Review IV – Decision Making Under Risk

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Risk Aversion and Expected Utility - 1

1. The expected utility hypothesis was developed by
    a. Fischer Black and Myron Scholes
    b. John von Neumann and Oskar Morgenstern
    c. John Lintner and William Sharpe
    d. Some Nobel Prize winner.
2. A risk-taking individual will
    a. Pay less than the expected value for a risky alternative.
    b. Pay the risky alternative's expected value.
    c. Pay more than the expected value for a risky alternative.
    d. It is impossible to determine.

Risk Aversion and Expected Utility - 2

3. The certainty equivalent is
   a. The expected value of the risky alternative.
   b. The least dollar amount that a risk averse decision maker will take for the risky alternative.
   c. The greatest dollar mount that a risk averse decision maker will take for the risky alternative.
   d. None of the above.
4. The risk premium is
   a. The most that a risk averse decision maker would pay to remove the risk from a risky alternative.
   b. The expected benefit from a risky gamble.
   c. The market price for a risky investment in the capital market.
   d. None of the above.

Risk Aversion and Expected Utility - 2

- For the next four questions consider a gamble with payoff E_1 of \$ 125,000 and payoff E_2 of \$ 175,000. Also assume that the each outcome is equally likely (i.e., $P[E_1] = P[E_2] = 0.5$). Also assume a power utility function

$$U[Y] = \frac{Y^{(1-r)}}{1-r}. \quad (1)$$

Assume that $r = 1.20$ (Note that the expected utility may be less than zero).

5. The expected utility of this alternative is
   a. -0.4548
   b. 55,250
   c. -0.4626
   d. None of the above.

Risk Aversion and Expected Utility - 3

6. The certainty equivalent of the risky alternative is
    a. $ 110,938
    b. $ 147,484
    c. $ 160,537
    d. None of the above
7. The risk premium for this investment is
    a. $ 39,063
    b. $ 2,516
    c. $ 1,963
    d. None of the above

Risk Aversion and Expected Utility - 4

8. What would happen to the certainty equivalent for $r = 1.20$ if the probability of event 2 $(P[E_2])$ increased and the probability of event 1 $(P[E_1])$ decreased?
   a. The certainty equivalent of the gamble would increase.
   b. The certainty equivalent of the gamble would decrease.
   c. The expected value of the gamble would increase.
   d. a and c.

Portfolio Theory - 1

- For the next three questions use the information in the following table

Acres Planted in						Expected
Corn	Cotton	Soybeans	Peanuts	Wheat	Variance	Income
287.89	992.11	0.00	0.00	0.00	2.441E+10	450,000
212.11	1,067.89	0.00	0.00	0.00	1.9488E+10	425,000
146.06	1,104.79	29.14	0.00	0.00	1.5403E+10	400,000
94.85	1,082.49	102.66	0.00	0.00	1.1938E+10	375,000
43.64	1,060.18	176.18	0.00	0.00	9.0388E+09	350,000

9. In general, the results presented in the optimal portfolios indicate that
    a. It is generally more risky to hold two assets than one.
    b. It is generally less risky to hold two assets than one.
    c. Soybeans are risky
    d. None of the above

Portfolio Theory - 2

10. The results in the forgoing table indicate that the Expected Value–Variance frontier is
    a. Upward sloping - higher returns can only be acquired at a higher variance (more risk).
    b. Concave - the rate that additional variance is added for expected return increases as returns increase.
    c. Both a and b.
    d. Niether a nor b.
11. The highest risk/return relationship across crops is likely to be
    a. Corn
    b. Cotton
    c. Soybeans
    d. Impossible to tell

Capital Asset Pricing Model - 1

- For the next six questions use the results of the regression

$$r_{it} = \alpha_i + \beta_i r_{mt} + \epsilon_t \tag{2}$$

where r_{it} is the return for stock i and r_{mt} is the return for the market portfolio (e.g., the S & P 500 stock index).

Stock	α_i	β_i
AMD	-0.0029	1.2289
	(0.0029)	(0.2186)
MCD	-0.0006	0.6807
	(0.0012)	(0.1131)
MSFT	0.0016	1.4273
	(0.0012)	(0.0906)

Capital Asset Pricing Model - 2

12. The Capital Asset Pricing Model suggests that
    a. Market prices for stock adjust based on the market's evaluation of the riskiness of that stock's returns.
    b. The riskiness of a stock can be estimated based on how the return on that stock responds to changes in the market portfolio's returns.
    c. Assumes arbitrage efficiency – buyers must be able to buy and sell the stock at any time – for this valuation to be appropriate.
    d. All of the above.
13. The riskiest stock in the above analysis is
    a. AMD
    b. MCD
    c. MSFT
    d. All the stocks are equally risky.

