

**ESTIMATING AND FORECASTING THE YIELD  
CURVE:  
SRI LANKAN GOVERNMENT SECURITIES MARKET**

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## CANDIDATE'S DECLARATION

“I declare that this is my own work, and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text”

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“I have supervised and accepted this thesis for the submission of the degree”

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Date

## **DEDICATION**

*This thesis is dedicated to my parents  
for their endless love, support and encouragement.*

## **ACKNOWLEDGEMENT**

First and foremost, I thank and pay respect to my parents who has been my pillars of strength giving me moral support at all times. My two younger brothers deserve my wholehearted thanks as well, for assisting me in so many ways, from helping to debug a code, to sharing their ideas, to simply being there whenever I needed their support.

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Thavisha Senarath Yapa

## ABSTRACT

In this study, I evaluate two versions of the Nelson and Siegel (1987) model, namely the Nelson-Siegel model using the methodology presented in Diebold and Li (2006) and Nelson-Siegel-Svensson model (1994), with the purpose of fitting the current yield curve and forecasting the yield curve for the Sri Lankan government securities market.

The study finds that using the Svensson model which has an additional curvature factor compared to the Nelson -Siegel (Diebold and Li model) leads to a better in-sample fit of the term structure, and thus a better fit of the yield curve is observed. The superior in-sample fit of the Svensson model is clearly visible in the graphical outputs obtained and is further supported by the higher  $R^2$  and lower RMSE associated with the Svensson model.

The results obtained are robust for recent events such as the COVID -19 pandemic that affected the country.

Forecasting performance of the two models, indicated opposite results compared to results obtained in the estimation of yield curves. Yield curves from Nelson-Siegel (Diebold and Li) model are predicted better compared to the Svensson model under both the short forecast horizon of one month and longer forecast horizon of six months. This is clearly exhibited in the lower RMSE associated with the Nelson -Siegel (Diebold and Li) model under the rolling window forecasting design that was applied using an AR(1) forecasting model.

**Keywords:** Yield curve, Term structure of interest rates, Nelson-Siegel, Diebold & Li, Svensson, Estimating, Forecasting.

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## LIST OF ABBREVIATIONS

Abbreviation	Description
<b>AIC</b>	Akaike Information Criterion
<b>AR</b>	Auto Regressive
<b>CBSL</b>	Central Bank of Sri Lanka
<b>ESS</b>	Explained Sum of Squares
<b>MAPE</b>	Mean Absolute Prediction Error
<b>NS Model</b>	Nelson-Siegel model, using the methodology presented in Diebold and Li, 2006
<b>OLS</b>	Ordinary Least Squares
<b>QAR</b>	Quantile Autoregression
<b>R<sup>2</sup></b>	Coefficient of Determination
<b>RMSE</b>	Root Mean Squared Error
<b>SV Model</b>	Nelson-Siegel-Svensson model
<b>TSS</b>	Total Sum of Squares