

# 4 Dividend Irrelevancy

## Introduction

Under conditions of *certainty*, the Gordon growth model ( $P_0 = D_1 / (K_e - g)$ ) reveals why movements in share price relate to the profitability of a company's investment policy (business risk) and not variations in dividend policy (financial risk).

In a world of *uncertainty*, Gordon then explains why movements in share price relate to corporate dividend policy. Rational, risk-averse investors prefer their returns in the form of dividends now, rather than later (a "bird in the hand" philosophy).

The purpose of this Chapter is to evaluate an alternative hypothesis developed by the joint Nobel Prize winning economists, Franco Modigliani and Merton H. Miller (MM henceforth). Since 1958, their views on the *irrelevance of dividend policy* when valuing shares based on the economic "law of one price" have defined the development of modern finance.

### 4.1 The MM Dividend Irrelevancy Hypothesis

MM (1961 onwards) criticise the Gordon growth model under conditions of uncertainty supported by a wealth of empiricism, most recently the consultancy work of Stern-Stewart referenced by the author in *Strategic Financial Management (op cit)*. According to MM, dividend policy is not a determinant of share price in reasonably efficient markets because dividends and retentions are *perfect economic substitutes*.

If *shareholders* forego a current dividend to benefit from a future retention-financed capital gain, they can still create their own *home made* dividends to match their consumption preferences by the sale of shares or personal borrowing and be no worse off.

If a *company* chooses to make a dividend distribution, it too, can still meet its investment requirements by a new issue of equity, rather than use retained earnings. So, the effect on shareholders' wealth is also neutral.

Consequently, *business risk*, rather than *financial risk*, defines all investors and management need to know about corporate economic performance.

Theoretically and mathematically, MM have no problem with Gordon under conditions of *certainty*. Their equity capitalisation rate ( $K_e$ ) conforms to the company's class of business risk. So, as Fisher predicts (1930) share price is a function of variations in profitable corporate investment and not dividend policy. But where MM depart company from Gordon is under conditions of *uncertainty*.

As we explained in Chapter Three, Gordon confuses dividend policy with investment policy. For example, an increase in the dividend payout ratio, without any additional finance, reduces a firm's operating capability and *vice versa*. MM also assert that because uncertainty is *non-quantifiable*, it is logically impossible to capitalise a *multi-period* future stream of dividends, where  $K_{e1} < K_{e2} < K_{e3} \dots etc.$  according to the investors' perception of the unknown.

MM therefore define a current *ex-div* share price using the following *one period* model, where  $K_e$  equals the shareholders' desired rate of return (capitalisation rate) relative to the "quality" of a company's periodic earnings (class of business risk). The greater their variability, the higher the risk, the higher  $K_e$ , the lower the price and *vice versa*.

$$(18) P_0 = D_1 + P_1 / 1 + K_e$$

MM then proceed to prove that for a *given* investment policy of *equivalent* business risk (where  $K_e$  remains constant) a change in dividend policy cannot alter current share price ( $P_0$ ) because:

- The next *ex-div* price ( $P_1$ ) only increases by any corresponding reduction in dividend ( $D_1$ ) and vice versa.

### Activity 1

To illustrate MM's dividend irrelevancy hypothesis, let us reinterpret the stock exchange data for Jovi plc, initially applied to Gordon's growth model in Chapter Three.

- With an EPS of 10 pence a full dividend distribution policy and yield of 2.5 per cent, establish Jovi's current *ex-div* share price using Equation (18).
- Now recalculate this price, with the same EPS forecast of 10 pence, assuming that Jovi revises its dividend policy to reinvest 100 percent of earnings in future projects with rates of return that equal its current yield.

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With a policy of *full* dividend distribution, MM would define:

$$(18) P_0 = D_1 + P_1 / 1 + K_e = \text{£}0.10 + \text{£}4.00 / 1.025 = \text{£}4.00$$

Refer back to Chapter Three and you will discover that this *ex-div* price is *identical* to that established using the Gordon growth model.

