



Financial Modeling Best Practices

2018 Financial Modeling Competition

World Case Championships

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PART 01

Analytics: Financial Modeling

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FINANCIAL STATEMENTS

Historical Results

2013

2014

2015

2016

Balance Sheet Check

OK

OK

OK

OK

Assumptions

Income Statement

Revenue	102,007	118,086	131,345	142,341
Cost of Goods Sold (COGS)	39,023	48,004	49,123	52,654
Gross Profit	62,984	70,082	82,222	89,687
Expenses				
Salaries and Benefits	26,427	22,658	23,872	23,002
Rent and Overhead	10,963	10,125	10,087	11,020
Depreciation & Amortization	19,500	18,150	17,205	16,544
Interest	2,500	2,500	1,500	1,500
Total Expenses	59,390	53,433	52,664	52,066
Earnings Before Tax	3,594	16,649	29,558	37,622
Taxes	1,120	4,858	8,483	10,908
Net Earnings	2,474	11,791	21,075	26,713

A. What is Financial modeling?

To learn more, please check out our online courses



What is a financial model?

A financial model is a tool that's built in Excel to forecast a business' financial performance into the future. The forecast is typically based on the company's historical performance and requires preparing the income statement, balance sheet, cash flow statement and supporting schedules. Below is an example of financial modeling in Excel:

FINANCIAL STATEMENTS	Historical Results					Forecast Period				
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Balance Sheet Check	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Assumptions										
Income Statement										
Revenue	102,007	118,086	131,345	142,341	150,772	158,311	165,435	172,052	178,074	183,416
Cost of Goods Sold (COGS)	39,023	48,004	49,123	52,654	56,710	58,575	61,211	61,939	64,107	64,196
Gross Profit	62,984	70,082	82,222	89,687	94,062	99,736	104,224	110,113	113,967	119,220
Expenses										
Salaries and Benefits	26,427	22,658	23,872	23,002	25,245	26,913	28,124	29,249	30,273	31,181
Rent and Overhead	10,963	10,125	10,087	11,020	11,412	10,000	10,000	10,000	10,000	10,000
Depreciation & Amortization	19,500	18,150	17,205	16,544	16,080	15,008	15,005	15,003	15,002	15,001
Interest	2,500	2,500	1,500	1,500	1,500	1,500	1,500	500	500	500
Total Expenses	59,390	53,433	52,664	52,066	54,237	53,421	54,629	54,752	55,774	56,682
Earnings Before Tax	3,594	16,649	29,558	37,622	39,825	46,314	49,595	55,361	58,193	62,539
Taxes	1,120	4,858	8,483	10,908	11,598	12,968	13,887	15,501	16,294	17,511
Net Earnings	2,474	11,791	21,075	26,713	28,227	33,346	35,708	39,860	41,899	45,028

Balance Sheet

Cash Flow Statement

Supporting Schedules

What is a financial model used for?

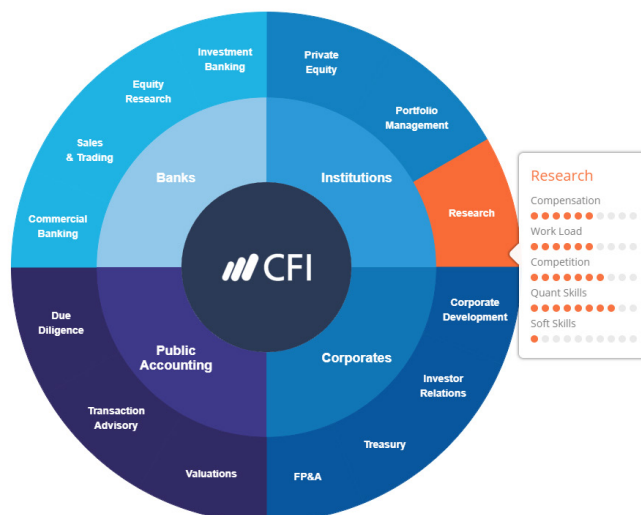
The output of a financial model is used for decision-making and performing financial analysis, whether inside or outside of the company. Inside a company, executives will use financial models to make decisions about:

- Raising capital (debt and/or equity)
- Making acquisitions (businesses and/or assets)
- Growing the business (i.e. opening new stores, entering new markets, etc.)
- Selling or divesting assets and business units
- Budgeting and forecasting (planning for the years ahead)
- Capital allocation (priority of which projects to invest in)
- Valuing a business

Who builds financial models? (Jobs and career)

There are many different types of professionals who build financial models. The most common types of career tracks are investment banking, equity research, corporate development, FP&A, and accounting (due diligence, transaction advisory, valuations, etc.).

To learn more about jobs and careers that require building financial models, explore our interactive career map.



How can you learn financial modeling?

The best way to learn financial modeling is to practice. It takes years of experience to become an expert at building a financial model, and you really have to learn by doing. Reading equity research reports can be a helpful way to practice, as it gives you something to compare your results to. One of the best ways to practice is to take a mature company's historical financials, build a flat-line model into the future, and calculate the net present value per share. This should compare closely to the current share price or the target prices of equity research reports.

It's also important to establish a solid base understanding by taking professional financial modeling training courses such as the online courses we offer at CFI. In the meantime, you may also be interested right away in building your own financial models. Feel free to use our available free templates to get a jump start before taking one of our courses.

© Corporate Finance Institute. All rights reserved.		Startup year						Terminal year
		2016	2017	2018	2019	2020	2021	2022
Balance Sheet Check		OK	OK	OK	OK	OK	OK	OK
Balance Sheet								
ASSETS								
Current								
Cash	4,954,646	3,344,792	2,992,993	2,886,117	4,448,738	6,668,315	10,325,123	
Accounts Receivable	52,529	75,985	121,007	189,380	262,356	367,719	436,532	
Inventory	900,493	1,055,342	1,452,082	2,185,151	2,951,507	4,035,945	4,791,205	
Total	5,907,668	4,476,119	4,566,082	5,260,647	7,662,601	11,071,979	15,552,860	
Technology	240,000	220,000	190,000	510,000	370,000	1,040,000	800,000	
Property & Equipment	160,000	160,000	150,000	130,000	220,000	230,000	550,000	
Total Assets	6,307,668	4,856,119	4,906,082	5,900,647	8,252,601	12,341,979	16,902,860	
LIABILITIES & SHAREHOLDER EQUITY								
Liabilities								
Current								
Revolver								
Accounts Payable	880,708	769,479	776,587	845,832	1,111,226	1,494,404	1,751,365	
Total	880,708	769,479	776,587	845,832	1,111,226	1,494,404	1,751,365	
Debt	0	0	0	0	0	0	0	
Total Liabilities	880,708	769,479	776,587	845,832	1,111,226	1,494,404	1,751,365	
Shareholder Equity								
Share Capital	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	
Retained Earnings	(2,573,040)	(3,913,360)	(3,870,505)	(2,945,185)	(858,625)	2,847,575	7,151,495	
Total Shareholder Equity	5,426,960	4,086,640	4,129,495	5,054,815	7,141,375	10,847,575	15,151,495	
Total Liabilities & Shareholder Equity	6,307,668	4,856,119	4,906,082	5,900,647	8,252,601	12,341,979	16,902,860	
Check	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

What are financial modeling best practices?

1. Excel tips and tricks

It's very important to follow best practices in Excel when building a financial model. For more details, you can take our free [Excel Crash Course](#), which outlines the following key themes:

- Limit or eliminate the use of your mouse (keyboard shortcuts are much faster)
- Use a blue font for hard-codes and inputs (formulas can stay black)
- Keep formulas simple and break down complex calculations into steps
- Ensure you know how to use the most important Excel formulas and functions
- Use INDEX and MATCH instead of VLOOKUP to query data
- Use the CHOOSE function to build scenarios

2. Formatting

It's important to clearly distinguish between inputs (assumptions) in a financial model and output (calculations). This is typically achieved through formatting conventions, such as making inputs blue and formulas black. You can also use other conventions like shading cells or using borders.

3. Model layout and design

It's critical to structure a financial model in a logical, easy-to-follow design. This typically means building the whole model on one worksheet and using grouping to create different sections. This way, it's easy to expand or contract the model and move around it easily.

The main sections to include in a financial model (from top to bottom) are:

1. Assumptions and drivers
2. Income statement
3. Balance sheet
4. Cash flow statement
5. Supporting schedules
6. Valuation
7. Sensitivity analysis
8. Charts and graphs

Below is an example of the grouped sections of a well laid out financial model:

	A	B	C	D	E	F	G	H	I	J	K	L
1	© Corporate Finance Institute. All rights reserved.					Startup year						Terminal year
2						2016	2017	2018	2019	2020	2021	2022
3	Balance Sheet Check					OK	OK	OK	OK	OK	OK	OK
4												
5		Assumptions										
107												
108		Income Statement										
141												
142		Balance Sheet										
168												
169		Cash Flow Statement										
197												
198		Supporting Schedules										
253												
254		Customer Metrics										
266												
267		Valuation										
298												
299		Charts & Graphs										
350												

How do you build a financial model? (10-step Guide)

Financial modeling is an iterative process. You have to chip away at different sections until you're finally able to tie them all together.

Below is a step-by-step breakdown of where you should start and how to eventually connect all the dots. For more detailed instructions and to work through your own Excel model, check out our [financial modeling courses](#).

1. Historical results and assumptions

Every financial model starts with a company's historical results. You begin building the financial model by pulling three years of financial statements and inputting them into Excel. Next, you reverse engineer the assumptions for the historical period by calculating items such as revenue growth rate, gross margins, variable costs, fixed costs, AR days, inventory days, and AP days, to name a few. From there you can fill in the assumptions for the forecast period as hard-codes.

2. Start the income statement

With the forecast assumptions in place, you can calculate the top of the income statement with revenue, COGS, gross profit, and operating expenses down to EBITDA. You will have to wait to calculate depreciation, amortization, interest, and taxes.

3. Start the balance sheet

With the top of the income statement in place, you can start to fill in the balance sheet. Begin by calculating accounts receivable and inventory, which are both functions of revenue and COGS, as well as the AR days and inventory days assumptions. Next, fill in accounts payable which is a function of COGS and AP days.

4. Build the supporting schedules

Before completing the income statement and the balance sheet, you have to create a schedule for capital assets like PP&E, as well as for debt and interest. The PP&E schedule will pull from the historical period and add capital expenditures and subtract depreciation. As for the debt

schedule, it will also pull from the historical period and add increases in debt and subtract repayments. Interest will be based on the average debt balance.

5. Complete the income statement and balance sheet

The information from the supporting schedules completes the income statement and balance sheet. On the income statement, link depreciation to the PP&E schedule and interest to the debt schedule. From there you can calculate earnings before tax, taxes and net income. On the balance sheet, link the closing PP&E balance and closing debt balance from the schedules. Shareholder's equity can be completed by pulling forward last year's closing balance, adding net income and capital raised and subtracting dividends or shares repurchased.

6. Build the cash flow statement

With the income statement and balance sheet complete, you can build the cash flow statement with the reconciliation method. Start with net income, add back depreciation and adjust for changes in non-cash working capital, which results in cash from operations. Cash used in investing is a function of capital expenditures in the PP&E schedule, and cash from financing is a function of the assumptions that were laid out about raising debt and equity.

7. Perform the DCF analysis

When the three statement model is completed, it's time to calculate free cash flow and perform the business valuation. The free cash flow of the business is discounted back to today at the firm's cost of capital (its opportunity cost, or required rate of return). We offer a full suite of courses that teach all of the above steps with examples, templates, and step-by-step instruction. Read more about how to build a DCF model.

8. Add sensitivity analysis and scenarios

Once the DCF analysis and valuation sections are complete, it's time to incorporate sensitivity analysis and scenarios into the model. The point of this analysis is to determine how much the value of the company (or some other metric) will be impacted by changes in underlying

assumptions. This is very useful for assessing the risk of an investment or for business planning purposes (i.e. does the company need to raise money if sales volume drops by x percent?).

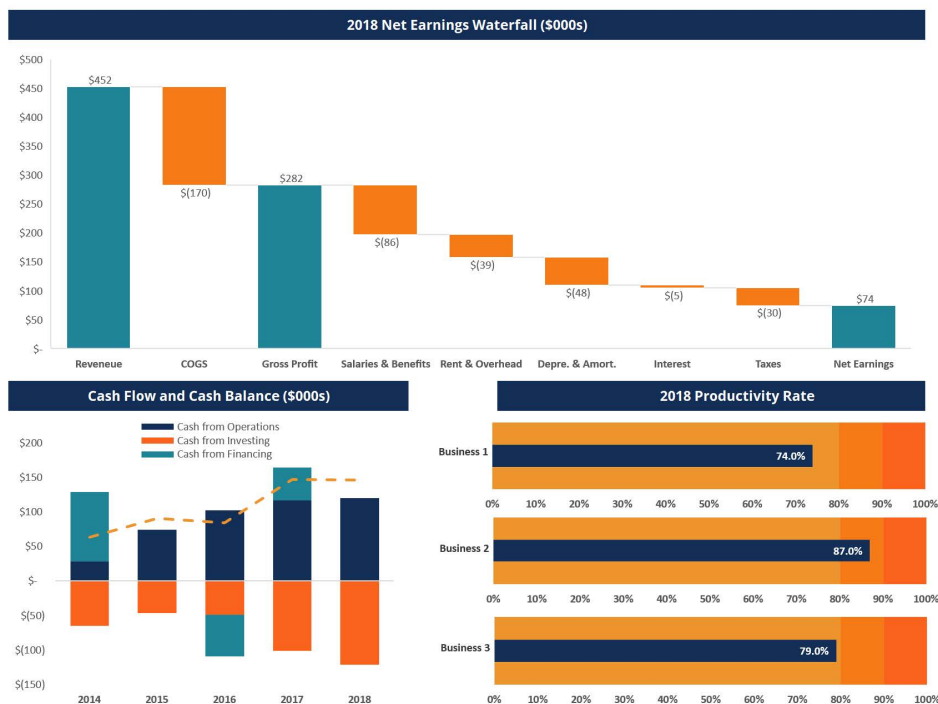
9. Build charts and graphs

Clear communication of results is something that really separates good from great financial analysts. The most effective way to show the results of a financial model is through charts and graphs, which we cover in detail in our advanced Excel course as well as many of the individual financial modeling courses. Most executives don't have the time or patience to look at the inner workings of the model, so charts are much more effective.

10. Stress test and audit the model

When the model is done, your work is not yet over. Next, it's time to start stress-testing extreme scenarios to see if the model behaves as expected. It's also important to use the auditing tools covered in our financial modeling fundamentals course to make sure it's accurate and the Excel formulas are all working properly.

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DASHBOARD TEMPLATE

Free financial modeling video lesson

Want to see all the above steps in action? Check our CFI's [free webinar video](#) about how to build a three statement financial model in Excel. This live demonstration will show steps 1 – 6 listed above.



More about financial modeling

We hope this has been a helpful guide on what financial modelling is all about and how to perform it.

If you want to learn more, we've got all the resources you need:

- Types of financial models
- DCF model guide
- Valuation methods
- Free Excel crash course

B. Types of Financial Models

To learn more, please check out our online courses



Top 10 types of financial models

Here is a list of the 10 most common types of financial models:

1. Three Statement Model
2. Discounted Cash Flow (DCF) Model
3. Merger Model (M&A)
4. Initial Public Offering (IPO) Model
5. Leveraged Buyout (LBO) Model
6. Sum of the Parts Model
7. Consolidation Model
8. Budget Model
9. Forecasting Model
10. Option Pricing Model

More detail about each type of financial model

To learn more about other types of financial analysis, you may want to check out:

Related links:



Three Statement Model

This is the most basic setup for financial modeling. As the name implies, the three statements (income statement, balance sheet and cash flow) are all dynamically linked with formulas in this model.

Related links:

[Equity research](#)

Discounted Cash Flow (DCF) Model

This model builds on the three statement model to value the business based on the net present value of the business' future cash flow. These types of financial models are used in equity research and other areas of capital markets.

