VECM system, lag order 4

Maximum likelihood estimates, observations 1961:4-2010:1 (T = 194)

Cointegration rank = 4

Case 2: Restricted constantRestrictions on beta: b[1,8] = 1 b[2,4] = 1 b[3,7] = 1 b[4,3] = 1 b[1,2] = 0 b[1,3] + b[1,4] = 0 b[1,5] = 0 b[1,6] = 0 b[2,1] = 0 b[2,6] = 0 b[2,7] = 0 b[2,8] + b[2,11] = 0 b[3,1] = 0 b[3,2] = 0 b[3,3] = 0 b[3,4] = 0 b[4,1] = 0 b[4,4] = 0 b[4,5] = 0 b[4,8] + b[4,11] = 0 b[2,2] = 0 b[4,7] = 0 b[4,10] = 0 b[2,3] + b[2,4] = 0 b[1,12] = 0 b[2,12] = 0 b[3,11] = 0 b[4,12] = 0 b[3,5] = 0 b[3,8] = 0 b[4,6] = 0Restrictions on alpha: a[1,1] = 0 a[2,1] = 0 a[2,6] = 0 a[2,8] = 0 a[3,2] = 0 a[3,3] = 0 a[4,5] = 0 a[4,6] = 0 a[4,7] = 0 a[4,8] = 0Unrestricted loglikelihood (lu) = 5228.1056

Restricted loglikelihood (lr) = 5216.1317

2 \* (lu - lr) = 23.9479

P(Chi-square(25) > 23.9479) = 0.522388

Relative to prior restriction:

Unrestricted loglikelihood (lu) = 5218.6492

Restricted loglikelihood (lr) = 5216.1317

2 \* (lu - lr) = 5.03494

P(Chi-square(3) > 5.03494) = 0.169257

beta (cointegrating vectors, standard errors in parentheses)

ma4\_q2 0.033468 0.00000 0.00000 0.00000

(0.0057271) (0.00000) (0.00000) (0.00000)

dulc 0.00000 0.00000 0.00000 -0.77691

(0.00000) (0.00000) (0.00000) (0.048902)

dp -0.58260 -1.0000 0.00000 1.0000

(0.27144) (0.00000) (0.00000) (0.00000)

r 0.58260 1.0000 0.00000 0.00000

(0.27144) (0.00000) (0.00000) (0.00000)

debt\_costs 0.00000 -0.014969 0.00000 0.00000

(0.00000) (0.0023650) (0.00000) (0.00000)

cf 6.3427e-018 0.00000 -1.4922 0.00000

(0.00000) (0.00000) (0.097539) (0.00000)

i -0.012757 0.00000 1.0000 0.00000

(0.012968) (0.00000) (0.00000) (0.00000)

y 1.0000 0.39162 0.00000 0.055843

(0.00000) (0.038762) (0.00000) (0.020270)

const 0.27568 0.066885 1.1712 -0.0026516

(0.039786) (0.014874) (0.32342) (0.0022714)

poil 0.039884 0.0079058 0.26542 0.00000

(0.0064397) (0.0020352) (0.062285) (0.00000)

yp -1.0962 -0.39162 0.00000 -0.055843

(0.015615) (0.038762) (0.00000) (0.020270)

Dpoil -7.8102e-017 0.00000 -0.22105 0.00000

(0.00000) (0.00000) (0.046349) (0.00000)

alpha (adjustment vectors, standard errors in parentheses)

ma4\_q2 0.00000 0.00000 -0.052122 -2.0307

(0.00000) (0.00000) (0.017910) (0.75651)

dulc -0.16704 0.73915 0.00000 1.1629

(0.070433) (0.17380) (0.00000) (0.19915)

dp -0.063707 0.20949 0.00000 -0.23529

(0.026596) (0.069789) (0.00000) (0.080513)

r 0.040858 -0.076490 -0.0037371 -0.055386

(0.015019) (0.037243) (0.0010518) (0.029375)

debt\_costs 0.87737 -0.88882 -0.19252 0.00000

(0.57445) (1.4345) (0.041753) (0.00000)

cf -1.4940 0.00000 0.16170 0.00000

(0.30432) (0.00000) (0.033448) (0.00000)

i 0.25489 -1.4760 -0.036901 0.00000

(0.18635) (0.45047) (0.014420) (0.00000)

y -0.18009 0.00000 -3.8030e-006 0.00000

(0.038272) (0.00000) (0.0045863) (0.00000)

