





A COMPARISON OF FUZZY TIME SERIES WITH STATISTICAL ANALYSES  
IN FORECASTING MALAYSIAN GOVERNMENT TAX REVENUE

By  
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## DECLARATION

I hereby declare that this thesis entitled A Comparison of Fuzzy Time Series with Statistical Analyses in Forecasting Malaysian Government Tax Revenue is the result of my own research except as cited in the references.

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## **A COMPARISON OF FUZZY TIME SERIES WITH STATISTICAL ANALYSES IN FORECASTING MALAYSIAN GOVERNMENT TAX REVENUE**

### **ABSTRACT**

Many forecasting models based on the concept of fuzzy time series have been proposed in the past decades. In recent years, many researchers have used fuzzy time series to handle forecasting various domain problems and it has been shown to forecast better than other models such as the predictions of stock prices, academic enrollments, weather, road accident casualties, etc. However, two main factors, which are the lengths of intervals and the content of forecast rules, impact the forecasted accuracy of the models. This paper presents a simple fuzzy set theory and fuzzy time series forecasting method of order three towards Malaysian government tax revenue which uses a time variant difference parameter on current state to forecast the next state. Based on the relationship, the forecast of the government tax revenues is generated in fuzzy terms, such as: 'moderate value', 'poor value', 'excellent value' and etc. The accuracy of using the different number of fuzzy sets on the prediction of the government tax revenue has shown and compared in this paper.

## **PERBANDINGAN SIRI MASA KABUR DENGAN ANALISIS STATISTIK DALAM PERAMALAN PUNGUTAN CUKAI KERAJAAN MALAYSIA**

### **ABSTRAK**

Banyak model peramalan yang berdasarkan konsep siri masa kabur telah diperkenalkan dan diaplikasikan sejak beberapa dekad yang lalu. Sejak kebelakangan ini, ramai penyelidik telah menggunakan siri masa kabur untuk menjalankan peramalan bagi pelbagai masalah domain dan telah terbukti bahawa siri masa kabur dapat meramal dengan lebih tepat berbanding dengan teknik-teknik peramalan yang lain. Walaubagaimanapun, panjang selang masa dan kandungan peraturan-peraturan peramalan, bertindak sebagai dua faktor terpenting, dapat menjejaskan ketepatan hasil peramalan. Contoh-contoh masalah yang telah dijalani peramalan ialah harga saham, bilangan pendaftaran dan kemasukan akademik universiti, cuaca, kemalangan jalan raya dan sebagainya. Tesis ini menunjukkan teori set kabur dan teknik peramalan siri masa kabur berdarjah tiga yang mengaplikasikan parameter perbezaan masa dari satu tahun ke tahun yang depan terhadap pungutan cukai kerajaan Malaysia. Berdasarkan hubungan set kabur tersebut, peramalan pungutan cukai kerajaan Malaysia telah dijanakan dalam terma-terma kabur, iaitu 'nilai sederhana', 'nilai kecil', 'nilai bagus' dan lain-lain lagi. Penggunaan bilangan set kabur yang berlainan untuk menghasilkan ketepatan peramalan yang berbeza telah ditunjukkan dan dibandingkan dalam tesis ini.