# NSCOEF

Updated: 31 Mar 2016

Use NSCOEF to calculate the Nelson Siegel coefficients for a zero coupon curve. Nelson and Siegel suggested calculating the yield curve at a point using this formula:

$$y_\tau = \beta_0 + \beta_1\left[\frac{1-\exp(-\tau/\lambda)}{\tau/\lambda}\right] + \beta_2\left[\frac{1-\exp(-\tau/\lambda)}{\tau/\lambda} - \exp(-\tau/\lambda)\right]$$

To find the coefficients, the program uses ordinary least squares to calculate the values of $B_0$, $B_1$, and $B_2$ for any value of λ and simply finds the value of λ (to 4 decimal places) which has the smallest $r^2$. There may be more than one solution; however the function only returns the first one that it finds.

## Syntax

```
Public Shared Function NSCOEF(
    ByVal YieldCurve_RangeQuery As String,)
```

## Arguments

*YieldCurve_RangeQuery*

a T-SQL statement, as a string, that specifies the maturities (as measured in years) and their zero coupon rates to be used as in calculating the Nelson Siegel coefficients. *YieldCurve_RangeQuery* is an expression that returns a **String**, or of a type that can be implicitly converted to **String**.

## Return Type

FinancialTypes.**NSCOEF_table**

```
  Class NSCOEF_table
    Inherits Data.DataTable
    Property Item(RowIndex As Integer) As FinancialTypes.OutputRow_NSCOEF

  Class OutputRow_NSCOEF
    Public B0 As Double
    Public B1 As Double
    Public B2 As Double
    Public Tau As Double
    Public RMSE As Double
  End Class
```

| Column | Description |
|---|---|
| **B0** | The first coefficient |
| **B1** | The second coefficient |
| **B2** | The third coefficient |
| **Tau** | Tau |
| **RMSE** | Residual sum of squares. SQUARE(SUM(y – ŷ)) |

## Remarks

- The function is insensitive to order; it does not matter what order the dates and rates are passed in.
- See `NSCOEF` to calculate the interpolated values using the Nelson Siegel coefficients.
- See `NSCOEF2` for another way to calculate the Nelson Siegel coefficients.

## See Also

- NELSONSIEGEL - Zero coupon rate using Nelson Siegel formula
- NSCOEF2 - Nelson Siegel coefficients for a zero coupon curve