Determinant of covariance matrix = 6.1124209e-034

AIC = -50.2282

BIC = -44.4336

HQC = -47.8818

Equation 1: d\_ma4\_q2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.664571 | 0.0701099 | 9.4790 | <0.00001 | \*\*\* |
| d\_ma4\_q2\_2 | -0.00487231 | 0.088726 | -0.0549 | 0.95628 |  |
| d\_ma4\_q2\_3 | -0.179711 | 0.0693003 | -2.5932 | 0.01042 | \*\* |
| d\_dulc\_1 | -1.32261 | 0.295464 | -4.4764 | 0.00001 | \*\*\* |
| d\_dulc\_2 | -0.532328 | 0.313477 | -1.6981 | 0.09149 | \* |
| d\_dulc\_3 | -0.573501 | 0.238148 | -2.4082 | 0.01721 | \*\* |
| d\_dp\_1 | 0.570099 | 0.767425 | 0.7429 | 0.45868 |  |
| d\_dp\_2 | -1.48179 | 0.818285 | -1.8109 | 0.07210 | \* |
| d\_dp\_3 | -0.0863671 | 0.826354 | -0.1045 | 0.91690 |  |
| d\_r\_1 | -0.689558 | 1.90316 | -0.3623 | 0.71760 |  |
| d\_r\_2 | 0.17657 | 2.01336 | 0.0877 | 0.93023 |  |
| d\_r\_3 | -1.11736 | 1.94766 | -0.5737 | 0.56701 |  |
| d\_debt\_costs\_1 | -0.00441688 | 0.0539591 | -0.0819 | 0.93487 |  |
| d\_debt\_costs\_2 | -0.030063 | 0.0528551 | -0.5688 | 0.57033 |  |
| d\_debt\_costs\_3 | 0.0111404 | 0.0478665 | 0.2327 | 0.81627 |  |
| d\_cf\_1 | -0.0876495 | 0.0417488 | -2.0994 | 0.03740 | \*\* |
| d\_cf\_2 | -0.00502149 | 0.0421774 | -0.1191 | 0.90538 |  |
| d\_cf\_3 | -0.0650608 | 0.0409394 | -1.5892 | 0.11405 |  |
| d\_i\_1 | -0.014135 | 0.112013 | -0.1262 | 0.89974 |  |
| d\_i\_2 | -0.119731 | 0.115331 | -1.0382 | 0.30082 |  |
| d\_i\_3 | 0.121522 | 0.109193 | 1.1129 | 0.26747 |  |
| d\_y\_1 | 0.90361 | 0.343005 | 2.6344 | 0.00928 | \*\*\* |
| d\_y\_2 | -0.163687 | 0.334587 | -0.4892 | 0.62538 |  |
| d\_y\_3 | -0.400568 | 0.329494 | -1.2157 | 0.22595 |  |
| d\_poil | 0.0333315 | 0.0299043 | 1.1146 | 0.26675 |  |
| d\_yp | -0.172083 | 0.546411 | -0.3149 | 0.75324 |  |
| d\_Dpoil | -0.074177 | 0.0330852 | -2.2420 | 0.02638 | \*\* |
| d\_d\_poil | -0.0495806 | 0.038699 | -1.2812 | 0.20204 |  |
| d\_d\_yp | -16.6475 | 10.5157 | -1.5831 | 0.11543 |  |
| d\_d\_Dpoil | 0.0926284 | 0.0409604 | 2.2614 | 0.02512 | \*\* |
| d\_d\_d\_poil | 0.0151917 | 0.0179973 | 0.8441 | 0.39991 |  |
| d\_d\_d\_yp | 30.7138 | 18.0989 | 1.6970 | 0.09170 | \* |
| d\_d\_d\_Dpoil | -0.0335959 | 0.0174561 | -1.9246 | 0.05611 | \* |
| d\_Dr | -0.00674244 | 0.0106809 | -0.6313 | 0.52880 |  |
| d\_Dma4\_q2 | 0.0789717 | 0.0118079 | 6.6880 | <0.00001 | \*\*\* |
| EC1 | 0 | 0 | undefined | undefined |
| EC2 | 0 | 0 | undefined | undefined |
| EC3 | -0.052122 | 0.0179097 | -2.9103 | 0.00414 | \*\*\* |
| EC4 | -2.03067 | 0.756506 | -2.6843 | 0.00806 | \*\*\* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 0.001127 |  | S.D. dependent var | 0.047331 |
| Sum squared resid | 0.091426 |  | S.E. of regression | 0.024287 |
| R-squared | 0.788666 |  | Adjusted R-squared | 0.736856 |
| rho | -0.032450 |  | Durbin-Watson | 2.053620 |

