Excel

Keyboard Shortcuts and Basic Knowledge

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EXCEL BASIC FUNCTIONALITY

The Importance of Excel

Microsoft Excel is one of the most widely used business applications. Having a high level of proficiency in excel will not only save the user hours of time in careers like finance, accounting, and business analytics, but it is a required skill for many jobs and internships in these fields. This tutorial will walk students through the basics of Excel from the simplest functionality. Feel free to use the table of contents below to skip to sections that are most necessary for you.

Much of the information in this tutorial is from the Wall Street Prep Introduction to Excel Course. Wall Street Prep offers a variety of step by step self-study online financial modeling courses to prepare students for real world modeling and corporate finance. While the course can be expensive, Babson has a limited number of subscriptions a year to offer to students. Email Leslie Romiza (lromiza1@babson.edu) for more information or to request a subscription.

Babson also offers a course titled "Modeling with Excel." This two credit class is a great way to take your skills to the next level.

EXCEL BASIC FUNCTIONALITY

Keyboard Shortcuts

When using Excel, moving your hands between the keyboard and the mouse can be time-consuming and inefficient. Instead, most advanced Excel users memorize keyboard shortcuts that allow them to keep their hands on the keyboard.

Open a blank excel worksheet and hit the ALT button. You will notice that the tabs in the toolbar are each associated with a letter on the keyboard. Hitting "H" to enter the home tab brings the user to another set of options from which the user can choose (ie hitting "L" to enter the conditional formatting toolbar). Using the ALT key, every functionality in Excel has a unique path of keystrokes.
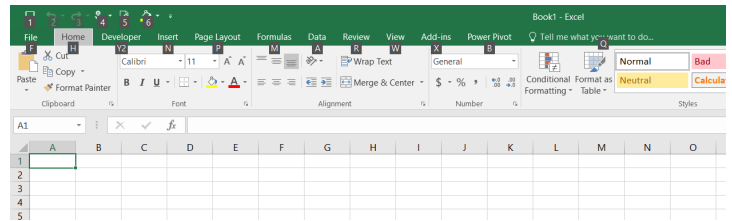
As you begin to work with Excel more heavily, you will memorize the keystrokes for the functionality that you use the most. Many popular functions also have separate shortcuts. Some of the most common shortcuts are listed below.

When the keys are connected with a "+" sign, this indicates that you must hold down on the key before pushing the next key. If they are separated by commas, you can strike the keys in order and let go of keys in between.

General

Ctrl + [select cells to the right using arrow keys] + R : *copy formula or value to the right*
Ctrl + [select cells downward using arrow keys] + D : *copy formula or value down*
Alt E, S, T : *Paste special*
F2 : *Edit formula (within a cell)*
F4 : *absolute reference*
F9 : *recalculate*
F12 : *save as*
Ctrl + F: *find*
Ctrl + H : *Replace*
ESC : *Cancel cell entry*
Ctrl+A : *Select All*

Auditing[1]

ALT, M, P : *Trace Precedents*
ALT, M, D : *Trade Dependents*
ALT, M, A, A : *Remove Tracing Arrows*

Navigation

Ctrl+O : *Open a workbook*
Ctrl+W : *Close a Workbook*
Ctrl+PgUp/PgDown : *Navigate between worksheets*
Shift+Space : *select row*
Ctrl+Space : *select column*
Alt W, F, F : *Freeze panes*
ALT, H, O, M : *Copy/Move a tab*
ALT, H, O, R : *Change tab name*
Shift + F11 : *New tab*
ALT, W, G : *Zoom to Selection*

Formatting

Ctrl+1 : *open formatting dialog box*
Alt, H, H : *Choose a fill color*
Alt H, B : *Add borders*
Alt H, A, C : *Center and align contents*
Shift + UP arrow key : *make font in a cell bigger*
Shift + DOWN arrow key : *make font in a cell smaller*
Shift + F2 : *Insert a comment*
ALT, H, E, A : *Clear cell contents and formatting*

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[1] Auditing is the process of tracing links and formulas in excel. It is often used to ensure that the builder of the model did not make a mistake.

