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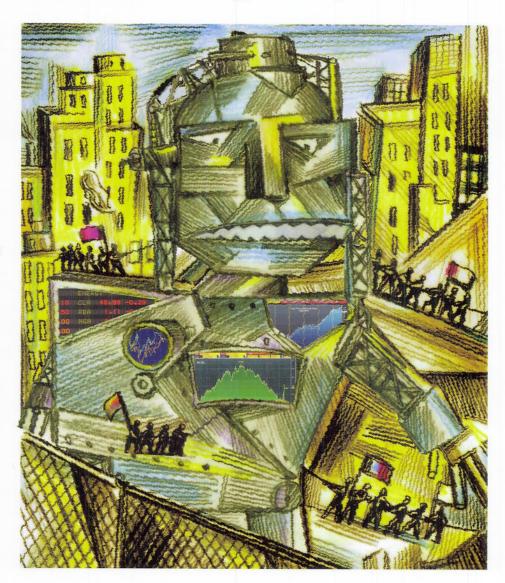
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The Seat Belt Problem

A NEW APPROACH TO CALCULATING RISK-ADJUSTED RETURNS

BY STEVEN ABERNATHY AND GUNNY SCARFO

"People don't perceive that *they* are going to be the one in a crash," laments Russ Rader, media director at the IIHS (Insurance Institute for Highway Safety). "They believe that they are in control when they're behind the wheel. They don't sense how high the risk actually is." The IIHS, a Virginia-based, national nonprofit that has helped significantly increase seat belt usage in the last twenty years, has a simple objective: lessen the risk taken in everyday driving behavior. The risk-measurement approach it employs has the potential to revolutionize how the investment community evaluates manager performance.

In our industry any credible performance comparison is risk adjusted. It makes no sense to equate the returns of two funds that take different amounts of risk. The challenge has always been how to *measure* the risk taken by managers—mathematically speaking, what to stick in the denominator.

Formulas generally fall into one of two categories. Those in the first category, inculcated in CFP®/CFA® study courses as the definitive way of measuring risk, view the variance of past returns as the primary indicator of risk. The Sharpe ratio, Sortino ratio, information ratio, Treynor ratio, and the Morningstar risk rating all fall into this category. Canonized by great thinkers such as Harry M. Markowitz and William Sharpe, these approaches gave us a way to measure risk with precision and a toolbox for evaluating performance. Look at returns as a distribution, MPT (modern portfolio theory) told us, and you can apply measures like skew, kurtosis, standard deviation, correlation, beta, and alpha. The second school of evaluating performance—found in the Calmar, MAR, and Sterling ratios—suggests that the risk denominator should be a manager's maximum historical drawdown. There is something elegant and candid about this approach: it says to managers, "No amount of positive performance will make up for that downturn."

Critics have jumped on both schools for their reliance on applying past correlations to future market events. Yet there is a larger, more fatal flaw in both of these schools that has yet to be adequately addressed: neither solves the "seat belt problem."

THE SEAT BELT PROBLEM

Each day somewhere between 15% and 20% of drivers do not wear a seat belt in their excursions. This is indisputably risky behavior. While serious crashes are rare, their magnitude is catastrophic. Here is what is most important: not wearing a seat belt is risky whether or not one is ever in a crash. In other words, the *amount of risk taken* and the *outcome* are distinct.

In some areas of life, such as poker and other math-driven games, this distinction is worthless, because a big enough data set yields a reversion to a mathematical expectation. Play enough hands of poker, or roll enough dice, and the variance of your results will, over time, closely resemble the actual risk you took. But, in open-ended complex systems (like driving and capital markets), there is no certain mathematical expectation—and even if there were, we would have no idea how many data points we would need in order to draw conclusions.

When dealing with investments, how does one measure the risk that managers *actually took*, independent of the outcomes of their returns? This is the seat belt problem. The formulas above, from Sharpe to Sterling, fail to measure the one thing they are used to measure most: the risk managers took to earn their returns. In fact, these formulas use returns in *both the numerator and the denominator*. How could such a thing ever measure risk in a complex open system?

