Financial Analysis

F305 Intermediate Corporate Finance

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Slide Set B2 – Financial Analysis

1

1

Phase 1 of Valuation Project

What I'm looking for:

Bullet Points

- Background on the firm
  - What it does
  - What markets it competes in
  - Principle competitors
- What the historical growth rates have been (revenues, profits)?
- Are margins increasing or decreasing?
- Describe the company's growth strategy in a paragraph
  - What does management expect its near-term growth rate to be?
  - Do you buy it? Do you think it will work?
- Tell me what you're considering for your short-term and perpetual revenue growth rates

2

Phase 1 of Valuation Project

This is an iterative process
I expect there to be some back and forth among your group on the numbers and what you're learning as you research

- How to deal with things you've never seen before, etc.

Nothing you submit now is final
I'm trying to make sure you're on the right path

- Revised due date for Phase 1 Submission is 5 PM on Friday, Oct 17th

3

Overview

Financial Statement Analysis is the gateway to building financial models.

It relies on understanding what's presented on the financial statements

It provides a meaningful way of determining the health of a firm and comparing it to others

4

What We Want to Get Out of Chapter 3

Compute and, more importantly, interpret some common ratios.

- Ratios standardize financial statements for comparison purposes.

Name the relationships that determines a firm's profitability.

- I.e., which ratios matter?

Explain some of the problems and pitfalls in financial statement analysis.

5

Liquidity Ratios

6

Category I: Liquidity Ratios

Why do companies go bankrupt?

- Too Much Debt?
- Sales Decline?
- Costs Increase?
- Poor Management Decisions/Strategy?
- Economic Downturns?

The reason companies fail is that ***THEY RUN OUT OF CASH.***

- As a result, monitoring LIQUIDITY is crucial

7

Liquidity Ratios

What do they measure?

- Firm's **short-term solvency**: how well can the firm pay its bills
- The ability to convert assets to cash (mostly A/R & Inventory) shows that the firm is "liquid"

Some important issues to consider:

- How quicky is inventory turned into a sold product?
- How quickly are receivables collected?
- Does the firm have easy access to borrowing?
  - Available external cash can substitute for low liquidity ratios—for a while

8

Some Widely-Used Liquidity Ratios

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

Answers the question:
Can we quickly liquidate assets to pay off all our maturing liabilities?

Why does QR take Inventory out?

$$Quick\ Ratio = \frac{Current\ Assets\ -\ Inventory}{Current\ Liabilities}$$

Inventory is comprised of three components:

- Raw Materials
- Work-in-Progress
- Finished Goods

More Easily Liquidated

As a result, the QR can be a better indicator of short-term liquidity for some firms

9

Some Widely-Used Liquidity Ratios

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Quick\ Ratio = \frac{Current\ Assets\ -\ Inventory}{Current\ Liabilities}$$

- What happens to the current ratio if a firm buys inventory with cash?
  - NOTHING. No Change
    - Cash ⬇ Reducing CA
    - Inv ⬆ Increasing CA
- What about the quick ratio?
  - QR declines!
    - Cash ⬇ Reducing CA
    - Inv 😐 is ignored

10

Question:

CJ's Cookies, Inc. has net working capital of $1,580, current liabilities of $4,930, and inventory of $1,775.

What is the current ratio?

What is the quick ratio?

11

Question:

CJ's Cookies, Inc. has net working capital of $1,580, current liabilities of $4,930, and inventory of $1,775.

What is the current ratio?

$$\mathbf{NWC = CA\ -CL}$$

CA = CL + NWC = $4,930 + $1,580 = $6,510

Current ratio = CA / CL = $6,510 / $4,930 = **1.32x**

What is the quick ratio?

Quick ratio = (CA – Inventory) / CL = ($6,510 – 1,775) / $4,930 = **0.96x**

Can we make any value judgments about CJ's operation based on these numbers?

12

Leverage Ratios

13

Category II: Leverage Ratios

What is "Leverage?"

- A measure of how much debt a firm has relative to other relevant categories

Why does Leverage matter?

- It helps optimize shareholder returns
  - "All Equity" capital structures are inefficient and expensive to maintain
  - Debt is cheaper than Equity

Optimal Capital Structure is Module C
For now, it's enough to know that leverage improves return ratios for shareholders

	NO Leverage	With Leverage
A/P	100	100
Other CL	25	25
Total CL	125	125
LT Liabilities	125	250
Total Liabilities	250	375
Total Equity	500	250
Total L&E	625	625
Net Income	50	50
ROA	8.0%	8.0%
ROE	10.0%	20.0%

14

Why Does Leverage Matter (continued)

At some point, if your leverage is viewed as too high, you can't raise additional external dollars

- Leverage Ratios are measures of long-term solvency
- How much debt needs to be serviced?
- How is our operation doing at producing sufficient cash to service it?

