Markets Update

- What is happening in U.S. and global financial markets and why?

Markets Update

Some headlines:

“Gold Goes on a Print Run”

WSJ. Oct. 6

“Africa's Investment Bug Is Proving Contagious”

WSJ. Oct. 6

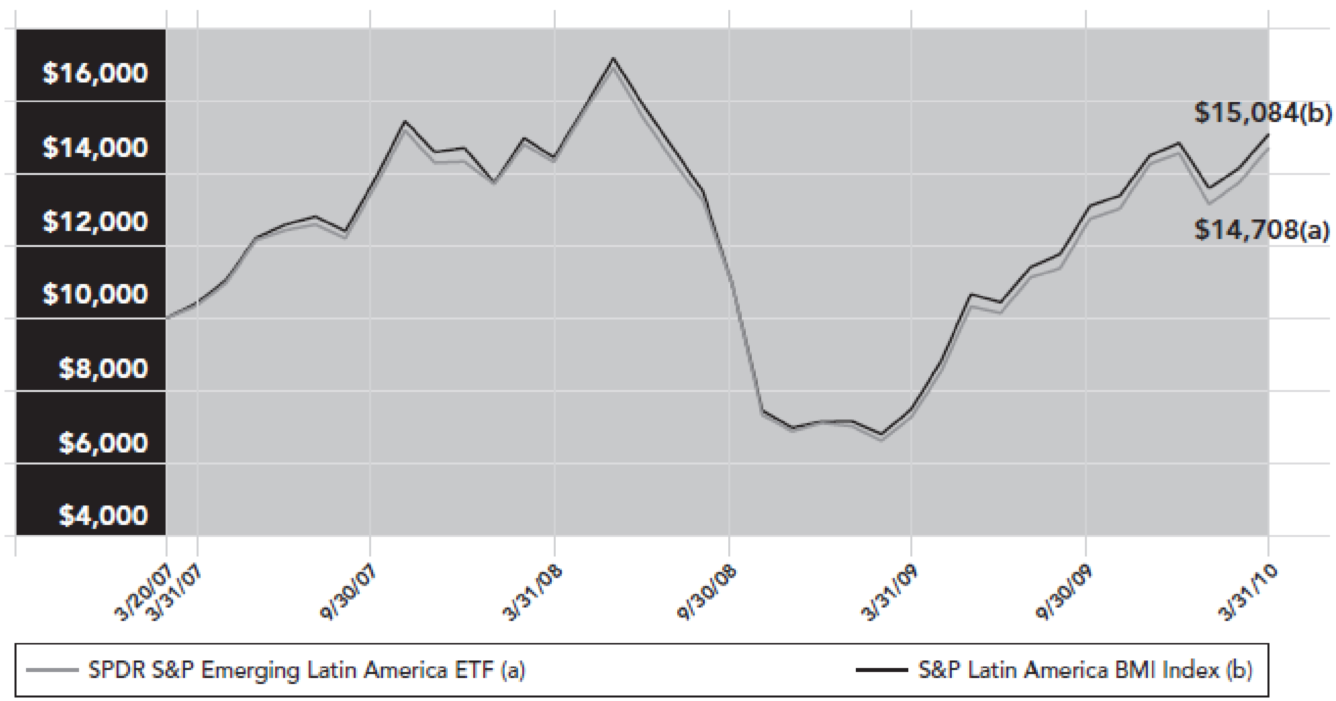
“Yield Hunt Leads to Currency Debt”

WSJ. Oct. 5

Markets Update

SPDR S&P Emerging Latin America ETF —
Performance Summary (continued)

