|  |  |  |
| --- | --- | --- |
| **#** | **Step** | **Description** |
| 1 | Understand the model in worksheet "Section1" | Read the article: http://aswathdamodaran.blogspot.com/2012/05/how-much-is-growth-worth.html. For the list of formulation in the model in worksheet "Section1" take a look at the formulas in worksheet "Section2". Also take alook at the Sub PRINT\_FORMULATIONS\_IN\_WORKSHEET\_SECTION1\_FUNC() in module "Section2". |
| 2 | No Growth Scenario: Formulation for "Value of assets in place". | For the calculation of "Value of assets in place" refer to cells B23 and B50 in worksheet "Section1". Also take a look at the function GROWTH\_WORTH\_CALC\_FUNC in module "Section1", used in cell C50. |
| 3 | Growth Scenario: Formulation for "Intrinsic enterprise value". | For the calculation of "Intrinsic enterprise value" refer to cells B25 and B63 in worksheet "Section1". Also take a look at the function GROWTH\_WORTH\_CALC\_FUNC in module "Section1", used in cell C63. |
| 4 | Formulation for "Value added by future growth" = "Growth Scenario" minus "No Growth Scenario" | For the calculation of "Value added by future growth" refer to cells B24 and B66 in worksheet "Section1". Also take a look at the function GROWTH\_WORTH\_FORMULA\_FUNC in module "Section1", used in cell C66. |
| 5 | Solve for the implied growth rate "cell B14: Expected growth rate in operating income" in your market value "cell B28: Price you are paying for growth". | Click the button "Run Goal Seek" in worksheet "Section1". Same as running the Sub "Run\_Goal\_Seek" in module "Section\_1". Or manually done by: (1) Open the Goal Seek function in Excel (under Tools);  (2) Set cell B24 to the value in cell B28 by changing cell B14; (3) You should see the implied growth rate in B14. |
| 6 | Worksheet "Section3": Derivation for the implied growth rate "cell B14 in Section1: Expected growth rate in operating income" in your market value "cell B28 in Section1: Price you are paying for growth". | In Worksheet "Section3" I will increase manually the "Expected growth rate in operating income" in column L until the error in column R is lower or equal to the value in cell F36. Here I had to iterate manually by using the changes in "Expected growth rate in operating income" in column K to find the solution in cell S32. Instead of using this brute force technique I could use the solver function "GROWTH\_WORTH\_SOLVER\_FUNC" in module "Section\_3". To compare the speed run the Sub TEST\_BRUTE\_FORCE\_SOLVER\_FUNC in module "Section\_3". Also refer to cell G37 for the function "GROWTH\_WORTH\_SOLVER\_FUNC" on-site in Excel. The advantage of coding your own solver function vs. "Excel Goal-Seek" is that you can solve multiple problems in Excel "on-site" instead of having to solve one by one with Goal-Seek or Solver. To verify the accuracy (see cell G39) of "GROWTH\_WORTH\_SOLVER\_FUNC" make sure you enter the EBIT\_GROWTH\_VAL (see cell G38). This will not trigger the solver routine (Muller's method), but instead use this "Expected growth rate in operating income" to calculate the "Value added by future growth". |
| 7 | Worksheet "Section4" to semi-automate the coding of the model in "Section1" with multiple scenarios capability. | Follow Steps 1 to 10 in module "Section\_4". |

**Option Explicit**

**Option Base 1**

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step1: Replicate and organize the model in worksheet "Section1" in column B of worksheet

'"Section4". Make sure you enter the correct headings in Column A. See cells A2 to A10 and

'A38 to A61 of worksheet "Section4". We will use the generic framework

'"STEP1\_HOW\_MUCH\_IS\_GROWTH\_FUNC"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP1\_HOW\_MUCH\_IS\_GROWTH\_FUNC()

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP1\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP1\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 2: Explain your input variables.

'Copy the content in cells D1 to D19 and paste below the line

'"Function STEP2\_HOW\_MUCH\_IS\_GROWTH\_FUNC"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP2\_HOW\_MUCH\_IS\_GROWTH\_FUNC()

'MARKET\_CAPITALIZATION\_RNG: Market capitalizarion of all classes of shares in your company.

'BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG: Book value of equity from the balance sheet, including retailed earnings.

'BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG:

'TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG: Book value of interest bearting debt, short as well as long term. Should not include accounts payable, supplier credit, deferred iems or other non-interest bearing debt.

'TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG:

'CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG: Cash and marketable securites as of last balance sheet.

'CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG:

'REVENUES\_THIS\_YEAR\_RNG: Sales or revenues in most recent year

'REVENUES\_LAST\_YEAR\_RNG:

'OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG: Operating income for the most recent year

'OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG:

'EFFECTIVE\_TAX\_RATE\_RNG: Effective tax rate from income statement. Divide taxes paid by taxable income.

'NET\_INCOME\_RNG: Net income for most recent year, prior to extraordinary items.

'COST\_OF\_EQUITY\_RNG: Expected compounded annual growth rate in operating income during high growth period.

'COST\_OF\_CAPITAL\_RNG: While the default is set to the current ROIC, you can change it to reflect industry averages or trends you see at your company.

'RISKFREE\_RATE\_RNG: Length of the period that you will be able to maintain high growth before becoming stable growth firm.

'LENGTH\_OF\_GROWTH\_PERIOD\_RNG: If you want to use the worksheet, you can or you can use the industry average.

'RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG: If you want to use the worksheet, you can or you can use the industry average

'EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG: Long term riskfree rate in the currency of valuation.

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP2\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP2\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

Function RNG\_COMMENT\_FUNC(ByRef SRC\_RNG As Range, \_

Optional ByVal LOOK\_STR As String = "Aswath Damodaran:", \_

Optional ByVal REPLACED\_STR As String = "")

Dim COMMENT\_STR As String

On Error GoTo ERROR\_LABEL

COMMENT\_STR = SRC\_RNG.Comment.Text

COMMENT\_STR = Replace(COMMENT\_STR, LOOK\_STR, REPLACED\_STR)

COMMENT\_STR = Replace(COMMENT\_STR, Chr(9), "")

COMMENT\_STR = Replace(COMMENT\_STR, Chr(10), "")

RNG\_COMMENT\_FUNC = Trim(COMMENT\_STR)

Exit Function

ERROR\_LABEL:

RNG\_COMMENT\_FUNC = ""

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 3: Get the names for your input variables and insert your input variables in your function

'Copy the content in cells J1 to J19 and paste at the end of the line

'"Function STEP3\_HOW\_MUCH\_IS\_GROWTH\_FUNC("

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP3\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP3\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP3\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 4: Declare your input variables as Variant

'Copy the content in cells L1 to L19 and paste below the line "Dim HEADINGS\_STR As String"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP4\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim MARKET\_CAPITALIZATION\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR As Variant

Dim REVENUES\_THIS\_YEAR\_VECTOR As Variant

Dim REVENUES\_LAST\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR As Variant

Dim EFFECTIVE\_TAX\_RATE\_VECTOR As Variant

Dim NET\_INCOME\_VECTOR As Variant

Dim COST\_OF\_EQUITY\_VECTOR As Variant

Dim COST\_OF\_CAPITAL\_VECTOR As Variant

Dim RISKFREE\_RATE\_VECTOR As Variant

Dim LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR As Variant

Dim RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR As Variant

Dim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR As Variant

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP4\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP4\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 5: Assign your input variables as Variant

'Copy the content in cells M21 to M76 and paste below the line "ASSIGN\_VARIABLES\_LINE:"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP5\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim MARKET\_CAPITALIZATION\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR As Variant

Dim REVENUES\_THIS\_YEAR\_VECTOR As Variant

Dim REVENUES\_LAST\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR As Variant