Related links:

[Investment banking](#)

[Corporate development](#)

Merger Model (M&A)

This is a more advanced model used to evaluate the accretion / dilution pro forma of a merger or acquisition. Level of complexity can vary widely. This model is most commonly used in investment banking and/or corporate development.

Related links:

[Excel crash course](#)

Initial Public Offering (IPO) Model

Bankers and corporate development professionals will also build IPO models in Excel to value their business in advance of going public. This includes "an IPO discount" to ensure the stock trades well in the secondary market.

Related links:

[Leveraged buyout](#)

Leveraged Buyout (LBO) Model

A leveraged buyout typically requires modeling complicated debt schedules and is an advanced form of financial modeling.

Related links:

[Marketable Securities](#)

Sum of the Parts Model

This type of model is based on several DCF models added together, as well as other components of the business that might not be suitable for a DCF (i.e. marketable securities, which would be valued based on the market).

Consolidation Model

Multiple business units added into one model. Typically, each business unit is its own tab with consolidation tab that simply sums up the other business units.

Related links:

 [FP&A Analyst](#)

Budget Model

Used in financial planning & analysis to get the budget for the coming year(s). Budget models are typically designed to be based on monthly figures.

Related links:

 [Forecast Modeling](#)

Forecasting Model

Also used in FP&A to build a forecast that compares to the budget model. Sometimes the budget and forecast models are just one.

Option Pricing Model

The two main types are binomial tree and Black-Sholes. These models are based purely on mathematical models rather than subjective criteria.

Download our 3 statement financial model:



Examples of financial models

Here are some screenshots of the various types of financial models discussed above. If you'd like to get the templates, you can always download our financial models.

3 Statement Model

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	© Corporate Finance Institute® All rights reserved.													
2	FINANCIAL STATEMENTS				Historical Results					Forecast Period				
3					2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
4	Balance Sheet Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
5	Assumptions													
22	Income Statement													
38	Balance Sheet													
39	Assets													
40	Cash				167,971	181,210	183,715	211,069	239,550	272,530	307,632	327,097	368,487	413,243
41	Accounts Receivable				5,100	5,904	6,567	7,117	7,539	7,807	8,158	8,485	8,782	9,045
42	Inventory				7,805	9,601	9,825	10,531	11,342	11,715	12,242	12,388	12,821	12,839
43	Property & Equipment				45,500	42,350	40,145	38,602	37,521	37,513	37,508	37,505	37,503	37,502
44	Total Assets				226,376	239,065	240,252	267,319	295,951	329,564	365,540	385,474	427,592	472,629
45	Liabilities													
46	Accounts Payable				3,902	4,800	4,912	5,285	5,671	5,938	6,205	6,279	6,498	6,507
47	Debt				50,000	50,000	30,000	30,000	30,000	30,000	30,000	10,000	10,000	10,000
48	Total Liabilities				53,902	54,800	34,912	35,265	35,671	35,938	36,205	16,279	16,498	16,507
49	Shareholder's Equity													
50	Equity Capital				170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000
51	Retained Earnings				2,474	14,265	35,340	62,053	90,280	123,627	159,335	199,195	241,094	286,122
52	Shareholder's Equity				172,474	184,265	205,340	232,053	260,280	293,627	329,335	369,195	411,094	456,122
53	Total Liabilities & Shareholder's Equity				226,376	239,065	240,252	267,319	295,951	329,564	365,540	385,474	427,592	472,629
54														
55														
56														

Download our DCF model:



DCF Model

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	© Corporate Finance Institute® All rights reserved.																
2					Historical Results					Forecast Period							
3					2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E			
4	Balance Sheet Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK		
197																	
198	Discounted Cash Flow Analysis																
199					2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E				
200	EBIT				1,393,000	1,261,000	1,426,000	1,353,953	1,534,487	1,736,877	1,838,590	1,895,847	1,953,739				
201	Cash Tax Rate				2.4%	2.7%	6.2%	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%				
202	Less: Cash Taxes				33,000	34,000	88,000	224,756	254,725	288,322	305,206	314,711	324,321				
203	Plus: D&A				120,000	140,000	120,000	143,505	140,443	138,484	137,230	136,427	135,913				
204	Less: Capital Expenditures				162,728	168,716	154,830	135,000	135,000	135,000	135,000	135,000	135,000				
205	Plus: Changes in Non Cash Working Capital				313,000	(301,000)	73,000	118,781	(9,161)	(9,619)	(8,060)	(4,161)	(4,244)				
206	Unlevered Free Cash Flow				1,630,272	897,281	1,376,170	1,256,483	1,276,044	1,442,420	1,529,554	1,578,402	1,626,088				
207																	
208	Valuation Timing								Acquisition	Stub Period	FY1	FY2	FY3	FY4	FY4	Terminal	
209	Date								10/31/2017	12/31/2017	12/31/2018	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/2022	
210	Days in Period								1	61	365	365	366	365	365	1	
211	Cash Flow Weighting								100%	17%	100%	100%	100%	100%	100%	100%	
212																	
213	Unlevered Free Cash Flow																
214	Equity								(3,600,000)								
215	Transaction Costs								(60,000)								
216	Vendor Take Back Note								-	-	(4,400,000)						
217	Business Free Cash Flow								-	209,988	1,276,044	1,442,420	1,529,554	1,578,402	1,626,088	11,198,263	
218	Total Unlevered Free Cash Flow								(3,660,000)	209,988	1,276,044	1,442,420	(2,870,446)	1,578,402	1,626,088	11,198,263	
219																	
220	Cumulative FCF								0	209,988	1,486,032	2,928,452	58,006	1,636,407	3,262,495	14,460,758	
221																	

More learning

To learn more about financial modeling and valuation you may want to check out:

- > [What is financial modeling](#)
- > [Financial modeling for dummies](#)
- > [Excel shortcuts](#)
- > [Why investment banking](#)
- > [How to get a job in investment banking](#)
- > [How to become a financial analyst](#)
- > [DCF model infographic](#)
- > [Comparing and Contrasting CFI Courses](#)
- > [Financial Modelling Companies](#)

To find out more about finance careers out our interactive Career Map:

- > [Interactive career map](#)

C.

Financial Modeling Best Practices

In this guide, we will build on what we know so far about financial modeling by examining all of its most important aspects and provide tips and tricks about industry-leading, best practices.

CFI's mission is to help anyone in the world become a world-class financial analyst. With that goal in mind, we've designed this guide to be extremely practical with specific takeaways that can help you improve your financial modeling skills.

	A	B	C	D	E	H	I	J	K	L	M	N	O	P
1		© Corporate Finance Institute®	IRR (unlvr)	37.4%	Historical Results				Forecast Period					
2			IRR (lvr)	56.6%	2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E
3		Balance Sheet Check			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4														
5		Assumptions												
54														
55		Income Statement												
105														
106		Balance Sheet												
107		Assets												
108		Cash & Short Term Investments			513,882	3,610,573	4,493,846	5,522,257	6,768,732	8,034,768	9,467,180	10,986,726	12,555,120	14,171,199
109		Accounts Receivable			1,106,000	961,000	1,382,000	1,204,000	824,486	865,711	908,996	936,266	954,991	974,091
110		Advances - Staff			2,000	3,000	1,000	-	-	-	-	-	-	-
111		Prepaid Expenses			68,000	63,000	72,000	75,000	65,000	65,000	65,000	65,000	65,000	65,000
112		Current Portion of Future Tax Assets			-	-	6,000	-	-	-	-	-	-	-
113		Total Current Assets			1,689,882	4,637,573	5,954,846	6,801,257	7,658,218	8,965,479	10,441,176	11,987,992	13,575,111	15,210,291
114		PP&E			795,000	441,309	330,036	398,625	390,120	384,677	381,193	378,964	377,537	376,623
115		Deposits			197,000	98,000	98,000	112,000	112,000	112,000	112,000	112,000	112,000	112,000
116		Future Tax Assets			-	-	11,000	11,000	11,000	11,000	11,000	11,000	11,000	11,000
117		Total Long Term Assets			992,000	539,309	439,036	521,625	513,120	507,677	504,193	501,964	500,537	499,623
118		Total Assets			2,681,882	5,176,882	6,393,882	7,322,882	8,171,338	9,473,156	10,945,369	12,489,956	14,075,648	15,709,914
119														
120		Liabilities												
121		Accounts Payable & Accrued Liabilities			881,000	909,000	985,000	909,000	641,267	673,330	706,997	728,207	742,771	757,626
122		Taxes Payable			74,000	36,000	39,000	37,000	37,000	37,000	37,000	37,000	37,000	37,000
123		Deferred Income			49,000	42,000	57,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000
124		Income Tax Payable			25,000	22,000	12,000	106,000	106,000	106,000	106,000	106,000	106,000	106,000
125		Future Tax Liabilities			48,000	3,000	-	-	-	-	-	-	-	-
126		Due to Shareholders / Related Parties			155,000	38,000	100,000	-	-	-	-	-	-	-
127		Current Portion of Long Term Liabilities			52,000	4,000	5,000	3,000	-	-	-	-	-	-
128		Total Current Liabilities			1,284,000	1,054,000	1,198,000	1,103,000	832,267	864,330	897,997	919,207	933,771	948,626
129		Long Term Debt			-	-	-	-	-	-	-	-	-	-

Download our financial modeling templates

[View templates](#)

What will this guide cover?

This financial modeling guide will cover several important topics designed to sharpen your financial analysis skills. Topics in this guide include:

- Why build a financial model
- Excel tips and tricks
- Modeling best practices
- Building the forecast
- Linking the statements
- Further analysis (DCF, sensitivity, M&A and more)
- Presenting results

All of these topics are covered in more detail in our online financial modeling courses.



Why build a financial model?

For anyone pursuing or advancing a career in corporate development, investment banking, financial planning and analysis (FP&A), equity research, commercial banking, or other areas of corporate finance, building financial models is part of the daily routine.

Financial models are essential tools to help make decisions. These decisions often include: whether or not to invest in a company, asset, or security; whether or not to invest in a project (project finance); whether or not to do a merger or acquisition; whether or not to raise money, as well as other corporate finance transactions.

Financial models allow decision-makers to test scenarios, observe potential outcomes, and make informed decisions. There is a lot of talk about software programs that can be used, but the truth is the vast majority of financial modeling takes place in Excel.

Excel tips and tricks

As mentioned earlier, Excel is the main tool used by banks, corporations, and institutions to perform financial modeling. The main reason for this is Excel's remarkable versatility. Every company or investment opportunity is unique, and Excel is a blank canvas that can be totally customized and tailored to any financial situation. The flip side of this is that there are no controls or rules in place to ensure the model is accurate or error-free.

Here are some of the most important Excel tips for financial modeling:

1. Use as many keyboard short-cuts as possible.
2. Keep formulas and calculations simple – break them down into smaller steps.
3. Use the grouping function to organize sections of the financial model.
4. Use F5 (go to special) to quickly locate all hardcoded numbers or formulas.
5. Use Trace Precedents and Trace Dependents to audit the model.
6. Use XNPV and XIRR to apply specific dates to cash flows.
7. Use INDEX MATCH over VLOOKUP for looking up information.
8. Use a combination of date functions (EOMONTH) and IF statements to make dates dynamic.
9. Remove grid lines when presenting or sharing the financial model.
10. Memorize the most important Excel formulas for financial modeling.

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FINANCIAL STATEMENTS		Historical Results					Forecast Period				
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Balance Sheet Check		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
DCF Model		LIVE SCENARIO					1				
Assumptions											
Tax Rate	25%										
Discount Rate	12%										
Perpetual Growth Rate	4%										
EV/EBITDA Multiple	8.0x										
Transaction Date	2018-03-31										
Current Price	15.00										
Shares Outstanding	20,000										
Discounted Cash Flow		Entry	2018	2019	2020	2021	2022	Exit	Terminal Value		
Date	2018-03-31	2018-12-31	2019-12-31	2020-12-31	2021-12-31	2022-12-31	2022-12-31	2022-12-31	EV/EBITDA		
Year Fraction		0.75	1.00	1.00	1.00	1.00	1.00	1.00	812,428		
EBIT		39,866	36,890	37,013	74,263	86,887					
Less: Cash Taxes		9,966	9,223	9,253	18,566	21,722					
NOPAT		29,899	27,668	27,759	55,697	65,165					
Plus: D&A		13,132	13,786	14,211	14,487	14,667					
EBITDA		52,969	50,676	51,224	88,750	101,554					
Less: Capex		15,000	15,000	15,000	15,000	15,000					
Less: Changes in NWC		3,175	5,062	5,768	(2,613)	2,041					
Unlevered FCF		24,856	21,391	21,203	57,797	62,791	812,428				

For a refresher on basic Excel functions, check out our free Excel Crash Course. When you're ready to take your skills to the next level, our Advanced Excel Formulas course will help your financial modeling skills stand out.



Modeling best practices

Over and above good Excel skills, analysts who really stand out in financial modeling are great at structuring and organizing their spreadsheets.

Here are our top 10 best practices for structuring a model:

1. Use color-coding to distinguish between inputs and formulas (i.e. blue and black).
2. Build a standalone [3 statement model](#) on one worksheet (don't separate the statements onto different sheets).
3. Clearly separate the assumptions or drivers from the rest of the model (one section at the top).
4. Use clear headers and subheads (with bold shading) to clearly distinguish sections.
5. Use the cell comments function (shift + F2) to describe calculations or assumptions that need explaining.
6. Build in error checks such as ensuring the balance sheet balances (without a plug).
7. Pull forward (or repeat) information where it helps users follow the logic of the model (i.e. pull forward [EBITDA](#) from the income statement to the cash flow valuation section).
8. Avoid linking to other Excel workbooks unless absolutely necessary (and if so, clearly indicate those links exist).
9. Avoid circular references unless necessary (and use iterative calculation to solve them).
10. Use tables, charts and graphs to summarize important information.

Download our financial
modeling templates



	A	B	C	D	E	H	I	J	K	L	M	N	O	P	
1		© Corporate Finance Institute®	IRR (unltd)	37.4%		Historical Results				Forecast Period					
2			IRR (ltd)	56.6%		2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E
3		Balance Sheet Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4															
5		Assumptions													
6		Days Per Period				365	365	365	365	365	365	365	365	365	365
7															
8		Income statement													
9		Revenue Growth					4.5%	4.3%	4.2%	7.0%	5.0%	5.0%	3.0%	2.0%	2.0%
10															
11		Gross Margin				23.5%	39.0%	36.3%	38.6%	36.0%	36.8%	37.8%	38.0%	38.0%	38.0%
12		Depreciation & Amortization				99,000	120,000	140,000	120,000	143,505	140,443	138,484	137,230	136,427	135,913
13		Payroll				14.2%	11.8%	13.3%	14.1%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
14		Rent				942,000	980,000	1,035,000	1,064,000	2.5%	2.5%	2.5%	2.5%	2.5%	2.5%
15		Transportation				33.6%	25.9%	26.5%	24.0%	26.0%	26.0%	26.0%	26.0%	26.0%	26.0%
16		Warehouse Expenses				165,000	105,000	120,000	113,000	120,000	120,000	120,000	120,000	120,000	120,000
17															
18		Interest (% of Debt)													
19		Tax Rate (% of Earnings Before Tax)				8.7%	1.7%	1.9%	6.4%	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%
20		Dividends (Distributed)				(100,000)	(150,000)	(150,000)	(300,000)	-	-	-	-	-	-
21															
22		SG&A													
23		Auto Expenses				16,000	10,000	10,000	12,000	14,000	14,000	14,000	14,000	14,000	14,000
24		Bank charges				1,000	1,000	1,000	2,000	3,000	2,600	2,600	2,600	2,600	2,600
25		Insurance				38,000	35,000	34,000	31,000	70,000	70,000	70,000	70,000	70,000	70,000
26		Interest Expenses				9,000	4,000	14,000	11,000	12,000	12,000	12,000	12,000	12,000	12,000
27		Licenses & Permits				1,000	2,000	2,000	2,000	3,900	3,900	3,900	3,900	3,900	3,900
28		Meals & Entertainment				8,000	8,000	8,000	9,000	15,000	15,000	15,000	15,000	15,000	15,000
29		Office Expenses				33,000	23,000	31,000	40,000	45,000	45,000	45,000	45,000	45,000	45,000
30		Payroll - Profit Sharing Plan Base				-	-	-	105,000	-	-	-	-	-	-
31		Payroll - Profit Sharing Plan Upside				-	-	-	-	-	-	-	-	-	-
32		Payroll - Management Fee				-	172,000	188,000	107,000	200,000	200,000	200,000	200,000	200,000	200,000

Building the forecast

The “art” of financial modeling mostly relates to making assumptions about the future performance of the business being modeled. This is the most subjective and important part in the valuation of a company.