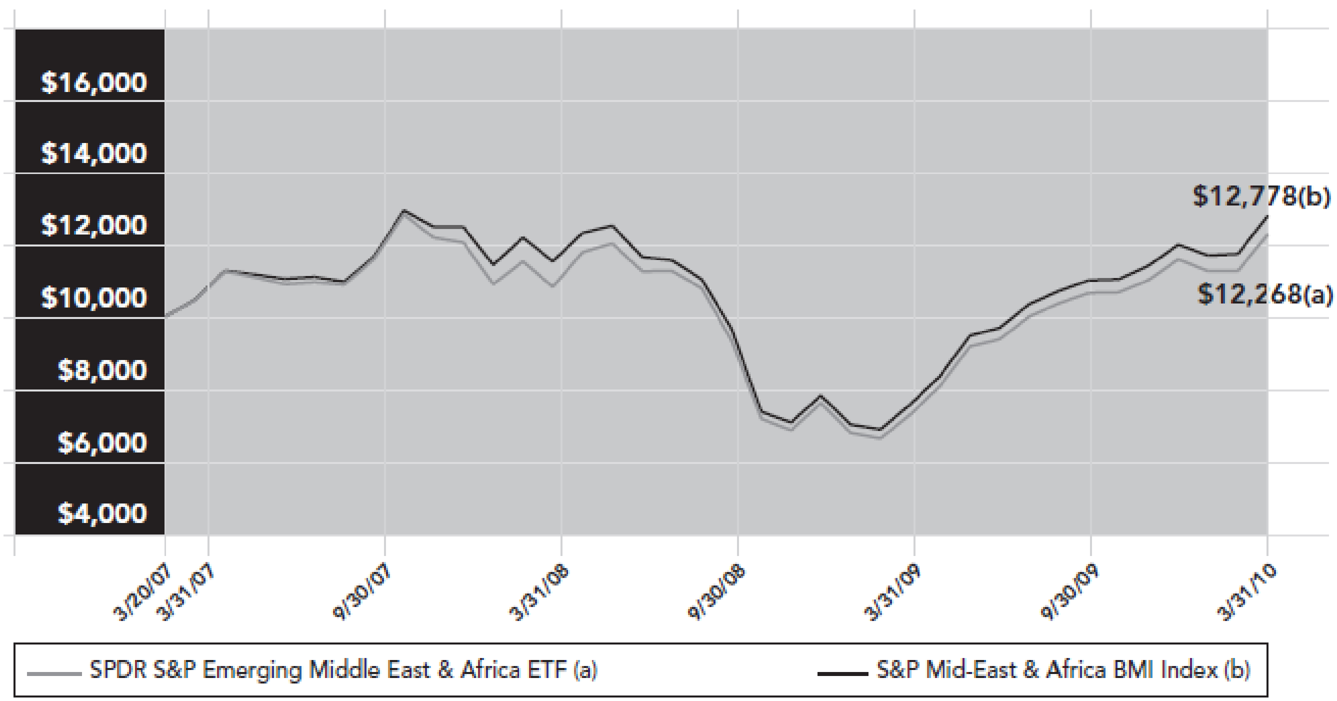
COMPARISON OF CHANGE IN VALUE OF A $10,000 INVESTMENT
SPDR S&P EMERGING LATIN AMERICA ETF (BASED ON NET ASSET VALUE)



Markets Update

SPDR S&P Emerging Middle East & Africa ETF — Performance Summary (continued)

COMPARISON OF CHANGE IN VALUE OF A $10,000 INVESTMENT
SPDR S&P EMERGING MIDDLE EAST & AFRICA ETF (BASED ON NET ASSET VALUE)



Markets Update

Search for Yield?

