

A COMBINATION OF FUZZY AUTOREGRESSIVE
INTEGRATED MOVING AVERAGE MODEL FOR
FORECAST MALAYSIA'S CURRENCY
EXCHANGE RATES

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A COMBINATION OF FUZZY AUTOREGRESSIVE INTEGRATED MOVING
AVERAGE MODEL FOR FORECAST MALAYSIA'S CURRENCY
EXCHANGE RATES

By
Ho Chui Yee

A final year project submitted in partial fulfillment of
the requirements for the award of the degree of
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DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCES AND TECHNOLOGY
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2009

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**JABATAN MATEMATIK
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PENGAKUAN DAN PENGESAHAN LAPORAN MAT 4499 B

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk **A Combination Of Fuzzy Autogressive Integrated Moving Average Model For Forecast Malaysia's Currency Exchange Rates** oleh **Ho Chui Yee**, No matrik: **UK 14033** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Matematik sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains Matematik Kewangan, Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this Final Year Project entitled **A Combination of Fuzzy Autoregressive Integrated Moving Average Model for Forecast Malaysia's Currency Exchange Rates** is the result of my own research except as cited in the references.

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ABSTRACT

Time series models such as Auto-Regressive Integrated Moving Average (ARIMA) models are the most important forecasting models used in financial market forecasting over the past three decades. However, the recent studies show that the combination ARIMA models with different kind of models can be an effective method of improving upon their predictive performance. Due to factors of uncertainty from the integral environment and rapid development of new technology, little data in a short time period to forecast future situations is encourage. This study is mainly concerned on the effectiveness of ARIMA and combination fuzzy ARIMA (FARIMA) forecasting model, which combines the time series ARIMA model and the fuzzy regression model. Both of these models are applied in forecast the foreign exchange rates of Malaysian Ringgit to US dollars. FARIMA model includes both interval models with interval parameters and the possible distribution of future value. Based on the results, it can be shown that the combination FARIMA can makes a good forecast by using fewer observations than the ARIMA model.

SATU KOMBINASI MODEL KABUR PURATA BERGERAK TERKAMIR AUTOREGRESIF UNTUK RAMALAN KADAR PERTUKARAN WANG DI MALAYSIA

ABSTRAK

Analisis siri masa model seperti model Purata Bergerak Terkamir Autoregresif (ARIMA) merupakan model-model peramalan yang penting dalam peramalan pasaran kewangan sejak tiga dekad yang lalu. Walaubagaimanapun, kajian baru-baru ini menunjukkan gabungan model ARIMA dengan jenis model lain yang berbeza boleh menjadi satu kaedah yang berkesan dalam peningkatan prestasi satu peramalan. Akibat daripada faktor-faktor ketidakpastian daripada persekitaran dan pembangunan teknologi baru yang pesat, data yang sedikit dalam satu jangka masa pendek adalah digalakkan dalam peramalan. Kajian ini terutamanya tertumpu kepada keberkesanan bagi peramalan model ARIMA dan gabungan model ARIMA kabur (FARIMA) iaitu kombinasi siri masa model ARIMA dan model regresi kabur. Kedua-dua model ini digunakan untuk peramalan kadar pertukaran asing Ringgit Malaysia dengan dolar Amerika. Model FARIMA termasuk model selang dengan parameter selang dan taburan berpotensi bagi nilai masa depan. Berdasarkan keputusan, model FARIMA memberikan satu ramalan yang baik dengan penggunaan data ramalan yang kurang daripada model ARIMA.