

Name: \_\_\_\_\_ **KEY** \_\_\_\_\_

**ECON 337  
Agricultural Marketing  
Spring 2014**

**Exam I**

Answer each of the following questions by circling True or False (2 point each).

1. True **False** Futures and options contracts have flexible sizes to cover any number of animals.
2. True **False** A futures trader's margin account is settled only when the contract is offset.
3. **True** False A futures trader may be subject to a margin call if they have a short futures position and prices increase.
4. **True** False Hedging is accomplished by taking an opposite futures position to one's current cash position.
5. True **False** In the futures market it is possible for buyers to make more money than sellers lose.
6. **True** False Basis patterns reflect local market conditions rather than national or global markets.
7. True **False** Basis is more volatile than futures prices for most agricultural commodities.
8. **True** False Assuming the local cash price is generally lower than the futures price, a decrease in transportation costs will narrow basis.
9. **True** False Options contracts are on the underlying futures contract and not the commodity itself.
10. **True** False A call is in-the-money when the market price of the underlying commodity futures contract is above the strike price.
11. True **False** Option premiums are set at predetermined levels by the Chicago Mercantile Exchange.
12. **True** False A cattle feeder anticipating filling their feedlot in a few months, attempting to reduce price risk, might take a long position in the feeder cattle futures market.

Answer each of the following questions by filling in the blank (2 point each).

13. **Price discovery** \_\_\_\_\_ is the process by which buyers and sellers arrive at a transaction price for a given quality and quantity of product at a given time and place.
14. **Price determination** \_\_\_\_\_ is the broad forces of supply and demand establishing a market clearing price for a commodity.
15. **Speculators** \_\_\_\_\_ have no use for the physical commodity and are attempting to profit from price movements.
16. **Hedgers** \_\_\_\_\_ are willing to make or take physical delivery because they are producers or users of the commodity.
17. **Brokers** \_\_\_\_\_ exercise trades and are paid a commission.

Multiple Choice: Circle the appropriate response for each statement or question (2 points each).

18. A marketing plan should:
  - a. Be flexible
  - b. Be written down
  - c. Suggest alternative methods to achieve pricing goals
  - d. None of these
  - e. All of these**
19. Which of the following is not an advantage of forward pricing?
  - a. Always hitting the market high**
  - b. More stable returns
  - c. Avoiding large losses
  - d. More predictable cash flow
  - e. Better access to credit
20. Some of the major advantages of centralized pricing (e.g., auction markets) are:
  - a. full and immediate information, competitive bidding, transaction costs
  - b. competitive bidding, equalization in market power, physical movement of product
  - c. full and immediate information, transaction costs, physical movement of product
  - d. full and immediate information, competitive bidding, equalization of market power**
21. What is an advantage to decentralized pricing (e.g., direct sales)?
  - a. More skills and information needed
  - c. No assembly function
  - d. Higher search costs
  - e. None of these**
  - f. All of these

22. The connection between live cattle options and the live cattle futures market is
- a live cattle option is the right to buy or sell live cattle
  - a live cattle option is the right to buy or sell the underlying live cattle futures contract
  - that you must have a live cattle option to buy or sell live cattle futures
  - none of these
23. The buyer of a call option can liquidate the position by
- buying a put option of the same strike price and any contract month
  - selling a call option of the same strike price and any contract month
  - selling a call option of the same strike price and the same contract month
  - buying a call option of a different strike price with the same contract month
  - selling a put option of the same strike price and any contract month
  - none of these
24. A lean hog “put” option
- is the right to sell lean hogs in the cash market at a given strike price
  - is the right to sell a lean hog futures contract at a specified price within a given time period
  - is the right to buy a lean hog futures contract at a specified price within a given time period
  - all of these
25. A feeder cattle “call” option
- is the right to buy a feeder cattle futures contract at a specified price within a given time period
  - is the right to sell a feeder cattle futures contract at a specified price within a given time period
  - is the right to buy feeder cattle in the cash market at a given strike price
  - all of these
26. Option premiums
- are paid up front
  - are made up of intrinsic value and time value
  - are the cost of buying specific options
  - all of these
  - none of these
27. The adjustments that must be made to an option strike price to obtain an estimate of the net price floor or ceiling include
- the premium cost and the commission cost
  - the premium cost and the value of the underlying futures contract
  - the expected basis on the futures contract
  - a & c
  - b & c

28. A difference in using options for price protection compared with hedging or cash contracting is
- a. there is no cost in using options unlike hedging or cash contracting
  - b. hedging and cash contracting set an approximate selling price, regardless of later price changes
  - c. an option position establishes a minimum selling price or maximum purchase price, but leaves the buyer in a position to benefit from favorable price changes
  - d. a and b.
  - e. b and c.