Proper Formatting

When building financial statements in excel, there are formatting guidelines to follow for ease of use and transparency between the builder and the viewers of the model.
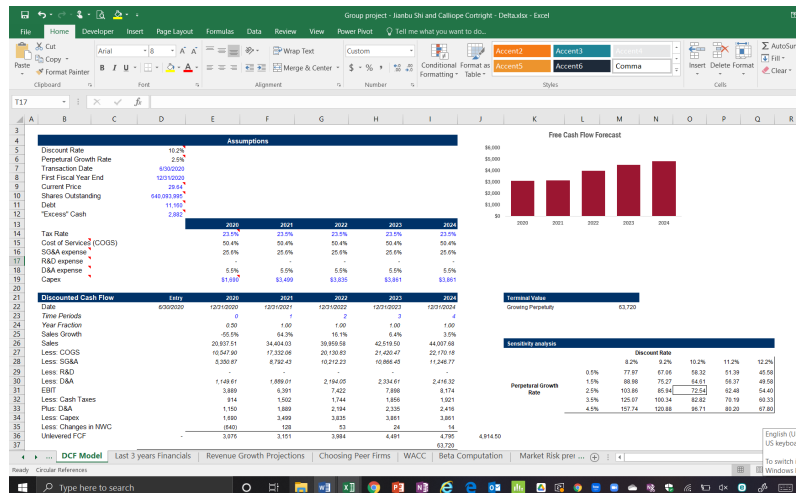
When numbers are hard coded into the worksheet (they are simply typed into the cell with no functions), these numbers should appear in blue. This signifies to the user that these numbers were likely found from an external source (i.e. the company's financial statements on its 10K). Note that some analysts use green for these values as well.

Numbers that are calculated by the builder of the model (ie "gross profit" numbers if they are calculated by subtracting "COGS" from "Revenue") should be in black. This shows the end user that these numbers were not given on a secondary source.

It is important to note that excel also has recommended cell styles for inputs, calculations, and outputs. A user can use these to quickly format their cells to match excels recommendations. The user can access this by locating the menu on the home tab to the right of the "format as a table" option and selecting the down arrow button in the bottom right (see image). The user can also select ALT, H, J and use the arrow keys to select the desired formatting.
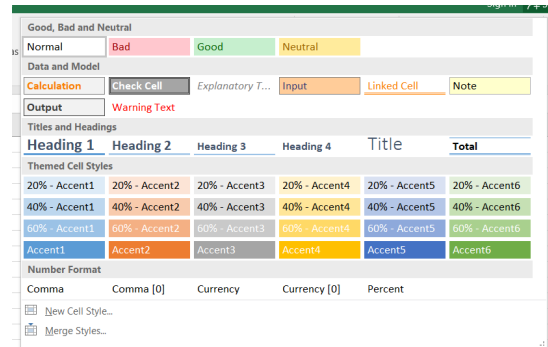
- The most important thing to remember in excel formatting is consistency. If you are using excel's recommended formats for one part of a model, you must use those formats for the rest of the model. Additionally, if you are using blue for hardcoded values and black for formulas (as can be seen in the image to the left), you must carry this through the whole workbook. All cells should also be consistent in data type. If one cell is in the currency form with one decimal place, then all other cells of that type should be too.

Conditional Formatting

Often, it is beneficial to format cells based on the value contained in that cell. This allows the user to visually see the differences in values using cell fills and fonts. After selecting a cell or range of cells to format, either click on the "Conditional formatting" option in the home tab ribbon or use the Alt, H, L keyboard shortcut. Either of these options should bring you to this drop down menu:
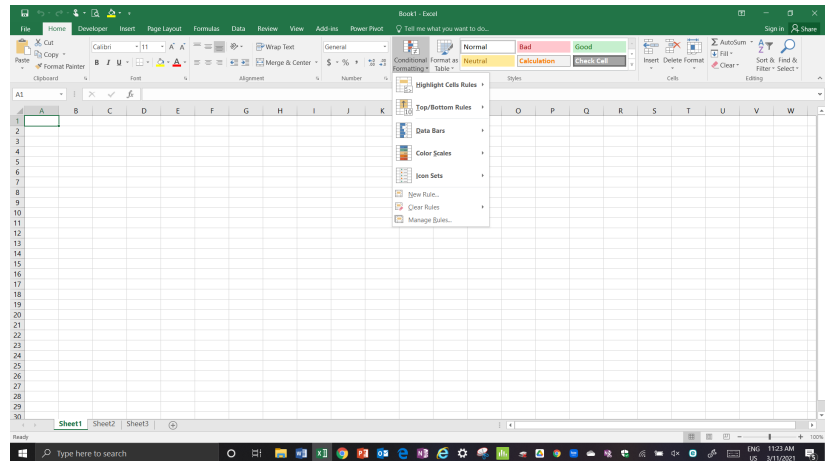
From here, you can format your cell in any way that you see fit. Below are the most common uses:

