Stock Market Volatility, Recurrence Interval and Memory Effect

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***Abstract*—The stock market volatility in 2015 has caused serious damage to investors and the market has also suffered severely and immensely. During the last year, large volatility and extreme events were increasingly frequent than before, which made great theoretical and practical significance to gain a deep understanding of extreme value statistics of the volatility. Extreme events also bring huge risk to financial market, therefore the risk prevention, estimation and prediction are of necessity.The research uses 1-min high-frequency datasets of Shanghai 50 Stock Index Futuresin 2015. The data comes from Tongdaxin Database. The paper is the first one to study Shanghai 50 Stock Index Futures and a relationship between recurrence interval and risk estimation has been constructed. We find the recurrence interval of stock volatility can be fitted with stretched exponential function and the recurrence interval decreases when the threshold decreases. Then we demonstrate the existence of short-term and long-term correlations in recurrence intervals. We further construct a hazard function and define a loss probability to evaluate risk and find a crossover point in the loss probability plot. The study would enable one to improve risk estimation andthere are some shortcomings and need to be perfect in the future.**

Key words: **extreme events; recurrence interval; probability distribution; memory effect; risk estimation**

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