Solutions

# A1

1. 1. Venture capitalists expect returns of 40% or more from their investments, because the betas of start-up companies are very high. True.
2. The better shareholders are protected in a country, the higher the ownership concentration of shareholders. False
3. The rate of return of a perpetuity is equal to the cash flow multiplied by the price. False
4. The share price of a company reflects accurately the effort of a manager. False.
5. The constant growth formula for stock valuation does not work for firms with negative growth (declining) rates in dividends. True
6. The average beta of all stocks is always equal to zero. False
7. Delegation of financial decision making is not possible, since investors have different consumption preferences. True.
8. Risky assets have always a higher rate of return than the risk-free rate. True.
9. If capital markets are efficient, then the purchase or sale of any security at the prevailing market price is never a positive-NPV transaction. True.
10. A reverse stock split is illegal. False.
11. According to Miller and Modigliani, the cost of equity increases as more debt is issued, but the weighted average cost of capital remains unchanged. True.
12. The pecking order theory implies that firms prefer external to internal financing. False.
13. The risk of outstanding bonds decreases over time. False.
14. Shares of companies with valuable PVGO trade at low E/P ratios. False.
15. The longer the time to expiration, the higher the value of a put option. True.

# B1

1)

Expected return from Share X = RX = 15%

Expected return from Share Y = RY = 10%

The expected return on portfolio can be written as

Where,

= Percentage of share X in the portfolio, and

= Percentage of share Y in the portfolio

The expected return on Portfolio 1 ()

Therefore,

The expected return on Portfolio 2 ()

Therefore,

The expected return on Portfolio 3 ()

Therefore,

To calculate standard deviations of the portfolios:

Standard deviation of the portfolio is given by the following equation:

Where,

= Std. deviation of returns of share X = 10%,

= Std. deviation of returns of share Y = 5%, and

= covariance between the returns of Share X and Share Y

Now

Where

= correlation between the returns of X and Y = 0.3

Therefore,

Standard Deviation of Portfolio 1

0.0622 = 6.22%

Standard Deviation of Portfolio 2

0.0497 = 4.97%

Standard Deviation of Portfolio 3

0.0835 = 8.35%



2)



3)

Madoff can borrow or lend at an interest rate of 7.3731

rf = 7.3731



4)

To find proportions of the common stock portfolio should that be invested in X and Y

Analytical solution:

We find the tangency portfolio for share X and share Y

The proportion of Share X in the portfolio is given by the following equation:

Therefore,

Therefore,

The proportion of Share Y in the portfolio = = 1 -

Therefore,

Therefore for the most efficient portfolio, Mr Madoff should invest 50% of his common stock portfolio in X and the other 50% in Y.

The proportion to be invested in the interest-based instrument depends on the risk-profile of Mr. Madoff.

**Graphical Solution:**



The most efficient portfolio is the tangency line between the risk-free rate and the risky investment opportunity curve.

This tangency line will be the one with the highest Sharpe’s Slope and this line is tangent to the risky investment opportunity curve at Portfolio 1 (50% of X and 50% of Y)

# Problem B2



Salvage value of the new machine has been calculated on the basis of WDV depreciation of 20% each year based on the fact that the old machine has been depreciated 20% each year to reach its current market value of $20000 from $60000 five years back

NPV = PV (Cash in flow for year 1-10) – Cash outlay

Therefore,

NPV = PV (Reduction in operating expenses for years 1- 10 + salvage value of the new machine at the end of 10 years) – (Cost of the new machine – current market value of the old machine)

Therefore,

NPV = PV(10000 annuity for 10 years) + PV (8590 after 10 years) – (80000 – 20000)

Therefore,

However, the NPV as calculated by the company = 13,600.87

Therefore,

Therefore,

Solving by substituting different values for r, we get

Now assuming that CAPM holds,

Where,

= risk-free rate = 3%,

= market-risk premium = 6%

Therefore,

Therefore,

= 1.433

# B3

1)

Weighted average cost of capital is given by

Where

= market value of equity,

= market value of debt,

= cost of equity

= cost of debt.

