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Isi Kandungan

The Effects of Production, Stock and Export Variables on the Prices of the Malaysian Crude Palm Oil Futures Market

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ABSTRACT

Futures markets play an important role in the price discovery and forward pricing of agricultural commodities. The analysis of this study mainly focuses on the empirical test of the effects of production, stock and export variables on the prices of the Malaysian Crude Palm oil futures market. For the empirical work, correlation analysis, multiple regression and recent econometric analysis were conducted to determine the price relationships of the Malaysian Crude Palm oil futures markets with the production, stock and export variables. Order of integration for all the variables was checked using the Augmented Dickey-Fuller and Phillips-Perron tests of unit root. The Johansen approach was used to test the cointegration in a multivariate system that involved long run and short run estimations. The Vector Error Correction Model was used to test for causal relationships. The empirical evidence obtained from the study shows that a significant long run and short run relationships exist between the cash and future prices of the Malaysian Crude Palm oil futures market with the production, stock and export variables. The results of the causality test also shows that there is a strong relationship between the Malaysian Crude Palm oil futures market with the production, stock and export variables This means that any information flow regarding the price movement of the Malaysian Crude Palm oil futures market will affect the production, stock and export variables and vice-versa.

INTRODUCTION

Palm oil is currently the second most important vegetable oil in the world oils and facts market, accounting for 14.35% of the world production of seventeen major oils and facts, ranking only behind soyabean oil, which contributed to 20.23% of the world output. In terms of world exports of oils and facts, the palm oil is currently leading with a market share of 32% while the soyabean oil has a share of 16.2%. Palm oil and palm kernel oil have become the production growth leaders in the oils and facts complex since the early seventies (Mielke, 1991).

Although palm oil has been dominating the world exports market, palm oil futures are not as active as the Chicago Board of Trade (CBOT) soyabean oil futures where the volume is about 23 times the production of soyabean oil in the United States of America. The volume of crude palm oil (CPO) futures on the Kuala Lumpur Commodity Exchange (KLCE) or now on MDEX is slightly more than the production of the Malaysian palm oil.

As the price of a palm oil is dependent upon its consumption and the stock level, it is important to analyze these two variables simultaneously. The world stock/usage of palm oil is usually higher than that of Malaysia, not only because of the large stocks in transshipment centers such as Singapore and Rotterdam, but also because some consuming countries prefer to keep relatively large stocks (Mielke, 1991). It has become a common practice among major industrialized countries to use buffer stocks to stabilize

the prices of agricultural commodities in the world market [Sarasorro (1988)], including palm oil.

Studies in agricultural economics have shown that the fluctuation of commodity prices is significant and persistent (Wilkinson (1976), Brendt (1985)). According to Mad Nasir and Fatimah (1992), two of the salient features of agricultural commodities are the volatility and variability in prices. As far as volatility and variability of prices are concerned, the impact is more remarkable in the vegetable oils and fats market, notably palm oil, which is the most widely consumed edible oil in the world. If producers are in fact using futures prices as expected output prices when allocating resources, an assessment of the quality of the prices is important. Thus studies on the efficiency of futures markets have important implications on the issue of whether economic resources are being optimally allocated in the agricultural sector or not.

It is particularly important to assess the Malaysian Derivatives Exchange (MDEX) market since it is the only futures market for palm oil and producers. Also, other market intermediaries use it as a price indicator. The existence of pricing efficiency in the markets will assume that futures prices move in line with cash prices in a long-term and that they do not deviate from cash prices for long periods of time. The major objective of this study is to empirically examine the price relationships and the direction of information flow between the Malaysian crude palm oil futures market and the production, stock, export variables.

REVIEW OF RELATED LITERATURE

Initial empirical research on the theory of efficient markets was concerned with testing the randomness of futures price series. Following from Working's theory/works (1958) who emphasized in his Theory of Anticipatory Prices that prices are formed through human decision-making based on available information about supply and demand and past conditions on the market. The continuous flow of the many different kinds of information into the market causes frequent changers, which might be random. Price fluctuations are, therefore, implied to be due to expert appraisal of changing economics information and thus price quotations in a futures market exhibited a random walk.

There has been substantial empirical work, which has investigated the efficiency issue by testing the random walk model. Some of this work rejected the random walk hypothesis, for example in Stevenson and Bear (1970), Cargill and Rausser (1975), and Barnhart (1984); other studies accepted the hypothesis, for example in Larson (1960). Kamara (1982) noted that most of these studies found some evidence of serial correlations in futures prices in the short-run, but the evidence is not strong, and the result depends heavily on the technique as well as the sample period of the studies.

Another definition is that the efficiency of a market refers to the performance of its functions in facilitating transactions and improving on the terms of transactions (Burns, 1983). According to this definition, the efficiency of a market can be related to three aspects: transaction costs, liquidity and pricing efficiency. Pricing efficiency reflects the degree to which an asset's price reflects demand and supply conditions in a market. Pricing efficiency is defined to include two elements: the degree to which an asset's price is determined by competitive prices and the speed with which an asset's price reflects changes in information.

