

GUIDE TO SCENARIO ANALYSIS IN FINANCIAL MODELING



FINANCIAL MODELING
— INSTITUTE —



A best practice in 3-statement financial modeling is to include scenarios. Scenarios allow decision-makers to evaluate different opportunities and outcomes.

The Advanced Financial Modeler accreditation program covers a variety of ways to incorporate scenarios in your financial models so that they are powerful communication tools.

This Guide will introduce how to think about scenario analysis, best practices, and the use of powerful Excel tools to manage risk in your financial models.

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Key Drivers

Flexibility in models is critical, as stakeholders typically want to know the impacts of changing key drivers on the overall business under various scenarios.

Key drivers are assumptions that are difficult to forecast, hard to control, and they materially affect the business.

Examples of key drivers can include:

- Sales Price
- Sale Volume Growth
- Cost Inflation
- Currency Exchange Rates
- Input Costs

An effective model should be able to switch between different operating cases, or scenarios, and these assumptions should dynamically flow through the model and ultimately through to the financial statements.

Best Practices

Scenario analysis assists to manage risk.

By considering best and worst case scenarios stakeholders are provided a clearer picture of possibilities, and are therefore able to consider implications.

An effective model will have at least three different scenario cases:

- 1 = Base Case
- 2 = Best Case
- 3 = Worst Case

Note that having a high number of scenario variables is not ideal since too many variables complicate the analysis and require substantial work to update and maintain.

Scenarios should be reserved only for key driver assumptions that materially affect the business.

Scenario Analysis Skills

When a financial modeler needs to choose from a number of items (in this instance, 1- Base Case, 2 - Best Case, and 3 - Worst Case) the IF statement is typically the go-to function to perform the task.

In the AFM learning resources, three of the most useful functions are discussed:

- CHOOSE
- INDEX
- OFFSET

Additional options include XLOOKUP and SWITCH.

Scenario Analysis Skills

Instead of manually typing in the number “1,” “2,” or “3” for the three different operating cases, or scenarios, you can use a combo box.

A combo box is a more user-friendly way to toggle between scenarios and allows the model user to choose the case they to run using a drop-down that states the name of the case.

A complete explanation on how to build and incorporate a combo box in your model can be found on pages 18-19.

CHOOSE Function

The CHOOSE function allows for multiple scenarios to be quickly toggled. The formula is simple to use and easy to understand.

In cell C5 (on the following page), we see the function `=CHOOSE($C$1,C7,C8,C9)`.

There are two parts to this function, the index number `$C$1`, and the values `(C7,C8,C9)`.

The index number in cell C1 dictates which value to display.



`=CHOOSE(index_num, value1, [value2], ...)`

CHOOSE Function

fx =CHOOSE(\$C\$1,C7,C8,C9)

SUM			fx =CHOOSE(\$C\$1,C7,C8,C9)		
	A	B	C		
1	SCENARIO SWITCH		1		
2					
3	Economic Scenarios				
4					
5	Cost Inflation		=CHOOSE(\$C\$1,C7,C8,C9)		
7	Base Case		2.0%		
8	Best Case		1.8%		
9	Worse Case		2.5%		

If there is a 1 in C1, it displays the value in C7 (2.0%).
If there is a 2 in C1, it displays the value in C8 (1.8%).
If there is a 3 in C1, it displays the value in C9 (2.5%).

The benefit to the **CHOOSE** function is that it is extremely simple and easy to understand by anyone who reviews it, which creates a lot of confidence for the person reviewing the file.

INDEX Function

The **INDEX** function is a great tool to run scenarios and is especially helpful for scenarios that have many cases.

In cell C5 (on the following page), we see the function **=INDEX(C7:C9,\$C\$1)**. There are two parts to this function, the array (C7:C9), and the row number (\$C\$1).

The row number checks the number in cell C1 to see which value in the array (C7:C9) to display in cell C5.

The first cell in the array will be displayed in cell C5 if the switch is set to 1, the second cell will be displayed if the switch is set to 2, and so on.



=INDEX(array, row_num, [column_num])

INDEX Function

fx =INDEX(C7:C9,\$C\$1)

SUM ✖ ✔ <i>fx</i> =INDEX(C7:C9,\$C\$1)		
	A	B
1	SCENARIO SWITCH	1
2		
3	Economic Scenarios	
4		
5	Cost Inflation	=INDEX(C7:C9,\$C\$1)
7	Base Case	2.0%
8	Best Case	1.8%
9	Worse Case	2.5%

If there is a 1 in C1, it displays the value in C7 (2.0%).
If there is a 2 in C1, it displays the value in C8 (1.8%).
If there is a 3 in C1, it displays the value in C9 (2.5%).