Highlight Cell Rules: (Alt, H, L, H)

This function allows the user to highlight cells if they are greater than, less than, between, or equal to a specified value. Hover over the "Highlight Cell Rules" option in the Conditional Formatting drop down menu and select an option (for this example, I will use greater than). A dialog box will appear with two boxes: the first to select the cell containing the value that you want formatted cells to be greater than (you can also hard code this number strait into the box) and the second for your desired formatting (you can use a common format from the drop down menu or choose "custom format" for more options). Select "okay" to activate the conditional formatting.
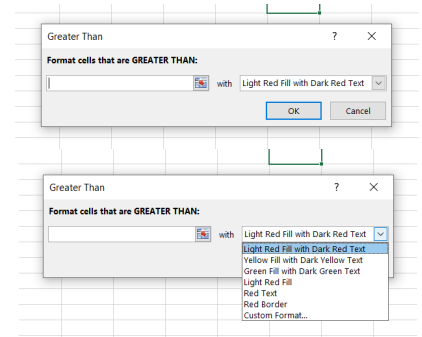
Top/Bottom Rules: (Alt, H, L, T)

This function allows users to highlight values that represent the highest or lowest points in a data set. The default options include top 10 items, top 10%, bottom 10 items, and bottom 10%, but after selecting these options the user can increase or decrease the value of "10" using the arrows on the dialog box. The user can also highlight cells above and below the average. To create a more customized "top/bottom" rule, the user can select the "more rules…" (Alt, H, L, T, M) option at the bottom of the Top/Bottom Rules pop-up.

Data Bars: (Alt, H, L, D)

Data Bars allow users to quickly visualize their data using conditional formatting. When a user selects this option, excel will create in the cell a vertical bar chart with horizontal bars representing the relative value of the data inside the cell. The user can choose from a variety of colors and fills. In the "more options…" (Alt, H, L, D, M) dialog box in the data bars option, the user can select the "show bar only" option to hide the values in the cell.

	A
1	$ 55.22
2	$ 35.39
3	$ 1.59
4	$ 21.07
5	$ 16.37
6	$ 24.35
7	$ 8.25
8	$ 60.67
9	$ 64.06
10	$ 77.25

Color Scales: (Alt, H, L, S)

	A
1	$ 49.21
2	$ 23.34
3	$ 37.08
4	$ 33.02
5	$ 73.73

Similar to Data Bars, color scales format the cells based on the relative value of the data in the cell. Many of the default options, for example, will format higher values in green and lower values in red. This allows the user to better visualize the data. By selecting "more rules…" (Alt, H, L, S, M), the user can customize the color scale.

Icon Sets: (Alt, H, L, I)

	A
1	$49.21
2	$23.34
3	$37.08
4	$33.02
5	$73.73

Icon sets are similar to color scales but instead of changing the color of the cell this rule inputs an icon next to the value in the cell.

More with Conditional Formatting

New Rule…
Clear Rules
Manage Rules…
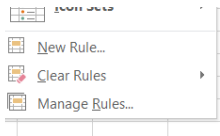
Excel allows for flexibility by creating a "new rule" option (Alt, H, L, N) that allows users to customize a rule. Users can also clear rules (Alt, H, L, C) and manage rules (Alt, H, L, R) from the conditional formatting menu.

Lookup Functions

When building excel models, it is often necessary to create a cell that will change depending on the contents of other cells.
To do this, we use LookupFunctions.

Suppose that given this table of revenues in each week of the year, you wanted to output the revenue in the second week of April. However, instead of simply looking in the table and finding the value, you want to make your output dynamic in that when the inputs in cells I5 and I6 change, the output changes as well.

