

# Navigating the Perfect Storm

## The Payoff of Forward Looking Risk Management

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## Prepare for 2010 by integrating 'lessons learned' during the recent market storm

Investors and asset managers experienced a period of extreme market stress in 2008 - probably the highest level of market anxiety that most investment professionals working today have ever faced, or will ever face again.

While desiring to resume "business-as-usual" and not dwelling on what transpired is understandable, doing so will only lead to more distress in the future. Asset managers and investors simply cannot carry on as if another catastrophic event won't happen again, because most likely it will re-occur.

The ability of long-term investors to survive the next market storm is directly linked to both their level of preparedness, and their capability to plan ahead for the next major upheaval. Successful realization of these objectives ultimately depends on using forward- rather than backward-looking risk management techniques when analyzing portfolio risk.

Forward-looking risk management enables analysts to answer questions such as:

- How much could the portfolio potentially lose in the current market environment?
- What are the most adverse market scenarios that may be envisioned?  
(Equity down or credit spread up etc.)
- How would these scenarios impact the portfolio?  
(What if the S&P 500 falls 20%?)

If one could look forward and identify portfolio risks, what difference would this make? How would it impact results? What does the ability to look forward at risks add to overall performance?



To begin addressing these questions, consider the track records of the portfolios in the graph below:

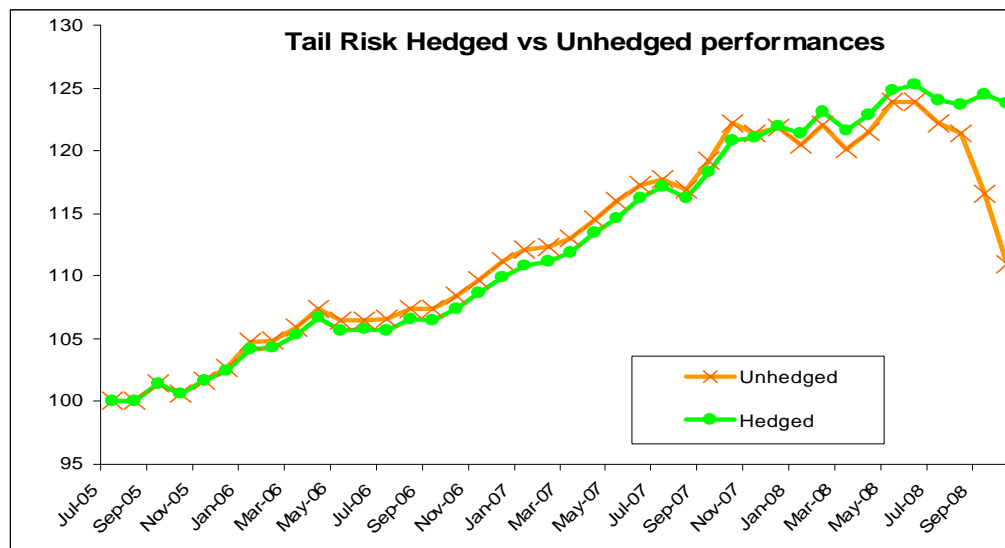


Figure 1: Impact of Risk Management on Portfolio Performance

Represented by the orange line in the preceding graph, risk is equally-allocated in the unhedged portfolio. In the hedged portfolio, risk is actively-managed through a forward looking risk control system, represented by the green line. Considering the four year track record of the portfolios, which would you have chosen to invest in?

Clearly, over the four year portfolio life-span, the hedged, ‘proactively risk-managed portfolio’, represents the more attractive investment. Yet, if one analyzes these two portfolios at any time up to July 2007 in a back-projected manner, one would most likely choose to invest in the unhedged portfolio, because it appears to slightly outperform. However, if one had the power to look forward, then the hedged portfolio would be the most likely choice – at least from the summer of 2007 onwards (and despite temporary sacrifice of some basis points in performance, early on).

