

*From: Het Financiale Dagblad  
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### **Bob Merton: “Derivates provide security”**

Bob Merton, together with Myron Scholes, received the Nobel-prize for Economics for the Black Scholes formula. Merton played an important role in translating these academic insights into Wall-street practice. He was active at various exchanges and played a role in the creation of LTCM, the hedge fund that almost caused a collapse of the financial markets when it imploded in 1998. Here is an exclusive interview with Nobel-prize winner Merton, who is a professor at Harvard Business School.

- You delivered an important missing link in the Black Scholes formula, the volatility. Don't you wish your name had been added to the formula?

“I gave the formula its name. You can hardly give your own name to a model. However, people often refer to the model as the Black Scholes Merton model anyway.”

- The option pricing model caused a revolution in the financial markets. What was the most important consequence?

“The model made many innovations possible, which is a result of how the model was used once it was created. It is possible to mirror the pay-out of an option –which gives someone the right to buy or sell a security at a given price– perfectly via a portfolio of securities. You can do this for all sorts of derivatives, not just the option from the Black-Scholes formula. The model is sort of like a cookbook, which allows you to create a derivative that does not exist yet. You can create something to resolve a problem, without actually having to test it via trading. You can perfectly calculate risk characteristics and pricing. The result has been quick innovation.

The model has many applications. It has been used to give a price to the capital structure of a company, and to value deposit guarantees. It can even help explain why filmmakers hardly ever tape a movie and its sequel at the same time. It would be much cheaper and easier to do that, after all, you have assembled the cast and crew. But by not making the sequel at the same time, you have the option not to make it. If the first movie fails, you will have saved yourself money. That is the value of the option, especially if the chance of success is very uncertain and the risk therefore substantial. It is this uncertainty that makes the option valuable. Uncertainty/risk is a crucial part of financial theory. It is about re-allocation and management of risk. Black Scholes helps us to better understand uncertainty/risk.”

- Some people worry about the risks of derivatives; just think about the concentration of large risky positions at a few institutions, and the lack of knowledge to spread the risks. Are you worried as well?

“Whether the growth in the derivatives market leads to more risk is not the appropriate question, even though the question is logical. The point is that we ourselves choose the amount of risk in the community or in companies. Airplanes now have the technology to be able to land and takeoff in thick fog. However, you may still have the same amount of accidents as before. The difference is that prior to the innovation, we could not be able to fly in thick fog without undue risk, whereas we can do that now. Thus we are not necessarily taking on less risk now, because we also have more options. The same accounts for derivatives. There is no doubt that derivatives can reduce risk in the financial markets. But we choose our own levels of risk. The question is really whether we understand the risks that we face. As far as the concentration of risks at financial institutions is concerned, I believe that the risks are mostly covered with liquid collateral assets. The Central Bank can still always function as liquidity provider, in case of a crisis.”

- What about the recent worry that hedge funds and private equity funds are obtaining debt financing too easily?

“The influence or degree of debt financing is no argument. The word leverage can become not meaningful very quickly. People associate risk with a large debt position, but a company can have a large risk position with low leverage or be highly leveraged without much risk. In addition, we cannot be blind to the challenges that the financial system has worked its way through with success. The Amaranth hedge fund lost \$6 billion last summer. General Motors’s bonds were downgraded to junk-status. But the financial world continued to operate. In the past, a downgrade of GM’s bonds to junk-status would have had a much larger impact.”

- You were involved with a shock to the financial markets with the implosion of LTCM. Did you learn anything from this event?

“I did not learn anything in terms of contradicting existing financial theory, but I did learn practical lessons. The people who were managing the fund were very experienced. But there are always events that you cannot anticipate.”

- You were one of the first academics who brought theoretical insights to Wall Street. Today you are chief science officer of advisory company Trinsum Group. What made you take the step from academics to practice?

“Good financial theory is a good predictor of future financial practice. Scholes and I came to Wall Street in 1971 with our options pricing model. Today you can see that much of the research is done in the financial world as opposed to the academic world since it has access to better data. My Wall Street experience helps me with my research, partially by making more realistic assumptions.”

- People make mistakes in the financial world. Investors show irrational behavior, such as the “behavioral finance” theory dictates. How do you reconcile that with the theory that markets are efficient?

“I still believe that the efficient markets model is very strong. The alternative is that people can easily make money by investing, and I don’t think this is true. I believe that you need all the right means to understand the world’s complex reality, which is why you also need behavioral finance and neo-institutional theory. They help explain why institutional structures in the market – such as the accountancy system or the way in which companies are organized – change as a response to imperfections such as transaction costs or human behavior. I try to synthesize these three theories. It is ironic that people consider me a follower of the efficient markets theory only. My research does not support that conclusion.”