The Crash of '87: Was It Expected? The Evidence from Options Markets

David S. Bates

Summary by Dan Wouden

Big Picture:

Bates examines S&P 500 futures options transactions prices from 1985-1987, before the 1987 crash to see if the market knew, or had inclinations towards the crash of 1987.

Deep out of the money put options became very expensive one year prior to the crash. The second main finding of this paper is where I start to get confused. Bates derives a "model for pricing American options on jump diffusions with systematic jump risk ". This jump diffusion in the model suggests that the crash was anticipated. Bates theory that the U.S stock market crashed since everyone thought it was going to crash is very interesting!

The data they sampled had some very explicit restrictions on it. Only contracts of single maturity, with relatively short maturities between 1 and 4 months. Bates avoided "thin trading" days. He also only used days in which at least 20 calls and 20 puts were traded. Last of all, transactions in at least 4 strike classes for calls and 4 for puts.

Bates shows that the phenomenon of high prices for out of the money put options cannot be explained by many different methods. In particular, Black sholes, GARCH, or constant elasticity of variance.

Bates concludes that there indeed was a strong perception of downside risk on the market one year prior to the actual crash. Out of the money puts provide insurance in case of a crash. These options were expensive relative to out of the money calls.

This paper accomplishes a few things. It shows that the crash of 1987 was not due to a bubble. 2 months before, even the Friday before the crash the market was relatively calm, it wasn't fearful or boastful.

I would really like to talk about Jump Diffusion models in class. We could even try to program one in computational methods.

Questions:

Would you discuss how this wasn't a bubble? The market had a bubble like experience, leveled off for a short period of time and popped. Isn't the market "fixing" the bubble that was there?