4 Dividend Irrelevancy

Introduction

In a world of *uncertainty*, but reasonably efficient markets, Gordon presents a plausible hypothesis to explain why movements in share price relate to corporate dividend policy using the following growth model.

(17) $P_0 = D_1 / K_e - g$ subject to the constraint that $K_e > g$

Because rational, risk-averse investors prefer their returns in the form of dividends now, rather than later (a "bird in the hand" philosophy), the *overall* shareholder return (yield) or managerial cut-off rate for investment, is not a *constant* but a function of the *timing* and *size* of the dividend payout ratio. Expressed mathematically:

$$K_e = f (K_{e1} < K_{e2} < \dots K_{en})$$

Consequently, share price is a *positive* function of the dividend payout ratio.

As we explained in Chapter Three, Gordon and others who tested his model empirically were unable to prove this proposition categorically, even for all-equity firms, because of the statistical problem of *multicolinearity*. Explained simply, change D_1 and all the other variables on the right hand side of Equation (17) are also affected (i.e. not only K_e but g).

Fortunately, two of Gordon's American academic contemporaries, Franco Modigliani and Merton H. Miller (MM henceforth) provided the investment community with a lifeline.

According to MM (1961 onwards) the equity capitalisation rate (K_e) conforms to the company's class of business risk, so that under conditions of *certainty* share price is indeed a function of corporate investment and not dividends, just as Gordon predicts.

However, under conditions of *uncertainty*, MM maintain that the statistical significance of the Gordon model is *inconclusive* because it confuses dividend policy with investment policy.

- Any increase in the dividend payout ratio, without any additional finance, reduces a firm's operating capability and *vice versa*.
- Because uncertainty is *non-quantifiable*, it is logically impossible to capitalise a *multi-period* future stream of dividends, where $K_{e1} < K_{e2} < K_{e3}$ ...*etc.* according to the investors' perception of the unknown.

MM therefore define a current *ex-div* share price using the following *one period* model:

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

where K_e equals the shareholders' desired rate of return (yield) and managerial cut-off rate for investment, which correspond 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*.

MM then proceed to prove that because dividends and earnings are *perfect economic substitutes* in reasonably efficient markets:

> For a *given* investment policy of *equivalent* business risk, a change in dividend (D_1) cannot alter a company's current ex-div share price (P_0) because K_e remains constant.
>
> The next ex-div price (P_1) increases by any corresponding reduction in dividend (D_1) and *vice versa*, leaving P_0 unchanged

Exercise 4.1: Dividend Irrelevancy

Before we rehearse the MM *dividend irrelevancy hypothesis* more fully, let us benchmark the inter-relationship between shareholder wealth maximisation, the supremacy of investment policy and dividend irrelevancy in a perfect capital market characterised by Fisher (*op cit*).

Suppose the Winehouse Company, an all equity firm generates a net annual cash flow of £100 million to be paid out as dividends in perpetuity. The yield and corporate cut-off (discount rate) correspond to a 10 per cent market rate of interest commensurate with the degree of business risk. Thus, the *constant dividend valuation model*, based on the capitalisation of a *level perpetuity* gives a total equity value (market capitalisation):

$$V_E = £100 \text{ million} / 0.10 = £1{,}000 \text{ million}$$

Now assume that the company intends to finance a new project of equivalent risk by retaining the next dividend to generate an *incremental* net cash inflow of £200 million twelve months later, all paid out as an *additional* dividend. Thereafter, a full distribution policy will still be adhered to.

Required:

1. Calculate the revised value for V_E
2. Evaluate whether management is correct to retain earnings and whether shareholders should continue to invest in the company?

An Indicative Outline Solution

Our answer reviews the investment and financial criteria that underpin the normative objective of shareholder wealth maximisation, using NPV maximisation as a determinant of share price.

1. The Revised Equity Value (V_E)
   The first question we must ask ourselves is how the incremental investment (a new project financed by the non-payment of a dividend) affects the shareholders' wealth?

