

**Comparison study of different Value at Risk Models and their effectiveness
on the Malaysian Palm Oil Futures (FCPO) market.**

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ABSTRACT

Market risk is an important element of derivatives trading and can cause derivatives market participants to suffer substantial amount of loss if not managed properly. Value at Risk (VaR) is a tool that has been used to manage market risk particularly in the developed markets. This research tries to identify which VaR model out of three models namely Historical Simulation, Delta Normal and Age Weighted Historical Simulation that can be effectively used as risk management tool for Malaysian derivatives market particularly the Malaysian Palm Oil Futures (FCPO) market. The back testing process was conducted to study the number of violations of each models produced and the exceptions were tested using Kupiec Proportion of Failure (POF) test to find the most accurate model. The study revealed that the Age Weighted Model was the most effective and robust compared to the other two models. Age Weighted potentially can be a viable alternative method of market assessment along with more complex models such as Monte Carlo Simulation and GARCH.

Keywords: Value at Risk (VaR), Market risk, Back testing, Futures market.

ABSTRAK

Risiko Pasaran merupakan suatu elemen yang penting dalam perdagangan derivatif. Jika risiko pasaran tidak diuruskan secara teliti, ia akan mengakibatkan kerugian yang besar. Risiko pada Nilai atau Value at Risk (VaR) merupakan satu cara yang digunakan untuk menguruskan risiko berkenaan terutamanya di negara-negara maju. Kajian ini menguji nilai dalam kerugian dengan membuat kajian dan mengenal pasti model VaR yang terbaik untuk risiko pasaran ini. Justeru itu tiga model VaR yakni Simulasi Sejarah atau Historical Simulation (HS), Delta Normal (DN) dan Wajaran Hayat Simulasi Sejarah atau Age Weighted Historical Simulation (AWHS) dikaji untuk kegunaan menilai risiko pasaran untuk pasaran hadapan minyak kelapa sawit Malaysia (FCPO). Proses ujian kembali (back test) dibuat untuk mengkaji berapa kali model-model berkenaan gagal untuk meramal kerugian yang berlaku. Perbandingan dan ujian dibuat ke atas bilangan kegagalan yang di catat oleh setiap model. Daripada ujian yang di buat di dapati model Wajaran Simulasi Sejarah (AWHS) paling berkesan dalam menganggar risiko pasaran untuk pasaran hadapan kelapa sawit Malaysia (FCPO). Wajaran Simulasi Sejarah (AWHS) memiliki potensi untuk menjadi model alternatif selain daripada model yang lebih kompleks seperti simulasi Monte Carlo dan GARCH untuk di gunakan di pasaran hadapan berkenaan.

Kata Kunci: Risiko pada nilai, Risiko pasaran, Ujian kembali, Pasaran hadapan.

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GLOSSARY OF TERMS

Basel Committee:	An international organ for banking supervision by providing standards, guidelines and recommendations to financial institution around the world.
Confidence level:	The confidence level is used to indicate the reliability of an estimate.
Kupiec Test:	Statistical test for model validation based on failure rates.
Kurtosis:	Describes the degree of flatness of a distribution.
Normal distribution:	The Gaussian probability distribution.
Risk:	The dispersion of unexpected outcomes owing to movements in financial variables.
Skewness:	Describes departures from symmetry.
Value at Risk (VaR):	The maximum expected loss over a given holding period at a given level of confidence.

LIST OF ACRONYMS

AWHS:	Age Weighted Historical Simulation.
CaVia:	Conditional Autoregressive Value at Risk.
DN:	Delta Normal.
EGARCH:	Exponential Generalized Autoregressive Conditional Heteroskedasticity.
FCPO:	Futures Crude Palm Oil.
GARCH:	Generalized Autoregressive Conditional Heteroskedasticity.
HS:	Historical Simulation.
I.I.D:	Identically and Independently Distributed.
LR:	Likelihood Ratio.
OTC:	Over the Counter
P&L:	Profit and Loss.
POF:	Proportion of Failure.
TUFF:	Time until First Failure.
VaR:	Value at Risk.

CHAPTER 1

INTRODUCTION

1.1 Background of study

Risk taking is an integral part of any financial institutions and it is important to balance the return that they are willing to accept with the soundness of their financial position. An effective risk management function can help the institutions to manage its risk based on its strategy and risk appetite. Financial institutions face various risks in their day to day activity like operational risk, financial risk, credit risk, regulatory risk and market risk. It is therefore imperative that financial institutions establish a rigorous risk management process of identifying, assessing, controlling and mitigating the risks.

This study is conducted to find the most effective yet a simple risk management tool that can assess the market risk that can be used by derivatives brokers particularly the smaller brokers that do not have sophisticated systems in place due to insufficient resources and expertise. This will allow smaller derivatives broker to assess market risk exposure in a structured and quantitative manner. The study focuses on risk assessment model called Value at Risk (VaR). The objective of the study is to compare three models of VaR and identify which is the most viable method for smaller derivatives brokers to use for assessment of their exposure to market risk.

Market Risk is one of the major risks faced by the financial industry and is one of the major factors of the financial crisis of 2008 due to excessive usage of mortgage backed

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