Capital Asset Pricing Model - 3

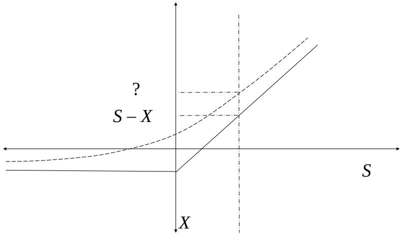
14. Given an expected return on S & P 500 of 0.080 and a risk-free interest rate of 0.028, the risk adjusted rate or return for McDonalds' (MCD) is
    a. 0.0919
    b. 0.0634
    c. 0.1022
    d. None of the above.
15. The fact that the αs are relatively small supports the contention that
    a. The stock market appears to be fairly volatile at the current time.
    b. The stock market is fairly close to equilibrium (i.e., the returns are largely explained by their relative riskiness).
    c. We should expect inflation in the near future.
    d. None of the above.

Black-Scholes Option Pricing Models - 1

16. A call option gives the bearer the right but does not require
    a. is an instrument that gives the bearer the right to purchase a stock at a fixed price over a specified time period.
    b. is an instrument that gives the bearer the right to sell a stock at a fixed price over a specified time period.
    c. Both a and b
    d. Neither a nor b.
17. The Black-Scholes option pricing formula is a function of
    a. Today's stock price and the strike price (the price that the option can be executed at).
    b. The daily volatility of the stock price.
    c. The risk-free interest rate.
    d. All of the above.

Black-Scholes Option Pricing Models - 2

18. The graph below is the payoff function for a
    a. A call option
    b. A put option
    c. The Capital Asset Pricing Model
    d. None of the above.



Stochastic Net Present Value - 1

- Assume that the following table contains 15 draws from a stochastic Net Present Value of an investment with an initial investment of $ 500 (already included in the Net Present Value values).

1	2	3	4	5	6	7	8	9	10	NPV
65.34	320.90	218.49	122.12	308.33	130.18	172.62	-90.21	179.78	-2.17	704.56
-52.43	181.71	105.80	26.43	18.65	119.76	14.36	1.84	123.49	-61.14	-98.06
339.81	54.20	-12.49	172.03	-112.87	-21.26	50.97	264.62	426.00	76.25	737.25
-5.02	189.35	-61.33	220.82	223.73	47.84	155.82	183.96	146.19	196.51	514.46
32.49	154.83	-89.51	40.80	279.16	-172.63	82.29	340.98	77.08	272.09	272.36
-257.79	210.92	273.98	163.92	-74.93	211.55	-44.42	102.52	298.00	-58.59	147.37
-73.62	-37.36	164.24	151.73	-3.54	-163.21	37.35	210.17	207.34	83.06	-77.77
-17.51	-46.54	-185.34	268.33	237.58	12.53	333.95	249.73	-64.80	-49.58	67.14
184.92	57.98	321.50	6.83	166.77	21.74	250.92	29.80	46.52	67.20	467.85
213.64	260.95	-188.83	268.69	206.20	20.63	-101.51	183.23	-4.87	189.08	375.34
-98.18	57.32	-178.44	142.81	111.16	139.94	-67.48	54.39	279.13	166.13	-79.19
-106.72	61.58	163.63	135.35	37.78	137.70	338.03	222.61	212.56	85.23	481.83
-0.42	-120.25	-136.28	-164.13	166.39	74.65	471.44	215.52	299.37	304.23	254.32
222.15	306.43	95.02	187.60	-43.60	334.06	202.96	155.99	-113.48	-119.03	578.00
164.14	223.25	40.61	-130.25	526.31	126.26	264.23	-156.77	159.87	170.37	635.03
40.72	125.02	35.40	107.54	136.48	67.98	144.10	131.23	151.48	87.98	332.03
157.67	133.39	172.24	129.31	171.03	130.55	167.42	138.71	146.75	128.11	288.74

Stochastic Net Present Value - 1

19. Assuming a negative exponential utility function

$$U\left(\mu, \sigma^2\right) = \mu - \frac{\rho}{2}\sigma^2 \tag{3}$$

and a risk aversion coefficient $\rho = 0.003$ would you make this investment?

20. What is the probability that the investment will not be able to make its required cash flow in Year 6?