“IMF Cuts 2011 Global Growth Prospects” *WSJ*, Oct. 6

Markets Update

“Dow Up 193.45, Boosted by Fed” *WSJ*, Oct.6

“Stocks Rally to Five-Month High” *WSJ*, Oct.6

Markets Update

“Dow Up 193.45, Boosted by Fed” *WSJ*, Oct.6

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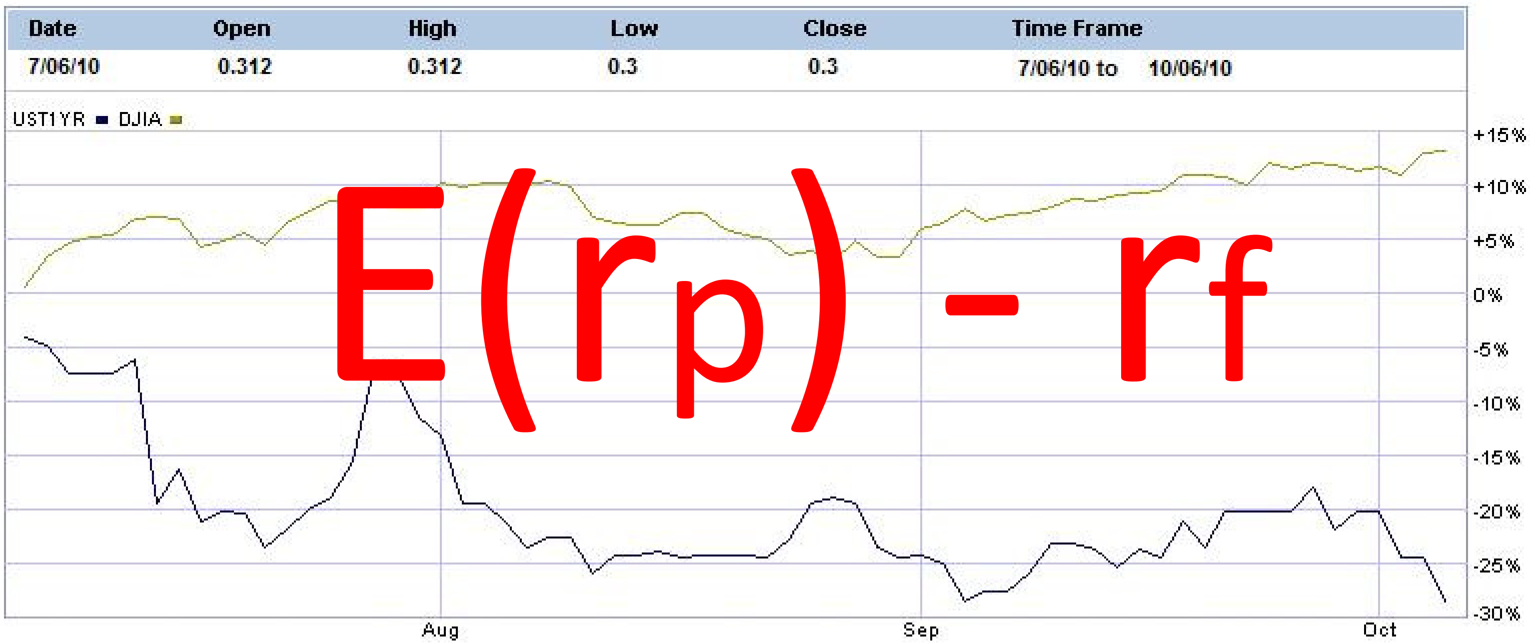
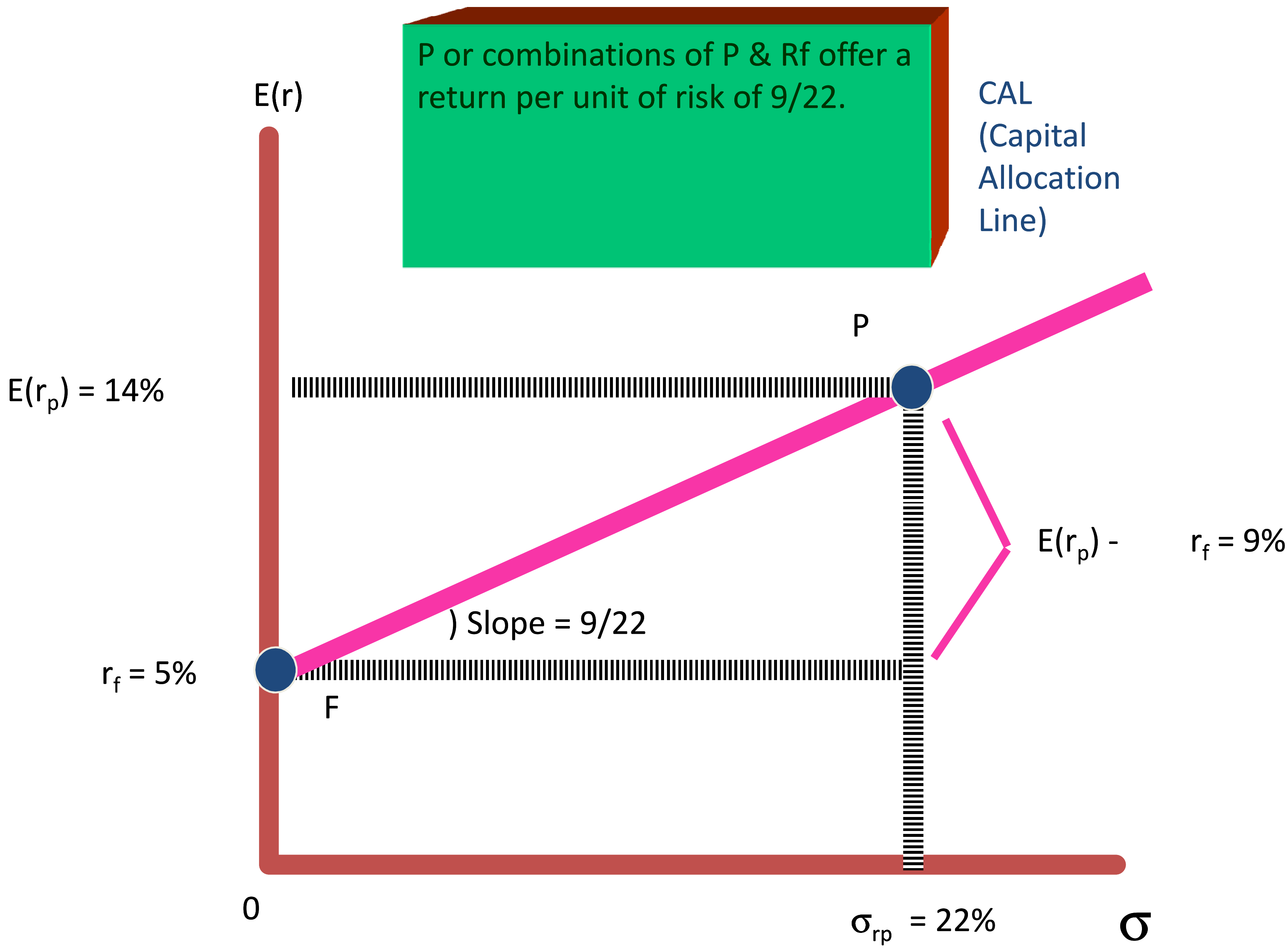


$$E(r_p) - r_f$$

Chapter 5

Risk and Return

(Cont'd)


P or combinations of P & Rf offer a return per unit of risk of 9/22.
E(r)
CAL (Capital Allocation Line)
P
E(rp) = 14%
E(rp) - rf = 9%
) Slope = 9/22
rf = 5%
F
0
σrp = 22%
σ