Dim EFFECTIVE\_TAX\_RATE\_VECTOR As Variant

Dim NET\_INCOME\_VECTOR As Variant

Dim COST\_OF\_EQUITY\_VECTOR As Variant

Dim COST\_OF\_CAPITAL\_VECTOR As Variant

Dim RISKFREE\_RATE\_VECTOR As Variant

Dim LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR As Variant

Dim RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR As Variant

Dim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR As Variant

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP5\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

MARKET\_CAPITALIZATION\_VECTOR = CHECK\_DIMENSION\_FUNC(MARKET\_CAPITALIZATION\_RNG)

NROWS = UBound(MARKET\_CAPITALIZATION\_VECTOR, 1)

BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_THIS\_YEAR\_RNG)

If UBound(REVENUES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_LAST\_YEAR\_RNG)

If UBound(REVENUES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

EFFECTIVE\_TAX\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(EFFECTIVE\_TAX\_RATE\_RNG)

If UBound(EFFECTIVE\_TAX\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

NET\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(NET\_INCOME\_RNG)

If UBound(NET\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_EQUITY\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_EQUITY\_RNG)

If UBound(COST\_OF\_EQUITY\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_CAPITAL\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_CAPITAL\_RNG)

If UBound(COST\_OF\_CAPITAL\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RISKFREE\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(RISKFREE\_RATE\_RNG)

If UBound(RISKFREE\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR = CHECK\_DIMENSION\_FUNC(LENGTH\_OF\_GROWTH\_PERIOD\_RNG)

If UBound(LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR = CHECK\_DIMENSION\_FUNC(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG)

If UBound(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

'If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'Remember that in class we discussed:

If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

For i = 1 To NROWS

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

Next i

Else

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

End If

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP5\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 6: Create the headings for your output matrix

'Copy the content in cells U1 to U6 and paste below the line "LOAD\_HEADINGS\_LINE:"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP6\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim MARKET\_CAPITALIZATION\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR As Variant

Dim REVENUES\_THIS\_YEAR\_VECTOR As Variant

Dim REVENUES\_LAST\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR As Variant

Dim EFFECTIVE\_TAX\_RATE\_VECTOR As Variant

Dim NET\_INCOME\_VECTOR As Variant

Dim COST\_OF\_EQUITY\_VECTOR As Variant

Dim COST\_OF\_CAPITAL\_VECTOR As Variant

Dim RISKFREE\_RATE\_VECTOR As Variant

Dim LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR As Variant

Dim RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR As Variant

Dim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR As Variant

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

Next i

STEP6\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

MARKET\_CAPITALIZATION\_VECTOR = CHECK\_DIMENSION\_FUNC(MARKET\_CAPITALIZATION\_RNG)

NROWS = UBound(MARKET\_CAPITALIZATION\_VECTOR, 1)

BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_THIS\_YEAR\_RNG)

If UBound(REVENUES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_LAST\_YEAR\_RNG)

If UBound(REVENUES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

EFFECTIVE\_TAX\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(EFFECTIVE\_TAX\_RATE\_RNG)

If UBound(EFFECTIVE\_TAX\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

NET\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(NET\_INCOME\_RNG)

If UBound(NET\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_EQUITY\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_EQUITY\_RNG)

If UBound(COST\_OF\_EQUITY\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_CAPITAL\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_CAPITAL\_RNG)

If UBound(COST\_OF\_CAPITAL\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RISKFREE\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(RISKFREE\_RATE\_RNG)

If UBound(RISKFREE\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR = CHECK\_DIMENSION\_FUNC(LENGTH\_OF\_GROWTH\_PERIOD\_RNG)

If UBound(LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR = CHECK\_DIMENSION\_FUNC(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG)

If UBound(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

'If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'Remember that in class we discussed:

If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

For i = 1 To NROWS

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

Next i

Else

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

End If

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

HEADINGS\_STR = "Market Capitalization,Book value of equity - this year,Book value of equity - last year,Total Debt Outstanding - this year,Total Debt Outstanding - last year,Cash and Marketable Securities - this year,Cash and Marketable Securities - last year,Revenues - this year,Revenues - last year,Operating income EBIT - this year,Operating income EBIT - last year,Effective tax rate,Net Income,Cost of equity,Cost of capital,Riskfree rate,Length of growth period,Return on Invested capital on growth,Expected growth rate in operating income,"

HEADINGS\_STR = HEADINGS\_STR & "ROE,ROIC,Net margin,Pre-tax operating margin,D/E ratio (book),D/E ratio (market),Growth rate (revenue),Growth rate (EBIT),"

HEADINGS\_STR = HEADINGS\_STR & "Value of assets in place,Expected growth rate in operating income,Value added by future growth,Intrinsic enterprise value,Intrinsic equity value,"

HEADINGS\_STR = HEADINGS\_STR & "Price you are paying for growth,Value of this growth,Price of growth/ Value of growth,"

HEADINGS\_STR = HEADINGS\_STR & "Market value of equity,Enterprise value,"

HEADINGS\_STR = HEADINGS\_STR & "P/E: Total - Actual,P/E: Total - Intrinsic,P/E: Assets in Place - Actual,P/E: Assets in Place - Intrinsic,P/E: Growth - Actual,P/E: Growth - Intrinsic,P/BV: Total - Actual,P/BV: Total - Intrinsic,P/BV: Assets in Place - Actual,P/BV: Assets in Place - Intrinsic,P/BV: Growth - Actual,P/BV: Growth - Intrinsic,EV/Sales: Total - Actual,EV/Sales: Total - Intrinsic,EV/Sales: Assets in Place - Actual,EV/Sales: Assets in Place - Intrinsic,EV/Sales: Growth - Actual,EV/Sales: Growth - Intrinsic,EV/Invested Capital: Total - Actual,EV/Invested Capital: Total - Intrinsic,EV/Invested Capital: Assets in Place - Actual,EV/Invested Capital: Assets in Place - Intrinsic,EV/Invested Capital: Growth - Actual,EV/Invested Capital: Growth - Intrinsic,"

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP6\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 7: Start coding the formulations of the output matrix (TEMP\_MATRIX)

'Copy the content in cells X1 to X19 and paste below the line "For i = 1 To NROWS"

'Then run the "Sub RUN\_CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC" and copy the content in

'the immediate window, and paste it below the line:

'"TEMP\_MATRIX(i, 19) = EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1)"

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP7\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim MARKET\_CAPITALIZATION\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR As Variant

Dim REVENUES\_THIS\_YEAR\_VECTOR As Variant

Dim REVENUES\_LAST\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR As Variant

Dim EFFECTIVE\_TAX\_RATE\_VECTOR As Variant

Dim NET\_INCOME\_VECTOR As Variant

Dim COST\_OF\_EQUITY\_VECTOR As Variant

Dim COST\_OF\_CAPITAL\_VECTOR As Variant

Dim RISKFREE\_RATE\_VECTOR As Variant

Dim LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR As Variant

Dim RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR As Variant

Dim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR As Variant

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

TEMP\_MATRIX(i, 1) = MARKET\_CAPITALIZATION\_VECTOR(i, 1)

TEMP\_MATRIX(i, 2) = BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 3) = BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 4) = TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 5) = TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 6) = CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 7) = CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 8) = REVENUES\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 9) = REVENUES\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 10) = OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 11) = OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 12) = EFFECTIVE\_TAX\_RATE\_VECTOR(i, 1)

TEMP\_MATRIX(i, 13) = NET\_INCOME\_VECTOR(i, 1)

TEMP\_MATRIX(i, 14) = COST\_OF\_EQUITY\_VECTOR(i, 1)

