Asset Pricing and Risk Management

FINTECH 522

Jake Vestal

Class 4:

Equities

Use the Teams Channels!

- Keep 522 separate from 533
- **Link is in Sakai Overview page, also here:**
  - https://teams.microsoft.com/l/channel/19%3au7BRwUXtx9CjLSxDAaMwgPmXgzbotB9ZyapGF6tgytc1%40thread.tacv2/General?groupId=248729ba-9b05-47c7-92d3-0117307b9e65&tenantId=cb72c54e-4a31-4d9e-b14a-1ea36dfac94c

Common Stock

Stockholders are owners of the firm and the residual claimant

- Stockholders have the right to:
  - Vote at company meetings
  - Dividends and other distributions
  - Sell their shares
- Stockholders benefit in three ways:
  - **Dividends** – periodic payments
  - **Capital gains** – appreciation in value
  - **Control** – have a say in company decisions
- Stock is issued by public corporations
  - To finance investments
  - To acquire other companies
  - To repurchase debt

Stock Transactions

Buy

"**Long**" **position**: makes money if stock increases in value

Sell

Liquidity needs: you need cash instead of stock for some reason

- Want to finance a more appealing investment
- Part of an algorithmic strategy
- Expect stock to decline in value

- "**Short**" **position**: sell a stock that you don't own, meaning that you *owe* or are *short* some number of shares of that stock.

  - if stock gets delisted, you don't pay it back

Life Cycle of a Short Stock Position

Say you wish to short a stock XYZ.

1) **Within your trade execution system, sell more shares of XYZ than you own (** i.e., **ENTER** the short position**)**
2) **Your brokerage then finds that number of XYZ shares owned by someone else, sells them, and puts the cash from the sale into your account!**
3) **While the short position is open:**
   a) You may use the cash to do something else
   b) **You must pay interest on the short position** while it's open
   c) Your execution system tells you that you own a **negative** number of XYZ shares.
4) **Give the stock back to its owner**
   - i.e., **exit** the short position
   - i.e., **buy to cover**
   - You do this by issuing an order to buy the stock in your execution system.

Short Fees

You might think that the expected return of shorting a stock equals the negative of the expected return of buying the stock long: = , **but this is not the case .**

Two reasons :

1. A ***short fee*** is applied to your short position while it's open
2. Your profits from shorting are *always* considered ***short-term capital gains*** and therefore may be taxed at a higher rate than your long positions.
3. On the hook for dividends

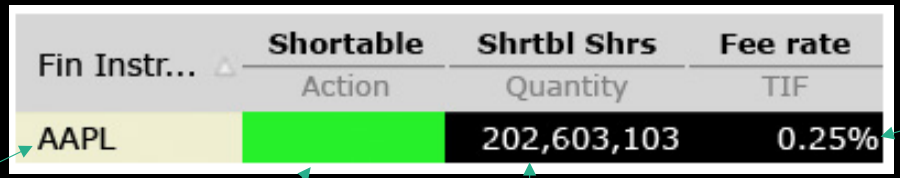
The thing to remember is :

For the same stock, **is always less than** !!

Short Fees: Example

Let's say you want to short Apple (NYSE: AAPL).

Your Execution System Says:



In Apple's case: a lot. For smaller, less common stocks, this number might be lower than the amount you'd like to short.

Short Fee

- As always, **read the fine print** to be sure you understand this!
- It's common for the short fee to be *applied daily* – every calendar day, *not* every trading day – to your short position, and charged to your account *monthly*.

Short Fees: Example

Let's say you want to short Apple (NYSE: AAPL).

Your Execution System Says:

Fin Instr...	Shortable	Shrtbl Shrs	Fee rate
	Action	Quantity	TIF
AAPL		202,603,103	0.25%

Short Fee

Short Fee: Fine Print

- Sometimes hard to find! May have to have a support chat with your brokerage to verify your understanding.
- **Remember**: From your brokerage's perspective, **YOU ARE THE CUSTOMER** . You have my express permission to be *as irritating as you need to be* (in a respectful way) to customer support until you're comfortable you understand how this works!!!

In Interactive Brokers' (NYSE: IBKR) case :

Short fee is represented as an annual, continuously compounded rate having a 360-day accounting basis.

? But, for example, maybe we need the rate on a *trading year* basis:

So convert the two CCRs

bond: 250 day trading yr
stock: 252 day trading yr

Brokerages must overcome several challenges to offer shorting as a service.

- In order to execute your short sale, **your brokerage must be able to obtain enough shares of the stock** you want to short, either from one of the brokerage's other clients or from clients at other brokerages who collaborate to offer this service.
- Participating in a brokerage's shorting program – i.e., making shares available for shorting – is **optional** for traders. **Why would they want to do this**?
- Because **the original owner of the stock receives a small premium** in exchange for making the shares available for shorting! (in finance, *nothing* is free)
- **The original owner sees no difference in their stock positions** while the shares are being lent; e.g., if you owned 100 shares of AAPL and 50 were lent out to allow someone else to short, then you would *still* be able to sell your 100 shares at any time!

