MTH 301E: Numerical Methods in CE (Fall 2015)

Assignment 2

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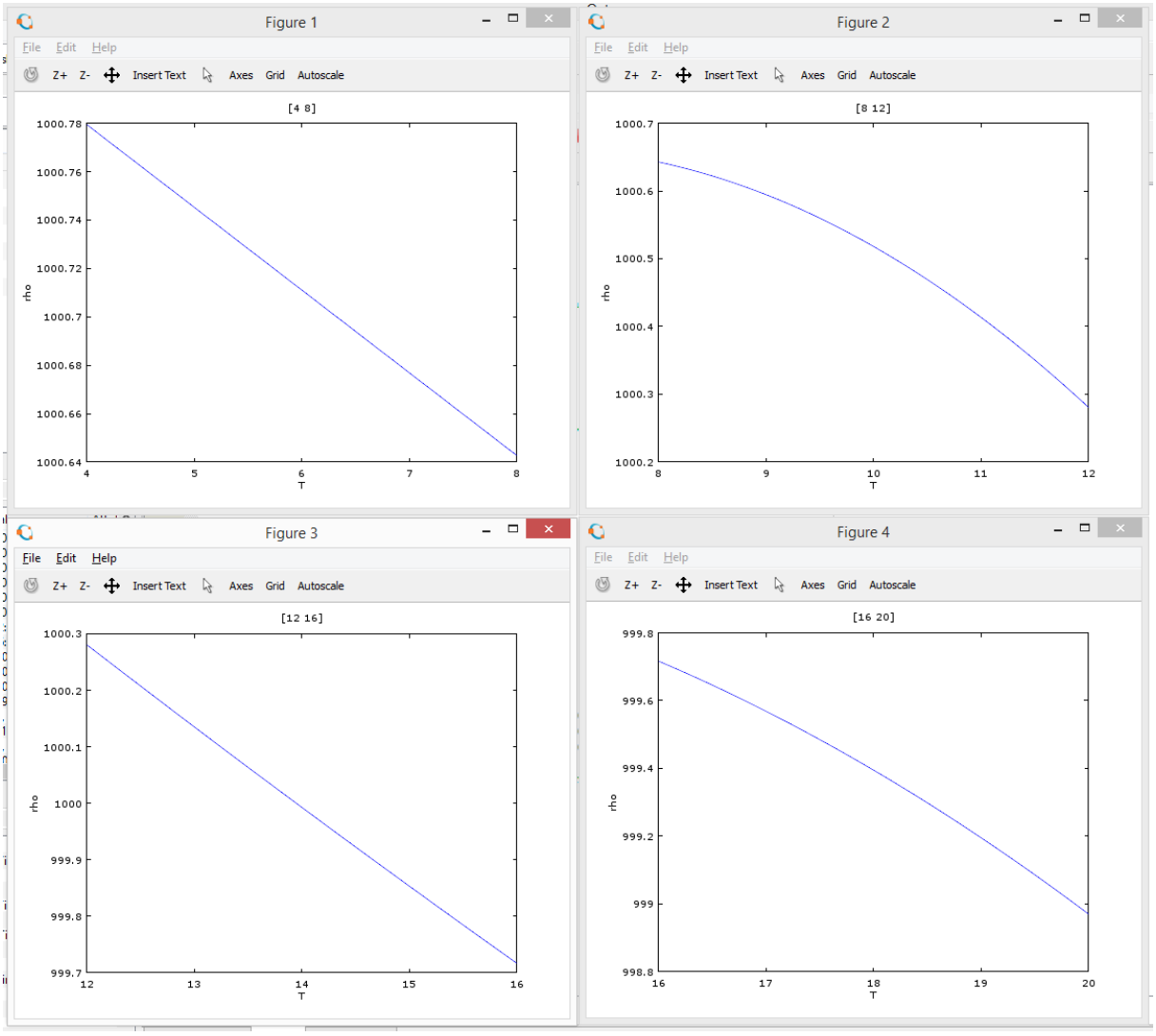
1. Spline functions

Details are on the code with comments.



from the value of D_6,...,D_18 the relative errors are about 0.003 then the interpolation of the data is precise.

calculating the relative errors for the further values of T

D_6 = 0.0029748

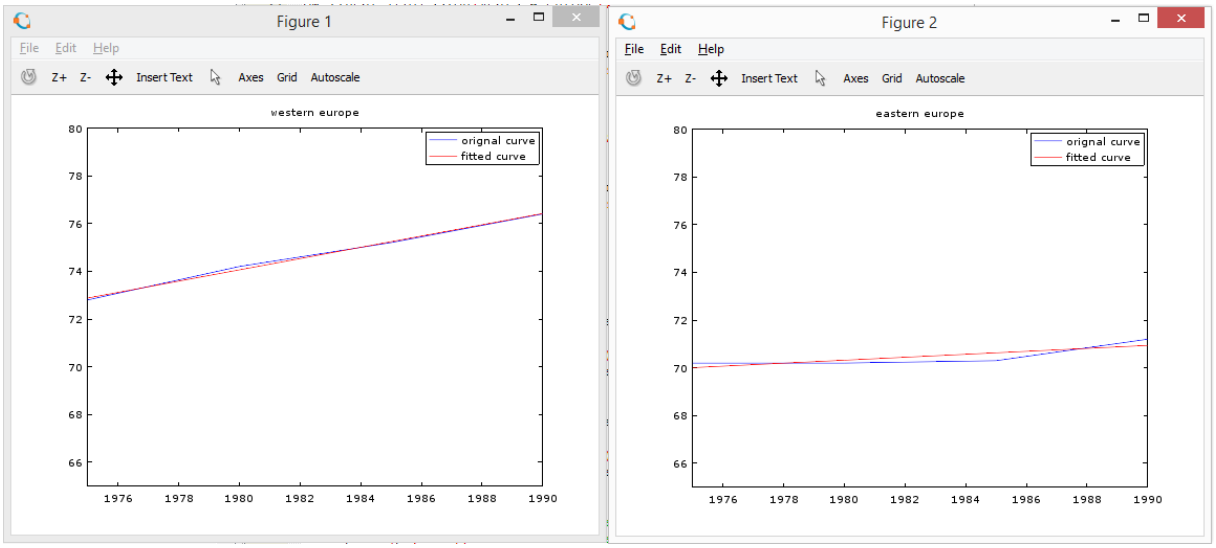
D_10 = 0.0029760

D_14 = 0.0029824

D_18 = 0.0029819

2. Regression Analysis

Details are on the code with comments.



b.) Calculating errors for western Europe case

Goodness of fit R^2: 0.99599

MAE: 0.070000

RMSE: 0.083666

MAPE: 0.094485

Calculating errors for eastern Europe case

Goodness of fit R^2: 0.67915

MAE: 0.22500

RMSE: 0.23822

MAPE: 0.31905

c.) Our fit is for the range [1975 1990], and we want to extrapolate the value of 1995. 1970 is also spaced by 5 years to the fitted interval then corresponding value at 1970 can be used to estimate the accuracy of the values extrapolated at 1995.

Extrapolation for the year 1995

The case of western Europe: 77.600

The case of eastern Europe: 71.250

3. Integration

Details are on the code with comments.

Requires matlab.