**Appendix 1: Raw Data**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | POVR | TOI | LNGDP | LNGDP\_C | UNEMP |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1978 | 33.3000 | 0.810675 | 14.16155 | 12.39361 | 2.033444 |
| 1979 | 30.9036 | 0.948504 | 14.22222 | 12.38488 | 2.091944 |
| 1980 | 28.6000 | 1.319514 | 14.31644 | 12.71022 | 1.650000 |
| 1981 | 26.6552 | 1.350959 | 14.39272 | 12.85689 | 2.700000 |
| 1982 | 24.7605 | 1.347068 | 14.41494 | 12.85775 | 3.010000 |
| 1983 | 23.0188 | 1.237119 | 14.45601 | 12.73122 | 2.000000 |
| 1984 | 21.6000 | 1.103165 | 14.52344 | 13.22919 | 2.000000 |
| 1985 | 19.9944 | 1.539537 | 14.54777 | 13.28417 | 2.140000 |
| 1986 | 18.7117 | 1.286627 | 14.60486 | 13.32080 | 2.600000 |
| 1987 | 17.4000 | 1.417556 | 14.65294 | 13.49644 | 2.550000 |
| 1988 | 16.6053 | 1.474578 | 14.70914 | 13.65915 | 2.810000 |
| 1989 | 15.7816 | 1.628028 | 14.78105 | 13.82305 | 2.870000 |
| 1990 | 15.1000 | 3.276118 | 14.85097 | 13.96583 | 2.510000 |
| 1991 | 14.8000 | 3.546686 | 14.91817 | 14.11857 | 2.590000 |
| 1992 | 14.1000 | 3.709108 | 14.98076 | 14.22364 | 2.710000 |
| 1993 | 13.7000 | 3.704864 | 15.04370 | 14.36231 | 2.760000 |
| 1994 | 13.6000 | 3.809235 | 15.11639 | 14.49396 | 4.360000 |
| 1995 | 12.4000 | 4.866943 | 15.19539 | 14.65175 | 7.240000 |
| 1996 | 11.3000 | 4.865339 | 15.27067 | 14.79527 | 4.890000 |
| 1997 | 17.4700 | 4.766196 | 15.31659 | 14.94508 | 4.680000 |
| 1998 | 24.2000 | 4.394044 | 15.17587 | 15.35133 | 5.460000 |
| 1999 | 23.4300 | 14.44698 | 15.18376 | 15.47770 | 6.360000 |
| 2000 | 19.1400 | 22.26383 | 15.23178 | 15.69799 | 6.080000 |
| 2001 | 18.4100 | 21.24917 | 15.26757 | 15.85375 | 8.100000 |
| 2002 | 18.2000 | 17.71287 | 15.31158 | 15.90083 | 9.100000 |
| 2003 | 17.4200 | 16.94061 | 15.35828 | 16.01504 | 9.500000 |
| 2004 | 16.6600 | 22.33402 | 15.40736 | 16.18451 | 9.900000 |
| 2005 | 15.9700 | 27.13987 | 15.46273 | 16.33482 | 11.20000 |
| 2006 | 17.7500 | 26.65165 | 15.51628 | 16.47880 | 10.30000 |
| 2007 | 16.5800 | 30.48858 | 15.57779 | 16.67915 | 9.100000 |
| 2008 | 15.4200 | 47.19967 | 15.63619 | 16.98259 | 8.100000 |
| 2009 | 14.1500 | 31.03378 | 15.68144 | 16.87279 | 7.400000 |
| 2010 | 13.3300 | 38.43662 | 15.74182 | 17.15124 | 7.100000 |
| 2011 | 12.4900 | 47.39937 | 15.80169 | 17.31434 | 6.600000 |
| 2012 | 11.6600 | 47.76878 | 15.86024 | 17.39301 | 6.100000 |
| 2013 | 11.3600 | 62.21209 | 15.91433 | 17.60574 | 6.300000 |
| 2014 | 11.2500 | 58.18624 | 15.96334 | 17.58907 | 5.940000 |
| 2015 | 11.2200 | 51.58378 | 16.01017 | 17.64773 | 6.200000 |

**Appendix 2: Data Summary**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date: 10/23/16 Time: 22:25 |  |  |  |  |  |
| Sample: 1978 2015 | |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  | POVR | TOI | LNGDP | LNGDP\_C | UNEMP |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Mean | 17.85371 | 16.72236 | 15.12047 | 15.02195 | 5.237773 |
| Median | 16.63265 | 4.815768 | 15.18957 | 14.87018 | 5.175000 |
| Maximum | 33.30000 | 62.21209 | 16.01017 | 17.64773 | 11.20000 |
| Minimum | 11.22000 | 0.810675 | 14.16155 | 12.38488 | 1.650000 |
| Std. Dev. | 5.594604 | 18.95558 | 0.527881 | 1.693076 | 2.825939 |
| Skewness | 1.043700 | 1.008834 | -0.111714 | 0.042409 | 0.416394 |
