FUTURES

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Mathematics Department | ACTU461
Exercise's Lecture (5)
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FUTURES CONTRACTS

- Quoted in Public Market
- Actively Traded
- Standardized Contract
- Regulated
- No Counterparty Risk

FORWARD CONTRACTS

- Privately Negotiated
- Non-Transferrable
- Customized Terms
- Carries Credit Default Risk
- Fully Dependent on Counterparty
- Unregulated

MARGIN ACCOUNT

LONG

FUTURE

SHORT

FUTURE

$$M_t = M_{t-\frac{1}{365}} e^{\frac{r}{365}} + N(St - S_{t-\frac{1}{365}})$$

$$M_t = M_{t-\frac{1}{365}} e^{\frac{r}{365}} + N(S_{t-\frac{1}{365}} - S_t)$$

Settlements could be
Weekly > 52
Monthly > 12 ..

maintenance margin : The minimum level that the Investors are required to keep the margin account at it.

Margin call?

When ..

margin account < maintenance margin

an investor’s broker will require the investor to deposit funds sufficient to restore the balance to the initial margin level.

Determine which of the following is NOT a distinguishing characteristic of futures contracts, relative to forward contracts.

A. Contracts are settled daily, and marked-to-market.
B. Contracts are more liquid, as one can offset an obligation by taking the opposite position.
C. Contracts are more customized to suit the buyer's needs.
D. Contracts are structured to minimize the effects of credit risk.
E. Contracts have price limits, beyond which trading may be temporarily halted.

SOA PAST EXAMS | Q 30

Judy decides to take a short position in **20** contracts of S&P 500 futures. Each contract is for the delivery of **250** units of the index at a price of **1500** per unit, exactly one month from now. The initial margin is **5%** of the notional value, and the maintenance margin is **90%** of the initial margin. Judy earns a continuously compounded risk-free interest rate of **4%** on her margin balance. The position is marked-to-market on a daily basis. On the day of the first marking-to-market, the value of the index drops to **1498**. On the day of the second marking-to-market, the value of the index is **X** and Judy is not required to add anything to the margin account. Calculate the largest possible value of X.

A. 1490.50
B. 1492.50
C. 1500.50
D. 1505.50
E. 1507.50

SOA PAST EXAMS | Q 32

An investor enters a long position in a futures contract on an index **(F)** with a notional value of **200 x F,** expiring in one year. The index pays a continuously compounded dividend yield of **4%,** and the continuously compounded risk-free interest rate is **2%**. At the time of purchase, the index price is **1100**. Three months later, the investor has sustained a loss of **100**. Assume the margin account earns an interest rate of **0%.** Let **S** be the price of the index at the end of month three.

Calculate S.

A. 1078
B. 1085
C. 1094
D. 1105
E. 1110

On 5 March, a company enters into a short future contract to sell **1000** barrels of oil at **51** the barrel. The initial margin is **50%** and the maintenance margin is **40%** of the market value of the futures' underlier. The annual continuously
compounded interest rate is **6%**.

1) On 6 March, the price of a barrel of oil increase to **53**. Find the new balance in the margin account.

2) Find the minimum price of barrel of oil on 7 March that would lead to a margin call.

ACTU461 PAST EXAM | Q4