אוניברסיטת חיפה
דורון קליגר

FINANCIAL TOOLS FOR EVALUATING CASH FLOWS (II)

(II) Dealing With Risk

When investing in *one asset only*:

$$A \succ B$$

for all risk averse

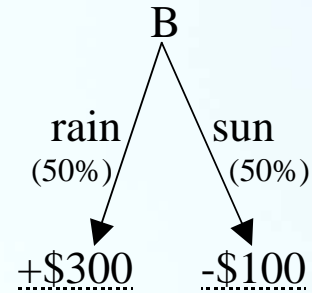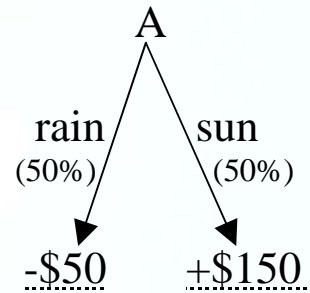$$\Leftrightarrow$$
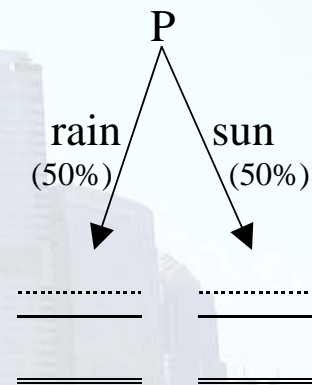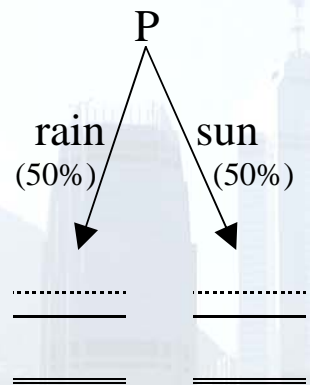
$$\mu_A \geq \mu_B$$
and
$$\sigma_A \leq \sigma_B$$
and
at least one inequality is strong

Example: Systematic Risk

Which CF is riskier?

A

rain (50%)   sun (50%)

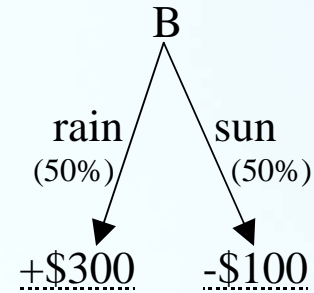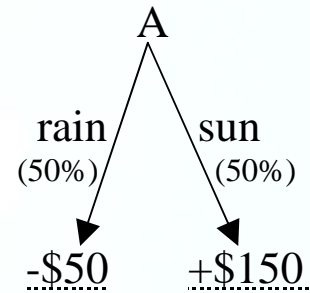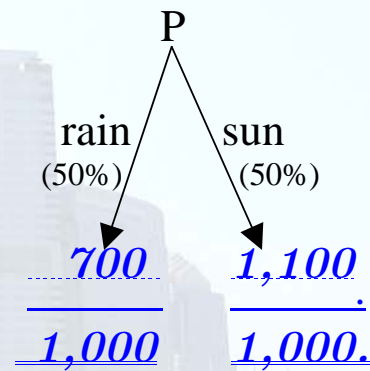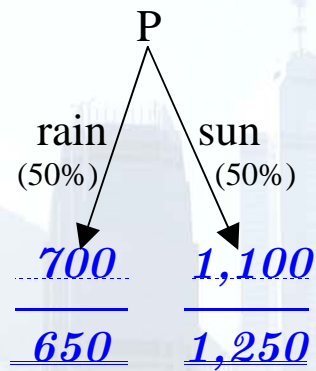-$50   +$150

B

rain (50%)   sun (50%)

+$300   -$100

Your portfolio:

P

rain (50%)   sun (50%)

_____   _____

_____   _____

P

rain (50%)   sun (50%)

_____   _____:

_____   _____:

Example: Systematic Risk

Which CF is riskier?

	A			B	
	rain (50%)	sun (50%)		rain (50%)	sun (50%)
	-$50	+$150		+$300	-$100

Your portfolio:

	P			P	
	rain (50%)	sun (50%)		rain (50%)	sun (50%)
	700	*1,100*		*700*	*1,100*
	650	*1,250*		*1,000*	*1,000.*

Measure risk according to contribution to your portfolio

Required risk premium according to CAPM:

For security i:
$$\Pi_i = K \cdot Cov[r_i, r_m].$$

Also for the market portfolio:
$$\Pi_m = K \cdot Cov[r_m, r_m].$$

Thus:
$$K = \frac{\Pi_m}{Var[r_m]}.$$

So, the CAPM formula is:

$$\Pi_i = \frac{\Pi_m}{Var[r_m]} \cdot Cov[r_i, r_m],$$

or:

$$\Pi_i = \beta_i \cdot \Pi_m.$$

The security's risk premium is proportional to it's beta, *not to* Var[r_i].