If, in 2008, one had the ability to look forward, to project the impact of events, and then to structure the portfolio accordingly, wouldn't it have been reasonable to pay a few ‘up-front’ basis points to secure subsequent performance? What would have been the payoff of having the capability to look forward and actively manage longer-term portfolio risk? If having the ability to look-forward when analyzing risks allows investors to achieve superior long-term portfolio performance – analogous to ensuring protection of capital during market downturns – most would choose to do so, even at an initial cost of a few basis points in performance. Whereas effective risk management may cost the portfolio slightly in the short-term, the eventual payoff will more than compensate. Our review of the latest market storm demonstrates the payoff potential offered by forward-looking risk management.



## Looking forward to your risks is possible, even in a perfect storm

Some argue that the recent market meltdown represented a so-called “black swan” event – a unique and unpredictable occurrence – and that it is impossible to use historical events in order to forecast future market behavior. We strongly disagree. The recent market meltdown and its impact on alternative investments was simply not a black swan, namely an “unpredictable” or “unimaginable” event occurring within the current framework. Even within this perfect storm, the potential losses were predictable, and one could have spotted the most adverse market scenario and properly assessed its market impact – in advance.

Using the analogy of sailing, the market environment in the period between 2003 and 2006 was like sailing in very good weather, with sunshine and moderately favorable winds. In 2007, we could see the first clouds on the horizon, with the wind becoming far more unstable, and sea conditions more adverse. In 2008, the weather grew stormier, turning into a hurricane.

As with accurate meteorological technology, this “perfect storm” in alternative investments could have been detected long ago, using appropriate risk solutions. The graph below shows the 99% risk predicted by the FOFIX Risk Profiling model, as applied to the HFRI FoF composite index:

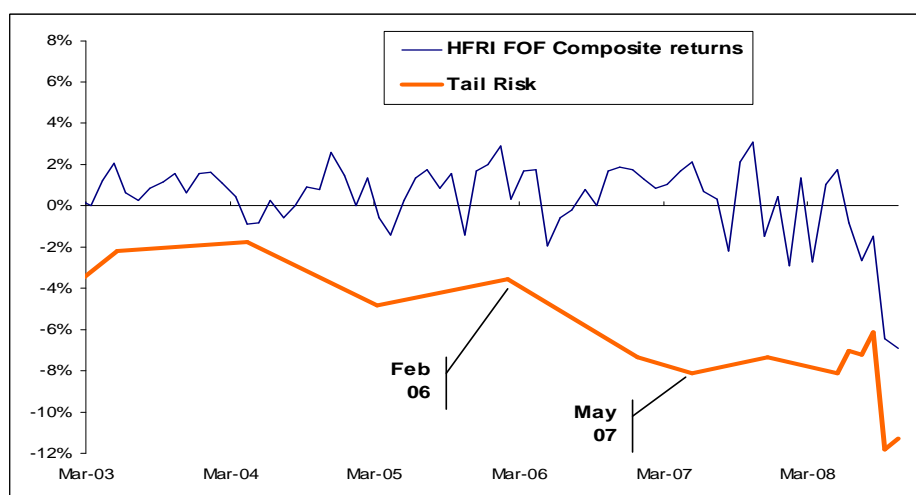


Figure 2: HFRI FoF Composite Returns vs. Tail Risk as measured by FOFiX  
(Source: Hedge Fund Research, Inc., © 2009, [www.hedgefundresearch.com](http://www.hedgefundresearch.com))

As shown in Graph 2 below, one can observe risk growing since February 2006, when the credit bubble entered its cruise regime. The red alert actually emerged in May 2007, with the highest level of risk ever observed since the LTCM crisis.



“Black swan” proponents claim that the market dislocated, instruments became correlated and liquidity dried up due to the massive flow in redemptions. They allege that these factors rendered the *impact* of the crisis on hedge funds unpredictable. In other words, the market itself was not the black swan; rather the market impact on hedge fund managers *was* the black swan.

