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Nearly 100 years ago, Frank Knight had the insight that what is generally simply called “risk” in common parlance actually refers to two quite different notions.

One is the familiar kind of risk in a gambling game like throwing dice, in which the possible outcomes and their probabilities are known ahead of time, but the realization is not. The election of Donald Trump as the next President of the United States is widely explained as the result of a surprisingly large portion of the electorate choosing to “throw the dice” in order to shake things up in Washington.

But in Knight’s terms, voting for Trump was not at all like throwing dice: It illustrates exposure to “uncertainty” rather than risk. Uncertainty describes a situation in which event probabilities, and even the space of possible results, is not known *ex ante*. Evidence suggests that human beings are averse to both manifestations of “risk,” but uncertainty is normally more upsetting. Yet many voters seem to have preferred Trumpian uncertainty to what they viewed as largely a continuation of the current policies. Predictability would have been a lot greater with Clinton, but the voters felt the expected value, for them personally, was too low.

How many voters were willing, and even eager, to jump into the unknown was largely invisible to pollsters. Surveys using many different methods consistently showed Hillary Clinton several percentage points ahead of Trump in the popular vote and with an even more commanding lead in electoral votes. For the pundits, the pollsters, Clinton’s supporters and many of Trump’s, the financial markets, the prediction markets, and basically the entire world at large, Trump’s victory was so unanticipated that it could easily be called a “black swan,” the term coined by Nassim Taleb to describe an event that is widely regarded as impossible.

In a sense, black swans should constitute the most damaging kind of “risk,” because no one buys insurance or prepares in advance for something that cannot happen. Within the past few months, I have personally attended several public discussions by well-known economists in business, academia, and government who found it nearly impossible to predict how the economy would behave under a Trump presidency, since his policy proposals were very short on details and were largely dismissed by economists on both the left and the right as being either unworkable or politically impossible.

So at this point on the morning of the day after the election, a black swan has just landed on the lawn. No one really has any idea what will happen next, only that going forward the world will be quite different from what it has been and that past experience is of limited use in forecasting. This brings in one more risk concept that economists and

financial analysts will be facing: a regime shift. When some major event causes massive change in basic economic and political relationships, the existing models estimated from historical data no longer apply—and there is not yet any empirical evidence to guide our understanding of the new order. Everyone will be flying blind for a while, and maybe for a long time.

With those comforting thoughts, let us turn to one thing at least that we can be sure of: this issue of *The Journal of Derivatives*.

Our first article offers a major step forward in modeling the behavior of crude oil futures, by far the most active commodity futures market. Sophisticated models of stock price dynamics have gone well beyond Black-Scholes to add stochastically time-varying volatility and jumps in both the returns process and the volatility process. Much less has been done to extend these models to commodities. Only a few articles fit such models to both the returns on an underlying security and also the prices of options on that underlier. Options give direct exposure to volatility and to the factors that produce the volatility smile/skew, which should greatly help in the estimation of a correct model. But it is not easy for a model to reconcile pricing in the two markets simultaneously. Christoffersen, Jacobs, and Li develop GARCH models for both the diffusive volatility and also jumps, derive option pricing formulas for that kind of returns process, and fit them on oil futures and options prices. By combining the two markets, they obtain estimates of the risk premiums for both types of volatility, which show considerable variability over time. This is a significant advance over modeling that treats risk premiums as being constant, if they are considered at all.

The second article looks at the impact of cash flows into and out of exchange-traded funds that are tied to stock market volatility. There are currently more than 20 of these, focusing on different parts of the volatility term structure and/or different long/short exposures and leverage. Białkowski, Dang, and Wei demonstrate that fund flows produce pricing effects in the markets for VIX-type derivatives, in the directions one would expect.

Next, O’Kane considers the important practical problem of optimal “compression” of derivative contracts, specifically interest rate swaps, within a

population of OTC dealers. What is the most efficient way to combine multiple contracts between the same counterparties into a smaller number, while keeping the same DV01 exposures within a set of maturity buckets? O’Kane offers some answers.

The following article, by Yueh, Chiu, and Tsai, describes how structured debt instruments can be designed to allow life insurers and other firms to hedge exposure to longevity risk. They show how mortality options can be priced based on several kinds of mortality indexes and incorporated into bonds in different ways. Finally, Wang takes another look at the interactions between trading in options and pricing in the market for the underlying stock. Does placing an aggressively priced order in the stock limit order book lead to directional trading in options, or vice versa? Apparently it does, as Wang shows, and the Granger causality runs in both directions.

...AND VOLATILITY

The American people have just opted for major regime change, which has produced a “yuge” increase in economic uncertainty. So what does it mean for market volatility? As the regime shift has drawn closer over the past several years, regular readers of this Editor’s Letter have heard my repeated expressions of surprise over unusually low market volatility at times when the level of uncertainty should have been quite high, as when the Republicans were threatening to force a default on U.S. government bonds. I eventually arrived at the working hypothesis that volatility can be low in such circumstances because even though everyone knows uncertainty is high, there may be very little flow of *new* information into the market from day to day that would help to resolve the uncertainty. Investors may feel they don’t have a clue about the future, but they are just as clueless today as they were yesterday, so there is no reason to adjust their stock portfolios. If this hypothesis holds, once the initial shock of yesterday’s black swan is over, we might see relatively calm stock markets, at least for a while, until the massive uncertainties of the new regime begin to be resolved.

Stephen Figlewski
Editor