Four-Scenario Example

Two farmers. Cora has COnstant (relative) Risk Aversion:

$$U(C) = \frac{1}{1-\rho}\, C^{1-\rho}$$

Ira has Infinite Risk Aversion. Output of each farmer can be either 1 or 2 with equal probability; independent. Four "states" with probability $\frac{1}{4}$ each:

g – "good state" – each has output 2; total output 4. b – "bad state" – each has 1; total 2.

c – Cora has 2 and Ira hast 1; total 3. i – Cora has 1 and Ira has 2; total 3.

Cora's budget constraint: $P_g\ C_g^c + P_c\ C_c^c + P_i\ C_i^c + P_b\ C_b^c = 2\ P_g + 2\ P_c + P_i + P_b$

Ira's budget constraint is $P_g\ C_g^i + P_c\ C_c^i + P_i\ C_i^i + P_b\ C_b^i = 2\ P_g + P_c + 2\ P_i + P_b$

Equilibrium conditions: total demands must equal the total outputs in each state:

$$C_g^c + C_g^i = 4,\ C_c^c + C_c^i = 3,\ C_i^c + C_i^i = 3,\ C_b^c + C_b^i = 2$$

We can find three relative prices using any three of these equations. Numerical solution:

Cora's Risk–Aversion Coefficient ρ	Cora's Consumption Quantities in Scenarios				Ira's Consumption Quantities (all Scenarios)	Prices of Arrow-Debreu Securities in Scenarios			
	g	c	i	b		g	c	i	b
0.001	2.50	1.50	1.50	0.50	1.50	0.99	1.00	1.00	1.01
0.50	2.60	1.60	1.60	0.60	1.40	0.78	1.00	1.00	1.64
1.00	2.68	1.68	1.68	0.68	1.32	0.63	1.00	1.00	2.44
2.00	2.81	1.81	1.81	0.81	1.19	0.51	1.00	1.00	4.99
10.00	2.99	1.99	1.99	0.99	1.01	0.02	1.00	1.00	1013