According to Hawawini (1993), there are two kinds of efficiency: informational efficiency and operational efficiency. Informational efficiency refers to the performance of a market as an information processor and a price setter whereas operational efficiency refers to the performance of a market as an exchange system. If the market is informationally efficient, then, it means that the market is able to process information and the securities prices in that market reflect all that is known about the firms. A market can be operationally efficient in the sense that it offers an inexpensive and reliable trading mechanism. It can be stated that the informational and operational efficiency is related; poor operational efficiency may delay the adjustment of prices to new information and prevent them from reaching their equilibrium value. As a consequence, in an efficient

Once we determine the order of integration of each series, the next step is to test for cointegration relationships among the series. The Johansen-Juselius which is based on maximum-likelihood estimation, is designed to test a number of linearly independent cointegrating vectors existing among the variables. The model also utilises the likelihood ratio test statistic that has an exact limiting distribution, which can be used to estimate cointegration relationships among a group of two or more variables. Besides it can estimate a number of linearly independent vectors, Perman (1991) pointed out that the advantage of Johansen-Juselius approach over E-G approach is that the procedure allows testing for linear restriction on the cointegrating parameters. The test statistic in the Johansen and Juselius can also be compared to known critical values.

The likelihood-ratio test of the null hypothesis is obtained by the trace test defined as;

$$\textit{Trace Tests} = -T \sum_{i=r+1}^{p} \ln(1 - Q_i^2) \qquad (1)$$

where T is the number of time period available in the data. The null hypothesis for trace test is that whether or not there are r or less cointegrating vectors. The null of r = 0 is test against the general hypothesis of $r \leq 1, \ldots, r \leq p$. Equivalently we can also use the maximal eigenvalue test. The test is that there are r-cointegrating vectors in a set of p variables against r+1. In other words, the null of r = 0 is test against the specific hypothesis of r = 1, ..., r = p. It is defined as;

$$\textit{Maximal Eigenvalue Tests} = -T \ln(1 - Q_{r+1}^2) \qquad (2)$$

The test statistics of the trace and maximum eigenvalues may be compared with the critical values provided by Osterwald-Lenum (1992).

$$\begin{vmatrix} \Delta SPT \\ \Delta PROD \\ \Delta STOCK \\ \Delta EXPORT \end{vmatrix} = \sum_{i=1}^{k} (\Gamma_i) \begin{vmatrix} \Delta SPT \\ \Delta PROD \\ \Delta STOCK \\ \Delta EXPORT \end{vmatrix} + (\Pi \begin{vmatrix} SPT \\ PROD \\ STOCK \\ EXPORT \end{vmatrix} + \begin{vmatrix} \mu_2 \\ \mu_3 \\ \mu_4 \end{vmatrix} + \begin{vmatrix} \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \end{vmatrix}$$

Attaining the long run estimates of the cointegration relationships is only half of the whole process of cointegration in multivariate systems. Estimating the short run model of spot prices of Malaysian crude palm oil and the international competiting oils market is another important part of the analysis in order to capture the short run adjustment behaviour of economic variables, which is quite relevant to policy implications. The number of cointegrating vectors, which is revealed from the results of Johansen's tests, will determine the approach of estimating the short run model of spot prices of the Malaysian crude palm oil futures market and spot prices of international competitive oils. When there is only one cointegrating vector, the short run dynamics of spot prices of the Malaysian crude palm oil and the international competiting oils functions can be estimated using the (single equation) general to specific procedure. The technique departs from the general autoregressive distributed lag representation with error correction term(s) or EC obtained from the relevant estimated cointegrating vector(s):

$$A(L)\Delta SPT_t = \alpha_0 + B(L)\Delta LPROD_t + C(L)\Delta LSTOCK_t + D(L)\Delta LEXPORT_t + \alpha_1 EC_{t-1}$$

where SPT_t is spot price while $A(L) \ldots D(L)$ are lag polynomials. The equation can be estimated using ordinary least square (OLS) if all of the independent variables are weakly exogenous, however, when one or some of the independent variables are not weakly

We can conclude from the evidence that the cash and future prices of the Malaysian crude palm oil futures market has a causal relationship with the export, production and stock level variables.

CONCLUDING REMARKS

The study also proves that the spot and future prices of the Malaysian crude palm oil market has a stable long-run and short-run relationships with the production, stock and export from the results of Johansen's cointegration and vector error-correction model. This indicates that the production, stock level and export variables play an important role in influencing the prices of the crude palm oil. These results uphold the theory of the previous studies that production; stock level and export variables do influence the prices of the Malaysian crude palm oil futures market and this indicates the existence of inefficient. The study of market efficiency of agricultural futures market has important implications for commodities exchange, policy makers, traders and producers. The most important implication is that a good price transmission system is essential to ensure that future prices do not diverge from the fundamentals. The futures market has to be closely related to actual demand and supply conditions in order for futures prices to be good indicators for the cash market.

The potential uses of these findings are numerous. Hedgers may benefit from this information when deciding upon the appropriate futures contract to use. The cointegration results imply that it may be possible to hedge whether in the long term or short term in the Malaysian crude palm oil futures market in order to reduce their risks. On the other hand, the causal relationships discovered in the studies may be useful to both traders and speculators in using their arbitrage opportunities between the cash (spot) and futures contracts.

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