| Kurtosis | 3.495088 | 2.715259 | 1.965413 | 1.683751 | 1.940338 |
|  |  |  |  |  |  |
| Jarque-Bera | 7.287059 | 6.574101 | 1.773792 | 2.754535 | 2.875996 |
| Probability | 0.026160 | 0.037364 | 0.411932 | 0.252267 | 0.237403 |
|  |  |  |  |  |  |
| Sum | 678.4411 | 635.4498 | 574.5779 | 570.8342 | 199.0354 |
| Sum Sq. Dev. | 1158.085 | 13294.61 | 10.31034 | 106.0607 | 295.4794 |
|  |  |  |  |  |  |
| Observations | 38 | 38 | 38 | 38 | 38 |

**Appendix 3: Stationarity Test at Level**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: POVR has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 3 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -2.277585 | 0.1846 |
| Test critical values: | 1% level |  | -3.639407 |  |
|  | 5% level |  | -2.951125 |  |
|  | 10% level |  | -2.614300 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(POVR) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:29 | | |  |  |
| Sample (adjusted): 1982 2015 | | |  |  |
| Included observations: 34 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| POVR(-1) | -0.143974 | 0.063213 | -2.277585 | 0.0303 |
| D(POVR(-1)) | 0.729458 | 0.161389 | 4.519864 | 0.0001 |
| D(POVR(-2)) | -0.596065 | 0.175701 | -3.392508 | 0.0020 |
| D(POVR(-3)) | 0.270063 | 0.159201 | 1.696369 | 0.1005 |
| C | 2.179910 | 1.108688 | 1.966207 | 0.0589 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.514425 | Mean dependent var | | -0.453976 |
| Adjusted R-squared | 0.447449 | S.D. dependent var | | 1.961842 |
| S.E. of regression | 1.458311 | Akaike info criterion | | 3.727487 |
| Sum squared resid | 61.67343 | Schwarz criterion | | 3.951952 |
| Log likelihood | -58.36729 | Hannan-Quinn criter. | | 3.804036 |
| F-statistic | 7.680762 | Durbin-Watson stat | | 1.964872 |
| Prob(F-statistic) | 0.000239 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: TOI has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 4 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | 2.755122 | 1.0000 |
| Test critical values: | 1% level |  | -3.646342 |  |
|  | 5% level |  | -2.954021 |  |
|  | 10% level |  | -2.615817 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(TOI) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:29 | | |  |  |
| Sample (adjusted): 1983 2015 | | |  |  |
| Included observations: 33 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| TOI(-1) | 0.233992 | 0.084930 | 2.755122 | 0.0104 |
| D(TOI(-1)) | -0.718934 | 0.228671 | -3.143968 | 0.0040 |
| D(TOI(-2)) | -0.851624 | 0.266310 | -3.197863 | 0.0035 |
| D(TOI(-3)) | -0.403061 | 0.250934 | -1.606244 | 0.1199 |
| D(TOI(-4)) | -0.621253 | 0.216859 | -2.864771 | 0.0080 |
| C | 1.672314 | 1.214837 | 1.376575 | 0.1800 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.389104 | Mean dependent var | | 1.522325 |
| Adjusted R-squared | 0.275975 | S.D. dependent var | | 5.904611 |
| S.E. of regression | 5.024212 | Akaike info criterion | | 6.229380 |
| Sum squared resid | 681.5530 | Schwarz criterion | | 6.501472 |
| Log likelihood | -96.78477 | Hannan-Quinn criter. | | 6.320931 |
| F-statistic | 3.439478 | Durbin-Watson stat | | 1.982393 |
| Prob(F-statistic) | 0.015608 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: LNGDP has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -0.796560 | 0.8084 |
