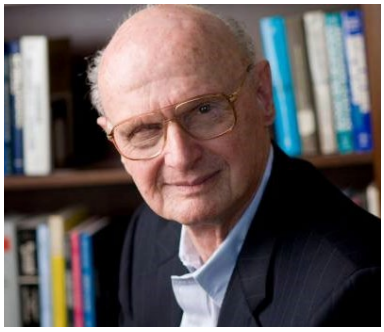
The impact of Markowitz - An interview with GSI

The recent death of Professor Harry Markowitz, who won a Nobel Prize for his work on portfolio construction, has sparked debate in the asset management industry about the role he played in the development of academic finance.



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So how big a contribution did he make? What legacy does he leave? And how do his insights inform the approach of a modern-day systematic fund manager like GSI?

Robin Powell has been discussing some of Markowitz's key insights and the impact they've had on the GSI approach with Garrett Quigley and Bernd Hanke.

Robin Powell: There have been so many tributes paid to Harry Markowitz since his death, and they all testify to the pivotal role he played in our understanding of investing. The FT's obituary, for example, asserted that the study of finance can be split into two eras: before and after Markowitz. Is that a fair comment?

Garrett Quigley: Markowitz was the first to set out a mathematically rigorous way of modelling portfolios and how they relate to investors' utility for wealth. He applied ideas from utility theory, probability and optimisation, which was a real breakthrough at the time. It laid the foundation for a new way to think about how to build portfolios and investing in general, and those key concepts still apply today, though in many different ways.

Bernd Hanke: Yes, I do think it's fair to say that Markowitz was pivotal. Crucially he introduced the concept of diversification to investing. Diversification allows investors to combine securities in such a way that they obtain the lowest possible risk for a given level of expected return or the highest expected return for a given level of portfolio risk. Before Markowitz, academic finance was solely about expected returns, ignoring risk and diversification. Markowitz's discovery was the stepping stone for a host of further important developments in finance.

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We discuss some of Markowitz's key insights and the impact they've had on the GSI approach.

RP: As you say, Bernd, it's widely agreed that the chief contribution Markowitz made was to prove, mathematically, the benefits of diversification and not putting all your eggs in one basket. But there was far more to Modern Portfolio Theory (MPT) than that, wasn't there?

GQ: That's right, it's not all about diversification. Markowitz identified the key general issues that apply to any investor when thinking about investing. This involves having some expectation about returns for different investments — for example, across different stocks, or say stocks versus bonds — and then thinking about how "best" to combine them. But each person may have different views on the expected returns of each of those assets and their risk. Also, they might have different degrees of sensitivity to risk in general. His model set out how to combine all of that information into one combined analysis. This was a completely general framework that anyone could apply.

Markowitz emphasised the importance of risk when thinking about portfolios and developed the initial framework for optimising how to achieve the best trade-off between the expected return of a portfolio and its risk.

BH: The main focus of Markowitz's work over the years was on optimal portfolio selection. He was the first person to demonstrate that there are two components of risk, namely systematic risk that cannot be reduced through diversification and unsystematic risk specific to individual securities, which can be diversified away. Markowitz did a lot of work as well on how to build a portfolio in the most efficient and robust manner. So not only did he have invaluable insights, he also knew how to put those insights to work in practice.

RP: It's extraordinary to think that Markowitz was essentially awarded a Nobel prize for the work contained in his PhD thesis, Portfolio Selection, which he wrote in 1952. Professor Campbell Harvey at Duke University described that thesis as "the foundational paper in finance". William Sharpe has said that Markowitz got him thinking about what became the Capital Asset Pricing Model (CAPM), which in turn was built on by Fama and French. Was Portfolio Selection foundational?

GQ: Yes, it was foundational, because of the rigour and clarity of analysis that he brought to the field. Integrating utility theory, probability theory and optimisation was certainly a foundational innovation. Markowitz emphasised the importance of risk when thinking about portfolios and developed the initial framework for optimising how to achieve the best trade-off between the expected return of a portfolio and its risk. He also set out the key benefits of diversification in reducing the risk of a portfolio and how to model the risk and return of portfolio based on the assets in it, and their weights. Later developments are really extensions built on those key ideas.

BH: There's a direct link between Portfolio Selection and Bill Sharpe's CAPM. In essence the CAPM states that the systematic risk represents market risk and that all risk that is unrelated to market risk is security specific risk, or unsystematic risk, which can be diversified away. The CAPM is therefore an extension of Markowitz's foundational work. Multi-factor models, such as the Fama-French model, that were developed later are based on the same general idea.

RP: Campbell Harvey mentioned two specific examples of research he's conducted over the years that were inspired by Harry Markowitz. Both of you have conducted academic research on your own. Has any of that been specifically informed by the work that Markowitz did? And if so, how?

GQ: A key theme that we emphasise in our investment process is maintaining diversification. We think it's really important not to over-concentrate portfolios. One of the critiques of Markowitz's optimisation process is that it can in fact potentially lead to very concentrated portfolio unless steps are taken to manage that. Also, stock returns are very noisy and unpredictable therefore its always best to maintain diversification. Our work has shown that this clearly benefits portfolios in the long run.

BH: In everything we do at GSI, be it capturing factor premia or an ESG or sustainability tilt, we always attempt to achieve these objectives in a well-diversified manner. This allows us to exploit these desirable characteristics efficiently, without incurring undue risk. In the past, research I've done on risk estimation has also been heavily influenced by Harry Markowitz's work, which often extended beyond finance and into operations research.

RP: There are, though, aspects of the MPT approach that GSI, as a company, you haven't chosen to integrate. An example of that is mean variance optimisation — in other words, trying to find the biggest reward at a given level of risk or the least risk at a given level of return. Why haven't you gone down that route?

