

THE VOLATILITY OF VOLATILITY

"In the long run, we may all be dead, as Keynes suggested, but we need to make sure that the short run doesn't kill us first," says Andrew Lo

By Nathan Jaye, CFA

A significant challenge for investors and regulators “is to recognize that the financial system is in fact a *system*,” says Andrew Lo, professor of finance at MIT Sloan School of Management. The point may seem obvious at first glance, but according to Lo, until the system is mapped in greater detail and its interactions with other systems are better understood, trying to measure or manage systemic risk will remain a nearly impossible task. The inability to think “with the system as the unit of analysis” leads to policies that increase uncertainty in financial markets—or what Lo calls “the volatility of volatility”—which means investors can expect more turbulence and dislocation ahead.

Among his varied roles and achievements—founder and chief investment strategist of Alpha-Simplex Group (a Cambridge, Massachusetts-based investment advisory firm), associate editor of the *Financial Analysts Journal*, recipient of CFA Institute’s 2005 James R. Vertin Award—Lo now serves on the advisory council of the Future of Finance initiative. In this interview, Lo explains his ideas for a “financial safety board” as well as “Financial Regulation 2.0,” why his adaptive markets hypothesis is catching on with practitioners, what makes the Future of Finance project “an incredibly important and timely initiative,” and how the unnecessary coupling of alpha and sigma harms investors.

What are your thoughts on financial regulation enacted since 2008?

Like most large-scale regulatory reform, it’s a bit of a mixed bag. There are definitely very positive things that have come out of the Dodd-Frank Act of 2010. But at the same time, it’s also introduced tremendous complexity. It’s going to take us probably another 3–5 years to fully realize all of the implications of this seismic shift in the financial regulatory landscape.

The hope is that it’s an ongoing and adaptive process where policymakers and regulators are going to be interacting with industry to be able to produce a better and more productive regulatory framework. But it’s still in the early days of how all of that will play out.

You’re saying we’re not sure how regulations will work in practice?

That’s right, because the Dodd-Frank Act is 2,319 pages long and calls for tremendous change in terms of oversight as well as compliance. Many of the rules that have been proposed are yet to be implemented. Clearly, the regulatory agencies are behind, largely because we’ve actually reduced their resources—we cut their budgets despite the fact that we’ve given them much greater responsibility now for oversight. This situation is a very frustrating one, not the least for regulators, never mind those who are being regulated.

In the past, you proposed a financial markets safety board. Is that similar to the Financial Stability Oversight Council?

Not really. The Financial Stability Oversight Council is currently a college of regulators that gather together on a regular basis to discuss current threats to financial stability. It really isn't designed to function the way that a "Financial Safety Board" would operate. What we need is something akin to the National Transportation Safety Board (NTSB), an organization that is outside of the regulatory system and whose sole function is to conduct nonpartisan scientific investigations into industrial disasters. The NTSB is the organization that figures out what happened, how did it happen, why did it happen, and what needs to change in order to prevent it from happening again.

One of the most effective aspects of the NTSB is the fact that they have no regulatory authority whatsoever and do not sit inside any regulatory agency. So, they are actually free to come up with all sorts of observations and suggestions to improve the system, including changes in how regulators operate. On occasion, they've been critical of regulators like the FAA [Federal Aviation Administration], and that has led to some very positive change at that agency. We don't have anything equivalent for financial regulators. There's no agency that sits outside of the regulatory system to provide constructive criticism for the regulators themselves.

You've come up with a framework called Financial Regulation 2.0. What is that about?

It's a relatively straightforward idea in principle, but the details are, of course, quite complex and implementation is going to be a big challenge. The basic idea is to recognize that the financial system is in fact a *system*. And as a result, it really can't be regulated in a piecemeal fashion the way it is now.

We need to look at the financial system as a system, one that's part of an even larger economic system, and then understand how the various different parts of these systems interact. Financial Regulation 2.0 begins with the system as the unit of analysis, and then within that system, we try to map out all of the different pieces. Ultimately, that will be the only way to get regulation that's more effective than what we have today.

Let's shift to your adaptive markets hypothesis. How widely accepted is AMH?

There seems to be more take-up of the adaptive markets hypothesis among practitioners than among academics. Certainly, there have been academics who have been very supportive of the adaptive markets hypothesis. But the efficient market hypothesis (EMH) is still the dominant theory in academia.

However, in industry, especially after the financial crisis, a number of practitioners, particularly financial advisers

who are on the hook for making decisions for their clients, have taken to the AMH. They've been among the first to adopt the AMH perspective because, from their point of view, the EMH really just doesn't fit with their experience. For example, passive 60/40 investing has not produced the kind of performance in the last decade that it did in the prior six decades. So, something about financial markets has changed, and financial advisers are at the front lines of dealing with these issues.

