

PORTFOLIO CHOICE PROBLEM

WHAT WILL YOU LEARN?

- ▶ Expected utility
- ▶ Mean variance problem
- ▶ Portfolio choice problem

EXPECTED UTILITY

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- ▶ Expected utility is the main workhorse in modeling individual choices in economics.
- ▶ Expected utility combines probabilities of outcomes with how investors feel about these outcomes.

EXPECTED UTILITY

- ▶ Maximize expected utility by choosing different
 - ▶ Spending/savings plans
 - ▶ Asset holdings
 - ▶ Production plans

EXPECTED UTILITY EXAMPLE: PORTFOLIO CHOICE PROBLEM

- ▶ Two assets: stocks and bonds

MEAN-VARIANCE PREFERENCES

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- Mean-variance utility

INDIFFERENCE CURVES FOR DIFFERENT LEVELS OF UTILITY

INDIFFERENCE CURVES

- ▶ Along an indifference curve, an investor is indifferent to all mean-volatility (or mean-variance) combinations.
- ▶ One particular indifference curve represents a particular level of utility.

INDIFFERENCE CURVES FOR DIFFERENT LEVELS OF RISK AVERSION

INDIFFERENCE CURVES

- The more risk averse an investor, the steeper the slope of the indifference curve.

PORTFOLIO CHOICE PROBLEM WITH MEAN VARIANCE PREFERENCES

- Portfolio choice problem = maximizing expected utility = finding the highest mean-variance indifference curve given the investment opportunity set and constraints

PORTFOLIO CHOICE PROBLEM: AN ILLUSTRATION

PORTFOLIO CHOICE PROBLEM: A GRAPHICAL ILLUSTRATION

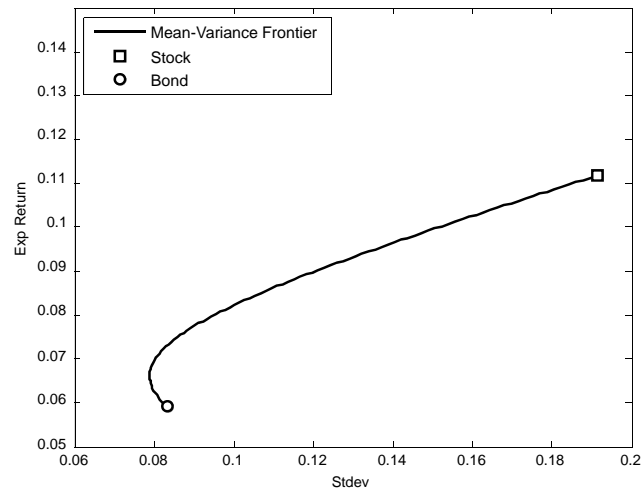
	Mean	Standard deviation
Stocks	11.9%	19.15%
Bonds	5.91%	8.33%
Corr(stocks, bonds)	0.113	

- Investors can hold only stocks and bonds.
- For a given risk aversion, what are the optimal holdings?

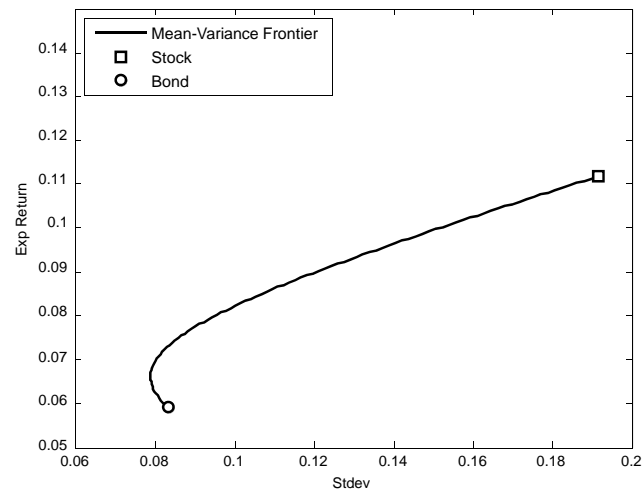
MEAN VARIANCE FRONTIER

- We can trace the mean-variance frontier by taking all combinations of the two assets (stocks, bonds).