	Week 1	Week 2	Week 3	Week 4	Total		
Jan	$630.34	$743.49	$624.48	$222.66	$2,220.97		Looking for:
Feb	$255.88	$284.74	$64.81	$100.28	$705.71		Apr
Mar	$665.44	$243.24	$970.80	$201.69	$2,081.17		Week 2
Apr	$534.72	$443.78	$956.35	$163.64	$2,098.50		
May	$192.13	$291.91	$742.40	$162.78	$1,389.23		
Jun	$286.65	$629.01	$289.54	$294.87	$1,500.08		
Jul	$724.35	$761.63	$180.60	$826.22	$2,492.80		
Aug	$983.36	$90.00	$735.09	$483.35	$2,291.79		
Sep	$221.89	$546.32	$995.03	$749.82	$2,513.06		
Oct	$570.90	$653.42	$18.14	$448.91	$1,691.37		
Nov	$540.30	$973.91	$626.21	$972.23	$3,112.66		
Dec	$45.49	$737.53	$388.27	$528.18	$1,699.47		

HLOOKUP:

The HLOOKUP function signals excel to horizontally search for a value in the first row of a table. The syntax of arguments, in order, are as follows:

	Week 1	Week 2	Week 3	Week 4	Total		
Jan	$630.34	$743.49	$624.48	$222.66	$2,220.97		Looking for:
Feb	$255.88	$284.74	$64.81	$100.28	$705.71		Apr
Mar	$665.44	$243.24	$970.80	$201.69	$2,081.17		Week 2
Apr	$534.72	$443.78	$956.35	$163.64	$2,098.50		
May	$192.13	$291.91	$742.40	$162.78	$1,389.23		
Jun	$286.65	$629.01	$289.54	$294.87	$1,500.08		
Jul	$724.35	$761.63	$180.60	$826.22	$2,492.80		
Aug	$983.36	$90.00	$735.09	$483.35	$2,291.79		
Sep	$221.89	$546.32	$995.03	$749.82	$2,513.06		
Oct	$570.90	$653.42	$18.14	$448.91	$1,691.37		
Nov	$540.30	$973.91	$626.21	$972.23	$3,112.66		
Dec	$45.49	$737.53	$388.27	$528.18	$1,699.47		
Hlookup	=HLOOKUP(I6,B3:G15,5)						
Vlookup	$443.78						
match	4						
offset/match	$443.78						
index/match	$443.78						

1. Lookup value - This is what you want excel to look for in the first row of the table. It will usually be imputed as a cell containing this value. In this case, we use I6, which tells excel to search for "Week 2" in the first row of the table

2. The table array - this is the whole table that contains the value you are searching for. In this case, it is the revenue table in cells B3:G15.

3. Row index number - this tells excel how many rows to go down from the cell that it found based on the lookup value. In this case, how many rows does excel have to jump down from "Week 2" to get to the desired output. This includes the top row, so in this case it is 5.

VLOOKUP:

The VLOOKUP function is similar to the HLOOKUP function, but it searches vertically in the first column of the table instead. The arguments, in order, are as follows.

1. Lookup value - similar to HLOOKUP, this is the value, or the cell containing the value, that you want excel to look for in the first column of the table. In this case, we want excel to look for "Apr," which is contained in cell I5.

2. Lookup array - the full table containing the value that you are looking for. In this case, it is the same as above (B3:G15).

3. Column index number - This is the number of columns that excel should look right from the cell containing "Apr" to find the desired output. Again, this includes the first column, so in this example it is 3.

4. Unlike HLOOKUP, VLOOKUP requires a fourth argument of "0" if the lookup value is text rather than a number.

MATCH:

The MATCH function is not very useful on its own, but it has important implications when paired with lookup functions. Given a lookup value and an array, MATCH outputs the relative position of the value in that array. The arguments are as follows:

1. The lookup value - Similar to above, this is the value or cell containing a value that you hope to find in an array. In this case we are using I5 to find "Apr."

2. The array - A 1-by-*x* array in a table that contains the lookup value. In this case, we will find "Apr" in the array from B4:B15.

3. The match type - excel considers "0" to be an exact match, "1" to mean less than, and "-1" to mean greater than. In this case we want an exact match.

