For the Students of
M.Com Applied Economics (Sem -II)
Accounting for Financial Decision-II

Topic: Dividend Model by Modigliani with Solved Practical Questions

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IRRELEVANCE THEORY OF DIVIDEND BY MODIGLIANI MILLER

- The Irrelevance model of Dividend policy was propounded by Franco Modigliani and Merton Miller in 1961.
- Modigliani and Miller school of thought believed that dividend policy are irrelevant to the value of the firm, meaning thereby, that it does not affect the shareholders wealth.
- Under this model, market price of share is affected by investment patterns that determine the earnings of the firm. Thus, the shareholders are indifferent in case the firm pays dividend or retains its earnings for expanding investment opportunities. It simply means that Earnings of the firm (either in the form of current dividends or as capital gains) influences the Market value of the firm under M-M Approach.

Assumptions of the MM theorem

- Existence of Perfect capital markets and assumes that all investors are rational.
- No taxes and floatation costs.
- Firms follow a fixed Investment Policy.
- No Risk or Uncertainty exist-meaning that shareholders can expect future dividends (D_1) with certainty and one discount rate is allowed for all kinds of stocks. Hence, ($r=k_e$)

Investor has no preference between paying out dividends and income from Capital gains as it gets equal satisfaction in both the cases

Formula for calculation of MM Hypothesis:

$$P_O = \frac{D_1 + P_1}{1+k_e}$$

Where, P_0= Current Market Price Per Share

D_1= Expected Dividend at the end of year

P_1= Expected Market Price Per Share at the end of year

k_e= Cost of Equity Share Capital

Funds for exploiting opportunities of the firm are financed either through retained earnings or by way of issue of fresh equity shares to raise capital. The amount used up in paying out dividends is replaced by the new capital raised through issuing shares. This will affect the value of the firm in an opposite ways. The increase in the value because of the dividends will be offset by the decrease in the value for new capital raising.

PRACTICAL QUESTIONS

Q.1. Following are the details regarding three companies A Ltd., B Ltd. and C Ltd.

Details	A Ltd	B Ltd	C Ltd
Internal rate of return	15%	5%	10%
Cost of equity capital	10%	10%	10%
Earnings per share	Rs 8	Rs 8	Rs 8

Calculate the value of an equity share of each of these companies applying Walter's formulae when dividend payout ratio is:

i. **50%**
ii. **75%**
iii. **25%**

(Practical Question extracted from LU M.Com Applied Exam, AFD-Sem 2, Exam-2019)

Solution:

The market price of share according to Walter's Model for 3 different companies are calculated as follow:

FORMULA:

$$P = \frac{DPS + r/k_e(EPS - DPS)}{k_e}$$

Effect of Dividend Policy on Market Price of Shares

Particulars	A Ltd (r=15%)	B Ltd (r=5%)	C Ltd (r= 10%)
D/P ratio is 50% i.e. DPS=50% of Rs 8=Rs 4	= 4+.15/.10(8-4) / .10 = 4+ 3/2(4) / .10 = **Rs 100**	= 4+.05/.10(8-4) / .10 = 4+ 1/2(4) / .10 = **Rs 60**	= 4+.10/.10(8-4) / .10 = 4+ 1(4) / .10 = **Rs 80**
D/P ratio is 75% i.e. DPS=75% of Rs 8=Rs 6	= 6+.15/.10(8-6) / .10 = 6+ 3/2(2) / .10 **= Rs 90**	= 6+.05/.10(8-6) / .10 = 6+ 1/2(2) / .10 = **Rs 70**	= 6+.10/.10(8-6) / .10 = 6+ 1(2) / .10 = **Rs 80**
D/P ratio is 25% i.e. DPS=75% of Rs 8=Rs 2	= 2+.15/.10(8-2) / .10 = 2+ 3/2(6) / .10 **= Rs 110**	= 2+.05/.10(8-2) / .10 = 2+ 1/2(6) / .10 **= Rs 50**	= 2+.10/.10(8-2) / .10 = 2+ 1(6) / .10 **= Rs 80**

Conclusions drawn:

A Ltd.-Since r (15%) is more than k (10%), therefore it is a Growth firm. It is always good for growth firms to have maximum retained earnings with zero payout ratio. The above situations reflect that value of market price per share is highest at Rs 110 when dividend payout ratio is least i.e. 25% amongst the three combinations.

B Ltd. Since r (5%) is less than k (10%), therefore it is a declining firm. It is always good for these to pay maximum dividends and retain minimum earnings (zero). The above situations reflect that value of market price per share is highest at Rs 70 when dividend payout ratio is highest amongst the three combinations i.e. 75%.

C Ltd. Since r (10%) is equal to k (10%), therefore it is characterized as a normal firm. Here, D/P ratio does not influence the value of market price per share. Therefore, it can be seen from the above cases that value of share remains the same in all the three situations.

Q.2. In a company the EPS is Rs 10. The cost of capital is expected to be 10%, The rate of return on investment is 12%. Compute the value of a company's shares using Gordon's Model under each of the following retention ratios: (i) 20% (ii) 40% (iii) 50% (iv) 60% and (v) 80%.

(Practical Question extracted from LU M.Com Applied Exam, AFD-Sem 2, Exam-2015)

Solution:

Formula used for calculation of Market value of Co.'s share by Gordon's Model

$$\mathbf{P=}\ \frac{E(1-b)}{k_e - br}$$

In this case, we can see that r>k i.e. 12% > 10% means it is a growth firm.

where, g=br= growth rate of firm

b=retention ratio

Particulars	Given EPS =Rs 10, k_e=10%=.10 r=12% = .12
Retention ratio is 20% i.e. b=.20 g=br =.20*.12 =.024	= 10(1-.20) / .10-.024 = 10*.80 / .076 = **Rs 105.23**
Retention ratio is 40% i.e. b=.40 g=br =.40*.12 =.048	= 10(1-.40) / .10-.048 = 10*.60 / .052 **= Rs 115.38**
Retention ratio is 50% i.e. b=.50 g=br =.50*.12 =.06	= 10(1-.50) / .10-.06 = 10*.50 / .04 **= Rs 125**

Retention ratio is 60% i.e. b=.60 g=br =.60*.12 =.072	= 10(1-.60) .10-.072 = 10*.40 .028 **= Rs 142.86**
Retention ratio is 80% i.e. b=.80 g=br =.80*.12 =.096	= 10(1-.80) .10-.096 = 10*.20 .004 **= Rs 500**

For **growth firms** where r>ke>g, market price of share increases with increase in retention ratio and falls with increase in payout ratio. Therefore, market price of share is highest at Rs 500 when retention ratio is 80%.

References

- Business Finance by Prof. Bimal Jaiswal
- Financial Management by Dr R.P. Rustagi

THANKING YOU