Access the Rest of the Fundamentals Course

Financial Modeling Fundamentals Modules 2 and 3: Accounting and the 3 Financial Statements – Working Capital, Free Cash Flow, and Key Metrics and Ratios

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And now we return to the most important formula of all:

Company Value = Cash Flow / (Discount Rate – Cash Flow Growth Rate)

We have the 3 financial statements, including the Cash Flow Statement, so it's easy to determine "Cash Flow": We just take the "Net Change in Cash" from the bottom of the Cash Flow Statement, right?

WRONG!

The problem is that companies can spend their cash in tons of different ways, and not all these methods of spending cash are truly "necessary."

For example, if a company issues debt or equity, both activities boost its cash flow – but neither one is "required" for the business to keep operating.

A company could spend cash buying investments, issuing dividends, or repurchasing shares, but all those activities are also "optional."

So we need to estimate the company's **discretionary cash flow** each year – what it earns *after* paying for the items that it truly needs to run the business.

There are many definitions for "discretionary cash flow," but here's a very simple one: **Cash Flow from Operations minus Capital Expenditures (CapEx)**.

Many companies *do* define their "Free Cash Flow" like that.

Later on, we'll look at other variations and learn why it's not *quite* this simple when you value a company. But this definition is a good starting point.

Cash Flow from Operations minus CapEx is a good initial definition because:

- *Everything* in a company's "Operating Activities" section is assumed to be required for its business – earning Net Income, paying for Inventory, collecting Receivables, etc.

- But almost every line item within Investing and Financing Activities is "optional," except for Capital Expenditures.

CapEx is a "required" item because companies need buildings, factories, and equipment to manufacture products and sell them to customers.

Even companies that sell services or software need buildings and computer equipment, and spending on both of them is considered CapEx.

If a company generates positive Free Cash Flow, it can spend it in many ways:

1) It could **hire more employees**, i.e. increase its Operating Expenses, to do more marketing or develop new products.

2) It could **spend more on "Working Capital"** items like Inventory to get the materials and parts it needs to grow *in advance*.

3) It could **spend more on Capital Expenditures** to acquire more equipment, which should boost its long-term growth.

4) It could **invest in other assets** like stocks, bonds, or real estate so that it's at least doing "something" with its cash rather than earning 0% interest on it.

5) It could **repay its debt** to reduce its interest expense.

6) It could **return money to shareholders** by issuing dividends or repurchasing shares.

7) It could **acquire other companies** to expand into new markets or geographies.

Ideally, Free Cash Flow will be positive and growing each year, and it will be doing so because the company's sales and profits are growing.

If FCF is positive and growing, but the company's sales are declining, it might mean that the company is simply cutting expenses or "playing games" with its Working Capital or CapEx.

If FCF is **negative** or declining, you have to ask **why** before drawing conclusions.

For example, did FCF decline in just one year because of unusually high CapEx spending?

If so, that dip may not mean anything at all.

On the other hand, if FCF has been declining consistently because the company is becoming less profitable over time, that's a serious problem.

If a company gets into this situation and its cash balance starts to decline each year, it might have to raise debt or equity, restructure itself, or otherwise cut costs to keep running.

In real life, you use **Free Cash Flow** in the Discounted Cash Flow (DCF) analysis for valuing companies, and also in the Leveraged Buyout (LBO) analysis for assessing an acquisition and sale of a company.

You do not use *this* type of Free Cash Flow (CFO – CapEx), exactly, but you do use variations that are closely related to it.

Components of Free Cash Flow: Working Capital

To say much about a company's Free Cash Flow, you have to look at its individual components.

A big part of FCF is the company's Net Income: what it earns from core business activities and "side activities" after expenses and taxes.

Non-cash adjustments and Capital Expenditures also factor in, but those are fairly straightforward to understand.

One part that's **NOT** so straightforward is the company's "Working Capital."

The *official* definition of Working Capital is "Current Assets minus Current Liabilities":

Balance Sheet:		
Assets:	**Start of Period**	**End of Period**
Current Assets:		
Cash:	$ 300	$ 660
Short-Term Investments:	-	-
Accounts Receivable:	-	50
Inventory:	-	30
Prepaid Expenses:	-	30
Total Current Assets:	**300**	**770**
Long-Term Assets:		
Property, Plant & Equipment:	-	30
Goodwill:	100	50
Other Intangible Assets:	50	40
Long-Term Investments:	-	100
Total Long-Term Assets:	**150**	**220**
Total Assets:	**$ 450**	**$ 990**
Liabilities & Equity:		
Current Liabilities:		
Revolver (Short-Term Debt):	$ -	$ 50
Accounts Payable:	-	15
Accrued Expenses:	-	10
Deferred Revenue:	-	15
Total Current Liabilities:	**-**	**90**

Working Capital = $300 - $0 = $300 at the start of the period, and $770 - $90 = $680 at the end of the period, according to the "official definition" of it.

