Introduction to Finance

L15

Total Payout Model

- Total Payout model- ignore the firm's choice between dividends and share repurchases
- Dividend Discount Model (DDM)-assumes any cash paid out by the firm to shareholders takes the form of a dividend.
- However, recent trend-dividend payouts replaced with share repurchases – which implies firm uses excess cash to buy back its own stock.
- Two consequences: a) the more cash used to repurchase share-the less firm has to pay dividends; b) Repurchase decreases shares outstanding count which increases its EPS and there by dividends

Total Payout Model

- In DDM, *P*o = *PV*(Future Dividends per Share)
- When firm repurchases shares TPM is better alternative method over DDM
- TPM= Values both dividends and share repurchases

Total Payout Model

$$P_0 = \frac{PV(\text{Future Total Dividends and Repurchases})}{\text{Shares Outstanding}_0}$$

TPM

- We can apply the same simplifications that we obtained by assuming constant growth to TPM.
- The only change is that *we discount total dividends and share repurchases and use the growth rate of total earnings (rather than earnings per share) when forecasting the growth of the firm's total payouts*.
- This method can be more reliable and easier to apply when the firm uses share repurchases.

Example

- Titan Industries has 217 million shares outstanding and expects earnings at the end of this year of $860 million. Titan plans to pay out 50% of its earnings in total, paying 30% as a dividend and using 20% to repurchase shares. If Titan's earnings are expected to grow by 7.5% per year and these payout rates remain constant, determine Titan's share price assuming an equity cost of capital of 10%.

Solution

- Titan will have total payouts this year of 50% * $860 million = $430 million.
- Based on the equity cost of capital of 10% and an expected earnings growth rate of 7.5%, the present value of Titan's future payouts can be computed as a constant growth perpetuity:
- *PV* (Future Total Dividends and Repurchases) =$430 million/ (0.10 - 0.075)= $17.2 billion
- PV represents?

Solution

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- *PV* (Future Total Dividends and Repurchases) =$430 million/ (0.10 - 0.075)= $17.2 billion
- PV represents the total value of Titan's equity (i.e., its market capitalization).
- To compute the share price, we divide by the current number of shares outstanding:

Solution

- To compute the share price, we divide by the current number of shares outstanding:

$$P_0 = \frac{\$17.2 \text{ billion}}{217 \text{ million shares}} = \$79.26 \text{ per share}$$

- Using the total payout method, we did not need to know the firm's split between dividends and share repurchases.
- To compare this method with the dividend-discount model, note that Titan will pay a dividend of
- (30% * $860 million)/(217 million shares) = $1.19 per share,
- for a dividend yield of 1.19/79.26 = 1.50%.
- Titan's share price growth rate is $g = rE - (Div1/P0)$ = 10%-1.5%=8.50%.
- These "per share" growth rates exceed the 7.5% growth rate of total earnings because Titan's share count will decline over time due to share repurchases.

The Discounted Free Cash Flow Model (FCF)-

- In TPM= Value firm's equity (rather than single share)
- In Discounted FCF model- one step further- determines value of firms to all investors- both equity and debt holders-i.e. we need to estimate the firm's enterprise value.
- Enterprise value= Market Value of Equity + Debt-Cash
- We can interpret the enterprise value as the net cost of acquiring the firm's equity, taking its cash, paying off all debt, and thus, owning the unlevered business.
- The advantage of the discounted free cash flow model is that it allows us to value a firm without explicitly forecasting its dividends, share repurchases, or its use of debt.

Valuing the Enterprise

- Enterprise value= PV(Free cash flow-FCF) that the firm has available to pay all investors, both debt and equity holders
- We can loosely interpret net investment as investment intended to support the firm's growth, above and beyond the level needed to maintain the firm's existing capital.
- With that definition, we can also write the free cash flow formula as:

$$\text{Free Cash Flow} = \overbrace{EBIT \times (1 - \tau_c)}^{\text{Unlevered Net Income}} + \text{Depreciation} - \text{Capital Expenditures} - \text{Increases in Net Working Capital}$$

$$\text{Net Investment} = \text{Capital Expenditures} - \text{Depreciation}$$

$$\text{Free Cash Flow} = EBIT \times (1 - \tau_c) - \text{Net Investment} - \text{Increases in Net Working Capital}$$

Valuing the Enterprise

- Free cash flow measures the cash generated by the firm before any payments to debt or equity holders are considered
- Then Firms enterprise value (Vo) is the PV of firm's free cash flow

$$\text{Free Cash Flow} = EBIT \times (1 - \tau_c) - \text{Net Investment} - \text{Increases in Net Working Capital}$$

Discounted Free Cash Flow Model

$$V_0 = PV(\text{Future Free Cash Flow of Firm})$$

Enterprise Value

- A key difference between the discounted free cash flow model and the earlier models we have considered is the discount rate.
- In previous models, we used the firm's equity cost of capital, r_E, because we were discounting the cash flows to equity holders.
- Here we are discounting the free cash flow that will be paid to both debt and equity holders. Thus, we should use the firm's **weighted average cost of capital (WACC)**, denoted by r_{wacc}
- r_{wacc} is the average cost of capital firm must pay to all of its investors, both debt and equity holders

