

Quantitative Approaches to Wealth Management: *An Interview with Artur Sepp*

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Overview

The investment industry has changed dramatically since the global financial crisis. As investors adapt to the new world, some wealth management firms are adopting hybrid approaches to risk assessment and asset allocation in the form of algorithmic, or robo-advisory, services. **Artur Sepp** of **Julius Baer** has observed the evolution closely and in this interview with **Institutional Investor Journals** he offers reflections on his research and the value of technology and quantitative solutions to wealth management. Sepp presented at **Global Derivatives** in Budapest.

Practical Applications

- **Tension.** The financial industry is holding onto a short-term focus in terms of performance expectations and compensation structures. However, many investors have long time frames for savings and retirement planning. This leads to conflicts in outlook and strategy.
- **Insight.** A deeper understanding of quantitative investment, behavioral financial and economic utility models will inform the design of tools for risk management and asset allocation.
- **Adaptive Solutions.** Algorithmic, or robo-advisory services, can generate adaptive client-tailored solutions for changing investment needs. They can also help bring sophisticated wealth management techniques to middle-class investors in a cost-effective manner.

Practical Applications

The past decade has been a turbulent time for quantitative finance, and Sepp has witnessed the changes firsthand. Born in Estonia, Sepp earned a BA in mathematical economics from the **University of Tallinn** and a PhD in probability and mathematical statistics from the **University of Tartu**. For his doctorate, he focused on time series, option pricing and volatility. Sepp was attracted to career opportunities in both academia and industry, but decided that putting theory into practice is what excites him most.



Artur Sepp

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Artur works as Director in the Quantitative Development Team at the Swiss wealth management company **Julius Baer**. His focus is on quantitative models for FX and equity derivatives trading, asset allocation and investment strategies. Prior to that, Artur worked as a front-office quant in equity, credit and risk at Bank of America Merrill Lynch, Merrill Lynch and Bear Stearns, with particular emphasis on volatility modelling and trading, cross-asset derivatives and risk management.

Artur has a PhD in probability and statistics from the University of Tartu in Estonia, specializing in stopping time problems of jump-diffusion processes. He also has an MSc in industrial engineering from Northwestern University in Chicago and a BA in mathematical economics. Artur's research areas and expertise involve quantitative investment and trading strategies, wealth management and asset allocation, single- and cross-asset volatility models, econometric models and computational methods. He has published several research articles on quantitative finance in leading journals and is on the editorial board of the **Journal of Computational Finance**.

Artur enjoys exploring new ideas, and some of his models have been successfully implemented by financial institutions.



Key Definitions

Algorithmic advisor

A new tool to assist with asset allocation, an algorithmic advisor (or robo-advisor) makes use of preprogrammed models and parameters to assist with investment decisions. The investor supplies a profile, including information on income, savings and risk preference and the advisor will make recommendations, which may be adjusted as life circumstances change over time.

Back testing

Testing a trading strategy on prior time periods via simulation. The process relies on recent past data to gauge the efficacy of a proposed strategy.

Beta

A measure of the systematic risk of a stock or portfolio compared with the market. Beta greater than 1 means that the stock is more exposed to the market trend and its volatility. Beta less than 1 means it is less exposed to the market trend and volatility.

Historical volatility

The standard deviation of the total returns of a security, portfolio or market, measured daily, weekly or at other set time frames, over past periods, usually annualized.

“I came to the US to continue my studies at Northwestern University, where I received an MSc in industrial engineering. I started to work as a quant in equity derivatives at Bear Stearns because I was very interested in talking to traders and doing real-world modeling,” he recalls. Sepp then landed in credit derivatives at Merrill Lynch at the top of the credit bubble. “At a certain point during the financial crisis, the models stopped working. It was actually one of the best times to work in this field, as you could learn so much about limitations of supposedly risk-neutral models and challenges of exposure to counterparty credit risk, but then the credit market died out,” he says.