BH: Our portfolio construction approach is implicitly a mean-variance optimisation. However, we don't estimate the inputs to the mean-variance optimisation — i.e. expected returns, risks and correlations — in the traditional manner. Whenever a mean-variance optimisation is performed on a large number of securities, some of which might be highly correlated, slight misestimates of returns, risk or correlations can lead to extreme and unreasonable portfolios as well as fragile allocations over time. To guard against this, more robust proxies and heuristics often lead to better portfolios. This is the approach we have adopted.

RP: GSI is a value, and deep value, investor. I had the privilege of interviewing Harry Markowitz in San Diego in 2017 and I asked him about factor investing. He told me investors should have cash and bonds and be broadly diversified across all the major types of stocks. Markowitz had his critics in the factor investing space. Do you see a tension between broad diversification and the factor-based approach?

BH: I don't see a tension between the two approaches. The market-weighted approach is itself a factor-based approach where the only systematic factor is assumed to be the market. Over the last few decades though, researchers such as Fama and French have found other systematic factors, in addition to the

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market factor. Just like the market, they are factors that affect all assets and are therefore called “systematic”. Whatever set of factors you use, it is always important to exploit those factors in a manner that is well-diversified. This ensures an efficient investment process with an optimal return-to-risk trade-off.

GQ: Investors should be diversified regardless of the asset class they invest in — for example, large cap, small cap, value, growth and so on. There is a trade-off between maintaining diversification and tilting a portfolio further along say the value spectrum, especially if we want to combine that with an emphasis on stocks with higher ESG ratings. We do try to carefully manage those different objectives. In fact, at the stock level, even our deeper value strategy has a higher level of diversification than a broad market index.

RP: In 1999, the financial newspaper Pensions & Investments named Harry Markowitz “man of the century”, which is quite an accolade. Of course, investing has changed a great deal over Harry’s lifetime, and arguably the biggest challenge the industry faces in this century is the need to balance financial risk and return on the one hand and environmental risk and return on the other. Does Markowitz have any relevance for ESG fund managers specifically?

GQ: Markowitz’s framework is quite general and can in principle be applied to whatever set of objectives an investor may care about. Therefore, in our investment approach, we can integrate a tilt to ESG as well as to typical factor tilts using the same approach of maintaining diversification, managing risk, as well as managing expected trading costs.

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BH: I agree that Markowitz is relevant for all forms of investing. His theory implies that any potential portfolio tilt, such as a tilt to high-ESG stocks or to stocks with low carbon emissions, should ideally be constructed in the most diversified manner possible. This allows managers to achieve a “clean” tilt with stock-specific risk minimised or eliminated. This approach differs from impact investing which tends to build relatively concentrated portfolios that contain a small number of high-sustainability or high-ESG stocks only.

RP: In his 1996 investing classic Against the Gods, Peter L Bernstein suggested that Markowitz misunderstood risk. He used the analogy of a group of hikers that come upon a bridge that would greatly shorten their return to base. “Noting that the bridge was high, narrow and rickety,” he wrote, “they fitted themselves with ropes, harnesses and other safeguards before starting across. When they reached the other side, they found a hungry mountain lion patiently awaiting their arrival. I have a hunch that Markowitz, with his focus on volatility, would have been taken by surprise by that mountain lion.” Do you think catastrophic climate change might be that mountain lion?

GQ: It’s up to us as investors as to what ingredients we put into these risk-return models. The models themselves are agnostic unless they are specifically designed to model climate risk or other issues related to sustainability and will generate optimised portfolios based on whatever data is input to them. Some

investors may choose to ignore climate change in their portfolio, and many investors might still perceive large gains to be had from investing in companies involved in fossil fuels, for example. We think it is important to include climate considerations when building portfolios, not just because of the obvious climate risks, but because innovation in renewable energies and technology will likely mean that the expected returns to fossil fuel companies could be much lower than in the past.

BH: We can only speculate, of course, on how the future will unfold. We could see catastrophic climate change, or perhaps more widespread war and unrest, or a more lethal pandemic than Covid, or something else entirely. I suppose the nature of the risk that Peter Bernstein describes is such that we don't know whether a catastrophic event will happen or when it will happen, and we don't even know what the catastrophic event could be.

RP: As we discussed earlier, there's a clear connection between the work of Markowitz, Sharpe, Fama and French. It's now three decades since Fama and French published their research on the Three-Factor Model, and although they've added new factors to the model, we haven't seen any truly ground-breaking developments in academic finance since then. What aspects would you like to see future Nobel laureates focus on?

GQ: The factor research literature has led to a huge proliferation of proposed factors, as researchers such as Campbell Harvey and John Cochrane have critiqued. There is still much work to be done to simplify this so-called zoo of factors. I would also like to see economists push harder on issues related to the internalisation of environmental costs, where companies are properly charged for their use of natural resources, or for their waste. Plenty of economists are now trying to focus on this, as well as issues such as how to best structure charging systems or taxes for carbon emissions.

BH: Given the situation the world is in now, one of the most important areas that future financial economics research should focus on is sustainability in its various shapes and forms and how sustainability can increase company value to incentivise companies to adopt sustainable business practices. If companies can see a clear path on how they could be "doing well by doing good", they are going to be more likely to take that direction.

RP: Thank you, both, for your thoughts Harry Markowitz. And let's remember, he wasn't just a hugely intelligent man; he was also a man of integrity, who believed in doing the right thing. He loved philosophy, and his favourite philosopher was Aristotle. When I interviewed him he told me that his guiding principle in his life and work was eudaimonia — essentially being a good person and helping others. The financial industry would probably benefit from a greater spirit of eudaimonia.

ROBIN POWELL is a freelance journalist and author, and is the founding editor of The Evidence-Based Investor.

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