The role of market participants in agricultural futures markets

Jingnan Wu, Finbarr Murphy, John Garvey and Weifeng Ma

Synopsis

This paper uses a modified behavioural finance model and trader categories defined by the Commodity Futures Trading Commission to examine sentiment driven price changes and speculative activity in wheat, soybean, rough rice, soybean meal, soybean oil, corn and live cattle. The paper further combines a Vector Autoregression (VAR) model and Cumby-Modest tests to describe the positive feedback trading behaviour of different investors.

Introduction and Background

Global commodity prices traded in capital markets can have a profound effect on commodity production and society as a whole. Commodity futures prices have exhibited large fluctuations, particularly around the financial crisis of 2008. Agricultural commodities, as a particularly important commodity category, also saw large price movements. The US Commodity Futures Trading Commission (CFTC) divides all market participants into three categories: non-commercial investors, commercial investors and non-report investors. Non-commercial and commercial positions together are reportable positions, which are at or above CFTC's reporting level. Commercial positions can be regarded as the positions used for hedging, while noncommercial traders do not hold positions in the corresponding spot commodity market and are usually regarded as speculators. Non-report traders can thus be regarded as small investors. This paper finds that speculators (or non-commercial traders) and some non-report traders are noise traders, but commercial traders are not.

Many researchers believe that the irrational behaviour of speculators created bubbles in commodities markets, especially during 2004 to 2008 (for example, Büyüksahin et al, 2008; Gilbert, 2010; and Irwin et al, 2009). However, no consensus has been reached with regard to the role of speculators and other market participants.

Issues and Questions Considered

Commodity traders are a heterogeneous group with different behavioural traits. A distinction of this paper is the utilization of behavioural finance models to analyse the research question. De Long et al

KBS AUTHORS

Dr Finbarry Murphy, Dept. of Accounting & Finance, Kemmy Business School, University of Limerick

Dr John Garvey, Dept. of Accounting & Finance, Kemmy Business School, University of Limerick

(1990a) established the De Long, Shleifer, Summers and Waldmann (DSSW) model, which models the influence of noise trading on equilibrium prices. Since this model is established for equity markets and one of its important assumptions is that the net supply or demand is not zero, it is therefore not suited to commodity markets. To solve this problem, we use a modified noise trader model to analyse the role of market participants in agricultural markets. A positive feedback trader is a type of noise trader. The behaviour of positive feedback traders is determined by a price momentum, and a positive price movement will encourage a positive feedback trader to purchase the asset, and vice versa. However, positive feedback trading is a particularly destabilizing form of noise trading, and may be one of the reasons for the large volatility observed during the past decade. Therefore, to present a clear picture of the role of all the market participants in agricultural commodities markets, the identification of positive feedback traders is necessary.

Furthermore, this paper combines a VAR model and Cumby-Modest test to describe the positive feedback trading behaviour of different investors during different periods. Although using a VAR model to distinguish positive feedback trading behaviour has been widely used, combining the VAR with a Cumby-Modest test is rare. According to the DSSW model, the price of risky assets is directly impacted by the presence of noise traders and the variance of their activity. The DSSW model cannot be used in commodity markets because it is based on the assumption that the net supply or demand of the whole market is not zero, while the net supply or demand of any commodity market is always zero. In addition, De Long et al (1990a) do not include any empirical analysis, and thus the DSSW model does not propose a specific method for measuring noise trader activity. Many modified models have been proposed to accommodate the commodities futures market. For instance, Sanders et al (1997) set the net supply as zero rather than one. Gilbert (2000) developed a DSSW-based model for the relationship between investor demand and expected price. Investors are categorized as informed speculators, hedgers and noise traders, and it is assumed that each investor is maximizing his or her utility function. The demand function can be estimated by assuming that the sum of these three net positions is zero. Sanders et al (2009) use the 'percent net long' (PNL) index defined by De Roon et al (2000) as a sentiment index. This is calculated as long minus short positions divided by their sum for each investor group.

Methodology

Tang and Xiong (2010) posit that the characteristics of commodity futures before and after 2004 are different, as most commodity prices fluctuated within a relatively narrow range before 2004, but subsequently increased rapidly to their peaks in 2007 or 2008. We believe it is reasonable to divide the whole period into three subperiods: January 1999 to January 2004, January 2004 to January 2008 and January 2008 to mid-2013. The first can be regarded as a 'stable period', the second as a 'rapidly rising period', and the last as an 'adjustment period'. Positions data are taken from Commitments of Traders (COT) reports released by the CFTC, and price data are collected from Bloomberg. The weekly price of wheat, soybean, rough rice, soybean meal, soybean oil, corn and live cattle of the Chicago Board of Trade (CBOT) and the Chicago Mercantile Exchange (CME) is included in this analysis.

Outcomes and Findings

We divided market participants into three categories: commercial traders (hedgers), non-commercial traders (speculators) and non-report traders. The goal of this research was explicitly to examine their roles in pricing commodity futures based on behavioural finance models (noise trader model and positive feedback trader model). We find that speculators (or non-commercial traders) and some non-report traders are noise traders, but commercial traders are not. Moreover, the noise traders in each period did play a role in making prices deviate (upward or downward) by contributing to noise in the seven agricultural commodities markets. The empirical results of the VAR are similar to those in other papers, and we find that commercial traders are negative feedback traders, while non-commercial traders and the non-report traders in some markets are positive feedback traders. Previous research has used the Cumby Modest test, but we combine this test with positive and negative feedback trading strategies. We find that high sentiment should be more closely examined as it can destabilize markets: extremely high sentiment of noncommercial traders and some non-report traders may contribute to price rises, but that of commercial traders contributes to price falls. Meanwhile, the VAR impulse response analysis suggests that sentiment can easily be magnified and reach extreme levels.

Authors:
Dr Jingnan Wu, Tongji University, Shanghai, China

Dr Finbarry Murphy, Dept. of Accounting & Finance, Kemmy Business School, University of Limerick

Dr John Garvey, Dept. of Accounting & Finance, Kemmy Business School, University of Limerick

Dr Weifeng Ma, Tongji University, Shanghai, China

For further information and comments, please contact:
Dr. Sheila Killian
Assistant Dean, Research
Kemmy Business School
University of Limerick, Ireland
T: +353 61 202237
E: sheila.killian@ul.ie

Forthcoming Research Bulletin
Title: On temporary organizations: A review, synthesis and research agenda

Authors: Burke, C. and Morley, M.

About the KBS Research Bulletin
The purpose of the KBS Research Bulletin is to make our research more readily accessible to a wide range of interested stakeholders, and in doing so to enhance the impact of excellent, evidence-based research on the society and economy in which we operate. The bulletins are an important part of stakeholder engagement at the KBS. Their dissemination aligns with both the UL research focus on "translational research" - that is, research with real consequences and real practice impact - and the KBS strategic goals of strengthening excellence in research and contributing to economic, social and community development.

KEMMY BUSINESS SCHOOL
University of Limerick