Equation 2: d\_dulc

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | -0.025009 | 0.0211417 | -1.1829 | 0.23865 |  |
| d\_ma4\_q2\_2 | 0.0184685 | 0.0267555 | 0.6903 | 0.49106 |  |
| d\_ma4\_q2\_3 | 0.0127058 | 0.0208976 | 0.6080 | 0.54408 |  |
| d\_dulc\_1 | -0.0673831 | 0.0890975 | -0.7563 | 0.45063 |  |
| d\_dulc\_2 | -0.0522294 | 0.0945296 | -0.5525 | 0.58139 |  |
| d\_dulc\_3 | 0.0437082 | 0.071814 | 0.6086 | 0.54366 |  |
| d\_dp\_1 | -0.186103 | 0.231418 | -0.8042 | 0.42252 |  |
| d\_dp\_2 | -0.568768 | 0.246755 | -2.3050 | 0.02249 | \*\* |
| d\_dp\_3 | -0.34541 | 0.249188 | -1.3861 | 0.16769 |  |
| d\_r\_1 | -0.629841 | 0.5739 | -1.0975 | 0.27414 |  |
| d\_r\_2 | 0.274458 | 0.607131 | 0.4521 | 0.65186 |  |
| d\_r\_3 | -0.437253 | 0.587319 | -0.7445 | 0.45771 |  |
| d\_debt\_costs\_1 | 0.0148025 | 0.0162715 | 0.9097 | 0.36438 |  |
| d\_debt\_costs\_2 | 0.00241704 | 0.0159385 | 0.1516 | 0.87966 |  |
| d\_debt\_costs\_3 | 0.00066334 | 0.0144342 | 0.0460 | 0.96340 |  |
| d\_cf\_1 | 0.00860589 | 0.0125894 | 0.6836 | 0.49526 |  |
| d\_cf\_2 | 0.0116277 | 0.0127187 | 0.9142 | 0.36202 |  |
| d\_cf\_3 | -0.0195507 | 0.0123453 | -1.5836 | 0.11531 |  |
| d\_i\_1 | 0.071189 | 0.0337778 | 2.1076 | 0.03668 | \*\* |
| d\_i\_2 | -0.00427469 | 0.0347782 | -0.1229 | 0.90234 |  |
| d\_i\_3 | -0.00573292 | 0.0329272 | -0.1741 | 0.86201 |  |
| d\_y\_1 | -0.0618197 | 0.103434 | -0.5977 | 0.55093 |  |
| d\_y\_2 | -0.0662374 | 0.100895 | -0.6565 | 0.51248 |  |
| d\_y\_3 | 0.0830843 | 0.0993594 | 0.8362 | 0.40433 |  |
| d\_poil | -0.0146156 | 0.0090177 | -1.6208 | 0.10710 |  |
| d\_yp | -0.897854 | 0.164771 | -5.4491 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.0177547 | 0.0099769 | 1.7796 | 0.07710 | \* |
| d\_d\_poil | 0.0143814 | 0.0116697 | 1.2324 | 0.21968 |  |
| d\_d\_yp | -3.28 | 3.17101 | -1.0344 | 0.30258 |  |
| d\_d\_Dpoil | -0.0212605 | 0.0123517 | -1.7213 | 0.08720 | \* |
| d\_d\_d\_poil | -0.00224703 | 0.00542711 | -0.4140 | 0.67942 |  |
| d\_d\_d\_yp | -3.89409 | 5.45774 | -0.7135 | 0.47661 |  |
| d\_d\_d\_Dpoil | 0.00788789 | 0.00526392 | 1.4985 | 0.13604 |  |
| d\_Dr | 0.000466072 | 0.00322085 | 0.1447 | 0.88513 |  |
| d\_Dma4\_q2 | -0.00117353 | 0.00356069 | -0.3296 | 0.74216 |  |
| EC1 | -0.16704 | 0.0704326 | -2.3716 | 0.01894 | \*\* |
| EC2 | 0.739149 | 0.173795 | 4.2530 | 0.00004 | \*\*\* |
| EC3 | 0 | 0 | undefined | undefined |
| EC4 | 1.16292 | 0.199149 | 5.8395 | <0.00001 | \*\*\* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | -0.000029 |  | S.D. dependent var | 0.010682 |
| Sum squared resid | 0.008314 |  | S.E. of regression | 0.007324 |
| R-squared | 0.622509 |  | Adjusted R-squared | 0.529962 |
| rho | -0.024072 |  | Durbin-Watson | 2.044930 |