The benefit to the **INDEX** function is that you can reference a range of cells instead of clicking on each cell individually.

OFFSET Function

The **OFFSET** function is a great tool to run scenarios and is helpful for scenarios that have many cases and will have more cases added over time.

In cell C5 (on the following page), we see the function `=OFFSET(C6,$C$1,0)`.

There are three parts to this function, the reference cell, the number of rows to drop down from the reference cell, and the number of columns to move over from the reference cell.

The reference value, C6, is the starting point. The **OFFSET** will drop down one row because the switch, C1, has been set to 1. Last, the **OFFSET** will stay in the same column because the third argument is set to zero.



=OFFSET(reference, rows, cols, [height], [width])

OFFSET Function

fx =OFFSET(C6,\$C\$1,0)

SUM			fx	=OFFSET(C6,\$C\$1,0)
	A	B	C	
1	SCENARIO SWITCH		1	
2				
3	Economic Scenarios			
4				
5	Cost Inflation			=OFFSET(C6,\$C\$1,0)
7	Base Case			2.0%
8	Best Case			1.8%
9	Worse Case			2.5%

If there is a 1 in C1, it displays the value in C7 (2.0%).
If there is a 2 in C1, it displays the value in C8 (1.8%).
If there is a 3 in C1, it displays the value in C9 (2.5%).

The benefit to the **OFFSET** function is that you can add more cases and you don't need to change the syntax in the formula.

XLOOKUP Function

In cell C5 (on the following page), we can use the function `=XLOOKUP($C$1,A7:A9,C7:C9)`. There are three key components to this function: the lookup value (`$C$1`), the lookup array (`A7:A9`), and the return array (`C7:C9`).

The function searches for the value in cell C1 within the range A7:A9, finding the value in A7, and returns the corresponding value from the range C7:C9, with the value in C7.



**`=XLOOKUP(lookup_value, lookup_array,
return_array)`**

XLOOKUP Function

fx =XLOOKUP(\$C\$1, A7:A9,C7:C9)

	A	B	C	D
1	SCENARIO SWITCH		1	
2				
3	Economic Scenarios			
4				
5	Cost Inflation		=XLOOKUP(\$C\$1,A7:A9,C7:C9)	
6				
7	1	Base Case	2.0%	
8	2	Best Case	1.8%	
9	3	Worse Case	2.5%	
10				

If there is a 1 in C1, it displays the value in C7 (2.0%).
If there is a 2 in C1, it displays the value in C8 (1.8%).
If there is a 3 in C1, it displays the value in C9 (2.5%).

The benefit of the **XLOOKUP** function is that it allows you to reference a range of cells for both the lookup and return arrays, simplifying the formula. Additionally, it provides clarity in auditing since it clearly displays both the lookup and return ranges, making it easier to verify the data source and output.

SWITCH Function

The SWITCH function is a great alternative to using multiple nested IF statements, allowing for simplified expressions when evaluating an expression against a list of values to return the corresponding result of the first matching value.

In cell C5 (on the following page), we see the function `=SWITCH($C$1,A7,C7,A8,C8,A9,C9)`. There are three main parts to this function: the expression, the values, and the results.

The expression is the value or cell reference to evaluate, which in this case is `$C$1`. The values are the possible values of the expression to match (A7, A8, A9).

