

DSCI 922 – Advanced Regression

Computer Problem 8 International Markets Study – SUR

You wish to investigate whether the stock markets of Japan and New Zealand depend on past daily movements in the U.S. stock market.

Get daily closing stock index values for the U.S., Japanese, and New Zealand markets.

I. Specify the following Seemingly Unrelated Regressions model:

$$R_{jt} = [a_{j1} d_1 + a_{j2} d_2 + a_{j3} d_3 + a_{j4} d_4 + a_{j5} d_5] + b_{j1} \text{Trend}_t + c_{j1} R_{jt-1} + c_{j2} R_{jt-2} + c_{j3} R_{jt-3} + c_{j4} R_{jt-4} + c_{j5} R_{jt-5} + d_{j1} R_{ust-1} + d_{j2} R_{ust-2} + d_{j3} R_{ust-3} + d_{j4} R_{ust-4} + d_{j5} R_{ust-5} + \varepsilon_{jt} \quad (1)$$

$$R_{nzt} = [a_{nz1} d_1 + a_{nz2} d_2 + a_{nz3} d_3 + a_{nz4} d_4 + a_{nz5} d_5] + b_{nz} \text{Trend}_t + c_{nz1} R_{nzt-1} + c_{nz2} R_{nzt-2} + c_{nz3} R_{nzt-3} + c_{nz4} R_{nzt-4} + c_{nz5} R_{nzt-5} + d_{nz1} R_{ust-1} + d_{nz2} R_{ust-2} + d_{nz3} R_{ust-3} + d_{nz4} R_{ust-4} + d_{nz5} R_{ust-5} + \varepsilon_{2t} \quad (2)$$

where $d_1 = 1$ if Monday, 0 otherwise; $d_2 = 1$ if Tuesday, 0 otherwise; etc.
 Trend_t = time trend (values range from 1 to T);
 R_{jt} = daily return in Japanese stock market;
 R_{nzt} = daily return in New Zealand stock market;
 R_{ust} = daily return in U.S. stock market.

II. Test the following hypotheses:

H1: $b_{j1} = 0$;

H2: $d_{j1} = 0.25$;

H3: H1 and H2;

H4: $d_{j1} + d_{j2} + d_{j3} + d_{j4} + d_{j5} = 0.5$;

H5: H1 and H2 and H4;

H6: $a_{j1} = a_{j2}$; $a_{j1} = a_{j3}$; $a_{j1} = a_{j4}$; $a_{j1} = a_{j5}$.

H7: $b_{nz1} = 0$;

H8: $d_{nz1} = 0.25$;

H9: H7 and H8;

H10: $d_{nz1} + d_{nz2} + d_{nz3} + d_{nz4} + d_{nz5} = 0.5$;

H11: H7 and H8 and H10;

H12: $a_{nz1} = a_{nz2}$; $a_{nz1} = a_{nz3}$; $a_{nz1} = a_{nz4}$; $a_{nz1} = a_{nz5}$.

III. Test the following cross-equation restrictions:

H7: H2 and H8;

H8: H4 and H10.