



Equity Valuation: Basic Tools

EE532 Selected Topics in Monetary Economics 2

February 2020

Thana-ek Laohapongchana

Valuation in Real World

- The objectives of a valuation
 - To get an idea of what it's worth in order to justify an acquisition offer or a price
 - To estimate a company's value for internal purposes
 - Always ***focus on ranges*** rather than specific numbers
- How can we tell whether a company is undervalued, overvalued, or fairly valued?

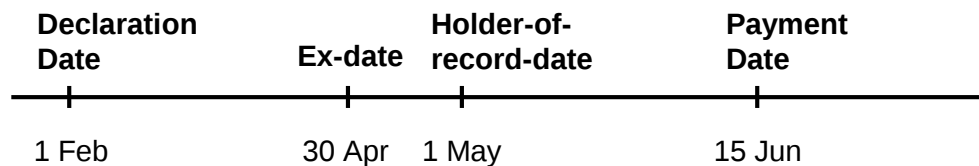
Major Categories of Equity Valuation Models

- There are 3 major equity valuation methods
 1. Present Value Model (or Discounted Cash Flow Model) estimates the intrinsic value based on the present value of the future benefits expected to be received from the security
 - Dividend discount model, Free Cash Flow to Firm Model, and Free Cash Flow to Equity Model
 2. Multiplier Model (or Market Multiple Model) estimates the intrinsic value based on share price multiples or enterprise value multiples
 - EV/Sales, EV/EBIT, EV/EBITDA, P/E, and P/B
 3. Asset-based Valuation Model estimates the intrinsic value based on the estimated value of the assets minus liabilities and preferred shares
 - Liquidation Valuation (or Net Asset Value Model)

Present Value Model

Dividend Discount Model

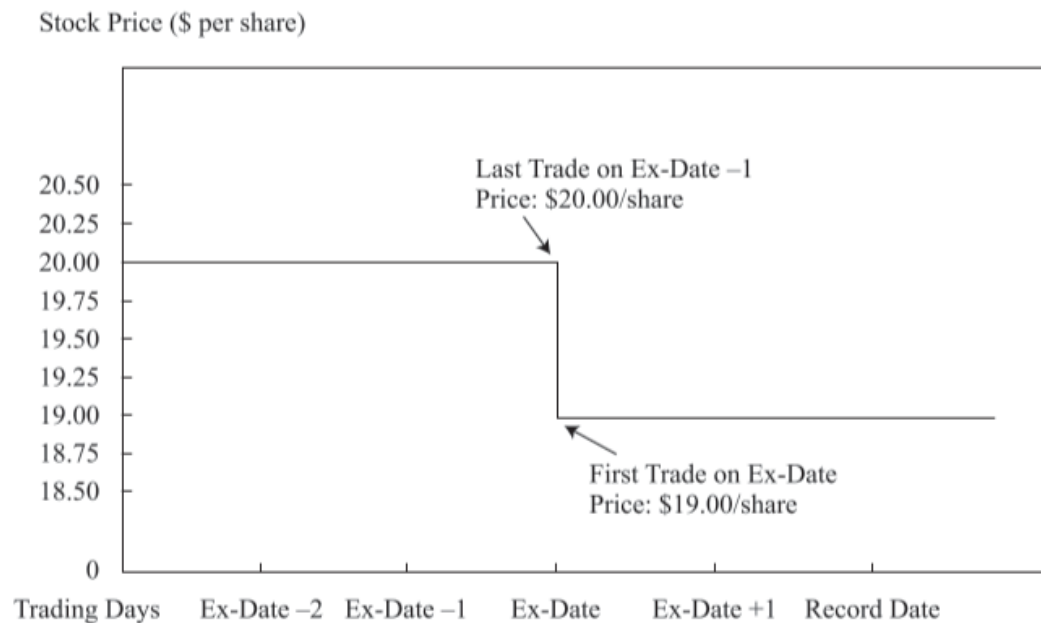
- **Dividend** is a distribution paid to shareholders based on the number of shares owned
 - Cash Dividend
 - Extra Dividend / Special Dividend
 - Stock Dividend
 - o Stock Split
 - o Reverse Stock Split
 - Share Repurchase
- Standard chronology of regular cash dividends payout
 - Declaration date is the day that the company issues a statement declaring a specific dividends
 - Ex-dividend date is the first date that a share trades with the dividend
 - Holder-of-record date is the date that a shareholder listed on the company's books will have ownership of the shares for purposes of receiving the upcoming dividend
 - Payment date is the day that the company actually pays a dividend



Present Value Model (Cont'd)

Dividend Discount Model

- What happens to the share price when a company pays dividend?



