

Finance 450: Securities Analysis

“Trillion Dollar Bet”

List of Questions – Fall 2003

The videotape you will be watching is entitled, “Trillion Dollar Bet.” The idea of using mathematical statistics to describe stock returns was originally explored in 1900 by Louis Bachelier, a French doctoral student. But it took the work of Fisher Black, Myron Scholes, and Robert Merton to turn this idea into a model with broad, practical applications. This videotape describes the quest of Black, Scholes, and Merton to develop their famous option-pricing model, which was a key development in theoretical finance and earned Nobel prizes for two of its developers (unfortunately, Fisher Black had passed away from throat cancer before the prizes were awarded, and the Nobel is never awarded posthumously). But the model was not only a theoretical novelty; it also had great practical importance and helped spur on both the development of the market for derivatives, which has since grown in size to over a trillion dollars, and an increasing level of sophistication within the fixed-income (bond) markets as well. Black, Scholes, and Merton were all interested in seeing the practical application of their ideas, and the latter part of the videotape describes the story of Long Term Capital Management (LTCM), a hedge fund in which Merton and Scholes were partners, which grew to become the largest hedge fund in the world in the late 1990s.

The following is a list of questions regarding the material covered in the video. It is a long list, including 15 questions, but many of them can be answered with a short “yes” or “no” answer or a short phrase (e.g., “rocket science”); moreover, most of the questions are listed in the same order in which they are presented in the video (and the one that is out of order can be answered using the information in the paragraph above). In order to get the most out of the videotape, please review the questions before watching the videotape, then answer them either as you watch the tape or shortly thereafter. The answers to the questions will be due at the beginning of the following class period. Good luck, and enjoy the movie!

Questions:

1. What is the “golden rule” of finance and capitalism? **In order to make money, you have to take risks.**
2. What would need to be done with regard to risk in order to turn finance into a science? **To quantify it or describe it mathematically.**
3. In tests that financial economists conducted in the years following the stock market crash of 1929, was it possible to distinguish between skill and luck in terms of which is responsible for the success of stock market investors? **No; a random selection using a tosses of a dart performed as well as professionally selected stocks.**
4. What is an option? **A financial security that gives you the right, but not the obligation, to trade in the underlying stock at a pre-specified price – allows one to participate in the upside of a trade without having to accept the downside.**
5. Who were the three researchers who finally figured out how to price options (hint – they are mentioned in the first paragraph, above)? **Fisher Black, Myron Scholes, and Robert Merton.**
6. Who helped Black and Scholes to solve the problem they faced with their equations, and to what field of study did he turn in order to find this solution (hint – see the second paragraph in the introduction)? **Robert Merton, who turned to the field to rocket science to find specific results in stochastic calculus, or Ito calculus, that were useful for solving the option-valuation problem.**

7. Did real-world traders in the financial markets actually use this formula? **Yes.**
8. Did this model require traders to trade more frequently or less frequently in order to control or manage their investment risks? What effect did this have on the size of the market for “derivatives”? **Much more frequently; this active trading led to dramatic increases in the size of the derivatives market.**
9. What was the hedge fund through which, as partners, Merton and Scholes helped to see their ideas applied to the real world, and where did lead partner John Meriwether previously work? **Long Term Capital Management (LTCM); lead partner John Meriwether had previously worked at Salomon Brothers.**
10. Did LTCM have trouble raising capital to start operations? What was their minimum required investment? **Not at all – investors were competing to be allowed to invest; the minimum required investment was \$10 million.**
11. How successful was LTCM during its first three years? Was it equally successfully during its 4th year? **Very successful – 1st year, 20%; 2nd year, 43%; 3rd year, 41%. In the 4th year, with increased competition together with turmoil in the global capital markets, LTCM’s returns fell to 17%.**
12. The characteristics of the financial markets changed in 1998 with the Asian currency crisis and the Russian default. As a consequence of these events, how much did LTCM end up losing in a single day, four days after the Russian default? What eventually happened to LTCM as a further consequence of these events? **In the following days, LTCM was losing hundreds of millions of dollars a day, culminating in a single-day loss on the 4th day of half a billion dollars (\$500,000,000). As a consequence of the margin calls entailed with these losses, LTCM became financially insolvent and had to be bailed out by a consortium of banks, under the encouragement of the Federal Reserve.**
13. Was LTCM ultimately able to pay off its debts? **Yes; while the trades moved against LTCM in the short run, causing the fund’s equity to be wiped out by margin calls, in the long run the trades did move in the direction LTCM had anticipated, allowing them to repay the debt incurred during the bailout.**
14. According to the videotape, what drives financial markets? Do mathematical equations drive financial markets? Given the answers to these questions, would you categorize finance as an art or a science? **Mathematical equations do not drive financial markets; *people* drive financial markets. Consequently, finance is probably at least as much of an art as it is a science.**
15. What do you see as the most important lesson from LTCM’s experiences? Will this affect how you manage your virtual portfolio for the class? **(Student’s individual response.)**