LESSON 20:
EQUITY VALUATION

Stock Valuation is more difficult than Bond Valuation because stocks do not have a finite maturity and the future cash flows, i.e., dividends, are not specified. Therefore, we use different techniques for stock valuation as mentioned as;

1. Balance-Sheet Valuation
2. Dividend discount models
3. Price earning method
4. CAPM

Balance-Sheet Valuation
Analysts often look at the balance sheet of the firm to get a handle on some valuation measures. Three measures derived from the balance sheet are: book value, liquidation value, and replacement cost.

1. Book Value
The most common valuation measure is book value. The book value per share is simply the net worth of the company (which is equal to paid up equity capital plus reserves and surplus) divided by the number of outstanding equity shares. For example, if the net worth of Zenith Limited is Rs 37 million and the number of equity shares of Zenith is 2 million; the book value per share works out to Rs 18.50 (Rs 37 million divided by 2 million).

How relevant and useful is the book value per share as a measure of investment value?
The book value per share is firmly rooted in financial accounting and hence can be established relatively easily. Due to this, its proponents argue that it represents an ‘objective’ measure of value. A closer examination, however, quickly reveals that what is regarded as ‘objective’ is based on accounting conventions and policies which are characterised by a great deal of subjectivity and arbitrariness. An allied and a more powerful criticism against the book value: measure, is that the historical balance sheet figures on which it is based are often very divergent from current economic value. Balance sheet figures rarely reflect earning power and hence the book value per share cannot be regarded as a good proxy for true investment value.

2. Liquidation Value
Value realised from liquidating Amount to be paid to all the creditors all the assets of the firm and preference shareholders Number outstanding equity shares To illustrate, assume that Pioneer Industries would realise Rs 45 million from the liquidation of its assets and pay Rs 18 million to its creditors and preference shareholders in full settlement of their claims. If the number of outstanding equity shares of Pioneer is 1.5 million, the liquidation value per share works out to:
Rs 45 mn - Rs 18 mn = Rs 27 mn
1.5 mn

While the liquidation value appears more realistic than the book value, there are two serious problems in applying it.
a. It is very difficult to estimate what amounts would be realised from the liquidation of various assets
b. The liquidation value does not reflect earning capacity. Given these problems, the measure of liquidation value seems to make sense only for firms, which are ‘better dead and alive’ - such firms are not viable and economic values cannot be established for them.

1. Replacement Cost
Another balance sheet measure considered by analysts in valuing a firm is “the replacement cost of its assets less liabilities. The use of this measure is based on the premise that the market value of a firm cannot deviate too much from its replacement cost. If it did so, competitive pressures will tend to align the two.

This idea seems to be popular among economists. The ratio of market price to replacement cost is called Tobin q, after James Tobin a Nobel Laureate in economics. The proponents of replacement cost believe that in the long run Tobin’s q will tend to 1.

1. The empirical evidence, however, is that this ratio can depart significantly from 1 for long periods of time. There is a major limitation of the replacement cost concept. The organisational capital, a very valuable asset, is not shown on the balance sheet. (Organisational capital is the value created by bringing together employees, customers, suppliers, managers, and others in a mutually beneficial and productive relationship. An important characteristic of organisational capital is that it cannot be easily separated from the firm as a going entity.) Although balance sheet analysis may provide useful information about book value, liquidation value, or replacement cost, the analyst must focus on expected future dividends, earnings, and cash flows to estimate the value of a firm as a going entity.

As we have already discussed in our previous lectures, the intrinsic value of corporate security is equal to the present value of the payment stream on the security discounted at an appropriate discount rate (capitalisation rate). Symbolically,

\[ V = \frac{C_1}{(1+k)} + \frac{C_2}{(1+k)^2} + \frac{C_3}{(1+k)^3} + \ldots + \frac{C_n}{(1+k)^n} \]

Where:
V is the present value
Ct is Payments at time t
k is the Discount or capitalisation rate
n = S C / (1+k) t t=1

Now we will examine the quantitative models used for this purpose.
Model 1: Dividend Discount Model
Dividend discount models are designed to compute the intrinsic value of a share of common stock under specific assumption as to the expected growth pattern of future dividends and the appropriate discount rate to employ. Merrill Lynch, CS First Boston, and a number of other investment banks routinely make such calculations based on their own particular models and estimates. What follows is a examination of such models, beginning with the simplest one.