Quantifying Risk Aversion

$$E(r_p) - r_f = 0.5 \times A \times \sigma_p^{\ 2}$$

$E(r_p)$ = Expected return on portfolio p

r_f = the risk free rate

0.5 = Scale factor

A x σ_p^2 = Proportional risk premium

The larger A is, the larger will be the

____

investor's added return required to bear risk

Quantifying Risk Aversion

Rearranging the equation and solving for A

$$A = \frac{E(r_p) - r_f}{0.5 \times \sigma_p^2}$$

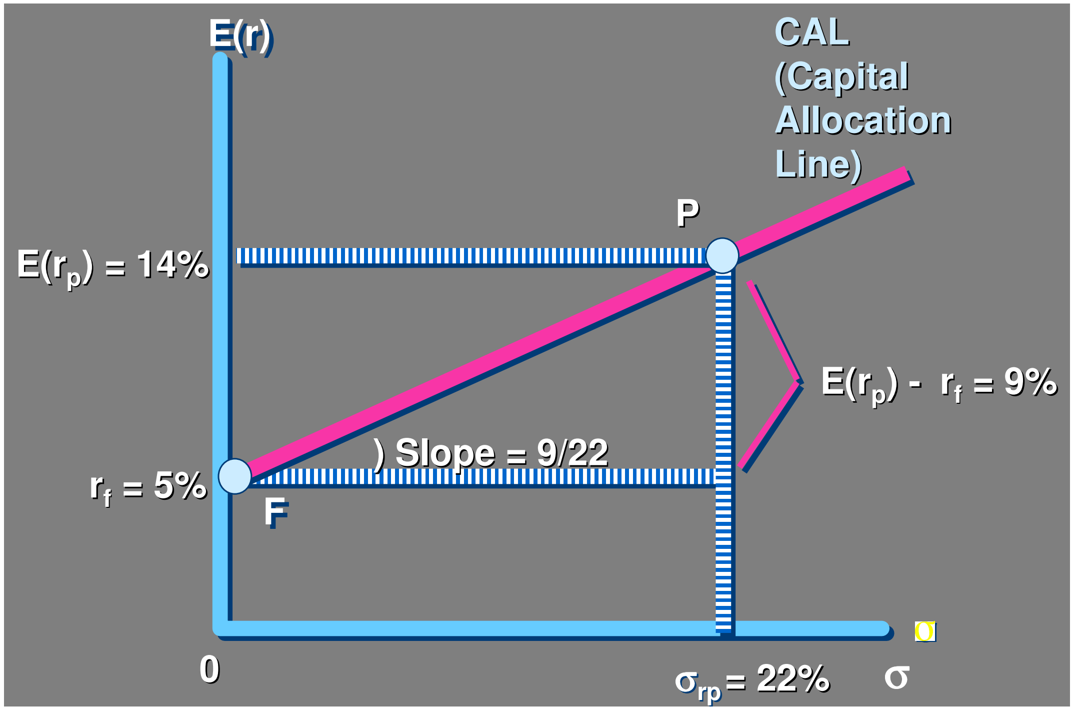
Many studies have concluded that investors' average risk aversion is between _______

2 and 4

Using A

$$A = \frac{E(r_p) - r_f}{0.5 \times \sigma_p^2}$$

What is the maximum A that an investor could have and still choose to invest in the risky portfolio P?



