Test 3, Lecture 1 Review

ACCOUNTING INCOME VS. CASH FLOW

What are the 3 Basic Differences Between Accounting Income and Cash Flow?

1. Matching Principle: accounting recognizes revenues and expenses as they occur, while finance focuses on cash flows
2. Finance looks at the impact of the project on the entire firm
3. Finance values opportunity cost

We can use cash flow estimation to evaluate new projects for the firm and to also value the firm as a whole

* To estimate the value of a firm, we need the firms Free Cash Flow (FCF)
	+ Free Cash Flow: the cash flow available for distribution to all investors after the company has made all the investments in fixed assets, new products, and working capital necessary to sustain ongoing operations
		- FCFs are the cash flows created by the firm before any investors are paid through dividends or interest payout

$$FCF\_{t}=cash flows from operations-investment in NWC-investment in PPE$$

* Cash Flows From Operations:
	+ Found on the income statement
	+ $=EBIT\*\left(1-Tax Rate\right)+Depreciation$
* Investment In NWC:
	+ Found on the balance sheet
	+ Net Working Capital: short term assets and liabilities used to support operations

$$NWC=current assets-current liabilities$$

\*\*\*excludes any investments or investors (i.e. notes payable)

$$Investment in NWC=∆NWC$$

$$∆NWC=NWC at end of year-NWC at beginning of year$$

* An increase in inventory increases NWC which decreases FCF
* Investment in PPE:
	+ Found on the balance sheet (fixed assets)

$$Investment in GrossPPE=∆GrossPPE$$

$$∆GrossPPE=GrossPPE at end of year-GrossPPE at beginning of year$$

$$FCF\_{t}=\left[EBIT\*\left(1-T\right)+D\_{t}\right]-\left[∆NWC\right]-[GrossPPE]$$

* A FCF < 0 means that firm had to raise additional capital in that year
	+ This isn’t necessarily bad
		- For a growing firm, a FCF < 0 is typical
		- For established firms, a FCF < 0 is a red flag

Once the firm has the PV of all FCFs, how do they determine the fair value of a share of company stock?

1. Value of Asset = PV of CFs it pays investors
2. Firm Value = PV of FCFs it pays investors
3. Enterprise Value

$$Firm Value=Estimated Enterprise Value$$

$$EV=MV of CS+MV of PS+MV of Debt-Cash$$

Steps in Determining the Equity Value per Share

1. Estimate or predict planning period dividends
	1. Planning Period Dividends = Predictable FCFs
2. Find the value of all FCFs in the forecasting period
	1. Forecasting Period = Beyond the Planning Period

$$TV\_{N}=\frac{FCF\_{N}\*(1+g)}{WACC-g}$$

$TV\_{N}$ = Terminal Value at time N (firm selling price at time N)

WACC = r = cost of capital (%) = return you have to get for the average investor

g = Growth rate in FCFs

1. Find the NPV of the Planning Period - Terminal Value

$$NPV=\frac{FCF\_{1}}{1+r}+\frac{FCF\_{2}}{(1+r)^{2}}+…+\frac{FCF\_{N}}{(1+r)^{N}}$$

Solve using CF on calculator

1. Plug in numbers to the EV equation and solve for MV of CS
	1. To find the per share value, divide MV of CS by the # of shares

Strengths and Weaknesses of the FCF Valuation Approach

* Pros:
	+ Uses cost of capital (r = WACC)
	+ Uses financials to determine value
* Cons:
	+ Everything is based on predictions
	+ Its hard to estimate FCF
	+ Stock price is sensitive to your choice of growth rate

MULTIPLES

Another approach to valuing firms is through multiples

* Multiple: a measure of implied value that comes from the value of a company compared to some financial metric on its income statement or balance sheet
	+ Pretty accurate

$$multiple=\frac{value }{performance}=\frac{enterprise value}{EBITDA}=\frac{MV\_{C}}{VI\_{C}}$$

* Multiple Approach: finding the implied value of a firm by using a comparable firm
	+ Ex: If I was valuing Pepsi, I might look at Coke as a proxy for its value
* Once we have the multiple, we can use it to find the value of our target firm using the following formula:

$$MV\_{T}=\frac{MV\_{C}}{VI\_{C}}\*VI\_{T}$$

$MV\_{T}$ = MV of target firm (some measure of overall value i.e. enterprise value, share price)

$MV\_{C}$ = MV of comparable firm

$VI\_{T}$ = Value Indicator of target firm (i.e. EBITDA, sales, earnings, square footage)

$VI\_{T}$ = Value Indicator of comparable firm

* Strengths and Weaknesses to the Multiple Approach of Valuing a Firm
	+ Pros:
		- Widely used
		- Market driven
	+ Cons:
		- Ignored cost of capital or TVM
		- Assumes companies are alike
		- Assumes multiples hold over time

CAPITAL BUDGETING

$$FCF\_{t}=\left[EBIT\*\left(1-T\right)+D\_{T}\right]-\left[∆NWC\right]-[∆GrossPPE]$$

$$FCF\_{T}=\left[S-E-D\*\left(1-T\right)+D\right]-\left[∆NWC\right]-[∆GrossPPE]$$

$$NPV=\sum\_{t=1}^{N}\frac{FCF\_{t}}{(1+r)^{t}}+FCF\_{0}$$

Alternative Equation

$$∆GrossPPE=∆NetPPE+D\_{t}$$

$$FCF\_{t}=(S-E-D)\*\left(1-T\right)+D-∆NWC-(∆NetPPE+D)$$

$$FCF\_{t}=(S-E-D)\*\left(1-T\right)-∆NWC-∆NetPPE$$

How do we Depreciate a Fixed Asset?

* First, we need a depreciable basis
	+ Depreciable Basis: the dollar amount that can be used to figure annual depreciation expenses

Firms have 2 sets of books:

1. Financial Statement Reporting
	1. For financial statements, firms subtract out salvage value for the depreciable basis
2. Tax Reporting
	1. Goal is to reduce tax liability for the firm
	2. For tax liability and CF analysis, we don’t remove salvage value
	3. Finance tries to maximize FCF and NPV, so to do this, we defer taxes into the future by maximizing depreciation today
		1. Increased depreciation decreases taxes which increase FCF and increases NPV

The 2 Tax Depreciation Methods

1. Straight Line Depreciation: same depreciation amount every year

$$D\_{t}=\frac{depreciable basis}{useful life}=\frac{purchase price+depreciation+installation costs}{useful life}$$

1. Modified Accelerated Cost Recovery System (MACRS): asset falls into a category defined by the IRS

$$D\_{t}=Allowed \%\*Depreciable Basis$$

How Does Depreciation Impact Cash Flow?

* A higher depreciation leads to a higher FCF

$$FCF\_{t}=(S-E-D)\*\left(1-T\right)+D-∆NWC-∆GrossPPE$$

Isolate Depreciation:

$$FCF\_{t}=(0-0-D)\*\left(1-T\right)+D-0-0$$

$$FCF\_{t}=-D\*\left(1-T\right)+D$$

$$FCF\_{t}=-D+D\*T+D$$

$$FCF\_{t}=D\*T$$