**Assignment 1 – Financial Management**

1 – a

Because it is U.S. Treasury note, we consider real rate of interest (real risk-free rate), maturity risk premium and inflation premium.

K = k\* + IP + MRP = 2.5% + 3% + (5-1)0.1% = 5.9%

1 – b

These two corporate bonds have different interest rates, because they have different default risk premium. Gateway has more default risk than Dell.

In treasury, we don’t consider default risk premium and liquidity risk premium, but in corporate bonds, we have to do it, which makes difference between these two types debt financing.

1 – c

In corporate bond, we get nominal rate by below equation.

K = k\* + IP + DRP + LP + MRP

Dell’s interest rate: 7.5% = 2.5% + 3% + DRPDell + 1.4% + (5-1)0.1%

Thus, default risk premium of Dell is 0.2%

Gateway’s interest rate: 8.2% = 2.5% + 3% + DRPGateway + 1.4% + (5-1)0.1%

Thus, default risk premium of Gateway is 0.9%

2 – a

2- b

This yield curve is upward sloping. If a yield curve is upward, it means long-term interest rates are higher than short-term interest rates. In contrast, if a yield curve is downward, it means short-term interest rates are higher than long-term interest rates. And in case of flat yield curve, it means short-term and long-term interest rates are same.

2 – c

According to pure expectations theory, this upward yield curve means investors expect interest rates will be increase in future. In market segmentation theory, these future interest rates are equilibrium of supply and demand curves of this treasury. And liquidity preference theory explains that because investors consider short-term bonds are less risky they prefer short-term bonds. In case of long-term bonds, they demand more interest rate, which is called default risk premium. Therefore, the yield curve of liquidity preference theory should be upward.

2 – d

According to the expectations theory, 0r2 = (0r1 + 1r2) / 2

* 4.3% = (4.1% + 1r2) / 2

Thus, 1r2(expected one-year treasury yield one year from today)= 4.5%

In short-term treasury, k = k\* + IP

* 4.5% = 2% + IP

Thus, expected inflation rate of year 2 = 2.5%

2 – e

According to the expectations theory, 0r3 = (0r1 + 1r2 + 2r3) / 3

* 5.0% = (4.1% + 4.5% + 2r3) / 3

Thus, 2r3(expected one-year treasury yield two years from today) = 6.4%

In short-term treasury, k = k\* + IP

* 6.4% = 2% + IP

Thus, expected inflation rate of year 3 = 4.4%

2 – f

According to the expectations theory, 1r3 = (1r2 + 2r3) / 2

* 1r3 = (4.5% + 6.4%) / 2 =5.45%

Thus, 1r3(expected two-year treasury yield one year from today) = 5.45%

2 – g

According to the expectations theory, 0r5 = (0r1 + 1r2 + 2r3 + 3r4 + 4r5) / 5

* 5.7% = (4.1% + 4.5% + 6.4% + 3r4 + 4r5) / 5
* 3r4 + 4r5 = 13.5%
* 3r5 = (3r4 + 4r5) / 2
* 3r5 = 13.5% / 2 = 6.75%

Thus, 3r5(expected two-year treasury yield three years from today) = 6.75%

2 – h

In treasury, k = k\* + IP + MRP

6.2% = 1% + IP + (10-1)0.1%

Thus, IP (the expected average annual rate of inflation over the next 10 years) = 4.3%

3 - a

Expected return of ABC Inc. = 0.15(-10%) + 0.55 \* 20% + 0.20 \* 25% + 0.10 \* 40% = 18.5%

Standard deviation of ABC Inc. = [0.15(-10% - 18.5%)2 + 0.55(20% - 18.5%)2 + 0.20(25% - 18.5%)2 + 0.10(40% - 18.5%)2]0.5 = 13.33%

Coefficient of variation of ABC Inc.= 13.33% / 18.5% = 0.72

Expected return of XYZ Inc. = 0.15 \* 30% + 0.55 \* 25% + 0.20 \* 2% + 0.10(-40%) = 14.65%

Standard deviation of XYZ Inc. = [0.15(30% - 14.65%)2 + 0.55(25% - 14.65%)2 + 0.20(2% - 14.65%)2 + 0.10(-40% - 14.65%)2]0.5 = 20.61%

Coefficient of variation of XYZ Inc.= 20.61% / 14.65% = 1.41

3 – b

Expected return of portfolio = 0.15(-10% \* 0.3 + 30% \* 0.7) + 0.55(20% \* 0.3 + 25% \* 0.7) + 0.20(25% \* 0.3 + 2% \* 0.7) + 0.10(40% \* 0.3 + (-40%) \* 0.7) = 15.81%

Before calculate standard deviation of portfolio, first calculate probability distribution of possible stock returns for portfolio.

|  |  |  |
| --- | --- | --- |
| State of Economy | Probability of state | Portfolio |
| Recession | 0.15 | 0.3 \* (-10%) + 0.7 \* 30% = 18% |
| Normal | 0.55 | 0.3 \* 20% + 0.7 \* 25% = 23.5% |
| Boom | 0.20 | 0.3 \* 25% + 0.7 \* 2% = 8.9% |
| Bubble | 0.10 | 0.3 \* 40% + 0.7 \* (-40%) = -16% |

Standard deviation of portfolio = [0.15(18% - 15.81%)2 + 0.55(23.5% - 15.81%)2 + 0.20(8.9% - 15.81%)2 + 0.10(- 16% - 15.81%)2]0.5 = 12.00%

3 – c

Weighted average of standard deviations of these two stocks = 0.3 \* 13.33% + 0.7 \* 20.61% = 18.43% It is different from portfolio standard deviation, because these two stocks, they are correlated. When their interest rates are moving exactly same direction depending on state of economy, their correlation coefficient will be positive one and in this case, weighted average of standard deviations and standard deviation of portfolio are equal. But in reality, most stocks are changing different ways, in this circumstance correlation coefficient is smaller than positive one, which makes difference these two standard deviations.