Again, we believe this analysis to be flawed. Rather, we argue that the impact of the market crisis on hedge funds was perfectly predictable, as seen in the following analysis:

- Winners: predicted to make money during a crisis
- Followers: predicted to lose less than the average
- Losers: predicted to lose more than the average

We have tested the same three buckets for actual performance and compared them to the predicted impact. Therefore, each of the nine bubbles in the following graph corresponds to a couple: the predicted bucket versus the actual bucket.

The size of the bubble is equal to the size of the corresponding fund population. For instance, the large green bubble in the bottom left quadrant corresponds to the funds predicted to be losers and that actually were losers: they represent 36% of the overall population. The yellow open circles represent what would have been a perfect prediction, so the largest errors are the bubbles furthest from the yellow circles.

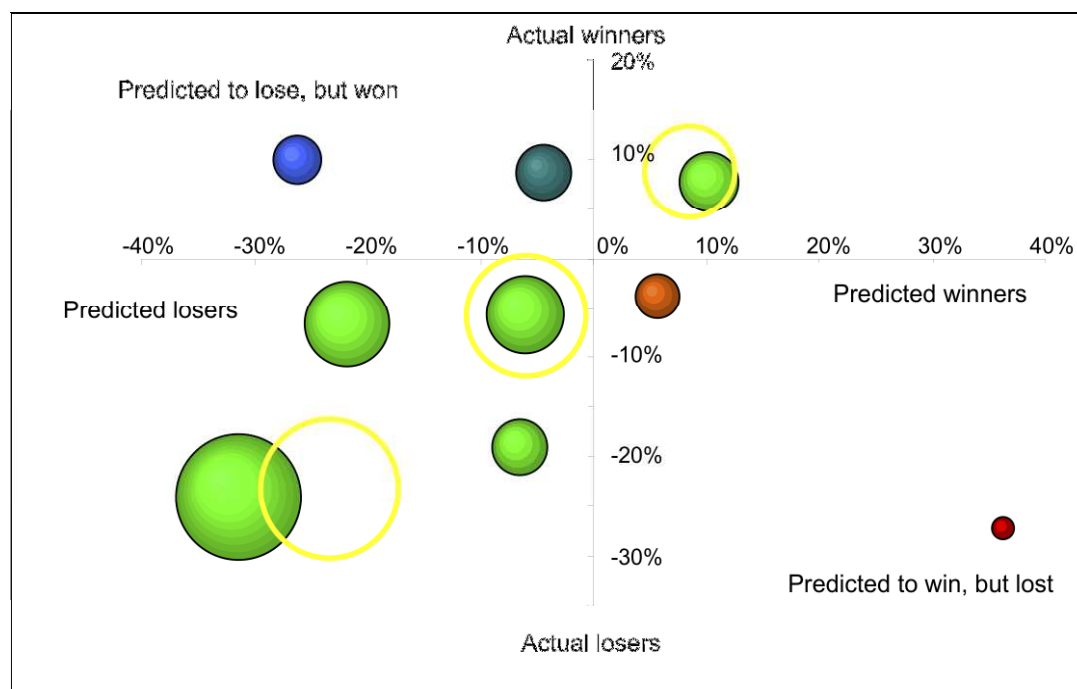


Figure 3 : Predicted performances (horizontal axis) vs. actual performances (vertical axis) for September and October 2008. Study run on 3,100 Hedge funds reporting to HFR. Size of the bubble represents the proportion of the population.



Returning to the storm analogy, this result is similar to observing boats in a race bobbing in the water prior to a hurricane (the vertical axis amplitude of the waves being reported, due to accurate weather forecasts). One then guesses performance in the horizontal axis: the ones who will win the race (i.e. expected to make positive returns, the right part of the chart), the followers, who will end the race without winning (i.e. had losses below average, the medium part of the chart) and the ones who will sink (i.e. had losses above average, the left part). Then, after the hurricane, we observe the actual behavior (again the vertical axis): the actual winners are in the upper part of the chart, the followers in the middle part, and the ones who actually sunk are in the lower part.