Matching: Match each cattle pricing method with the appropriate statement. Cattle pricing methods may be used more than once (2 points each).

- a. Live weight pricing    b. Carcass weight pricing    c. Value-based pricing (grid)

29. c Each animal is priced individually.
30. a Pricing location is at the feedlot and adjusted for shrink.
31. b Meat yield is based on the carcass weight.
32. c Potential for large discounts.
33. b Dressed market is used to establish a base price.
34. c Sellers knowledge is very critical.
35. a Buyer pays the trucking costs.

Provide a complete answer to each of the following questions.

36. (5 points) List 5 factors that influence an options premium and explain clearly how a decrease in each of the factors (before expiration) affects the premium of a put option.

1. Underlying futures price [futures price decreases, option premium for a put increases)
2. Strike price [strike price decreases, option premium for a put decreases)
3. Time to expiration [time to expiration decreases, option premium for a put decreases)
4. Volatility [volatility decreases, option premium for a put decreases)
5. Interest rate [interest rate decreases, option premium for a put increases)

37. (5 points) Calculate a seasonal index price projection for December 2013 cull cows, given a September 2013 price of \$80.85 per cwt. Recall:  $P_1 \times \frac{I_2}{I_1} = P_2$

Seasonal Price Index -- Cull Cows, Sioux Falls SD, 2003-2012

|                           | <u>Jan</u> | <u>Feb</u> | <u>Mar</u> | <u>Apr</u> | <u>May</u> | <u>Jun</u> | <u>Jul</u> | <u>Aug</u> | <u>Sep</u> | <u>Oct</u> | <u>Nov</u> | <u>Dec</u> | <u>Annual</u> |
|---------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|---------------|
| Average Price             | 53.96      | 57.14      | 58.37      | 61.04      | 62.65      | 61.32      | 60.75      | 61.36      | 59.95      | 57.68      | 55.13      | 55.46      | 58.73         |
| % of Annual Price (Index) | 0.919      | 0.973      | 0.994      | 1.039      | 1.067      | 1.044      | 1.034      | 1.045      | 1.021      | 0.982      | 0.939      | 0.944      |               |

$$P_{\text{Sep13}} \times \frac{I_{\text{Dec}}}{I_{\text{Sep}}} = P_{\text{Dec13}} = \$80.85 \times \frac{0.944}{1.021} = \$74.75/\text{cwt}$$

38. You are a manager for a feeder-to-finish operation and want to determine the expected marginal return from feeding pigs to different weights. You know this will depend on several production measures and gather the following data to help with the analysis.

Cost of late finisher diet, \$/lb      \$0.2400  
 Carcass price, \$/lb                    \$1.20  
 Yield, %                                    75.0%

a. (5 points) The table below shows the shows the cumulative amount of feed at 5 pound increments of increasing live selling weight for finished hogs near market weight. Calculate the incremental amount of feed, incremental feed/gain, and marginal cost of gain for each 5 pound increase in live selling weight. Please show your calculations to the fourth decimal place.

| Carcass weight, lb | Live wt, lb | Cumulative feed, lb | Incremental feed, lb | Incremental Feed/Gain | Marginal cost of gain, \$/lb gain |
|--------------------|-------------|---------------------|----------------------|-----------------------|-----------------------------------|
| 202.5              | 270         | 676.165             |                      |                       |                                   |
| 206.3              | 275         | 694.642             | 18.4777              | 3.6955                | \$0.8869                          |
| 210.0              | 280         | 713.324             | 18.6812              | 3.7362                | \$0.8967                          |
| 213.8              | 285         | 732.208             | 18.8848              | 3.7770                | \$0.9065                          |
| 217.5              | 290         | 751.297             | 19.0883              | 3.8177                | \$0.9162                          |
| 221.3              | 295         | 770.589             | 19.2918              | 3.8584                | \$0.9260                          |
| 225.0              | 300         | 790.084             | 19.4954              | 3.8991                | \$0.9358                          |

- b. (3 points) If the selling price for finished hogs is \$1.20 per pound carcass, what is the optimal live selling weight for your hogs? Explain how you determined this. Hint: Live Price = Carcass Price × Yield

$$\text{Live Price} = \text{Carcass Price} \times \text{Yield} = 1.20 \times 0.75 = \$0.9000$$

The optimal selling live weight is 280 lbs. At 285 pounds the marginal cost exceeds the selling price.