15

Two Categories of Debt-Related Ratios

Coverage Ratios:

- Measure firm's ability to service interest payments
- Measure the ability to service interest & principal

High coverage ratios: firm can generate enough cash to make payments

Leverage Ratios:

- Measure the amount of debt relative to
  - Cash creation
  - Equity
  - Total Capitalization

High leverage ratios: firm risking financial distress if conditions deteriorate

Low leverage ratios: firm isn't taking advantage of the benefits of debt in its capital structure

16

Leverage

This one is key. The One that Matters

- Answers the Question: How many years' worth of cash flow do we have in debt?
  - Banks can only go so high, depending on the structure (4x?)
  - Other lenders (e.g., private credit, institutional investors, etc.) can go higher

The standard for comparison across the Finance Industry

17

Debt/EBITDA - Drawbacks

Excludes CapEx

- D&A is a proxy for required CapEx
- You can't run a company w/o CapEx!
- Including it in the "leverageable amount" creates the concept that the D&A can be used to cover debt instead

Excludes Interest & Taxes

- Try not paying them and see what happens
- Including them in the leverageable amount is distortion

Ignores CF Variability

- Start at 3x, end the year at 4x without borrowing another $1

For this reason, firms with VERY CONSISTENT cash generation (by any measure) can tolerate higher levels of debt (leverage).

18

Leverage

Debt-to-EBITDA	Total Debt / EBITDA
Debt-to-Equity	Total Debt / Total Equity
Debt-to-Capitalization	Total Debt / Total Debt + Total Equity
Total Debt Ratio	Total Debt / Total Assets
Equity Multiplier	Total Assets / Total Equity

NOTE: Numerators can be modified
- Net Debt (Debt minus cash)
- Senior Debt (excludes any subordinated debt)
- Unsecured or Secured Debt (takes lien priority into account)

Comes into play in a way that you'll see shortly

19

Coverage

Interest Coverage	EBITDA / Interest
	EBIT / Interest
Fixed Charge Coverage	EBITDA - CapEx / Scheduled Principal + Interest

If these numbers get below 1.2x, there's generally trouble afoot

Do we have enough cash flow after spending to keep the operation going to cover the principal and interest payments?

20

Question:

Bonnie's Biscuits has a Total Debt Ratio of 0.25x.

What is the Debt-to-Equity Ratio?

Total debt ratio = TD / TA = 0.25 ⟶ 0.25 / 1.00
TA = TD+TE
If 1.00 = (0.25 + TE), then TE = 0.75

Debt/Equity ratio = TD / TE = 0.25 / 0.75 = 0.33x

What is the Equity Multiplier?

Equity Multiplier = TA / TE = 1.00 / 0.75
Equity Multiplier = 1.33x

ALTERNATIVE: Equity Multiplier = 1 + Debt/Equity Ratio

21

Efficiency Ratios

22

Category III: Efficiency Ratios

Measure how efficiently the firm uses its assets to generate sales

- Looks at both fixed and current assets
- **Turnover ratios:**
  - How quickly are you turning assets (A/R, Inv) into cash?
  - How quickly are you paying off your suppliers (using your cash)?
  - How much sales are you generating using an underlying asset?
    - Numerator is generally sales (or COGS)
    - Denominator is always an asset value

These ratios are very industry-dependent

- Utility companies have huge fixed cost structures and have few A/R (everything collects in 1 month)
- Retail firms have massive inventories but rent their warehouses (or don't have warehouses at all!)

23

Calculating Days

Receivables Turnover	$\frac{\text{Sales}}{\text{Accounts Receivable}}$	Days Receivable	$\frac{365}{\text{Receivables Turnover}}$
Inventory Turnover	$\frac{\text{COGS}}{\text{Inventory}}$	Days Inventory	$\frac{365}{\text{Inventory Turnover}}$
Payables Turnover	$\frac{\text{COGS}}{\text{Accounts Payable}}$	Days Payable	$\frac{365}{\text{Payables Turnover}}$

24

Two Other Efficiency Ratios

$$\text{NWC Turnover} = \frac{\text{Sales}}{\text{NWC}}$$

$$\text{Fixed Asset Turnover} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

How efficiently are we converting our NFA into Sales?
How many $ of sales do our NFAs generate?
Is what we're spending on CapEx resulting in higher sales?