According to the dividend discount model, the value of an equity share is equal to the present value of dividends expected from its ownership plus the present value of the sale price expected when the equity share is sold. For applying the dividend discount model, we will make the following assumptions:

i. Dividends are paid annually—this seems to be a common practice for business firms in India; and

ii. The first dividend is received one year after the equity share is bought.

I. Single Period Valuation Model
Let us begin with the case where the investor expects to hold the equity share for one year. The price of the equity share will be:

\[ P_0 = \frac{D_1}{(1+r)} + P_1 (1+r) \]

Where:

- \( P_0 \) is the current price of the equity share
- \( D_1 \) is the expected dividend expected next year
- \( P_1 \) is the price expected next year
- \( r \) is the rate of return required on the equity share.

Let us take an example. Assume that the equity share of a company is expected to provide a dividend of Rs 2 and fetch a price of Rs 18 a year hence. What price would it sell for now if investors’ required rate of return is 12%.

\[ P_0 = \frac{2.0}{(1.12)} + 18(1.12) = Rs 17.86 \]

If I ask you, change in the price of the share if the company is expected to grow at a rate of 5% every year.

If the current price, \( P_0 \) becomes \( P_0 (1+g) \) s, a year hence, we get:

\[ P_0 = \frac{D_1}{(1+r)} + P_0 (1+g)/(1+r) \]

Or

\[ P_0 = \frac{D_1}{(r-g)} \]

Let us take another example. Suppose that the expected dividend per share of a company is Rs 5. The dividend is expected to grow at the rate of 6% per year. If the price share now is Rs 50, what is the expected rate of return? If we put the values in the above-defined equation, we get 16%. I hope I am making you clear at every step. Ok! Let’s move to another model of valuation i.e. Multi-period valuation model.

II Multi-Period Valuation Model
Now that we have already covered the basics of equity share valuation in a single period framework, we will now discuss the more realistic, and also a bit complex, case of multi-period valuation.

Since equity shares have no maturity period, they may be expected to bring a dividend stream of infinite duration. Hence the value of an equity share may be put as:

\[ P_0 = \frac{D_1}{(1+r)} + \frac{D_2}{(1+r)^2} + \frac{D_3}{(1+r)^3} + \ldots + \frac{D_n}{(1+r)^n} \]

= \( S D_t/(1+r)^t \) t=1

Where:

- \( P_0 \) is the price of the equity share today
- \( D_1 \) is the dividend expected a year hence
- \( D_2 \) is the dividend expected two years hence
- \( D_n \) is the dividend expected at the end of infinity
- \( r \) is the expected rate of return on the equity share.

We know that the equation above presents the valuation model for an infinite horizon. Let’s now see whether it is applicable to a finite horizon also. Let’s consider how an equity share would be valued by an investor who plans to hold it for n years and sell it thereafter for a price of \( P_n \). The value of the equity share to him would be:

\[ P_0 = \frac{D_1}{(1+r)} + \frac{D_2}{(1+r)^2} + D_3/(1+r)^3 + \ldots + \frac{P_n}{(1+r)^n} \]

= \( S D_t/(1+r)^t + P_n/(1+r) \) n=1

If you notice, we have got the same equation as a generalize multi period valuation formula. This equation is general enough to permit any dividend pattern—constant, rising, declining, or randomly fluctuating. For practical applications we make simplifying assumptions.
about the pattern of dividend growth. The most commonly used assumptions are as follows:

1. The dividend per share remains constant forever, implying that the growth rate is nil (the zero growth model).
2. The dividend per share grows at a constant rate per year forever (the constant growth model).
3. The dividend per share grows at a constant extraordinary rate for a finite period, followed by a constant normal rate of growth forever thereafter (the two-stage model).
4. The dividend per share, currently growing at an above normal rate, experiences a gradually declining rate of growth for a while. Thereafter, it grows at a constant normal rate (the H model).

Let's now discuss the Zero growth Model

Zero growth Model
A special case of the constant growth model calls for an expected growth rate, g, of zero. Here the assumption is that dividends will be maintained at their current level forever.

The dividend per share is expected on the current market price per share. The amount of dividend does not grow. This is the fixed amount of dividend.

\[ D_0 = D_1 = D_2 = D = \text{Constant} \]

In this case, the model reduces to perpetuity.

