

Chapter 6 Case Studies

Top Performing Mutual Funds

Vanguard's Precious Metals and Mining fund (Metals) and Fidelity's Strategic Income fund (Income) were two top-performing mutual funds for the years 2000 through 2009. An analysis of annual return data for these two funds provided important information for any type of investor. Over the past 10 years, the Metals fund posted a mean return of 24.65% with a standard deviation of 37.13%. On the other hand, the mean and the standard deviation of return for the Income fund were 8.51% and 11.07%, respectively. It is reasonable to assume that the returns of the Metals and the Income funds are both normally distributed, where the means and the standard deviations are derived from the 10-year sample period.

In a report, use the sample information to compare and contrast the Metals and Income funds from the perspective of an investor whose objective is to:

1. Minimize the probability of earning a negative return.
2. Maximize the probability of earning a return between 0% and 10%.
3. Maximize the probability of earning a return greater than 10%.

Metals $\mu = 24.65\%$ $\sigma = 37.13\%$

Inc. $\mu = 8.51\%$ $\sigma = 11.07\%$

1. Negative return would be anything less than $X=0$

$P(X \leq 0) = P(Z \leq -0.66) = 0.2546$

$Z = \frac{0 - 24.65}{37.13} = -0.66$

$P(X \leq 0) = P(Z \leq -0.77) = 0.2206$

$Z = \frac{0 - 8.51}{11.07} = -0.77$

The income fund has a smaller probability of yielding a negative return

$0.2206 < 0.2546$

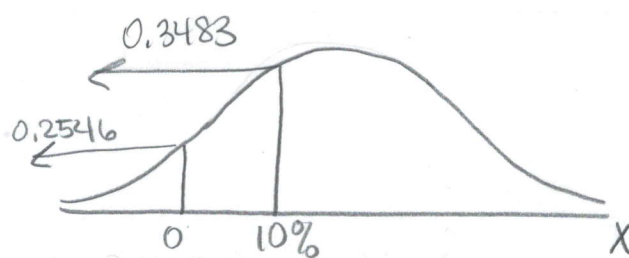
Inc

Metals

Metals

Inc.

2. Maximize



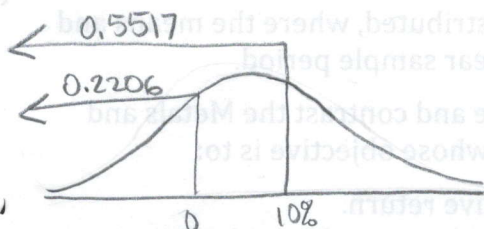
Metals

$$P(X \leq 0) = P(Z \leq -0.66) = 0.2546$$

$$P(X \leq 10) = P(Z \leq -0.39) = 0.3483$$

$$Z = \frac{10 - 24.65}{37.13} = -0.39$$

$$P(0 \leq X \leq 10) = 0.3483 - 0.2546 = 0.0937$$



Inc.

$$P(X \leq 0) = P(Z \leq -0.77) = 0.2206$$

$$Z = \frac{10 - 8.51}{11.07} = 0.13$$

$$P(X \leq 10) = P(Z \leq 0.13) = 0.5517$$

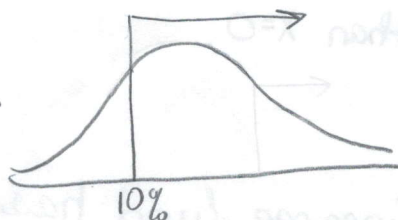
$$P(0 \leq X \leq 10) = 0.5517 - 0.2206 = 0.3311$$

The income fund has a higher probability of yielding a return between 0% and 10%

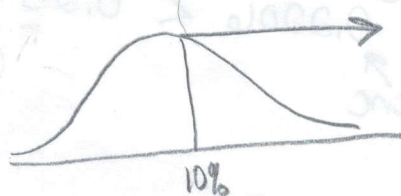
$$0.3311 > 0.0937$$

↑ metals
↑ inc.

3.



$$P(X \geq 10) = 1 - P(X \leq 10) = 1 - 0.3483 = 0.6517$$



$$P(X \geq 10) = 1 - P(X \leq 10) = 1 - 0.5517 = 0.4483$$

The metals fund has a higher probability of yielding a return greater than 10%.

$$0.6517 > 0.4483$$

↑ metals

↑ income