TEMP\_MATRIX(i, 15) = COST\_OF\_CAPITAL\_VECTOR(i, 1)

TEMP\_MATRIX(i, 16) = RISKFREE\_RATE\_VECTOR(i, 1)

TEMP\_MATRIX(i, 17) = LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR(i, 1)

TEMP\_MATRIX(i, 18) = RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR(i, 1)

TEMP\_MATRIX(i, 19) = EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1)

'replaced =B13/B3 in cell B20 for :

TEMP\_MATRIX(i, 20) = TEMP\_MATRIX(i, 13) / TEMP\_MATRIX(i, 3)

'replaced =B10\*(1-B12)/(B3+B5-B7) in cell B21 for :

'TEMP\_MATRIX(i,21) =TEMP\_MATRIX(i,10)\*(1-TEMP\_MATRIX(i,12))/(TEMP\_MATRIX(i,3)+TEMP\_MATRIX(i,5)-TEMP\_MATRIX(i,7)

'replaced =B13/B8 in cell B22 for :

TEMP\_MATRIX(i, 22) = TEMP\_MATRIX(i, 13) / TEMP\_MATRIX(i, 8)

'replaced =B10\*(1-B12)/B8 in cell B23 for :

TEMP\_MATRIX(i, 23) = TEMP\_MATRIX(i, 10) \* (1 - TEMP\_MATRIX(i, 12)) / TEMP\_MATRIX(i, 8)

'replaced =B4/B2 in cell B24 for :

TEMP\_MATRIX(i, 24) = TEMP\_MATRIX(i, 4) / TEMP\_MATRIX(i, 2)

'replaced =B4/B1 in cell B25 for :

TEMP\_MATRIX(i, 25) = TEMP\_MATRIX(i, 4) / TEMP\_MATRIX(i, 1)

'replaced =B8/B9-1 in cell B26 for :

TEMP\_MATRIX(i, 26) = TEMP\_MATRIX(i, 8) / TEMP\_MATRIX(i, 9)

'replaced =(B10/B11)-1 in cell B27 for :

'TEMP\_MATRIX(i,27) =(TEMP\_MATRIX(i,10)/TEMP\_MATRIX(i,11)

'replaced =B10\*(1-B12)/B15 in cell B28 for :

TEMP\_MATRIX(i, 28) = TEMP\_MATRIX(i, 10) \* (1 - TEMP\_MATRIX(i, 12)) / TEMP\_MATRIX(i, 15)

'replaced =IF(B19="",GROWTH\_WORTH\_SOLVER\_FUNC(B1,B4,B6,B10,B12,B18,B17,B15,B16,"",1),B19) in cell B29 for :

'TEMP\_MATRIX(i,29) =IF(TEMP\_MATRIX(i,19)="",GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i,1),TEMP\_MATRIX(i,4),TEMP\_MATRIX(i,6),TEMP\_MATRIX(i,10),TEMP\_MATRIX(i,12),TEMP\_MATRIX(i,18),TEMP\_MATRIX(i,17),TEMP\_MATRIX(i,15),TEMP\_MATRIX(i,16),"",1)),TEMP\_MATRIX(i,19)

'replaced =GROWTH\_WORTH\_SOLVER\_FUNC(B1,B4,B6,B10,B12,B18,B17,B15,B16,B29) in cell B30 for :

'TEMP\_MATRIX(i,30) =GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i,1),TEMP\_MATRIX(i,4),TEMP\_MATRIX(i,6),TEMP\_MATRIX(i,10),TEMP\_MATRIX(i,12),TEMP\_MATRIX(i,18),TEMP\_MATRIX(i,17),TEMP\_MATRIX(i,15),TEMP\_MATRIX(i,16),TEMP\_MATRIX(i,29)

'replaced =B28+B30 in cell B31 for :

TEMP\_MATRIX(i, 31) = TEMP\_MATRIX(i, 28) + TEMP\_MATRIX(i, 30)

'replaced =B31-B4+B6 in cell B32 for :

TEMP\_MATRIX(i, 32) = TEMP\_MATRIX(i, 31) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)

'replaced =(B1+B4-B6-B28) in cell B33 for :

'TEMP\_MATRIX(i,33) =(TEMP\_MATRIX(i,1)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)-TEMP\_MATRIX(i,28)

'replaced =B30 in cell B34 for :

TEMP\_MATRIX(i, 34) = TEMP\_MATRIX(i, 30)

'replaced =IF(B34=0,0,B33/B34) in cell B35 for :

'TEMP\_MATRIX(i,35) =IF(TEMP\_MATRIX(i,34)=0,0),TEMP\_MATRIX(i,33)/TEMP\_MATRIX(i,34)

'replaced =B1 in cell B36 for :

TEMP\_MATRIX(i, 36) = TEMP\_MATRIX(i, 1)

'replaced =B1+B4-B6 in cell B37 for :

TEMP\_MATRIX(i, 37) = TEMP\_MATRIX(i, 1) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6)

'replaced =B1/B13 in cell B38 for :

TEMP\_MATRIX(i, 38) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 13)

'replaced =(B30+B28-B4+B6)/B13 in cell B39 for :

TEMP\_MATRIX(i, 39) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 13)

'replaced =(B28-B4+B6)/B13 in cell B40 for :

TEMP\_MATRIX(i, 40) = (TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 13)

'replaced =B40 in cell B41 for :

TEMP\_MATRIX(i, 41) = TEMP\_MATRIX(i, 40)

'replaced =B38-B40 in cell B42 for :

TEMP\_MATRIX(i, 42) = TEMP\_MATRIX(i, 38) - TEMP\_MATRIX(i, 40)

'replaced =B39-B41 in cell B43 for :

TEMP\_MATRIX(i, 43) = TEMP\_MATRIX(i, 39) - TEMP\_MATRIX(i, 41)

'replaced =B1/B2 in cell B44 for :

TEMP\_MATRIX(i, 44) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 2)

'replaced =(B30+B28-B4+B6)/B2 in cell B45 for :

TEMP\_MATRIX(i, 45) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 2)

'replaced =(B28-B4+B6)/B2 in cell B46 for :

TEMP\_MATRIX(i, 46) = (TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 2)

'replaced =B46 in cell B47 for :

TEMP\_MATRIX(i, 47) = TEMP\_MATRIX(i, 46)

'replaced =B44-B46 in cell B48 for :

TEMP\_MATRIX(i, 48) = TEMP\_MATRIX(i, 44) - TEMP\_MATRIX(i, 46)

'replaced =B45-B47 in cell B49 for :

TEMP\_MATRIX(i, 49) = TEMP\_MATRIX(i, 45) - TEMP\_MATRIX(i, 47)

'replaced =B1/B8 in cell B50 for :

TEMP\_MATRIX(i, 50) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 8)

'replaced =(B30+B28)/B8 in cell B51 for :

TEMP\_MATRIX(i, 51) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28)) / TEMP\_MATRIX(i, 8)

'replaced =B28/B8 in cell B52 for :

TEMP\_MATRIX(i, 52) = TEMP\_MATRIX(i, 28) / TEMP\_MATRIX(i, 8)

'replaced =B52 in cell B53 for :

TEMP\_MATRIX(i, 53) = TEMP\_MATRIX(i, 52)

'replaced =B50-B52 in cell B54 for :

TEMP\_MATRIX(i, 54) = TEMP\_MATRIX(i, 50) - TEMP\_MATRIX(i, 52)

'replaced =B51-B53 in cell B55 for :

TEMP\_MATRIX(i, 55) = TEMP\_MATRIX(i, 51) - TEMP\_MATRIX(i, 53)

'replaced =B1/(B2+B4-B6) in cell B56 for :

