3rd set assignments Introductory Econometrics

Task 1

Different methods for testing linear restrictions:

Use the data set dcx_gh.wf1 to estimate the Glosten/Harris(1988) model.

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

Test the joint hypotheses that \( z_0 = z_1 = 0 \):

i) Estimate the unrestricted OLS regression with EViews and name the equation (e.g. UMOD) object by clicking on NAME.

ii) Estimate the restricted OLS regression with EViews and name the equation (e.g. RMOD) object by clicking on NAME.

iii) Create a scalar object for the sum of squared residuals of each estimated regression by using the following EViews commands in the command line:

\[
\begin{align*}
\text{scalar} & \ \text{ussr}=\text{UMOD.@ssr}; \\
\text{scalar} & \ \text{rssr}=\text{RMOD.@ssr}; \\
\text{iv)} & \ \text{Create a scalar object for the number of observations:} \\
\text{scalar} & \ \text{n}=\text{UMOD.@regobs};
\end{align*}
\]

v) Compute the F-statistic with help of the three created scalar objects.

Task 2

i) Use the Excel spreadsheet dcxft_tim.xls to estimate the Glosten/Harris model as in assignment sheet 1. Then, calculate the variance-covariance matrix of the parameter vector \( \mathbf{b} \). The VC matrix can be computed as:

\[ Var(\mathbf{b}|\mathbf{X}) = \sigma^2 \cdot (\mathbf{X}'\mathbf{X})^{-1} \]

Here, \( \sigma^2 \) can be replaced by its unbiased estimator \( s^2 = \mathbf{e}'\mathbf{e}/(n-K) \), where \( \mathbf{e} = \mathbf{y} - \mathbf{X}\mathbf{b} \), \( n \) is the number of observations and \( K \) is the number of estimated parameters.

ii) Test the joint hypotheses that \( 2c = 0.01 \) and \( z_0 = z_1 = 0 \! \) ! Therefore, create the matrices \( \mathbf{R} \) and \( \mathbf{r} \) (Hayashi(2000) p.40). Then, compute the \( F \)-statistic as:

\[ F \equiv (\mathbf{R}\mathbf{b} - \mathbf{r})' [\mathbf{R}Var(\mathbf{b}|\mathbf{X})\mathbf{R}']^{-1} (\mathbf{R}\mathbf{b} - \mathbf{r}) / \# \mathbf{r} \]

where \( \# \mathbf{r} \) is the dimension of \( \mathbf{r} \) (number of restrictions).