This guide will outline various approaches to forecasting, which include:

- Top down analysis. In this approach, you start with the total addressable market (TAM) and then work down from there based on market share and segments, such as geography, products, customers, etc., until you arrive at revenues.
- Bottom up analysis. In this method, you start with the most basic drivers of the business such as website traffic, then conversion rate, then order value, and finally revenue, in the case of an e-commerce business.
- Regression analysis. With this type of forecast, you analyze the relationship between the revenue of the business and other factors such as marketing spend and product price by performing a regression analysis in Excel.
- Year over year growth rate. This is the most basic form of forecasting.

Linking the statements

Once the forecast assumptions are in place, it's just a bunch of basic mathematical operations to fill in the three financial statements in the model. From a financial modeling perspective, this is the least subjective part of the process. With the assumptions clearly stated, an analyst more/less multiplies, divides, add or subtracts to produce the statements.

Step #1

Begin by calculating revenue, based on the forecasting approach used from the above section. From there, fill in cost of goods sold, gross profit, operating expenses, and arrive at earnings before interest taxes depreciation and amortization (EBITDA).

Step #2

Create supporting schedules for (i) capital assets (PP&E, depreciation, and capital expenditures, (ii) working capital balances (accounts receivable, accounts payable and inventory, and (iii) financing schedules to equity capital, debt balances and interest expense.

Step #3

Finish the income statement (depreciation, interest, taxes, net income and fill in the balance sheet items except for cash, which will be the last part of the financial model to be completed.

Step #4

Build the cash flow statement, consisting of cash from operating activities, cash used in investing activities, and cash from financing activities. Combining these three sections will determine the closing cash balance, which links to the balance sheet to complete the financial model.

This is a simplified overview of the financial modeling process, or [linking of the three statements](#), so please watch our video-based courses on financial modeling if you'd like more detailed instructions.

Download our financial modeling templates



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		© Corporate Finance Institute®	IRR (unltd)	37.4%	Historical Results				Forecast Period							
2			IRR (ltd)	56.6%	2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E		
3		Balance Sheet Check			OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4																
5		Assumptions														
54																
55		Income Statement														
105																
106		Balance Sheet														
139																
140		Cash Flow Statement														
163																
164		Supporting Schedules														
165		Changes in Working Capital Schedule														
166		(Increase) Decrease in Current Assets			318,000	(434,000)	182,000	389,514	(41,224)	(43,286)	(27,270)	(18,725)	(19,100)			
167		(Increase) Decrease in Other Assets			-	(11,000)	(14,000)	-	-	-	-	-	-			
168		Increase (Decrease) in Current Liabilities			(5,000)	144,000	(95,000)	(270,733)	32,063	33,667	21,210	14,564	14,855			
169		Change in NWC			313,000	(301,000)	73,000	118,781	(9,161)	(9,619)	(6,060)	(4,161)	(4,244)			
170																
171		Depreciation Schedule														
172		PPE Opening						398,625	390,120	384,677	381,193	378,964	377,537			
173		Plus Capex						135,000	135,000	135,000	135,000	135,000	135,000			
174		Less Depreciation						143,505	140,443	138,484	137,230	136,427	135,913			
175		PPE Closing					398,625	390,120	384,677	381,193	378,964	377,537	376,623			
176																
177																
178		Valuation & Returns														
276																
277		Sensitivity Analysis														

Further analysis

With the baseline financial model in place, it's time to layer on whatever type of financial modeling exercise suits the situation.

We've published an overview of the various types of financial models, but to recap, the most common ones include:

- DCF analysis – Discounted cash flow analysis (DCF model) to value a business.
- M&A analysis – Evaluate the attractiveness of a potential merger, acquisition or divestiture.
- Capital raising – Analyze the proforma impact of raising debt or equity, or other capital events.
- LBO analysis – Determining how much leverage (debt) can be used to purchase the company.
- Sensitivity analysis – Layering on a section that evaluates how sensitive the business or the investment is to changes in assumptions or drivers (sensitivity analysis course).

Download all of our financial modeling templates



	A	B	C	D	E	H	I	J	K	L	M	N	O	P	
1		© Corporate Finance Institute®	IRR (unltd)	37.4%		Historical Results				Forecast Period					
2			IRR (ltd)	56.6%		2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E
3		Balance Sheet Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4															
5		Assumptions													
54															
55		Income Statement													
105															
106		Balance Sheet													
139															
140		Cash Flow Statement													
163															
164		Supporting Schedules													
165		Changes in Working Capital Schedule													
166		(Increase) Decrease in Current Assets				318,000	(434,000)	182,000	389,514	(41,224)	(43,286)	(27,270)	(18,725)	(19,100)	
167		(Increase) Decrease in Other Assets				-	(11,000)	(14,000)	-	-	-	-	-	-	
168		Increase (Decrease) in Current Liabilities				(5,000)	144,000	(95,000)	(270,733)	32,063	33,667	21,210	14,564	14,855	
169		Change in NWC				313,000	(301,000)	73,000	118,781	(9,161)	(9,619)	(6,060)	(4,161)	(4,244)	
170															
171		Depreciation Schedule													
172		PPE Opening							398,625	390,120	384,677	381,193	378,964	377,537	
173		Plus Capex							135,000	135,000	135,000	135,000	135,000	135,000	
174		Less Depreciation							143,505	140,443	138,484	137,230	136,427	135,913	
175		PPE Closing						398,625	390,120	384,677	381,193	378,964	377,537	376,623	
176															
177															

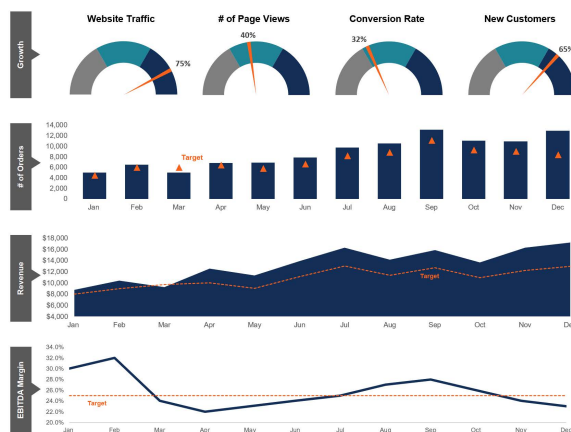
Presenting the results

When all of the above analysis is done, the work still not over. The last step is to develop charts, graphs, and other outputs that can be used to easily communicate the information from the model. This is where the best analysts really get to shine.

It's one thing to build a complex model that only you understand, but it's another thing to effectively communicate the risks, rewards, and critical factors to all audiences.

As the capstone for your financial modeling training, we recommend either an [advanced Excel course](#) or a [dashboards and data visualization course](#) to learn how to build all the best charts and graphs for a presentation, dashboard, or any other document you're producing.

DASHBOARD TEMPLATE



More financial modeling guides

We hope this has been a helpful guide to financial modeling in Excel, and has helped you advance your career as a financial analyst. At CFI, we pride ourselves in creating the best free guides to help you get an edge.

Please check out these other resources to continue developing your skills:

- [DCF modeling guide](#)
- [3 statement model guide](#)
- [How to link the financial statements](#)
- [All financial modeling resources](#)

D.

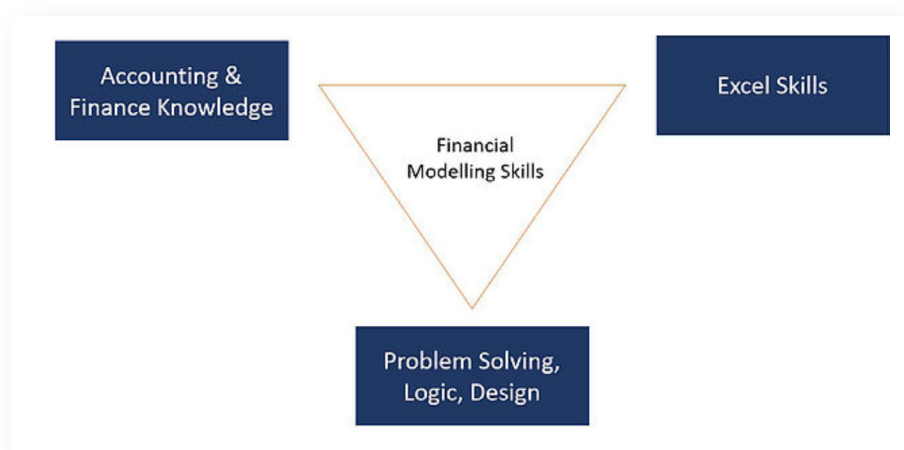
Financial Modeling Skills

Overview of financial modeling skills

This guide will focus on the most important financial modeling skills required to be a world-class financial analyst. These are:

1. A solid understanding of accounting
2. Strong Excel skills
3. Knowing how to link the 3 financial statements
4. Understanding how to build a forecast
5. A logical framework for problem solving
6. Attention to detail
7. Ability to distill large amounts of data into a simple format
8. An eye for design and esthetics

Each of these financial modelling skills will be broken down in further detail below. As the image below shows, these skills can be divided into 3 categories: accounting/finance, Excel, and problem solving/logic/design.



Accounting skills

In order to build a financial model, it's important to have a solid understanding of [accounting fundamentals](#). These include concepts such as matching principle, accruals, revenue recognition, non-cash items like depreciation, amortization, and more. You need to know [how to read financial statements](#), how to dissect them, and how to build them back up again.

Excel skills

Strong Excel skills are critical for financial modelling, and it can be more of an art than a science. You'll need to know all the main [keyboard shortcuts](#) to help save time and build models as quickly as possible. You'll also need to know all the main [formulas and functions](#) to perform calculations and financial analysis.

Check out our [free Excel course](#) to make sure you have the basics down!

Linking the 3 financial statements

As mentioned numerous times, another very important skill is being able to link the 3 financial statements. This means taking historical financial statements (income statement, balance sheet, and cash flow statement) and dynamically linking them together in Excel. For example, connecting net income on the income statement to retained earnings on the balance sheet. This can be one of the trickiest skills.

Free step-by-step guide: [how to link the 3 financial statements](#) in Excel.

Problem solving skills

A good financial analyst has the ability to think logically and in a very organized manner. When building a financial model, it's important to follow a logical flow of information, so that other users can easily understand what you've done when it's their turn to work on your Excel file.

Attention to detail

This is an absolutely essential skill for financial modeling. Given the vast amount of information and intricate nature of a complex model, if you don't have attention to detail, you'll unfortunately have a difficult time becoming a capable financial modeler.

Check out our [financial modeling courses](#) to see the level of detail required.

Simplification of complex information

One of the hallmarks of a someone with great financial modeling skills is their ability to distill large amounts of complex information into a simple format. As Leonardo da Vinci said, "Simplicity is the ultimate sophistication."

Check out our [Advanced Excel Skills Course](#) to help you simplify complex information.

Design skills

One of the least discussed, yet most important financial modeling skills, is having an eye for design and esthetics. A good model is simple to follow and easy on the eyes – it should look professional, have clean formatting, and include beautiful charts and graphs. This is one of the 3 pillars of our Analyst Trifecta method, which we outline in our guide on [how to be a great financial analyst](#).

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	© Corporate Finance Institute® All rights reserved.				Historical Results					Forecast Period				
2	FINANCIAL STATEMENTS				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
3	Balance Sheet Check				OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4														
5	Assumptions													
6														
22														
23	Income Statement													
24														
38														
39	Balance Sheet													
40	Assets													
41	Cash				167,971	181,210	183,715	211,069	239,550	272,530	307,632	327,097	368,487	413,243
42	Accounts Receivable				5,100	5,904	6,567	7,117	7,539	7,807	8,158	8,485	8,782	9,045
43	Inventory				7,805	9,601	9,825	10,531	11,342	11,715	12,242	12,388	12,821	12,839
44	Property & Equipment				45,500	42,350	40,145	38,602	37,521	37,513	37,508	37,505	37,503	37,502
45	Total Assets				226,376	239,065	240,252	267,319	295,951	329,564	365,540	385,474	427,592	472,629
46														
47	Liabilities													
48	Accounts Payable				3,902	4,800	4,912	5,265	5,671	5,938	6,205	6,279	6,498	6,507
49	Debt				50,000	50,000	30,000	30,000	30,000	30,000	30,000	10,000	10,000	10,000
50	Total Liabilities				53,902	54,800	34,912	35,265	35,671	35,938	36,205	16,279	16,498	16,507
51	Shareholder's Equity													
52	Equity Capital				170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000	170,000
53	Retained Earnings				2,474	14,265	35,340	62,053	90,280	123,627	159,335	199,195	241,094	286,122
54	Shareholder's Equity				172,474	184,265	205,340	232,053	260,280	293,627	329,335	369,195	411,094	456,122
55	Total Liabilities & Shareholder's Equity				226,376	239,065	240,252	267,319	295,951	329,564	365,540	385,474	427,592	472,629
56														
57	Check				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
58														
59														

Financial model example

Another way to get acquainted with the different types of financial models is to purchase our [financial modeling templates](#) and work through them yourself.

More financial modeling resources

We hope you now have thorough understanding of the various financial modeling skills required to be a world-class financial analyst. You may want to check out some of our other popular resources, including:



Financial modeling best practices



DCF model training



3 statement model



Interactive Career Map



Excel courses

Analytics: **Valuation**

01

02

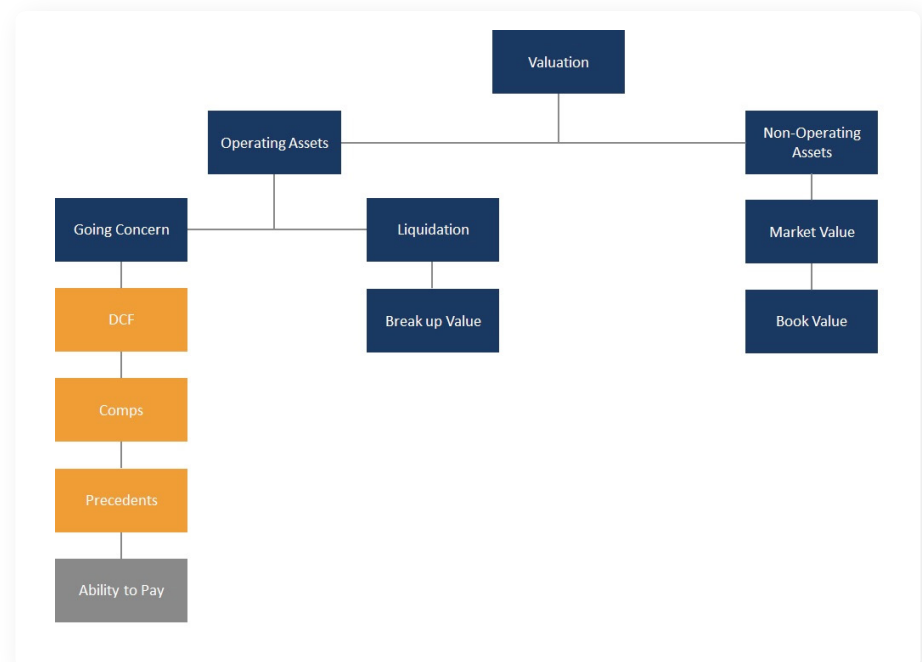


A.

Valuation Methods

What are the main valuation methods?

When valuing a company as a going concern, there are three main valuation methods used: [DCF analysis](#), comparable companies, and precedent transactions. These are the most common methods used in [investment banking](#), equity research, private equity, corporate development, [MBOs](#) and most areas of finance.



