# DIVIDENDS VERSUS EARNINGS: MUCH ADO ABOUT NOTHING

By **Dr GEORGE KARATHANASSIS,** Management Centre, The University of Aston (England)

## Introduction

Because of the complete prevalence of the dividend valuation model in theliterature, students and practitioners may be under the erroneous impression that a share may be valued only in terms of its expected stream of dividends. This is clearly not the case and it is extremely important ot understand the main sources of value.

A good understanding of valuation theory is of paramount importance because it will enable us to study profitably such important topics as the nature and meaning of capital costs, capital structure analysis, dividend policy etc.

The objective of this brief paper is to explain analytically, exactly what determines share values.

### I. The valuation debate

As is well known, there has been a great deal of controversy and debate regarding the nature of expected benefits investors discount in determining the fundamental value of shares. If our objective is to determine the fundamental value of a share, should we discount its earnings stream or its dividend stream? This question has been asked many a time by academics, practitioners, investors and students. The answer varies depending on whether one subscribes to the earnings or dividends school of thought.

An adherent to the earnings school of thought would argue that it is the earnings attributable to a share that should be discounted to determine its value. Whether or not earnings are distributed in the form of dividends is immaterial because retained earnings will be reflected in higher share values. Accordingly, the fundamental value of a share P can be found by discounting its expected earnings:

$$P = \frac{e_1}{(1+k)} + \frac{e_2}{(1+k)^2} + \dots + \frac{e_n}{(1+k)^n} \qquad (1)$$

Where e represents earnings per share and k is the appropriate discount rate. This line of reasoning has led a number of people to believe that current and future earnings are the main determinants of share values. Although this approach properly stated is sound, applying equation (1) without specifying the investment policy of the company may yield inaccurate results. If for instance the company finances its investments through retained earnings application of equation (1) would yield inaccurate results because we would be discounting both the retained earnings and the additional earnings expected to be received as a result of investing these retained earnings.

On the other hand supporters of the dividends school of thought would argue that it is the share's dividend stream that determines its value.[1] Accordingly, the fundamental value of a share should be found by appropriate discounting of its dividend stream, as shown by equation (2):

$$P = \frac{d_1}{(1+k)} + \frac{d_2}{(1+k)^2} + \ldots + \frac{d_n}{(1+k)^n} \qquad (2)$$

Where d represents dividends and all other variables are as defined before. Proponents of this approach argue that earnings are only a means to an end. What counts is the income shareholders expect to receive over time. For a long term investor the only form of income is dividends. Therefore, the argument continues, it is reasonable to maintain that a share derives its value from its dividends not from its earnings.

Prime facie, this argument sounds very convincing and it might make one feel that the earnings approach to valuation is wrong. However, as we will show shortly, when both approaches are properly stated so that the main sources of value are explicitly recognised in their respective equations, both will yield identical results.

Below we explain two approaches to share valuation using a minimum amount of mathematics. This, we feel is necessary because it will show quite clearly what the main sources of value are and hence will enable us to construct a consistent operational valuation model.

Our objective is the relationship between share value and dividends or earnings. In real life of course a number of other variables will affect values. The only way to realise our objective is to keep all other things equal. Therefore we will begin by making the following assumptions:

1. We will assume that we have a debt-free self financing company which with existing assets only is capable of producing on a per share basis £e of earnings every year for the indefinite future.

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1. See *M.H. Miller and F. Modigliani,* Dividend Policy, Growth and the Valuation of Shares, The Journal of Business of the University of Chicago, October 1961, and E. Solomon, The Theory of Financial Management, Columbia University Press, 1969.

2. There is certainty regarding the determination of such important factors as earnings, dividends, investment policies, biscount rates and profitability of new investments.
3. The smaces will be hald for the indefinite future and traded on perfect tax free capital markets.

What should the investor discount in order to calculate the fundamental value of a share of the above company? We cannot answer this question properly unless we know the company's investment policy. Since our hypothetical company is self-financing its investment policy will be represented by the value of the retention ration ie b.[2]

We shall start off by assuming that the company believes that in year one only there will be an investment opportunity which will require a capital outlay equal to the year's earnings (on a per share basis) times the retention ratio b ie 'be'. After that year all future earnings will be dividends. Finally, the rate of return on the new investment will be equal to r which initally will be assumed equal to k the discount rate.

When $r=k$ the share is defined as a non-growth one and when $r>k$ we have a growth share.

