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Risk efficiency of hedging strategy in China financial market☆

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Summary This paper presents the analysis of China financial market and method of hedging optimization for compute expected shortfall risk based on attitude towards risk under the Black—Scholes model. The application demonstrates an example of the efficient hedging strategy for call option in the Black—Scholes model based on geometric Brownian motion with loss function. The data of illustrations which applies in China financial market. The resulting efficient hedges allow the investor to interpolate in a systematic way extreme of partial hedging (between no hedge and full hedge) that depend on the accepted level of shortfall risk.
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Introduction

This paper is going to describe the general invest environment of China financial market. Consider risk management has become progressively more important for corporations. It will use the risk measure analysing a call option to demonstrate how active trading in China financial market. Furthermore, in particular calculate the cases of lower partial moments, linear and risk-taking that considers the attitude towards risk, the result presents the efficient hedge for call option in Black—Scholes model. The objective of this paper is risk measure analysis which for Value at Risk (VaR) and distinguish between VaR and expected shortfall (ES) in China financial market and analyse partial hedge of estimate the expected shortfall risk in the Black—Scholes model. Risk measure and hedging which are two concepts investor used and considered every daily life. But how much should be hedged 0—50—100% (no hedge—partial hedge—full hedge)? Depends on exposure and risk attitude towards. Risk attitude is a complex area, it can measure in variety ways, though not perfect and entirely accurate, but it is progressing. The paper is interested in the approach of partial hedge of estimate risk measure's ES risk in the Black—Scholes model based on different risk attitude towards.

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Table 1 Chinese stock market statistics in 2014.

	Q1	Q2	Q3	Q4
Total funds raised (100 million yuan)	1344	1221	1262	3232
Turnover of trading (100 million yuan)	121,903	94,691	190,646	335,146
Quarter-end volume of stock issued (100 million shares)	34,224	35,483	36,239	36,795
Quarter-end market capitalization (100 million yuan)	236,625	244,129	239,548	372,547
Quarter-end numbers of companies listed	2537	2540	2569	2613
Quarter-end close index				
Shanghai stock exchange composite index (December 19, 1990 = 100)	2033	2048	2364	3235
Shenzhen stock exchange component index (July 20, 1994 = 1000)	7190	7343	8080	11,015

Source: a.

Analysis of China financial market

As the fastest growing and one of the largest economies of the world, China has witnessed a magical transformation from a stagnant command economy to a dynamic market economy. In this section is presents the overview of China financial market and risk measure analysis in China financial market.

Overview of China financial market

The Chinese stock market has promoted the reform of state-owned enterprises and the change of their systems, and enabled a stable transition between the two systems. On the strength of the stock market in the past decade, many large state-owned enterprises have realized system change. The change also has stimulated medium and small-sized state-owned enterprises to adopt the shareholding system, thus solving the most important issue — the system problem — during the transition from planned to a market economy. As for ordinary citizens, bank deposit is not the only way to put their money. The stock market has become one of the most important channels for investment. Following Table 1 presents the Chinese stock market statistics in 2014.

Methods of stock trading are constantly being improved. Today, a network system for securities exchange and account settlement has been formed, with the Shanghai and Shenzhen exchanges as the powerhouse, radiating to all parts of the country (see china.org.cn).

China has three stock exchanges, two of them (Shanghai stock exchange, Shenzhen stock exchange) are located in mainland of China, one is located in Hong Kong. Also there are four futures exchanges in mainland of China. Zhengzhou Commodity Exchange (ZCE) which established in 1993. Dalian Commodity Exchange (DCE) which established in February 1993. Shanghai Futures Exchange (SHFE) which established in 1999. China Financial Futures Exchange (CFFEX) which established in Shanghai in September 2006. There are two futures exchanges in Hong Kong which are Hong Kong Exchanges and Clearing (HKEx) and Hong Kong Mercantile Exchange (HKMEx). Following Table 2 presents the Chinese futures market statistics in 2014.

Outlook of China options market

China launched simulated trading in stock index option on 8th November 2013, as regulators move to enhance risk hedging options to support further financial reforms. The first stock options launched on the Shanghai Stock Exchange on 2014, offering investors a new hedging tool for trading index heavyweights, which regulators long have hoped to boost. The options are based on the exchange-trade fund (ETF) that tracks the SSE50 index, composed of the 50 most heavily weighted stocks on the bourse. Regulators are essentially guiding investors into blue chips, which most retail investors have avoided in favour of smaller firms, whose valuations have been pushed up.

Risk measure analysis in China financial market

General there are two basic but often use measures of risk that are VaR and ES. To comparison them, a measure that can produce better incentives for traders than VaR is ES. This is also sometimes referred to as conditional VaR, conditional tail expectation, or expected tail loss.

ES has better properties than VaR in that it encourages diversification. In spite of its weaknesses, VaR has become the most popular measure of risk among both regulators and risk managers. Because the disadvantage of ES are it does not have the simplicity of VaR and as a result is more difficult to understand, and it is more difficult to back-test

Table 2 Chinese futures market statistics in 2014.

	Q1	Q2	Q3	Q4
Transaction volume (10 thousand lots)	49,192	55,102	65,011	81,280
Turnover of trading (100 million yuan)	573,161	583,577	674,833	1,088,312
Quarter-end position (10 thousand lots)	803	986	1004	910

Source: a.

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