

Hedging in an Asymmetrical Freight Market

Chih-Chen Hsu, C. Edward Wang and Chih-Yueh Huang

Feng Chia University, National Taipei University and City University London UK

Abstract

This paper develops a bivariate asymmetric non-linear smooth-transition Generalized Autoregressive Conditional Heteroskedasticity (GARCH) (BANST-GARCH) model to hedge the risk in the shipping freight rate market. Our dataset consists of 1,768 daily spot and forward freight agreement (FFA) prices of two tanker routes TD3 and TD5 with the latter showing an asymmetric pattern. The empirical results of hedging effectiveness strongly support the concept that the BANST-GARCH model outperforms other models in both in-sample and out-of-sample periods with the largest variance reduction. Thus, our model is able to capture the asymmetric pattern in the tanker freight market. This study contributes to the literature by providing a new overview of the interaction between tanker spot and FFA markets, discovering the asymmetric effect of shocks in the shipping market, developing an advanced econometric model to capture the asymmetrical effect, and constructing a better hedge strategy on the basis of our BANST-GARCH model.

Keywords: FFAs, optimal asymmetric hedge ratio, BANST-GARCH model.

1. Introduction

Forward freight agreements (FFAs) are forward contracts for shipping freight rates and are typically used to hedge freight market risk. The contracts are transacted on a cleared basis and based on the terms and conditions of the Forward Freight Agreement Brokers' Association's (FFABA) standard contracts. FFAs are currently cleared by the London Clearing House (LCH), NASDAQ OMX Commodities (NDAQ), the Singapore Exchange (SGX), and the Chicago Mercantile Exchange (CME). This paper investigates the asymmetrical effect of shocks on the dynamics of tanker spot and FFA markets, develops a smooth-transition model to capture this asymmetrical pattern, and then constructs a hedge strategy to improve hedging performance in the tanker market. The shipping market has been characterized as a highly volatile market compared with other commodity and financial markets (see Figure. 1). However, these volatile fluctuations in freight rates are undesirable for shipping participants because they affect the cash flow, profitability, and costs of ship owners and charterers. Hence, risk management and hedging on shipping freight rates is one of the most important issues in the shipping industry and the subject of numerous recent shipping studies.