Enterprise Value

- r_{wacc} is the average cost of capital firm must pay to all of its investors, both debt and equity holders
- If the firm has no debt, then $r_{wacc} = r_E$
- But when a firm has debt, r_{wacc} is an average of the firm's debt and equity cost of capital. In that case, because debt is generally less risky than equity, r_{wacc} is generally less than r_E.
- We can also interpret the WACC as reflecting the average risk of all of the firm's investments

Enterprise Value

- Given the firm's weighted average cost of capital, we can determine the discounted free cash flow. For that we forecast the firm's free cash flow up to some horizon, together with a terminal (continuation) value (V_N) of the enterprise
- The terminal value is estimated by assuming a constant long-run growth rate g_{FCF} for free cash flows beyond year *N*

$$V_0 = \frac{FCF_1}{1 + r_{wacc}} + \frac{FCF_2}{(1 + r_{wacc})^2} + \cdots + \frac{FCF_N + V_N}{(1 + r_{wacc})^N}$$

$$V_N = \frac{FCF_{N+1}}{r_{wacc} - g_{FCF}} = \left(\frac{1 + g_{FCF}}{r_{wacc} - g_{FCF}} \right) \times FCF_N$$

FCF model for stock valuation

- Given the enterprise value (V_0) , we can estimate share price
- Enterprise value= Market value of equity+ Debt-Cash
- Market value of equity= Enterprise value(V_0)+ Cash-Debt
- Market Value of equity= Share Price*No of Shares outstanding
- Then share price is

$$P_0 = \frac{V_0 + \text{Cash}_0 - \text{Debt}_0}{\text{Shares Outstanding}_0}$$

Problem

Kenneth Cole (KCP) had sales of $518 million in 2005. Suppose you expect its sales to grow at a 9% rate in 2006, but that this growth rate will slow by 1% per year to a long-run growth rate for the apparel industry of 4% by 2011. Based on KCP's past profitability and investment needs, you expect EBIT to be 9% of sales, increases in net working capital requirements to be 10% of any increase in sales, and net investment (capital expenditures in excess of depreciation) to be 8% of any increase in sales. If KCP has $100 million in cash, $3 million in debt, 21 million shares outstanding, a tax rate of 37%, and a weighted average cost of capital of 11%, what is your estimate of the value of KCP's stock in early 2006?

Step 1: Estimate FCF in future

$$\text{Free Cash Flow} = EBIT \times (1 - \tau_c) - \text{Net Investment} - \text{Increases in Net Working Capital}$$

$$\text{Net Investment} = \text{Capital Expenditures} - \text{Depreciation}$$

	Year	2005	2006	2007	2008	2009	2010	2011
FCF Forecast ($ millions)								
1	Sales	518.0	564.6	609.8	652.5	691.6	726.2	755.3
2	*Growth versus Prior Year*		*9.0%*	*8.0%*	*7.0%*	*6.0%*	*5.0%*	*4.0%*
3	**EBIT** (9% of sales)		50.8	54.9	58.7	62.2	65.4	68.0
4	Less: Income Tax (37% EBIT)		(18.8)	(20.3)	(21.7)	(23.0)	(24.2)	(25.1)
5	Less: Net Investment (8% ΔSales)		(3.7)	(3.6)	(3.4)	(3.1)	(2.8)	(2.3)
6	Less: Inc. in NWC (10% ΔSales)		(4.7)	(4.5)	(4.3)	(3.9)	(3.5)	(2.9)
7	**Free Cash Flow**		23.6	26.4	29.3	32.2	35.0	37.6

Step 2: Estimate terminal enterprise value

- We expect FCF to grow at constant rate of 4% after 2011 and r_{wacc} is 11%

$$V_{2011} = \left(\frac{1 + g_{FCF}}{r_{wacc} - g_{FCF}}\right) \times FCF_{2011} = \left(\frac{1.04}{0.11 - 0.04}\right) \times 37.6 = \$558.6 \text{ million}$$

Step 3: Enterprise value

- KCP's current enterprise value is the present value of its free cash flows plus the terminal enterprise value:

$$V_0 = \frac{23.6}{1.11} + \frac{26.4}{1.11^2} + \frac{29.3}{1.11^3} + \frac{32.2}{1.11^4} + \frac{35.0}{1.11^5} + \frac{37.6 + 558.6}{1.11^6} = \$424.8 \text{ million}$$

Step 4: Value of Share price

- Value of share price of KCP's stock

$$P_0 = \frac{424.8 + 100 - 3}{21} = \$24.85$$

A comparison of Discounted Cash Flow Models of Stock valuation

- By computing the present value(PV) of the firm's dividends, total payouts or free cash flows, we can estimate the value of the stock, the total value of the firm's equity, or the firm's enterprise value.

Present Value of …	Determines the …
Dividend Payments	Stock Price
Total Payouts (All dividends and repurchases)	Equity Value
Free Cash Flow (Cash available to pay all security holders)	Enterprise Value