- c. (2 points) If the price of feed decreased to \$0.2200 per pound and the selling price for finished hogs is \$1.20 per pound carcass, would you expect the optimal live selling weight to increase, decrease, or stay the same? Explain why you expect this result.

You would expect the optimal live selling weight to increase because the marginal cost for each incremental 5 pound of gain is smaller and the selling price for finished hogs remained the same.

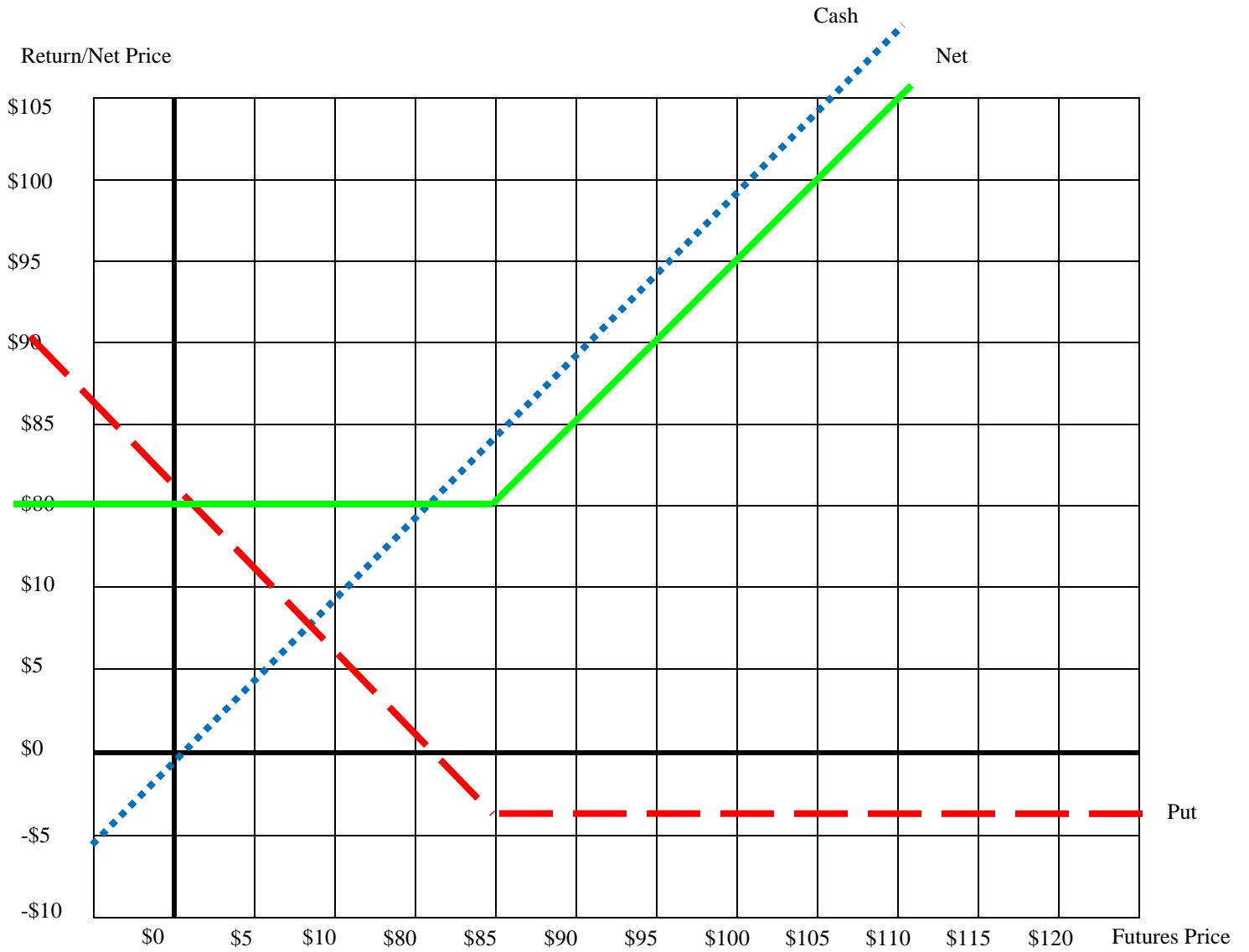
39. For the following questions use the attached futures and options data. Assume historical expected basis of -\$0.50 per cwt and a commission of \$0.075 per cwt.