But by itself, this definition doesn't mean much. You care most about the **CHANGE** in Working Capital!

Also, you have to exclude cash, investments, and debt.

But if you define Working Capital this way, it will NOT affect a company's Free Cash Flow in a way that makes logical sense and that is consistent with the financial statements.

This is because the Cash Flow from Operations section of a company's Cash Flow Statement shows only the **CHANGE** in Working Capital, and it excludes certain items within Current Assets and Current Liabilities:

Cash Flow Statement:		
Cash Flow from Operating Activities:		
Net Income:	$	135
Depreciation:		10
Amortization of Intangible Assets:		10
Stock-Based Compensation:		20
Goodwill Impairment:		50
PP&E Write-Down:		10
Deferred Income Taxes:		50
(Gains) / Losses on Investment Sales		15
Change in Operating Assets & Liabilities:		
Change in Accounts Receivable:		(50)
Change in Inventory:		(30)
Change in Prepaid Expenses:		(30)
Change in Accounts Payable:		15
Change in Accrued Expenses:		10
Change in Deferred Revenue:		15
Cash Flow from Operations:	**$**	**230**

These items are what you *really* care about with "Working Capital": **the changes in operational items on the Balance Sheet**.

So you exclude cash, investments, and debt, and you also include any *longer-term* items that are, in fact, related to the company's operations.

You exclude cash because the Net Change in Cash appears at the bottom of the Cash Flow Statement.

You exclude items related to short and long-term investments because they're part of the company's Investing Activities in the next section of the CFS.

And you exclude debt-related items because they're part of a company's Financing Activities.

So the most **USEFUL** definition is:

Working Capital = Current Assets (Excluding Cash and Investments) – Current Liabilities (Excluding Debt)

This definition is sometimes called "Operating Working Capital," and you may also factor in certain Long-Term Assets and Liabilities *if they are related to the company's operations*.

And then you define the Change in Working Capital like this:

Change in Working Capital = Old Working Capital – New Working Capital

Normally, when you calculate a "Change," you take the new number and subtract the old number. So why is it different here?

To answer this question, pretend that a company's Working Capital consists of **only Inventory**.

In Year 2, it has $200 in Inventory, and in Year 1, it had $100 in Inventory. It has no other operationally-related Current Assets or Current Liabilities.

Therefore, its Working Capital was $100 in Year 1 and $200 in Year 2.

Since the company's Working Capital increased and Working Capital consists of **ONLY** Inventory, its Inventory must have increased. And if Inventory increased, the company must have **SPENT cash** to do that.

But if you calculated Working Capital this way: New WC – Old WC, it would show up as a *positive $100* on the Cash Flow Statement, which is wrong.

So to calculate the Change in Working Capital on the Cash Flow Statement, you must use Old Working Capital – New Working Capital.

When a company's Working Capital INCREASES, the company USES cash to do that.

When Working Capital DECREASES, it FREES UP cash.

If you add up all the items under "Change in Operating Assets & Liabilities" above, the sum is negative $70.

Since this change is negative, it means that the company's Current Assets (excluding cash and investments) are increasing by **MORE** than its Current Liabilities (excluding debt):

Balance Sheet:		
Assets:	**Start of Period**	**End of Period**
Current Assets:		
Cash:	$ 300	$ 660
Short-Term Investments:	-	-
Accounts Receivable:	-	50
Inventory:	-	30
Prepaid Expenses:	-	30
Total Current Assets:	**300**	**770**
Long-Term Assets:		
Property, Plant & Equipment:	-	30
Goodwill:	100	50
Other Intangible Assets:	50	40
Long-Term Investments:	-	[illegible]
Total Long-Term Assets:	**150**	**22[illegible]**
Total Assets:	**$ 450**	**$ 990**
Liabilities & Equity:		
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Revolver (Short-Term Debt):	$ -	$ 50
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Total Current Liabilities:	-	**90**