Method 1: DCF Analysis

In the Discounted Cash Flow (DCF) approach, you forecast the business' unlevered free cash flow into the future and discount it back to today at the firm's WACC.

A DCF analysis is performed by building a financial model in Excel and requires an extensive amount of detail and analysis. It is the most detailed of the three approaches, requires the most assumptions and often produces the highest value. However, the effort required for preparing a DCF model will also often result in the most accurate valuation. A DCF model allows the analyst to forecast value based on different scenarios and to even perform a sensitivity analysis.

For larger businesses, the DCF value is commonly a sum-of-the-parts analysis, where different business units are modeled individually and added together. To learn more, see our DCF model infographic.

Method 2: Comparable Analysis ("Comps")

Comparable company analysis (also called "trading multiples" or "peer group analysis" or "equity comps" or "public market multiples" is a relative valuation method in which you compare the current value of a business to other similar businesses by looking at trading multiples like P/E, EV/EBITDA, or other ratios. Multiples of EBITDA are the most common valuation method.

The "comps" valuation method provides an observable value for the business, based on what companies are currently worth.

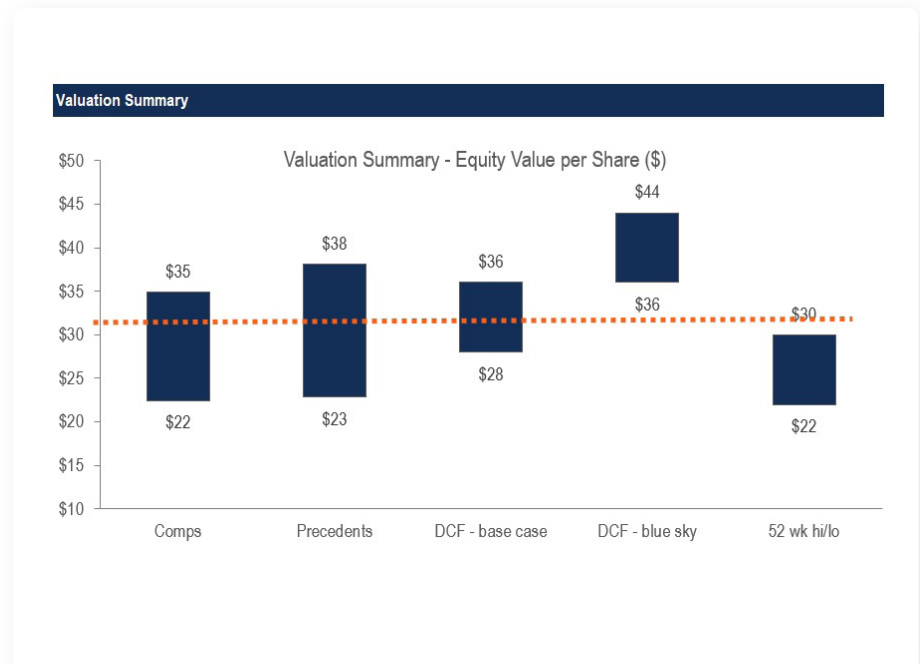
Method 3: Precedent Transactions

Precedent transactions analysis is a form of valuation where you compare the company with other businesses that have recently been sold or been acquired in that industry. These values include the takeover premium for which they were acquired.

These values represent the en bloc value of a business. They are useful for M&A transactions, but can easily become stale-dated and no longer reflective of the current market.

Football field chart (summary)

Bankers will often put together a football field chart to summarize the range of values for a business based on the different valuation methods used. Below is an example of a football field graph, which is typically included in an investment banking pitch book.



More valuation methods

Another valuation method for a company that is a going concern is called “ability to pay analysis.” This approach looks at the maximum price an acquirer can pay for a business while still hitting some target. For example, if a private equity firm needs to hit a hurdle rate of 30%, what is the maximum price it can pay for the business?

If the company will not continue to operate, then a liquidation value will be estimated based on breaking up and selling the company's assets,

Finally, non-operating assets may be valued at either book value or market value.

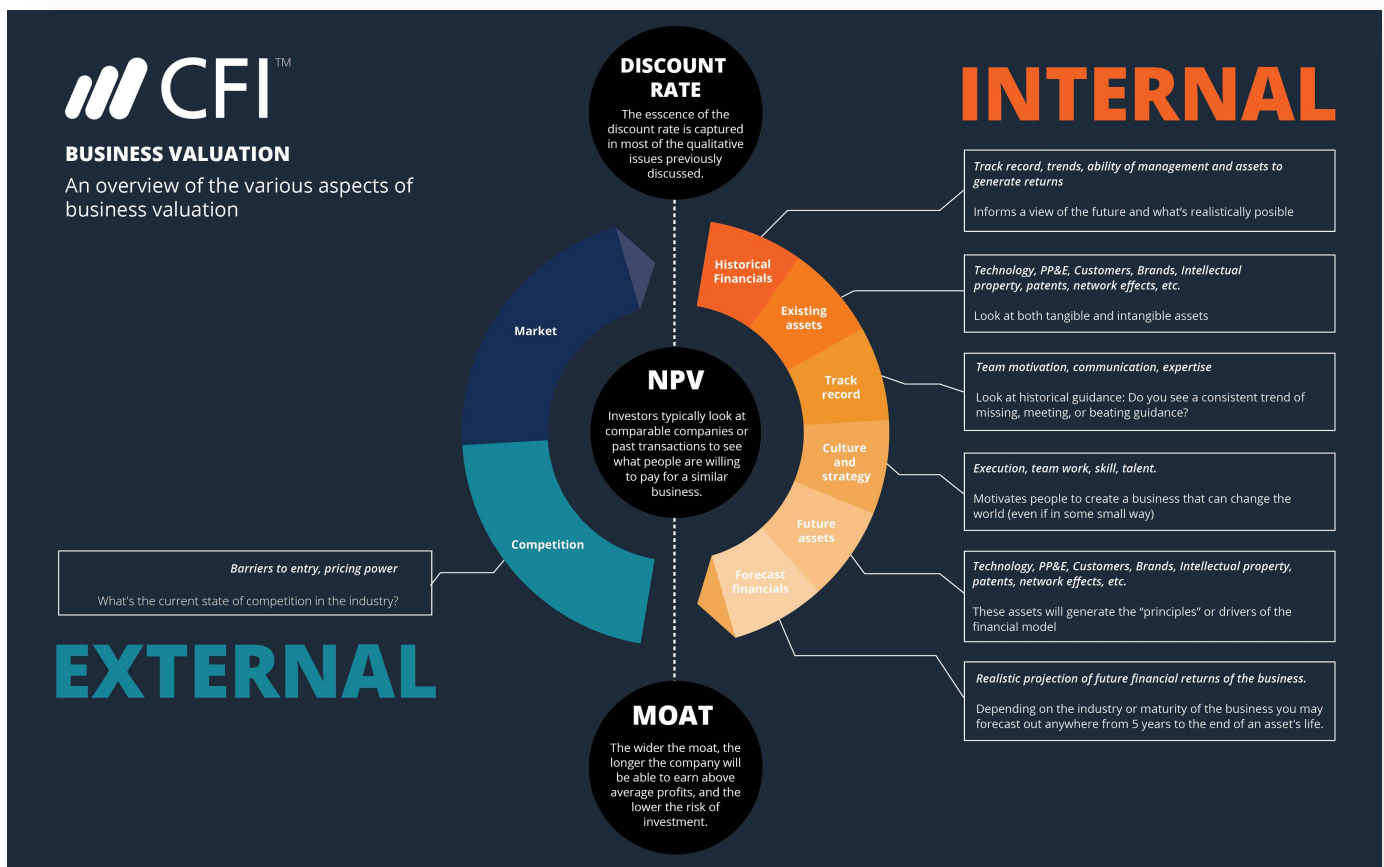
Additional valuation resources

To learn more about how to value a business, or to prepare for a career in corporate finance, we've got all the resources you need! Here are some of our most popular resources relating to valuation methods:

- > [Valuation infographic – How to value a business](#)
- > [Terminal value](#)
- > [Weighted Average Cost of Capital](#)
- > [How to get a job in investment banking](#)
- > [Excel formulas for finance](#)

B.

DCF Analysis



Performing a DCF analysis

This infographic will walk you through the step-by-step process of how to build a discounted cash flow (DCF) model to value a business.

A discounted cash flow model takes into account all factors that could affect a company's current and future performance. This performance equates to certain inflows and outflows of cash, which are then discounted back to the present value. The sum of the present value of all future cash flows equals the net present value.

There are two categories of influence on the value of business:

- Internal
- External

The internal side consists of most of the data that a financial analyst has to consider when generating models. This includes the historical performance of the company, its current operations and its future potential. The internal side also often has the most concrete or solid data, since most of the raw information used in the models is quantitative. A financial analyst, for example, will use a historical income statement to forecast future net income. This forecast will eventually flow down through other financial statements and supporting schedules to generate an estimate of future free cash flow. This cash flow is what is used in the discounted cash flow analysis.

It is important, however, to remember that the external side should be considered, too. While the internal side of the DCF analysis is important and key to the quantitative side of the analysis, external factors must not be neglected when considering the future potential of a company.

External forces, such as market cycle and growth of competitors, will indefinitely have an impact towards the performance of any company. While these are harder to forecast, educated and informed estimates must be made towards these factors, if one wishes to make a more accurate DCF model.

Read about the different [types of financial models](#).

Infographic

The infographic above was designed to help you visualize the process of how to actually think about a DCF analysis in your head before building a DCF model.

Please read through the various steps described in the image above to master the process step by step.

Career paths

There are many finance jobs that require building DCF models for a living. To learn more about those various careers, explore our interactive career map to find out which path is right for you.

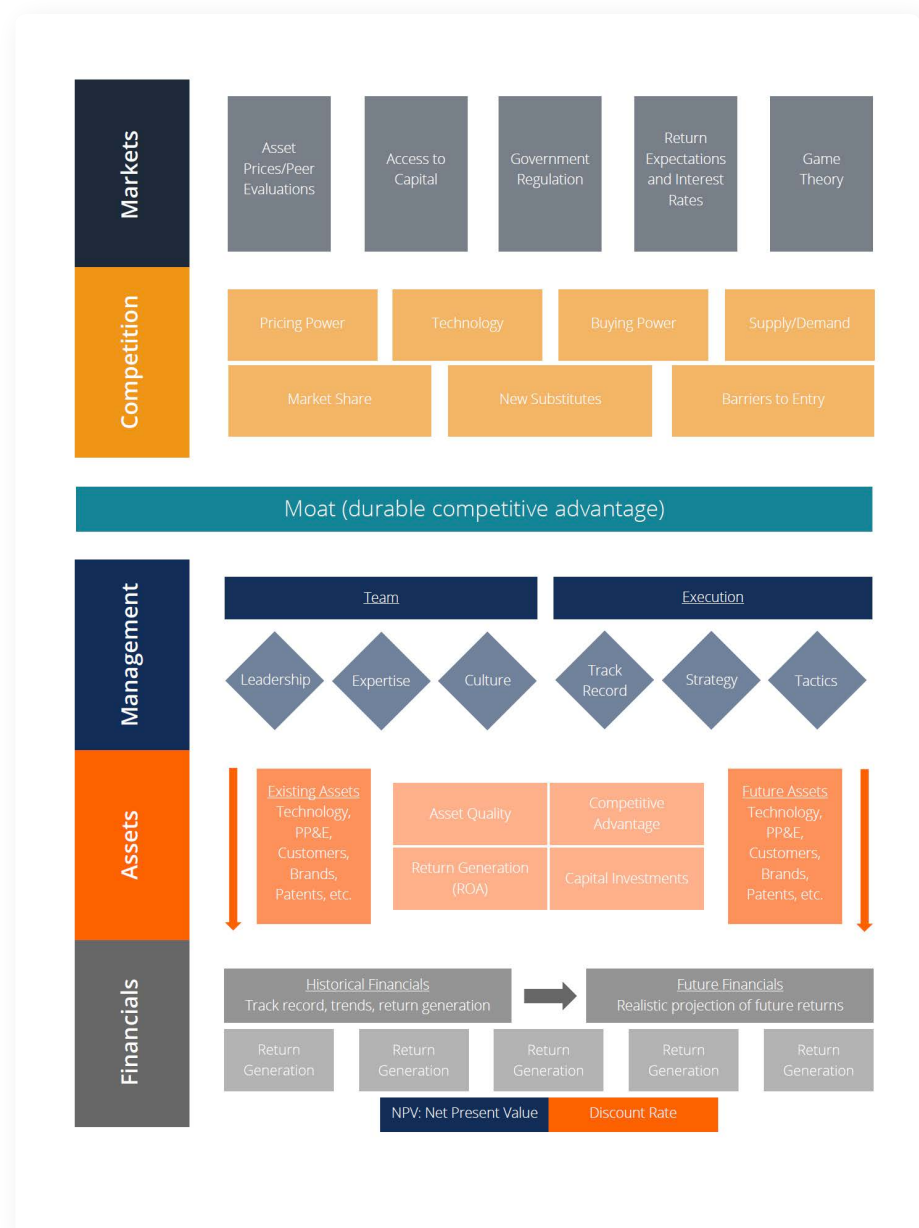
Additional Resources

-  [Valuation infographic](#)
-  [Valuation methods](#)
-  [What is financial modeling?](#)
-  [Financial modeling for dummies](#)

C.

Business Valuation

Valuation Infographic



Business Valuation Framework

Over the years, we've spent a lot of time thinking about and working on business valuations across a broad range of transactions. Given that the majority of us are visual learners, we thought it would be helpful to illustrate our thoughts into the diagram on the previous page.

Top Down vs. Bottom Up

As we look at the diagram, it logically flows from top to bottom, however, when building a financial model to value a business, we usually think about it bottom up, and in an iterative way. We start in the bottom left corner of the diagram with historical financials, working our way up to the top, then back down again to build the forecast financials (and repeat the process again).

1. Historical Financials

The first place to start when valuing a business is usually with historical financial statements. The past is significant when performing a valuation as it gives a view of what's realistically possible in the future. The future, of course, is heavily influenced by the company's assets and what the management team, competition and markets will do going forward.

2. Assets

Examining the asset base in conjunction with the historical income statement will paint a picture of the business' ability to generate a return on assets ("ROA": net income divided by total assets), and most importantly, generate free cash flow (operating cash flow less capital expenditures). When evaluating a business' assets, it's important to look at both tangible (property, plant, equipment, etc.) and intangible assets (brands, customer lists, intellectual property, etc.).

3. Management Track Record

Assessing management can be quite challenging, especially if you don't have the opportunity to meet them in person (which is the case for most retail investors). An easy way to evaluate their performance is to look back at historical guidance (if a public company) and measure

it against results achieved. Do you see a consistent trend of missing, meeting, or beating guidance? Measuring the track record combined with in-person meetings to assess integrity, honesty, work ethic, etc. will be the best way to decide whether you assign a “management premium” or “management discount” to the business.

4. Competition

What is the current state of competition in this industry? Are barriers to entry high or low, and how much pricing power does the company have? Answers to these types of questions (and others listed in the diagram above) will help shape your view of risk and the company's ability to protect profits (which will be reflected in the forecast financials).

5. “Moat”

Warren Buffett and Charlie Munger are notorious for buying businesses that have wide moats around them, or more literally, have durable competitive advantages. Examples of companies with big moats around them include Google (Alphabet), railroad companies (infrastructure), Coca Cola (it's brand), and businesses with network effects like Facebook and Amazon. The wider the moat, the longer the company will be able to earn above average profits, and the lower the risk of the investment. The inverse is true for companies with little to no moat.

6. Culture & Strategy

We group these two together because they are two of the main objectives of the CEO. Culture is critical as it drives the “why” of an organization (see Simon Sinek) and motivates people to create a business that can change the world (even if in some small way). Culture is also critical in driving company behavior such as honesty and integrity, which lowers the risk of the business. Next in importance is strategy (i.e. “strategy eats culture for breakfast”?) as this will be critical in maintaining any durable competitive advantage that a company has, or is attempting to gain/increase.