Investing under the EMH might call for a diversified, long-only, stocks-for-the-long-run, control-your-risk-by-your-asset-mix approach. How does an AMH approach differ?

The point of adaptive markets is that EMH is not incorrect—it's merely incomplete. There are certain market conditions under which those principles that you just described are perfectly appropriate. For example, from the 1930s to the early 2000s, an approach of long-only passive investing—60/40 or 70/30 or whatever your risk tolerance dictated—actually produced pretty decent returns, particularly for those who were investing over a 10- or 20-year horizon.



The problem is that this approach doesn't always work. It really depends upon the environment in which investors are operating. In relatively calm markets—where there are relatively few systemic shocks to the economy—the EMH is a pretty good approximation to reality. When market conditions change and you experience large macro shocks, then simple heuristics like 60/40 no longer work as well because financial markets have changed in their dynamics.

Markets are now much more responsive to intervention by central banks like the Fed and punctuated by the irregular cycle of fear and greed. So, since 2007 and 2008, we've seen a very different market dynamic than in the previous six decades. The point of adaptive markets is simply not to be religiously wedded to any static theory but rather to understand how the nature of markets can change. And once it does change, you need to change with it.

Explain the importance of survival under the AMH.

Fund managers aren't just concerned with wealth creation but also with the avoidance of loss. I think that's really where the EMH has its limitations. When investors fear loss, that fear overtakes all other considerations, and as a result, the whole idea of a risk-reward trade-off can be turned on its head. For example, in 2007 and 2008, virtually all assets lost money, whether you were invested in domestic or international stocks, small cap, large cap, balanced, growth, value. Everyone lost money in virtually every asset class. In fact, the only asset class that did well during that period was government bonds and cash. The logic for this outcome is quite simple. During 2007 and 2008—with the demise of Bear Stearns and Lehman Brothers and The Reserve Fund breaking the buck—all of these macro shocks caused a tremendous wave of panic among a large group of investors.

So what did they do? They reacted like all animals when they are threatened—fly to safety. That meant divesting from risky assets and switching into riskless assets. That process of divestiture basically causes the returns of the higher-risk assets to be lower or negative, and it causes the returns of safer assets to be positive. Basically, that turns the risk-reward trade-off on its head.

Risky assets lose money; riskless assets make money. This kind of phenomenon can happen from time to time, and it can happen over a period of not just months but years. This dynamic is missing in the EMH. In the very long run (by that I mean two or three decades), it may be that equities will earn a reasonable expected return. But over the course of, say, three to five years, it is possible for equity returns to be negative. That's what investors need to take into account. In the long run, we may all be dead, as Keynes suggested, but we need to make sure that the short run doesn't kill us first.

The AMH opens up significant investment opportunities that are impossible to the same degree under EMH, correct?

That's right. It recognizes that things are changing all the time and if you can recognize the change in advance and you are positioned to take advantage of it, you will outperform your competitors. I think the EMH implicitly recognizes this fact because, obviously, it's only through competition, adaptation, and innovation that you're able to make a living by maintaining the efficiency of markets. The EMH is the long-run steady-state limit of adaptive markets.

The EMH is not wrong—it just captures one of many different aspects of market dynamics. Lately, the most interesting aspect of market dynamics is not the steady state of equilibrium; it's the adaptations necessary to drive markets to that efficient limit.

In that adaptation, there is a lot of room for innovation, is there not?

There's a theory that evolutionary biologists have come up with called "punctuated equilibrium." This theory suggests that when there is a large shock to the environment, we are likely to see very, very big changes in the flora and fauna of our ecology. Many species will go extinct—the ones that



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can't adapt quickly enough to the new environment—but a host of new species will emerge and take advantage of these changes, creating their own new ecological niches in the process.

We're seeing that happen right now. ETFs, for example, are filling a niche that didn't exist 10 years ago, and a number of hybrid strategies that mutual funds are launching take advantage of some of these emerging opportunities. Out of the ashes emerges a new phoenix of financial innovation. That's really the nature of progress. It's always two steps forward, one step back.

What are your thoughts on CFA Institute's Future of Finance initiative?

I think this is both an incredibly important and timely initiative. We in the financial industry sometimes need to be reminded that finance is a means to an end. It's a tool that must be used responsibly. This is what the Future of Finance is all about.

Future of Finance will obviously consider financial innovation, but it's also focused on the role of trust, ethics, and fiduciary responsibility in financial markets. These are things that are part and parcel of most financial transactions. CFA charterholders have studied these concepts ever since the beginning of the CFA Program, but it hasn't been as widely appreciated by people outside of the CFA Institute umbrella. Shining a spotlight on creative and responsible ways of using finance to support economic growth and society is a tremendously timely effort.