| Test critical values: | 1% level |  | -3.621023 |  |
|  | 5% level |  | -2.943427 |  |
|  | 10% level |  | -2.610263 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(LNGDP) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/29/16 Time: 13:49 | | |  |  |
| Sample (adjusted): 1979 2015 | | |  |  |
| Included observations: 37 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| LNGDP(-1) | -0.009402 | 0.011803 | -0.796560 | 0.4311 |
| C | 0.191900 | 0.178289 | 1.076347 | 0.2891 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.017806 | Mean dependent var | | 0.049963 |
| Adjusted R-squared | -0.010257 | S.D. dependent var | | 0.036190 |
| S.E. of regression | 0.036375 | Akaike info criterion | | -3.737313 |
| Sum squared resid | 0.046311 | Schwarz criterion | | -3.650236 |
| Log likelihood | 71.14028 | Hannan-Quinn criter. | | -3.706614 |
| F-statistic | 0.634508 | Durbin-Watson stat | | 1.478411 |
| Prob(F-statistic) | 0.431077 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: GDP has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | 3.969152 | 1.0000 |
| Test critical values: | 1% level |  | -3.621023 |  |
|  | 5% level |  | -2.943427 |  |
|  | 10% level |  | -2.610263 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(GDP) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:30 | | |  |  |
| Sample (adjusted): 1979 2015 | | |  |  |
| Included observations: 37 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| GDP(-1) | 0.049536 | 0.012480 | 3.969152 | 0.0003 |
| C | 2743.328 | 56479.32 | 0.048572 | 0.9615 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.310401 | Mean dependent var | | 204418.4 |
| Adjusted R-squared | 0.290699 | S.D. dependent var | | 178117.6 |
| S.E. of regression | 150010.7 | Akaike info criterion | | 26.72734 |
| Sum squared resid | 7.88E+11 | Schwarz criterion | | 26.81442 |
| Log likelihood | -492.4558 | Hannan-Quinn criter. | | 26.75804 |
| F-statistic | 15.75417 | Durbin-Watson stat | | 1.480722 |
| Prob(F-statistic) | 0.000341 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: LNGDP\_C has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -0.223822 | 0.9265 |
| Test critical values: | 1% level |  | -3.621023 |  |
|  | 5% level |  | -2.943427 |  |
|  | 10% level |  | -2.610263 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(LNGDP\_C) | | | |  |
| Method: Least Squares | | |  |  |
| Date: 10/29/16 Time: 13:50 | | |  |  |
| Sample (adjusted): 1979 2015 | | |  |  |
| Included observations: 37 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| LNGDP\_C(-1) | -0.002787 | 0.012451 | -0.223822 | 0.8242 |
| C | 0.183668 | 0.187260 | 0.980813 | 0.3334 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.001429 | Mean dependent var | | 0.142003 |
| Adjusted R-squared | -0.027101 | S.D. dependent var | | 0.122225 |
| S.E. of regression | 0.123870 | Akaike info criterion | | -1.286630 |
| Sum squared resid | 0.537032 | Schwarz criterion | | -1.199554 |
| Log likelihood | 25.80266 | Hannan-Quinn criter. | | -1.255932 |
| F-statistic | 0.050096 | Durbin-Watson stat | | 2.601351 |
