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Information content of volume: An investigation of Tokyo commodity futures markets

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Abstract

This study examines the relationship between volume and price changes for Tokyo commodity futures contracts by focusing on the predictive power of volume. The findings indicate a positive simultaneous relation between volume and absolute returns. The relation is not entirely contemporaneous since lagged volume contains predictive power for absolute returns. However, linear and nonlinear causality tests show that volume does not forecast returns. The results are qualitatively the same for contracts traded with different methods. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

The nature of price–volume relationship in asset markets has long been a subject of financial research. Many papers document a positive contemporaneous relation between volume and absolute value of returns in both futures and equity markets. This is usually explained as a result of the same variable, the flow of information, directing changes in prices and volume as in the mixture of distributions hypothesis (MDH) of Clark (1973). Gallant et al. (1992) conducted an extensive analysis of stock price–volume relation for

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the U.S. equity market and concluded that more can be learned by studying prices jointly with volume than by examining them alone.

This paper investigates the relationship between price changes and trading volume for gold, platinum and rubber futures contracts traded on the Tokyo Commodity Exchange (TOCOM). The main research question of the study is whether volume contains information useful for predicting future price movements. The information content of volume is examined for the direction and magnitude of price changes, i.e. for returns and absolute value of returns.

The theoretical motivation for the study is provided by Blume et al. (1994), who argue that volume conveys information to the market that cannot be deduced from price alone. Specifically, their model suggests that volume contains information about the precision of price's signal and, therefore, current trading volume could improve forecast of price movements. Their analysis is consistent with the use of technical analysis in financial markets.

An investigation of the TOCOM is of interest for two main reasons. First, the evidence on price–volume relation in futures markets is mainly from U.S. futures exchanges. Results from an international market can be useful for comparison. Second and more importantly, the TOCOM provides an opportunity to examine whether market structure affects price–volume relation in futures markets since two different methods of trading are used on the TOCOM.

The first is systems trading, which is continuous trading similar to the methods used by U.S. futures exchanges. Gold and platinum futures contracts on the TOCOM are traded with the systems method. The second is *Itayose* trading, an auction-like periodic call market trading, under which all orders are treated as having arrived at the same time. The *Itayose* system closely resembles a classical Walrasian auction, where recontracting is allowed at provisional futures prices until an equilibrium (market consensus) price is determined. Rubber futures contract is traded using the *Itayose* method.

Currently, no theory exists to link market structure to information content of trading volume. However, it can be argued that the predictive power of volume for future price movements should be greater for continuous trading systems. On a continuous trading market, trades occur one at a time and prices are not market consensus. The price in any transaction will differ depending on a number of factors, whether the trade is large or small being one of them. Hence, as Schwartz (2000) argues, price discovery will be more accurate on periodic call markets since trades are executed only at market consensus prices.¹ Webb (1995) similarly notes that prices produced by periodic call markets will be less noisy compared to those produced by continuous trading systems. These arguments suggest that prices will be more revealing on a periodic call market and, hence, trading volume as an additional statistic should be less informative. In fact, consistent with this argument, trading volume emerges as a useful statistic in the Blume et al. (1994) model only because prices are noisy and traders cannot obtain the full information signal from price alone.

¹ The author thanks an anonymous referee for pointing out Schwartz's (2000) study.

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