Cash Flow Statement:	
Cash Flow from Operating Activities:	
Net Income:	$ 135
Depreciation:	10
Amortization of Intangible Assets:	10
Stock-Based Compensation:	20
Goodwill Impairment:	50
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Deferred Income Taxes:	50
(Gains) / Losses on Investment Sales	15
Change in Operating Assets & Liabilities:	
Change in Accounts Receivable:	(50)
Change in Inventory:	(30)
Change in Prepaid Expenses:	(30)
Change in Accounts Payable:	15
Change in Accrued Expenses:	10
Change in Deferred Revenue:	15
[illegible] Flow from Operations:	**$ 230**
Cash Flow from Investing Activities:	
Capital Expenditures (CapEx):	$ (50)
Purchases of Short-Term Investment	(100)
Purchases of Long-Term Investment	(100)
[illegible]	85
Cash Flow from Investing:	**$ (165)**

These items add up to negative $70 here. That negative sign indicates that **Current Assets (excluding cash and investments) are increasing by MORE than Current Liabilities (excluding debt)**.

Current Assets have gone from $0 to $130, but Current Liabilities have only gone from $0 to $40.

If the Change in Working Capital were *positive* instead, it would mean that Current Liabilities (excluding debt) have increased by more than Current Assets (excluding cash and investments).

The Change in Working Capital tells you whether a company has to spend money BEFORE it can grow, or whether it generates extra money as a RESULT of its growth.

Companies such as **retailers** tend to have **negative Changes in Working Capital** because they have to spend on Inventory upfront before being able to sell anything.

Companies such as **subscription-based software companies** tend to have **positive Changes in Working Capital** because they collect cash from customers upfront, but take months or years to recognize it as revenue.

A company might also have a positive Change in Working Capital if it waits a long time to pay its suppliers, or if it has minimal Inventory or Accounts Receivable.

You can draw conclusions about a company's business model by calculating its Change in Working Capital and comparing it to the company's revenue and change in revenue.

For example, here are Wal-Mart's figures for one 3-year period:

Wal-Mart - Working Capital Excerpt from Cash Flow Statement:

Changes In Certain Assets and Liabilities:		Year 1	Year 2	Year 3
Accounts Receivable:		$ (796)	$ (614)	$ (566)
Inventories:		(3,727)	(2,759)	(1,667)
Accounts Payable:		2,687	1,061	531
Accrued Liabilities:		(935)	271	103
Accrued Taxes:		994	981	(1,224)
Net Change in (Operating) Working Capital:		**(1,777)**	**(1,060)**	**(2,823)**
Annual Revenue:	$ 421,395	$ 446,509	$ 468,651	$ 476,294
Change in Annual Revenue:		25,114	22,142	7,643
Annual Net Income:		16,387	17,756	16,695
Net Change as a % of Revenue:		(0.4%)	(0.2%)	(0.6%)
Net Change as a % of Change in Revenue:		(7.1%)	(4.8%)	(36.9%)
Net Change as a % of Net Income:		(10.8%)	(6.0%)	(16.9%)

As you can see, the company is spending a **huge amount** on Inventory, which is the main reason why its Change in Working Capital is negative each year.

Its Accounts Payable balance keeps increasing, resulting in positive cash flow, because it keeps suppliers waiting a fair bit before paying them.

When you compare the Change in Working Capital to the Change in Revenue, **the negative percentage indicates that Wal-Mart must SPEND additional cash to fuel its growth.**

This percentage is quite small, so it's not concerning, but it also means that the company doesn't get any "bonus" from growth. This negative Change in Working Capital will also reduce the company's Free Cash Flow, making it less valuable.

The Change in Working Capital tells you if the company needs to spend in ADVANCE of its growth, or if it generates extra money as a RESULT of its growth – and as a direct result, the company's Free Cash Flow is lower, making it less valuable, or higher, making it more valuable.