The linkage between NFA and Sales is not necessarily direct.
If we went on a CapEx buying binge, lots of forces come into play on whether that turns into more sales.
Investors use it to judge the effectiveness of management's CapEx spending.

25

Example

O'Reilly Automotive has the following balance sheet:

($mm)

Balance Sheet as of:	Dec-31-2023
ASSETS	
Total Cash & ST Investments	**279.1**
Total Receivables	**515.5**
Inventory	4,658.4
Other Current Assets	105.3
Total Current Assets	**5,558.3**
Net Property, Plant & Equipment	**7,237.5**
Other Long-Term Assets	1,077.2
Total Assets	**13,873.0**
LIABILITIES	
Accounts Payable	6,091.7
Other Current Liabilities	1,569.7
Total Current Liabilities	**7,661.4**
Long-Term Debt	5,570.1
Other Long-Term Liabilities	2,380.8
Total Liabilities	**15,612.3**
Total Equity	**(1,739.3)**
Total Liabilities And Equity	**13,873.0**

Sales for the year were $15,812.3
COGS were $7,707.4

- How long on average did ORLY hold inventory?
- What was Inventory Turnover?

26

ORLY Inventory

($mm)

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Total Liabilities	**15,612.3**
Total Equity	**(1,739.3)**
Total Liabilities And Equity	**13,873.0**

Sales: 15,812.3

COGS: 7,707.4

$$Days\ Inventory = \frac{Inventory}{COGS/365} = \frac{4,658.4}{7,707.4/365} = 220.61 \approx 221\ Days$$

$$Inventory\ Turnover = \frac{COGS}{Inventory} = \frac{7,707.4}{4,658.4} = 1.65x$$

OR:

$$Inventory\ Turnover = \frac{365}{Days} = \frac{365}{221} = 1.65x$$

27

Example 2

O'Reilly Automotive has the following balance sheet:

($mm) Balance Sheet as of:	Dec-31-2023
ASSETS	
Total Cash & ST Investments	**279.1**
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Total Liabilities And Equity	**13,873.0**

Sales for the year were $15,812.3

COGS were $7,707.4

- What was Payables Turnover?
- How long on average did it take ORLY to pay its suppliers?

28

ORLY Payables

Sales: 15,812.3

COGS: 7,707.4

$$Days\ Payabe\ = \frac{Payable}{COGS/365} = \frac{6{,}091.7}{7{,}707.4/365} = 288.49\ \approx 288\ Days$$

$$Inventory\ Turnover = \frac{COGS}{Payables} = \frac{7{,}707.4}{6{,}091.4} = 1.27x$$

OR:

$$Inventory\ Turnover = \frac{365}{Days} = \frac{365}{288} = 1.27x$$

($mm) Balance Sheet as of:	Dec-31-2023
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Total Liabilities And Equity	**13,873.0**

29

What Does This Tell Us?

Days in Inventory = = 221 days

Days Payable = = 288 days

?

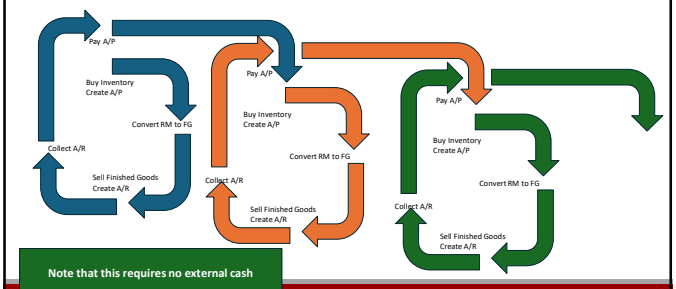
Selling the Inventory before you pay for it from Suppliers
Effectively creates Costless Borrowing

Using the Supplier's Money instead of borrowing yourself

What Does This Tell Us?
Why is it important?

30

The Optimal Working Capital Cycle



Note that this requires no external cash

31

Cash Conversion Cycle

- Buy Raw Materials
- Convert it to a Finished Good
- Sell it (on credit)
- Collect the Receivable

Cash Conversion Cycle = A/R Days + Inv Days - A/P Days

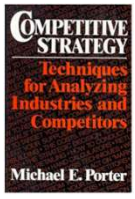
How much power you have over suppliers and customers drives this number

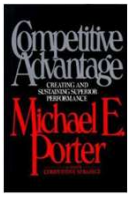
32

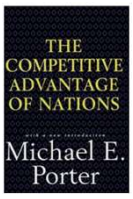
Michael Porter

Harvard Business School

Michael Porter is the founder of the modern strategy field and one of the world's most influential thinkers on management and competitiveness.