The Stock Market

- All US and global equities that are available to trade
- Value of all global equities (stocks) that are publicly tradeable is about $70 trillion
  - The US is the largest single market…
  - …but more than 50% of this value is outside the US
- Stock prices are affected by:
  - Economic environment – interest rates / FED
  - Company fundamentals (sales, earnings, news, etc.) – balance sheet
  - Market psychology (herd behavior, sentiment, **over** and **underreaction**)
- Stock exchanges are forums for publicly traded equities (i.e. where you can buy and sell)
  - US: NYSE, NASDAQ
  - Japan: NIKKEI
  - Hong Kong: Hang Seng
- Stock exchanges are becoming increasingly virtual (on-line trading)

Stock Indices

- Stock market indices track the “average” returns on a bundle of stocks in a particular market (geographical, e.g. US, UK, Germany) or market segments (e.g. small companies, specific industries, or other categorizations)
- How are the stocks in the index “weighted”?
  - Price weighted (DJIA): equivalent to holding one share of each company in the index
  - Market-value weighted (S&P500, NASDAQ): weighted on the basis of Market Capitalization (larger firms more heavily weighted in the index)

Siblis – backtesting data

Financial Statement Analysis

- Three main financial statements
  - Balance Sheet = equity
    - a snapshot at a moment in time
    - What the company owns (assets)
    - What it owes to others (liabilities)
    - Remainder: accrues to owners (equity)
  - Income Statement – a report of flows
    - How much money the company makes (revenue)
    - What are the costs of producing (expenses)
    - The difference between the two (profit)
  - Cash Flow Statement – also a report of flows
    - What cash has come in or out

Balance Sheet

Assets

($mm)	2006
Cash & Equivalents	246.6
Receivables, Net	212.0
Inventories	88.0
Other Current Assets	12.0
Current Assets	558.6
PP&E, Net	755.8
Other Assets	5.0
Total Assets	1,319.4

- Note distinction between “current assets” (some of which could be liquidated immediately) and longer term, fixed & intangible assets. Why is this distinction important?
- The Asset side of the balance sheet reflects the operations of the firm

Liabilities & Equity

($mm)	2006
Payables	148.9
Short-Term Borrowings	10.0
Other Current Liabilities	16.0
Current Liabilities	174.9
Long Term Debt	112.0
Other Liabilities	55.0
Stockholders' Equity	977.5
Total Liabilities and Equity	1,319.4

- What type of financial instrument might be included in “long-term debt”?
- Note that these are “book” values, and may not equal the firm’s “market” value
- Liabilities and equity reflect the financing aspect of the firm

Balance Sheet

Its usefulness

- Gives information about the liquidity of a company
- Tells us how “asset intensive” a company is or how many assets (machines, buildings, equipment) are necessary
- Tells us about the ability of a company to meet its long-term fixed expenses and to accomplish long-term growth

Its limitations

- Assets are recorded at historical cost rather than at market value (what you paid, not what it’s “worth” or the price at which you could sell the asset)
- Resources such as employee skills and reputation are NOT recorded on balance sheet

Income & Cash Flow Statements

Income

Revenues	1,220.30
less COGS (cost of goods sold)	756.60
Less S,G&A expense	303.20
EBITDA	160.50
less D&A	37.80
EBIT	122.70
Less Interest Expense	7.30
Pre-tax Income	115.40
Taxes	39.24
Net Income	76.16

Cash flow

Net Income	76.16
D&A addback	37.80
Change in working Capital	5.50
Less Capex	(45.80)
Free Cash Flow	73.66

Income Statement

Its usefulness

- Summarizes sales and profits and losses (P&L) over a period of time
- Lets us look at changes in key line items and ratios across time to see whether operations have been changing and in what direction

Its limitations

- Difficult to compare some ratios for companies in different industries
- Management teams have lots of options for accounting practices within the income statement
- Revenues reported don't always equal cash collected, and expenses reported aren't always equal to cash paid, so net income is not the same as cashflow for the period

Cash Flow Statement

- Free cash flow is what a company has left over at the end of the year - or quarter - after paying all its employees' salaries, its bills, its interest on debt, and its taxes, and after making capital expenditures to expand the business
- Investors often refer to this as the “cash” that the company is producing. The company can decide what to do with the cash (expand, pay a dividend, pay down debt, etc).

Where to Get this Info?

- Use EDGAR: https://www.sec.gov/edgar/search-and-access
- US-listed equities & financial statements in an easily scrapable & downloadable format.