| Prob(F-statistic) | 0.824197 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: GDP\_C has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 1 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | 4.296657 | 1.0000 |
| Test critical values: | 1% level |  | -3.626784 |  |
|  | 5% level |  | -2.945842 |  |
|  | 10% level |  | -2.611531 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(GDP\_C) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:30 | | |  |  |
| Sample (adjusted): 1980 2015 | | |  |  |
| Included observations: 36 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| GDP\_C(-1) | 0.134232 | 0.031241 | 4.296657 | 0.0001 |
| D(GDP\_C(-1)) | -0.422190 | 0.181826 | -2.321942 | 0.0266 |
| C | 486691.2 | 381846.8 | 1.274572 | 0.2114 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.362931 | Mean dependent var | | 1275712. |
| Adjusted R-squared | 0.324321 | S.D. dependent var | | 2212862. |
| S.E. of regression | 1818966. | Akaike info criterion | | 31.74509 |
| Sum squared resid | 1.09E+14 | Schwarz criterion | | 31.87705 |
| Log likelihood | -568.4116 | Hannan-Quinn criter. | | 31.79115 |
| F-statistic | 9.399868 | Durbin-Watson stat | | 1.975486 |
| Prob(F-statistic) | 0.000588 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: UNEMP has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -1.297267 | 0.6206 |
| Test critical values: | 1% level |  | -3.621023 |  |
|  | 5% level |  | -2.943427 |  |
|  | 10% level |  | -2.610263 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(UNEMP) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:30 | | |  |  |
| Sample (adjusted): 1979 2015 | | |  |  |
| Included observations: 37 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| UNEMP(-1) | -0.070580 | 0.054407 | -1.297267 | 0.2030 |
| C | 0.480457 | 0.322439 | 1.490071 | 0.1452 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.045877 | Mean dependent var | | 0.112610 |
| Adjusted R-squared | 0.018616 | S.D. dependent var | | 0.942536 |
| S.E. of regression | 0.933721 | Akaike info criterion | | 2.753260 |
| Sum squared resid | 30.51423 | Schwarz criterion | | 2.840337 |
| Log likelihood | -48.93532 | Hannan-Quinn criter. | | 2.783959 |
| F-statistic | 1.682903 | Durbin-Watson stat | | 1.802181 |
| Prob(F-statistic) | 0.203025 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**Appendix 4: Stationarity Test at 1st Differences**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: D(POVR) has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 1 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -5.226930 | 0.0001 |
| Test critical values: | 1% level |  | -3.632900 |  |
|  | 5% level |  | -2.948404 |  |
|  | 10% level |  | -2.612874 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(POVR,2) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:32 | | |  |  |
| Sample (adjusted): 1981 2015 | | |  |  |
| Included observations: 35 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| D(POVR(-1)) | -0.857303 | 0.164016 | -5.226930 | 0.0000 |
| D(POVR(-1),2) | 0.473622 | 0.152551 | 3.104683 | 0.0040 |
| C | -0.447382 | 0.287873 | -1.554096 | 0.1300 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.462100 | Mean dependent var | | 0.064960 |
| Adjusted R-squared | 0.428482 | S.D. dependent var | | 2.119019 |
| S.E. of regression | 1.601954 | Akaike info criterion | | 3.862142 |