Equation 3: d\_dp

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | -0.00605835 | 0.00691857 | -0.8757 | 0.38257 |  |
| d\_ma4\_q2\_2 | 0.0013429 | 0.00875565 | 0.1534 | 0.87830 |  |
| d\_ma4\_q2\_3 | 0.00447495 | 0.00683868 | 0.6544 | 0.51385 |  |
| d\_dulc\_1 | -0.0984726 | 0.0291569 | -3.3773 | 0.00093 | \*\*\* |
| d\_dulc\_2 | -0.0671866 | 0.0309345 | -2.1719 | 0.03138 | \*\* |
| d\_dulc\_3 | -0.027726 | 0.0235009 | -1.1798 | 0.23989 |  |
| d\_dp\_1 | -0.28399 | 0.0757309 | -3.7500 | 0.00025 | \*\*\* |
| d\_dp\_2 | -0.253723 | 0.0807499 | -3.1421 | 0.00201 | \*\*\* |
| d\_dp\_3 | -0.139684 | 0.0815462 | -1.7129 | 0.08872 | \* |
| d\_r\_1 | 0.180033 | 0.187807 | 0.9586 | 0.33925 |  |
| d\_r\_2 | -0.399889 | 0.198682 | -2.0127 | 0.04588 | \*\* |
| d\_r\_3 | -0.239638 | 0.192199 | -1.2468 | 0.21434 |  |
| d\_debt\_costs\_1 | -0.00206359 | 0.00532479 | -0.3875 | 0.69889 |  |
| d\_debt\_costs\_2 | 0.0133858 | 0.00521584 | 2.5664 | 0.01122 | \*\* |
| d\_debt\_costs\_3 | 0.00482779 | 0.00472355 | 1.0221 | 0.30834 |  |
| d\_cf\_1 | 0.00530922 | 0.00411986 | 1.2887 | 0.19943 |  |
| d\_cf\_2 | 0.0046438 | 0.00416215 | 1.1157 | 0.26627 |  |
| d\_cf\_3 | -0.000619921 | 0.00403998 | -0.1534 | 0.87825 |  |
| d\_i\_1 | 0.0247452 | 0.0110537 | 2.2386 | 0.02660 | \*\* |
| d\_i\_2 | -0.0078282 | 0.0113811 | -0.6878 | 0.49259 |  |
| d\_i\_3 | 0.00438694 | 0.0107753 | 0.4071 | 0.68448 |  |
| d\_y\_1 | -0.00830138 | 0.0338484 | -0.2453 | 0.80659 |  |
| d\_y\_2 | -0.00387056 | 0.0330177 | -0.1172 | 0.90683 |  |
| d\_y\_3 | 0.0105218 | 0.0325151 | 0.3236 | 0.74668 |  |
| d\_poil | 0.00580146 | 0.00295102 | 1.9659 | 0.05109 | \* |
| d\_yp | -0.0801929 | 0.0539208 | -1.4872 | 0.13898 |  |
| d\_Dpoil | 0.000224204 | 0.00326491 | 0.0687 | 0.94534 |  |
| d\_d\_poil | -0.00606591 | 0.00381889 | -1.5884 | 0.11423 |  |
| d\_d\_yp | -1.72455 | 1.03771 | -1.6619 | 0.09856 | \* |
| d\_d\_Dpoil | -0.00269914 | 0.00404205 | -0.6678 | 0.50528 |  |
| d\_d\_d\_poil | 0.00326999 | 0.00177601 | 1.8412 | 0.06750 | \* |
| d\_d\_d\_yp | 4.87646 | 1.78603 | 2.7303 | 0.00706 | \*\*\* |
| d\_d\_d\_Dpoil | 0.00170346 | 0.0017226 | 0.9889 | 0.32426 |  |
| d\_Dr | 0.00173572 | 0.00105401 | 1.6468 | 0.10163 |  |
| d\_Dma4\_q2 | -0.00228793 | 0.00116523 | -1.9635 | 0.05138 | \* |
| EC1 | -0.0637074 | 0.0265955 | -2.3954 | 0.01779 | \*\* |
| EC2 | 0.209489 | 0.0697886 | 3.0018 | 0.00313 | \*\*\* |
| EC3 | 0 | 0 | undefined | undefined |
| EC4 | -0.235294 | 0.0805134 | -2.9224 | 0.00399 | \*\*\* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 4.37e-07 |  | S.D. dependent var | 0.002872 |
| Sum squared resid | 0.000890 |  | S.E. of regression | 0.002397 |
| R-squared | 0.440711 |  | Adjusted R-squared | 0.303595 |
| rho | -0.065479 |  | Durbin-Watson | 2.129272 |

Equation 4: d\_r

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.00445404 | 0.00366441 | 1.2155 | 0.22603 |  |
| d\_ma4\_q2\_2 | -0.00981823 | 0.00463742 | -2.1172 | 0.03584 | \*\* |
| d\_ma4\_q2\_3 | -0.000470282 | 0.0036221 | -0.1298 | 0.89686 |  |
| d\_dulc\_1 | -0.0050446 | 0.0154429 | -0.3267 | 0.74436 |  |
| d\_dulc\_2 | -0.0158072 | 0.0163844 | -0.9648 | 0.33616 |  |
| d\_dulc\_3 | -0.015247 | 0.0124472 | -1.2249 | 0.22246 |  |
| d\_dp\_1 | 0.0630247 | 0.0401108 | 1.5713 | 0.11816 |  |
| d\_dp\_2 | 0.216816 | 0.0427691 | 5.0695 | <0.00001 | \*\*\* |
| d\_dp\_3 | 0.0874807 | 0.0431908 | 2.0254 | 0.04454 | \*\* |
| d\_r\_1 | 0.391124 | 0.0994718 | 3.9320 | 0.00013 | \*\*\* |
| d\_r\_2 | -0.530072 | 0.105232 | -5.0372 | <0.00001 | \*\*\* |
| d\_r\_3 | 0.0973146 | 0.101798 | 0.9560 | 0.34058 |  |
| d\_debt\_costs\_1 | -0.00751326 | 0.00282027 | -2.6640 | 0.00854 | \*\*\* |
| d\_debt\_costs\_2 | 0.0119756 | 0.00276256 | 4.3350 | 0.00003 | \*\*\* |
| d\_debt\_costs\_3 | -0.00371015 | 0.00250182 | -1.4830 | 0.14011 |  |
| d\_cf\_1 | 0.00113329 | 0.00218208 | 0.5194 | 0.60425 |  |
| d\_cf\_2 | -0.00484886 | 0.00220447 | -2.1996 | 0.02932 | \*\* |
| d\_cf\_3 | -0.00313469 | 0.00213977 | -1.4650 | 0.14496 |  |
| d\_i\_1 | 0.013656 | 0.00585456 | 2.3325 | 0.02096 | \*\* |
| d\_i\_2 | -0.00775381 | 0.00602797 | -1.2863 | 0.20025 |  |
| d\_i\_3 | -0.00320008 | 0.00570714 | -0.5607 | 0.57580 |  |
| d\_y\_1 | 0.0347112 | 0.0179278 | 1.9362 | 0.05467 | \* |
| d\_y\_2 | 0.0401245 | 0.0174878 | 2.2944 | 0.02311 | \*\* |
| d\_y\_3 | 0.0226866 | 0.0172216 | 1.3173 | 0.18967 |  |
| d\_poil | -0.00132256 | 0.001563 | -0.8462 | 0.39876 |  |
| d\_yp | -0.335485 | 0.0285591 | -11.7470 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.00608034 | 0.00172926 | 3.5162 | 0.00057 | \*\*\* |
| d\_d\_poil | 0.00328054 | 0.00202267 | 1.6219 | 0.10686 |  |
| d\_d\_yp | -1.12399 | 0.549619 | -2.0450 | 0.04254 | \*\* |
| d\_d\_Dpoil | -0.00696331 | 0.00214087 | -3.2526 | 0.00140 | \*\*\* |
| d\_d\_d\_poil | -0.00143041 | 0.000940659 | -1.5206 | 0.13039 |  |
| d\_d\_d\_yp | 3.48437 | 0.945968 | 3.6834 | 0.00032 | \*\*\* |
| d\_d\_d\_Dpoil | 0.00200327 | 0.000912375 | 2.1957 | 0.02960 | \*\* |
| d\_Dr | 0.00658116 | 0.000558257 | 11.7888 | <0.00001 | \*\*\* |
| d\_Dma4\_q2 | 0.000231439 | 0.00061716 | 0.3750 | 0.70817 |  |
| EC1 | 0.0408578 | 0.0150193 | 2.7204 | 0.00727 | \*\*\* |
| EC2 | -0.0764897 | 0.0372429 | -2.0538 | 0.04167 | \*\* |
| EC3 | -0.00373714 | 0.00105184 | -3.5529 | 0.00051 | \*\*\* |
| EC4 | -0.0553863 | 0.0293749 | -1.8855 | 0.06123 | \* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | -0.000020 |  | S.D. dependent var | 0.002226 |
| Sum squared resid | 0.000250 |  | S.E. of regression | 0.001269 |
| R-squared | 0.738856 |  | Adjusted R-squared | 0.674834 |
| rho | 0.117695 |  | Durbin-Watson | 1.755786 |

