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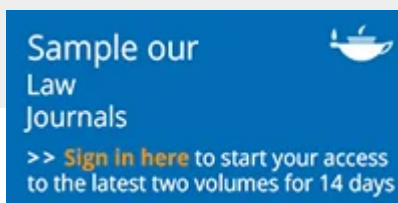
Perspectives

Black Monday and Black Swans

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Abstract

Investors need to be aware that rare events with an extreme impact that, afterwards, we think we could have predicted—in short, black swans—happen in the markets. Those who are trying to measure risk in the financial markets need to carefully distinguish risk, with its probabilities, from uncertainty, which cannot be measured. We have become increasingly vulnerable to black swans because our financial economy has come to play an ever-larger role in our productive economy.

The 20th anniversary of what came to be known as “Black Monday”—19 October 1987—provides a platform for considering, yet again, the role of risk in the financial markets. On that single day, the Dow Jones Industrial Average dropped from 2,246 to 1,738, an astonishing decline of almost 25 percent that is nearly twice the largest previous daily decline of 13 percent (24 October 1929). Black Monday was a black swan.

In his book *The Black Swan: The Impact of the Highly Improbable*, Nassim Nicholas Taleb lists three characteristics of a black swan: rarity (it is an outlier), extremeness (it

carries an extreme impact), and retrospective predictability (after it happens, human nature enables us to accept it by concocting explanations that make it seem predictable). Black Monday demonstrates that not only can anything happen in the stock market; anything does happen.

In this article, I take advantage of the anniversary of Black Monday to explore risk as a measurable aspect of investing and as an uncertainty that is always with us. We speak of “forecasts” and “probabilities,” but the application of the laws of probability to our financial markets is badly misguided. Black swans do occur.

Black swans remind us of uncertainty. What other black swans are lurking beyond the horizon, waiting to become part of financial market history? The fact is that the movements of the stock market exhibit a lot of randomness. So, the knowledge that black swans can and do occur holds important lessons for how we think about risk.

Black swans are one reason that many theorists warn us to beware of using past Gaussian stock market return patterns and thinking we have defined the bounds by which we can predict the future. Furthermore, changes in the nature and structure of our equity markets—and a radical shift in the participants—are making shocking and unexpected market aberrations ever more probable. Over the past two centuries, the United States has moved from an agricultural economy to a manufacturing economy, to a service economy, and to a financial economy—and a global one at that. The nation is becoming a country where no business actually makes anything. Our financial intermediaries merely trade pieces of paper, swap stocks and bonds back and forth with one another, and pay the financial croupiers a veritable fortune.

Moreover, long before the recent wave of complex financial products, observers noted that the financial system is particularly prone to innovation. Indeed, the value of these financial “products”—stock market futures and options—has overwhelmed the total value of the stock market itself. Now, one of the riskiest of derivatives, credit-default swaps, alone totals \$45 trillion, an amazing ninefold increase over the last three years. These swaps are five times the size of the U.S. national debt and three times U.S. GDP. We have become increasingly vulnerable to black swans because our financial economy has swamped our productive economy.

Note: The opinions expressed in this article do not necessarily represent the views of the Vanguard Group’s present management.

Notes

¹ From its September 1929 high of 381 to its July 1932 low of 41, the Dow dropped by an astonishing 90 percent.

² Before the discovery in the 17th century of Australia, where black swans are common, Europeans thought that all swans were white; to imagine swans of any other color was completely unreasonable.

³ The average annual return on stocks during the 1926–2006 period was 10.4 percent. Curiously, in only 2 years of those 80 years did the returns realized fall between 9 percent and 11 percent. The “average” year, then, rarely occurred.

⁴ This thesis, written for Princeton University, was entitled “The Economic Role of the Investment Company” and was published in [Bogle \(2001\)](#).

⁵ For a discussion of the stock market’s historical returns, including each decade’s investment return, speculative return, and total return, see pp. 15–18 of [Bogle \(2007\)](#).

⁶ In this section, I have liberally quoted and paraphrased investment adviser Frank K. [Martin \(2006\)](#). Martin’s quotes from Hyman Minsky come from Minsky’s 1974 article “The Modeling of Financial Instability: An Introduction,” in *Modeling and Simulation*.

⁷ Joseph Schumpeter (1883–1950) characterized capitalism with the famous phrase “creative destruction,” in which the old ways of doing things are endogenously destroyed and replaced by new ways.

⁸ These data are Bogle Financial Markets Research Center estimates based on data from the Securities Industry and Financial Markets Association, Lipper Analytical Services, and Empirical Research Associates. I recognize the fragility of these data and continue to urge a thorough and independent economic analysis of the costs and benefits of our financial system.

⁹ Data in this paragraph are from the McGraw-Hill Companies symposium held 20 June 2007 to recognize the 50th anniversary of the S&P 500.

¹⁰ These figures come from [Seides \(2007\)](#).

¹¹ These write-down amounts are from the New York Times (1 February 2008, p. C6).

¹² Spoken at a symposium entitled “The Greenspan Era: Lessons for the Future” in Jackson Hole, Wyoming, 26 August 2005.



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