Understanding Quant Quakes and Book Liquidations in Equity Strategies

Teza

Teza Capital Management ("Teza") is a global quantitative asset management firm. We pride ourselves on attracting and retaining top talent, developing strategies with a data-driven and science-backed methodology, and continuously innovating in pursuit of alpha for our clients. Our Manager Insights pieces delve into our "quant's eye view" on markets, investment strategies, and industry developments.

Quantitative strategies, particularly Market Neutral Statistical Arbitrage (StatArb) and Quantitative Long/Short Equities (QLS), have been a cornerstone of sophisticated investment portfolios since the late 1970s. The foundational appeal lies in their market-neutral approach, which allows them to perform independently of broader market trends, relying instead on the statistical and value relationships between various securities. This independence from market direction makes them particularly attractive to investors seeking diversification and downside protection.

These strategies have been continuously celebrated for their high Sharpe ratios and the ability to deliver consistent returns. However, their popularity has also led to an influx of capital, which, while initially beneficial, led to a phenomenon where there is "more money than alpha."

The Quant Quake

The term "quantquake" refers to the sudden and severe dislocations within the stock market driven by the activities or failures of quantitative hedge funds. Such "quakes" can take place "under the surface," being relatively invisible for the external observer, as the overall stock market can remain quite calm during such an event. The first notable quant quake occurred in August 2007, when several large quant funds experienced massive losses over a short period of time. The magnitude of 12 sigma (!) moves were observed over 3 consecutive dates of August 7, 8 and 9. Again, these enormous moves were observed in a residual space, meaning the moves were measured relative to the market. That event (unobserved before) highlighted the interconnected nature of quantitative strategies and how the failure of one or more funds can have cascading effects across the market.

Many quantitative managers were convinced that the market disruptions were merely short-lived irregularities, diverging from the fair value predicted by their models. However, In the midst of the turmoil, each manager faced a difficult choice: either reduce their positions to prevent further losses and margin calls or to maintain the positions, hoping for a market correction. For some, the decision was even out of their control. While hedge funds with no immediate liquidity had the advantage of not being forced by investors to sell, managers of separately managed accounts (SMAs) were often compelled to act quickly.

One of the key drivers of quantquakes is the homogeneity in the strategies employed by different funds. When many funds are following similar models and trading the same signals, a shock to one part of the market can quickly spread to others, amplifying the impact. The quant quake of 2007 was largely driven by the need for liquidity among managers running leveraged credit strategies, which led to the liquidation of positions in StatArb and QLS strategies. Such liquidations of StatArb and QLS positions acted as a "perfect storm." With the overall market not really moving, most of the long positions were pressured down while most of the shorts were pushed up by several liquidating managers. The other managers, who may have had nothing to do with credit needs, but were in correlated positions in equities, were forced to react causing a falling domino effect.

More recently, a similar event occurred in China's equity markets in 2024. The so-called "China Quant Quake" was triggered by a combination of factors, including changes in regulatory policies and shifts in market sentiment. The result was a rapid and significant sell-off in quantitative equity strategies, leading to widespread losses among funds with exposure to Chinese equities.

The triggers for liquidations can be different, but it is often a need for capital. (StatArb and QLS are very liquid and can be used as a source of immediate cash). As such, a potential source of more recent liquidations of Summer 2024 is the unwind of yen carry trades due to the shifting outlooks for dollar / yen interest rates.

The Perpetual Overfunding of Equity Markets

We believe that equity markets are likely to remain permanently overfunded, driven by the allure of consistent returns from well-executed StatArb and QLS

strategies. The ongoing flow of capital into these strategies is fueled by the continuous development of new models and the promise of high Sharpe ratios. But as the system takes in more money than can be supported by existing alpha, the system periodically should correct itself by shedding less capable managers through the liquidations of their portfolios. These types of liquidations do not require an external trigger to the equity system (e.g. a credit crunch) but are caused by the necessity of the system to correct itself.

Strategic Considerations and Opportunities

For managers, the key to navigating these periods of stress lies in minimizing the impact of liquidations and taking advantage of the opportunities that may be present in the periods after. During a liquidation, distressed selling can lead to overshoots, where securities are sold off more aggressively than warranted by fundamentals (symmetrically on the short squeezes of less fundamentally viable stocks). These overshoots can create attractive entry points for managers who are positioned to take advantage of the dislocation.

However, predicting the exact timing of the regime switch from liquidation to recovery is a very hard problem.

Quant quakes and book liquidations are now an inherent part of the landscape for StatArb and QLS strategies. While these events can be disruptive, they also play a crucial role in maintaining the overall health of the equities alpha market. As equity markets remain overfunded, we expect the frequency of these events to increase, albeit with potentially less severe impacts. External triggers (unlike the internal correction) may cause more dramatic liquidation events as they can potentially create more forceful selling of positions coming simultaneously from different managers affected by an external trigger.

While timing and tactical trading during the liquidation might help, the more universal cure is of course orthogonality of a manager's portfolio from similar strategies in the market. In that, the uniqueness of alpha, especially if comes from a proprietary source, can play a dramatic role.

Teza's Edge

Teza has built an organization consisting of a highly talented group of researchers and investment professionals driven by success.

- **HERITAGE:** Our endeavors in institutional asset management are based on our 10+ year tenure as a proprietary, algorithmic low-latency trading firm, as we strive to leverage the extensive synergies we've identified between the two models.
- **TEAM:** We have world-wide talent with over 90 employees in 5 locations. Our 30+ accomplished researchers and investment professionals hold advanced degrees from renowned universities in science, technology, engineering, and mathematics.
- **APPROACH:** We follow a rigorous, scientific process in portfolio construction and optimization.
- **EXECUTION:** We have highly developed futures execution capabilities given our quantitative trading roots.
- **RISK PHILOSOPHY:** We ensure controls and checks and every key step of research and operations.
- **INFRASTRUCTURE:** As a result of significant investments into our operational infrastructure, we have created a scalable, robust platform.

Founder Biography

Misha Malyshev has led Teza Group as the CEO since the company's founding in 2009. He earned his Ph.D. in Astrophysics from Princeton University in 1998. He also holds an M.S. in Theoretical Physics and a B.S. degree summa cum laude in Physics and Mathematics from Moscow Institute of Physics and Technology. Dr. Malyshev worked for Bell Labs conducting scientific research until 2000. From 2000 through early 2003, he worked as a consultant with McKinsey & Company, where he developed substantial experience working for asset management and investment banking clients. Dr. Malyshev joined Citadel Investment Group, L.L.C. in April 2003 as a member of its strategy group. In 2004, he moved to Citadel's Quantitative Analytics group, where he developed a quantitative trading business. Dr. Malyshev was rapidly promoted to the position of Managing Director and Global Head of High Frequency Trading at Citadel, which he held until he resigned in the winter of 2009. Dr. Malyshev is an avid supporter of education initiatives, and has partnered with organizations that inspire young people, particularly women and minorities, to pursue careers in science, technology, engineering and math. He is currently on the global leadership council of buildOn, an international nonprofit organization that runs youth service after-school programs in United States high schools and builds schools in developing countries.

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