularly in the U.S., has led to increased measurement and assessment of liquidity risk by institutional investors.

Over recent years, clients have allocated growing time and resources to developing liquidity risk management programs and engaging with regulatory agencies over rules affecting portfolio liquidity.

THE RISE OF MODERN MACHINE LEARNING AND “BIG DATA”

“The search for proprietary factors will change the way researchers use and incorporate data. And, one of the potentially significant developments will be in the areas of computer science, linguistics and data, and their combined role in the research process. Further, relatively recent advances in statistics provide interesting alternatives which can help researchers identify and estimate factors...”

The QLC has driven quant managers to find new, proprietary sources of alpha from (what is now referred to as) Big Data and machine-learning techniques.⁵ Areas where we may see largest impact are model design and construction, consumption of risk and performance information, investor/client communication, identification and classification of sources of risk and return, and automation of quality assurance methods.

Why are we seeing an increase in the application of Big Data and machine-learning techniques? One way to think about it is in terms of supply and demand for such services. On the supply side, improvements in computer processing (e.g., parallel/

distributed computing) speed have made algorithms involving statistical learning, for example, much more tractable. The boom in digitized information, combined with advances in technology, has spurred growth in available data (e.g., via social media) and the speed at which it can be delivered.

On the demand side, we see institutional investors seeking to be more operationally efficient (e.g., why ask humans to read reports if machines can do so faster?) and improve investment performance (e.g., through alternative ways to identify and capitalize on financial anomalies).

The cost and complexity to interpret and act on information grows with the volume and speed at which it becomes available.

“The intersection of business intelligence, analytics and data visualization should be an important and exciting area for quantitative managers for years to come as they work towards ways to better manage the risk of their portfolios.”

Over the last several years, we have seen a growth in use of visualization capabilities to extract important insights in a timely manner. Being able to identify relationships in high dimensional datasets facilitates understanding of risk exposures. These new capabilities are in demand among analysts and managers across all types of investment persuasions – not just quants.

CONCLUSION

Some of today's more significant industry trends stem from the Quant Liquidity Crunch event and, more broadly, the financial crisis of the late 2000s. These crises fundamentally changed the way that institutional investors — and quant managers in particular — view risk and how it relates to alpha:

- 1) Risk management is a central part of the investment management process and a differentiating point for those asset managers who can show it is a core part of the value proposition.
- 2) Institutional investors have placed greater emphasis on alternative sources of return, from factor investing to private asset classes.
- 3) A better understanding of the sources of risk beyond volatility has fundamentally changed the ways that investors approach asset allocation and evaluate risk in their portfolios.

Institutional investors have three important challenges to confront and overcome. How do they:



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