'TEMP\_MATRIX(i,56) =TEMP\_MATRIX(i,1)/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'replaced =(B30+B28)/(B2+B4-B6) in cell B57 for :

'TEMP\_MATRIX(i,57) =(TEMP\_MATRIX(i,30)+TEMP\_MATRIX(i,28))/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'replaced =B28/(B2+B4-B6) in cell B58 for :

'TEMP\_MATRIX(i,58) =TEMP\_MATRIX(i,28)/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'replaced =B58 in cell B59 for :

TEMP\_MATRIX(i, 59) = TEMP\_MATRIX(i, 58)

'replaced =B56-B58 in cell B60 for :

TEMP\_MATRIX(i, 60) = TEMP\_MATRIX(i, 56) - TEMP\_MATRIX(i, 58)

'replaced =B57-B59 in cell B61 for :

TEMP\_MATRIX(i, 61) = TEMP\_MATRIX(i, 57) - TEMP\_MATRIX(i, 59)

Next i

STEP7\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

MARKET\_CAPITALIZATION\_VECTOR = CHECK\_DIMENSION\_FUNC(MARKET\_CAPITALIZATION\_RNG)

NROWS = UBound(MARKET\_CAPITALIZATION\_VECTOR, 1)

BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_THIS\_YEAR\_RNG)

If UBound(REVENUES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_LAST\_YEAR\_RNG)

If UBound(REVENUES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

EFFECTIVE\_TAX\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(EFFECTIVE\_TAX\_RATE\_RNG)

If UBound(EFFECTIVE\_TAX\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

NET\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(NET\_INCOME\_RNG)

If UBound(NET\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_EQUITY\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_EQUITY\_RNG)

If UBound(COST\_OF\_EQUITY\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_CAPITAL\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_CAPITAL\_RNG)

If UBound(COST\_OF\_CAPITAL\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RISKFREE\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(RISKFREE\_RATE\_RNG)

If UBound(RISKFREE\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR = CHECK\_DIMENSION\_FUNC(LENGTH\_OF\_GROWTH\_PERIOD\_RNG)

If UBound(LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR = CHECK\_DIMENSION\_FUNC(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG)

If UBound(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

'If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'Remember that in class we discussed:

If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

For i = 1 To NROWS

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

Next i

Else

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

End If

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

HEADINGS\_STR = "Market Capitalization,Book value of equity - this year,Book value of equity - last year,Total Debt Outstanding - this year,Total Debt Outstanding - last year,Cash and Marketable Securities - this year,Cash and Marketable Securities - last year,Revenues - this year,Revenues - last year,Operating income EBIT - this year,Operating income EBIT - last year,Effective tax rate,Net Income,Cost of equity,Cost of capital,Riskfree rate,Length of growth period,Return on Invested capital on growth,Expected growth rate in operating income,"

HEADINGS\_STR = HEADINGS\_STR & "ROE,ROIC,Net margin,Pre-tax operating margin,D/E ratio (book),D/E ratio (market),Growth rate (revenue),Growth rate (EBIT),"

HEADINGS\_STR = HEADINGS\_STR & "Value of assets in place,Expected growth rate in operating income,Value added by future growth,Intrinsic enterprise value,Intrinsic equity value,"

HEADINGS\_STR = HEADINGS\_STR & "Price you are paying for growth,Value of this growth,Price of growth/ Value of growth,"

HEADINGS\_STR = HEADINGS\_STR & "Market value of equity,Enterprise value,"

HEADINGS\_STR = HEADINGS\_STR & "P/E: Total - Actual,P/E: Total - Intrinsic,P/E: Assets in Place - Actual,P/E: Assets in Place - Intrinsic,P/E: Growth - Actual,P/E: Growth - Intrinsic,P/BV: Total - Actual,P/BV: Total - Intrinsic,P/BV: Assets in Place - Actual,P/BV: Assets in Place - Intrinsic,P/BV: Growth - Actual,P/BV: Growth - Intrinsic,EV/Sales: Total - Actual,EV/Sales: Total - Intrinsic,EV/Sales: Assets in Place - Actual,EV/Sales: Assets in Place - Intrinsic,EV/Sales: Growth - Actual,EV/Sales: Growth - Intrinsic,EV/Invested Capital: Total - Actual,EV/Invested Capital: Total - Intrinsic,EV/Invested Capital: Assets in Place - Actual,EV/Invested Capital: Assets in Place - Intrinsic,EV/Invested Capital: Growth - Actual,EV/Invested Capital: Growth - Intrinsic,"

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP7\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'To convert all the formulas in range $B$20:$B$61 in worksheet "Section4" I created

'the function CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC. It will loop through all the cells

'in this range and will replace the address "B" (column B) for the string

'"TEMP\_MATRIX(i," so I dont have to manually code all the formulas.

Sub RUN\_CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC()

'Remember to clean the immediate windows in VBA before running this Sub, since

'you will be copying all the output and pasting it inside the loop of the

'function "HOW\_MUCH\_IS\_GROWTH\_FUNC" in module "MOD3\_CODING".

Dim i As Long

Dim j As Long

Dim TEMP\_MATRIX As Variant

TEMP\_MATRIX = CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC(Range("FORMULAS\_RNG"), "B", \_

"TEMP\_MATRIX(i,", Range("FORMULAS\_RNG").Rows(1).Row)

'Please notice that I named range $B$20:$B$61 FORMULAS\_RNG in worksheet "3. Coding"

'that is why it is within quotes "FORMULAS\_RNG". "FORMULAS\_RNG" is not a variable

'defined anywhere in this module.

j = 1

For i = LBound(TEMP\_MATRIX) To UBound(TEMP\_MATRIX)

Debug.Print "'replaced " & Range("FORMULAS\_RNG").Cells(j).Formula & " in cell " & Range("FORMULAS\_RNG").Cells(j).Address(False, False) & " for :"

Debug.Print TEMP\_MATRIX(i, 1)

j = j + 1

Next i

End Sub

Function CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC(ByRef SRC\_RNG As Range, \_

Optional ByVal LOOK\_STR As String = "B", \_

Optional ByVal REPLACED\_STR As String = "TEMP\_MATRIX(i,", \_

Optional ByVal SCOLUMN As Long = 20)

Dim i As Long

Dim j As Long

Dim k As Long

Dim l As Long

Dim NROWS As Long

Dim TEMP\_STR As String

Dim FORMULA\_STR As String

Dim DCELL As Range

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

NROWS = SRC\_RNG.Cells.Count

ReDim TEMP\_MATRIX(1 To NROWS, 1 To 1)

l = 1

k = SCOLUMN 'The formulas that I am trying to create are going to start

'in this column of TEMP\_MATRIX.

For Each DCELL In SRC\_RNG

If DCELL.HasFormula = False Then

GoTo 1983

Else

FORMULA\_STR = DCELL.Formula

If InStr(1, FORMULA\_STR, LOOK\_STR) = 0 Then: GoTo 1983

End If

FORMULA\_STR = Replace(FORMULA\_STR, LOOK\_STR, REPLACED\_STR)

TEMP\_STR = ""

i = 1

j = InStr(i, FORMULA\_STR, ",")

If j = 0 Then: GoTo 1983

Do

Do

j = j + 1

If IsNumeric(Mid(FORMULA\_STR, j, 1)) = False Then: Exit Do

If j > Len(FORMULA\_STR) Then: GoTo 1983

Loop

TEMP\_STR = TEMP\_STR & Mid(FORMULA\_STR, i, j - i) & ")"

i = j

j = InStr(i, FORMULA\_STR, ",")

Loop Until j = 0

TEMP\_MATRIX(l, 1) = REPLACED\_STR & k & ") " & TEMP\_STR

TEMP\_MATRIX(l, 1) = Replace(TEMP\_MATRIX(l, 1), ",)", ",")

1983:

k = k + 1

l = l + 1

Next DCELL

CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC = TEMP\_MATRIX

'If you try to use this function in excel you will get an error.