Once you have the individual components of a company's Free Cash Flow, you can start analyzing it and drawing conclusions about the company. Here's an example for Wal-Mart:

Wal-Mart - FCF Excerpt from Financial Statements:

Free Cash Flow Calculation:		Year 1	Year 2	Year 3
Cash Flow from Operations:	$ 23,643	$ 24,255	$ 25,591	$ 23,257
(-) Capital Expenditures:	(12,699)	(13,510)	(12,898)	(13,115)
Free Cash Flow:	**$ 10,944**	**$ 10,745**	**$ 12,693**	**$ 10,142**

Changes In Certain Assets and Liabilities:		Year 1	Year 2	Year 3
Accounts Receivable:		$ (796)	$ (614)	$ (566)
Inventories:		(3,727)	(2,759)	(1,667)
Accounts Payable:		2,687	1,061	531
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Net Change in (Operating) Working Capital:		**(1,777)**	**(1,060)**	**(2,823)**
Annual Revenue:	$ 421,395	$ 446,509	$ 468,651	$ 476,294
Annual Net Income:	16,993	16,387	17,756	16,695
Net Change in WC % Change in Revenue:		*(7.1%)*	*(4.8%)*	*(36.9%)*
Free Cash Flow Growth Rate:		*(1.8%)*	*18.1%*	*(20.1%)*
CapEx as a % of Cash Flow from Operations:		*55.7%*	*50.4%*	*56.4%*
CapEx as a % of Revenue:		*3.0%*	*2.8%*	*2.8%*
Revenue Growth Rate:		*6.0%*	*5.0%*	*1.6%*
Cash Flow from Operations Growth Rate:		*2.6%*	*5.5%*	*(9.1%)*

Even though the company's revenue is growing, its Free Cash Flow (FCF) and Cash Flow from Operations (CFO) have both declined because the Change in Working Capital was far more negative in Year 3.

Capital Expenditures also fluctuate quite a bit, sometimes increasing and sometimes decreasing when the company's sales grow.

Like most retailers, Wal-Mart needs to spend *in advance* of its growth because of its Inventory requirements. Those requirements aren't massive since the Change in Working Capital is a relatively small percentage of the Change in Revenue.

The Year 3 result seems to be an anomaly because Accrued Taxes suddenly became a large, negative number, indicating that the company made an owed tax payment. So the change from Year 1 to Year 2 may be more representative of the company as it grows.

Key Metrics and Ratios on the Financial Statements

Once you have a company's 3 financial statements, you can also calculate **metrics and ratios** to analyze them in more detail.

You already know one of these metrics: **Free Cash Flow**, or Cash Flow from Operations – CapEx.

Net Income, which represents the company's after-tax profits, is another important one.

A few others include:

- **EBIT (Earnings Before Interest and Taxes):** This is simply the company's Operating Income on the Income Statement, sometimes with "adjustments."
    - *Meaning:* It's sometimes a "proxy" for Free Cash Flow since, like FCF, it reflects the company's capital spending (as Depreciation appears somewhere above Operating Income on the Income Statement).
- **EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization):** Operating Income plus Depreciation and Amortization *taken from the Cash Flow Statement*.
    - *Meaning:* It's sometimes a "proxy" for Cash Flow from Operations since, like CFO, it adds back D&A and does not include Capital Expenditures at all.
- **NOPAT (Net Operating Profit After Taxes):** Operating Income * (1 – Tax Rate).
    - *Meaning:* What would a company's After-Tax Profits be if you ignored its interest income and expense, income from side activities, write-downs, and impairments?

Once you calculate these metrics, you can pair them up with the company's Equity, Assets, and Liabilities. A few examples:

- **Return on Equity (ROE):** Net Income / Average Equity
  - *Meaning:* For each $1.00 of equity raised or saved up, how much in after-tax profits does the company generate?
- **Return on Assets (ROA):** Net Income / Average Total Assets
  - *Meaning:* For each $1.00 in assets created or generated, how much in after-tax profits does the company generate?
- **Return on Invested Capital (ROIC):** NOPAT / Average Equity + Debt
  - *Meaning:* For each $1.00 of debt and equity raised, how much in after-tax Operating Income does the company generate? This metric measures how much it costs the business to **grow**.

You have to use **averages** for Balance Sheet figures when you mix them with Income Statement figures because the Balance Sheet represents only a snapshot in time, but the Income Statement represents an entire period.

You use these metrics to **compare peer companies in the same industry**.

For example, if a company's sales are growing at 20% and it has a ROE of 15%, but another company's sales are growing at 10%, and it has a ROE of 25%, that stands out.

The first company might be spending a lot more to grow, or it might be using more debt to fuel that growth, resulting in a higher interest expense and lower Net Income.

But you don't know until you look at each company's financial statements in depth; these metrics and ratios are like the clues in a murder mystery – not the full solution.