33

Porter's Five Forces

This drives so much of firm behavior

- When we pay our bills
- When we can expect to collect
- Our pricing level and ability to change
- How much inventory we should hold
- How aggressively we need to be on CapEx
- Our ability to grow market share

Understanding your selected firm's competitive position will be important for your Valuation

34

Supplier Relationships

Driven by which party has leverage (power) in the relationship.
The larger company generally has more relationship leverage

- Either as a supplier or a customer

If you need steel, there are only a few companies you can go to, so they have loads of power in the relationship. (Think Boeing and commercial aircraft)

If you're one of the only large-scale sellers of a product (think Wal-Mart, AutoZone/O'Reilly, Amazon, Home Depot, Target) and they want to carry your product, you're under their control

This matters for things like:

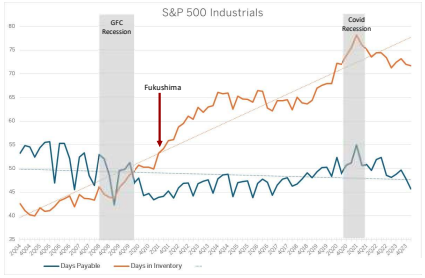
- Pricing
- Payment terms
  - When you pay them
  - When they pay you
- Delivery times
- Priority in the face of scarcity

As a result, these relationships affect

- Cash / Borrowings
- A/R
- Inventory
- A/P

35

Growth in Inventory



DECREASED EFFICIENCY

- Effect of Recessions
- Fukushima—March 11, 2011

- More investment tied up in inventory requires more cash to buy it
  - External (suppliers, banks)
  - Internal (cash flow, redirected resources)

36

When Projecting Financial Statements:

Given Sales and Gross Margin and Days, calculate:

- Accounts Receivable Balance
- Inventory Balance
- Accounts Payable Balance

Why are we doing this? When you do your valuation, you will project Sales and Gross Margin and Days.

You'll need to compute A/R, Inv, A/P to calculate Δ in NWC

37

DuPont and Profitability Ratios

38

Profitability Ratios

Profit per dollar of assets:

- *Return on Assets*
- $\frac{Net\ Income}{Total\ Assets}$
- Feels like an efficiency ratio

Profit per dollar of equity

- *Return on Equity*
- $\frac{Net\ Income}{Equity}$
- How well did management do for shareholders?

39

The DuPont Identity

The DuPont identity, also known as DuPont analysis, is named after the DuPont Corporation, where Frank Donaldson Brown, an explosives salesman, developed the formula in 1914. DuPont began using it in the 1920s to evaluate the company's return on investment. The formula became widely adopted over time. **Over 100 years later, we're still teaching it.**

$$\text{ROE} = \frac{Net\ Income}{Revenue} * \frac{Revenue}{Total\ Assets} * \frac{Total\ Assets}{Total\ Equity}$$

Being able to understand and manipulate this equation ***is important***

40

Breaking it Down

$$\text{ROE} = \frac{Net\ Income}{\cancel{Revenue}} * \frac{\cancel{Revenue}}{Total\ Assets} * \frac{Total\ Assets}{Total\ Equity}$$

Return On Assets | Equity Multiplier

$$\text{ROE} = \frac{Net\ Income}{Revenue} * \frac{Revenue}{\cancel{Total\ Assets}} * \frac{\cancel{Total\ Assets}}{Total\ Equity}$$

Net Profit Margin | Return On Equity

41

The Importance of DuPont

$$Return\ on\ Equity = \frac{Net\ Income}{Revenue} * \frac{Revenue}{Total\ Assets} * \frac{Total\ Assets}{Total\ Equity}$$

$$ROE = NPM * TAT * EM$$

Disaggregating ROE into these three components, you can see what drives the ROE

Increased ROE comes from:
- Higher Net Profit Margin
- Increased Efficiency in Asset Utilization to generate more revenue
- Higher Financial Leverage (but not so high that it endangers solvency)
  - More debt reduces Net Profit Margin due to interest expense

42

Exercise

Seaborn Clothing has sales of $34 million, total assets of $25 million, and total debt of $6 million.