'FormulaArray property has a character limit of 255.

'See http://support.microsoft.com/kb/213841

Exit Function

ERROR\_LABEL:

CREATE\_ARRAY\_RNG\_FORMULA\_STRING\_FUNC = ""

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 8: Make final adjustments:

'-----------------------------------------------------------------------------------------------

'i) TEMP\_MATRIX(i,21) =TEMP\_MATRIX(i,10)\*(1-TEMP\_MATRIX(i,12))/(TEMP\_MATRIX(i,3)+

'TEMP\_MATRIX(i,5)-TEMP\_MATRIX(i,7)

'-> from B10\*(1-B12)/(B3+B5-B7) in cell B21 you can see the line above is missing the

'parentheses ")" at the end. It should be TEMP\_MATRIX(i, 10) \* ....TEMP\_MATRIX(i, 7))

'-----------------------------------------------------------------------------------------------

'ii) TEMP\_MATRIX(i, 26) = TEMP\_MATRIX(i, 8) / TEMP\_MATRIX(i, 9)

'-> from B8/B9-1 in cell B26 you can see the line above is missing the

'"-1". It should be TEMP\_MATRIX(i, 26) = TEMP\_MATRIX(i, 8) / TEMP\_MATRIX(i, 9) - 1

'-----------------------------------------------------------------------------------------------

'iii) TEMP\_MATRIX(i, 27) = (TEMP\_MATRIX(i, 10) / TEMP\_MATRIX(i, 11)

'-> from (B10/B11)-1 in cell B27 you can see the line above is missing the

'"-1". It should be TEMP\_MATRIX(i, 27) = TEMP\_MATRIX(i, 10) / TEMP\_MATRIX(i, 11) - 1

'Also remove the "(" at the beginning, no need for it!

'-----------------------------------------------------------------------------------------------

'iv) replace TEMP\_MATRIX(i,29) =IF(TEMP\_MATRIX(i,19)="",GROWTH\_WORTH\_SOLVER\_FUNC( \_

TEMP\_MATRIX(i,1),TEMP\_MATRIX(i,4),TEMP\_MATRIX(i,6),TEMP\_MATRIX(i,10),TEMP\_MATRIX(i,12), \_

TEMP\_MATRIX(i,18),TEMP\_MATRIX(i,17),TEMP\_MATRIX(i,15),TEMP\_MATRIX(i,16),"",1)), \_

TEMP\_MATRIX(i,19)

'for:

'If TEMP\_MATRIX(i, 19) = "" Then

' TEMP\_MATRIX(i, 29) = GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i, 1), \_

TEMP\_MATRIX(i, 4), TEMP\_MATRIX(i, 6), TEMP\_MATRIX(i, 10), TEMP\_MATRIX(i, 12), \_

TEMP\_MATRIX(i, 18), TEMP\_MATRIX(i, 17), TEMP\_MATRIX(i, 15), TEMP\_MATRIX(i, 16), "", 1)

'Else

' TEMP\_MATRIX(i, 29) = TEMP\_MATRIX(i, 19)

'End If

'-----------------------------------------------------------------------------------------------

'v) Lines

'TEMP\_MATRIX(i, 30) = GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i, 1), TEMP\_MATRIX(i, 4), \_

TEMP\_MATRIX(i, 6), TEMP\_MATRIX(i, 10), TEMP\_MATRIX(i, 12), TEMP\_MATRIX(i, 18), \_

TEMP\_MATRIX(i, 17), TEMP\_MATRIX(i, 15), TEMP\_MATRIX(i, 16), TEMP\_MATRIX(i, 29)

'TEMP\_MATRIX(i,33) = (TEMP\_MATRIX(i, 1) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6) - TEMP\_MATRIX(i, 28)

'TEMP\_MATRIX(i,56) =TEMP\_MATRIX(i,1)/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'TEMP\_MATRIX(i,57) =(TEMP\_MATRIX(i,30)+TEMP\_MATRIX(i,28))/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'TEMP\_MATRIX(i,58) =TEMP\_MATRIX(i,28)/(TEMP\_MATRIX(i,2)+TEMP\_MATRIX(i,4)-TEMP\_MATRIX(i,6)

'are missing the parentheses at the end, so add them!

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'vi) replace TEMP\_MATRIX(i,35) =IF(TEMP\_MATRIX(i,34)=0,0),TEMP\_MATRIX(i,33)/TEMP\_MATRIX(i,34)

'for:

'If TEMP\_MATRIX(i, 34) = 0 Then

' TEMP\_MATRIX(i, 35) = 0

'Else

' TEMP\_MATRIX(i, 35) = TEMP\_MATRIX(i, 33) / TEMP\_MATRIX(i, 34)

'End If

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Function STEP8\_HOW\_MUCH\_IS\_GROWTH\_FUNC(ByRef MARKET\_CAPITALIZATION\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG As Variant, \_

ByRef BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG As Variant, \_

ByRef TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG As Variant, \_

ByRef CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_THIS\_YEAR\_RNG As Variant, \_

ByRef REVENUES\_LAST\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG As Variant, \_

ByRef OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG As Variant, \_

ByRef EFFECTIVE\_TAX\_RATE\_RNG As Variant, \_

ByRef NET\_INCOME\_RNG As Variant, \_

ByRef COST\_OF\_EQUITY\_RNG As Variant, \_

ByRef COST\_OF\_CAPITAL\_RNG As Variant, \_

ByRef RISKFREE\_RATE\_RNG As Variant, \_

ByRef LENGTH\_OF\_GROWTH\_PERIOD\_RNG As Variant, \_

ByRef RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG As Variant, \_

Optional ByRef EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG As Variant)

'Added Optional!

'Remember that in class we discussed (Step 5):

'If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

' ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

' For i = 1 To NROWS

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

' Next i

'Else

' EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

' If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'End If

Dim i As Long

Dim j As Long

Dim k As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim HEADINGS\_STR As String

Dim MARKET\_CAPITALIZATION\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR As Variant

Dim BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR As Variant

Dim TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR As Variant

Dim CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR As Variant

Dim REVENUES\_THIS\_YEAR\_VECTOR As Variant

Dim REVENUES\_LAST\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR As Variant

Dim OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR As Variant

Dim EFFECTIVE\_TAX\_RATE\_VECTOR As Variant

Dim NET\_INCOME\_VECTOR As Variant

Dim COST\_OF\_EQUITY\_VECTOR As Variant

Dim COST\_OF\_CAPITAL\_VECTOR As Variant

Dim RISKFREE\_RATE\_VECTOR As Variant

Dim LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR As Variant

Dim RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR As Variant

Dim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR As Variant

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

GoSub ASSIGN\_VARIABLES\_LINE

GoSub LOAD\_HEADINGS\_LINE

For i = 1 To NROWS

TEMP\_MATRIX(i, 1) = MARKET\_CAPITALIZATION\_VECTOR(i, 1)

TEMP\_MATRIX(i, 2) = BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 3) = BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 4) = TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 5) = TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 6) = CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 7) = CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 8) = REVENUES\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 9) = REVENUES\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 10) = OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 11) = OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR(i, 1)

TEMP\_MATRIX(i, 12) = EFFECTIVE\_TAX\_RATE\_VECTOR(i, 1)

TEMP\_MATRIX(i, 13) = NET\_INCOME\_VECTOR(i, 1)

TEMP\_MATRIX(i, 14) = COST\_OF\_EQUITY\_VECTOR(i, 1)