Russ Rader understands this intuitively: "We track success by measuring what percentage of people buckle up each year. We focus on the actual risk they are taking, not just the outcome of whether or not they were killed in an accident that year." Rader does not define safety by the standard deviation of crash results, or the average number of people who were or were not injured, or the skew of severity of injuries. Instead he measures the risks people take rather than the frequency or magnitude of the outcomes.

MEASURING RISK WITHOUT USING RETURNS

Suppose you are presented with a choice between two managers. One has earned a 7% return over a five-year period while keeping the portfolio hedged (using options, short positions, and/or cash) so that the most a client could have lost in a large-scale market crash would have been 20%. The second manager also earned a 7% return but did so with a portfolio that put 99% of capital at risk in the event of a large market crash. Suppose the second manager had a less volatile performance and a smaller maximum drawdown.

Which manager was less risky? Conventional measures would suggest the second manager, with less volatility and a smaller drawdown, earned the better risk-adjusted

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return. Yet certainly there must be room for a perspective that argues that the first manager put considerably less capital at risk while earning the same return. Is this not a better risk-adjusted performance? Our industry lacks a way to acknowledge the insurance that the first manager bought against something that never materialized. The risk metrics in use today focus on *what happened* rather than *what could have happened*. As a consequence, we are vulnerable of becoming the turkey in Nassim Nicholas Taleb's *The Black Swan*—unknowingly exposing ourselves to a major blowup.

CALCULATING THE RISK TAKEN

In order for risk management mathematics to evolve, they must become simpler, not fancier. There is a way to measure market risk and acknowledge it as primary to measuring volatility risk. Like all portfolio ratios, it is imperfect but valuable. The metric, which we will call the CaR ratio, uses a manager's returns in the numerator and the manager's CaR (average daily capital at risk) in the denominator. CaR is measured by asking: if the value of every stock and bond in the portfolio dropped to zero, what percentage of invested capital would the portfolio lose? How much pain could a downturn possibly inflict on this portfolio? For example, a stock with a put option at a strike price 10% below market would mean the position has only 10% CaR. On a portfolio level, one can similarly measure the CaR by determining what percentage of capital is protected by options or short positions, or is in cash. There are several mathematical expressions of this formula, but all would use CaR as representative of the risk taken.

The CaR ratio is important for those who select managers for a living. It is built to be used right next to—and sometimes in place of—the traditional MPT measures of risk-adjusted performance. It is important because it reveals something that, to date, has been largely hidden or ignored: there are managers who maintain serious protection against a market crash—in other words, a CaR of less than 75%, 50%, or even 10%—while still outperforming markets. Imagine a manager who triples the S&P 500's performance with less than 10% CaR in a crash. They are out there. These managers are built for periods like the present; they have the capability to protect investor capital from unforeseeable events and save advisory businesses from client loss. Without the measure of CaR, however, they never show up in a manager screening. Instead, capital gets allocated to a "low risk" manager (one with low historical volatility/drawdown) who may wear no "seat belt" whatsoever.

A SHIFT IN THINKING

How quickly can our industry embrace this shift? Maybe Russ Rader can help answer that. Rader, whose organization has helped to increase seat belt use from 11% in 1981 to 83% today, knows something about changing attitudes: "Telling people about the risk of death doesn't seem to get them to buckle up. People just don't believe that a serious crash is going to happen to them. People don't do what's best for them unless they believe they're likely to get a ticket."

In our industry, the "speeding ticket" feared by managers is a loss of allocation from consultants, advisors, and institutions. Since those allocators currently use traditional measures of risk-adjusted returns, few managers bother to take CaR into account. As a result, our industry remains saddled with the seat belt problem. Everyone's exposure to black swans is higher. Clients earn returns that could have been earned with considerably less capital at risk.

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Intelligent allocators have always found new ways to evaluate (and thus incentivize) managers. The CaR ratio offers allocators a new way to measure risk—and hence performance—in a world in which past correlations are suspect and the most pernicious risks we face going forward may be invisible until they happen. ∎

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