Company Valuation Comparables

- Financial Analysts often use ratios to evaluate firms relative to their peers. Typical Ratios include
  - **EBITDA Multiple**: Enterprise Value / EBITDA
  - **Net Income Multiple**: Equity Value / Net Income
    - Equity value (or Market Capitalization, or MCAP) is calculated as Price per share x number of shares outstanding
    - Net Income / number of shares = Earnings per share (EPS)
    - Hence the Net Income multiple = Price/Earnings ratio (P/EPS)
- Why use ratios rather than absolute values?
- Why use ratios when we can use discounted cash flows?

* Enterprise Value = Equity Value + Net Debt . Net debt = short term debt + long term debt – cash + minority interest preferred stock Think of Enterprise Value as the value of the firm that is of interest to both owners & lenders (e.g. bond holders)

Price/Earnings Ratio

Comparison Between Firms:

1. **Firm A** has a share price of $66. **Firm B** has a share price of $75. Is **Firm B** more valuable? Or should we buy **Firm A** because it is “cheaper”?
2. **Firm A** has EPS of $3.30 this year. **Firm B** has EPS of $3.00. Is **Firm A** more valuable because its EPS is higher?
3. **Firm A** has a P/E ratio of 20. **Firm B** has a P/E ratio of 25. Should we buy **Firm B** because it has a higher P/E ratio?

EBITDA Multiple

- Financial analysts use EBITDA multiples more than any other multiple, as a way to compare firms' performance
- **What are the benefits of using EBITDA multiples rather than P/E multiples?**
  - Enterprise value encompasses the overall value of the firm to all stakeholders – both equity and bond holders
  - EBITDA captures the operations of the firm – its business-related profit – without taking into account the financing aspect. Thus it is better for comparing two firms in the same industry that might have very different financing structures

Valuation Using Comparables

Company	Ticker	Share Price (US$) [1]	Fully Diluted Shares (FY10) [2]	Market Value 3/3/11	Enterprise Value [1] 3/3/11	EBITDA [3] 2011E	EPS [3] 2011E
Caribou Coffee	CBOU	9.81	20.1	197.6	171.3	28.0	0.61
JM Smucker	SJM	69.70	118.3	8,247.6	8,780.0	1,076.0	4.66
Starbucks	SBUX	33.01	746.0	24,625.5	22,530.0	2,184.0	1.49
Peet's Coffee & Tea	PEET	47.87	13.1	625.2	552.0	50.7	1.59
Sara Lee	SLE	17.10	622.4	10,643.7	11,100.0	1,314.0	0.87
SodaStream Intl	SODA	40.65	6.3	255.3	298.9	30.0	0.90
Green Mountain Coffee	GMCR	42.01	141.0	5,948.6	6,800.0	431.0	1.20

Company	Ticker	P/E Ratio 2011E	EBITDA Multiple 2011E
Caribou Coffee	CBOU	16.1	6.1
JM Smucker	SJM	15.0	8.2
Starbucks	SBUX	22.2	10.3
Peet's Coffee & Tea	PEET	30.1	10.9
Sara Lee	SLE	19.7	8.4
SodaStream Internatior	SODA	45.2	10.0
Mean		24.7	9.0
Median		20.9	9.2
High		45.2	10.9
Low		15.0	6.1
Green Mountain Coffee	GMCR	35.0	15.8

- How do Green Mountain's multiples look, relative to their competitors?
- Does it look like a good equity investment? What about as a potential acquisition target financing structures?

[1]Yahoo finance
[2]Company 10K
[3]Thomson Reuters estimates

Valuation Using P/E Multiples

- Compare comparables median P/E with GMCR P/E (why use median rather than mean?)
  - Median comparables P/E is 20.9
  - GMCR P/E (current share price / 2011 est. earnings) = 35
  - Why is GMCR P/E so much higher?
- Equivalently: GMCR market value relative to MCAP implied by peers
  - GMCR 2011 estimated EPS is 1.20, with 141.0 Mill shares outstanding: estimated total earnings = $169.2 Mill
  - GMCR MCAP = 20.9 x 169.2 = $3,536 (using comparables P/E)
  - GMCR actual MCAP (current share price x # shares) = $5,948.6
  - Thus market share price implies higher value for GMCR
- Is GMCR overvalued?

Valuation Using EBITDA Multiples

EBITDA Multiples comparison

- Median comparables EBITDA multiple is 9.2
- GMCR 2011 estimated EBITDA multiple is 15.8 (EV / 2011 estimated EBITDA)

Equivalently: Enterprise Value implied by peer multiple

- Implied GMCR Enterprise Value using peer multiple: 9.2 x 431 = $3,968
- GMCR actual Enterprise Value = $6,800

- Is GMCR overvalued?
- Note that both EBITDA multiple and P/E ratio for GMCR are higher than peers' average. Would it be surprising for one of these multiples to be greater than peer average, while the other was lower?