TEMP\_MATRIX(i, 15) = COST\_OF\_CAPITAL\_VECTOR(i, 1)

TEMP\_MATRIX(i, 16) = RISKFREE\_RATE\_VECTOR(i, 1)

TEMP\_MATRIX(i, 17) = LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR(i, 1)

TEMP\_MATRIX(i, 18) = RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR(i, 1)

TEMP\_MATRIX(i, 19) = EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1)

'replaced =B13/B3 in cell B20 for :

TEMP\_MATRIX(i, 20) = TEMP\_MATRIX(i, 13) / TEMP\_MATRIX(i, 3)

'replaced =B10\*(1-B12)/(B3+B5-B7) in cell B21 for :

TEMP\_MATRIX(i, 21) = TEMP\_MATRIX(i, 10) \* (1 - TEMP\_MATRIX(i, 12)) / (TEMP\_MATRIX(i, 3) + TEMP\_MATRIX(i, 5) - TEMP\_MATRIX(i, 7))

'replaced =B13/B8 in cell B22 for :

TEMP\_MATRIX(i, 22) = TEMP\_MATRIX(i, 13) / TEMP\_MATRIX(i, 8)

'replaced =B10\*(1-B12)/B8 in cell B23 for :

TEMP\_MATRIX(i, 23) = TEMP\_MATRIX(i, 10) \* (1 - TEMP\_MATRIX(i, 12)) / TEMP\_MATRIX(i, 8)

'replaced =B4/B2 in cell B24 for :

TEMP\_MATRIX(i, 24) = TEMP\_MATRIX(i, 4) / TEMP\_MATRIX(i, 2)

'replaced =B4/B1 in cell B25 for :

TEMP\_MATRIX(i, 25) = TEMP\_MATRIX(i, 4) / TEMP\_MATRIX(i, 1)

'replaced =B8/B9-1 in cell B26 for :

TEMP\_MATRIX(i, 26) = TEMP\_MATRIX(i, 8) / TEMP\_MATRIX(i, 9) - 1

'replaced =(B10/B11)-1 in cell B27 for :

TEMP\_MATRIX(i, 27) = TEMP\_MATRIX(i, 10) / TEMP\_MATRIX(i, 11) - 1

'replaced =B10\*(1-B12)/B15 in cell B28 for :

TEMP\_MATRIX(i, 28) = TEMP\_MATRIX(i, 10) \* (1 - TEMP\_MATRIX(i, 12)) / TEMP\_MATRIX(i, 15)

'replaced =IF(B19="",GROWTH\_WORTH\_SOLVER\_FUNC(B1,B4,B6,B10,B12,B18,B17,B15,B16,"",1),B19) in cell B29 for :

If TEMP\_MATRIX(i, 19) = "" Then

TEMP\_MATRIX(i, 29) = GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i, 1), TEMP\_MATRIX(i, 4), \_

TEMP\_MATRIX(i, 6), TEMP\_MATRIX(i, 10), TEMP\_MATRIX(i, 12), TEMP\_MATRIX(i, 18), \_

TEMP\_MATRIX(i, 17), TEMP\_MATRIX(i, 15), TEMP\_MATRIX(i, 16), "", 1)

Else

TEMP\_MATRIX(i, 29) = TEMP\_MATRIX(i, 19)

End If

'replaced =GROWTH\_WORTH\_SOLVER\_FUNC(B1,B4,B6,B10,B12,B18,B17,B15,B16,B29) in cell B30 for :

TEMP\_MATRIX(i, 30) = GROWTH\_WORTH\_SOLVER\_FUNC(TEMP\_MATRIX(i, 1), TEMP\_MATRIX(i, 4), TEMP\_MATRIX(i, 6), TEMP\_MATRIX(i, 10), TEMP\_MATRIX(i, 12), TEMP\_MATRIX(i, 18), TEMP\_MATRIX(i, 17), TEMP\_MATRIX(i, 15), TEMP\_MATRIX(i, 16), TEMP\_MATRIX(i, 29))

'replaced =B28+B30 in cell B31 for :

TEMP\_MATRIX(i, 31) = TEMP\_MATRIX(i, 28) + TEMP\_MATRIX(i, 30)

'replaced =B31-B4+B6 in cell B32 for :

TEMP\_MATRIX(i, 32) = TEMP\_MATRIX(i, 31) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)

'replaced =(B1+B4-B6-B28) in cell B33 for :

TEMP\_MATRIX(i, 33) = (TEMP\_MATRIX(i, 1) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6) - TEMP\_MATRIX(i, 28))

'replaced =B30 in cell B34 for :

TEMP\_MATRIX(i, 34) = TEMP\_MATRIX(i, 30)

'replaced =IF(B34=0,0,B33/B34) in cell B35 for :

If TEMP\_MATRIX(i, 34) = 0 Then

TEMP\_MATRIX(i, 35) = 0

Else

TEMP\_MATRIX(i, 35) = TEMP\_MATRIX(i, 33) / TEMP\_MATRIX(i, 34)

End If

'replaced =B1 in cell B36 for :

TEMP\_MATRIX(i, 36) = TEMP\_MATRIX(i, 1)

'replaced =B1+B4-B6 in cell B37 for :

TEMP\_MATRIX(i, 37) = TEMP\_MATRIX(i, 1) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6)

'replaced =B1/B13 in cell B38 for :

TEMP\_MATRIX(i, 38) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 13)

'replaced =(B30+B28-B4+B6)/B13 in cell B39 for :

TEMP\_MATRIX(i, 39) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 13)

'replaced =(B28-B4+B6)/B13 in cell B40 for :

TEMP\_MATRIX(i, 40) = (TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 13)

'replaced =B40 in cell B41 for :

TEMP\_MATRIX(i, 41) = TEMP\_MATRIX(i, 40)

'replaced =B38-B40 in cell B42 for :

TEMP\_MATRIX(i, 42) = TEMP\_MATRIX(i, 38) - TEMP\_MATRIX(i, 40)

'replaced =B39-B41 in cell B43 for :

TEMP\_MATRIX(i, 43) = TEMP\_MATRIX(i, 39) - TEMP\_MATRIX(i, 41)

'replaced =B1/B2 in cell B44 for :

TEMP\_MATRIX(i, 44) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 2)

'replaced =(B30+B28-B4+B6)/B2 in cell B45 for :

TEMP\_MATRIX(i, 45) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 2)

'replaced =(B28-B4+B6)/B2 in cell B46 for :

TEMP\_MATRIX(i, 46) = (TEMP\_MATRIX(i, 28) - TEMP\_MATRIX(i, 4) + TEMP\_MATRIX(i, 6)) / TEMP\_MATRIX(i, 2)

'replaced =B46 in cell B47 for :

TEMP\_MATRIX(i, 47) = TEMP\_MATRIX(i, 46)

'replaced =B44-B46 in cell B48 for :

TEMP\_MATRIX(i, 48) = TEMP\_MATRIX(i, 44) - TEMP\_MATRIX(i, 46)

'replaced =B45-B47 in cell B49 for :

TEMP\_MATRIX(i, 49) = TEMP\_MATRIX(i, 45) - TEMP\_MATRIX(i, 47)

'replaced =B1/B8 in cell B50 for :

TEMP\_MATRIX(i, 50) = TEMP\_MATRIX(i, 1) / TEMP\_MATRIX(i, 8)

'replaced =(B30+B28)/B8 in cell B51 for :

TEMP\_MATRIX(i, 51) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28)) / TEMP\_MATRIX(i, 8)

'replaced =B28/B8 in cell B52 for :

TEMP\_MATRIX(i, 52) = TEMP\_MATRIX(i, 28) / TEMP\_MATRIX(i, 8)

'replaced =B52 in cell B53 for :