| Sum squared resid | 82.12022 | Schwarz criterion | | 3.995457 |
| Log likelihood | -64.58748 | Hannan-Quinn criter. | | 3.908162 |
| F-statistic | 13.74532 | Durbin-Watson stat | | 1.707266 |
| Prob(F-statistic) | 0.000049 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: D(TOI) has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -7.348424 | 0.0000 |
| Test critical values: | 1% level |  | -3.626784 |  |
|  | 5% level |  | -2.945842 |  |
|  | 10% level |  | -2.611531 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(TOI,2) | | |  |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:32 | | |  |  |
| Sample (adjusted): 1980 2015 | | |  |  |
| Included observations: 36 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| D(TOI(-1)) | -1.256730 | 0.171020 | -7.348424 | 0.0000 |
| C | 1.815703 | 0.966052 | 1.879509 | 0.0688 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.613633 | Mean dependent var | | -0.187230 |
| Adjusted R-squared | 0.602270 | S.D. dependent var | | 8.817479 |
| S.E. of regression | 5.560819 | Akaike info criterion | | 6.323321 |
| Sum squared resid | 1051.372 | Schwarz criterion | | 6.411294 |
| Log likelihood | -111.8198 | Hannan-Quinn criter. | | 6.354026 |
| F-statistic | 53.99934 | Durbin-Watson stat | | 2.049934 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: D(LNGDP) has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -4.446293 | 0.0011 |
| Test critical values: | 1% level |  | -3.626784 |  |
|  | 5% level |  | -2.945842 |  |
|  | 10% level |  | -2.611531 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(LNGDP,2) | | | |  |
| Method: Least Squares | | |  |  |
| Date: 10/29/16 Time: 13:51 | | |  |  |
| Sample (adjusted): 1980 2015 | | |  |  |
| Included observations: 36 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| D(LNGDP(-1)) | -0.734198 | 0.165126 | -4.446293 | 0.0001 |
| C | 0.036362 | 0.010198 | 3.565461 | 0.0011 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.367672 | Mean dependent var | | -0.000385 |
| Adjusted R-squared | 0.349074 | S.D. dependent var | | 0.044437 |
| S.E. of regression | 0.035852 | Akaike info criterion | | -3.764893 |
| Sum squared resid | 0.043702 | Schwarz criterion | | -3.676919 |
| Log likelihood | 69.76807 | Hannan-Quinn criter. | | -3.734188 |
| F-statistic | 19.76952 | Durbin-Watson stat | | 1.908711 |
| Prob(F-statistic) | 0.000089 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: D(LNGDP\_C) has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -8.408646 | 0.0000 |
| Test critical values: | 1% level |  | -3.626784 |  |
|  | 5% level |  | -2.945842 |  |
|  | 10% level |  | -2.611531 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(LNGDP\_C,2) | | | |  |
| Method: Least Squares | | |  |  |
| Date: 10/29/16 Time: 13:51 | | |  |  |
| Sample (adjusted): 1980 2015 | | |  |  |
| Included observations: 36 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| D(LNGDP\_C(-1)) | -1.335107 | 0.158778 | -8.408646 | 0.0000 |
| C | 0.194552 | 0.029945 | 6.497020 | 0.0000 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.675279 | Mean dependent var | | 0.001872 |
| Adjusted R-squared | 0.665729 | S.D. dependent var | | 0.200055 |
| S.E. of regression | 0.115664 | Akaike info criterion | | -1.422300 |