7. Future Assets

Based on the strategy of the business, what will the assets look like in the future? Will the company have to significantly invest to grow the

asset base, and if so, what types of ROA will they earn? It's important to think carefully about how much capital is required to sustain and grow the assets (based on the strategy) and how those assets will create value in the form of free cash flow generation. The details/inputs behind these assets will generate the "principles" or drivers of the financial model.

8. Forecast Financials

With a deep understanding of the industry, management (culture & strategy), and the business' assets, it's now possible to forecast future financial statements. A good financial model will dis-aggregate the various drivers of revenues, expenses, etc. and present them as inputs that can easily be changed. Depending on the industry or maturity of the business, you may forecast out anywhere from 5 years to the end of an asset's life.

9. Discount Rate

Once the financial forecast is in place, setting up the discounted cash flow ("DCF") model is just simple mechanics in Excel. The most challenging and subjective part of the DCF model is determining what discount rate to use. There are specific formulas you can use based on interest rates and relative volatility, but the essence of the discount rate is captured in most of the qualitative issues discussed above: stability of assets, durability of a moat, competence of management, risk of changes in competitive dynamics, and risk of changes in markets (i.e. government regulation). Taking all of these into account will determine what discount rate you think is appropriate to account for the riskiness of the investment. To the extent, you have risk-adjusted the cash flows directly in the model (for the risks discussed above). You don't need to include those risks in the discount rate (i.e. a perfectly risk adjusted cash flow forecast would be discounted at only the appropriate risk-free government treasury rate).

10. Price

The net present value (“NPV”) of future cash flows gives you the value of the business, but how much are you willing to pay for it? Value investors will typically want to build in a margin of safety (say 20-30%) by paying less than the intrinsic value. Other investors pay full value if they are willing to accept the discount rate as their internal rate of return (“IRR”). Investors typically look at comparable companies or past transactions (acquisitions) to see what other people are willing to pay for similar business (this adds an element of game theory or “greater fool theory” and moves away from intrinsic value).

Conclusion

This is how we think about valuation when building a financial model, and we hope you found it insightful. As visual learners, we find it useful to organize mental models, like valuation, on paper. The key takeaway for us is that valuation is an iterative process — we have to cycle through things like markets, competition, management, and assets multiple times with sensitivity and scenario analysis before we can build a reliable financial forecast and discount it back to today.

Additional Resources



Valuation books



What is financial modeling?



Financial modeling for dummies

Analytics Excel

01

02



A.

List of Excel shortcuts

To be more more efficient when building financial models or performing financial analysis, it's important to know the main keyboard shortcuts in Excel. These are critical for careers in investment banking, equity research, FP&A, finance, accounting, and more.

The first thing you'll do if you're hired as an investment banking analyst is take a series of intense Excel training courses. Your mouse will be taken away, and you'll be expected to learn financial modeling with only keyboard shortcuts. If you follow our tips and tricks below, you'll be able to master theses shortcuts on Windows or Mac operating systems.

It may seem slower at first if you're used to the mouse, but it's worth the investment to take the time and learn these important shortcuts. We have provided the top, time-saving shortcuts for both PCs and Macs below. To master these skills, check out our Free Excel Crash Course.

You may also want to check out our section on other Excel formulas or the Excel formulas cheat sheet. Excel is quite robust, meaning there is a lot of different tools that can be utilized within it, and therefore many skills one can practice and hone.

Keyboard shortcuts

Editing shortcuts

F2 Edit active cell

F3 Paste name into a formula

F4 Toggle references

ALT + ENTER Start a new line within the same cell

SHIFT + F2 Insert or edit cell comment

SHIFT + F10 Display shortcut menu (i.e. same as right click)

SHIFT + F11 Insert worksheet

CTRL + F3 Define a name for a cell

CTRL + D Fill down (e.g. copy formula down in selected cells)

CTRL + R Fill right

CTRL + SHIFT + A Insert argument names and parentheses for a function after typing a function name in a formula

SHIFT + SPACEBAR Select entire row

ALT + I + R Insert row

ALT + I + C Insert column

Formatting Shortcuts

CTRL + 1 Brings up format cells menu

CTRL + B Bold

CTRL + I Italic

CTRL + C Copy

CTRL + V Paste

ALT + S + E Paste special

CTRL + X Cut

CTRL + Z Undo

CTRL + Y Repeat last action

CTRL + A Select all used cells (select entire worksheet if ⌘ is repeated)

Navigation shortcuts

F5 Goto

SHIFT + ARROW Select the adjacent cell

SHIFT + SPACEBAR Select entire row

CTRL + SPACEBAR Select entire column

CTRL + SHIFT + HOME Select all to the start of the sheet

CTRL + SHIFT + END Select all to the last used cell of the sheet

CTRL + SHIFT + ARROW Select to the end of the last used cell in row/
column

CTRL + ARROW Select the last used cell in row/column

CTRL + PAGE UP/DOWN Move to the next or previous worksheet (Move
between tabs if you are in a menu window)

CTRL + TAB Move to next workbook (while in spreadsheet) Move to next
divider (when in menu options)

TAB Move to the next cell (Move between items within a menu window)

Other shortcuts

CTRL + ; Enter date

CTRL + : Enter time

CTRL + ` Show formula/show values (key to the left of 1)

CTRL +] Select cells which refer to the active cell (useful before deleting
a cell in a worksheet)

ALT Drives menu bar

ALT + TAB Next open program

ALT + = Autosum

Mac shortcuts

Editing shortcuts

CTRL + U Edit active cell

⌘ + T Toggle references

CTRL + OPTION + ENTER Start a new line within the same cell

SHIFT + F2 Insert or edit cell comment

SHIFT + F10 Display short cut menu

SHIFT + F11 Insert worksheet

CTRL + F3 Define a name

CTRL + D Fill down (e.g. copy formula down in selected cells)

CTRL + R Fill right

CTRL + SHIFT + A Insert argument names and parentheses for a function after typing a function name in a formula

Formatting Shortcuts

⌘ + 1 Brings up format cells menu

⌘ + B Bold

⌘ + I Italic

⌘ + C Copy

⌘ + V Paste

⌘ + SHIFT + V Paste special

⌘ + X Cut

⌘ + Z Undo

⌘ + Y Repeat last action

⌘ + A Select all used cells (select entire worksheet if ⌘ is repeated)

Navigation shortcuts

F5 / CTRL + G Goto

SHIFT + ARROW Select the adjacent cell

SHIFT + SPACEBAR Select entire row

CTRL + SPACEBAR Select entire column

CTRL + SHIFT + HOME Select all to the start of the sheet

CTRL + SHIFT + END Select all to the last used cell of the sheet

CTRL + SHIFT + ARROW Select to the end of the last used cell in row/
column

CTRL + ARROW Select the last used cell in row/column

CTRL + PAGE UP/DOWN Move to the next or previous worksheet (Move
between tabs if you are in a menu window)

CTRL + TAB Move to next workbook or window

TAB Move to the next cell (Move between items within a menu window)

Other shortcuts

CTRL + ; Enter date

CTRL + : Enter time

CTRL + ` Show formula / show values (key to the left of 1)

CTRL +] Select cells which refer to the active cell (useful before deleting
a cell in a worksheet)

⌘ + TAB Next open program

⌘ + SHIFT + T Insert autosum formula

B.

Excel formulas cheat sheet

If you want to become a master of Excel, financial analysis and building financial models, then you've come to the right place. We've built a cheat sheet of the most important Excel formulas and functions required to become a spreadsheet power user.

Below is a written overview of the main formulas for your own self-study. However, if you want a video explanation of the formulas, check out our Free Excel Crash Course.

If you're already a power user, check out our Advanced Excel Course and learn the most powerful combinations of formulas and functions.

Dates and time

=EDATE – add a specified number of months to a date in Excel

=EOMONTH – convert a date to the last day of month (i.e. 7/18/2018 to 7/31/2018)

=TODAY – insert and display today's date in a cell

=YEAR – extract and display the year from a date (i.e. 7/18/2018 to 2018) in Excel

=YEARFRAC – expresses the fraction of a year between two dates (i.e. 1/1/2018 – 3/31/2018 = 0.25)

Navigation

Go To Special – press F5 and find all cells that are hard-codes, formulas and more. Great for auditing.

Find and Replace – press Ctrl + F and you can changes parts of many formulas at once

Lookup formulas

INDEX MATCH – a combination of lookup functions that are more powerful than VLOOKUP

=VLOOKUP – a lookup function that searches vertically in a table

=HLOOKUP – a lookup function that searches horizontally in a table

=INDEX – a lookup function that searches vertically and horizontally in a table

=MATCH – returns the position of a value in a series

=OFFSET – moves the reference of a cell by the number of rows and/or columns specified

Math functions

=SUM – add the total of a series of numbers

=AVERAGE – calculates the average of a series of numbers

=MEDIAN – returns the median number of a series

=SUMPRODUCT – can be used to calculate the weighted average, very useful for financial analysis

=ROUNDDOWN – rounds a number to the specified number of digits

=ROUNDUP – the formula rounds a number to the specific number of digits

AutoSum – a shortcut to quickly sum a series of numbers

Financial formulas

=NPV – calculates the net present value (NPV) of cash flows based on a discount rate

=XNPV – calculate the NPV of cash flows based on a discount rate and specific dates

=IRR – this formula calculates the internal rate of return (discount rate that sets the NPV to zero)

=XIRR – calculates the internal rate of return (discount rate that sets the NPV to zero) with dates

=YIELD – returns the yield of a security based on maturity, face value, and interest rate

=INTRATE – the interest rate on a fully invested security

=IPMT – this formula returns the interest payments on a debt security

=PMT – this function returns the total payment (debt and interest) on a debt security

=DB – calculates depreciation based on the fixed-declining balance method

=DDB – calculates depreciation based on the double-declining balance method

=SLN – calculates depreciation based on the straight-line method

Conditional functions

=IF – checks if a condition is met and returns a value if yes and if no

=OR – checks if any conditions are met and returns only “TRUE” or “FALSE”

=AND – checks if all conditions are met and returns only “TRUE” or “FALSE”

IF AND – combine IF with AND to have multiple conditions

=IFERROR – if a cell contains an error you can tell Excel to display an alternative result

Other functions and formulas

Sheet Name Code – a formula using MID, CELL and FIND functions to display the worksheet name

Consolidate – how to consolidate information between multiple Excel workbooks

C.

Advanced Excel Formulas

10 Advanced Excel Formulas You Must Know

Every financial analyst spends more time in Excel than they may care to admit. Based on years and years of experience, we have compiled the most important and advanced Excel formulas that every world-class financial analyst must know. Several formulas mentioned previously are broken down here.

1. INDEX MATCH

Formula: =INDEX(C3:E9,MATCH(B13,C3:C9,0),MATCH(B14,C3:E3,0))

This is an advanced alternative to the VLOOKUP or HLOOKUP formulas (which several drawbacks and limitations). Index Match is a powerful combination of formulas that will take your financial analysis and financial modeling to the next level.

INDEX returns the value of a cell in a table based on the column and row number. MATCH returns the position of a cell in a row or column.

Here is an example of the INDEX and MATCH formulas combined together. In this example, we look up and return a person's height based on their name. Since name and height are both variables in the formula, we can change both of them!

	AB	C	D	E	F	G	H	I	J	K	L
1											
2		1	2	3							
3		Name	Height	Weight		Search Criteria					
4		Sally	6.2	185		Name	Sally				
5		Tom	5.9	170		Parameter	Height				
6		Kevin	5.8	175							
7		Amanda	5.5	145		INDEXMATCH Result					
8		Carl	6.1	210			6.2				
9		Ned	6.0	180		=INDEX(C3:E9,MATCH(H4,C3:C9,0),MATCH(H5,C3:E3,0))					
10											
11											
12											
13											
14											
15											

For a step-by-step explanation or how to use this formula, please see our free guide on [how to use INDEX MATCH MATCH in Excel](#).

2. IF combined with AND / OR

Formula: =IF(AND(C2>=C4,C2<=C5),C6,C7)

Anyone who's spent a great deal of time in various [types of financial models](#) knows that nested IF formulas can be a nightmare. Combining IF with the AND or the OR function can be a great way to keep or formulas easier to audit and for other users to understand. In the example below, you will see how we used the individual functions in combination to create a more advanced formula.

For a detailed breakdown of how to perform this function in Excel, please see our free guide on [how to use IF with AND / OR](#).

	A	B	C	D	E	F	G	H
1								
2		Data Cell	150					
3								
4		Condition 1	100	>=				
5		Condition 2	999	<=				
6		Result if True	100					
7		Result if False	0					
8								
9		Result	100					
10								
11		Live Formula	=IF(AND(C2>=C4,C2<=C5),C6,C7)					
12								

3. OFFSET combined with SUM or AVERAGE

Formula: =SUM(D7:OFFSET(D6,D4,0))

The OFFSET function on its own is not particularly advanced, but when we combine it with other functions like SUM or AVERAGE, we can create a pretty sophisticated formula. Suppose you want to create a dynamic function that can sum a variable number of cells. With the regular SUM

formula, you are limited to a static calculation, but by adding OFFSET, you can have the cell reference move around.

To make this formula work, we substitute ending reference cell of the SUM function with the OFFSET function. This makes the formula dynamic and cell referenced, as D4 is where you can tell Excel how many consecutive cells you want to add up. Now we've got some advanced Excel formulas!

[Learn how to build this formula step-by-step in our advanced Excel course.](#)

4. CHOOSE

Formula: =CHOOSE(choice, option1, option2, option3)

The CHOOSE function is great for scenario analysis in financial modeling. It allows you to pick between a specific number of options, and return the "choice" that you've selected. For example, imagine you have three different assumptions for revenue growth next year: 5%, 12% and 18%. Using the CHOOSE formula, you return 12% if we tell Excel you want choice #2.

	A	B	C	D	E	F	G
1							
2							
3			Option 1	5%			
4			Option 2	12%			
5			Option 3	18%			
6							
7		Selection ->	2	=CHOOSE(C7,D3,D4,D5)			
8							
9							
10							
11							

To see a video demonstration, check out our [Advanced Excel Formulas Course](#).

5. XNPV and XIRR

Formula: =XNPV(discount rate, cash flows, dates)

If you're an analyst working in [investment banking](#), equity research, or financial planning & analysis ([FP&A](#)), or any other area of corporate finance that requires discounting cash flows, then these formulas are a lifesaver!

Simply put, XNPV and XIRR allow you to apply specific dates to each individual cash flow that's being discounted. The problem with Excel's basic NPV and IRR formulas is that it assumes the time periods between cash flow are equal. Routinely, as an analyst, you'll have situations when cash flows are not timed evenly, and this formula is how you fix that.

For a more detailed breakdown, see our [free IRR vs XIRR formulas guide](#).

6. SUMIF and COUNTIF

Formula: =COUNTIF(D5:D12,">=21")

These two advanced formulas are great uses of conditional functions. SUMIF adds all cells that meet a certain criteria, and COUNTIF counts all cells that meet a certain criteria. For example, imagine you want to count all cells that are greater than or equal to 21 (the legal drinking age in the U.S.) to find out how many bottles of champagne you need for a client event. You can use COUNTIF as an advanced solution, as shows in the screenshot below.

	A	B	C	D	E	F	G	H
1								
2								
3								
4				Age				
5				19				
6				26				
7				20				
8				19				
9				29				
10				31				
11				21				
12				25				
13								
14				=COUNTIF(D5:D12,">=21")				
15								

In our [advanced Excel course](#), we break these formulas down in even more detail.

7. PMT and IPMT

Formula: =PMT(interest rate, # of periods, present value)

If you work in real estate, [commercial banking](#), or any financial analyst position that deals with debt schedules, you'll want to understand these two detailed formulas.

The PMT formula gives you the value of equal payments over the life of a loan. You can use it in conjunction with IPMT (which tells you the interest payments for the same type of loan) then separate principal and interest payments.