If we assume that the dividend per share remains constant year after year at a value of D, the equation becomes

\[ P_0 = \frac{D}{r} \]

It means that the present value interest factor of perpetuity is simply 1 divided by the interest rate expressed in decimal form. Hence, the present value of the perpetuity is simply equal to the constant annual payment divided by the interest rate. For example, the present value of a perpetuity of Rs 10,000 if the interest rate is 10% will be equal to: 10,000/0.10 = Rs 1,00,000.

The reason is that an initial sum if invested at a rate of interest of 10%, provide a constant annual income of Rs 10,000 forever without any impairment of the capital value. The no-growth case is equivalent to the valuation process for preferred stock because dividend amount remains unchanged.

Note: This is a straightforward application of the present value of perpetuity formula.

Let's take an example: Hindustan Manufacturing Ltd. Has distributed a dividend of Rs. 30 on each Equity share of Rs 10. The expected rate of return is 35%. Calculate current market price of share Substituting in the formula;

\[ \frac{30}{0.35} = Rs. 85.71 \]

Constant Growth Stock Valuation (Gordon Model)
A constant growth stock is a stock whose dividends are expected to grow at a constant rate (g) in the foreseeable future. This condition fits many established firms, which tend to grow over the long run at the same rate as the economy, fairly well.

Let's take another example to understand the constant growth model. Assume that you have purchased the shares of a company, which is expected to grow at the rate of 6% per annum. The dividend expected on your share a year hence is Rs 2. What price will you put on it if your required rate of return for this share is 14%.

The price for your share can be calculated as:

\[ P_0 = \frac{2.00}{0.14 - 0.06} = Rs 25 \]

Let's move to the extension of constant growth model i.e. two Stage Growth Model

Two Stage Growth Model
The simplest extension of the constant growth model assumes that the extraordinary growth (good or bad) will continue for a finite number of years and thereafter the normal growth rate will prevail infinitely. The constant growth model is extended to two-stage growth model. Here, the growth stages are divided into two, namely, a period of extraordinary growth (or decline) and a constant growth period of infinite nature. The extraordinary growth period will continue for some period followed by the constant growth rate. The information technology industry is at present experiencing an extra-ordinary growth rate, it may continue for some time and afterwards it may maintain constant growth rate.

Present value of the dividend during the above normal growth period

The present value of the stock / price = Present value of stock price at the end of the above normal growth period.

Let's try a practical application of the two-stage growth model. Assume that the current dividend on an equity share of ABC Ltd. Is Rs 2. The company is expecting to enjoy an above normal growth rate of 20% for a period of 6 years. Thereafter, the growth rate will fall and stabilise at 10%. Equity investors require a return of 15%.

Let's discuss the last and a bit complicated model of equity valuation i.e. H-model

H-Model
We will keep some assumptions for this model before starting the discussions:

1. While the current dividend growth rate, ga, is greater than gn, the normal long run growth rate, the growth rate declines linearly for 2H years.
2. After 2H years, the growth rate becomes gn.
3. After H years, the growth rate become exactly halfway between ga and gn.

Let's study the graphical representation of the dividend growth rate through this model.

Growth Rate
While the derivation of the H model is quite complicated but the valuation is quite simple. Let's work on the valuation.

P/E Ratio or Earnings Multiplier Approach
Much of the real world discussion of stock market valuation concentrates on the firm’s price-earnings multiple, the ratio of price per share to earnings per share, commonly called as the P/E ratio. The reciprocal of P/E ratio is called as (earnings -price) E/P ratio or earnings yield. Investors seem to attach a lot of importance to P/E ratios. Under this approach, we estimate the P/E ratio as follows:
We can conclude that:

\[ P_0 = \frac{E_1}{P/E} \]

\( P_0 \) is the estimated price
\( E_1 \) is the estimated earnings per share
\( P/O \) is the justified price - earnings ratio

You must have noticed that the financial dailies give information on \( P/E \) ratios of a large number of companies, and financial analysts evaluate the performance and prospects of shares in terms of \( P/E \) ratios. Can you think of some questions like whether \( P/E \) ratio relates to the cost of capital? Or how far is the \( P/E \) ratio reliable as a performance indicator.

It is sometime suggested that the reciprocal of \( P/E \) ratio is a measure of the opportunity cost of capital. We would be discussing all this in the coming part of the lesson.

