ESTIMATING DISCOUNT RATE WITH EXTENDED NEILSEN SIEGEL VENSSON MODELS

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Abstract: Nelson Siegel Svensson model usually is used for yield curve analysis. This model is very complicated because consist of about eight variables, so it will be problem to solve and optimize this model. This paper aims to discuss about solution of Nelson Siegel Svensson model by using Gauss-Newton method and Levenberg-Marquardt algorithms. The solution will be derived theoretically and it will be illustrated by numerical example.

Keyword: Gauss-Newton, Nonlinear Equation

1. INTRODUCTION

Bond is once instruments in market price, such as bond make the choice investor in invest his wealt in order increase wealth that don’t reduce his wealth value. The bond better is the bond wiches has default risk very small, it is the choice for investors, such as this bond has interest to get its. So, we interest in research develop this bond.

In Rahardjo (2003) bond from issuer consists of three i.e Government Bond, Municipal Bond, and Corporate Bond. Government Bond is bond issued by the central government with the aims to government purposes. Given collateral is the allocation of government revenue derived from taxes or other government revenue. Municipal bond is bond issued by local government for develop public facilities projects in the region. The fund from the bond using to requirement facilities public. Corporate bond is bond issued by private companies with aims for get fund in develop companies.

In this paper, we were research government bond, because it is one of the factors supporting the development of the State and has a relatively small risk. For interest investors, Government is given an attractive offer interesting for investor, and collateral is the best better from other bonds.

A widely cited study by Prastowo (2007) find that There are two main things that drives high interest on Government Bonds, i.e because included in group risk-free investment portofolio and its coupon higher intereste rate Bank. In May 2006 price of government bonds showed a very sharp decline, although at next week bond prices increase. This problem cause exchange of Dolar U. S to Rupiah, and performance IHSG under pressure (Bank Indonesia, 2006).

Due to many factors that influence the price of Government bonds, the researchers tried to see the factor of exchange rate U.S. dollar to rupiah and the Jakarta Stock Exchange (JKSE), researchers estimate that is very dominant factor affecting the yield curve of government bonds.

Various papers examine the effects of macro factors affecting the yield curve model of the bond, such as Landschoot (2004) writes that Nelson Siegel model by adding a liquidity factor and the difference between sample coupon bonds with its average, Diebold, Rudebusch, and Auroba (2005) who wrote about the model yield curve with macroeconomic factors. Among the manufacturing capacity utilization, the federal funds rate, and annual