If the net profit margin is 9%, what is the net income?

Sales	34
Net Profit Margin	9%
Net Income	3.06

What is the ROA?

$$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} = \frac{3.06}{25} = 12.24\%$$

What is the ROE?

Total Assets	25
Total Debt	6
Total Equity	19

$$\text{ROE} = \frac{\text{Net Income}}{\text{Total Equity}} = \frac{3.06}{19} = 16.11\%$$

43

Internal & Sustainable Growth Rates

44

These Answer the Question

How fast can we grow without additional funding?

- Internal Growth Rate:
  - Without Any External Financing
- Sustainable Growth Rate:
  - Without EQUITY **and** maintaining existing leverage

45

The "Retention Ratio"

Sometimes referred to as the "Plowback Ratio"

How much of Net Income do we keep?

Net Income – Dividends = Δ in Retained Earnings

Net Income * (1 – Dividend Payout Ratio) = Δ in Retained Earnings

The Retention Ratio = $\frac{\Delta \text{ in Retained Earnings}}{\text{Net Income}}$

46

Internal Growth Rate

Internal growth rate: Maximum growth *with no external financing*

THAT IS: You can't grow faster than your IGR for very long without either more debt or more equity

$$IGR = \frac{ROA * Retention\ Ratio}{1 - (ROA * Retention\ Ratio)}$$

Remember: INTERNAL = ROAssets = No External Money

47

Sustainable Growth Rate

Sustainable growth rate: Maximum growth feasible without external equity financing and a constant debt-to-equity ratio

THAT IS: You can't grow faster than your SGR for very long without either more leverage or more equity or both

$$SGR = \frac{ROE * Retention\ Ratio}{1 - (ROE * Retention\ Ratio)}$$

Remember

Sustainable = ROEquity = No New EQUITY & Constant Leverage

48

Example

In 2022, Young's Knife Corp. had

- ROE of 9.76%
- ROA of 4.18%.
- 46.377% of earnings were paid as a dividend

What is the growth rate that HP can achieve without issuing equity, but maintaining its current debt-to-equity ratio?

What is the growth rate that HP can achieve with no additional external financing?

49

Example Solution

In 2022, Young's Knife Corp. had

- ROE of 9.76%
- ROA of 4.18%.
- 46.377% of earnings were paid as a dividend

What is the growth rate that YKC can achieve without issuing equity, but maintaining its current debt-to-equity ratio?

- Which Ratio is this? Internal or Sustainable Growth?

Constant D/E Ratio = Sustainable

- What is the Retention Ratio?

Retention Ratio = 1 – Dividend Payout

So:

$$\text{Sustainable Growth Rate} \quad \frac{\text{ROE} * \text{Retention Ratio}}{1 - (\text{ROE} * \text{Retention Ratio})}$$

ROE * RR = 5.234%
1 – ROE * RR = 94.766%

SGR = 5.52%

50

Sustainable Growth

So: $\frac{ROE * Retention\ Ratio}{1 - (ROE * Retention\ Ratio)}$ ⟹ $\frac{\frac{Net\ Income}{Equity} * 1 - \left(\frac{Dividends}{Net\ Income}\right)}{1 - \left[\left(\frac{Net\ Income}{Equity}\right) * 1 - \left(\frac{Dividends}{Net\ Income}\right)\right]}$

What is this telling us?

- If Net Income was higher, or Total Equity was lower (increasing ROE), we could have more growth with the same leverage level
- If we'd retain more of our profits instead of paying them out, we could have more growth at the same leverage level

51

Example Solution

In 2022, Young's Knife Corp. had
- ROE of 9.76%
- ROA of 4.18%.
- 46.377% of earnings were paid as a dividend

What is the growth rate that YKC can achieve with no additional external financing?

- Which Ratio is this? Internal or Sustainable Growth?

No External Financing = **Internal**

- What is the Retention Ratio?

Retention Ratio = 1 – Dividend Payout

So:

$$IGR = \frac{ROA * Retention\ Ratio}{1 - (ROA * Retention\ Ratio)}$$

ROA * RR = 2.241%
1 – ROE * RR = 97.756%

IGR = 2.29%

52

Conclusion

Many ways to measure the firm's liquidity, solvency & efficiency

Get comfortable with what the ratios are trying to tell you

Remember that quantitative judgments about individual ratios are challenging without having something to compare it to (history, industry peers, etc.)

53

Up Next

Applying All This to Your Valuation Project

54