| Sum squared resid | 0.454858 | Schwarz criterion | | -1.334327 |
| Log likelihood | 27.60140 | Hannan-Quinn criter. | | -1.391595 |
| F-statistic | 70.70532 | Durbin-Watson stat | | 2.055148 |
| Prob(F-statistic) | 0.000000 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Null Hypothesis: D(UNEMP) has a unit root | | | |  |
| Exogenous: Constant | | |  |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=9) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | t-Statistic | Prob.\* |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller test statistic | | | -5.394050 | 0.0001 |
| Test critical values: | 1% level |  | -3.626784 |  |
|  | 5% level |  | -2.945842 |  |
|  | 10% level |  | -2.611531 |  |
|  |  |  |  |  |
|  |  |  |  |  |
| \*MacKinnon (1996) one-sided p-values. | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Augmented Dickey-Fuller Test Equation | | | |  |
| Dependent Variable: D(UNEMP,2) | | | |  |
| Method: Least Squares | | |  |  |
| Date: 10/23/16 Time: 22:35 | | |  |  |
| Sample (adjusted): 1980 2015 | | |  |  |
| Included observations: 36 after adjustments | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|  |  |  |  |  |
|  |  |  |  |  |
| D(UNEMP(-1)) | -0.922576 | 0.171036 | -5.394050 | 0.0000 |
| C | 0.105711 | 0.162216 | 0.651666 | 0.5190 |
|  |  |  |  |  |
|  |  |  |  |  |
| R-squared | 0.461137 | Mean dependent var | | 0.005597 |
| Adjusted R-squared | 0.445288 | S.D. dependent var | | 1.298226 |
| S.E. of regression | 0.966906 | Akaike info criterion | | 2.824522 |
| Sum squared resid | 31.78685 | Schwarz criterion | | 2.912495 |
| Log likelihood | -48.84140 | Hannan-Quinn criter. | | 2.855227 |
| F-statistic | 29.09578 | Durbin-Watson stat | | 1.970391 |
| Prob(F-statistic) | 0.000005 |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**Appendix 5: Optimal Lag Test Results**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VAR Lag Order Selection Criteria | | |  |  |  |  |
| Endogenous variables: POVR TOI LNGDP LNGDP\_C UNEMP | | | |  |  |  |
| Exogenous variables: C | | |  |  |  |  |
| Date: 10/23/16 Time: 22:43 | | |  |  |  |  |
| Sample: 1978 2015 | |  |  |  |  |  |
| Included observations: 34 | | |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Lag | LogL | LR | FPE | AIC | SC | HQ |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 0 | -274.3025 | NA | 9.395754 | 16.42956 | 16.65402 | 16.50611 |
| 1 | -79.98505 | 320.0523 | 0.000452 | 6.469709 | 7.816498\* | 6.929002 |
| 2 | -52.37902 | 37.34934 | 0.000430 | 6.316413 | 8.785525 | 7.158451 |
| 3 | -15.42425 | 39.12858 | 0.000282 | 5.613191 | 9.204628 | 6.837974 |
| 4 | 34.04354 | 37.82831\* | 0.000126\* | 4.173909\* | 8.887670 | 5.781437\* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| \* indicates lag order selected by the criterion | | | |  |  |  |
| LR: sequential modified LR test statistic (each test at 5% level) | | | | |  |  |
| FPE: Final prediction error | | |  |  |  |  |
| AIC: Akaike information criterion | | |  |  |  |  |
| SC: Schwarz information criterion | | |  |  |  |  |
| HQ: Hannan-Quinn information criterion | | | |  |  |  |
|  |  |  |  |  |  |  |

**Appendix 6: VAR Stability Test Results**



|  |  |
| --- | --- |