Let's start with some of the determinants of \( P/E \) ratio. The determinants of the \( P/E \) ratio can be derived from the dividend discount model, which is the foundation for valuing equity stocks. Let's begin with constant growth model. We know that:

\[ P_0 = \frac{D_1}{r-g} \]

In this model:
\( D_1 = E_1 (1-b) \)
\( r- (ROE*b) \)

If we divide, both the sides by \( E_1 \), we get:

\[ P_0/ \ E_1 = (1-b) \]
\( r- (ROE*b) \)

What does the above equation indicate?

1. The dividend payout ratio, \((1-b)\)
2. The required rate of return, \( r \)
3. The expected growth rate, \( ROE*b \)

Let's analyse the relation of all of the above with \( P/E \) ratio.

**P/E Ratio & Plough Back Ratio (P/E Ratio and b)**

Note that \( b \), the plough back ratio appears in the numerator as well as in the denominator: What is the effect of a change of \( b \) on the \( P/E \) ratio? Now, it depends on how \( ROE \) compares with \( r \). If: \( ROE > r \), an increase in \( b \) leads to an increase in \( P/E \) \( ROE < r \), an increase in \( b \) has no effect on \( P/E \) \( ROE = r \), an increase in \( b \) leads to a decrease in \( P/E \)

**P/E Ratio and Interest Rate (P/E Ratio and r)**

The required rate of return on equity stock reflects interest rate and risk. There is an inverse relationship between \( P/E \) ratios and interest rates:

- When interest rates increase, required rates of return on all securities, including equity stocks increase, pushing security prices downward.
- When interest rates fall, security prices rise.

**P/E Ratio and Risk**

Other things being equal, riskier stocks have lower \( P/E \) multiples. We can notice this easily by examining the formula for the \( P/E \) ratio of the constant growth model:

\[ P/E = (1-b) \]
\( (r-g) \)

We can conclude that:

Riskier stocks have higher required rate of return \((r)\) and hence lower \( P/E \) multiples. This is true in all cases, not just the constant growth model. For any expected earnings and dividend stream, the present value will be lower when the stream is considered to be riskier. Hence the \( P/E \) multiple will be lower.

**P/E Ratio and Liquidity**

Other things being equal, stocks which are highly liquid command higher \( P/E \) multiples and Stocks which are highly illiquid command lower \( P/E \) multiples. The reason for this is not far to seek. Investors value liquidity just the way they value safety and hence are willing to give higher \( P/E \) multiples to liquid stocks.

Now that we are growth rates and the valuation, let's analyse the impact of growth on price, earnings and \( P/E \) ratio.

**Impact of Growth on Price, Returns, and P/E Ratio**

The expected growth rates of companies differ widely. Some companies are expected to remain virtually stagnant or grow slowly; other companies are expected to show normal growth; still others are expected to achieve supernormal growth rate.

Assuming a constant total required return, differing expected growth rates mean differing stock prices, dividend yields, capital gains yields, and price-earnings ratios. To illustrate, let's consider three cases:

- **Growth Rate (%)**
  - Low growth firm 5
  - Normal growth firm 10
  - Supernormal growth firm 15

If we assume that the expected earnings per share and dividend per share of each of the three firms are Rs 3.00 and Rs 2.00 respectively. Investors' required total return from equity investments is 20 percent. Given the above information, we may calculate the stock price, dividend yield, capital gains yield, and price-earnings ratio. From the above calculations, we can conclude the following:

- As the expected growth in dividend, increases, other things being equal, the expected return depends more on the capital gains yield and less on the dividend yield.
- As the expected growth rate in dividend increases, other things being equal, the price-earnings ratio increases.
- High dividend yield and low price-earnings ratio imply limited growth prospects.
- Low dividend yield and high price-earnings ratio imply considerable growth prospects.

The expected EPS and DPS next year for each of the three firms are Rs 4 and Rs 2 respectively. Investors' total required rate of return from equity investments is 16%. Calculate the stock price, dividend yield, capital gains yield, and price-earnings ratio for the three cases. You must have heard about growth stocks and income stocks. I hope you are aware that growth stocks are supposed to provide returns primarily in the form of capital appreciation whereas income stocks are expected to provide returns mainly in the form of cash dividends. Now, I must ask you a basic question:
Does such a Distinction make Sense?