Present Value Model (Cont'd)

Dividend Discount Model

- Gordon Growth Model assumes dividends grow indefinitely at a constant rate

- $V_0 = \frac{D_0(1+g)}{r-g} = \frac{D_1}{r-g}$; where

- V_0 = Value of a share today

- D_0 = Current dividend

- r = Required rate of return on the stock

- g = Dividend growth rate = $(1 - \text{Dividend Payout Ratio}) \times ROE$

- Multistage Dividend Discount Model

- $V_0 = \sum_{t=1}^n \frac{D_0(1+g_S)^t}{(1+r)^t} + \frac{V_n}{(1+r)^n}$; where

- $V_n = \frac{D_{n+1}}{r-g_L}$

- g_S = Short-term growth rate

- g_L = Long-term growth rate

Present Value Model (Cont'd)

Dividend Discount Model

- Question 1: The current dividend is THB 5. Growth is expected to be 10% a year for 3 years and then at sustainable growth rate thereafter. Given the required rate of return is 15%, ROE is 5%, and dividend payout ratio of 60%, what is the intrinsic value?
 - Ans:

Present Value Model (Cont'd)

Preferred Share Valuation

- For a non-callable, non-convertible perpetual preferred share

- $V_0 = \frac{D_0}{r}$

- For a non-callable, non-convertible with maturity at time n

- $V_0 = \sum_{t=1}^n \frac{D_t}{(1+r)^t} + \frac{F}{(1+r)^n}$; where

F = Preferred share's par value

Present Value Model (Cont'd)

Preferred Share Valuation

- Question 1: Given a non-convertible preferred share with a par value of THB 100, maturity in 3 years, a nominal required rate of return of 8%, and semiannual dividends of THB 15, what is the fair value of this preferred share?
 - Ans:
- Question 2: Explain whether the intrinsic value of this issue would be higher or lower if the issue were callable with all other facts remaining unchanged
 - Ans:

Present Value Model (Cont'd)

Free Cash Flow Model

- Free Cash Flow to the Firm (“FCFF”) vs Free Cash Flow to the Equity (“FCFE”)
- What the value will we get when using FCFF and FCFE?
 - FCFF will provide the enterprise value
 - FCFE will provide the equity value
- When should we use a Free Cash Flow model?
 - The company is not paying a dividend
 - The company pays dividends but the dividends paid differ significantly from the company’s capacity to pay dividends
 - Free cash flows align with profitability within a reasonable forecast period
 - The investor takes a control perspective

Present Value Model (Cont'd)

Free Cash Flow Model

- Free Cash Flow is the after-tax cash flow the company generates on a **recurring** basis, after it has been taken into account non-cash charges, changes in operating assets and liabilities, and required capex
- Discounted cash flow model can be divided into 2 parts
 - Projection period (the near future)
 - Terminal value (the distant future)
- 6 Steps in DCF analysis
 1. Project a company's free cash flows
 2. Calculate the company's discount rate
 3. Discount and sum up the company's free cash flows
 4. Calculate the company's terminal value
 5. Discount the terminal value to its present value
 6. Add the discounted FCF to the discounted terminal value

Present Value Model (Cont'd)

Discount Rate

- WACC vs Cost of Equity
 - WACC is used as a discount rate in the FCFF method
 - Cost of equity is used as a discount rate in the FCFE method
- $WACC = W_d K_d (1 - T) + W_e K_e$
- $K_e = R_f + \beta_L (R_m - R_f);$

where

$$\beta_L = \beta_u (1 + (1 - T)(D/E))$$

Present Value Model (Cont'd)

Cost of Equity

- Rules of Thumb for Cost of Equity
 - Smaller companies generally have a higher cost of equity than larger companies because investors expect higher return
 - Companies in emerging and fast-growing geographies and markets tend to have a higher cost of equity
 - Additional debt raises the cost of equity because the percentage debt in a company's capital structure decreases
- Rules of Thumb for WACC
 - WACC is generally higher for smaller companies and those in emerging markets
 - Additional debt reduces WACC
 - Additional preferred share generally reduces WACC
 - Debt with high interest rate will increase WACC

Present Value Model (Cont'd)

Free Cash Flow to Firm Model

- Enterprise value =
$$\sum_{n=1}^{\infty} \left(\frac{FCFF_t}{(1 + WACC)^t} \right)$$

where

$$FCFF_t = EBIT_t(1 - T) + DA_t + \text{Change in } NWC_t - Capex_t$$

$$WACC = W_d K_d(1 - T) + W_e K_e$$

$$K_e = \text{Cost of Equity (or Required Rate of Return on Stock)}$$

$$R_f + \beta(R_m - R_f)$$

- Is it the equity value?

$$\text{Enterprise Value (EV)} = \text{Market Capitalization} + \text{Market Value of Preferred Stock} + \text{Market Value of Debt} - \text{Cash}$$

Market Capitalization

$$\begin{aligned} \text{(or Equity Value)} = & \text{Enterprise value} - \text{Market Value of Preferred Shares} \\ & - \text{Market Value of Debt} + \text{Cash} \end{aligned}$$

Present Value Model (Cont'd)

Free Cash Flow to Equity Model

- Equity Value =
$$\sum_{n=1}^{\infty} \left(\frac{FCFE_t}{(1 + K_e)^t} \right)$$

where

$$FCFE_t = NI_t + DA_t + \text{Change in } NWC_t - Capex_t + \text{Net Borrowing}_t$$

