

## **A Conversation With**

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# Optimization and the TD Epoch Quality Capital Reinvestment Strategies

**The Quality Capital Reinvestment strategies use portfolio optimization as part of their investment process. Let's start with a basic question: what does "optimization" even mean?**

At its core, the idea of optimization is about finding the "best" (or "optimal") combination of expected return and expected risk. The obvious question then is how do we define "best?" The answer goes all the way back to Harry Markowitz's seminal work in the 1950s on portfolio construction, which was the foundation of what we call Modern Portfolio Theory (MPT), and which won him a Nobel Prize in Economics. Markowitz's work was what really got people to think about portfolios in what we call "mean/variance" terms. In the world of MPT, the two most important characteristics of a portfolio are its mean return

over time and the variance of those returns, which MPT uses as its primary measure of risk. People had always had an intuitive sense that there should be some relationship between an investment's riskiness and its return. If you are considering two investments, and one seems riskier to you than the other in some way, presumably you want to get paid more – in the form of a higher return – for taking on that additional risk. MPT quantified that intuitive relationship by using the volatility of an investment's returns as a measure of risk and, and then devised various ways to measure the tradeoff between risk and return.

Now, when you combine different assets, such as a group of stocks, into a portfolio, the returns are additive, but the risk is not. To use a simple example, if you put 60% of your money in a stock that goes up 10%, and the other 40% in a stock that goes up 20%, your portfolio will be up 14%, the weighted average

of the two returns. But the volatility of the portfolio will not be the weighted average of the volatilities of the two stocks, in the way that the return is. It will depend on how the returns of the two stocks correlate with each other over time, because sometimes movements in one stock will offset movements in the other. The lower the correlation between the returns, the lower the volatility of the combined portfolio will be. A central point of Markowitz's work was that when you combine assets into a portfolio, you should pay attention to how they correlate with each other and set the individual asset weights within the portfolio in such a way as to make sure you are taking risk "efficiently," that is, you're getting the highest possible return for any given level of risk, or the lowest possible risk for a given level of return. That's very hard for a human to do without the help of technology such as an optimizer.

### **So, what exactly is the optimizer you speak of, and how does it work?**

An optimizer is just a software program. It draws on various data sources to calculate a portfolio's expected return and expected risk, both in absolute terms and relative to a benchmark that you specify. To calculate expected risk, it relies on historical volatility and correlation data for each stock over the previous few years. So, for any combination of stocks, it can calculate an expected total risk number as well as an expected tracking error. For expected returns, we have to provide the numbers, and we use the Epoch Core Model as the source for the expected alpha. Once the optimizer has all that data, it looks at our existing portfolio, considers all the stocks that pass our Cap Re screen that we don't currently own, and suggests some trades that it thinks will improve the relationship between our expected alpha and our expected tracking error. Some of those suggested trades will be new names, some will be complete sales of existing names, and some will be adjustments up or down to the weights of existing names. We put some constraints around the process, on things like turnover, country and sector weights, individual position sizes, and so on.

### **In practice, you end up rejecting many of the optimizer's suggestions. Why is that?**

Well, at TD Epoch we are big believers in the concept of "racing with the machine." What that means is that there are some things that machines (by which we really mean technology) can do better than humans, and there are other things that humans can

do better than machines. Working together, humans and machines can produce a better outcome than either could on their own. In our case, we think the thing that the machine can do better than we can is to take into account that huge correlation matrix of dozens of stocks and figure out the most risk-efficient way to combine them into a portfolio. But humans are still better at figuring out which stocks to own. And that's because the machine can only take into account the quantitative data. That data is important as a starting point, but there is all sorts of qualitative information you need to take into consideration as well when you are thinking about investing in a business, and that kind of information can really best be evaluated by humans. In our strategy, we are very focused on identifying what a company's sustainable competitive advantage is that will enable it to continue to earn high returns on invested capital in the future, and on what the risks to that sustainability are. That might involve understanding how unique a company's technology is, or how strong a company's brand is, which a machine can't do the way a human analyst can. Or it might be that a company looks good today on the quantitative data, but that could be a short-term phenomenon driven by, in the case of a mining company for example, a recent rise in the price of iron ore, something the company has no control over. The optimizer can see which companies look good today quantitatively, but it has no ability to judge whether those companies will continue to look good next month, next quarter, or next year. You need human judgment for that, and no stock gets into our portfolio unless it passes the vetting of our fundamental research. So yes, we do end up rejecting many of the names that the optimizer suggests we buy, but we do tend to listen to it when it comes to deciding how to weight the names we do choose to include. Even there, though, we do reserve the right to adjust individual security weights to reflect the strength of our views on a stock, including selling names that the optimizer suggested we hold on to.

### **How do you evaluate whether the interaction between you and the optimizer is working well?**

The best way to measure that is to see how our information ratio compares to our peers. The information ratio is the ratio of alpha to tracking error. Obviously, active managers have to look different than the benchmark if they want to outperform, and deviations from the benchmark create active risk, which we call tracking error. The information ratio just measures how efficiently a manager turns that active

risk into active return, i.e., alpha. At the simplest level, if two managers can both generate 2% alpha, but one can do it with 3% tracking error (an information ratio of 0.67) while the other one generates 6% tracking error (an information ratio of 0.33), the first manager has done a better job, because they have generated the same alpha as the second manager while staying closer to the client's desired underlying asset class exposure. When you look at the information ratio for the various Quality Capital Reinvestment strategies over longer-term periods, we have consistently ranked very highly within our peer groups. Over the five years through September 30, 2023, the information ratio for the Global Quality Capital Reinvestment strategy ranks in the top 1% of eVestment's Global All Cap Growth category, and the U.S. Quality Capital Reinvestment strategy ranks in the 3rd percentile of the U.S. All Cap Growth category. The Non-U.S. Quality Capital Reinvestment

strategy doesn't have a 5-year history yet, but for the three- and three-quarter years since its inception its information ratio ranks in the 6th percentile of the ACWI ex-US All Cap Growth category. And the high information ratios are not coming at the expense of alpha. Over those same time periods, the alphas for the three strategies rank in the 7th (Global), 11th (U.S.), and 16th (Non-U.S.) percentiles of their peer groups.<sup>1</sup> So we would say that the interaction has worked well. Historically, we've been able to find attractive stocks, and the optimizer has combined them in such a way that has enabled us to achieve those alphas with very efficient levels of active risk.

<sup>1</sup> Source: eVestment. The data referenced above is of a representative account and such data may vary for each client in the strategy due to market conditions, client guidelines and diversity of portfolio holdings. The data is unaudited and may change at any time. The data is shown for informational purposes only, and is not indicative of future portfolio characteristics or returns.

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