TEMP\_MATRIX(i, 53) = TEMP\_MATRIX(i, 52)

'replaced =B50-B52 in cell B54 for :

TEMP\_MATRIX(i, 54) = TEMP\_MATRIX(i, 50) - TEMP\_MATRIX(i, 52)

'replaced =B51-B53 in cell B55 for :

TEMP\_MATRIX(i, 55) = TEMP\_MATRIX(i, 51) - TEMP\_MATRIX(i, 53)

'replaced =B1/(B2+B4-B6) in cell B56 for :

TEMP\_MATRIX(i, 56) = TEMP\_MATRIX(i, 1) / (TEMP\_MATRIX(i, 2) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6))

'replaced =(B30+B28)/(B2+B4-B6) in cell B57 for :

TEMP\_MATRIX(i, 57) = (TEMP\_MATRIX(i, 30) + TEMP\_MATRIX(i, 28)) / (TEMP\_MATRIX(i, 2) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6))

'replaced =B28/(B2+B4-B6) in cell B58 for :

TEMP\_MATRIX(i, 58) = TEMP\_MATRIX(i, 28) / (TEMP\_MATRIX(i, 2) + TEMP\_MATRIX(i, 4) - TEMP\_MATRIX(i, 6))

'replaced =B58 in cell B59 for :

TEMP\_MATRIX(i, 59) = TEMP\_MATRIX(i, 58)

'replaced =B56-B58 in cell B60 for :

TEMP\_MATRIX(i, 60) = TEMP\_MATRIX(i, 56) - TEMP\_MATRIX(i, 58)

'replaced =B57-B59 in cell B61 for :

TEMP\_MATRIX(i, 61) = TEMP\_MATRIX(i, 57) - TEMP\_MATRIX(i, 59)

Next i

STEP8\_HOW\_MUCH\_IS\_GROWTH\_FUNC = TEMP\_MATRIX

Exit Function

'-----------------------------------------------------------------------------------------------------------------------

ASSIGN\_VARIABLES\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

MARKET\_CAPITALIZATION\_VECTOR = CHECK\_DIMENSION\_FUNC(MARKET\_CAPITALIZATION\_RNG)

NROWS = UBound(MARKET\_CAPITALIZATION\_VECTOR, 1)

BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_RNG)

If UBound(BOOK\_VALUE\_OF\_EQUITY\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_RNG)

If UBound(TOTAL\_DEBT\_OUTSTANDING\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_RNG)

If UBound(CASH\_AND\_MARKETABLE\_SECURITIES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_THIS\_YEAR\_RNG)

If UBound(REVENUES\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

REVENUES\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(REVENUES\_LAST\_YEAR\_RNG)

If UBound(REVENUES\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_THIS\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR = CHECK\_DIMENSION\_FUNC(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_RNG)

If UBound(OPERATING\_INCOME\_EBIT\_LAST\_YEAR\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

EFFECTIVE\_TAX\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(EFFECTIVE\_TAX\_RATE\_RNG)

If UBound(EFFECTIVE\_TAX\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

NET\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(NET\_INCOME\_RNG)

If UBound(NET\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_EQUITY\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_EQUITY\_RNG)

If UBound(COST\_OF\_EQUITY\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

COST\_OF\_CAPITAL\_VECTOR = CHECK\_DIMENSION\_FUNC(COST\_OF\_CAPITAL\_RNG)

If UBound(COST\_OF\_CAPITAL\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RISKFREE\_RATE\_VECTOR = CHECK\_DIMENSION\_FUNC(RISKFREE\_RATE\_RNG)

If UBound(RISKFREE\_RATE\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR = CHECK\_DIMENSION\_FUNC(LENGTH\_OF\_GROWTH\_PERIOD\_RNG)

If UBound(LENGTH\_OF\_GROWTH\_PERIOD\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR = CHECK\_DIMENSION\_FUNC(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_RNG)

If UBound(RETURN\_ON\_INVESTED\_CAPITAL\_ON\_GROWTH\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

'If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

'Remember that in class we discussed:

If IsMissing(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG) = True Then

ReDim EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(1 To NROWS, 1 To 1)

For i = 1 To NROWS

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR(i, 1) = ""

Next i

Else

EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR = CHECK\_DIMENSION\_FUNC(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_RNG)

If UBound(EXPECTED\_GROWTH\_RATE\_IN\_OPERATING\_INCOME\_VECTOR, 1) <> NROWS Then: GoTo ERROR\_LABEL

End If

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

LOAD\_HEADINGS\_LINE:

'-----------------------------------------------------------------------------------------------------------------------

HEADINGS\_STR = "Market Capitalization,Book value of equity - this year,Book value of equity - last year,Total Debt Outstanding - this year,Total Debt Outstanding - last year,Cash and Marketable Securities - this year,Cash and Marketable Securities - last year,Revenues - this year,Revenues - last year,Operating income EBIT - this year,Operating income EBIT - last year,Effective tax rate,Net Income,Cost of equity,Cost of capital,Riskfree rate,Length of growth period,Return on Invested capital on growth,Expected growth rate in operating income,"

HEADINGS\_STR = HEADINGS\_STR & "ROE,ROIC,Net margin,Pre-tax operating margin,D/E ratio (book),D/E ratio (market),Growth rate (revenue),Growth rate (EBIT),"

HEADINGS\_STR = HEADINGS\_STR & "Value of assets in place,Expected growth rate in operating income,Value added by future growth,Intrinsic enterprise value,Intrinsic equity value,"

HEADINGS\_STR = HEADINGS\_STR & "Price you are paying for growth,Value of this growth,Price of growth/ Value of growth,"

HEADINGS\_STR = HEADINGS\_STR & "Market value of equity,Enterprise value,"

HEADINGS\_STR = HEADINGS\_STR & "P/E: Total - Actual,P/E: Total - Intrinsic,P/E: Assets in Place - Actual,P/E: Assets in Place - Intrinsic,P/E: Growth - Actual,P/E: Growth - Intrinsic,P/BV: Total - Actual,P/BV: Total - Intrinsic,P/BV: Assets in Place - Actual,P/BV: Assets in Place - Intrinsic,P/BV: Growth - Actual,P/BV: Growth - Intrinsic,EV/Sales: Total - Actual,EV/Sales: Total - Intrinsic,EV/Sales: Assets in Place - Actual,EV/Sales: Assets in Place - Intrinsic,EV/Sales: Growth - Actual,EV/Sales: Growth - Intrinsic,EV/Invested Capital: Total - Actual,EV/Invested Capital: Total - Intrinsic,EV/Invested Capital: Assets in Place - Actual,EV/Invested Capital: Assets in Place - Intrinsic,EV/Invested Capital: Growth - Actual,EV/Invested Capital: Growth - Intrinsic,"

NCOLUMNS = 0

i = 1

Do

j = InStr(i, HEADINGS\_STR, ",")

NCOLUMNS = NCOLUMNS + 1

i = j + 1

Loop Until i = 1

NCOLUMNS = NCOLUMNS - 1

ReDim TEMP\_MATRIX(0 To NROWS, 1 To NCOLUMNS)

i = 1

For k = 1 To NCOLUMNS

j = InStr(i, HEADINGS\_STR, ",")

TEMP\_MATRIX(0, k) = Mid(HEADINGS\_STR, i, j - i)

i = j + 1

Next k

'-----------------------------------------------------------------------------------------------------------------------

Return

'-----------------------------------------------------------------------------------------------------------------------

ERROR\_LABEL:

STEP8\_HOW\_MUCH\_IS\_GROWTH\_FUNC = Err.Number

End Function

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 9: Testing your function in VBA. If the sub-routine below runs without an error