Equation 5: d\_debt\_costs

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.0674021 | 0.146358 | 0.4605 | 0.64578 |  |
| d\_ma4\_q2\_2 | -0.395439 | 0.18522 | -2.1350 | 0.03434 | \*\* |
| d\_ma4\_q2\_3 | 0.127757 | 0.144668 | 0.8831 | 0.37855 |  |
| d\_dulc\_1 | 0.690961 | 0.616795 | 1.1202 | 0.26434 |  |
| d\_dulc\_2 | -0.544719 | 0.654399 | -0.8324 | 0.40647 |  |
| d\_dulc\_3 | -0.22215 | 0.497146 | -0.4468 | 0.65561 |  |
| d\_dp\_1 | 2.03012 | 1.60204 | 1.2672 | 0.20698 |  |
| d\_dp\_2 | 4.19489 | 1.70821 | 2.4557 | 0.01516 | \*\* |
| d\_dp\_3 | 3.11206 | 1.72505 | 1.8040 | 0.07317 | \* |
| d\_r\_1 | 21.4008 | 3.97294 | 5.3866 | <0.00001 | \*\*\* |
| d\_r\_2 | -16.7245 | 4.20298 | -3.9792 | 0.00011 | \*\*\* |
| d\_r\_3 | 4.67315 | 4.06583 | 1.1494 | 0.25217 |  |
| d\_debt\_costs\_1 | -0.199779 | 0.112642 | -1.7736 | 0.07810 | \* |
| d\_debt\_costs\_2 | 0.37484 | 0.110338 | 3.3972 | 0.00087 | \*\*\* |
| d\_debt\_costs\_3 | -0.109416 | 0.0999236 | -1.0950 | 0.27522 |  |
| d\_cf\_1 | 0.0692515 | 0.0871528 | 0.7946 | 0.42806 |  |
| d\_cf\_2 | -0.237605 | 0.0880474 | -2.6986 | 0.00774 | \*\*\* |
| d\_cf\_3 | -0.12873 | 0.085463 | -1.5063 | 0.13404 |  |
| d\_i\_1 | 0.605939 | 0.233833 | 2.5913 | 0.01047 | \*\* |
| d\_i\_2 | -0.155752 | 0.240759 | -0.6469 | 0.51864 |  |
| d\_i\_3 | -0.201294 | 0.227945 | -0.8831 | 0.37856 |  |
| d\_y\_1 | 1.03864 | 0.71604 | 1.4505 | 0.14893 |  |
| d\_y\_2 | 0.388511 | 0.698466 | 0.5562 | 0.57885 |  |
| d\_y\_3 | 0.612759 | 0.687835 | 0.8909 | 0.37439 |  |
| d\_poil | 0.0469129 | 0.0624268 | 0.7515 | 0.45350 |  |
| d\_yp | -10.0617 | 1.14066 | -8.8210 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.0736024 | 0.069067 | 1.0657 | 0.28823 |  |
| d\_d\_poil | 0.0411352 | 0.0807861 | 0.5092 | 0.61135 |  |
| d\_d\_yp | -22.8679 | 21.952 | -1.0417 | 0.29916 |  |
| d\_d\_Dpoil | -0.104615 | 0.0855069 | -1.2235 | 0.22301 |  |
| d\_d\_d\_poil | -0.0385555 | 0.0375702 | -1.0262 | 0.30638 |  |
| d\_d\_d\_yp | 47.8952 | 37.7822 | 1.2677 | 0.20682 |  |
| d\_d\_d\_Dpoil | 0.0122854 | 0.0364405 | 0.3371 | 0.73647 |  |
| d\_Dr | 0.178109 | 0.022297 | 7.9880 | <0.00001 | \*\*\* |
| d\_Dma4\_q2 | -0.00481088 | 0.0246495 | -0.1952 | 0.84551 |  |
| EC1 | 0.877375 | 0.574454 | 1.5273 | 0.12872 |  |
| EC2 | -0.888822 | 1.43453 | -0.6196 | 0.53644 |  |
| EC3 | -0.192518 | 0.0417532 | -4.6108 | <0.00001 | \*\*\* |
| EC4 | 0 | 0 | undefined | undefined |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 0.009032 |  | S.D. dependent var | 0.088009 |
| Sum squared resid | 0.398421 |  | S.E. of regression | 0.050700 |
| R-squared | 0.736273 |  | Adjusted R-squared | 0.671617 |
| rho | 0.098329 |  | Durbin-Watson | 1.799558 |