Let's study the Relationship Between Earnings/Price Ratio, Expected Return And Growth to answer the question. We will analyse this relationship by taking a small example of a company. Suppose that Maturity Limited, a firm that does not grow at all. It pays all its earnings as dividends and does not plough back anything. Put differently, it pays a constant stream of dividends and hence its stock is like a perpetual bond. Hence the expected return on its stock is its dividend per share divided by the share price (i.e. the dividend yield) which is also the same as its earnings per share divided by the share price (i.e. the E/P ratio). If the earnings per share as well as the dividend per share is Rs 15 and the stock price is Rs 100, Expected return = Dividend yield = Earnings/Price ratio

Or
\[
\frac{D1}{P0} = \frac{E1}{P0}
\]

In this case \(\frac{D1}{P0} = \frac{E1}{P0}\), EPS is the same as DPS

Therefore:
\[
= 15/100 = 15\%
\]

Therefore, the price \(P0\) is equal to;
\[
\frac{D1}{r} = \frac{E1}{r}; \text{ where } r \text{ is the expected return}
\]

Note that even for a growing firm the expected return can equal the \(E/P\) ratio if retained earnings earn a return equal to the market capitalisation ratio.

Lets suppose Maturity Limited identifies a proposal to invest Rs 15 a share next year, which is expected to earn a return of 15 percent, just equal to the opportunity cost of capital. To undertake this investment, Maturity Limited decides to skip the dividend for year 1. The investment of Rs 15 a share will generate additional earnings of Rs 2.25 (Rs 15*15 percent) per share in future thereby raising the dividend per share to Rs 17.25 per share from year 2 onwards.

The NPV per share for this proposal will be:
\[
-15 + 2.25 = 0
\]

0.15

Since the prospective return on this investment is equal to the opportunity cost of capital, it makes no contribution to the value of the firm and has no effect on the share price. The reduction in value caused by a zero dividend in year 1 is offset by an increase in value due to higher dividends in subsequent years. Hence, the market capitalisation rate equals the \(E/P\) ratio:
\[
r = \frac{E1}{Po}
\]

We have seen that the market capitalisation rate is equal to E/P ratio when the proposed investment has a zero NPV. Now, let's analyse what happens when NPV is either positive or negative.

**CAPM (Capital Asset Pricing Model)**

"Cap-M" looks at risk and rates of return and compares them to the overall stock market. In other words, we can say that it is a model describing the relationship between risk and expected return that is used in the pricing of risky securities. CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return then the investment should not be undertaken.

If you use CAPM you have to assume that most investors want to avoid risk, (risk averse), and those who do take risks, expect to be rewarded.

Valuation with the Capital Asset Pricing Model uses a variation of discounted cash flows; only instead of giving yourself a "margin of safety" by being conservative in your earnings estimates, you use a varying discount rate that gets bigger to compensate for your investment's riskiness. There are different ways to measure risk; the original CAPM defined risk in terms of volatility, as measured by the investment's beta coefficient. We can calculate the required rate of return by using CAPM in the following way:

\[
Ks = Krf + B (Km - Krf)
\]

Where:

- \(Ks\) is the Required Rate of Return, (or just the rate of return).
- \(Krf\) is the Risk Free Rate (the rate of return on a "risk free investment", Government Treasury Bills)
- \(B\) = Beta. A measure of volatility, or systematic risk, of a security or portfolio in comparison to the market as a whole. Also known as beta coefficient. A beta of 1 indicates that the security's price will move with the market. A beta greater than 1 indicates that the security's price will be more volatile than the market. A beta less than 1 means that it will be less volatile than the market.
- \(Km\) = The expected return on the overall stock market.

\(\text{(You have to guess what rate of return you think the overall stock market will produce.)}\)

If your recall, we have discussed Beta in our earlier discussions on risk.

Let's take an example, to understand CAPM.