Now,

Where,

= risk-free rate = 7%

= market risk premium = 8%

= β on equity = 1.1

Therefore,

Therefore,

Also,

Where

= 0.15

Therefore,

Therefore,

Now substituting the values of and in the equation for

Since E and D are 50% each,

Therefore,

Therefore,

2)

Capital structure: Debt 80%, Equity 20%

= 0.15

To calculate:

and

Since only the capital structure has changed and the operation of the firm is unchanged, the overall risk of the firm is unchanged. This means that the will remain the same as in the previous question.

Calculating using values from the previous question:

Therefore,

Therefore,

Now using this value of we can calculate for a capital structure with 80% debt.

Therefore,

Therefore,

The will remain the same at 0.625

3)

Calculating the WACC for the capital structure with 80% debt and 20% equity

Therefore,

Therefore,

Therefore,

Therefore,

Therefore,

Therefore,

Therefore,

Thus, the change in capital structure doesn’t affect the and it remains the same. However, an increase in debt proportion of the capital structure increases increasing the risk to the equity holders.

4)

The minimum the company can have is when it has 100% equity and no debt.

i.e

Therefore,

Therefore,

i.e

Therefore,

Therefore,

is the lowest value it can have.

5) The can be = 1.1 if it is estimated that the is negligible and assumed to be = 0

# B4

1. Value after dividend payment = Value before rights issue + amount raised in the rights issue

= $100 x 100 + $50 x 10 = $10,500

1. For every 10 share outstanding, the company offers 1 share. Since there are 100 shares outstanding, Company XYZ has to offer 10 shares in total.
2. The value of Company XYZ = $100 x 100 = $10,000

The rights issue adds 10 shares at $50. = $500

The share price after the rights issue = ($10,000 + $500)/(100 + 10) = $95.45

1. the value of a right to buy a share of the new issue

= (P0 – S)/(N+1), where

P0 = market price of share = 100

S = subscription price per share = 50

N= Number of rights required to purchase one share of stock = 10 (Since each shareholder holds the right to buy 1/10th of the new shares)

Therefore the value of a right to buy a share of the new issue = (100-50)/(10+1) = $4.54

Therefore the value of a right to buy a 10th of a share of the new issue = $0.454

1. Assuming a non participating investor had 10 shares before the issue. The value of his shares before the issue = 10 \* $100 = $1000

After the issue, the value of his shares = 10 \* $95.45 = $954.5

However, he will sell his rights which is worth $4.54 per share. Hence for 10 shares he can sell it for $45.4.

Hence the total wealth with the investor will be $954.5 + $45.4 = $999

Thus, there is no change in the non-participating investors wealth.

# A2

1. As per the dividend discount model a stock is valued based on the dividends paid, growth in dividends and a required return. If the company is not expected to grow, the company would pay out all earnings as dividends. In such a case, the value will reflect the current earnings divided by the required return, or E/r. This is the no-growth value per share.

From the above scenario we know what will be the value of a stock if it does not grow, we can also calculate how much value the market will assigning to future growth opportunities. The total value will be V = E/r + PVGO where E/r is the no-growth value and PVGO is the present value of growth opportunities. Hence the first statement is correct as the value increases by PVGO.

Modigilani-Miller stated that if financial markets are perfectly efficient, then how a company is a financed will have no bearing on its performance. If taxes, asymmetric information, or government and other unnecessary fees are not imposed, then the performance of the company will be equal regardless of the way it has been financed by equity issues, debt, or something else. It also states that a company's dividend policy is irrelevant in these circumstances.

With more dividend price appreciation has is limited but the total return to be provided by the company to its shareholder is the same. As per the equation stated above if less dividends are paid and earnings are invested for growth the value of the PVGO component will rise. If all earnings are paid as dividends then PVGO will be zero while the value of E/r will rise. Hence the theory stands true.

1. As per the pecking order theory there is asymmetry of information between a company’s managers and investors. Because of this, decisions by firm managers relating to financing and specially to fund sourcing, may act as signals to investors.

Managers usually favor debt financing over equity financing. This is because the cost of debt is usually lower than cost of equity. A firm that chooses debt for funding might entail either an optimization of its leverage or an increase in investments, both of which convey positive expectations to investors. But these positive expectations can be reversed when the increase in debt might infer financial vulnerability.

Firm managers issue equity when they believe it is overvalued as they can raise more fund per stock issued and lower the cost of financing. But if the investors share the same view that the managers are issuing equity since its overpriced, there can be a corrective dip in the stock price. Also by issuing equity the company is giving away control which again raises questions.