8. LEN and TRIM

Formulas: =LEN(text) and =TRIM(text)

These are a little less common, but certainly very sophisticated formulas. These applications are great for financial analysts that need to organize and manipulate large amounts of data. Unfortunately, the data we get is not always perfectly organized, and sometimes there can be issues like extra spaces at the beginning or end of cells

In the example below, you can see how the TRIM formula cleans up the Excel data.

	A	B	C	D	E	F	G
1							
2							
3		No Extra spaces					
4		Example of extra spaces			=TRIM(B4)		
5							
6							
7		Example of extra spaces			Example of extra spaces		
8							
9							
10							

9. CONCATENATE

Formula: =A1&" more text"

Concatenate is not really a function on its own. It's really just an innovative way of joining information from different cells, and making worksheets more dynamic. This is a very powerful tool for financial analysis performing financial modeling (see our [free financial modeling guide](#) to learn more).

In the example below, you can see how the text "New York" plus ", " is joined with "NY" to create "New York, NY".

	A	B	C	D	E	F
1						
2		New York		NY		
3						
4						
5		=B2&", "&D2				
6						
7						
8		New York, NY				
9						
10						
11						

10. CELL, LEFT, MID and RIGHT functions

These advanced Excel functions can be combined to create some very advanced and complex formulas to use. The CELL function can return a variety of information about the contents of a cell (its name, location, row, column, and more). The LEFT function can return text from the beginning of a cell (left to right), MID returns text from any start point of the cell (left to right), and RIGHT returns text from the end of the cell (right to left).

Below is an illustration of these three formulas in action.

To see how these can be combined in a powerful way with the CELL function, we break it down for you in our [Advanced Excel Formulas Course](#).

	A	B	C	D	E	F
1						
2						
3		New York, NY		=LEFT(B3,3)	→	New
4						
5				=MID(B3,5,4)	→	York
6						
7				=RIGHT(B3,2)	→	NY
8						
9						
10						
11						

More Excel formulas training

We hope these top 10 advanced Excel formulas have been helpful for you, and should go a long way to improving your financial analysis and [financial modeling skills](#).

Below are more resources to help you become an Excel power user:

- > Excel formulas cheat sheet
- > Excel keyboard shortcuts
- > Free Excel crash course
- > Advanced Excel course
- > Excel for financial modeling

PART 02

Presentation Introduction

01

02



A.

Investment Banking Pitchbook

What is an investment banking pitchbook?

An [investment banking](#) pitchbook is a PowerPoint presentation designed to win new business. The “pitch” is typically an explanation of why the bank in question is best suited to lead the transaction, and why they should be engaged by the client.

There are various types of pitches, and, depending on the relationship with the client and the type of transaction, they can vary widely.

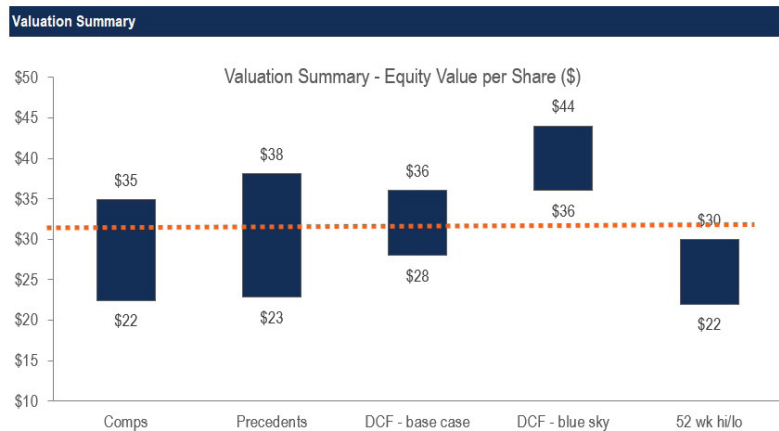
What’s included in an investment banking pitchbook?

Here is an example outline for an investment banking pitchbook:

1. Title page – Logos, date, and a title
2. Table of Contents – All sections in the pitch book
3. Executive Summary / Situation Overview – Explain why you’re giving the pitch and the call to action or recommendation in one page
4. Team & Bank Introduction – Introduce the people at the meeting (short biographies) and discuss the bank’s track record in the client’s space
5. Market Overview – [Charts and graphs](#) as well as commentary describing the current market environment and trends in the client’s sector
6. Valuation – [Valuation methods](#) such as comparable company analysis, precedent transactions and DCF analysis (if enough information has been provided to perform one) will all be displayed in a [football field graph](#)
7. Transaction Strategy – Details around the bank’s strategy for the transaction they’re pitching to the client to lead – whether an IPO, acquisition, or sale of the business
8. Summary – Recap why the team and the bank are best suited to

lead the transaction, how the market environment is relevant, the valuation you think is achievable, and the band's strategy if leading the transaction

9. Appendix – May contain a wide range of information depending on the pitch, but mostly backup information the bank feels there may be questions on, but doesn't belong in the main pitchbook (like [financial modeling](#) assumptions / details)



How is the pitch book actually made?

The pitchbook is a collaboration between junior and senior bankers, with most of the actual work being done by investment banking [analysts and associates](#).

Typically, a managing director (who has a relationship with the client) will sit down with a director or VP to create an outline of the pitch book. Then the VP or director will wireframe the structure of the pitch and have the associate work with the analyst to crunch all the numbers and create all the analysis used to populate the presentation.

The process can take anywhere from a couple of days to a few weeks, depending on the client's timeline, and how busy the team is. The process usually requires a high number of iterations with many drafts or version of the pitch, often done until late at night and over the weekend.

How is the pitch delivered?

In most cases, the pitch book is delivered in person to the bank's or [corporate client's](#) office by senior members of the investment banking team. The managing director with a relationship with the client will typically lead the meeting, and other bankers may have smaller roles as well. If junior members of the team like the analysts or associates attend, they usually don't say anything and just take notes or are prepared to dig up any additional information that's required.

	B Corporate Finance Institute	IRR (unltd)	37.4%	Historical Results				Forecast Period					
				2013A	2014A	2015A	2016A	2017E	2018E	2019E	2020E	2021E	2022E
Balance Sheet Check		IRR (ltd)	56.6%	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
Discounted Cash Flow Analysis													
EBIT				1,393,000	1,261,000	1,426,000	1,353,953	1,534,487	1,736,877	1,838,590	1,895,847	1,963,739	
Cash Tax Rate				2.4%	2.7%	6.2%	16.6%	16.6%	16.6%	16.6%	16.6%	16.6%	
Less: Cash Taxes				33,000	34,000	88,000	224,756	254,725	288,322	305,206	314,711	324,321	
Plus: D&A				120,000	140,000	120,000	143,595	140,443	138,484	137,230	136,427	135,913	
Less: Capital Expenditures				162,728	168,719	154,830	135,000	135,000	135,000	135,000	135,000	135,000	
Plus: Changes in Non Cash Working Capital				313,000	(301,000)	73,000	118,781	(9,161)	(9,619)	(6,060)	(4,191)	(4,244)	
Unlevered Free Cash Flow				1,630,272	897,281	1,376,170	1,256,483	1,276,044	1,442,420	1,529,554	1,578,402	1,626,088	
Valuation Timing													
Date				Acquisition	Stub Period			FY1	FY2	FY3	FY4	FY4	Termin
10/31/2017				12/31/2017				12/31/2018	12/31/2019	12/31/2020	12/31/2021	12/31/2022	12/31/20
Days in Period				1	61			365	365	366	365	365	
Cash Flow Weighting				100%	17%			100%	100%	100%	100%	100%	100
Unlevered Free Cash Flow													
Equity					(3,600,000)								
Transaction Costs					(80,000)								
Vendor Take Back Note										(4,400,000)			
Business Free Cash Flow								209,988	1,276,044	1,442,420	1,529,554	1,578,402	11,198,26
Total Unlevered Free Cash Flow								209,988	1,276,044	1,442,420	(2,870,446)	1,578,402	11,198,26
Cumulative FCF								0	209,988	1,486,032	2,928,452	58,006	14,460,75

More investment banking resources

Whether you're looking to get hired, or move up the ladder, we got all the resources you need for a successful career in investment banking or other corporate finance roles.

Helpful resources include:

[Career resources](#)

[Investment banking analyst interview](#)

[Investment banking salary](#)

[DCF model training](#)

[Investment banking training](#)

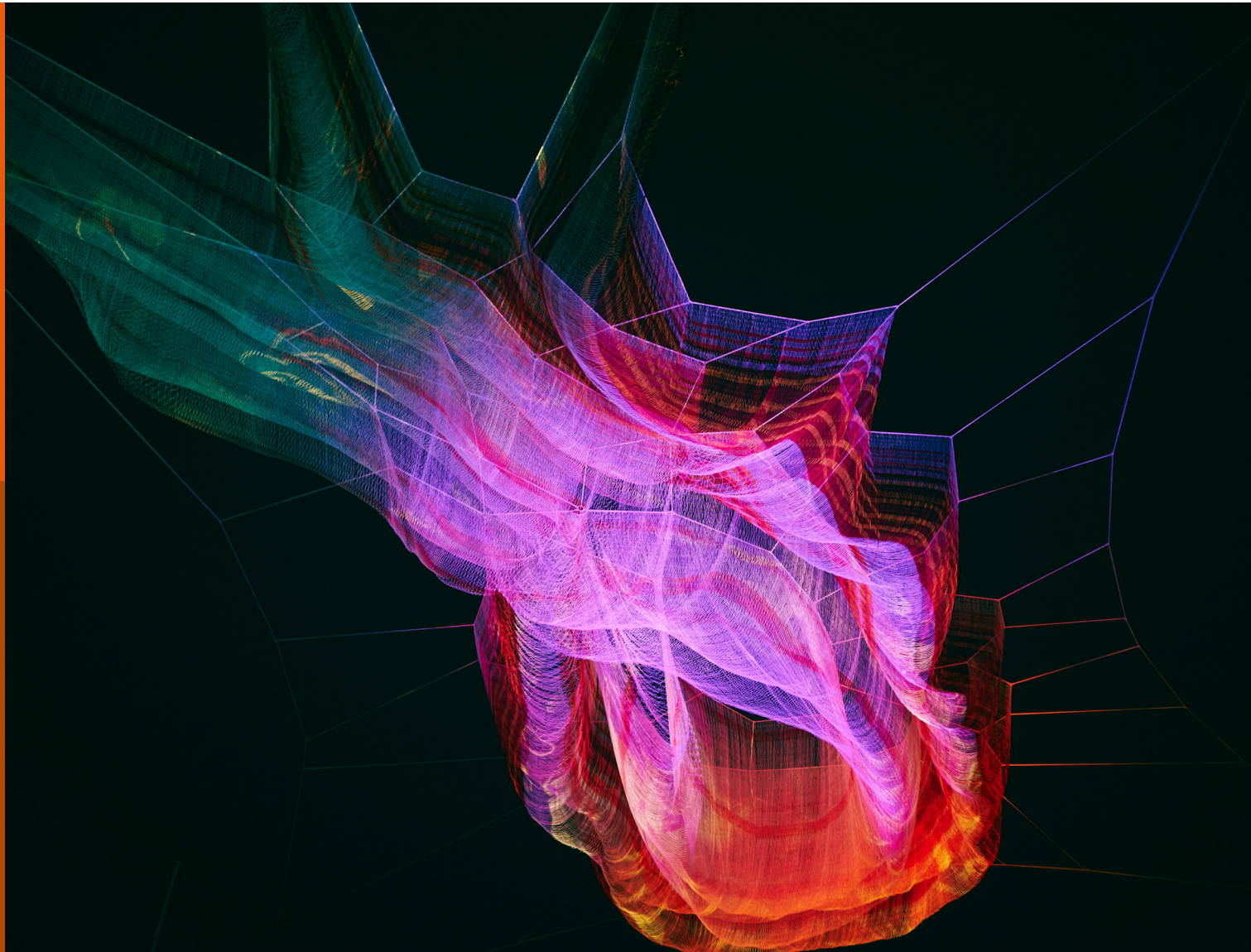
[Excel courses](#)

Presentation

Data Visualization

01

02



A.

Overview of Dashboards and Data Visualization

The Importance of Dashboards and Data Visualization

Financial analysts are required to present their findings in a neat, clear and straightforward manner. They spend most of their time with spreadsheets in Excel, building financial models and crunching numbers. These models and calculations can be pretty extensive and complex, and they may only be understood by the analyst who performed the work.

It is the job of the analyst, therefore, to effectively communicate the outputs to the targeted audience such as the management team or the company's external investors. This requires focusing on the main points, facts, insights and recommendations that will prompt necessary action from the audience. One of the challenges is to make intricate and elaborate work easy to absorb and comprehend through the help and use of great visuals and dashboards. For example, tables, graphs and charts are tools that an analyst can use to their advantage to unlock the deeper meaning of a company's financial information. These tools organize relevant numbers that are rather dull and dry and give life and story to them.

Here are some key objectives to think about when performing financial analysis:

1. Visual communication
2. Audience and context
3. Charts, graphs and images
4. Focus on important points
5. Design principles
6. Storytelling
7. Persuasiveness
8. Dashboards

For a further breakdown of each of these objectives, check out our course, [Excel Dashboards & Data Visualization](#), to help you become a world-class financial analyst.

Charts and Graphs for Great Visuals

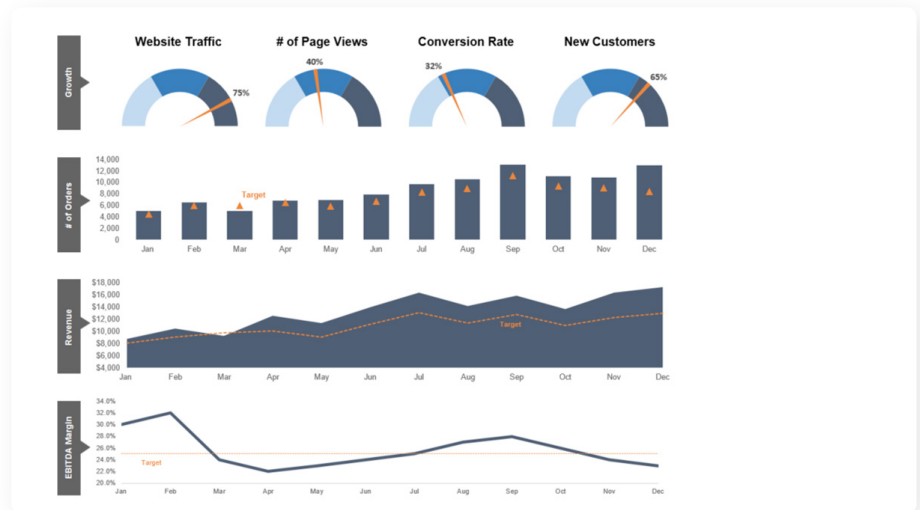
Charts and graphs make any financial analysis readable and easy to follow. They are often included in the financial model's output, which is essential for key decision-makers in a company. These decision-makers comprise executives and a team of managers who usually won't have enough time to synthesize and interpret data on their own to make sound business decisions. Hence, it is the job of the analyst to enhance decision-making and help guide the executives and managers to create value for the company.

When an analyst uses charts, it is necessary to be aware of what good charts and bad charts look like and how to avoid the latter when telling a story with data.

