



**Opalesque Exclusive: Markov Processes' reverse engineering of hedge fund portfolios with a minimum of information gives new insight to firms considering the risk management and replication possibilities of funds**

From Kirsten Bischoff, Opalesque New York: Opalesque recently had the chance to speak with Michael Markov, CEO and Director of Research at the U.S. offices of Markov Processes International (MPI) about the firm's reverse engineering approach to hedge fund analysis as well as their thoughts on hedge fund replication strategies and some of the new ways they are using their data capabilities to increase transparency to clients within the industry.

One of the tests which elite US Navy SEALs must take to be considered expert marksmen requires them to disassemble and reassemble a variety of weapons. In addition to the physical ability to take apart and put together the tools of their profession, they must name each part as they go, while an instructor times them and asks them various probing questions about each part of the weapon and about its function as a whole.

It is perhaps an apt comparison to the requirements of the team at MPI (a team that includes a former lead software engineer with a specialty in robotics and technical cybernetics who designed robots for Russian military and space programs) which disassemble and reassemble portfolios as part of their analysis of a fund's return streams. In fact, the team is capable of reverse engineering a portfolio to provide in-depth analysis of a fund even when given less than a year of returns to work with and only the most basic information on a fund's focus of investing.

MPI launched in 1992 with a focus on mutual funds and institutional products. Using the ideas that Nobel Laureate William Sharpe (creator of Sharpe ratio) published, Markov and Mik Kvitchko, MPI Chairman and Chief Technology Officer, wrote the first commercial application to analyze mutual fund products. The program itself received an endorsement from Sharpe . "It is harder to apply the same methodology to hedge funds because they have fewer restrictions, trade frequently, have derivatives, can turn their portfolio on a whim, and do various things which traditional managers cannot do," Markov explained. However, the collapse of Long Term Capital in 1998 proved to be too intriguing a case study for the team and soon MPI set their sights on the hedge fund industry.

"The key to the analysis is dynamic modelling," explains Markov. "Most analysis is static and the problem with that is betas are changing all of the time...There are techniques in other sciences, especially in the defense industry where they track moving targets. They are very delicate methodologies."

Using an international team of mathematicians MPI was able to write a program which could regress a hedge fund from performance backwards to reveal the portfolio's possible investments.



With only 8 or 9 months of performance numbers they reverse engineered the Long Term Capital portfolio and released a white paper detailing the fund's collapse. The program itself received several recommendations for the firm's first hedge fund clients.

More recently, Markov has used the same Dynamic Style Analysis and released a study on high profile, \$26bln Renaissance Institutional Equities Fund. (That report can be found at MPIs website: [Source](#))

For clients looking for transparency the benefits exist on many fronts. "Once you have a good idea of what the exposures of a fund look like you can actually learn in advance what performance you can expect. You also know what questions to ask of a manager because you have a fuller picture. You can ask them: Why do you appear so leveraged? Why does your strategy appear to have changed last year to this year?" Markov explained.

Once invested in a fund, it is also possible to know in advance of the month end disclosures what to expect. "If the numbers agree with what is reported – then it is a good thing. When the numbers disagree an investor knows to ask what changes have been made in the strategy."

The information can include alerts to fraud. Markov cites one client who requested analysis on Michael Berger's \$500m Manhattan Investment Fund. Unable to regress the fund performance and strategy to align, MPI was able to raise a red flag about the fund.

With the information Markov mines for its dynamic approach to reverse engineering portfolios there are also ways (in addition to risk management utilities) that clients may use the manipulated data. In depth analysis of hedge fund portfolios lends itself to the idea of replication, which is an area receiving attention of late.

Markov spoke about replication strategies at the recent Terrapin Hedge Fund Replication & Alternative Beta Conference. He explained to Opalesque, "The problem with replications is replicating an entire industry...My problem with this approach is when you take an index and replicate the stream of that index. In a pool of 700 or so funds there are good funds and bad funds. Why would you want to replicate bad funds? When you think about the dispersion of returns of hedge funds it is mind boggling. What is an average fund?"

However, there are other uses for replicating hedge fund indexes. MPI has been doing this for some time and it allows the team to know with incredible accuracy what to expect from certain sectors of an industry as they perform even week by week throughout a month, information which could prove important to fund of funds investors who need to determine redemption requests in advance of final monthly performance numbers.



While the team may look to bring transparency to clients with hedge fund investments, Markov himself has an obvious respect for the privacy of the industry apparent in his response to how his own clients decide to utilize the analysis MPI provides. “The jury is out on whether or not replication is a viable thing,” he says. “Clients use our tools to analyze the investments and see which ones can be replicated and which ones are a simple beta and may be better replaced by something else.”

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