

Realized Jump Risks in the U.S. TB and TIPS Markets

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Abstract

This paper discusses the jump risks for the Treasury bond futures, Treasury bonds (TB), and individual Treasury inflation-protected securities (TIPS). Using the 1-minute high-frequency data, the jump variations contribute more than half to the total variations during January 2003 to May 2014. During the financial crisis, the jump frequency and absolute jump amplitude are higher than normality. Interestingly, in the higher volatility status, the jump frequency is more than the lower volatility state. But, the jump amplitude in the higher volatility state is lower than the lower volatility state, it may be caused by persistent trading for the investors' anticipations. Moreover, we also use the daily rate of return for each TB and TIPS to investigate systematic jump risks. On average, the market participants who hold the long-term TB and TIPS face the systematic jump risks. The investors and the issuers must require the jump risk premium against the mispricing.

Keywords: Realized variation, bi-power variation, CAPM with jump risk, systematic jump risks, high-frequency data.

1. Introduction

Chicago Mercantile Exchange (CME) first issued the bond futures contract in 1977. It provides the market participants to hedge the risks of interest rate. The U.S. Treasury bond futures are the futures contract whose underlying security is the Treasury bond (TB). If the investors expect the decreasing interest rate in the future, they can purchase the bond futures to cover the purchasing-cost of the bonds. On the contrary, the investors make a short position with the bond futures for hedging the loss of increasing interest rate in the future. Thus, the market participants who face the large risks of interest rate like asset managers, banks, corporate treasurers, hedge funds, insurance companies, mortgage bankers, pension funds, primary dealers, proprietary traders, can use the Treasury bond futures contract to hedge risks. Thus, this paper focuses on the Treasury bond futures markets and discusses the levels of the jump risks for the bond markets.

There are five categories for the Treasury bond futures contracts: 2-year, 5-year, 10-year Treasury note futures, 30-year, Ultra Treasury bond futures. The underlying notes of 2-year Treasury note futures satisfy that the original maturity at issue date is less than