Examples of Good Charts

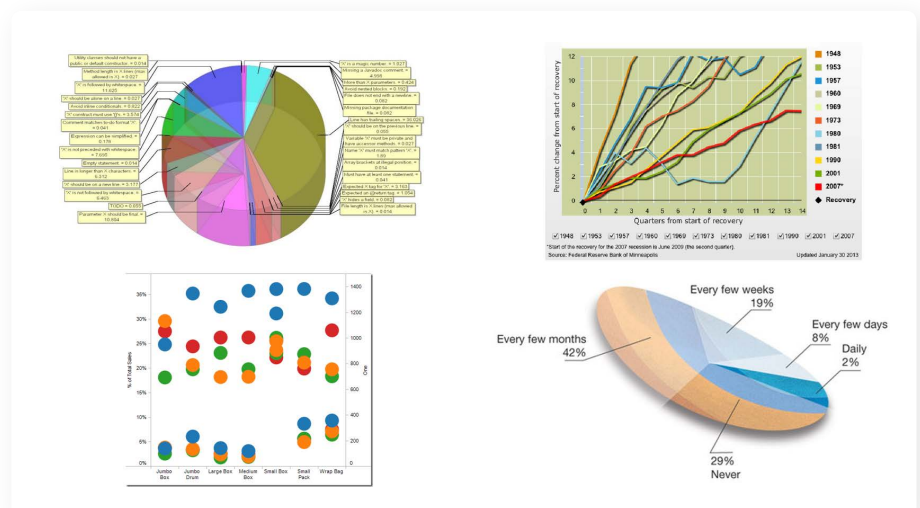
With great visuals, you can quickly see what's going on with the data presentation, which will save you time for deciphering their actual meaning. More importantly, great visuals facilitate business decision-making, because their goal is to provide persuasive, clear and unambiguous numeric communication. For a good reference, take a look at the figure below that shows a dashboard, containing a gauge chart for growth rates, bar chart for number of orders (i.e. a retailer), area chart for company revenues and a line chart for EBITDA margins.

To learn the step-by-step process of creating these essential tools in Excel, watch our video course titled "[Excel Dashboard & Data Visualization](#)". Aside from what is given in the example below, our course will also teach you the purpose for using other tables and charts to make your financial analysis stand out, professionally.



Example of Poorly Crafted Charts

A bad chart, as seen in the figure below, will give the reader a difficult time to find the main takeaway of a whole report or presentation. They often contain too many colors, labels, legends and thus, will often look too busy. Also, it doesn't help much if a chart, such as a pie chart, is displayed in 3D, as it skews the size and the perceived value of the underlying data. Overall, a bad chart will be hard to follow and understand.



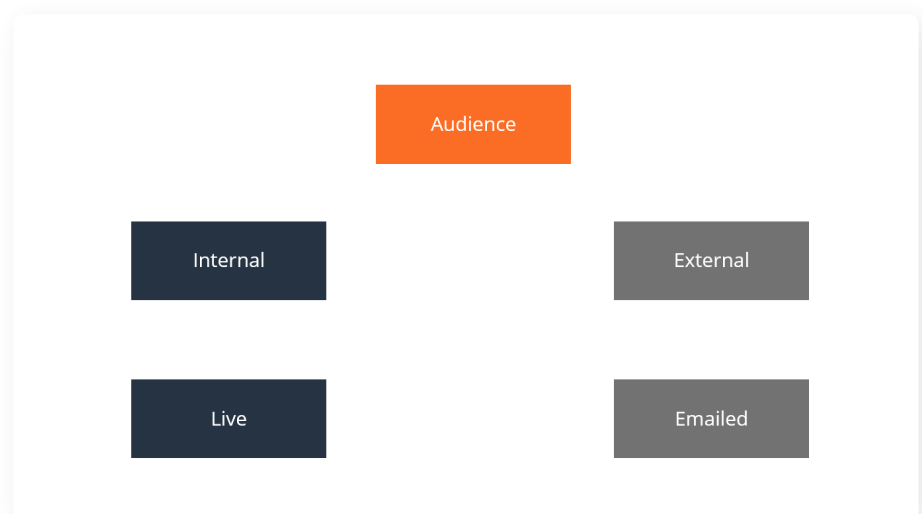
Storytelling with Data, Visuals and Text

Aside from just understanding what the numbers mean, a financial analyst must learn to combine numbers and language to craft a story. Relying on data only for your presentation may make it difficult for your audience to read, interpret and analyze your data. You have to do the work for them. Having a story will act as a guide, as it will help you and your audience arrive at the main points faster rather than just having a presentation full of numbers only that only you can read.

The data to be organized can be in the form of revenues, expenses, profits and cash flow. Even simply adding notes, comment and opinions to each line item will add an extra layer of insight, angles and new perspectives. Furthermore, by merging data, visuals and text together, the resulting story will give a clear sense of what is happening with the current situation, what happened in the past, and what conclusion and recommendation can be made for the future.

Audiences for Data-Analysis Presentations

This simple diagram below shows the different categories of your audience:



Internal Audience

An internal audience can either be the executives of the company or every employee that works in that company.

For executives, the purpose of communicating a data-filled presentation is to give an update about a certain business activity, such as a project or an initiative. Another important purpose is to facilitate decision-making, as mentioned earlier, with regards to managing the company's operations, growing its core business, acquiring new markets and customers, investing in R&D and many others. Knowing the relevant data and information beforehand will guide the decision makers in making the right choices that will best position the company to become more successful.

External Audience

An external audience can either be the clients of the company, where there are projects currently in progress, or new clients that the company wants to build new relationships with to win new businesses. The other external audience is the general public, such as the company's external shareholders and prospective investors.

When it comes to winning new business, the presentation made by the analyst will be more promotional and sales-oriented, whereas a project update will contain more specific information for the client with plenty of industry jargon.

Audiences for Live and Emailed Presentation

A live presentation contains more visuals, storytelling and connects with the audience. It has to be more precise and should get to the point faster while avoiding a long-winded speech or text because of limited time.

In contrast, with an emailed presentation, it is expected to be read, so it will have more text. Just like a document or a book, it will include more detailed information, because its context will not be explained with a voice over like in a live presentation.

When it comes to details, acronyms and jargon in a presentation, these things depend more on whether your audience are experts or non-experts.

The Big Idea

Every great presentation with dashboards and data visualization requires a big idea. It is the main purpose of the presentation and should be addressed clearly and remembered well. Its significance should be highlighted and should cause the target audience to bring action to the matter.

An example of a serious and profound idea is given below:

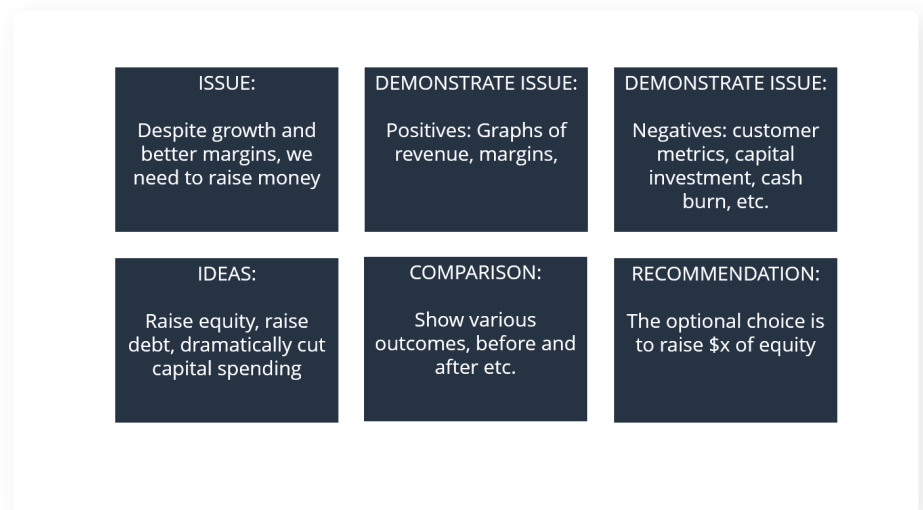
“Despite significant growth in our company’s top line and improving EBITDA margins, we require a significant capital investment next year or we will run out of money.”

To communicate this big idea, we have to come up with appropriate and effective visual displays to show both the good and bad things surrounding it. We do this while placing a huge emphasis and attention on the more important part, which is the critical cash balance and the capital investment situations for next year.

Storyboarding

Storyboarding, found in the figure below, is how an analyst would build the presentation based on this big idea as mentioned earlier. Once the issue or the main idea has been introduced, it will be followed by a demonstration of the positive aspects of the company’s performance, as well as the negative aspects, which are more important and will likely require more attention. Various ideas will then be suggested to

solve the negative issues. However, before choosing the best option, a comparison of the different outcomes of the several, suggested ideas will be performed. Finally, a recommendation will be made that centers around the optimal choice to tackle the imminent problem highlighted in the big idea.



To get to the final point (recommendation), a great deal of analysis has been performed, which includes the necessary charts and graphs to make the whole presentation easy to follow, convincing and compelling for your audience.

B.

Types of Graphs

Top 10 Types of Graphs

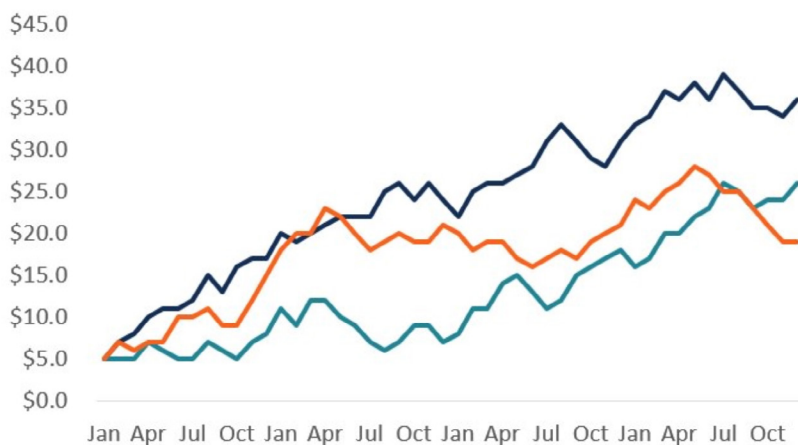
Any financial analyst knows the importance of effectively communicating results, which largely comes down to knowing the different types of charts and graphs, and when to use them. In this guide, we outline the top 10 types of graphs in Excel, and what situation each kind is best for. Learn how to deliver powerful presentations and clear takeaways with these effective chart types.

#1 Line Graphs

The most common, simplest, and classic graph is the Line Graph. It's the perfect solution for showing multiple series of closely related series of data. Since line graphs are very lightweight (they only consist of lines, as opposed to thicker chart types, as shown further below), they are great for a minimalistic look.

Tips:

- Remove all gridlines
- Remove any shading or borders
- Highlight a single series with a different color

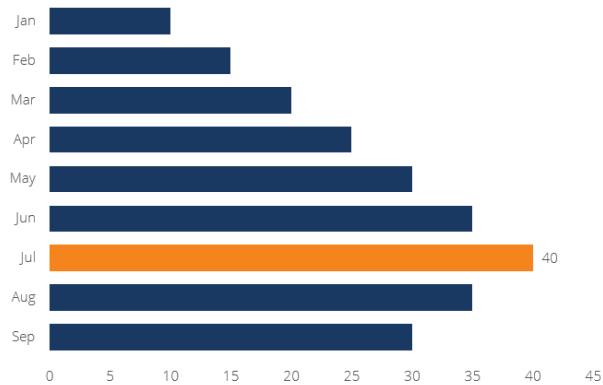


#2 Bar Graphs

Bars (or columns) are the best types of graphs for presenting a single data series. Bar charts have a much heavier weight to them than line graphs, so they really emphasize a point and stand out on the page

Tips:

- Remove all gridlines
- Reduce gap width



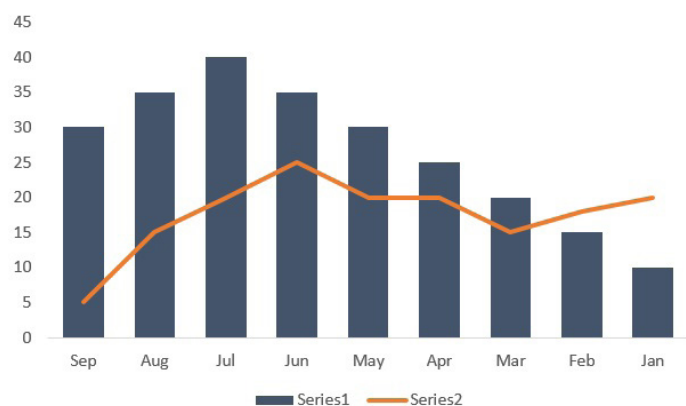
Source: Dashboards and Data Presentation course

#3 Combo Chart

The two types of graphs above can be combined to create a combo chart with bars and lines. This is very useful when presenting two data services that have a very different scale and might be expressed in different units. The most common example is dollars on one axis and percentage on the other axis.

Tips:

- Delete borders and gridlines
- Add a legend
- Reduce gap width for the bars
- Adjust the axis



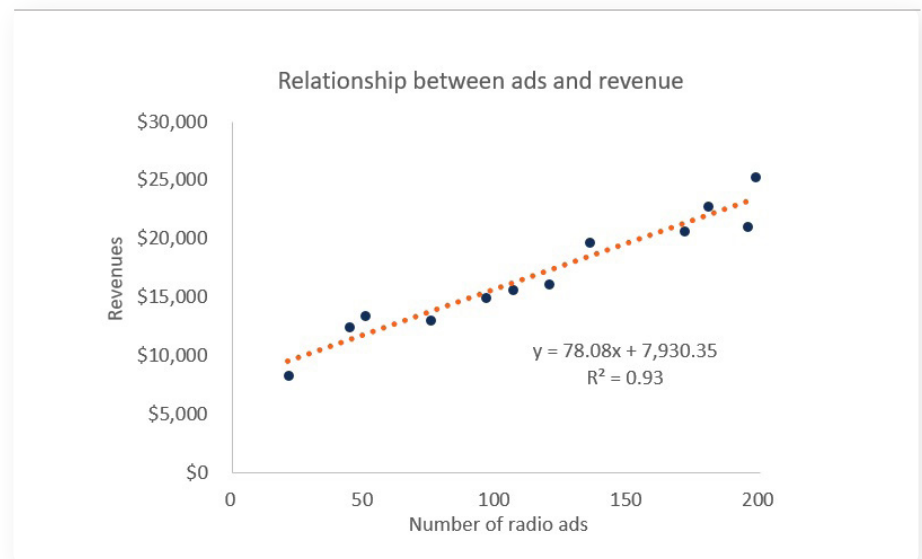
Source: Dashboards course

#4 Scatterplot

The scatterplot is excellent for showing the relationship between two data series and determining their correlation. The scatterplot is great for showing what the distribution of data points looks like and drawing a line of best fit for regression analysis.

Tips:

- Clearly label each axis
- Add a trendline
- Highlight clusters of data

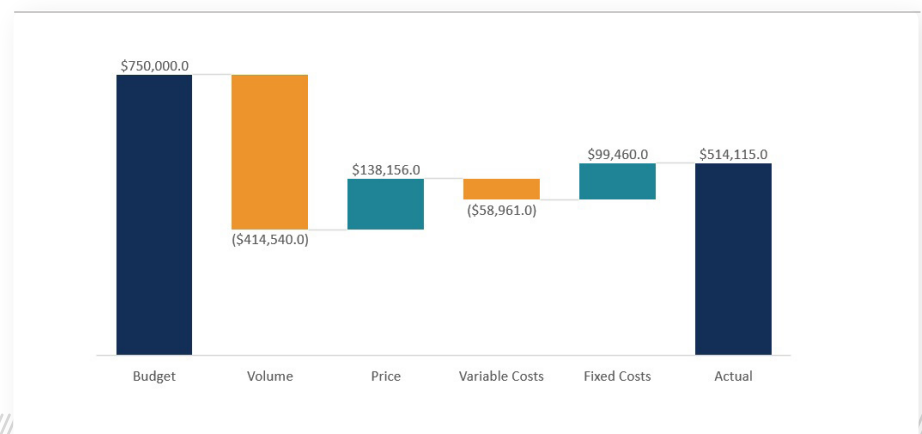


#5 Waterfall Chart

In Excel 2016, Microsoft finally introduced the waterfall chart. In older versions of Excel, analysts had to create a custom workaround using stacked column charts. If you use a version of Excel prior to 2016, please see our [free guide and waterfall chart template here](#). The waterfall chart is excellent for variance analysis and explaining how an “actual” result was different than a “budget,” or how something has changed relative to an original data point.

