

1069-60-165

Hongzhong Zhang (hz2244@columbia.edu), 1255 Amsterdam ave, Rm 1010, New York, NY 10027, and **Olympia Hadjiliadis*** (ohadjiliadis@brooklyn.cuny.edu), 365 fifth ave, rm 4214, New York, NY 10016. *Market crashes through the drawdown and its speed (Part I)*.

This abstract is the first in a sequence of two. In the first part we present a way to quantify market crashes through two cleverly chosen random variables, while in the second we study their probabilistic behavior. The first random variable is the drawdown of an asset and the second is the speed at which a drawdown is realized. Drawdowns measure the first time the current drop of an investor's wealth from its historical maximum reaches a pre-specified level. They are thus measures of risk which are widely used in financial risk management. Due to their path-dependent nature they can also be used as indicators of market crashes. Yet, in order to characterize the severity of a market crash one needs to take into account the speed at which it occurs. In order to capture this speed, we consider the last reset of the maximum of the underlying preceding the drawdown. We now propose the difference of the time of the drawdown to the last reset of the maximum preceding the drawdown as well as other measures related to this difference as possible measures of the speed of a market crash. An investor interested in insurance against a market crash could be interested in purchasing options related to the drawdown and its speed. This gives rise to the question of pricing such contracts. (Received January 21, 2011)