

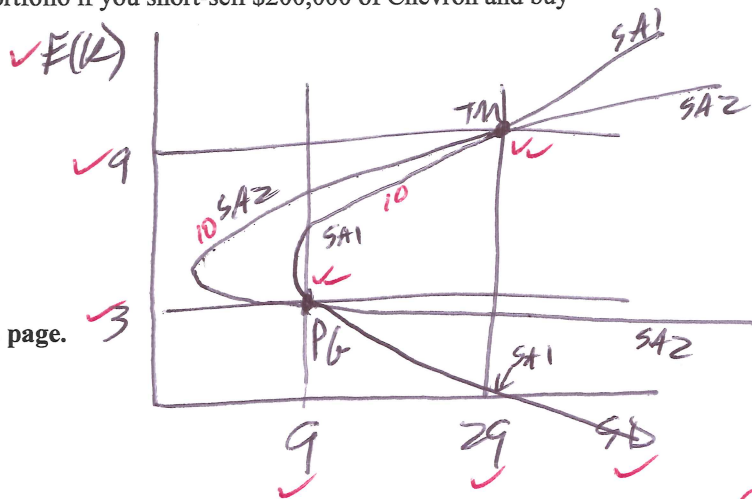
Short Answer 1 (15 points): Sketch a reasonable set of portfolios you could build if you buy and/or short-sell shares of Toyota (TM) and Proctor & Gamble (PG). Assume the expected return on TM is 9% and on PG is 3%, the standard deviation of returns on TM is 29% and on PG is 9%, and the correlation between TM and PG is +0.5.

Short Answer 2 (15 points): On the same graph you used to answer SA1, show how your graph would change if the correlation between TM and PG falls to -0.2. Be sure to clearly label which part of your graph answers SA1 and which part of your graph answers SA2.

Problem (75 points): Based on the past five years of returns, set up the calculations needed to determine the standard deviation of returns on Chevron (CVX) and Google (GOOG), the covariance between Chevron and Google, and the standard deviation of returns on your portfolio if you short-sell \$200,000 of Chevron and buy \$800,000 of Google.

Year	Return on: CVX	GOOG
2013	8%	16%
2012	30%	46%
2011	18%	-2%
2010	19%	6%
2009	-11%	24%

Wall Street Journal Questions are on the back of this page.



$$+3 \quad SD_{CVX} = \sqrt{\frac{1}{4}((8 - \bar{R}_c)^2 + (30 - \bar{R}_c)^2 + (18 - \bar{R}_c)^2 + (19 - \bar{R}_c)^2 + (-11 - \bar{R}_c)^2)} \quad (10)$$

$$+3 \quad \bar{R}_c = \frac{1}{5}(8 + 30 + 18 + 19 - 11) \quad (9)$$

$$+3 \quad SD_{GOOG} = \sqrt{\frac{1}{4}((16 - \bar{R}_g)^2 + (46 - \bar{R}_g)^2 + (-2 - \bar{R}_g)^2 + (6 - \bar{R}_g)^2 + (24 - \bar{R}_g)^2)} \quad (10)$$

$$+3 \quad \bar{R}_g = \frac{1}{5}(16 + 46 - 2 + 6 + 24) \quad (9)$$

$$+6 \quad COV_{CVX, GOOG} = \frac{1}{4}((8 - \bar{R}_c)(16 - \bar{R}_g) + (30 - \bar{R}_c)(46 - \bar{R}_g) + (18 - \bar{R}_c)(-2 - \bar{R}_g) + (19 - \bar{R}_c)(6 - \bar{R}_g) + (-11 - \bar{R}_c)(24 - \bar{R}_g)) \quad (18)$$

$$+7 \quad SD_p = \sqrt{\left(\frac{-200}{600}\right)^2 SD_{CVX}^2 + \left(\frac{800}{600}\right)^2 SD_{GOOG}^2 + 2\left(\frac{-200}{600}\right)\left(\frac{800}{600}\right) COV_{CVX, GOOG}} \quad (19)$$