Q&A WITH ANDREW LO, PHD

Why Indexes Need to Enter the 21st Century

The start of the 21st century may go down as the age of personalization. Technological advancements make it possible to manage massive volumes of data. Advanced analytics and algorithms make it possible to predict customer behavior. From Amazon’s recommended list to retargeting ad strategies, businesses are putting big data to work in creating personalized offers and experiences for their customers.

But not all businesses have come to grips with personalization. According to Andrew Lo, the investment management industry has been slow to deliver on personalization. Robo-advisors are applying algorithms to build rudimentary static investment portfolios, but Lo sees a greater opportunity in creating customized dynamic indexes.

Lo, who is the Charles E. and Susan T. Harris Professor of Finance and director of the Laboratory for Financial Engineering at the MIT Sloan School of Management, and chairman and chief investment strategist at AlphaSimplex Group, recently published his paper, “What Is an Index?” in the Journal of Portfolio Management. In it, he identifies this opportunity to construct personalized indexes by questioning long-held conceptions of what an index is and then asking what it could be.

David Goodsell, executive director of Natixis Global Asset Management’s Durable Portfolio Construction* Research Center, recently conducted a brief Q&A with Lo to find out more about this project.

Goodsell: Andrew, why do you think we need a new definition of an index?

Lo: Technology has really changed the way indexes can be constructed. Trading and back-office challenges used to imply that only market-cap-weighted indexes were feasible. But now, with automated trading platforms, electronic broker–dealers, and the ability to construct portfolios algorithmically, a lot more opportunities have emerged for constructing highly customized portfolios.

Goodsell: Your paper outlines a new definition of an index. What are the basics behind this new thinking?

Lo: The article begins by asking the basic question, “What is an index trying to accomplish?” An index can really serve two purposes: One is a summary of information regarding a particular group of securities or market. The second, and more important, function of an index is to serve as a benchmark for investors—this is what you could have earned if you had put your money to work in this way.

In breaking down an index into its core functions, you find three components: First, it has to be totally transparent—every aspect of the index must be public information. Second, it must be investable; an investor should be able to invest a large amount of capital over a short period of time and be able to realize the return reported by the index. Finally, it must be systematic; the index should be entirely rules-based and not dependent on any discretion or human judgment. No alpha should be necessary to implement the index in a live portfolio. Any investor should be able to do it.

If you take those three components as the definition of what an index ought to be, that really changes the landscape for what’s possible given the technologies we now have at our disposal.

Goodsell: So, what are the implications for this new definition? What does it mean in terms of how someone invests and the benefits of this new approach?

Lo: I think there are a host of implications. One is that it broadens the opportunity set for investors, and, in particular, creates the potential for developing personalized indexes, indexes that are designed to help an individual achieve his or her specific financial goals subject to that individual’s unique circumstances. The second implication is that it greatly increases the ability to diversify your portfolio—instead of diversifying just across asset classes, we can now diversify across strategies as well as other kinds of features that can be captured by these dynamic indexes.

Goodsell: This is the first in a series of papers and part of a larger overall project. What’s the goal of all this work?

Lo: The initial phase is to understand what we’re up against. This first paper describes the current state of the world, the rapidly changing nature of indexation, and the blurred lines between passive versus active

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investment management. The next step is to develop an algorithmic representation of how investors actually behave. We have a number of financial theories about how we think investors ought to behave, whether it's mean-variance portfolio theory or the capital asset pricing model, but we don't yet have a fully integrated algorithmic understanding of how investors really behave in different financial circumstances. Once we develop that algorithmic representation, we can then start designing financial products that address some of the least productive aspects of those behaviors.

We criticize investors for selling too soon or buying back too late—for having all sorts of behavioral biases—but we don't really have any clear understanding of when those kinds of biases kick in or don't kick in. And we don't understand how those biases interact with each other. Until we do, we're not going to be able to design financial products that are robust to these kinds of behavior.

So the next stage, the stage that we're currently in now, is to document and estimate those kinds of biases in an integrated fashion so as to develop a more complete and realistic representation of investor behavior. Once we have a reasonably accurate model, we can start to think about what kinds of financial products and services would end up being most productive to individuals.

Goodsell: Your paper discusses the difference between investment management and risk management. How important is it to understand that key difference?

Lo: It's absolutely critical, and that's one of the main reasons I wrote this paper. There seems to be this unspoken assumption in the investment management industry that passive investing and active investing ought to go hand in hand with no risk management and active risk management, and it's just not necessary.

In other words, the status quo is that actively managed funds also engage in active risk management, like a hedge fund, but passive index funds have no risk management to speak of because, of course, they're just trying to minimize tracking error with their index.

But shouldn't an investor always manage risk? When your portfolio starts to lose a significant amount of money, shouldn't you start taking some action so as to preserve value? However—and here's the really important question—are you also willing to move your money back into risky assets once the crisis subsides? Most people are great at moving money out of harm's way, but they forget that it's just as important to put money back to work when markets return to normal. Far too often, the process of shifting assets in response to changing risks happens instinctively and emotionally as opposed to rationally. That's where active risk management comes in. It's now possible, thanks to this new definition of an “index,” to be passive about alpha but active about risk management.

Goodsell: Andrew, just how personal can an index be?

Lo: Given the technology we have at our disposal today, I believe that it can be literally as personal as individual-by-individual, and it really ought to be because no two individuals are alike. Even two individuals in the very same household can have very different objectives—for example, a grandparent and his grandchild. That's a situation where you really need to take into account the unique circumstances of each and every member of that household, and we actually have the computer technology to be able to do that.

The challenge is that we don't yet have the financial technology. So that's what we're working on now, to come up with the appropriate algorithms that will allow us to customize products to each individual investor's unique circumstances, psychological profile, and emotional state. If we succeed, we'll be that much closer to Marvin Minsky's dream of someday building a computer that could be proud of him.1

Endnote
1. Marvin Lee Minsky (1927–2016) was a cognitive scientist and co-founder of MIT's Artificial Intelligence Laboratory.

Reference

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