From these arguments, excel outputs the position of "Apr" in the array in the form of a number. In this case, this means that "Apr" is the fourth number from the top in this array.

OFFSET + MATCH:

The OFFSET function allows users to choose a pivot point at the corner of the table and output a value *x* rows over and *y* rows down from that point. It can be more powerful when combined with MATCH. The syntax is as follows:

1. Reference - This is the pivot point in the table, usually in the top left corner. It is from this point that excel will move over and down. In this example, we use B3 in the top left corner of the table.

2. Rows - This is the number of rows to move down from the pivot point. We can use match to output the number representing the position of "Apr" in the array from B4:B15 (the match function we completed above). Using this MATCH function is essentially the same as inputting "4," but it is more dynamic because it will change as the value in I5 changes.

	A	B	C	D	E	F	G	H	I
1									
2									
3			Week 1	Week 2	Week 3	Week 4	Total		
4		Jan	$630.34	$743.49	$624.48	$222.66	$2,220.97		Looking for:
5		Feb	$255.88	$284.74	$64.81	$100.28	$705.71		Apr
6		Mar	$665.44	$243.24	$970.80	$201.69	$2,081.17		Week 2
7		Apr	$534.72	$443.78	$956.35	$163.64	$2,098.50		
8		May	$192.13	$291.91	$742.40	$162.78	$1,389.23		
9		Jun	$286.65	$629.01	$289.54	$294.87	$1,500.08		
10		Jul	$724.35	$761.63	$180.60	$826.22	$2,492.80		
11		Aug	$983.36	$90.00	$735.09	$483.35	$2,291.79		
12		Sep	$221.89	$546.32	$995.03	$749.82	$2,513.06		
13		Oct	$570.90	$653.42	$18.14	$448.91	$1,691.37		
14		Nov	$540.30	$973.91	$626.21	$972.23	$3,112.66		
15		Dec	$45.49	$737.53	$388.27	$528.18	$1,699.47		
16									
17									
18		Hlookup	$443.78						
19		Vlookup	$443.78						
20		match	4						
21		offset/match	=OFFSET(B3,MATCH(I5,B4:B15,0),MATCH(I6,C3:G3,0))						
22		index/match	$443.78						
23									

3. Columns - Use a MATCH function to output the position of "Week 2" in the array from C3:G3, as we did above.

4. Match type - Remember that excel considers "0" to be an exact match, "1" to mean less than, and "-1" to mean greater than. In this case we want an exact match.

It is important to note that, unlike other lookup values, index does not consider the first row or column in the table as the first position, so if "1" were imputed in the rows argument it would output "Jan."

	A	B	C	D	E	F	G	H	I
1									
2									
3			Week 1	Week 2	Week 3	Week 4	Total		
4		Jan	$630.34	$743.49	$624.48	$222.66	$2,220.97		Looking for:
5		Feb	$255.88	$284.74	$64.81	$100.28	$705.71		Apr
6		Mar	$665.44	$243.24	$970.80	$201.69	$2,081.17		Week 2
7		Apr	$534.72	$443.78	$956.35	$163.64	$2,098.50		
8		May	$192.13	$291.91	$742.40	$162.78	$1,389.23		
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10		Jul	$724.35	$761.63	$180.60	$826.22	$2,492.80		
11		Aug	$983.36	$90.00	$735.09	$483.35	$2,291.79		
12		Sep	$221.89	$546.32	$995.03	$749.82	$2,513.06		
13		Oct	$570.90	$653.42	$18.14	$448.91	$1,691.37		
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15		Dec	$45.49	$737.53	$388.27	$528.18	$1,699.47		
16									
17									
18		Hlookup	$443.78						
19		Vlookup	$443.78						
20		match	4						
21		offset/match	$443.78						
22		index/match	=INDEX(B3:G15,MATCH(I5,B3:B15,0),MATCH(I6,B3:G3,0))						

INDEX + MATCH:

Similar to OFFSET+MATCH, INDEX+MATCH allows the user to dynamically output the desired revenue. The syntax is as follows:

1. Array - The full table containing the values.

2. Row number - The number of rows to go down in the table. You can use a match function to find "Apr" in the

first column of the table and output its relative position. Unlike with OFFSET, excel considers the first position to be the top of the table, so you must start the array at this top row (B3).