A few other metrics and ratios include:

- **Leverage Ratio:** Total Debt / EBITDA
  - *Meaning:* How much debt does a company have relative to its ability to repay that debt?
  - A **variation** is Net Debt / EBITDA; you subtract cash and investments from Debt to get "Net Debt," which paints a rosier picture of the company's obligations.
- **Interest Coverage Ratio:** EBITDA / Net Interest Expense
  - *Meaning:* How easily can a company pay the interest on its debt?
- **Dividend Payout Ratio:** Dividends / Net Income
  - *Meaning:* How much of the company's after-tax profits is it returning to shareholders?

You could also look at items like CapEx as percentages of revenue, or Depreciation as a percentage of CapEx; these don't have "official names," but they're useful for comparing companies' spending patterns.

Finally, there are a few useful Balance Sheet-based ratios.

You already know one of them: **Working Capital** or **Operating Working Capital**, which measures a company's cash requirements as its business grows. Others include:

- **Asset Turnover Ratio:** Revenue / Average Total Assets
  - *Meaning:* How dependent is a company on its assets to generate sales? A lower ratio indicates *greater* dependency.
- **Current Ratio:** Current Assets / Current Liabilities
  - *Meaning:* Can a company pay off its Current Liabilities using its Current Assets? The meaning is **VERY** different depending on what's in these categories.
- **Inventory Turnover:** COGS / Average Inventory
  - *Meaning:* How many times does a company turn its entire Inventory balance into finished products and sell them each year?
  - A related metric is **Days Inventory Outstanding**, which is 365 / Inventory Turnover. It tells you how many *days* the Inventory balance remains outstanding.
- **Receivables Turnover:** Revenue / Average Accounts Receivable
  - *Meaning:* How many times does a company collect the entire Receivables balance from customers each year?
  - A related metric is **Days Receivables Outstanding**, which is 365 / Receivables Turnover. It tells you how many *days* the Receivables balance remains outstanding.
- **Payables Turnover:** COGS or OpEx / Average Accounts Payable
  - *Meaning:* How many times does a company pay the full balance of invoices and owed payments each year?
  - A related metric is **Days Payables Outstanding**, which is 365 / Payables Turnover. It tells you how many *days* the Payables balance remains outstanding.

You don't need to memorize every single metric; the most important ones for interviews are EBIT and EBITDA.

You can use these metrics to analyze and compare companies. Here's an example for Wal-Mart:

Financial Information:	Year 1	Year 2	Year 3
EBIT:	26,491	27,725	26,872
(+) Depreciation & Amortization:	8,106	8,478	8,870
EBITDA:	$ 34,597	$ 36,203	$ 35,742
Free Cash Flow (FCF):	10,745	12,693	10,142
EBIT Margin:	*5.9%*	*5.9%*	*5.6%*
EBITDA Margin:	*7.7%*	*7.7%*	*7.5%*
FCF Margin:	*2.4%*	*2.7%*	*2.1%*
Net Operating Profit After Taxes (NOPAT):	18,014	18,853	18,273
Return on Equity (ROE):	23.4%	24.1%	21.9%
Return on Assets (ROA):	8.8%	9.0%	8.2%
Return on Invested Capital (ROIC):	14.4%	14.2%	13.3%
Total Debt / EBITDA:	1.5 x	1.5 x	1.6 x
EBITDA / Net Interest Expense:	16.0 x	17.5 x	16.1 x
Asset Turnover Ratio:	2.39 x	2.36 x	2.34 x
Current Ratio:	0.88 x	0.83 x	0.88 x
Inventory Turnover:	8.68 x	8.34 x	8.08 x
Days Inventory Outstanding:	*42.0*	*43.9*	*45.2*
Receivables Turnover:	80.99 x	73.77 x	70.85 x
Days Receivables Outstanding:	*4.5*	*5.0*	*5.2*
Payables Turnover:	9.53 x	9.43 x	9.49 x
Days Payables Outstanding:	*38.3*	*38.8*	*38.5*

The company's profitability, according to any metric, is declining slightly. Is this a pattern, or a "temporary blip"?

Why are these metrics all falling? Is the company using its capital less efficiently, or is it just a "temporary blip"?

The company seems to be using about the same proportion of debt each year.

The company is taking more time to sell its Inventory, and also collecting cash from customers more slowly. Could these be affecting the results above?

These metrics and ratios point you in the direction of items you should investigate in more detail, but they're just a **starting point** for that process – like clues in a murder mystery.

To complete the process, you'd have to calculate the same metrics and ratios for similar companies in the industry, dig into the companies' financial statements, and see what might be causing the outcomes above.

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