Assignment 2: ECO764

Financial Econometrics

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Contents

1 Answer 1

% Change in number of flights $= -0.7 \times -1.64 = 1.148\%$
Number of flights in the month of April $= (1 + \frac{1.148}{100}) \times 700 = 708$
Earnings $= [(50,000 - 9,000 - 13 \times 510.75) \times 708 - 15 \times 10^6] \times 1.31191$
Therfore, $\boxed{\text{Earnings=12,236,259.35 AUD}}$

2 Answer 2

(using all available data)	Jet kerosene returns in USD	AUD/USD returns
Volatility per month	11.52%	3.16%
Volatility per annum	39.91%	10.93%
Mean per month	0.37%	-0.03%
Mean per annum	4.46%	-0.37%

3 Answer 3

The probability that in any given month jet kerosene returns in USD will be lower than -23% is $\boxed{0.0212}$ (calculation in Excel sheet).

4 Answer 4

The actual probability that in any given month jet kerosene returns in USD will be lower than -23% is $\boxed{0.0275}$ (calculation in Excel sheet).

5 Answer 5

The correlation between jet kerosene returns and AUD/USD returns using all available data is $\boxed{\text{-0.30769}}$ (calculation in Excel sheet). The implication for Qantas Airline is that the returns of jet kerosene and AUD/USD are inversely related. In other words, when the return of jet kerosene goes up, the return of AUD/USD tends to go down, and vice versa.

6 Answer 6

The monthly earning was calculated in the similar way as done in question 1. The number of flights each month were taken into account while calculating the monthly earning. The excel sheet **Q6** contains all the calculations for all of the 1000 paths.

	Earnings over next 12 months (in AUD)
a) Maximum (of total earnings)	\$29,68,75,636.37
b) 95^{th} percentile	\$21,07,68,677.72
c) Median or 50^{th} percentile	\$14,37,01,426.76
d) 5^{th} percentile	\$8,93,63,673.85
e) Minimum	\$3,42,49,506.41
f) Earnings at Risk (with 95% confidence) i.e. *c.–d.*	\$5,43,37,752.92

When sampling error is present, the distribution of outcomes can be skewed or distorted, leading to results that are different from the true population parameters. In addition, sampling error can also affect the precision or accuracy of the results.

7 Answer 7

Below answers are solved in Excel sheet **Q7**.

1. The correlation between earnings and jet kerosene is -0.56
2. The correlation between earnings and AUD/USD is 0.83
3. The minimum variance hedge for jet kerosene (assuming no currency hedge) is $\frac{\sigma_{earnings}}{\sigma_{jet}} \rho_{earnings,jet} = -0.023$
4. The minimum variance hedge for currency (assuming no fuel hedge) is $\frac{\sigma_{earnings}}{\sigma_{currency}} \rho_{earnings,currency} = 0.15$