Tips:

- Set the start and end points to be “totals”
- Format positive and negatives
- Clear away gridlines

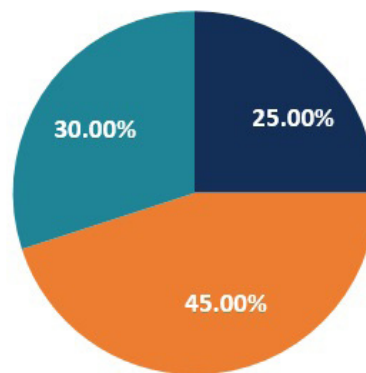


#6 Pie Graph

Pie charts have a bad reputation and are known for being messy and hard to read. If you're trying to illustrate the percentage breakdown of a small number of data point, they can be very effective. For example, the diagram below shows the percentage of people who prefer bananas, pineapple, and grapes.

Tips:

- Keep it 2-D only
- Don't graph more than 5 items in one pie
- Use infrequently

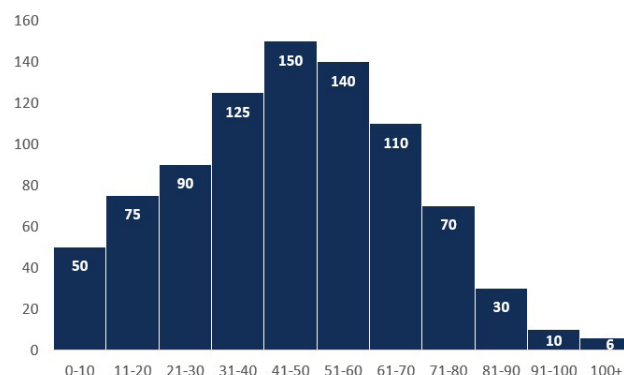


#7 Histogram

Histograms are the types of charts that show the distribution of a dataset. They graph the percentage or the number of instances of different categories. For example, in a distribution of age categories (0-10, 11-20, 21-30, etc.), we can clearly see which categories are the biggest, and how many people fall into each.

Tips:

- Set gap width to zero
- Add subtle border between bars
- Add data labels

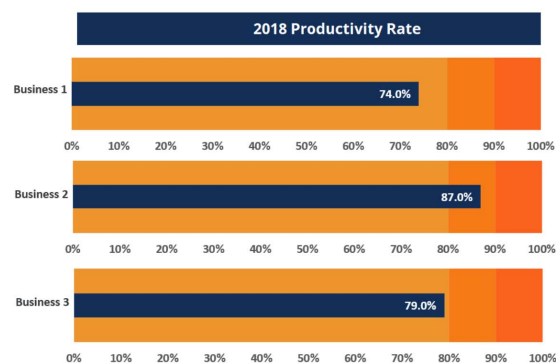


#8 Bullet Chart

The bullet chart is perfect for graphing a single data point and showing where that result fits on a scale from “bad” to “good.” Bullet charts are an advanced type of graph as Excel doesn’t have a standard template for making them. Learn how in our [data visualization course](#).

Tips:

- Best for a single data point
- Shows performance on a scale (i.e. bad to good)
- Learn via video instruction



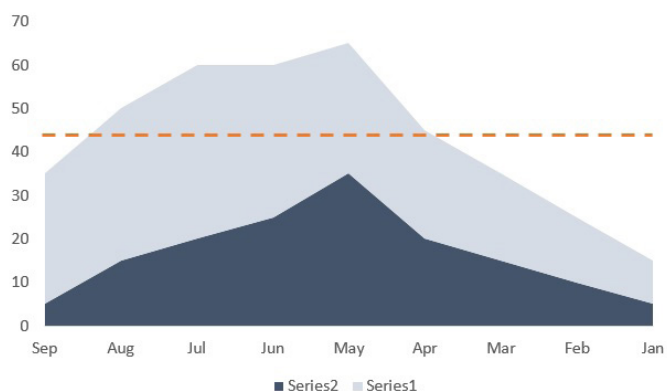
Source: [Data Visualization Course](#).

#9 Area Chart

An area chart graphs a solid area and can be effective when showing a stocked, cumulative data series, e.g. showing the cumulative sales revenue from different products. This allows the reader to easily visualize the “area” (or weight) of each series relative to each other.

Tips:

- Use stacked area
- Graph data that is cumulative
- Use colors carefully

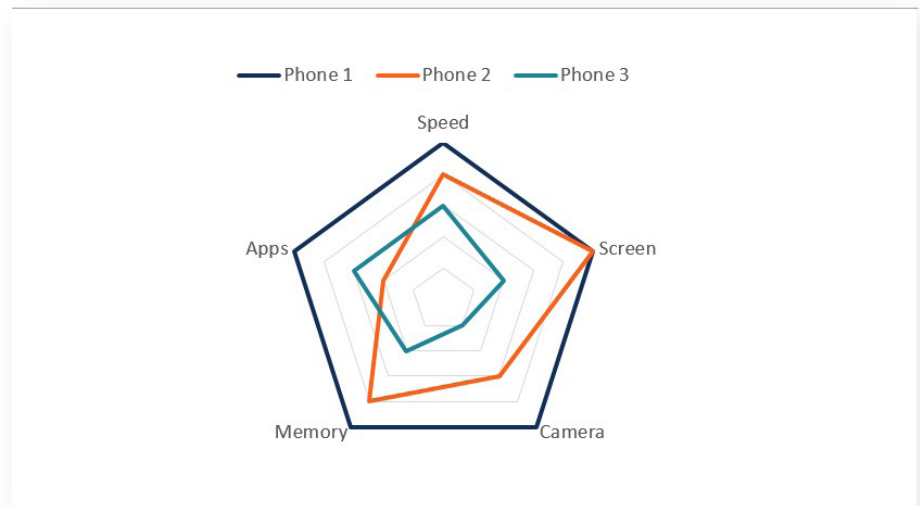


#10 Spider Chart / Radar Graph

A spider or radar graph is very useful for showing qualitative data or the overall “score” or comparison of multiple series. For example, a spider/radar can be easily used to compare 3 different types of phones based on 5 criteria (speed, screen size, camera quality, memory, apps).

Tips:

- Keep it simple
- Only graph a few series/items
- Format to be minimalistic
- Remove markers



Additional resources

This has been a guide to the top 10 different types of graphs that analysts need to perform top-notch analysis. To keep learning and developing your career, you will find these additional resources helpful:



[Advanced Excel formulas guide](#)



[Dashboard creation in Excel](#)



[How to make a pitch book](#)



[Data visualization course](#)

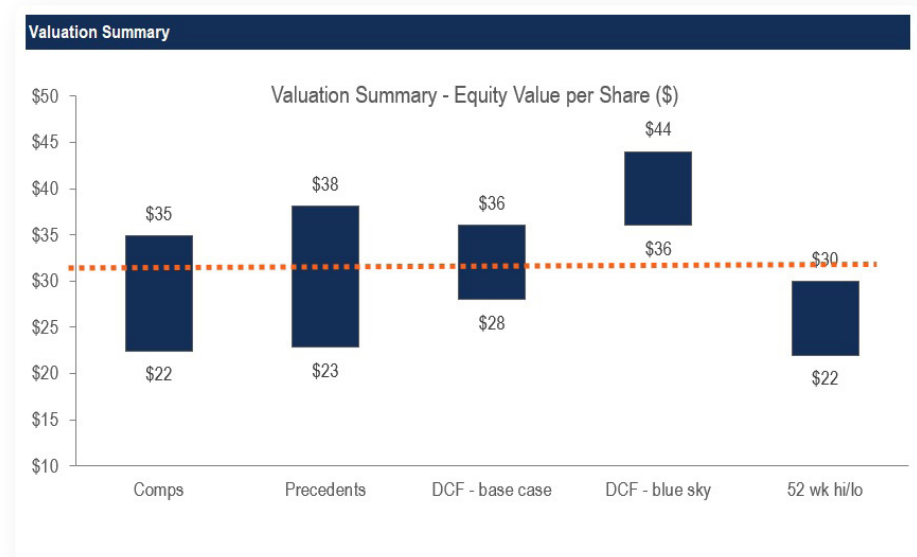
C.

Football Field Chart

What is a football field chart?

A football field chart is used to summarize a range of values for a business, based on different [valuation methods](#).

The purpose of the chart is to show how much someone might be willing to pay for a business, whether acquiring all of it, part of it, or even a single share (depending on the audience).



Why is it called a football field?

The bars look like yard lines on a football field, and hence the name. Also, the graph is commonly used in [investment banking](#), and bankers like sports analogies.

Why use a football field chart?

A football field chart is used to visually show what the range of values for a business are and see where an average target valuation lies compared to several alternatives. It's common to see these charts in investment banking [pitchbooks](#) or equity research reports.

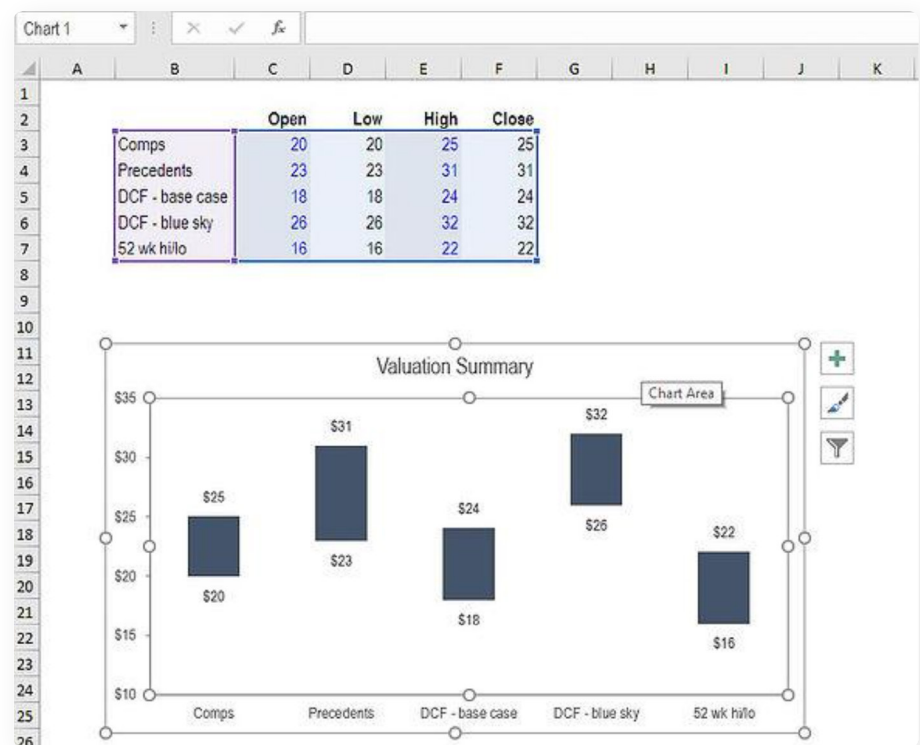
How do you make a football field chart?

Football fields are easy to make in Excel using the stock chart option.

Here are the steps of how to make a football field chart in Excel:

1. Create a table in Excel with the range of values.
2. Insert a stock chart type called Open-Low-High-Close.
3. Set the Open and Low values as being the same.
4. Set the High and Close values as being the same.

[Download our free football field chart template here.](#)



More corporate finance resources

At CFI, our mission is to help you advance your career. With that in mind, we've created a vast library of resources to help you along your journey. Here are some useful topics we think you will find valuable:

- > Investment banking interview questions
- > Valuation methods
- > Excel formulas and functions
- > Lists of investment banks

For more guidance with career development, check out our interactive [Career Map](#).

D.

Excel Waterfall Chart

How to create a Waterfall chart in Excel

Excel Waterfall Chart

If you're working in Excel 2013 or earlier versions, please follow the instructions below as a workaround to build your own waterfall chart using the stacked column chart feature.

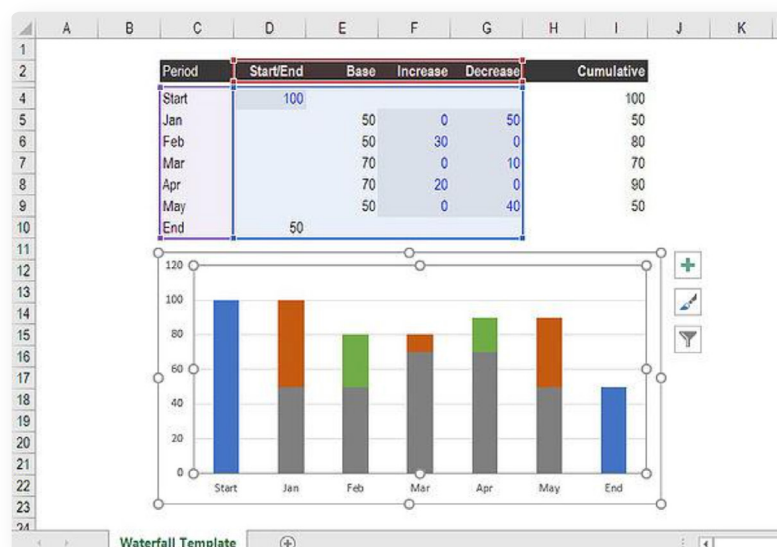
Step 1 – Organize the Data

In order to build your own waterfall chart, you first have to organize your data as follows:

1. Start Column – enter beginning value
2. Base Column – formula calculated for you (nothing required)
3. Increase Column – enter any increases
4. Decrease Column – enter any decreases
5. End Column – formula calculated for you (nothing required)

Step 2 – Insert a Stacked Column Chart

In the "Insert" ribbon across the top, select a "2-D Stacked Column Chart." Then enter the 5 series listed above as shown in the image below.

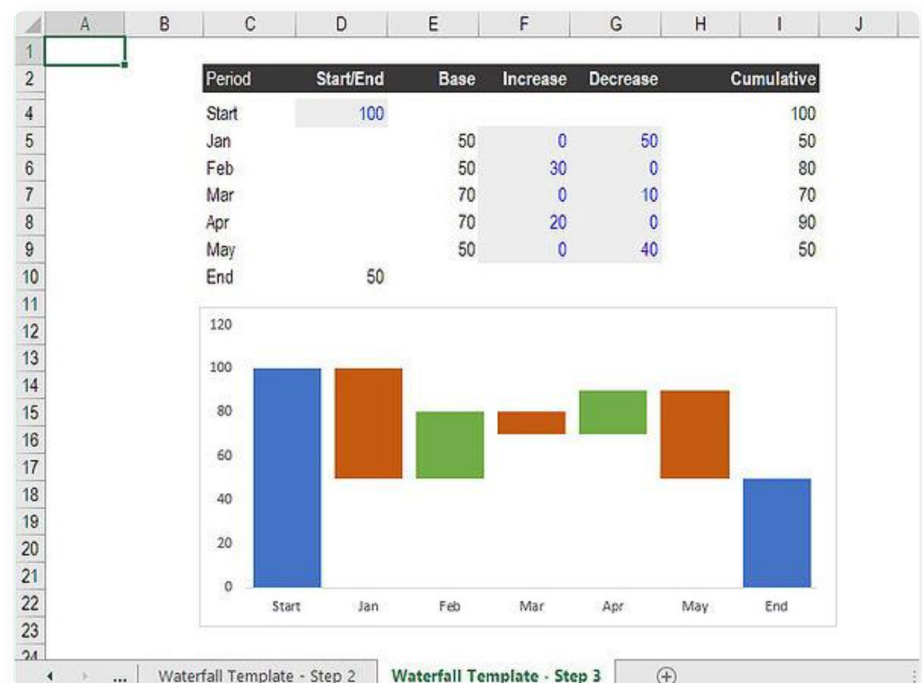


Step 3 – Format the Chart

Format the chart so that the base column fill color is “no fill,” which has the effect of making it invisible. Since older versions of Excel are not designed to make waterfall charts, we have to insert invisible data series to make it work. If you click within the column area, you will notice that the invisible section is just a column stacked under the colored column.

Additionally, you may want to decrease the series gap width and remove the grid lines.

Step 4 – View your Final Product



Step 5 – Download the Template for Free

Start creating your own chart in our [Free Excel Crash Course!](#)

More Excel Resources

Check out more of our resources to take you Excel skills to the next level:

- [List of Excel formulas and functions](#)
- [Free Excel course](#)
- [Advanced Excel formulas course](#)
- [Excel shortcuts](#)
- [All Excel resources](#)

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