3. Column number - The number of columns to go to the right. Again, excel considers the first position to be the first column, so you must start your array in your match function at B3.

4. Match type - See above

.

Finance Formulas

There are many formulas within excel that make mundane and time consuming financial calculations easier and faster. A few of the most common formulas are described below:

NPV (Net present value) = NPV(rate, values)

One of the most used formulas in excel for finance professionals is =NPV. This formula takes into account the time value of money and discounts future cash flows to the present. The first argument is the rate of return required for the cash flow (WACC, cost of equity, etc.) depending on the problem. Then, the user must input the cash flows in order starting from year 1. If there is a cash flow in year 0, add this to the cell *after* the NPV function because the function does not have an input for the cash flow in year 0.

		2021	2022	2023	2024	2025		WACC	10%
15									
16									
17									
18		2021	2022	2023	2024	2025		WACC	10%
19	Free Cash Flow to Firm	$ (800.00)	$ 250.00	$ 253.75	$ 257.56	$ 261.42			
20	NPV	=NPV(I18,C19:F19)+B19							
21									
22									

XNPV (NPV of cash flows at unequal intervals) = XNPV(rate, values, dates)

Similar to NPV, XNPV outputs the net present value of cash flows. However, these cash flows can be in unequal intervals. For example, if each cash flow didn't come at one year increments in the previous example, the user would need to use XNPV. The first two inputs are the same, but this function contains another input: the dates of the cash flows. The same rule applies to cash flows in year 0 as with the NPV function.

		1/1/2021	6/30/2022	5/25/2023	2/15/2024	7/29/2025		WACC	10%
	Free Cash Flow to Firm	$ (800.00)	$ 250.00	$ 253.75	$ 257.56	$ 261.42			
	NPV	=XNPV(I18,C19:F19,C18:F18)+B19							
		**if valuing the cash flows on 1/1/2021							

IRR (internal rate of return) =IRR(values, guess)

Besides NPV, another way to test the profitability of a group of cash flows is to test the internal rate of return relative to the required rate of return. The IRR function will output the implicit rate of return for a given group of cash flows. The only required input is the cash flows (starting at year 0 for IRR). The other input is "guess," but it is not required and often not used.

4		2021	2022	2023	2024	2025
5	Free Cash Flow to Firm	$ (800.00)	$ 250.00	$ 253.75	$ 257.56	$ 261.42
6	IRR	=IRR(B25:F25)				
7						

XIRR (Internal rate of return at unequal intervals) = XIRR(values, dates, guess)

Like XNPV, XIRR gives the output for the internal rate of return when the cash flows come at unequal intervals. The inputs are the same as IRR (with "guess" still being optional), but this function has another argument at the end of the function for the dates of the cash flows. Like with the traditional IRR function, cash flows start at year 0.

3							
4		1/1/2021	6/30/2022	5/25/2023	2/15/2024	7/29/2025	
5	Free Cash Flow to Firm	$ (800.00)	$ 250.00	$ 253.75	$ 257.56	$ 261.42	
6	IRR	=XIRR(B25:F25,B24:F24)					
7							

PV (present value) = PV(rate,nper,pmt,fv,type)

The PV function returns the present value of a series of certain payments. This becomes especially useful when valuing coupon bonds. The first argument is the discount rate or required return on the investment. The second is the number of payments received, then the dollar amount of each payment. The fourth argument is the future value (the payment received

Par Value	$1,000.00
Required Return	10%
Number of periods	20
Coupon Payments	$ 50.00
Present Value	=PV(Q11,Q12,Q13,Q1b)
	PV(rate, nper, pmt, [fv], [type])

at the end of the investment), and in bonds this is the par value. The type is an optional argument. Keep in mind that PV will output as a negative value because it represents a cash outflow when buying a bond or similar instrument.

NPER (number of periods) = NPER(rate,pmt,pv,fv)

Par Value	$ 1,000.00
Required Return	10%
Number of periods	=NPER(Q11,Q13,Q14,Q10)
Coupon Payments	$ 20.00
Present Value	($573.30)

If, in the previous example, the value we were missing was the number of periods rather than the present value, we would use the NPER function to find this missing value. The inputs are the same as above (but in a slightly

different order), and the present value must be entered as a negative number.

