A share of common stock represents part ownership of a corporation. How large a part of the corporation is owned depends on the total number of shares outstanding relative to the number of shares the stockholder owns. For example, suppose there are one million shares outstanding and the stockholder in question owns ten thousand shares. This stockholder owns $10,000/1,000,000 = .01$ or 1% of the corporation. With ownership come some privileges. Two important privileges are a vote at the annual meeting, where the board of directors of the corporation is elected, and a right to share in the profits of the corporation. Both rights depend on the portion of stock held. So, our stockholder would have 1% of the votes at the annual meeting and a claim to 1% of the corporation's profits or earnings.

An important theory of stock price determination rests on the present value formula. If an individual held all the stock of a corporation, she would have sole ownership. As sole owner she would have claim to all the corporation's current and future profits. We can write the present value of this profit stream as

$$PV \text{ of corporate profit stream} = E_t + E_{t+1}/(1+R) + E_{t+2}/(1+R)^2 + ...,$$

where $E_t$ is corporate profits at time $t$ and these profits may be earned into the indefinite future. This present value is called the fundamental value of the firm. How much did they have to pay to lay claim to this stream, this fundamental value? If there are one million shares of stock and the price of each share is $15, then the cost of the firm is $15 million. The cost of the firm is just the number of dollars that you would have to give up today to get the stream of corporate profits; in other words, the present value of the stream of corporate profits. So, we have

$$P_{stock} \cdot \# \text{ of shares} = E_t + E_{t+1}/(1+R) + E_{t+2}/(1+R)^2 + ... \quad (1)$$

This formula reveals the basic determinants of stock prices. Other things the same, if the corporation announces a new product that market analysts believe will be a highly profitable
line, forecasts of corporate profits will increase; and the stock price will rise. On the other hand, if news leaks that the Justice Department is about to bring a lawsuit against the corporation, profit forecasts will fall, and so will the price of stock. If interest rates rise, the fundamental value of the stock falls, and so does its price. Finally, if the corporation issues more stock, for example if it "splits" its stock by giving each investor additional shares, then the price of the stock will fall. In the case of a stock split of two new shares for one existing share, the price will be cut in half.

It is important to keep in mind that future corporate profits are very difficult to forecast. This means that risk plays an important role. So, if the corporation is a new venture with an uncertain future, the interest rate with which you discount ought to be large to take this into account. Also, difficulty in forecasting leads to disagreements, and this may cause the price of a stock to wander from its fundamental value, if the crowd becomes overly optimistic or pessimistic. In short, the above pricing formula is a beginning to the analysis of stock prices, not the end.¹

An important element of stock analysis is the relationship between the stock's price and its earnings. The ratio of these two variables is called the stock's price-earnings or p-e ratio. The average p-e ratio for the Standards & Poors index of 500 stocks from 1871 to 2002 is about 14.4. We can relate the idea of price-earnings ratio to the fundamental value theory of stock pricing using equation 1. If we divide both sides of the equation by current earnings, $E_t$, we get

$$\frac{P_{stock}}{(E_t/\text{# of shares})} = 1 + \frac{(E_{t+1}/E_t)}{(1+R)} + \frac{(E_{t+2}/E_t)}{(1+R)^2} + ...$$

Since $E_{t+1}/E_t$ is just one plus the rate of growth in earnings, which we write as $1 + g_E$, we can rewrite this equation as

$$\frac{P_{stock}}{(E_t/\text{# of shares})} = 1 + \frac{(1 + g_E)}{(1+R)} + \frac{(1 + g_E)^2}{(1+R)^2} + ...$$

where we have taken the rate of growth in earnings to be a constant over time.² More specifically, since cannot forecast the future with certainty, $g_E$ should be take as the expected rate

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¹ For a good discussion of stocks and their prices written for the lay person see Burton Malkiel's A Random Walk Down Wall Street (1985).
² Or, better, we can take $g_E$ to represent the average rate of growth in earnings in the future.
of growth in earnings. Which stocks will have a high p-e ratio? Those stocks whose earnings are expected to grow rapidly.

Is the fundamental value theory in line with the long-run evidence on p-e ratios. To check this question out we use the fact that equation 2 is a geometric series to rewrite it as

$$\frac{P_{stock}}{E_0/\# \text{ of shares}} = \frac{1+R}{R-gE}.$$

The average nominal return on stocks measures $R$ and over the past 130 years this average is 10.7%. The average rate of growth in earnings has been 3.3%. Plugging these numbers into the above relationship yields a P-E ratio of $\frac{(1.107)}{(0.107 - 0.033)} = 14.96$. This number is quite close to 14.4, the average P-E ratio over the same period. This suggest that the fundamental value theory of stock pricing is a good approximation over the long haul.