

FN 312 Quiz 2

An optimal portfolio A according to your level of risk aversion has an expected return of 8% a year. It is constructed from two funds: a money market fund and an S&P 500 index fund.

- The money market fund holds 3-month Treasury bills, which currently offer a 3% safe return per year.
- The S&P 500 index fund offers an expected return of 10% per year with a standard deviation of 20%.

a) What is the composition of the money market and the S&P500 index fund in portfolio A? What is the standard deviation of portfolio A? What is your level of risk aversion?

$E(r) = w \cdot 10 + (1-w) \cdot 3 = 8 \rightarrow 7w + 3 = 8 \rightarrow w = 5/7 = 0.714$ meaning that 71.4% is invested in the risky portfolio (S&P500 index) and 28.57% in the money market fund.

The standard deviation of portfolio A = $w \cdot 20 = 14.28\%$

**Level of risk aversion $\rightarrow w = (E(rp) - r_f) / A \sigma_p^2 = (0.10 - 0.03) / (A \cdot 0.2^2) = 0.714$
Solve for A, to get $A = 2.45$**

b) Suppose you can now also invest in an emerging market fund which has an expected return of 10% per year (same as S&P500 index fund) but with a standard deviation of 30% (higher than the S&P500 fund). Its correlation with the S&P500 index fund is 0. Would you consider adding the emerging market fund to your portfolio? Explain.

Yes, since its correlation is less than 1 so there are diversification benefits to be had and can reduce the total risk of the overall complete portfolio.