| Roots of Characteristic Polynomial | |
| Endogenous variables: POVR TOI LNGDP LNGDP\_C UNEMP | |
| Exogenous variables: C | |
| Lag specification: 1 4 | |
| Date: 10/23/16 Time: 22:48 | |
|  |  |
|  |  |
| Root | Modulus |
|  |  |
|  |  |
| 0.924982 - 0.311455i | 0.976011 |
| 0.924982 + 0.311455i | 0.976011 |
| 0.967942 | 0.967942 |
| 0.684858 - 0.553887i | 0.880807 |
| 0.684858 + 0.553887i | 0.880807 |
| 0.847175 - 0.074630i | 0.850456 |
| 0.847175 + 0.074630i | 0.850456 |
| -0.273860 + 0.779656i | 0.826355 |
| -0.273860 - 0.779656i | 0.826355 |
| -0.098577 + 0.818228i | 0.824145 |
| -0.098577 - 0.818228i | 0.824145 |
| -0.806819 | 0.806819 |
| 0.249763 + 0.737513i | 0.778657 |
| 0.249763 - 0.737513i | 0.778657 |
| -0.650070 + 0.421594i | 0.774811 |
| -0.650070 - 0.421594i | 0.774811 |
| -0.404220 - 0.325121i | 0.518746 |
| -0.404220 + 0.325121i | 0.518746 |
| 0.036579 + 0.268741i | 0.271219 |
| 0.036579 - 0.268741i | 0.271219 |
|  |  |
|  |  |
| No root lies outside the unit circle. | |
| VAR satisfies the stability condition. | |
|  |  |

**Appendix 7: Co-integration test results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date: 10/23/16 Time: 22:45 | | |  |  |
| Sample (adjusted): 1983 2015 | | |  |  |
| Included observations: 33 after adjustments | | | |  |
| Trend assumption: Linear deterministic trend | | | |  |
| Series: POVR TOI LNGDP LNGDP\_C UNEMP | | |  |  |
| Lags interval (in first differences): 1 to 4 | | | |  |
|  |  |  |  |  |
| Unrestricted Cointegration Rank Test (Trace) | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Trace | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* | 0.992360 | 362.9449 | 69.81889 | 0.0001 |
| At most 1 \* | 0.962869 | 202.0898 | 47.85613 | 0.0000 |
| At most 2 \* | 0.810202 | 93.41042 | 29.79707 | 0.0000 |
| At most 3 \* | 0.619347 | 38.57112 | 15.49471 | 0.0000 |
| At most 4 \* | 0.183685 | 6.697507 | 3.841466 | 0.0097 |
|  |  |  |  |  |
|  |  |  |  |  |
| Trace test indicates 5 cointegrating eqn(s) at the 0.05 level | | | | |
| \* denotes rejection of the hypothesis at the 0.05 level | | | | |
| \*\*MacKinnon-Haug-Michelis (1999) p-values | | | |  |
|  |  |  |  |  |
| Unrestricted Cointegration Rank Test (Maximum Eigenvalue) | | | | |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Max-Eigen | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* | 0.992360 | 160.8551 | 33.87687 | 0.0001 |
| At most 1 \* | 0.962869 | 108.6794 | 27.58434 | 0.0000 |
| At most 2 \* | 0.810202 | 54.83930 | 21.13162 | 0.0000 |
| At most 3 \* | 0.619347 | 31.87361 | 14.26460 | 0.0000 |
| At most 4 \* | 0.183685 | 6.697507 | 3.841466 | 0.0097 |
|  |  |  |  |  |
|  |  |  |  |  |
| Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level | | | | |
| \* denotes rejection of the hypothesis at the 0.05 level | | | | |
| \*\*MacKinnon-Haug-Michelis (1999) p-values | | | |  |
|  |  |  |  |  |

**Appendix 8. VECM Estimation Results**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vector Error Correction Estimates | | |  |  |  |
| Date: 10/24/16 Time: 18:34 | | |  |  |  |
| Sample (adjusted): 1983 2015 | | |  |  |  |
| Included observations: 33 after adjustments | | | |  |  |
