Econ 690
Spring 2019
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Answers to Homework 11

1.   This question continues from the second problem in Homework 10. This uses the model of sovereign default from the lecture slides and uses the notation of those slides.

        Assume $L = 1.5$ and $H = 4$. Assume $p = 0.5$

a.   Suppose $k = 0.6$. What is kL? What is $k(1-p)H$?
        If the borrower decides to borrow $D = kL$, what is his utility?
        (Hint: We are looking at Case 2 from the lecture slides.)
        What if the borrower chooses to borrow at the rate $R^p = \dfrac{1}{1-p}$. Calculate R^p. How much does he borrow in period 1? What is his utility?

Answer: $kL = 0.9$. $k(1-p)H = 1.2$

        If he decides to borrow $D = 0.9$, he can do so at a rate $R^p = 1$. His utility is

$$U = \ln(kL) + (1-p)(H - kL) + p(L - kL) = 1.744639$$

        If $R^p = \dfrac{1}{1-p}$, then $R^p = 2$. He would borrow $D = 1$ and his utility would be

$$U = \ln(1) + (1-p)\left(H - \frac{1}{1-p}\right) + p(1-k)L = 1.3$$

b.   Suppose $k = 0.4$. What is kL? What is $k(1-p)H$?
        If the borrower decides to borrow $D = kL$, what is his utility?
        (Hint: We are looking at Case 3.)
        What if the borrower chooses to borrow at the rate $R^p = \dfrac{1}{1-p}$. Calculate R^p. How much does he borrow in period 1? What is his utility?

Answer: $kL = 0.6$. $k(1-p)H = 0.8$

If he decides to borrow $D = 0.6$, he can do so at a rate $R^p = 1$. His utility is

$$U = \ln(kL) + (1-p)(H - kL) + p(L - kL) = 1.639174$$

If $R^p = \dfrac{1}{1-p}$, then $R^p = 2$. He would borrow $D = 0.8$ and his utility would be

$$U = \ln\big((1-p)kH\big) + (1-p)\left(H - \frac{1}{1-p}(1-p)kH\right) + p(1-k)L = 1.426856$$

2   Given the following information, how much would you have paid on September 16 to purchase a British pound call option contract with a strike price of 155 and a maturity of October?

Data for September 16

	Calls	**Puts**
50,000 Australian Dollar Options (cents per unit)		
64 Oct	══	0.48
65 Oct	══	0.90
67 Oct	0.22	══
31,250 British Pounds (cents per unit)		
152½ Dec	══	4.10
155 Oct	1.50	3.62
155 Nov	2.35	══

Answer: The correct price on September 16 for a British pound call option with a strike price of 155 and a maturity of October is 1.50. The units are cents per pound or $0.0150/£. The contract size is £31,250. Therefore, you would have paid

$$\frac{\$0.0150}{£} \times £31{,}250 = \$468.75$$

3.   Using the data in problem 2, how much would you have paid to purchase a Australian dollar put option contract with a strike price of 65 and an October maturity?

<u>Answer:</u>

The correct price on September 16 for an Australian dollar put option with a strike price of 65 and a maturity of October is 0.90. The units are cents per Australian dollar or $0.0090/AUD. The contract size is AUD50,000. Therefore, you would have paid

$$\frac{\$0.0090}{AUD} \times AUD50{,}000 = \$450$$