

2nd set assignments Introductory Econometrics

Task 1

Use the data set `dcx_gh.wf1` to estimate the Glosten/Harris(1988) model. An estimable linear equation can be derived in the following way.

The unknown true value of a stock m_t is given by:

$$m_t = \mu + m_{t-1} + \varepsilon_t + z_t Q_t$$

where μ is a constant, ε_t is a random disturbance, Q_t is a trade indicator (taking the value 1 for a buy and -1 for a sell) and $z_t = z_0 + z_1 V_t$. With V_t we denote the traded volume. The ask price p_t^a (the price to buy a stock) and the bid price p_t^b (the price to sell a stock) are:

$$\begin{aligned} p_t^a &= m_{t-1} + \mu + \varepsilon_t + z_t + c \\ p_t^b &= m_{t-1} + \mu + \varepsilon_t - z_t - c \end{aligned}$$

Thus, the transaction price in period t , p_t , and the price in period $t - 1$, p_{t-1} , can be written as:

$$\begin{aligned} p_t &= \underbrace{m_{t-1} + \mu + \varepsilon_t + z_t Q_t}_{m_t} + c Q_t \\ p_{t-1} &= m_{t-1} + c Q_{t-1} \end{aligned}$$

Subtracting p_{t-1} from p_t and plugging in the above expression for z_t yields:

$$\Delta p_t = \mu + c \Delta Q_t + z_0 Q_t + z_1 Q_t V_t + \varepsilon_t$$

data set description:

- $\Delta p_t \hat{=} dp$
- $\Delta Q_t \hat{=} dq$
- $Q_t \hat{=} q$
- $Q_t V_t \hat{=} qv$

- a) Estimate the OLS regression with EViews.
- b) Test if volume V_t has a significant impact on the market makers choice for setting p_t^a and p_t^b .
- c) Test, if $2c = 0.01$, which would imply that the order processing costs are minimized to the lower bound (1 euro cent) in an electronic order book.

Task 2

Analyze the data set `wine.wf1` considering functional form and change of measurement of the variables. Therefore, regress the price and the logarithm of the price, respectively, on the age of the wine. Explain and interpret your results. Further, analyze the effect of using different price measures on your results. Formulate an economic interest rate model in discrete time for wine (take wine as an asset) and interpret the parameters of the linear regression model in this context.

data set description:

- `age`: the age of the wine in years
- `price1`: price for one bottle of wine
- `price12`: price for twelve bottles of wine
- `logprice1`: log-price for one bottle of wine
- `logprice12`: log-price for twelve bottles of wine