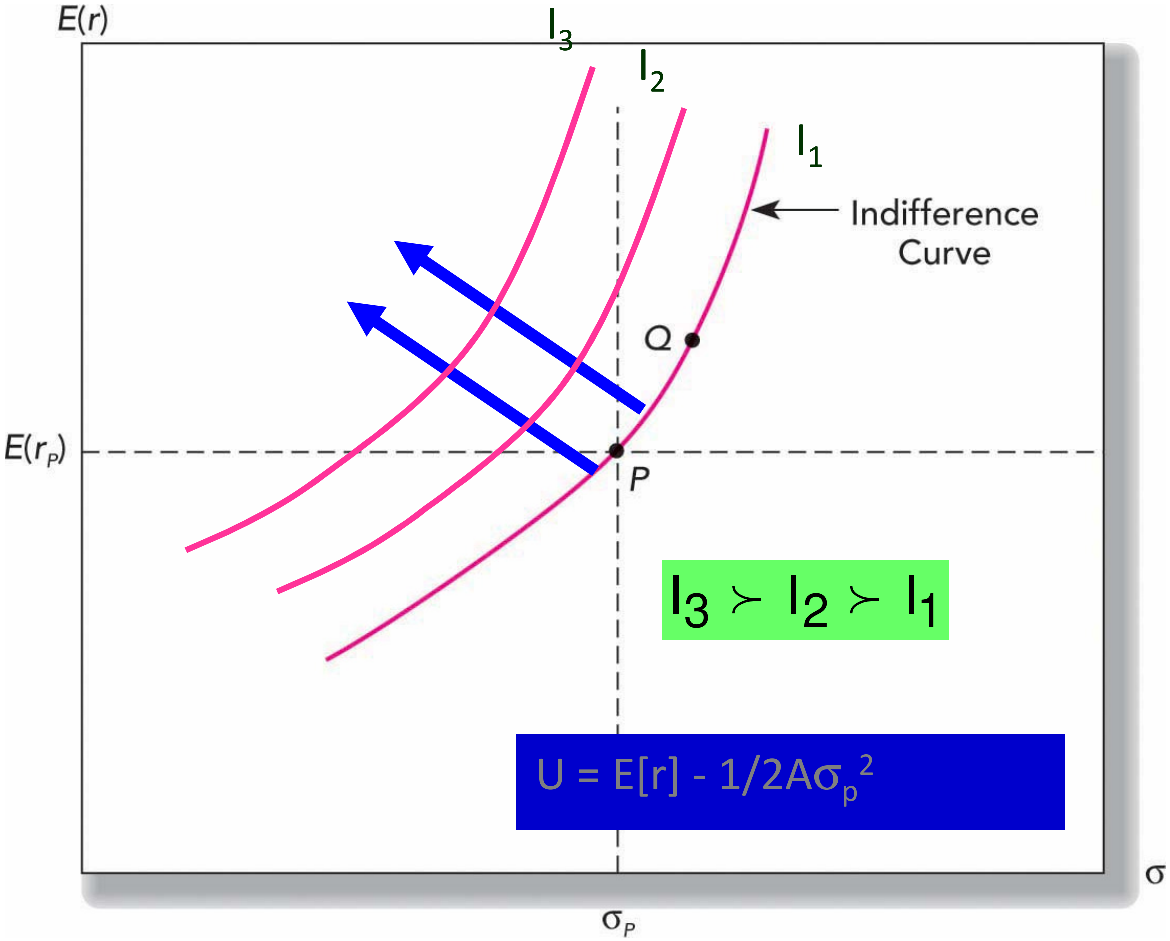
$$A = \frac{0.14 - 0.05}{0.5 \times 0.22^2} = 3.719$$