Equation 6: d\_cf

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.212004 | 0.148364 | 1.4289 | 0.15503 |  |
| d\_ma4\_q2\_2 | -0.00715496 | 0.187758 | -0.0381 | 0.96965 |  |
| d\_ma4\_q2\_3 | 0.104128 | 0.14665 | 0.7100 | 0.47875 |  |
| d\_dulc\_1 | 0.83644 | 0.625248 | 1.3378 | 0.18293 |  |
| d\_dulc\_2 | -0.603187 | 0.663368 | -0.9093 | 0.36461 |  |
| d\_dulc\_3 | -0.880473 | 0.50396 | -1.7471 | 0.08260 | \* |
| d\_dp\_1 | -1.25531 | 1.62399 | -0.7730 | 0.44071 |  |
| d\_dp\_2 | -0.344189 | 1.73162 | -0.1988 | 0.84271 |  |
| d\_dp\_3 | 1.17464 | 1.7487 | 0.6717 | 0.50276 |  |
| d\_r\_1 | 6.74256 | 4.02739 | 1.6742 | 0.09611 | \* |
| d\_r\_2 | -9.32225 | 4.26059 | -2.1880 | 0.03017 | \*\* |
| d\_r\_3 | -2.47134 | 4.12155 | -0.5996 | 0.54964 |  |
| d\_debt\_costs\_1 | -0.0381645 | 0.114186 | -0.3342 | 0.73866 |  |
| d\_debt\_costs\_2 | 0.249284 | 0.11185 | 2.2287 | 0.02727 | \*\* |
| d\_debt\_costs\_3 | 0.133283 | 0.101293 | 1.3158 | 0.19018 |  |
| d\_cf\_1 | 0.0404043 | 0.0883472 | 0.4573 | 0.64807 |  |
| d\_cf\_2 | -0.0612155 | 0.0892541 | -0.6859 | 0.49383 |  |
| d\_cf\_3 | -0.000568184 | 0.0866343 | -0.0066 | 0.99478 |  |
| d\_i\_1 | -0.2482 | 0.237038 | -1.0471 | 0.29669 |  |
| d\_i\_2 | -0.299053 | 0.244059 | -1.2253 | 0.22231 |  |
| d\_i\_3 | 0.296169 | 0.231069 | 1.2817 | 0.20185 |  |
| d\_y\_1 | 1.03807 | 0.725854 | 1.4301 | 0.15469 |  |
| d\_y\_2 | -0.0374864 | 0.708039 | -0.0529 | 0.95784 |  |
| d\_y\_3 | 1.19937 | 0.697262 | 1.7201 | 0.08741 | \* |
| d\_poil | 0.127573 | 0.0632823 | 2.0159 | 0.04554 | \*\* |
| d\_yp | 19.4202 | 1.15629 | 16.7952 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.10295 | 0.0700136 | 1.4704 | 0.14347 |  |
| d\_d\_poil | 0.00494155 | 0.0818933 | 0.0603 | 0.95196 |  |
| d\_d\_yp | 38.0466 | 22.2528 | 1.7097 | 0.08931 | \* |
| d\_d\_Dpoil | -0.232522 | 0.0866788 | -2.6826 | 0.00810 | \*\*\* |
| d\_d\_d\_poil | 0.0121509 | 0.0380851 | 0.3190 | 0.75012 |  |
| d\_d\_d\_yp | 121.971 | 38.3001 | 3.1846 | 0.00175 | \*\*\* |
| d\_d\_d\_Dpoil | 0.0888013 | 0.03694 | 2.4039 | 0.01740 | \*\* |
| d\_Dr | -0.00402932 | 0.0226026 | -0.1783 | 0.85874 |  |
| d\_Dma4\_q2 | 0.0257375 | 0.0249874 | 1.0300 | 0.30461 |  |
| EC1 | -1.49396 | 0.304316 | -4.9093 | <0.00001 | \*\*\* |
| EC2 | 0 | 0 | undefined | undefined |
| EC3 | 0.161705 | 0.0334476 | 4.8346 | <0.00001 | \*\*\* |
| EC4 | 0 | 0 | undefined | undefined |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 0.008151 |  | S.D. dependent var | 0.058954 |
| Sum squared resid | 0.409417 |  | S.E. of regression | 0.051395 |
| R-squared | 0.401148 |  | Adjusted R-squared | 0.254332 |
| rho | -0.015256 |  | Durbin-Watson | 2.024274 |

