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**The Effectiveness of Hedging Between Crude Palm Kernel Oil
(CPKO) Spot Price and Futures Crude Palm Oil Contract (FCPO)
In Malaysia.**



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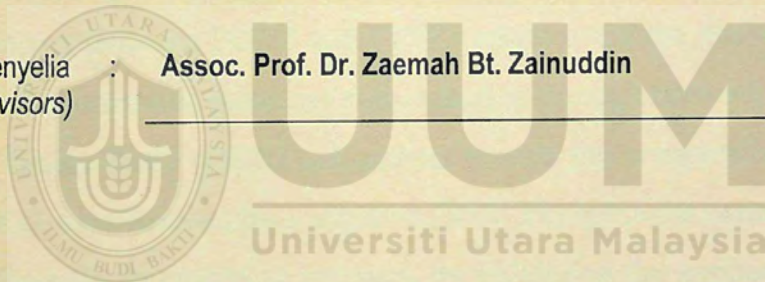
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ABSTRACT

The Malaysian palm oil market, a crucial component of the global edible oils industry, experiences significant price volatility, particularly in crude palm kernel oil (CPKO). This volatility presents substantial challenges for market participants in managing financial risks. This study examines the relationship between CPO's futures price and the hedging effectiveness of CPKO's spot price. It also investigates the relationship between unhedged and hedged portfolios and assesses the hedging effectiveness of FCPO contracts in mitigating CPKO price volatility. Advanced econometric techniques, including regression analysis, GARCH models, and time series analysis, were applied to a comprehensive dataset of daily CPKO spot prices and FCPO contracts from January 2010 to June 2022. This 12-year period provides a detailed examination of long-term market dynamics and price fluctuations in the Malaysian palm oil industry. The findings indicate a significant positive impact between FCPO and CPKO prices using the Naive 1-to-1 approach. The GARCH 1:1 model demonstrates enhanced risk reduction through time-adjusted hedge ratios. However, the Optimal Hedge Ratio (OHR) calculation reveals the complexities of using FCPO futures for hedging CPKO, as evidenced by a negative OHR. These results contribute significantly to hedging theory, particularly in emerging markets, by validating the application of regression and time series models in understanding the dynamics between spot and futures prices within the palm oil industry. Traders, producers, and policymakers for Crude palm kernel oil should emphasize the need for adaptable and effective hedging strategies to manage price risks within the palm oil industry. FCPO contracts may help stabilize price fluctuations, offering stability and predictability for the palm oil industry. Continuous adaptation and refinement of hedging strategies are essential for effectively mitigating risks.

Key Words: Crude palm kernel oil (CPKO), Futures contract crude palm oil contract (FCPO), Hedging, Price volatility, Risk management.

ABSTRAK

Pasaran minyak sawit Malaysia, komponen penting dalam industri minyak makan global, mengalami turun naik harga yang ketara, khususnya dalam minyak isirung sawit mentah (CPKO). Ketidakstabilan harga ini menimbulkan cabaran besar kepada peserta pasaran dalam menguruskan risiko kewangan. Kajian ini mengkaji hubungan antara harga hadapan FCPO dan keberkesanan lindung nilai harga spot CPKO. Ia juga menyiasat hubungan antara portfolio tidak dilindungi dan dilindungi nilai serta menilai keberkesanan lindung nilai kontrak FCPO dalam mengurangkan turun naik harga CPKO. Teknik ekonometri lanjutan, termasuk analisis regresi, model GARCH, dan analisis siri masa, digunakan pada dataset komprehensif yang terdiri daripada harga harian tempat CPKO dan kontrak FCPO dari Januari 2010 hingga Jun 2022. Tempoh 12 tahun ini menyediakan pemeriksaan terperinci terhadap dinamik pasaran jangka panjang dan turun naik harga dalam industri minyak sawit Malaysia. Penemuan menunjukkan kesan positif yang ketara antara harga FCPO dan CPKO menggunakan pendekatan Naive 1-to-1. Model GARCH 1:1 menunjukkan pengurangan risiko yang dipertingkatkan melalui nisbah lindung nilai terlaras masa. Walau bagaimanapun, pengiraan Nisbah Lindung Nilai Optimum (OHR) mendedahkan kerumitan penggunaan niaga hadapan FCPO untuk melindungi nilai CPKO, seperti yang dibuktikan oleh OHR negatif. Keputusan ini menyumbang dengan ketara kepada teori lindung nilai, terutamanya dalam pasaran baru muncul, dengan mengesahkan aplikasi regresi dan model siri masa dalam memahami dinamik antara harga spot dan niaga hadapan dalam industri minyak sawit. Pedagang, pengeluar, dan pembuat dasar bagi minyak isirung sawit mentah harus menekankan keperluan untuk strategi lindung nilai yang fleksibel dan berkesan bagi menguruskan risiko harga dalam industri minyak sawit. Kontrak FCPO mungkin dapat menstabilkan turun naik harga, menawarkan kestabilan dan kebolehamalan kepada industri minyak sawit. Penyesuaian dan penambahbaikan berterusan terhadap strategi lindung nilai adalah penting untuk mengurangkan risiko dengan lebih berkesan.

Kata Kunci: Minyak isirung sawit mentah (CPKO), Kontrak niaga hadapan kontrak minyak sawit mentah (FCPO), Lindung nilai, Turun naik harga, Pengurusan risiko.

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CHAPTER 1:

INTRODUCTION

Palm oil is derived from the *Elaeis guineensis* plant and constitutes a significant and vital edible oil source for consumers and industry usage. It underscores this commodity's pivotal role in the agricultural sectors of Indonesia, Malaysia, and Thailand, thereby contributing substantially to their respective economies (Saeyang & Nissapa, 2021). Palm oil is recognized as the primary edible oil source of direct consumption for global consumers, and it is widely used to produce agricultural products and industrial materials. Palm oil production has gained considerable relevance in the worldwide market for edible vegetable oil (Bea, 2020).

In 2018, palm oil production reached an impressive 73 million tons, making up 36% of the overall global output of edible vegetable oils, which amounted to 204 million tons. Moreover, as indicated, there will be a rise in palm oil consumption, reaching an approximate consumption of 75 million tons by 2020; this shows the significant contribution of palm oil to the whole world's vegetable oil supply (Dewi, 2021). Given the significant role that palm oil plays in Malaysia's economy and the global market, understanding the dynamics of CPKO spot prices and FCPO futures contracts becomes crucial (Kumar & Singh, 2019).

At the international level, if the agricultural economy competes in such conditions, the futures market ensures the stabilization of prices by increasing the profit-earning capacity of trading participants. Furthermore, price volatility is considered an aligned feature for agricultural commodities that significantly impact food security, especially edible oil. As a result, the

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