## II. A dividends only valuation model, when r=k

A supporter of the dividents only approach to valuation would discount all the dividends expected from the share. In equation form this is given by:

$$P = \frac{d_1}{(1+k)^1} + \frac{d_2}{(1+k)^2} + . + \frac{d_\infty}{(1+k)^\infty} \quad (3)$$

To find the dividends of any year say t, we simply deduct from the year's earnings the amount (on a per share basis) required to finance new investments as shwon by the following equation:

$$d_t = e_t - re_t \quad (4)$$

Equation (4) says that the dividends in any period are equal to the earnings for that period less the investment (retained earnings) re for that period. Therefore equation (3) can be rewritten as:

$$P = \frac{e_1 - re_1}{(1+k)1} + \frac{e_2 - re_2}{(1+k)^2} + . + \frac{e_\infty - re_\infty}{(1+k)^\infty} \quad (5)$$

Applying equation (5) to our hypothetical share we find that its value is equal to:

$$P = \frac{e(1-b)}{(1+k)^1} + \frac{e + ber}{(1+k)^2} + . + \frac{e + ber}{(1+k)^\infty} \quad (6)$$

As a numerical illustration suppose we have the following data:
$e=1$, $b=0.5$, $k=0.1$, $r=0.1$

2. Its numerator consists of retained earnings per share and its denominator of earnings per share.

Applying (6) we obtain $P = \frac{0.5}{(1+0.1)^1} + \frac{1+0.05}{(1+0.1)^2} + . + \frac{1+0.05}{(1+0.1)^\infty} = 10$

## IV. An earnings only valuation model, when r=k

Properly stated this approach discounts (a) the earnings from existing assets and the net earnings (or pure earnings) from new assets. By net earnings we mean the earnings attributable to owners minus the opportunity cost of their funds. In our case this is equal to ber-bek or be(r–k). For our share an earnings based equation is given by:

$$P = \frac{e}{(1+k)} + \frac{e + be(r-k)}{(1+k)^2} + . + \frac{e + be(r-k)}{(1+k)^\infty} \tag{7}$$

However, since r=k (7) can be rewritten as:

$$P = \frac{e}{(1+k)} + \frac{e + be(r-k)}{(1+k)^2} + . + \frac{e + be(r-k)}{(1+k)^\infty} \tag{8}$$

or

$$P = \frac{e}{k} \tag{9}$$

Using numbers, (9) yields $P = \frac{1}{0.1} = 10$

Note that this result is exactly the same as that obtained by using a dividends only model.

The equivalence between the two approaches can also be seen by noting that equation (6) can be rewritten as:

$$P = \frac{e(1-b) + \frac{ber}{k}}{(1+k)} + \frac{e}{(1+k)^2} + . + \frac{e}{(1+k)^\infty} \tag{10}$$

Note that ber/k is the discounted value at the end of year one of the stream of the additional benefits expected from the new investment. Since r=k equation (10) reduces to P = e/k which is exactly the same as our earnings based model.

Note that if we have relied on total earnings our equation of value would have been given by:

$$P = \frac{e}{(1+k)} + \frac{e + ber}{(1+k)^2} + . + \frac{e + ber}{(1+k)^\infty} \tag{11}$$

or

$$P = \frac{e}{k} + \frac{be}{(1+k)} \tag{12}$$

Equation (12) yields inaccurate results. This is due to the fact that the above model is subject to double counting. In our case we included in our formula (and hence discounted) not only the benefits of the new investment but also the capital cost of the new investment. The possibility of double counting is one of the arguments levelled against the earnings theorists. However, once it is understood that the supporters of the earnings approach to valuation discount not ber but be(r−k), the argument vanishes and both approaches yield identical results.

Hence under our assumptions in a non growth situation ie when r=k, application of either approach to valuation will yield identical results.

## IV. Valuation under a dynamic growth situation ie when r>k

Let us now remove the assumption that new investments yield a rate of return equal to k. Specifically we will now assume that the company foresees new investment opportunities every year, beginning with year 1, the capital cost of which is equal to be. In other words each new investment at the end of year t will require a sum of money equal to b (which remains constant over time) times the period's earnings. Furthermore, we will assume that each investment opportunity will yield every year a constant and uniform rate of return r which will be greater than the normal rate of return required by the shareholder ie k. Let us now see how a valuationmodel can be formulated firstly under the dividends approach and secondly under the earnings approach.

**A valuation model based on dividends.** Under this approach we simply discount the growing stream of dividends expected to be received from the company's existing and new assets. To find the growing stream of dividends we must firstly find the growing stream of all earnings. Let us assume that the company retains (be) in the first year which is reinvested ar r. Since the company is assumed to be able to reinvest $be_t$ every year for ever at r% per annum, earnings will grow at an annual rate equal to br, as shown in Table 1.

**Table 1**

| Year | Earnings per share |
|---|---|
| 1 | e |
| 2 | $e + ber = e(1 + br)$ |
| 3 | $e(1 + br) + e(1 + br)br = e(1 + br)^2$ |
| . | . |
| . | . |
| $\infty$ | $e(1 + br)^{\infty}$ |

Since the payout ratio is equal to $(1 - b)$ for every year, the dividend will grow according to the pattern shown in Table 2.