Equation 7: d\_i

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.134461 | 0.051129 | 2.6298 | 0.00940 | \*\*\* |
| d\_ma4\_q2\_2 | -0.0560626 | 0.0647052 | -0.8664 | 0.38759 |  |
| d\_ma4\_q2\_3 | 0.0164904 | 0.0505386 | 0.3263 | 0.74464 |  |
| d\_dulc\_1 | 0.0242479 | 0.215473 | 0.1125 | 0.91055 |  |
| d\_dulc\_2 | 0.103708 | 0.22861 | 0.4536 | 0.65072 |  |
| d\_dulc\_3 | 0.175257 | 0.173674 | 1.0091 | 0.31449 |  |
| d\_dp\_1 | 0.419823 | 0.559659 | 0.7501 | 0.45431 |  |
| d\_dp\_2 | -0.793622 | 0.59675 | -1.3299 | 0.18550 |  |
| d\_dp\_3 | -0.285927 | 0.602635 | -0.4745 | 0.63584 |  |
| d\_r\_1 | 2.60282 | 1.38792 | 1.8753 | 0.06263 | \* |
| d\_r\_2 | -0.122882 | 1.46828 | -0.0837 | 0.93341 |  |
| d\_r\_3 | 3.43011 | 1.42037 | 2.4149 | 0.01690 | \*\* |
| d\_debt\_costs\_1 | -0.0177339 | 0.0393507 | -0.4507 | 0.65286 |  |
| d\_debt\_costs\_2 | -0.00701288 | 0.0385456 | -0.1819 | 0.85587 |  |
| d\_debt\_costs\_3 | -0.0317958 | 0.0349075 | -0.9109 | 0.36379 |  |
| d\_cf\_1 | 0.0163808 | 0.0304462 | 0.5380 | 0.59133 |  |
| d\_cf\_2 | -0.0302645 | 0.0307587 | -0.9839 | 0.32668 |  |
| d\_cf\_3 | -0.0440142 | 0.0298559 | -1.4742 | 0.14245 |  |
| d\_i\_1 | 0.0697474 | 0.0816878 | 0.8538 | 0.39452 |  |
| d\_i\_2 | 0.0713375 | 0.0841073 | 0.8482 | 0.39765 |  |
| d\_i\_3 | 0.0710497 | 0.0796308 | 0.8922 | 0.37365 |  |
| d\_y\_1 | 0.612113 | 0.250143 | 2.4471 | 0.01552 | \*\* |
| d\_y\_2 | 0.327269 | 0.244004 | 1.3412 | 0.18180 |  |
| d\_y\_3 | 0.426553 | 0.24029 | 1.7752 | 0.07783 | \* |
| d\_poil | 0.0660797 | 0.0218083 | 3.0300 | 0.00287 | \*\*\* |
| d\_yp | 2.02712 | 0.398481 | 5.0871 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.00534337 | 0.024128 | 0.2215 | 0.82503 |  |
| d\_d\_poil | -0.0798961 | 0.028222 | -2.8310 | 0.00526 | \*\*\* |
| d\_d\_yp | 17.3705 | 7.66875 | 2.2651 | 0.02489 | \*\* |
| d\_d\_Dpoil | 0.00180966 | 0.0298712 | 0.0606 | 0.95177 |  |
| d\_d\_d\_poil | 0.0312415 | 0.0131249 | 2.3803 | 0.01851 | \*\* |
| d\_d\_d\_yp | 32.118 | 13.1989 | 2.4334 | 0.01610 | \*\* |
| d\_d\_d\_Dpoil | -0.000117717 | 0.0127302 | -0.0092 | 0.99263 |  |
| d\_Dr | 0.00951774 | 0.00778928 | 1.2219 | 0.22360 |  |
| d\_Dma4\_q2 | 0.00602055 | 0.00861113 | 0.6992 | 0.48550 |  |
| EC1 | 0.254886 | 0.186354 | 1.3678 | 0.17337 |  |
| EC2 | -1.47598 | 0.450465 | -3.2766 | 0.00130 | \*\*\* |
| EC3 | -0.0369005 | 0.0144199 | -2.5590 | 0.01146 | \*\* |
| EC4 | 0 | 0 | undefined | undefined |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 0.008286 |  | S.D. dependent var | 0.026046 |
| Sum squared resid | 0.048623 |  | S.E. of regression | 0.017712 |
| R-squared | 0.662916 |  | Adjusted R-squared | 0.580276 |
| rho | -0.047900 |  | Durbin-Watson | 2.090625 |