We can present the managerial retention decision in terms of the revised dividend stream:

	t_0	t_1	t_2	t_3	....	t_∞
£ million	£	£	£	£		£
Existing dividends		100	100	100		100
Project cashflows		(100)	200	-		
Revised dividends		-	300	100		100

If we now compare total equity values using the *discounted value* of future dividends:

V_E (existing) = £100 million / 0.10 = **£1,000 million**

V_E (revised) = £300 million / $(1.1)^2$ + (£100 million / 0.10) / $(1.1)^2$ = **£1,074.4 million**

Thus, once the project is accepted the present value (PV) of the firm's equity capital will rise and the shareholders will be £74.4million better off.

For those of you familiar with DCF analysis and the NPV concept, it is also worth noting that the same wealth maximisation decision can be determined from a *managerial perspective* without even considering the fact that the pattern of dividends has changed.

The increase in total value is simply the new project's *net present value* (NPV) given by the corporate DCF capital budgeting model.

$$\text{NPV} = \frac{(£100\text{million})}{1.1} + \frac{£200\text{ million}}{(1.1)^2} = \textbf{£74.4 million}$$

2. An Evaluation of the Data
   In our example, management is correct to retain earnings for reinvestment. The shareholders relinquish their next dividend. However, they gain an increase in the current *ex-div* value of their ordinary shares, which not only conforms to Fisher's Separation Theorem but also the MM dividend irrelevancy hypothesis.

In perfect capital markets, where the firm's investment decisions can be made independently of the consumption decisions of shareholders: - NPV project maximisation produces shareholder wealth maximising behaviour. - It is a change in investment and *not* dividend policy that determines the value of equity.

Exercise 4.2: The MM Dividend Irrelevancy Hypothesis

Chapter Four of *CVT* presents a comprehensive theoretical exposition and practical illustrations of the MM dividend irrelevancy hypothesis from both a *proprietary* (shareholder) and *entity* (managerial) perspective. Based on a sequential case study of different dividend-retention policies, initially applied to Gordon's growth model in Chapter Three, we developed a data set for an all equity firm (Jovi plc) with one million ordinary shares (common stock) in issue and an individual investor holding 40,000 shares. We observed that if Jovi adopts a *nil* dividend distribution policy, its current *ex-div* price per share was defined as follows using the MM *one period* model:

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

Required:

If you return to the companion text (*CVT*) and the Review Activity for Chapter Four, you will find the following question, for which I did not provide an answer.

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?

Let us now work through this together, given the assumption that profits are reinvested in projects of similar business risk with an equivalent yield of 2.5 per cent:

An Indicative Outline Solution

Our answer to the *CVT* Review Activity reinforces why MM hypothesised that dividends and retentions may be *perfect substitutes* in an all-equity firm, leaving shareholder wealth unaffected by changes in dividend distribution policy.

1. Dividend Irrelevancy
   For a given investment policy of equivalent risk, a change in dividend policy (either way) does not alter current share price. The future *ex-div* price falls by the rise in the dividend for a given investment policy of equivalent business risk and *vice versa*, leaving the current *ex-div* price unchanged.

2. The Shareholders' Reaction
   The MM case for *dividend neutrality* suggests that if a firm reduces its dividend payout, then shareholders can always satisfy their current income (consumption) preferences by creating *home-made* dividends. As we observed in Chapter Four, either they sell a requisite proportion of their holdings at an enhanced *ex-div* price, or borrow at the prevailing market rate of interest.

In our question, the company has moved from a *zero* distribution to a partial distribution. So, do shareholders who stay with the firm have a problem?

Using Equation (18) and our data where the Jovi company retains all earnings and K_e = 2.5%.

$P_0 = D_1 + P_1 / 1 + K_e$ = £0 + £4.10 / 1.025 = £4.00

Assuming that the firm pursues a 50 per cent retention policy to reinvest in projects of equivalent business risk (i.e. K_e = 2.5 per cent).

MM would redefine:

$P_0 = D_1 + P_1 / 1 + K_e$ = £0.05 + £4.05 / 1.025 = £4.00

So, no shareholder is worse off.

3. The Company's Reaction
   For their part too, firms can resort to new equity issues in order to finance any shortfall in their investment plans, or if they wish to pay a dividend.

