Q1.You are considering a security with the following possible rates of return:

|  |  |
| --- | --- |
| Probability | Return (%) |
| 0.10 | 8.5 |
| 0.30 | 12.6 |
| 0.40 | 14.7 |
| 0.20 | 22.3 |

a. Calculate the expected rate of return.

b. Calculate the standard deviation of the returns.

*Answer:*

*a. Expected Return = (0.1)(8.5)+(0.3)(12.6)+(0.4)(14.7)+(0.2)(22.3) = 14.97*

*b. Std. Dev. = [(8.5 - 14.97)2(0.1) + (12.6 - 14.97)2(0.3)*

*+ (14.7 - 14.97)2(0.4) + (22.3 - 14.97)2(0.2)]1/2 = 4.08%*

*Q2.*You are considering the three securities listed below.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Returns | | |
| Probability | Stock A | Stock B | Stock C |
| 20% | 2% | -3% | 5% |
| 50% | 10% | 8% | 8% |
| 30% | 15% | 20% | 12% |

a. Calculate the expected return for each security.

b. Calculate the standard deviation of returns for each security.

c. Compare Stock A with Stocks B and C. Is Stock A preferred over the others?

*Answer:*

*a.*

*RA = (.2)(2%)+(.5)(10%)+(.3)(15%) = 9.9%*

*RB = (.2)(-3%)+(.5)(8%)+(.3)(20%) = 9.4%*

*RC = (.2)(5%)+(.5)(8%)+(.3)(12%) = 8.6%*

*b.*

*Std.Dev.A = (2%-9.9%)2(.2)+(10%-9.9%)2(.5)+(15%-9.9%)2(.3) = 4.5%*

*Std.Dev.B = (-3%-9.4%)2(.2)+(8%-9.4%)2(.5)+(20%-9.4%)2(.3) = 8.1%*

*Std.Dev.C = (5%-8.6%)2(.2)+(8%-8.6%)2(.5)+(12%-8.6%)2(.3) = 2.5%*

*c.*

*Stock A dominates stock B because A has a higher expected return and a lower standard deviation. Stock A has a higher expected return than stock C, but also a higher standard deviation, so the choice between A and C depends on the level of risk aversion.*

Q3.Answer the questions below using the following information on stocks A, B, and C.

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | B | C |
| Expected Return | 13% | 13% | 10% |
| Standard Deviation | 12% | 10% | 10% |
| Beta | 1.6 | 2 | 0.5 |

Assume the risk-free rate of return is 4% and the expected market return is 10%

a. Calculate the required return for stocks A, B, and C.

b. Assuming an investor with a well-diversified portfolio, which stock would the investor want to add to his portfolio?

c. Assuming an investor who will invest all of his money into one security, which stock will the investor choose?

*Answer:*

*a. Stock A: 4% + (10% - 4%)(1.6) = 13.6%*

*Stock B: 4% + (10% -4%)(2.0) = 16.0%*

*Stock C: 4% + (10% - 4%)(0.5) = 7.0%*

*b. A well-diversified investor will select Stock C, which is the only stock with an expected return that exceeds its required return.*

*c. Stock B is preferred because it has the highest expected return along with the lowest standard deviation of returns.*