

ASYMMETRY AND PERSISTENCE IN RETURN VOLATILITY OF COMMODITY FUTURES

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ABSTRACT

Investments in commodity futures have increased significantly over the past two decades. Investors have tried to include commodity futures as part of portfolios to further diversify the risks associated with investing. The current paper attempts to study the persistence and asymmetry in commodity future returns for a time period of over two decades. The paper employs the well-known GARCH model and its variant GJR-GARCH model to study the persistence and asymmetry of these return series. Our results show that shocks to volatility for all series are highly persistent and these return series also show asymmetric behavior in response to shocks. The results of this paper can be useful for portfolio managers and investors who may be interested in including commodity futures into investment portfolios.

Keywords: Volatility Persistence, Asymmetry, GARCH, Commodity Futures

1. INTRODUCTION

There has been an increased interest in investing in commodity futures especially since the significant increase in commodity prices before the great recession. Commodity futures have been actively used as part of portfolios by investors ever since. This paper tries to study five different major commodity futures and their volatility over a time period of more than two decades. These commodity futures include corn, soybean, crude oil, silver, and copper futures. We employ weekly data from October 2000 to February 2022.

The well-known GARCH model is employed to estimate the persistence of volatility. We also employ a variant of the GARCH model known as the GJR-GARCH model to study the asymmetric behavior of each commodity future return series. Our results show high persistence of shocks in all return series. The results also suggest that for all future return series there is significant evidence of asymmetric behavior. We also perform forecasts for these commodity future return series using our GARCH models and the forecasts seem to suggest that although the volatility in each series has been fairly high recently, they all seem to be stabilizing as we continue into the future.

The paper can be broken down into six major sections with introduction in the beginning leading to the literature review. Following the literature review, we describe the methodology in terms of the econometric models used for the study. The later sections go over the data and discuss the empirical results of our tests. The paper comes to a conclusion with the concluding remarks.

2. LITERATURE REVIEW

The existing literature is divided into two different schools of thought in the sense that one group promotes the use of commodities futures into an investment portfolio while the other group cautions against it due to the declining returns on commodities in recent years in comparison to stocks or other investment options. According to Chevallier and Ielpo (2013) commodity spillovers increased during the time period from 1995 to 2012, however, agricultural commodities like corn and soybean have shown the least spillovers. Their research also suggests that precious metals like gold and silver as well as the energy commodities like oil and natural exhibited the most spillovers. The existence of spillovers or lack thereof is important as a consideration when building a portfolio including commodity futures. Hence, any commodities that show high persistence to volatility will likely have a longer-term impact on other series due to the existence of these