

## Exercises – Week #39

### Introduction to Financial Engineering

**Note: You may choose to work in R or Matlab. Sometimes solutions will be available in one language, sometimes in both.**

1. (yield curve) Use the results from Exercise 1 in Week 38

- (a) Plot the yield curve. Does something look odd? If so, what?
- (b) Calculate the Nelson-Siegel coefficients and fitted interest rates
- (c) Plot the the Nelson-Siegel fitted yield curve in the same plot as before and compare

Note: You may have to remove one of the bonds from your data before computing the Nelson-Siegel coefficients. In R, the following functions are useful: "YieldCurve" package (explore the documentation yourself), `Nelson.Siegel()` – for computing Nelson-Siegel coefficients (look at examples and pay attention to how data is formatted for input into function), `NSrates()` – for computing the interest rates by Nelson-Siegel's model. In Matlab, you might consider the functions (needs to be downloaded from the file exchange) `nelsonfit.m` etc.

2. (duration, convexity) Use the results from Exercise 1 in Week 38

- (a) Compute the duration for all bonds
- (b) Compute the convexity for all bonds