Turning to a policy of *nil* distribution (*maximum* retention) where profits are reinvested in projects of equivalent business risk (*i.e.* 2.5 per cent):

$$(18) P_0 = D_1 + P_1 / 1 + K_e = \text{£}0 + \text{£}4.10 / 1.025 = \text{£}4.00$$

According to MM, because the managerial cut-off rate for investment still equals  $K_e$ , the *ex-div* price rise matches the fall in dividend exactly, leaving  $P_0$  unchanged.

You might care to confirm that using the Gordon growth model from the previous Chapter:

$$(17) P_0 = D_1 / K_e - g = 0$$

In other words, if a company does not pay a dividend, which is not unusual (particularly for high-tech growth firms), it is not possible to determine a share price.

## 4.2 The MM Hypothesis and Shareholder Reaction

You will also recall from Chapter Three that even if Gordon's model is mathematically definable ( $K_e > g$  as well as  $D_1 > 0$ ) he argues that a *fall* in dividends should produce a *rise* in the equity capitalisation rate, causing share price to *fall*. However, MM *refute* this argument.

If a company's reduction in dividends fails to match shareholders' expectations, they can always create *home-made* dividends by selling part of their holdings (or borrowing) to satisfy their consumption preferences, without affecting their overall wealth.

To understand MM's proposition, let us develop the data from Activity 1 using Equation (18) assuming that the number of shares currently owned by an individual shareholder is defined by ( $n$ ) to represent their holding.

$$(19) nP_0 = nD_1 + nP_1 / 1 + K_e$$

Activity 2

Assume you own a number of shares ( $n = 10,000$ ) in Jovi plc and expect an initial policy of full dividend distribution. From the previous Activity and Equation (19) it follows that your current stock of wealth is worth:

$$nP_0 = nD_1 + nP_1 / 1 + K_e = \text{£}1,000 + \text{£}40,000 / 1.025 = \text{£}40,000$$

Now assume that the firm withholds all dividends for reinvestment. What do you do, if your income requirements (consumption preferences) equal the dividend foregone (£1,000)?

According to MM, the *ex-div* price should increase by the reduction in dividends. So, your holding is now valued as follows, with no overall change:

$$(19) \quad nP_0 = nD_1 + nP_1 / 1 + K_e = \text{£}0 + \text{£}41,000 / 1.025 = \text{£}40,000$$

However, you still need to satisfy your income preference for £1,000 at time period one.

So, why not sell 250 shares for £41,000 / 10,000 at £4.10 each?

You now have £1,025, which means that you can take the income of £1,000 and reinvest the balance of £25 on the market at your desired rate of return ( $K_e=2.5\%$ ). And remember you still have 9,750 shares valued at £4.10.

To summarise your new stock of wealth:

Shareholding 9,750: Market value £39,975: Homemade Dividends £1,000: Cash £25

Have you lost out?

According to MM, *of course not*, since future income and value are unchanged:

	£
$nP_1 = 9,750 \times \text{£}4.10$	39,975
Cash reinvested at 2.5%	<u>25</u>
Total Investment	40,000
Total annual return at 2.5%	<u>1,000</u>

To summarise, MM conclude that if *shareholders do not like the heat they can get out of the kitchen* by selling an appropriate proportion of their holdings, borrowing (or lending) to match their consumption (income) preferences.

### 4.3 The MM Hypothesis: A Corporate Perspective

Let us now turn to the company and what is now regarded as the *proof* of the MM dividend irrelevancy hypothesis. Usually, it is lifted *verbatim* from the mathematics of their original article and relegated to an Appendix in the appropriate chapter of most modern financial texts, with little, if any, numerical explanation.

So, where do we start?

According to MM, dividends and retentions are *perfect economic substitutes*, leaving shareholder wealth unaffected by changes in distribution policy. For its part too, a firm can resort to new issues of equity to finance any shortfall in its investment plans without compromising its current *ex-div* price.

To illustrate MM's *corporate* proposition, assume a firm's total number of shares currently in issue equals ( $n$ ). We can define its *total market capitalisation of equity* as follows:

$$(19) nP_0 = nD_1 + nP_1 / 1 + K_e$$

Now assume the firm decides *to distribute all earnings as dividends*. If investment projects are still to be implemented, the company must therefore raise new equity capital equivalent to the proportion of investment that is no longer funded by retentions.