Reconsider Jovi with an original nil distribution and dedicated investment policy, whose shares are currently valued at £4.00 with an *ex-div* price of £4.10 at time period one:

$P_0 = D_1 + P_1 / 1 + K_e$ = £0 + £4.10 / 1.025 = £4.00

The company has now decided to distribute 50 per cent of its earnings as dividends (5 pence per share on one million shares currently in issue).

If investment projects are still to be implemented, the company must raise new equity equivalent to the proportion of investment that is no longer funded by retained earnings. From our equations for the MM proof in Chapter Four, this equals:

(20) $mP_1 = nD_1 = £50{,}000$

The substitution of this figure into the equation for the total market value of the original shares, based on all the shares outstanding at time period one (nP_1+mP_1), defines the total market value of *original* shares in issue as follows:

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

And because the term ($mP_1 = nD_1$) disappears from this equation, it simplifies to:

(22) $nP_0 = 1/ K_e (n + m) P_1 = 1/ 1.025 (nP_1 + £50{,}000) = £4$ million

Since P_1 is the only *unknown*, dividing through by the number of Jovi's shares originally in issue (n = one million) and using Equation (18)

$P_0 = D_1 + P_1 / 1 + K_e = £0.05 + P_1 / 1.025 = £4.00$

And solving for P_1:

$P_1 = £4.05$

So, as MM hypothesise:

Share price movements compensate for revisions to dividend-retention policy.

In our example, the *ex-div* share price at the end of the period has fallen from its initial value of £4.10 to £4.05, which is exactly the same as the 5 pence rise in dividend per share, leaving P_0 unchanged.

Because the dividend term disappears from the MM equation for the market capitalisation of equity, it is impossible to assert that share price is a function of dividend policy.

Summary and Conclusions

Once a company has issued ordinary shares (common stock) and received the proceeds, it is neither directly involved with their subsequent market transactions, nor the prices at which they are transacted. These are negotiable between existing shareholders and prospective investors, based on their perception of corporate performance measured by earnings, dividends, growth and capital gains. So, in mature mixed market economies where ownership is divorced from control, modern finance theory neatly resolves this dilemma by assuming (rightly or wrongly) that:

The normative objective of modern financial management is to maximise shareholder wealth, based on NPV maximisation techniques.

We therefore began our analysis of this objective by tracing the development of modern finance throughout the twentieth century, underpinned by the simplistic assumptions of reasonably efficient capital markets under conditions of *certainty* with few barriers to trade, characterised by freedom of information.

According to a significant body of independent academic work by Fisher (1930), MM (1961) and Gordon (1962), reinforced by the efficient market hypothesis (EMH) of Fama (1965) and agency theory formalised by Jensen and Meckling (1976)

Management can justify retained earnings to finance future investment, rather than pay a current dividend, if their marginal return on new projects at least equals the market rate of interest that shareholders could obtain by using dividends to finance alternative investments of equivalent business risk elsewhere.

Shareholders would support such behaviour, since it cannot detract from their wealth. What they lose through dividends foregone, they receive through increased equity values generated by internally financed projects discounted at their required opportunity rate of return.

Moving to a real world of *uncertainty*, however, this academic consensus falls apart.

Gordon believes that movements in share price relate to corporate dividend policy, rather than investment policy. Rational, risk-averse investors should prefer their returns in the form of dividends now, rather than later. So, share price is a *positive* function of the dividend payout ratio.

MM maintain that because dividends and retentions are *perfect economic substitutes*, shareholders who need to replace a missing dividend to satisfy their consumption preferences have a simple solution. They can create *home-made* dividends by either borrowing an equivalent amount at the same rate as the company, or sell shares at a price that reflects their earnings and reap the capital gain.

According to MM, the borrowing (discount) rate is defined by an investment's *business* risk (the variability of earnings) and not *financial* risk (the pattern of dividends). So, corporate distribution policy is trivial. Dividend decisions are concerned with what is done with earnings after the event, but do not determine the risk originally associated with the quality of investment that produces them.

Let us now translate these conflicting theories into twenty-first century practice.

Selected References

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