VBA code to check analytical/semi-analytical analysis of the characteristics of the Expected Worst Loss in T realisations for Normal random variables

See here for an analytical/semi-analytical analysis. This page provides VBA code (for Microsoft Excel) capable of carrying out a simulation analysis to check the analytical/semi-analytical analysis:

```
Option Explicit

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Public Sub TestExpectedWorstLostInTRealisationsNormal()
    'tests (in VBA) results derived analytically or semi-analytically for Expected Worst Loss
    'in T realisations, if underlying random variables are unit Normal (i.e. N(0,1))
    Dim i As Integer
    Dim j As Integer
    Dim m As Integer
    Dim n As Integer
    Dim r() As Double
    Dim rmin() As Double
    Dim avrmin() As Double
    Dim xsum As Double

    m = 256
    n = 10000
    ReDim r(0 To m - 1, 0 To n - 1)
    ReDim rmin(0 To m - 1, 0 To n - 1)
    ReDim avrmin(0 To m - 1)

    'populate m series each with n example draws.
    For i = 0 To m - 1
      For j = 0 To n - 1
         r(i, j) = Excel.WorksheetFunction.NormSInv(Rnd())
      Next
    Next

    'calculate minimum of first i of the series, for each of the example draws, and their averages
    xsum = 0
    For j = 0 To n - 1
       rmin(0, j) = r(0, j)
       xsum = xsum + rmin(0, j)
    Next
    avrmin(0) = xsum / n

    For i = 1 To m - 1
       xsum = 0
       For j = 0 To n - 1
         If r(i, j) > rmin(i - 1, j) Then
            rmin(i, j) = rmin(i - 1, j)
         Else
```

```vba
            rmin(i, j) = r(i, j)
          End If
          xsum = xsum + rmin(i, j)
        Next
        avrmin(i) = xsum / n
    Next

    'and output
    With ThisWorkbook.Worksheets("Sheet1")
        .Cells(1, 1) = "T"
        .Cells(1, 2) = "EWL in T realisations (approx)"
        For i = 0 To m - 1
            .Cells(2 + i, 1) = i + 1
            .Cells(2 + i, 2) = avrmin(i)
        Next
    End With
End Sub
```