Equation 8: d\_y

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| d\_ma4\_q2\_1 | 0.058218 | 0.0184814 | 3.1501 | 0.00196 | \*\*\* |
| d\_ma4\_q2\_2 | -0.0106458 | 0.0233887 | -0.4552 | 0.64963 |  |
| d\_ma4\_q2\_3 | -0.0042551 | 0.018268 | -0.2329 | 0.81613 |  |
| d\_dulc\_1 | -0.0589798 | 0.0778859 | -0.7573 | 0.45004 |  |
| d\_dulc\_2 | 0.0933257 | 0.0826344 | 1.1294 | 0.26048 |  |
| d\_dulc\_3 | 0.042577 | 0.0627772 | 0.6782 | 0.49864 |  |
| d\_dp\_1 | 0.266302 | 0.202297 | 1.3164 | 0.18999 |  |
| d\_dp\_2 | -0.0261165 | 0.215705 | -0.1211 | 0.90379 |  |
| d\_dp\_3 | -0.114059 | 0.217832 | -0.5236 | 0.60130 |  |
| d\_r\_1 | 1.56312 | 0.501683 | 3.1158 | 0.00219 | \*\*\* |
| d\_r\_2 | -1.89959 | 0.530732 | -3.5792 | 0.00046 | \*\*\* |
| d\_r\_3 | 0.470375 | 0.513413 | 0.9162 | 0.36100 |  |
| d\_debt\_costs\_1 | -0.0216324 | 0.0142239 | -1.5208 | 0.13034 |  |
| d\_debt\_costs\_2 | 0.0361853 | 0.0139329 | 2.5971 | 0.01031 | \*\* |
| d\_debt\_costs\_3 | -0.00204508 | 0.0126179 | -0.1621 | 0.87146 |  |
| d\_cf\_1 | 0.00477023 | 0.0110052 | 0.4335 | 0.66529 |  |
| d\_cf\_2 | 0.0140436 | 0.0111182 | 1.2631 | 0.20844 |  |
| d\_cf\_3 | -0.00842176 | 0.0107919 | -0.7804 | 0.43636 |  |
| d\_i\_1 | 0.0512174 | 0.0295273 | 1.7346 | 0.08480 | \* |
| d\_i\_2 | 0.0168293 | 0.0304019 | 0.5536 | 0.58068 |  |
| d\_i\_3 | -0.00445278 | 0.0287838 | -0.1547 | 0.87726 |  |
| d\_y\_1 | 0.0359366 | 0.0904182 | 0.3974 | 0.69158 |  |
| d\_y\_2 | 0.130082 | 0.088199 | 1.4749 | 0.14228 |  |
| d\_y\_3 | -0.0352513 | 0.0868565 | -0.4059 | 0.68541 |  |
| d\_poil | -0.00165363 | 0.00788295 | -0.2098 | 0.83412 |  |
| d\_yp | 3.16894 | 0.144037 | 22.0009 | <0.00001 | \*\*\* |
| d\_Dpoil | 0.00500586 | 0.00872145 | 0.5740 | 0.56682 |  |
| d\_d\_poil | -0.00111394 | 0.0102013 | -0.1092 | 0.91319 |  |
| d\_d\_yp | 2.02114 | 2.77199 | 0.7291 | 0.46702 |  |
| d\_d\_Dpoil | -0.00571745 | 0.0107974 | -0.5295 | 0.59720 |  |
| d\_d\_d\_poil | -0.000186131 | 0.00474419 | -0.0392 | 0.96875 |  |
| d\_d\_d\_yp | 20.6395 | 4.77096 | 4.3261 | 0.00003 | \*\*\* |
| d\_d\_d\_Dpoil | 0.00332726 | 0.00460153 | 0.7231 | 0.47072 |  |
| d\_Dr | 0.00207449 | 0.00281555 | 0.7368 | 0.46236 |  |
| d\_Dma4\_q2 | 0.00541062 | 0.00311263 | 1.7383 | 0.08415 | \* |
| EC1 | -0.180093 | 0.0382722 | -4.7056 | <0.00001 | \*\*\* |
| EC2 | 0 | 0 | undefined | undefined |
| EC3 | -3.80304e-06 | 0.00458633 | -0.0008 | 0.99934 |  |
| EC4 | 0 | 0 | undefined | undefined |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 0.007794 |  | S.D. dependent var | 0.008573 |
| Sum squared resid | 0.006353 |  | S.E. of regression | 0.006402 |
| R-squared | 0.755382 |  | Adjusted R-squared | 0.695411 |
| rho | -0.007166 |  | Durbin-Watson | 2.009095 |

Cross-equation covariance matrix:

ma4\_q2 dulc dp r debt\_costs cf i y

ma4\_q2 0.00047127 -1.4501e-005 -4.7271e-006 -1.7232e-006 -4.0256e-006 -8.8046e-005 2.6808e-005 1.3027e-005

dulc -1.4501e-005 4.2854e-005 3.6563e-006 -1.0666e-008 -8.8017e-006 -0.00015423 -1.3713e-005 -1.7018e-005

dp -4.7271e-006 3.6563e-006 4.5893e-006 3.2314e-007 5.0508e-006 1.6416e-005 -1.2628e-006 -7.0546e-007

r -1.7232e-006 -1.0666e-008 3.2314e-007 1.2874e-006 3.8587e-005 8.6181e-006 9.9251e-007 4.5952e-007

debt\_costs -4.0256e-006 -8.8017e-006 5.0508e-006 3.8587e-005 0.0020537 0.00024915 4.6978e-005 5.5385e-006

cf -8.8046e-005 -0.00015423 1.6416e-005 8.6181e-006 0.00024915 0.0021104 8.1309e-005 6.7493e-005

i 2.6808e-005 -1.3713e-005 -1.2628e-006 9.9251e-007 4.6978e-005 8.1309e-005 0.00025064 4.0777e-005

y 1.3027e-005 -1.7018e-005 -7.0546e-007 4.5952e-007 5.5385e-006 6.7493e-005 4.0777e-005 3.2747e-005

determinant = 6.11242e-034