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**Problem Set: Risk and Return**

**(Solutions Below)**

**Expected Rate of Return**

1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 20% | -24% |
| 30% | 0 |
| 30% | 5% |
| 20% | 25% |

1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -10% |
| 20% | -5% |
| 50% | 15% |
| 20% | 10% |

1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -4% |
| 30% | 0 |
| 40% | 15% |
| 20% | 20% |

**Standard Deviation**

1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 20% | -24% |
| 30% | 0 |
| 30% | 5% |
| 20% | 25% |

1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -10% |
| 20% | -5% |
| 50% | 15% |
| 20% | 10% |

1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -4% |
| 30% | 0 |
| 40% | 15% |
| 20% | 20% |

**Two-Asset Portfolios**

1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| A | 14% | 20% | 20% | 0.6 |
| B | 12% | 15% | 80% |  |

1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| C | 9% | 15% | 50% | 0.8 |
| D | 8.5% | 13% | 50% |  |

1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| E | 12% | 19% | 30% | 0.4 |
| F | 10% | 10% | 70% |  |

**Two-Asset Portfolios**

1. Find the expected return (rf = 5 % and rM = 12%):

|  |  |
| --- | --- |
| Stock | Beta |
| A | 1.1 |
| B | 0.9 |
| C | 1.4 |
| D | 1.2 |

1. Find the expected return (rf = 4.5% and rM = 11.5%):

|  |  |
| --- | --- |
| Stock | Beta |
| A | 0.95 |
| B | 1.01 |
| C | 1.29 |
| D | 1.19 |

1. If the expected return on a stock is 9.4% (assuming rf = 5.2% and rM = 11.4%), what must be the beta?
2. If the expected return on a stock is 13.3% (assuming  = 1.1 and rM = 12.5%), what must be the risk free rate?
3. If the expected return on a stock is 11.5% (assuming  = 0.9 and rf = 5%), what must be the return on the market?

**Solutions**

**Expected Rate of Return**

1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 20% | -24% |
| 30% | 0 |
| 30% | 5% |
| 20% | 25% |

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1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -10% |
| 20% | -5% |
| 50% | 15% |
| 20% | 10% |

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1. Find the expected rate of return:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -4% |
| 30% | 0 |
| 40% | 15% |
| 20% | 20% |

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**Standard Deviation**

1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 20% | -24% |
| 30% | 0 |
| 30% | 5% |
| 20% | 25% |

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1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -10% |
| 20% | -5% |
| 50% | 15% |
| 20% | 10% |

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1. Find the variance and standard deviation:

|  |  |
| --- | --- |
| Probability | Return |
| 10% | -4% |
| 30% | 0 |
| 40% | 15% |
| 20% | 20% |

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**Two-Asset Portfolios**

1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| A | 14% | 20% | 20% | 0.6 |
| B | 12% | 15% | 80% |  |

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1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| A | 9.0% | 15% | 50% | 0.8 |
| B | 8.5% | 13% | 50% |  |

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1. Find the expected return, variance and standard deviation of the two-asset portfolio:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset | Return | Standard Deviation | Weight | Correlation |
| A | 12% | 19% | 30% | 0.4 |
| B | 10% | 10% | 70% |  |

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**Capital Asset Pricing Model (CAPM)**

1. Find the expected return (rf = 5 % and rM = 12%):

|  |  |
| --- | --- |
| Stock | Beta |
| A | 1.1 |
| B | 0.9 |
| C | 1.4 |
| D | 1.2 |

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1. Find the expected return (rf = 4.5% and rM = 11.5%):

|  |  |
| --- | --- |
| Stock | Beta |
| A | 0.95 |
| B | 1.01 |
| C | 1.29 |
| D | 1.19 |

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1. If the expected return on a stock is 9.4% (assuming rf = 5.2% and rM = 11.2%), what must be the beta?

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1. If the expected return on a stock is 13.3% (assuming  = 1.1 and rM = 12.5%), what must be the risk free rate?

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1. If the expected return on a stock is 11.48% (assuming  = 0.9 and rf = 5%), what must be the return on the market?

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