- a. (5 points) A hedger (producer) buys a \$85 put option on Dec 2014 lean hog futures. What is their floor price with the option in place? If the Dec 2014 lean hog futures price falls to \$83, what is their net price? Show the math and draw and label the graph.

$$\begin{aligned} \text{Floor price} &= \text{Strike Price} + \text{Basis} - \text{Premium} - \text{Commission} \\ &= \$85.00 - \$0.50 - \$4.275 - \$0.075 \\ &= \$80.150 \end{aligned}$$

If the Dec 2014 lean hog futures price falls to \$83.00, their net price is equal to the floor price, \$80.150. To see this, look at the graph. They receive \$82.50 from the cash market (\$83.00 - \$0.50, futures + basis) and they receive -\$2.350 from the put option.

$$\begin{aligned} &\text{Max}(0, \text{Strike Price} - \text{Futures Price}) - \text{Premium} - \text{Commission} \\ &= \text{Max}(0, \$85.00 - \$83.00) - \$4.275 - \$0.075 &= \text{Max}(0, \$2.00) - \$4.275 - \$0.075 \\ &= \$2.00 - \$4.275 - \$0.075 &= -\$2.350 \end{aligned}$$



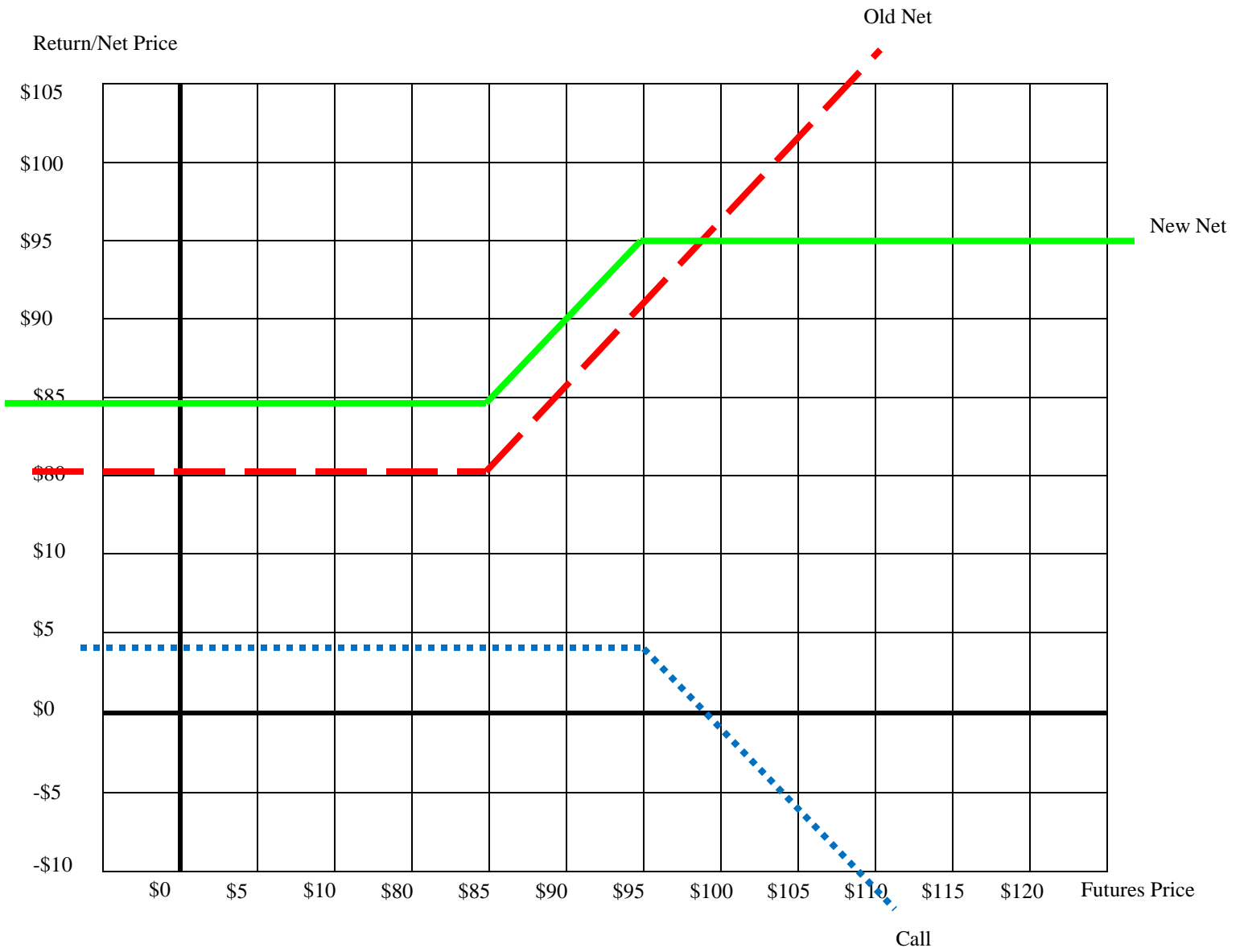
- b. (5 points) If the hedger in (a) also sold a \$95 call option on Dec 2014 lean hog futures, does that change their floor price? If so, what is the new floor price? How has their risks changed? Show the math and draw and label the graph.