**Table 2**

| Year | Dividend per share |
|---|---|
| 1 | $e(1-b)$ |
| 2 | $e(1+br)(1-b)$ |
| 3 | $e(1+br)^2(1-b)$ |
| . | . |
| . | . |
| $\infty$ | $e(1+br)^{\infty}(1-b)$ |

A dividends based valuation model is given by the following expression:

$$P = \frac{e(1-b)}{(1+k)} + \frac{e(1+br)(1-b)}{(1+k)^2} + \ldots \qquad (12)$$

or

$$P = \frac{e(1-b)}{(1+k)}\left[1 + \frac{(1+br)}{(1+k)} + \ldots \frac{(1+br)^{\infty}}{(1+k)^{\infty}}\right] \qquad (13)$$

Assuming k is greater than br the series within brackets has a finite sum equal to $(1+k)/(k-br)$ (see note 3).
Hence

$$P = \frac{e(1-b)}{k-br} \qquad (14)^4$$

For a numerical illustration assume the following values for the variables included in (14): $e=1$, $b=0.5$, $k=0.1$, $r=0.15$. Applying (14) we see that the value of the share is equal to

$$P = \frac{0.5}{0.025} = 20$$

According to this approach, to find the fundamental value of a share (given our assumptions) we must discount the growing stream of dividends ie dividends from

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3. Rewrite equation (8) as:

$$P = e\left[\frac{1}{(1+k)} + \frac{1}{(1+k)^2} + . + \frac{1}{(1+k)^{\infty}}\right] \qquad (1)$$

The expression within brackets is an infinite goemetric progression the sum of which can be found by using $a/(1-r)$ (2) where a is the first term and r is the ratio between terms. Assuming $r<1$ application of (2) yields $1/k$, and hence (1) is equal to $P = e/k$.

4. This formula can be found in M.J. Cordon and E. Shapiro, Capital Equipment Analysis: The Required Rate of Profit, Management Science, October 1956.

existing as well as new assets finances with retained earnings or alternatively we can use (14) a very well known formulation.

## V. A valuation model based on earnings

Although in the literature of Business Finance the dynamic dividend growth formulation has completely prevailed, it is possible to derive an all earnings valuation model. By earnings we mean the earnings expected from existing assets plus the net earnings expected from each new investment.

$$P = \frac{e}{k} + \frac{be(r-k)}{K(1+k)} + \frac{be(1+br)(r-k)}{k(1+k)^2} + . + \frac{be(1+br)^{\infty}(r-k)}{k(1+k)^{\infty}} \qquad (16)[5]$$

or

$$P = \frac{e}{k} + \frac{be(r-k)}{k(1+k)}\left[1 + \frac{(1+br)}{(1+k)} + \frac{(1+br)^2}{(1+k)^2}, \dots, \frac{(1+br)^{\infty}}{(1+k)^{\infty}}\right] \qquad (17)$$

Assuming k>br the series within brackets has a finite sum equal to (1+k)/(k−br). Hence (17) can be rewritten as:

$$P = \frac{e}{k} + \frac{be}{(k-br)} \left(\frac{r-k}{k}\right) \qquad (18)$$

Hence value according to equation (18) is equal to two parts: part one is the present value of the earnings expected from the company's existing assets only and part two is the total present value of the net earnings expected from each new investment. Using our numerical data the numerical value of our share is given by:

$$P = \frac{1}{0.1} + \frac{0.5}{0.025} \left(\frac{0.15 - 0.10}{0.1}\right) = 20$$

Hence value according to equation (18) an earnings based model, is exactly the same as value according to (14), a dividends based model. It should be noted that equations (18) and (14) are mathematically equivalent. We can see this by writting (18) as:

$$P = \frac{e}{k}\left[1 + \frac{b(r-k)}{(k-br)}\right] \qquad (19)$$

Simplifying equation (19) we obtain a dividends only valuation model ie

$$E = \frac{e(1-b)}{(k-br)}$$

5. Where the first term of (16) is the present value of the earnings expected from existing assets only, the second term is the present value of the net (pure) earnings expected from the first new investment and so on.

## Conclusion

We have seen that irrespective of whether we use an earnings only formulation or a dividends only formulation, we obtain identical results. Our simple analysis has shown that in general, it is a matter of indifference whether one discounts a dividend stream (properly defined) or an earnings stream (properly defined). This is very important for it can help us to design a good empirical valuation model. A good empirical valuation model is important for two main reasons: (a) it will show us whether capital markets are efficient and (b) it will enable us to measure a company's equity cost of capital.