NBA 5420 – Investments and Portfolio Management

Problem Set 2 – Portfolio Optimization

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Problem 1: Stock A’s expected return and standard deviation are E[RA] = 5% and A= 15%, while stock B’s expected return and standard deviation are E[RB] = 7% and B=21%.

1. Determine the expected return and standard deviation of the return on a portfolio with weights ωA=.35 and ωB=.65 for the following alternative values of correlation between A and B: ρAB=0.6 and ρAB= -0.4.
2. Assume now that ρAB=-1.0andfindtheportfoliopofstocksAandBthathasno risk (i.e. such that p=0). Can you do the same when ρAB=1.0? If not, why? If so, find that portfolio.
3. Finally, assume that ρAB=0. Find the standard deviations of portfolios with the following expected returns: 4%, 5%, 6%, 7%, 8%, 9%, 10%. Plot the expected return—standard deviation pairs on a graph (with the standard deviations on the horizontal axis, and the expected returns on the vertical axis).
4. Consider three stocks, A, B and C. Suppose that both ρAB=0 and ρBC=0. Does that imply ρAC=0? Show that it is, or find a counter-example.