Yes, their floor price changed with the addition of the call option premium less the commission.

$$\begin{aligned}\text{New Floor Price} &= \text{Old Floor Price} + \text{Call Option Premium} - \text{Commision} \\ &= \$80.150 + \$4.450 - \$0.075 \\ &= \$84.525\end{aligned}$$

There risks have changed. They have a higher floor, but limited upside potential as the call creates a ceiling once the futures price moves above \$96.







All prices and premiums are listed in dollars per cwt

Dec 2014 Lean Hogs

Futures 90.850

Price

| Options | Strike Price | Premium | Options | Strike Price | Premium |
|---------|--------------|---------|---------|--------------|---------|
| Put     | 51           | 0.050   | Call    | 51           | 39.525  |
| Put     | 53           | 0.050   | Call    | 53           | 37.525  |
| Put     | 55           | 0.075   | Call    | 55           | 35.525  |
| Put     | 57           | 0.075   | Call    | 57           | 33.525  |
| Put     | 59           | 0.100   | Call    | 59           | 31.550  |
| Put     | 61           | 0.150   | Call    | 61           | 29.550  |
| Put     | 63           | 0.150   | Call    | 63           | 27.600  |
| Put     | 65           | 0.250   | Call    | 65           | 25.625  |
| Put     | 67           | 0.325   | Call    | 67           | 23.700  |
| Put     | 69           | 0.450   | Call    | 69           | 21.800  |
| Put     | 71           | 0.625   | Call    | 71           | 19.950  |
| Put     | 73           | 0.850   | Call    | 73           | 17.625  |
| Put     | 75           | 1.175   | Call    | 75           | 15.950  |
| Put     | 77           | 1.575   | Call    | 77           | 14.350  |
| Put     | 79           | 2.075   | Call    | 79           | 12.850  |
| Put     | 81           | 2.70    | Call    | 81           | 11.500  |
| Put     | 83           | 3.450   | Call    | 83           | 10.250  |
| Put     | 85           | 4.275   | Call    | 85           | 9.100   |
| Put     | 87           | 5.150   | Call    | 87           | 7.975   |
| Put     | 89           | 0.050   | Call    | 89           | 6.900   |
| Put     | 91           | 7.075   | Call    | 91           | 5.950   |
| Put     | 93           | 8.275   | Call    | 93           | 5.125   |
| Put     | 95           | 9.225   | Call    | 95           | 4.450   |
| Put     | 97           | 10.600  | Call    | 97           | 3.850   |
| Put     | 99           | 12.025  | Call    | 99           | 3.325   |
| Put     | 101          | 13.525  | Call    | 101          | 2.875   |
| Put     | 103          | 15.050  | Call    | 103          | 2.450   |
| Put     | 105          | 16.675  | Call    | 105          | 2.100   |
| Put     | 107          | 18.325  | Call    | 107          | 1.800   |
| Put     | 109          | 20.050  | Call    | 109          | 1.525   |
| Put     | 111          | 21.775  | Call    | 111          | 1.300   |
| Put     | 113          | 23.550  | Call    | 113          | 1.100   |