Can the financial industry really change?

I think it's already changing—and this is a key insight of the adaptive markets hypothesis. When the industry is confronted with huge challenges, it has no choice but to change—it has to adapt to new market realities. For one thing, investors

are going to demand it. I think that financial market participants understand that this is important and necessary, and most stakeholders in this industry already have the sense that you can do well by doing good. There's no contradiction between capitalism and altruism. In many cases, using the financial system to better society is exactly what financial engineering and financial innovation were designed to do.

Greed *can* be good, as long as it doesn't reach the point where we forget that finance is supposed to be a means to an end—when the tail starts to wag the dog. I think this effort by the CFA Institute is really an important step in that direction.

What will it take for the FoF to succeed?

The way it can succeed is if we identify in advance the particular areas where fiduciary obligation is most beneficial—and currently missing—and then we close those gaps. If we look more carefully at the financial crisis, while there may certainly have been lapses of fiduciary duty, I don't think that as an entire industry there was a systematic and widespread violation of that duty. I do believe there were investors who lost money because those who were carrying out their fiduciary duty simply made a bad bet. I don't think we can outlaw financial loss. But if we can identify the gaps in fiduciary duty that should be filled, that would be a very positive development.

Are we going to see more and more volatility in markets?

Yes, I believe we are going to see more over the next year or so. It's related to the financial crisis and the reverberations of that huge shockwave—and more intervention by governments and central bankers than ever before. Quantitative easing, not just in the U.S. but in the eurozone and in Asia, has played a major role in creating more uncertainty about what's happening. When you have the Fed purchasing US\$85 billion of bonds every month and trying to decide when to take the foot off the accelerator and when to raise rates, that type of uncertainty is really contributing to the volatility of volatility.

This is not the fault of the central banks or regulators. They are doing the best they can in the face of huge economic challenges and complexity. But until we get out of this mode of quantitative easing and this dynamic of manipulating markets to benefit all of the stakeholders, we are going to continue experiencing great uncertainty. And during periods of great uncertainty, even small events can be quickly magnified into major market selloffs, so over the next year or two, I do expect that we may see further dislocation in markets, whether it's another flash crash or a problem stemming from European sovereign debt or the Chinese real estate bubble.

You've called for investors to adapt to conditions on a daily basis rather than quarterly or annually.

Yes, absolutely. If you think about the divide that we in the investment management industry have created between passive and active management, this distinction currently also applies to risk management. In other words, if you think

about investing in a passive vehicle, there's no alpha; it's passively managed. But there's also no risk management—if you put your money in an S&P 500 Index fund, when the market goes down by 30%, you will lose 30%. Investors who prefer passive management are now forced to be passive about risk management as well.

This coupling of alpha and sigma is both unnecessary and ultimately detrimental to investors. We need to break that link. In other words, investors should be allowed to invest passively while at the same time managing their risk actively. This kind of risk management involves a daily rebalancing of portfolios in response not to alpha but to sigma. When risks change, we need to change our market exposures in order to maintain the level of risk that we're comfortable taking.

You've gained attention for proposing a megafund for cancer research. What's the latest news?

It's actually developing more rapidly than I expected. My co-authors, Jose Maria Fernandez and Roger Stein, and I published a paper in October 2012 describing the basic idea. We held a conference here at MIT in June where we invited all the stakeholders in the biopharma community—entrepreneurs, biotech investors, venture capitalists, pharma companies, oncologists, the FDA, NCI, American Cancer Society, and various market participants. We had over 200 people register for the conference! It was an amazing set of discussions over the two and a half days. It was clear from those discussions that there is a real need for a different approach to funding biomedical innovation, a private-sector approach that would complement government sponsored research.

I'm cautiously optimistic that this will lead to positive innovation for the industry. But only time will tell whether or not this will really be a viable alternative to business as usual.

How would research backed obligations (RBOs) work?

It's very simple. It's very much like the CDOs that transformed the mortgage business. Research-backed obligations are debt instruments that are backed by cancer research projects as collateral. Because there are a large number of these projects that are put into a so-called "megafund," it will reduce the risk of the portfolio to the point where you can actually issue debt.

These RBOs have senior and junior tranches, just like CDOs. There's even the possibility of getting guarantees either from foundations, endowments, or from the federal government for the senior tranches so as to get a AAA rating. The rating agencies, by the way, were present at this conference, and they contributed their knowledge of how debt ratings are assigned and what bond investors are looking for.

The idea behind RBOs is really to use debt in addition to the traditional financing vehicles of public equity and private equity to finance drug development. This is an innovation because it changes the incentives of the biotech entrepreneurs. By having long-term debt, they are actually able to engage in long-term science, which in my view is how science ought to be done.

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