And as we can see, *the proportion of serious errors is very small*: the small red bubble in the bottom right quadrant corresponds to the funds predicted as winners that actually sank. The top left blue bubble represents those predicted to sink, but who actually won.

## Overcoming Storms: What works, what doesn't?

Some might still say that one lacks recourse, when facing calamitous market events. This is true of old practices, which are of two kinds:

- *qualitative diversification* - based on allocation limits per asset class (i.e. equity, fixed income) and/or per strategy (i.e. long short equity, macro, CTA, etc.);
- *quantitative diversification* - based on backward-looking models, including the most sophisticated ones, i.e. those supposed to account for *fat tails*.

The qualitative approach makes the implicit assumption that different allocation buckets behave more or less independently. However, what may be relatively true in periods of '*business-as-usual*', becomes misleading when entering a storm. That is to claim: "I design my sailing boat assuming that I can face tornados in some cases, and huge waves in other cases, but never both tornados and huge waves."

Unfortunately, the poor performance of 'Funds of Hedge Funds' during the crisis offers a good illustration of the limits inherent in this qualitative approach. It is particularly in this category that one finds the smallest proportion of winners (see Figure 4, below), precisely because of the flaws of qualitative diversification.



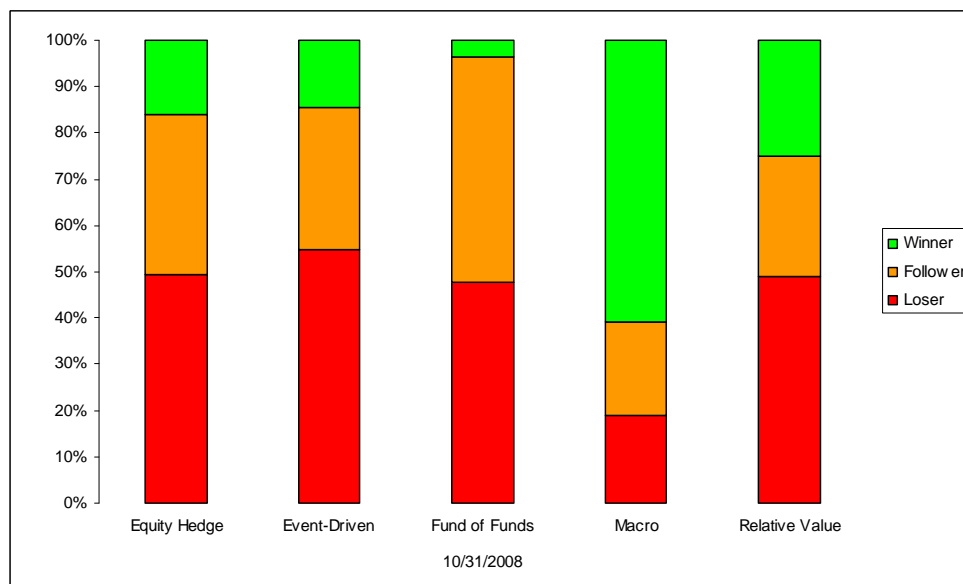


Figure 4: Breakdown of *per strategy* Performance for *September – October 2008*

Some investors and asset managers have resorted to more sophisticated approaches, in order to manage diversification challenges. These approaches include monitoring volatility and using sophisticated models based on “fat-tail distribution”, i.e. precisely designed to properly-assess the probability of an extreme event.

Regardless of their inherent sophistication, again these techniques usually fail because they invariably “look backward”, i.e. analyzing managers’ past performance. There is no need for a complex explanation to understand why this fails; it’s for the same reason that the optimal way to find disaster when sailing in a storm is to look at what just happened instead on focusing on what may happen.

Defenders of these models will argue that observing what just happened can help anticipate what may happen. That is true if you are in a short-term time frame, i.e. that of reactive observation, and able to react almost immediately.