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According to MM, the number of new shares ( $m$ ) issued at an *ex-div* price ( $P_1$ ) must therefore equal the total dividend per share retained ( $nD_1$ ) defined by:

$$(20) \quad mP_1 = nD_1$$

Based on all shares *outstanding* at time period one ( $nP_1 + mP_1$ ) MM then rewrite Equation (19) to represent the total market value of *original* shares in issue as follows:

$$(21) \quad nP_0 = 1/K_e [nD_1 + (n + m)P_1 - mP_1]$$

And because  $mP_1 = nD_1$  this equation simplifies to:

$$(22) \quad nP_0 = 1/K_e (n + m)P_1$$

MM therefore conclude that because the dividend term disappears from their market capitalisation, it is impossible to assert that share price is a function of dividend policy.

To illustrate the *corporate* dynamics of MM's argument, let us develop the data from Activity 2, using the preceding equations where the company's total number of shares in issue equals ( $n$ ).

### Activity 3

Assume Jovi plc begins the period with a *maximum* retention policy (*nil* distribution) and a given investment policy. Shares are therefore valued currently at £4.00 with an *ex-div* price of £4.10 at time period one as follows:

$$(18) \quad P_0 = D_1 + P_1 / 1 + K_e = £0 + £4.10 / 1.025 = £4.00$$

If Jovi has one million shares in issue, we can also derive the company's *total market capitalisation of equity*:

$$(19) \quad nP_0 = nD_1 + nP_1 / 1 + K_e = £0 + £4.1m / 1.025 = £4m$$

But now assume that the firm decides to *distribute all earnings as dividends* (10 pence per share on one million issued) without compromising investment (*i.e.* it is still a "given")

Confirm that this policy leaves Jovi's share price unchanged, just as MM hypothesise.

If investment projects are still to be implemented, the company must raise new equity capital equal to the proportion of investment that is no longer funded by retained earnings. According to MM, the number of new shares ( $m$ ) issued *ex-div* at a price ( $P_1$ ) must therefore equal the total dividend per share retained ( $nD_1$ ) defined by the following equation.

$$(20) \quad mP_1 = nD_1 = £100,000$$

Based on all shares *outstanding* at time period one ( $nP_1+mP_1$ ) we can rewrite Equation (19) representing the total market value of *original* shares in issue as follows:

$$(21) \quad nP_0 = 1/K_e [nD_1 + (n+m)P_1 - mP_1]$$

This simplifies to the following equation where *the dividend term disappears*.

$$(22) \quad nP_0 = 1/K_e (n+m)P_1 = 1/1.025 (nP_1 + \text{£}100,000) = \text{£}4 \text{ million}$$

Since there is also only one unknown in the equation ( $P_1$ ) dividing through by the number of shares originally in issue ( $n = \text{one million}$ ) and rearranging terms, we revert to:

$$(18) \quad P_0 = D_1 + P_1 / 1 + K_e = P_1 + \text{£}0.10 / 1.025 = \text{£}4.00$$

And simplifying, then solving for  $P_1$ :

$$P_1 = \text{£}4.00$$

Thus, as MM hypothesise:

- The *ex-div* share price at the end of the period has fallen from its initial value of £4.10 to £4.00, which is exactly the same as the 10 pence rise in dividend per share, therefore leaving  $P_0$  unchanged.
- Because the dividend term has disappeared from the equations, it is impossible to conclude that share price is a function of dividend policy.

### Review Activity

To reaffirm the logic of the MM dividend irrelevancy hypothesis, revise the Jovi data set for a *nil* distribution to assess the implications for both the shareholders and the company if management now adopt a policy of *partial* dividend distribution, say 50 per cent?

## Summary and Conclusions

MM criticise the Gordon growth model under conditions of uncertainty from both a *proprietary* (shareholder) and *entity* (corporate) perspective. The current value of a firm's equity is *independent* of its dividend distribution policy, or alternatively its retention policy, because they are *perfect economic substitutes*:

- The *quality* of earnings (business risk), rather than how they are *packaged* for distribution (financial risk), determines the shareholders' desired rate of return and management's cut-off rate for investment (project discount rate) and hence its share price.