PMT (payment) = PMT(rate,nper,pv,fv), RATE (rate of return) = RATE(nper,pmt,pv,fv), FV (future value) = FV(rate,nper,pmt,pv)

The above functions solve for different variables in this set of inputs provided that all other variables are known. Examples are shown in the image below. Each of these requires the present value to be inputted as a negative number.

Par Value	$ 1,000.00
Required Return	10%
Number of periods	8.00
Coupon Payments	=PMT(Q11,Q12,Q14,Q10)
Present Value	($573.30)

Par Value	$ 1,000.00
Required Return	=RATE(Q12,Q13,Q14,Q10)
Number of periods	8.00
Coupon Payments	$20.00
Present Value	($573.30)

Par Value	=FV(Q11,Q12,Q13,Q14)
Required Return	10%
Number of periods	8.00
Coupon Payments	$20.00
Present Value	($573.30)

There are many more functions on excel related to financial analysis that are specialized and useful for various tasks.

Sensitivity Analysis

Often in financial analysis it is necessary to understand how various assumptions in inputs affect the results of the model. This process is called sensitivity analysis. A popular tool in excel for sensitivity analysis is data tables.

Data tables in excel allow the user to see an output given a range of potential inputs. For example, the user can see various potential implied values per share given different revenue growth rates.

One way data tables:

Step 1: Set up the table

For a one-way data table, the user must define a range of different values that excel will replace a given input with. For example, if the user wishes to see the result of the output given a range of perpetual growth rates, she would define some values above and

below the current value in the model. For a vertical one-way data table, for example, the user would define a variety of different possible growth rates listed vertically in neighboring cells. It is important to note that these possible values can not be linked outside of the data table (aka you can not use an equation to define

	=M48
	0.5%
Perpetual	1.5%
Growth	2.5%
Rate	3.5%
	4.5%

Rate of Return	
Target Price Upside/Downside	145%

Market Value vs Intrinsic Value	
Market Value	29.64
Upside	42.90
Intrinsic Value	72.54

any value in this list from the model itself, it has to be hardcoded). You can, however, link to within the data table itself and to values outside of the model. The next part of the

set up is to link the output cell to the cell one above and one to the right of your data range. For example, if you want to find the effect on intrinsic value, then link intrinsic value in this cell.

Step 2: Create the datatable

Next, highlight the entire table as is shown to the right. Select ALT, D, T. The data table popup will appear. For a vertical one way data table, fill the

	73
	0.5%
Perpetual	1.5%
Growth	2.5%
Rate	3.5%
	4.5%

"column input cell" field with the cell that contains the input you want to change within your actual model. Leave the other field blank.

Assumptions		
Discount Rate	10.2%	
Perpetural Growth Rate	2.5%	
Transaction Date	6/30/2020	
First Fiscal Year End	12/31/2020	
Current Price	29.64	
Shares Outstanding	640,093,995	
Debt	11,160	
"Excess" Cash	2,882	

		2020	2021	2022	2023	2024
Tax Rate		23.5%	23.5%	23.5%	23.5%	23.5%
Cost of Services (COGS)		50.4%	50.4%	50.4%	50.4%	50.4%
SG&A expense		25.6%	25.6%	25.6%	25.6%	25.6%
R&D expense		-	-	-	-	-
D&A expense		5.5%	5.5%	5.5%	5.5%	5.5%
Capex		$1,690	$3,499	$3,835	$3,861	$3,861

Discounted Cash Flow	Entry	2020	2021	2022	2023	2024
Date	6/30/2020	12/31/2020	12/31/2021	12/31/2022	12/31/2023	12/31/2024
Time Periods		0	1	2	3	4
Year Fraction		0.50	1.00	1.00	1.00	1.00
Sales Growth		-55.5%	64.3%	16.1%	6.4%	3.5%
Sales		20,937.51	34,404.03	39,959.58	42,519.50	44,007.68
Less: COGS		10,547.90	17,332.06	20,130.83	21,420.47	22,170.18
Less: SG&A		5,350.87	8,792.43	10,212.23	10,866.45	11,246.77
Less: R&D		-	-	-	-	-
Less: D&A		1,149.61	1,889.01	2,194.05	2,334.61	2,416.32
EBIT		3,889	6,391	7,422	7,898	8,174
Less: Cash Taxes		914	1,502	1,744	1,856	1,921
Plus: D&A		1,150	1,889	2,194	2,335	2,416
Less: Capex		1,690	3,499	3,835	3,861	3,861
Less: Changes in NWC		(640)	128	53	24	14
Unlevered FCF	-	3,076	3,151	3,984	4,491	4,795
						63,720
Transaction CF	-	1,538	3,151	3,984	4,491	68,515