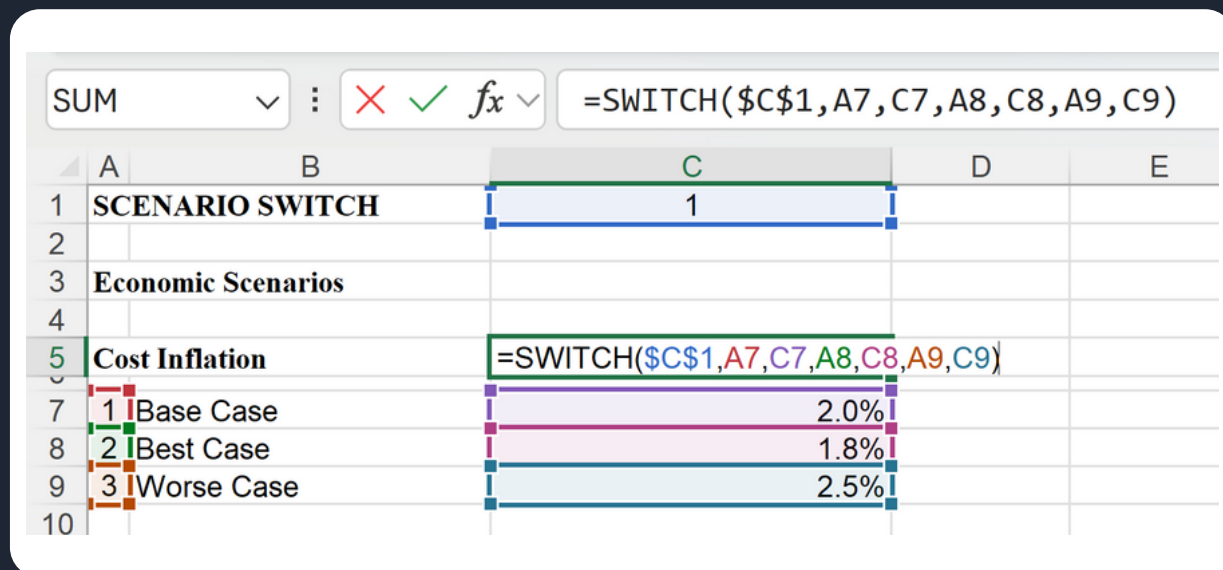
The results are the corresponding values to return (C7, C8, C9) if the expression matches one of the specified values.



=SWITCH(expression, value1, result1)

SWITCH Function

fx =SWITCH(\$C\$1,A7,C7,A8,C8,A9,C9)



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E
1	SCENARIO SWITCH		1		
2					
3	Economic Scenarios				
4					
5	Cost Inflation		=SWITCH(\$C\$1,A7,C7,A8,C8,A9,C9)		
7	1	Base Case	2.0%		
8	2	Best Case	1.8%		
9	3	Worse Case	2.5%		
10					

The formula bar at the top shows the formula: =SWITCH(\$C\$1,A7,C7,A8,C8,A9,C9)

If there is a 1 in C1, it displays the value in C7 (2.0%).
If there is a 2 in C1, it displays the value in C8 (1.8%).
If there is a 3 in C1, it displays the value in C9 (2.5%).

The benefit of the **SWITCH** function is that it simplifies decision-making logic by allowing you to check multiple conditions in a clean, readable format. This eliminates the need for complex nested IF statements, making the formula easier to audit and maintain.

Combo Box

A combo box combines a text box with a list box to create a drop-down list. This allows the user to select the data they want to display.

Ensure the developer tab has been turned on (File > Options > Customize Ribbon) and then follow the steps below to create a combo box.

- Click on Developer > Insert > Combo Box under the Form Controls
- Draw the combo box by clicking on the screen, dragging to the desired size and releasing
- Right click on the combo box and select Format Control
- In the input range select the scenario options (Base Case, Best Case, Worse Case in the example below) in your model
- In the cell link box, select the cell with the switch value
- Move and resize the combo box to hide the cell noted in the previous step
- Done! Now when you use the combo box, it will start changing the number in the switch cell and you should see the values in the live case change

Combo Box

EXAMPLE:

SCENARIO SWITCH

Base Case

▼

20242025202620272028

Economic Scenarios

Cost Inflation

Base Case
Best Case
Worse Case

2.0%	2.0%	2.0%	2.5%	2.5%
2.0%	2.0%	2.0%	2.5%	2.5%
1.8%	1.8%	1.8%	2.0%	2.0%
2.5%	2.5%	2.5%	2.5%	2.5%

Saving a Model

Version control is important to keep track of the latest version of the model.

- The only criterion that should be used when saving a new version of a model is “time.” A proper naming convention is (Company Name) (Date).xls
- Dates should be structured in the format Year/Month/Day so that models can be viewed in true chronological order.
- Never use “Save As” to re-save a version that is running a different operating case all cases should be captured using Scenarios in the same model.
- Save using “Password to Modify” provides read-only access to avoid situations where another user inadvertently introduces an error into the model.
- Always save your work regularly.

For more model building tips like these, enroll in an FMI program or accreditation and join the FMI Community today.