'then you are ready to test your function "on-site". For testing your function in Excel,

'set cell B80 to TRUE, and verify the accuracy of your function:

'-> Manual calculations: cells D83:BL92

'-> VBA Function: cells D94:BL103

'-> Accuracy: D83:BL92 - D94:BL103

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Sub TESTING\_HOW\_MUCH\_IS\_GROWTH\_FUNC\_IN\_VBA()

Dim NROWS As Long

Dim DATA\_RNG As Range

Dim FORMULA\_STR As String

With Worksheets("Section4")

NROWS = .Range("$B$81")

Set DATA\_RNG = Range(.Cells(84, 4), .Cells(84 + NROWS - 1, 4 + 19 - 1))

Debug.Print DATA\_RNG.Address '$D$5:$V$13

Call STEP8\_HOW\_MUCH\_IS\_GROWTH\_FUNC( \_

DATA\_RNG.Columns(1), \_

DATA\_RNG.Columns(2), \_

DATA\_RNG.Columns(3), \_

DATA\_RNG.Columns(4), \_

DATA\_RNG.Columns(5), \_

DATA\_RNG.Columns(6), \_

DATA\_RNG.Columns(7), \_

DATA\_RNG.Columns(8), \_

DATA\_RNG.Columns(9), \_

DATA\_RNG.Columns(10), \_

DATA\_RNG.Columns(11), \_

DATA\_RNG.Columns(12), \_

DATA\_RNG.Columns(13), \_

DATA\_RNG.Columns(14), \_

DATA\_RNG.Columns(15), \_

DATA\_RNG.Columns(16), \_

DATA\_RNG.Columns(17), \_

DATA\_RNG.Columns(18), \_

IIf(.Range("B3") = True, "", DATA\_RNG.Columns(19)))

End With

End Sub

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

'Step 11: Create the sub to load the inputs from worksheet "Section5" and print

'the output on a new sheet. Most of the codes in the section "FORMAT\_LINE:"

'I got it by recording a macro for cell formatting. For an example see:

'http://www.howtogeek.com/162975/geek-school-learn-how-to-use-excel-macros-to-automate-tedious-tasks/

'-----------------------------------------------------------------------------------------------

'-----------------------------------------------------------------------------------------------

Sub PRINT\_HOW\_MUCH\_IS\_GROWTH\_FUNC()

Dim k As Long

Dim SROW As Long

Dim SCOLUMN As Long

Dim NROWS As Long

Dim NCOLUMNS As Long

Dim FORMAT\_STR As String

Dim TEMP\_RNG As Excel.Range

Dim DATA\_RNG As Excel.Range

Dim TEMP\_MATRIX As Variant

'On Error GoTo ERROR\_LABEL

Call EXCEL\_TURN\_OFF\_EVENTS\_FUNC

With ActiveSheet

Set DATA\_RNG = Range(.Cells(2, 1), .Cells(.UsedRange.Rows.Count, .UsedRange.Columns.Count))

'Debug.Print DATA\_RNG.Address

End With

TEMP\_MATRIX = STEP8\_HOW\_MUCH\_IS\_GROWTH\_FUNC ( \_

DATA\_RNG.Columns(1), \_

DATA\_RNG.Columns(2), \_

DATA\_RNG.Columns(3), \_

DATA\_RNG.Columns(4), \_

DATA\_RNG.Columns(5), \_

DATA\_RNG.Columns(6), \_

DATA\_RNG.Columns(7), \_

DATA\_RNG.Columns(8), \_

DATA\_RNG.Columns(9), \_

DATA\_RNG.Columns(10), \_

DATA\_RNG.Columns(11), \_

DATA\_RNG.Columns(12), \_

DATA\_RNG.Columns(13), \_

DATA\_RNG.Columns(14), \_

DATA\_RNG.Columns(15), \_

DATA\_RNG.Columns(16), \_

DATA\_RNG.Columns(17), \_

DATA\_RNG.Columns(18), \_

DATA\_RNG.Columns(19))

If IsArray(TEMP\_MATRIX) = False Then: GoTo ERROR\_LABEL

SROW = LBound(TEMP\_MATRIX, 1): NROWS = UBound(TEMP\_MATRIX, 1)

SCOLUMN = LBound(TEMP\_MATRIX, 2): NCOLUMNS = UBound(TEMP\_MATRIX, 2)

Set DATA\_RNG = WSHEET\_ADD\_FUNC(PARSE\_CURRENT\_TIME\_FUNC("\_"), ActiveWorkbook).Cells(1, 1)

k = 1

Set DATA\_RNG = Range(DATA\_RNG.Cells(SROW + k, SCOLUMN), DATA\_RNG.Cells(NROWS + k, NCOLUMNS))

With DATA\_RNG

.RowHeight = 15

.ColumnWidth = 10

.VerticalAlignment = xlCenter

End With

DATA\_RNG = TEMP\_MATRIX

GoSub FORMAT\_LINE

Call EXCEL\_TURN\_ON\_EVENTS\_FUNC

Exit Sub

'----------------------------------------------------------------------------------------

FORMAT\_LINE:

'----------------------------------------------------------------------------------------

With DATA\_RNG

.NumberFormat = "0.00"

FORMAT\_STR = "DDDDDDDDDDDPDPPPSPPPPPPPPPPDPDDDDDPDDNNNNNNNNNNNNNNNNNNNNNNNN"

For k = 1 To Len(FORMAT\_STR) 'should be = NCOLUMNS

Select Case Mid(FORMAT\_STR, k, 1)

Case "D"

.Columns(k).NumberFormat = "$#,##0.0\_);($#,##0.0)"

Case "P"

.Columns(k).NumberFormat = "0.00%"

Case "S"

.Columns(k).NumberFormat = "0"

Case "N"

.Columns(k).NumberFormat = "0.00"

End Select

Next k

With .Rows(1)

.HorizontalAlignment = xlCenter

.VerticalAlignment = xlCenter

.WrapText = True

.Orientation = 0

.AddIndent = False

.IndentLevel = 0

.ShrinkToFit = False

.ReadingOrder = xlContext

.MergeCells = False

.EntireRow.AutoFit

.Borders(xlDiagonalDown).LineStyle = xlNone

.Borders(xlDiagonalUp).LineStyle = xlNone

With .Borders(xlEdgeLeft)

.LineStyle = xlContinuous

.ColorIndex = xlAutomatic

.TintAndShade = 0

.Weight = xlHairline

End With

With .Borders(xlEdgeTop)

.LineStyle = xlContinuous

.ColorIndex = xlAutomatic

.TintAndShade = 0

.Weight = xlHairline

End With

With .Borders(xlEdgeBottom)

.LineStyle = xlContinuous

.ColorIndex = xlAutomatic

.TintAndShade = 0

.Weight = xlHairline

End With

With .Borders(xlEdgeRight)

.LineStyle = xlContinuous

.ColorIndex = xlAutomatic

.TintAndShade = 0

.Weight = xlHairline

End With

With .Borders(xlInsideVertical)

.LineStyle = xlContinuous

.ColorIndex = xlAutomatic

.TintAndShade = 0

.Weight = xlHairline

End With

.Borders(xlInsideHorizontal).LineStyle = xlNone

With .Interior

.Pattern = xlSolid

.PatternColorIndex = xlAutomatic

.ThemeColor = xlThemeColorLight1

.TintAndShade = 0

.PatternTintAndShade = 0

End With

With .Font

.ThemeColor = xlThemeColorDark1

.TintAndShade = 0

End With

End With

End With

'----------------------------------------------------------------------------------------

Return

'----------------------------------------------------------------------------------------

ERROR\_LABEL:

Call EXCEL\_TURN\_ON\_EVENTS\_FUNC

End Sub