- If a company *chooses* to make a dividend distribution it can always meet its investment requirements by a new issue of equity, rather than use retained earnings, so that the effect on shareholders' wealth is neutral.
- As a corollary, dividend policy should therefore be regarded as a *passive residual*, whereby management return unused funds to shareholders (the *agency principle*) because their search for new investment opportunities cannot maintain shareholder wealth.

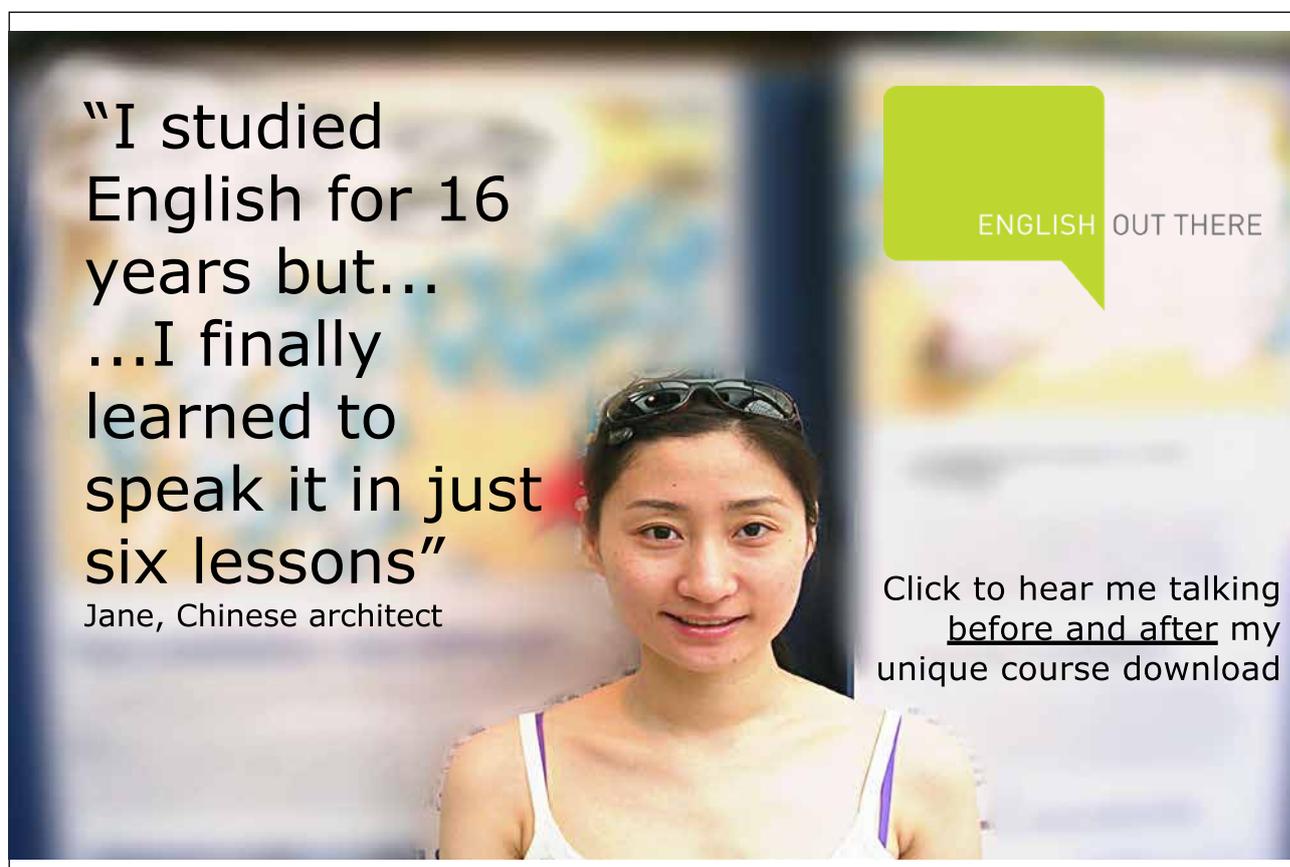
It therefore seems reasonable to conclude Part Two with the following practical observation on our analyses of share valuation theories.

The P/E ratios associated with *business risk*, rather than dividend yields associated with *financial risk*, which are published in the financial press that we first outlined in Chapter Two, should encapsulate all the investment community needs to know about corporate economic performance.

We shall see.

### Selected References

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