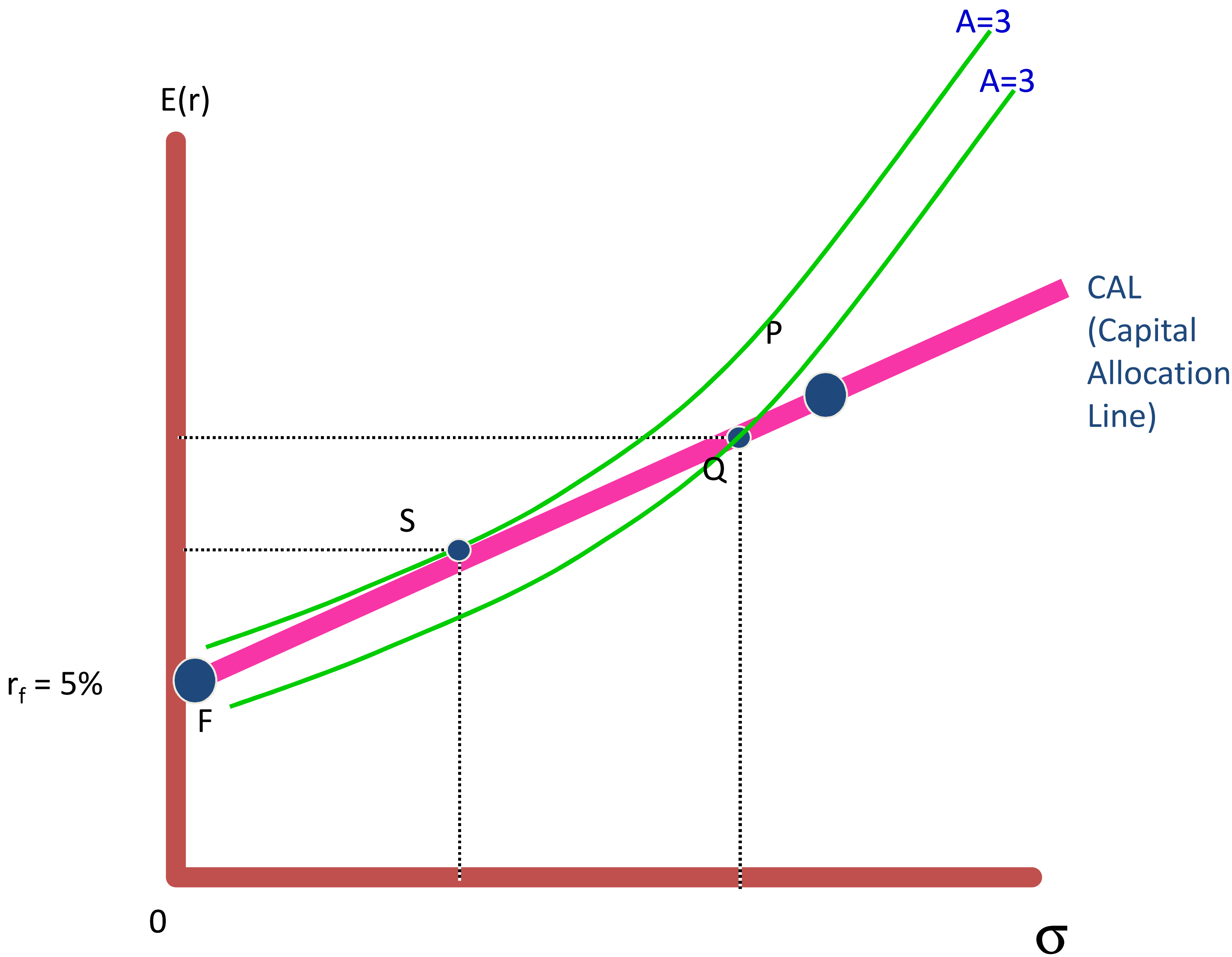
Maximum A = 3.719

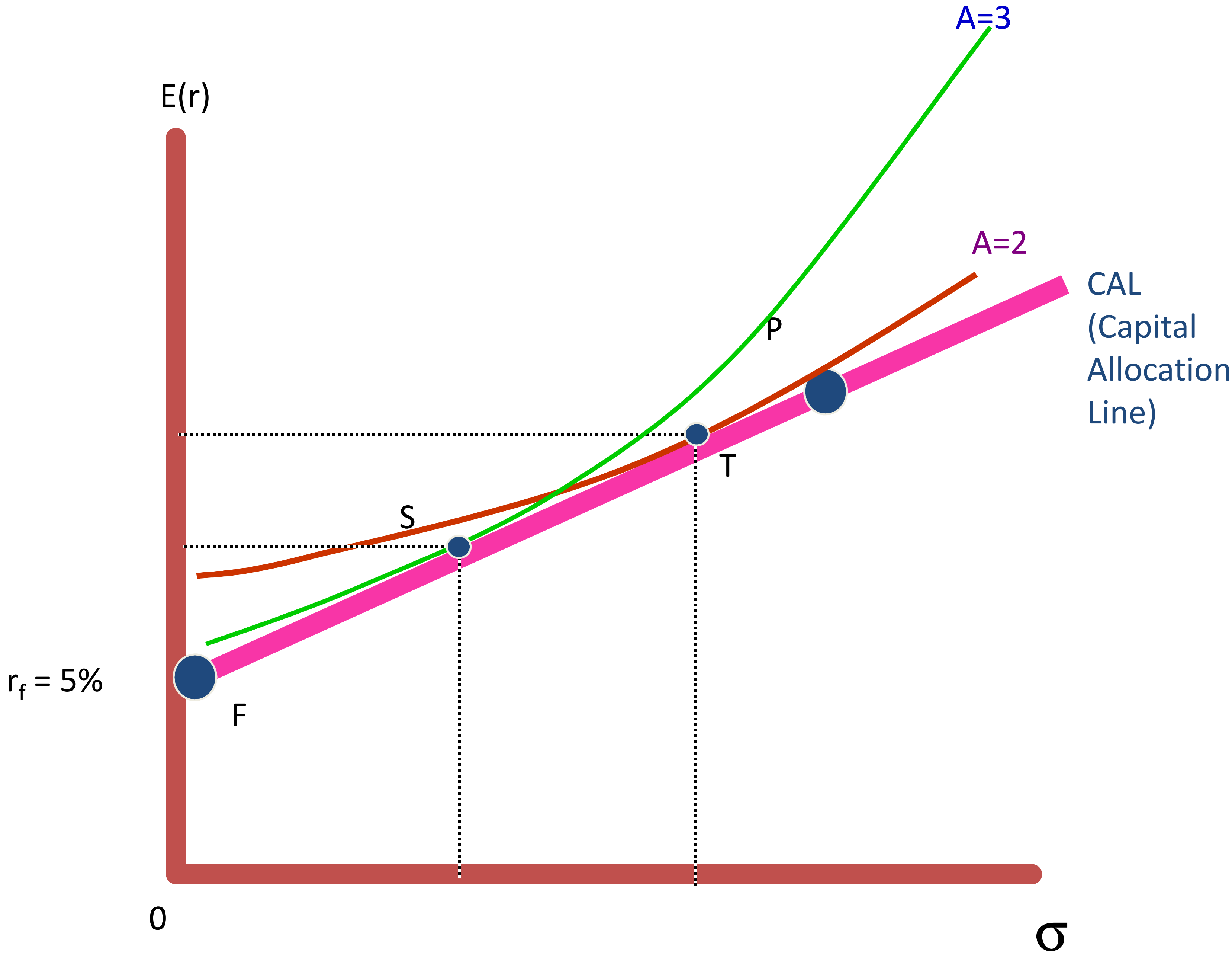
“A” and Indifference Curves

- The A term can used to create indifference curves.
- Indifference curves describe different combinations of return and risk that provide equal utility (U) or satisfaction.
- $U = E[r] - 1/2A\sigma_p^2$
- Indifference curves are curvilinear because they exhibit diminishing marginal utility of wealth.
  - The greater the A the steeper the indifference curve and all else equal, such investors will invest less in risky assets.
  - The smaller the A the flatter the indifference curve and all else equal, such investors will invest more in risky assets.