This is the case for short-term fat-tail / GARCH type VaR or “expected short fall” measures, such as the Shock VaR<sup>®</sup> that we calculate because it works well in anticipating potential crashes a few days ahead. This is similar to obtaining a measure of the size of the wave on which you are currently surfing, where estimates are made as a wave begins to form. This information is extremely useful when surfing. It is less useful when you are commanding a super tanker, i.e. when many decisions require hours or many weeks for effective implementation.

Investors can ‘surf’ only if they utilize highly liquid assets, either an overlay of hedges or the liquid component of a portfolio. In contrast, if you are piloting a super tanker and it takes a while to react, then you



require a long head-start, with a very forward-looking model. Looking backward – as most investors do – simply precipitates overreaction to events and a failure to maximize the upside, while minimizing the downside.

A forward-looking model should provide *on time* capabilities for anticipating the impact of market movements on a portfolio, as well as on a portfolio's overall risk. What matters is being able to anticipate the situation in a couple of hours/days, so that the boat and crew can prepare accordingly. This means analyzing the sky, the weather forecast, the wind prediction, the health of the boat, the experience of the crew and its observed reaction to past events – and then entering these ingredients into a model (which in our case will be based on skipper experience, and book reading) to forecast how they are all likely to interact.

### **Win the race in a hurricane: the true value of proactive risk management**

Having a robust risk engine – one stable enough to anticipate the behavior of a portfolio when market conditions become stormy – is like having the right instruments onboard when the wind is blowing and the waves are rising. Yet, having a risk system is not sufficient; one also needs *to integrate forward-looking risk management into the entire investment process*, just like a boat needs a captain and a crew to trim the sails. Having all those elements in place not only protects the vessel, but also, creates value – for instance by making the boat capable of winning a race, even during a hurricane. Similarly, investors and asset managers must begin to consider *forward looking risk management systems*, not just as a means of protection but more importantly, as a *means to create value*.

The purpose of risk management is to create value. At a time when asset management firms and investors continue to face adverse market conditions, saving a few basis points by not investing in an exceptional forward-looking risk system may ultimately maximize the potential impact of market volatility inherent within your portfolio. We see it as being, “points wise, but performance foolish.”

Advanced sailboats require advanced navigation systems, and both talented leaders and specialists to operate them. Tangible results depend on how well you totally-integrate risk management practices throughout your investment process.



In practical terms, this in turn implies that one requires:

- An advanced navigation system: a true, forward-looking risk management engine, capable of providing comprehensive answers to three questions:
  - How much?
  - What?
  - How?
- The above objectives should be realized on a long-term basis, and in various market regimes. The system must use proven, comprehensive, forward-looking and back-tested risk models that exploit large numbers of factors and that capture both non-linear behavior and correlation breaks.
- A well-trained navigator, i.e. a “risk manager”, capable of using such a system and with sufficient seniority to be actively involved in the navigation decision-making process.
- Explicit and clear risk guidelines for your portfolio construction process. These guidelines must be formulated in terms of commitment rather than means. Qualitative guidelines are typically described in terms of means (such as not more than 3% in a fund, or 20% in a strategy), which ultimately fail. Quantitative guidelines can be expressed in terms of commitment, (such as, no market loss higher than 5% with a 99% confidence). The reason for such strict limits is that such limits can be back-tested so as to assess how robust the investment process actually. For this reason alone, the approach presented represents a highly efficient way to structure the investment process and thus insure both confidence and conviction between asset managers and their investors

Knowing what you know now, the future payoff of a FORWARD-LOOKING RISK MANAGEMENT system is clear. A few basis points of performance in cost seem like a price worth paying to ensure smooth sailing.

#### About RISKDATA

RiskData is a leading provider of quantitative risk management tools developed for the hedge funds, funds of funds, mutual and pension funds and asset managers. Riskdata is the only risk control developer that manages both systemic and specific risks. Combining the expertise of professional daily market watchers with state-of-the-art software, Riskdata provides solutions for a sustainable asset growth. Headquartered in Paris, France with regional offices in New York, London and Moscow, Riskdata is servicing over hundred and fifty top financial and investment institutions worldwide.