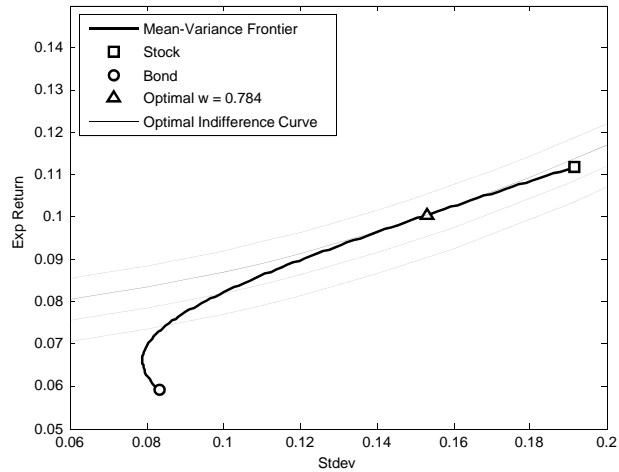
MEAN VARIANCE FRONTIER



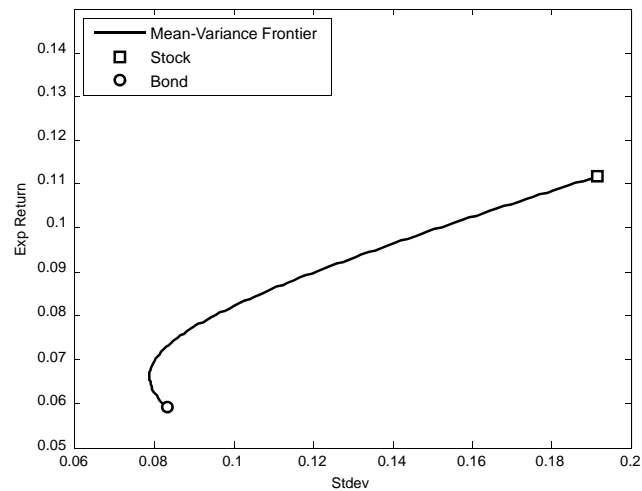
OPTIMAL PORTFOLIO CHOICE FOR RISK AVERSION = 2



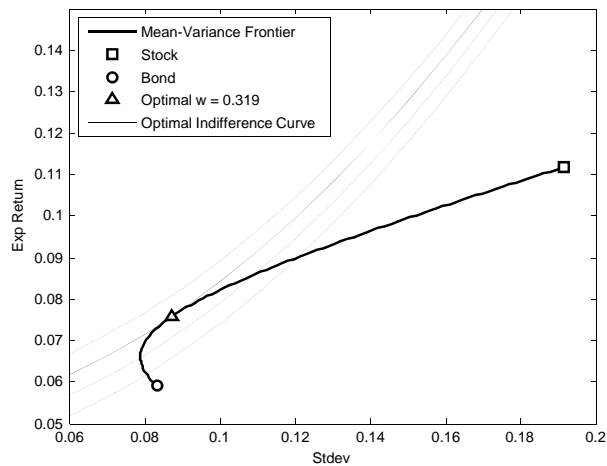
OPTIMAL PORTFOLIO CHOICE FOR RISK AVERSION = 2



OPTIMAL PORTFOLIO CHOICE FOR RISK AVERSION = 7



OPTIMAL PORTFOLIO CHOICE FOR RISK AVERSION = 7



SUMMARY

- Expected utility combines probabilities of outcomes with how investors feel about these outcomes.
 - Maximize expected utility given the investment opportunity set and constraints
- Mean-variance utility: investors only care about means and variances
- Portfolio choice problem: illustration