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Comparisons of short and long hedge performance: the case of Taiwan

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Abstract

This study examines the performance of short and long hedgers using four stock index futures contracts traded at the Taiwan Futures Exchange. We compare the optimal hedge ratios and resulting hedge performances based on three risk measures: variance, extended Gini, and lower partial moment. We find that long hedgers achieve greater hedging performance than short hedgers for both the minimum-extended Gini and minimum-lower partial moment hedge ratios. These results are observed in both in-sample and post-sample analyses. We also find that the minimum-extended Gini hedge ratio dominates the lower partial hedge ratio in terms of post-sample hedging performance.

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1. Introduction

Futures contracts are widely used as tools for risk reduction. By facilitating the shift of price uncertainty from hedgers to speculators, futures markets enable better planning of

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economic decisions, thereby increasing overall economic welfare. Their popularity in this role has led to a rapid and ongoing innovation in futures markets. As recently as 30 years ago, futures contracts were used mainly as tools for agricultural risk management. Today, however, futures markets serve highly diversified economies and are used to hedge complex risks.

Prior to modern finance theory, the long-established convention was to adopt a one-to-one, or “naïve,” hedge position. More recently, a substantial literature has evolved that seeks to find the optimal futures position recognizing the existence of basis risk. The dominant hedging framework to emerge is the portfolio approach which defines the optimal futures position as that which minimizes risk, measured as variance of the hedge portfolio. At the theoretical level, the portfolio approach is consistent with the expected utility hypothesis, provided substantial distributional structure (i.e., joint normality) is imposed on spot and futures price changes. However, departures from normality may result in suboptimal hedges and firms or individuals may choose futures positions that are inferior in terms of hedging effectiveness.

Two alternative frameworks, the Gini (Yitzhaki, 1982, 1983) and the lower partial moment (LPM) (Bawa, 1975; Bawa and Lindenberg, 1977) frameworks, have been suggested as robust alternatives to the variance-minimizing hedge ratio. Both the Gini and LPM hedge ratios are explicitly estimated as functions of the underlying distribution, and consequently have been shown to be optimal and robust to nonnormality. The futures positions obtained from these frameworks are not subject to the restrictive distributional requirements of the minimum-variance hedge and consequently may provide superior hedging performance.

The extended Gini is a two-sided measure of risk that measures the average distance between all observations. It incorporates a parameter of risk aversion whereby lower returns are more heavily weighted than higher returns as risk aversion increases. The lower partial moment is characterized by two parameters, a target level and a power term reflecting the weights imposed on the tails. These measures differ from the traditional variance measure which applies an equal weight to high and low returns equally distant from the mean. Bawa (1975) and Yitzhaki (1982, 1983), respectively, demonstrate the consistency between the stochastic dominance criteria and decisions based on the mean-LPM and mean-extended Gini frameworks.

In this paper, we compare minimum-variance, minimum-extended Gini, and minimum-lower partial moment hedge ratios and hedge performances of short and long hedgers. We examine four stock index futures contracts traded at the Taiwan Futures Exchange (TFE): TAIEX futures, Mini-TAIEX futures, TSE Electronic Sector Index futures, and TSE Banking and Insurance Index futures. Our results show that long hedgers obtain superior extended Gini and LPM hedge performance than short hedgers in both in-sample and post-sample analyses. A post-sample analysis also establishes the dominance of minimum-extended Gini hedge ratios over LPM hedge ratios.

The asymmetric performance of long and short hedgers is important for both practical and theoretical reasons. With respect to commodity futures, the volume of short hedging has been found to typically exceed that of long hedging (see Yamey, 1971 for example). Prior studies have suggested a number of explanations for this finding, including the planning horizons of producers and users, technical conditions of production, and the seasonality of the production of many of the commodities traded in organized markets.

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