Indifference Curves




A=3
A=3
E(r)
CAL
(Capital
Allocation
Line)
P
Q
S
r_f = 5%
F
0
σ


A=3
E(r)
A=2
CAL
(Capital
Allocation
Line)
P
T
S
r_f = 5%
F
0
σ

Capital Market Line

- Passive Investment Strategies
- Indexing
- ETFs
- "Spiders"

Chapter 6

Efficient Diversification

Diversification and Portfolio Risk

Market risk

– Systematic or Nondiversifiable

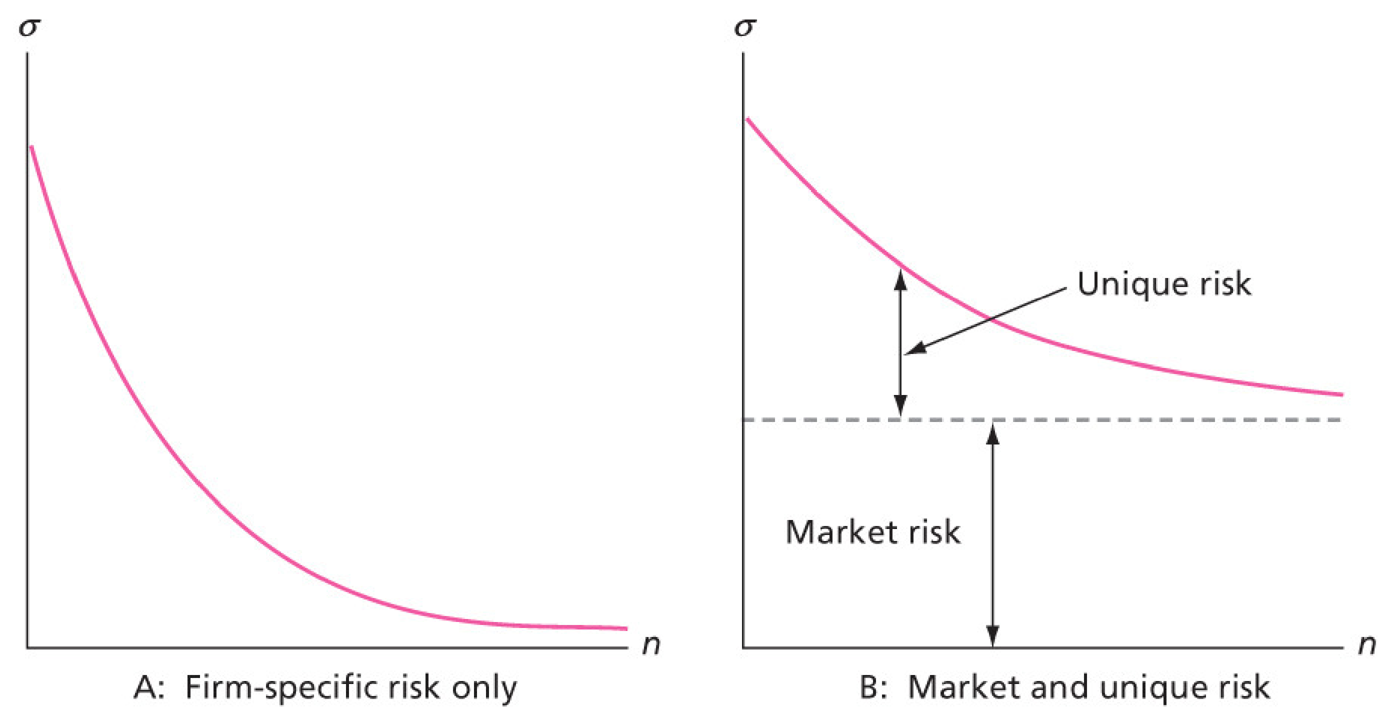
– Market risk is the risk that the value of an investment will decrease due to moves in market factors.