Intrinsic Value			Current Market Value		
Enterprise Value	54,707		Market Cap	18,972,386,012	
Plus: Excess Cash	2,882		Plus: Debt	11,160	
Less: Debt	11,160		Less: Excess Cash	2,882	
Equity Value	46,429		Enterprise Value	18,972,394,290	

Terminal Value		
Growing Perpetuity	63,720	

Sensitivity analysis

Discount Rate

		8.2%	9.2%	10.2%	11.2%	12.2%
	0.5%	77.97	67.06	58.32	51.39	45.58
Perpetural Growth Rate	1.5%	88				49.58
	2.5%	103				54.40
	3.5%	125				60.33
	4.5%	157				67.80

Data Table ? X
Row input cell: _____
Column input cell: D6
OK Cancel

Rate of Return		
Target Price Upside/Downside	145%	

	73
0.5%	
1.5%	
Perpetural Growth Rate — 2.5%	
3.5%	
4.5%	

4,914.50

	72.54
0.5%	58.32
1.5%	64.61
Perpetural Growth Rate — 2.5%	72.54
3.5%	82.82
4.5%	96.71

You will get this output. This shows the intrinsic values of the share give the different perpetual growth rates listed on the left.

You can also create one way data tables that are oriented horizontally. The only difference in set up is that the variable to change in the model should be defined in the "row input cell" field. The output will be the same, but oriented differently.

Perpetual Growth Rate

	0.5%	1.5%	2.5%	3.5%	4.5%
72.54					

Data Table ? X
Row input cell: D6
Column input cell: _____
OK Cancel

Perpetual Growth Rate

	0.5%	1.5%	2.5%	3.5%	4.5%
72.54	58.32	64.61	72.54	82.82	96.71

Two Way Data Tables:

Two way data tables are set up much the same way, but they allow the user to explore the effect of two different inputs on the model. To set up the data table, the user must define a range for two different inputs (one horizontal and one vertical) like the example to the right. In the corner of the inputs, the user will link the cell that contains the output of the model.

The user then must highlight the entire table and select ALT, D, T. This will bring up the same popup menu for the data table option. In the "row input cell" field, input the cell that contains the value denied in the range on the top of the data table. In the "column input cell" define the cell that contains the value defined in the range on the left side of the data table. You will obtain the output below. This shows the intrinsic value of the share given a combination of different discount rates and terminal growth rates.
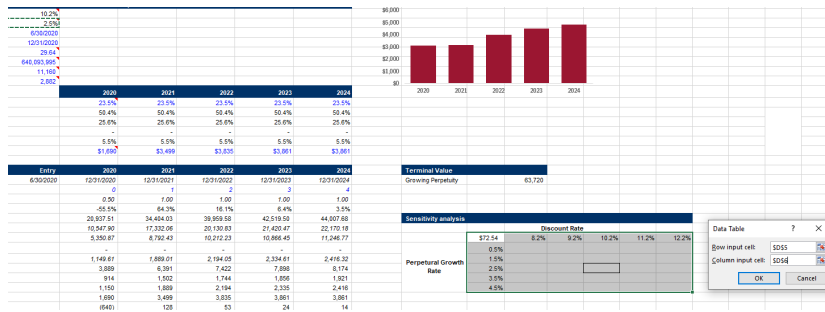
Sensitivity analysis						
		Discount Rate				
	$72.54	8.2%	9.2%	10.2%	11.2%	12.2%
Perpetural Growth Rate	0.5%	77.97	67.06	58.32	51.39	45.58
	1.5%	88.98	75.27	64.61	56.37	49.58
	2.5%	103.86	85.94	72.54	62.48	54.40
	3.5%	125.07	100.34	82.82	70.19	60.33
	4.5%	157.74	120.88	96.71	80.20	67.80