As an example, let's assume that the risk free rate is 5%, and the overall stock market will produce a rate of return of 12.5% next year. You assume that XYZ company has a beta of 1.7. What rate of return should you get from this company in order to be rewarded for the risk you are taking? Remember investing in XYZ company (beta =1.7) is more risky than investing in the overall stock market (beta = 1.0). So you want to get more than 12.5%, right? Let's plug these inputs in the equation.

\[
Ks = Krf + B (Km - Krf)
\]

\[
Ks = 5% + 1.7 (12.5% - 5%)
\]

\[
= 5% + 1.7 (7.5%) = 17.75%
\]

So, if you invest in XYZ Company, you should get at least 17.75% return from your investment. If you don’t think that XYZ Company will produce those kinds of returns for you, then you would probably consider investing in a different stock Analysts sometimes use a more complicated value for beta, that grows with a company’s debt level. There is also lot of controversy about whether beta, which measures past volatility, is sufficient or even relevant in predicting future risk. We would be discussing all these in detail in the next chapter.
Managing Equity Portfolio
Now that we have already learnt how to value equity with the various methods and models, we must know how to manage our portfolio. In other words, we should understand the correct time of buying the security, what should be the duration of holding the stock and so on. For that let's study some strategies, which help us in taking some crucial decisions.

Generally we adopt two broad approaches in managing an equity portfolio:
1. **Passive strategy**
2. **Active strategy**

Let's discuss them one by one.

1. **Passive Strategy**

   Investors who subscribe to the view that the market is efficient, typically adopt a passive strategy. The most commonly followed passive strategies are:
   - **Buy & Hold Strategy**: This is a very simple strategy which essentially says: “Buy a portfolio of equity stocks using some method and ‘hold the portfolio over the investment horizon.’” Hence, under this strategy, once the portfolio is created there is no active buying and selling of stocks.
   - **Indexing Strategy**: This strategy is based on the maxim: “If you can’t beat them, join them.” An index fund exactly replicates a well-defined index of equity stocks such as NSE-50 or BSE-National Index. This means that the composition of the index fund is identical to that of the index it imitates. If Hindustan Lever Limited constitutes 4 percent of the index, the fund places 4 percent of its money in Hindustan Lever stock; if Reliance Industries Limited constitutes 3 percent of the index, the fund places 3 percent of its money in Reliance Industries stock; so on and so forth. While exact replication is the simplest technique for building an index fund, most index funds are not constructed this way because the transaction costs involved in ensuring that the composition of the index fund is perfect all the time may be very high. In practice, a smaller set of stocks that matches the index in terms of its broad sectoral composition may be held.

2. **Active Strategy**

   Test your Understanding

**Stock Quiz**
1. Find the price for a stock given that the current dividend is $4.45 per share, the required return is 5.7%, and the growth rate in dividends is 3.3% per year.
   a. $183.75
   b. $188.29
   c. $191.54
   d. $194.14
2. Find the price for a stock given that the current dividend is $5.3 per share, the required return is 12.1%, and the growth rate in dividends is 7% per year.
   a. $101.93
   b. $103.95
   c. $106.57
   d. $111.2
3. Find the price for a stock given that the current dividend is $5.03 per share, the required return is 6.7%, and the growth rate in dividends is 3% per year.
   a. $134.36
   b. $140.02
   c. $143.26
   d. $145.43
4. Find the price for a stock given that the next dividend is $4.53 per share, the required return is 14.7%, and the growth rate in dividends is 5.9% per year.
   a. $47.6
   b. $51.48
   c. $57.39
   d. $63.21
5. Find the dividend growth rate for a stock given that the next dividend is $4.66 per share, the required return is 9.2%, and the stock price is $153.29 per share.
   a. 4.56%
   b. 5.27%
   c. 6.16%
   d. 6.57%
6. Find the dividend growth rate for a stock given that the current dividend is $2.53 per share, the required return is 15.8%, and the stock price is $38.5 per share.
   a. 7.14%
   b. 7.84%
   c. 8.66%
   d. 9.01%
7. Find the price for a stock given that the next dividend is $4.82 per share, the required return is 11.9%, and the growth rate in dividends is 5.9% per year.
   a. $77.01
   b. $80.33
   c. $84.23
   d. $89.64
8. Find the dividend growth rate for a stock given that the next dividend is $4.21 per share, the required return is 9%, and the stock price is $98.36 per share.
   a. 2.88%
   b. 3.32%
   c. 3.94%
   d. 4.72%
9. Find the required return on a stock given that the next dividend is $5.96 per share, the growth rate in dividends is 8.62%, and the stock price is $76.61 per share.
   a. 16.04%
   b. 16.4%
   c. 17.11%
10. Find the dividend growth rate for a stock given that the next dividend is $5.84 per share, the required return is 13.2%, and the stock price is $127.51 per share.

a. 7.9%
b. 8.62%
c. 9.14%
d. 9.65%