Agent 30

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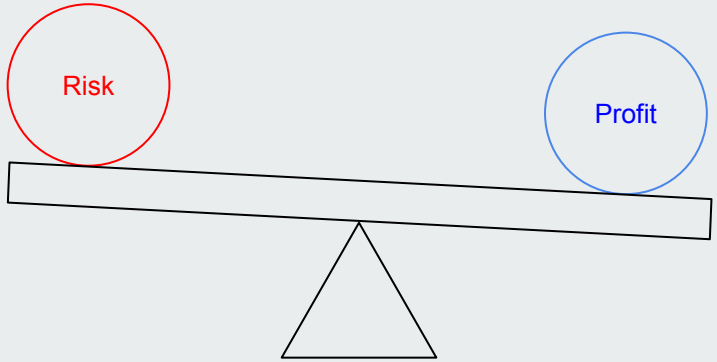

The Main Idea

Balance between risk and profits

Predicting excessive amount of buy & sell transactions will cause unsold inventory

Predicting insufficient amount of buy & sell transactions will not maximize the agent profits potential

Trading Strategy

1

$$baseline\_inputs[t] = 3.5 * NLINES * (1 - \tanh(\frac{1.6t}{n}))$$

2

$$Inv[s,t] = max(0, Inv[s,t-1] - SO[t]) + SI[t];\ Inv[s,s] = 0$$

$$TBS[s,t] = \sum_{i=s}^{t} max(0, SO[t] - Inv[s,t-1])$$

$$EI[c,t] = Inv[0,c] + \sum_{i=c}^{t}(SO[i] - SI[i]) - TBS[t+1,\infty]$$

3

$$\alpha[t] = (EI[t]/2 * NLINES)$$
$$\beta[t] = max(\exp(1-\alpha), exp(0))$$
$$IN[t] = \beta[t] * baseline_{in}[t]$$

$$\gamma[t] = \max(0.1, EI[t]/NLINES)$$
$$ON[t] = \gamma[t] * baseline_{out}[t]$$

- **Determines how much to sell and buy**
- **A-priori prediction on the amount of input and output needed [1]**
- **Predicts expected inventory according to current secured transactions [2]**
- **Uses expected inventory to update the a-priori prediction over the needs for input and output product [3]**

Sell Negotiation

1

$$\alpha[t] = \frac{EI[t]}{NLINES}$$

$$\beta[t] = \begin{cases} 1.2 & \text{if } \alpha[t] < 0 \\ 1 & \text{if } \alpha[t] \leq 4 \\ 1 - \alpha[t] * \frac{1}{80} & \text{if } \alpha[t] \leq 8 \\ 0.9 & \text{otherwise} \end{cases}$$

$$AOC[t] = (C + IC[t])\beta[t]$$

2

$$f(q) = \begin{cases} ON[t] - (q + SO[t]) & \text{if } ON[t] - (q + SO[t]) > 0 \\ -1000 & \text{else} \end{cases}$$

$$P(p) = p - (AVG\_IP + C) * 1.2$$

$$Utility(offer) = f(offer.q) \times P(offer.p) \times 0.95 + 0.05 \times offer.q$$

- Determines acceptable unit price as a function of expected inventory [1]
- Modifies utility to get at least ~20% profit margin [2]
- Find hints for unrealistic utility expectation and allows lower profit margin

Buy Negotiation

1

$$\alpha[t] = \frac{EI[t]}{NLINES}$$

$$\beta[t] = \begin{cases} \frac{(6-\alpha[t]/2)}{5} & \text{if } \alpha[t] > 2 \ \wedge \ \alpha[t] < 10 \\ 0.1 & \text{if } \alpha[t] \geq 10 \\ 1 & \text{otherwise} \end{cases}$$

$$AIC[t] = \begin{cases} (OP[0] - C) \times \beta[t] & \text{if t<5} \\ (AVGOP * 0.9 - C) \times \beta[t] & \text{otherwise} \end{cases}$$

- **Determines acceptable unit price as a function of expected inventory [1]**

Thank You