Multiplier Model

Price Multiple

- **Price multiple** refers to a ratio that compares the share price with some sort of monetary flow or value to allow evaluation of the relative worth of a company's stock
 - P/E multiple
 - P/B multiple
 - P/Levered FCF multiple
- It can be used as a screening mechanism
 - If the ratio falls below a specified value, the stock is identified as candidate for purchase
 - If the ratio exceeds a specified value, the stock is identified as candidate for sale
- What is pros and cons of using price multiple?
- Forward Price Multiple vs Trailing Price Multiple
- Public Comps vs Precedent Transactions

Multiplier Model (Cont'd)

Enterprise Value Multiple

- Enterprise value is often viewed as the cost of takeover
 - EV/Sales
 - EV/EBIT
 - EV/Unlevered FCF
- *Enterprise Value (EV) = Market Capitalization + Market Value of Preferred Stock + Market Value of Debt – Cash*
- When you should use enterprise value multiple?

Multiplier Model (Cont'd)

- How to pick the companies and transactions?
 - Criteria for choosing ***comparable public companies***
 - Geography (e.g. local, Asia, and global)
 - Industry and Nature of Business
 - Financial (e.g. revenue size, EBITDA margin, net profit margin, and leverage ratio)
 - Criteria for choosing ***precedent transactions***
 - Geography (e.g. local, Asia, and global)
 - Industry and Nature of Business
 - Financial (e.g. revenue size, EBITDA margin, net profit margin, and leverage ratio)
 - Time (i.e. transaction since... or transactions between year 20xx and 20xy)

Multiplier Model (Cont'd)

Comparison of Valuation Methodology

Multiple Name	Used for	What does it mean?
EV/EBIT	The company that capex is more important to factor in	Approximation of how valuable a company is relative to its income from business operations
EV/EBITDA	The company that capex and depreciation are not as important	Approximation of how valuable a company is relative to its operational cash flow
Equity Value/Levered FCF	• Not commonly use as it requires more work to calculate • May produce widely different numbers depending on capital structure	Most accurate measure of a company's true cash flow and how valuable it is relative to that
EV/Unlevered FCF	The company that capex and/or change in operational assets and liabilities have a big impact	Similar to equity value/levered FCF but it's capital structure-neutral
P/E	• Can be used across many types of companies due to its simplicity • It's distorted by non-cash charges, capital structure, and tax rates	Rough measure of how valuable a company is in proportion to its after-tax earnings
P/B	Most useful for banks and insurance firms	Measure of how valuable a company is relative to its balance sheet

Multiplier Model (Cont'd)

Link between metrics and multiples

- What is the relationship between growth rates and relevant multiples?
 - A company with higher EBITDA growth will have higher EBITDA multiples
 - A company with higher net income growth will have higher net income multiples
- Cautions
 - There might be other factors besides revenue/EBITDA/EPS growth rates that impact the multiples (e.g. recent earnings announcements, market leadership, brand loyalty, etc.)
 - Basic math, especially when companies have very different margins

Valuation Statistics

	Enterprise Value	EV/Revenue			EV/EBITDA		
		2018A	2019E	2020E	2018A	2019E	2020E
Company A	150	1.7x	1.5x	1.4x	16.7x	15.0x	13.6x
Company B	200	2.2x	2.0x	1.8x	11.1x	10.0x	9.1x

Operating Statistics

	Enterprise Value	Revenue			Revenue Growth			EBITDA			EBITDA Growth			EBITDA Margin		
		2018A	2019E	2020E	2018A	2019E	2020E	2018A	2019E	2020E	2018A	2019E	2020E	2018A	2019E	2020E
Company A	150	90	100	110	N/A	11.1%	10.0%	9	10	11	N/A	11.1%	10.0%	10.0%	10.0%	10.0%
Company B	200	90	100	110	N/A	11.1%	10.0%	18	20	22	N/A	11.1%	10.0%	20.0%	20.0%	20.0%

Asset-based Valuation Model

- Asset-based valuation model uses the estimated market or fair value of the company's assets and liabilities
- It works well for the company that has
 - Small proportion of intangible assets or off the book assets
 - High proportion of current assets and current liabilities
- What kind of business that does not suit with this method?
 - Companies with assets that do not have easily determinable market values
 - Asset and liability fair values can be very different from the values at which they are carried on the balance sheet of a company
 - When a company has significant intangibles, a forward-looking cash flow valuation is preferred
 - Asset values may be more difficult to estimate in a hyper-inflationary environment

Comparison of Valuation Methodologies

	DCF	Public Comps	Precedent Transactions	Asset-based Model
Pros	- Not subject to the market fluctuations - Based on the company's ability to generate cash flow	Based on real data as opposed to future assumptions	Based on what companies have actually paid for other companies	Works well when assets have easily determinable market value or the company reports fair values
Cons	- Subject to far-in-the-future assumptions - Less useful for fast-growing and unpredictable companies	- There may not be true comparables - Less accurate for thinly traded stocks or volatile companies	- Data can be spotty - There may not be truly comparable transactions	- Market value often different from book value - Asset value hard to determine during the hyperinflation