**MFE5130 – Financial Derivatives**

**Class Activity (27-September-2018) (Solution)**

**Important Notes:**

1. This class activity is counted toward to your class participation score. **Fail** to hand in this class activity worksheet in the class will receive **0 score** for that class.
2. **0 mark** will be received if you leave the solution blank.

|  |  |
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| Name: | Student No.: |

**Problem 1**

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**Solution**

a) The spot price of gold is $300.00 per ounce. With a continuously compounded annual risk- free rate of 5 percent, and at a one-year forward price of 310.686, we can calculate the lease rate according to the formula:



b) Suppose gold cannot be loaned. Then our cash and carry trade is: （cash and carry）

|  |  |  |
| --- | --- | --- |
| Transaction | Time 0 | Time *T* = 1 |
| Short forward | 0 | 310.686 − *ST* |
| Buy gold | −300 | *ST* |
| Total | −300 | 310.686 |

Let *y* be the rate of return of the cash and carry trade.



So, the return of the cash and carry trade is less than the prevailing risk-free interest rate of 5%.

The forward price bears an implicit lease rate. Therefore, if we try to engage in a cash and carry arbitrage but we do not have access to the gold loan market and thus do not have access to the additional revenue on our long gold position, it is not possible for us to replicate the forward price. We incur a loss.

c) If gold can be loaned, we engage in the following cash and carry arbitrage:

|  |  |  |
| --- | --- | --- |
| Transaction | Time 0 | Time *T* = 1 |
| Short forward | 0 | 310.686 − *ST* |
| Buy tailed gold position,  lease rate @ 1.5% | 300*e*−1.5% =  −295.5336 | *ST* |
| Total | −295.5336 | 310.686 |



Now the forward was fairly priced by taking the implicit lease rate into account.