Firm-specific risk

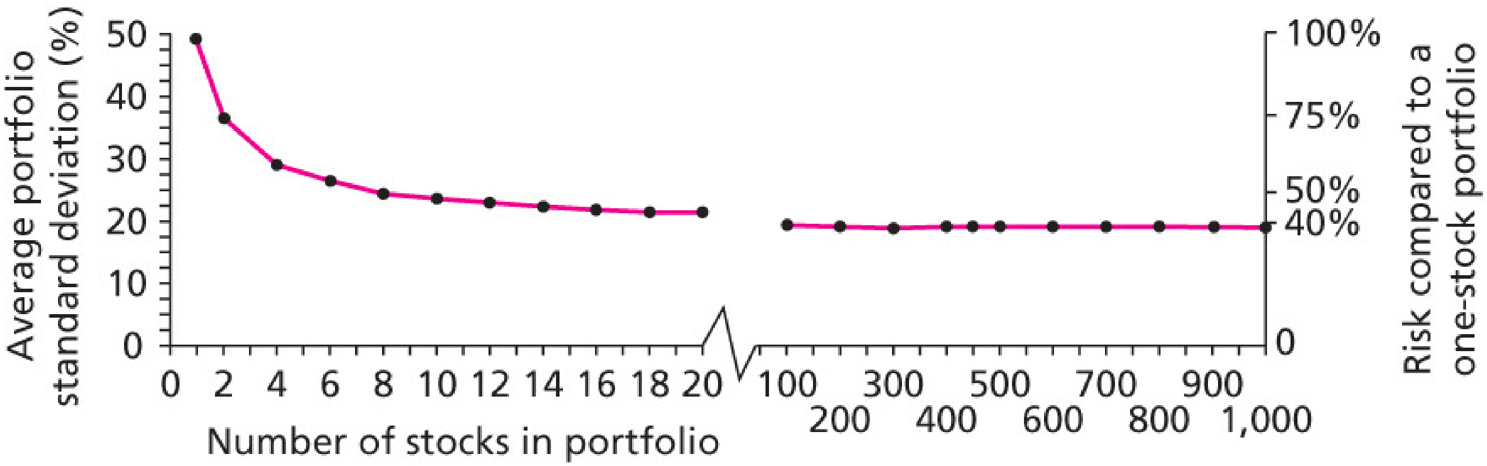
– Diversifiable or nonsystematic

– unique to each individual firm

Portfolio Risk as a Function of the Number of Stocks



Portfolio Risk as a Function of Number of Securities



Covariance and Correlation

•*Portfolio risk* depends on the correlation between the returns of the assets in the portfolio

•*Covariance* and the *correlation coefficient* provide a measure of the returns on two assets to vary

Two-Security Portfolio

$$E(\bar{r}_p) = W_1\bar{r}_1 + W_2\bar{r}_2$$

$E(r_p)$: portfolio return

W_1 : weight on security 1

W_1 : weight on security 2

$\bar{r}_1$: security 1 return

$\bar{r}_1$: security 2 return

Two-Security Portfolio Return

$$E(\bar{r}_p) = W_1\bar{r}_1 + W_2\bar{r}_2$$

$W_1 = 0.6$

$W_2 = 0.4$

$\bar{r}_1 = 9.28\%$

$\bar{r}_2 = 11.97\%$

$$E(r_p) = 0.6(9.28\%) + 0.4(11.97\%) = 10.36\%$$

Portfolio Variance and Standard Deviation

$$\sigma_p^2 = \sum_{I=1}^{Q}\sum_{J=1}^{Q}[W_I W_J \operatorname{Cov}(r_I, r_J)]$$

W_I, W_J = Percentage of the total portfolio invested in stock I and J respectively

Q = The total number of stocks in the portfolio

$\operatorname{Cov}(r_I, r_J)$ = Covariance of the returns of Stock I and Stock J

If $I = J$ then $\operatorname{Cov}(r_I, r_J) = \sigma_I^2$ & $\operatorname{Cov}(r_I, r_J) = \operatorname{Cov}(r_J, r_I)$

Variance of a Two Stock Portfolio:

$$\sigma_p^2 = W_1^2\sigma_1^2 + 2W_1W_2\operatorname{Cov}(r_1, r_2) + W_2^2\sigma_2^2$$

Ex ante Covariance Calculation

- Using scenario analysis with probabilities the covariance can be calculated with the following formula:

$$Cov(r_S, r_B) = \sum_{i=1}^{S} p(i)\left[r_S(i) - \overline{r_S}\right]\left[r_B(i) - \overline{r_B}\right]$$

Expost Covariance calculations

$$\text{Cov}(r_1, r_2) = \frac{n}{n-1} \sum_{T=1}^{N} \frac{(r_{1,T} - \bar{r}_1) \times (r_{2,T} - \bar{r}_2)}{n}$$

$\bar{r}_1$ = average or expected return for stock 1

$\bar{r}_2$ = average or expected return for stock 2

n = # of observations

- If when $r_1 > E[r_1]$, $r_2 > E[r_2]$, and when $r_1 < E[r_1]$, $r_2 < E[r_2]$, then COV will be _________.
  positive
- If when $r_1 > E[r_1]$, $r_2 < E[r_2]$, and when $r_1 < E[r_1]$, $r_2 > E[r_2]$, then COV will be _________.

  negative

Which will "average away" more risk?

Covariance and correlation

- The problem with covariance
  - Covariance does not tell us the intensity of the comovement of the stock returns, only the direction.
  - We can standardize the covariance however and calculate the correlation coefficient which will tell us not only the direction but provides a scale to estimate the degree to which the stocks move together.