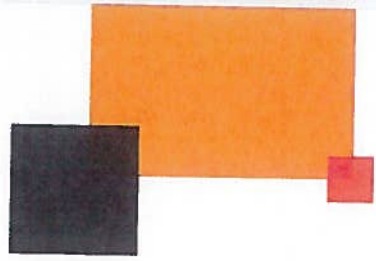
Sepp moved to London with **Bank of America Merrill Lynch**, where he continued his research on applications of volatility models to trading and published a joint paper with **Piotr Karasinski** on the log-normal stochastic volatility model. At the same time, he became interested in asset management and found a unique opportunity at Julius Baer. “In this role, I spend about half of my time doing traditional quant work—producing models and valuation tools for traders and risk managers. The other half of my time is spent on developing investment strategies for our clients; this entails a significant amount of work on asset allocation.”

One of the major influences in the area of asset allocation is **Robert Merton**, who wrote a groundbreaking paper in 1969, just prior to his work on option pricing theory that contributed to the **Black–Scholes–Merton** model (1973). Since then, Merton’s approach to optimal allocation has been widely adopted, with some modifications. “The basic question is, given the level of initial wealth and income, how much should an individual consume and how much should he or she invest? And further, what is the risk tolerance? What kind of balance should we be looking at with regard to risk-free assets, stocks and alternatives?” asks Sepp. “Naturally, wealth managers focus a significant amount of attention on these issues,” he adds.

THE PRACTICAL VIEW

“From a practical point of view, the preferences of each investor towards risk-taking can be measured by a degree of risk-aversion. For wealth management purposes, we have a classification system to determine which type of investor you are. Then, using a model with stated risk preferences and an amount of current wealth, we solve for the optimal balance between consumption and investment and obtain a set of investment allocation recommendations,” explains Sepp.

The suggestions from the system will not follow the hottest trends, he maintains. “Looking at the industry today, there is a great deal of interest in alternative risk-based approaches to asset allocation, and many papers are published on smart beta and minimum variance portfolios, but these concepts tend to be applied to asset management over short horizons—often less than a year. In this type of time frame, investment decisions may be driven by regular reviews and the fear of underperforming a benchmark.” Other issues include churn and transaction costs, he adds.



The main challenges for wealth managers:

- ✓ Access a diverse range of income vehicles.
- ✓ Model the long-term risk of these vehicles.
- ✓ Project the possible returns.

What sets wealth management apart from other forms of investment management is the consideration of long-term return, Sepp points out. In this case, the total return is very important, including received and reinvested dividends, price appreciation and the tax implications for the investor. Empirical studies over longer time periods have shown that dividends account for as much as 80% to 90% of the contribution to total return; compounding plays a very important role for long-term investors.

In addition, in catering to high-net-worth individuals and institutions, wealth management by nature draws on a much more diverse set of investment opportunities. For example, stakes in hedge funds and private equity are less liquid and also require modeling. One of the main challenges for wealth managers is to access a diverse range of income vehicles, to model the long-term risk of these vehicles and to project the possible returns. Further, the investment characteristics must match up with diverse risk profiles and levels of sophistication among the clients. Robo-advisors continuously monitor personal needs and market conditions and provide automated advice for portfolio rebalancing.

QUANT TOOLS THE MIDDLE CLASS CAN AFFORD

Sepp thinks robo-advisory services have broad applications. “Traditional wealth management oriented towards high-net-worth families is very expensive—it would be nice to provide similar services to middle-class families in an affordable way. Algorithmic advisors have the potential to help people figure out how to save and invest appropriately to buy a house, pay for college and plan for retirement,” Sepp says. “In the new realm of negative interest rates and lower expected returns, the attention to costs will become a critical factor for investors and wealth management firms,” he adds.

Turning to the subject of this year’s Global Derivatives, Sepp recalls that he first attended the conference in Paris in 2011. “I was working on local stochastic volatility models then, and the attendance was great. The organizers have been interested in attracting delegates from the buy side, trading houses and asset managers, so there is emphasis on XVA, regulation and risk management.” He laments new, time-intensive regulations. “There is a strong desire to meet the demands while improving the processes and increasing the use of the technology,” notes Sepp.

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