DISCOUNTED CASH FLOW MODEL
DPU EXHIBIT 6.1
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The Discounted Cash Flow (DCF) model is based on the theory that the current price of a stock embodies all future income generated by the stock discounted at an appropriate rate. Algebraically, assuming the stock is held indefinitely, the current price of a stock can be represented as,

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ldots + \frac{D_\infty}{(1+k)^\infty} \qquad (1)$$

where P_0 is the stock's current price, D_i is the expected dividend to be paid in the future period i, and k is the discount rate. The discount rate k is also the investor's opportunity cost of investing in the stock and, thus, is the investor's required rate of return on equity. The key to estimating the required return is to solve Equation 1, under various assumptions, for k.

To solve for k, define P_n as,

$$P_n = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \ldots + \frac{D_n}{(1+k)^n} \qquad (2)$$

Equation 1 and Equation 2 are equivalent as n approaches infinity. Equation 2 will serve as the basis for the following derivations.

CONSTANT GROWTH DCF MODEL

If dividends grow at a constant rate, g, then Equation 2 can be rewritten as,

$$P_n = \frac{D_1}{(1+k)} + \frac{(1+g)D_1}{(1+k)^2} + \frac{(1+g)^2 D_1}{(1+k)^3} + \ldots + \frac{(1+g)^{n-1} D_1}{(1+k)^n} \qquad (3)$$

Now define P_{n+1} as $(1 + g)*P_n /(1 + k)$; that is,

$$P_{n+1} = \frac{(1+g)D_1}{(1+k)^2} + \frac{(1+g)^2 D_1}{(1+k)^3} + \ldots + \frac{(1+g)^{n-1} D_1}{(1+k)^n} + \frac{(1+g)^n D_1}{(1+k)^{n+1}} \qquad (4)$$

Thus,

$$P_n - P_{n-1} = \frac{(k-g)}{(1+k)} P_n = \frac{D_1}{(1+k)} - \frac{(1+g)^n D_1}{(1+k)^{n+1}} \qquad (5)$$

Solving for P_n, we get,

$$P_n = \frac{D_1}{(k-g)} - \frac{(1+g)^n D_1}{(k-g)(1+k)^n} \qquad (6)$$

If the discount rate k is strictly greater than the expected growth rate g, then,

$$\lim_{n\to\infty} P_n \equiv P_0 = \frac{D_1}{(k-g)} \qquad (7)$$

Solving Equation 7 for k yields the familiar constant growth DCF model:

$$k = \frac{D_1}{P_0} + g \qquad (8)$$

where D_1 is defined as the dividend to be paid in the next period, P_0 is the current price, and g is the dividend growth rate.