

EXAMEN TRADING AND EXCHANGES 2017

QUESTION 1:

- Interpret the following equation

$$E[\tilde{W}_1^{NoTrade}] - \frac{A}{2} Var[\tilde{W}_1^{NoTrade}] = E[\tilde{W}_1^{Trade}] - \frac{A}{2} Var[\tilde{W}_1^{Trade}]$$

- Derive the price

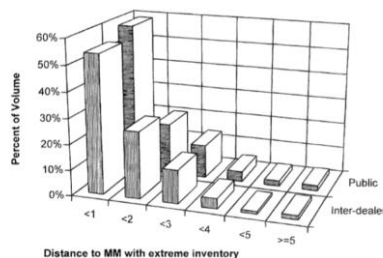
$$p_{0,i} = \bar{V}_i - A\sigma_{*,i} \sum_{i=1}^N V_{i,0} q_{i,0}^* + \frac{A}{2} \sigma_i^2 x_{0,i}$$

- Interpret the bid, ask, mid quote and spread

$$A_{0,i} = \bar{V}_i - A\sigma_{*,i} \sum_{i=1}^N V_{i,0} q_{i,0}^* + \frac{A}{2} \sigma_i^2 |x_{0,i}| = M_{0,i} + \frac{A}{2} \sigma_i^2 |x_{0,i}|$$

$$B_{0,i} = \bar{V}_i - A\sigma_{*,i} \sum_{i=1}^N V_{i,0} q_{i,0}^* - \frac{A}{2} \sigma_i^2 |x_{0,i}| = M_{0,i} - \frac{A}{2} \sigma_i^2 |x_{0,i}|$$

- Theory: Ho and Stoll (1983): market maker with the most divergent inventory should execute all the trades. Why is it?
 - Empirical test: take distance between inventory of the market maker executing the trade and the inventory of the market maker who at that time is most favorably placed to execute that trade. Is this a good test?
 - Does this figure confirm the theoretical predictions?



QUESTION 2: ASYMMETRIC INFORMATION

- Explain formally and in words how the dealer sets his initial bid and ask price
- Based on some concrete figures, derive the initial bid and ask price
 - $V_H = 0,5 = V_L$
 - $\alpha = 0,1$
 - Probability of uninformed trader to sell = 0,5
 - Ask = 1,45 Bid = 1,55
- Assuming that the initial order was a buy order, how will the dealer update his bid and ask price?
- Compute the updated bid and ask price

QUESTION 3: LO AND MO

- What are the advantages and drawbacks of LO and MO. Discuss them briefly. Give 4 determinants that help us choosing between LO and MO
- Explain all the steps needed to derive the following equations

$$\mu_0 + L - \hat{A} = \frac{\tau}{2} (\mu_0 + L - \hat{B})$$

$$\hat{B} - (\mu_0 - L) = \frac{\tau}{2} (\hat{A} - (\mu_0 - L))$$

- Interpret the formula of the best ask and best bid

$$A^* = \hat{A} = \mu_0 - L + \frac{4L}{2 + \tau}$$

$$B^* = \hat{B} = \mu_0 + L - \frac{4L}{2 + \tau}$$

- QUESTION 4: DARK POOLS
 - An informed trader has to choose between sending an order on dealer market or in dark Pool. What would you recommend? Why? Explain + and - of each alternative
 - Build a regression model that would enable us to test whether the informed trader would go for the DM or Dark pool