| Standard errors in ( ) & t-statistics in [ ] | | | |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Cointegrating Eq: | CointEq1 |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| POVR(-1) | 1.000000 |  |  |  |  |
|  |  |  |  |  |  |
| TOI(-1) | -0.120499 |  |  |  |  |
|  | (0.06060) |  |  |  |  |
|  | [-1.98855] |  |  |  |  |
|  |  |  |  |  |  |
| LNGDP(-1) | 29.02112 |  |  |  |  |
|  | (4.99671) |  |  |  |  |
|  | [ 5.80804] |  |  |  |  |
|  |  |  |  |  |  |
| LNGDP\_C(-1) | -11.71190 |  |  |  |  |
|  | (1.94637) |  |  |  |  |
|  | [-6.01732] |  |  |  |  |
|  |  |  |  |  |  |
| UNEMP(-1) | 0.565004 |  |  |  |  |
|  | (0.18024) |  |  |  |  |
|  | [ 3.13480] |  |  |  |  |
|  |  |  |  |  |  |
| C | -280.1892 |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Error Correction: | D(POVR) | D(TI) | D(LNGDP) | D(LNGDP\_C) | D(UNEMP) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| CointEq1 | -0.139820 | -0.433832 | 0.001315 | 0.000318 | -0.000781 |
|  | (0.06522) | (0.17099) | (0.00100) | (0.00383) | (0.06843) |
|  | [-2.14374] | [-2.53714] | [ 1.31605] | [ 0.08306] | [-0.01141] |
|  |  |  |  |  |  |
| D(POVR(-1)) | 0.149377 | -1.425414 | -0.005185 | 0.026259 | 0.237185 |
|  | (0.27729) | (0.72696) | (0.00425) | (0.01627) | (0.29094) |
|  | [ 0.53871] | [-1.96079] | [-1.22067] | [ 1.61370] | [ 0.81525] |
|  |  |  |  |  |  |
| D(POVR(-2)) | -0.986442 | 3.645386 | 0.023673 | 0.060933 | 0.084946 |
|  | (0.41200) | (1.08014) | (0.00631) | (0.02418) | (0.43228) |
|  | [-2.39425] | [ 3.37491] | [ 3.75058] | [ 2.52010] | [ 0.19650] |
|  |  |  |  |  |  |
| D(POVR(-3)) | -0.473020 | -3.034608 | 0.009167 | -0.030751 | 0.259417 |
|  | (0.37037) | (0.97099) | (0.00567) | (0.02174) | (0.38860) |
|  | [-1.27715] | [-3.12526] | [ 1.61569] | [-1.41479] | [ 0.66756] |
|  |  |  |  |  |  |
| D(POVR(-4)) | 0.823853 | 1.784923 | -0.004280 | 0.037843 | 0.114442 |
|  | (0.29636) | (0.77695) | (0.00454) | (0.01739) | (0.31095) |
|  | [ 2.77993] | [ 2.29734] | [-0.94268] | [ 2.17590] | [ 0.36805] |
|  |  |  |  |  |  |
| D(TOI(-1)) | -0.065552 | -0.350682 | 0.001043 | -3.50E-05 | -0.039170 |
|  | (0.08644) | (0.22662) | (0.00132) | (0.00507) | (0.09070) |
|  | [-0.75833] | [-1.54741] | [ 0.78741] | [-0.00690] | [-0.43187] |
|  |  |  |  |  |  |
| D(TOI(-2)) | -0.106230 | -0.731940 | 1.41E-05 | -0.008860 | -0.092403 |
|  | (0.08961) | (0.23494) | (0.00137) | (0.00526) | (0.09403) |
|  | [-1.18541] | [-3.11544] | [ 0.01025] | [-1.68467] | [-0.98274] |
|  |  |  |  |  |  |
| D(TOI(-3)) | -0.039161 | -0.398142 | -0.000822 | -0.005681 | -0.063447 |
|  | (0.08183) | (0.21454) | (0.00125) | (0.00480) | (0.08586) |
|  | [-0.47854] | [-1.85576] | [-0.65559] | [-1.18289] | [-0.73894] |
|  |  |  |  |  |  |
| D(TOI(-4)) | -0.044999 | -0.675021 | -0.000846 | -0.008562 | -0.016349 |
|  | (0.06481) | (0.16992) | (0.00099) | (0.00380) | (0.06800) |
|  | [-0.69430] | [-3.97268] | [-0.85212] | [-2.25108] | [-0.24042] |
|  |  |  |  |  |  |
| D(LNGDP(-1)) | -33.03915 | -62.20964 | 0.767421 | 1.328180 | 2.428723 |
|  | (17.2629) | (45.2576) | (0.26446) | (1.01309) | (18.1126) |
|  | [-1.91389] | [-1.37457] | [ 2.90181] | [ 1.31102] | [ 0.13409] |
|  |  |  |  |  |  |
| D(LNGDP(-2)) | -5.800945 | 25.20648 | 0.592448 | -0.442930 | 2.740147 |
|  | (14.5379) | (38.1138) | (0.22272) | (0.85317) | (15.2536) |
|  | [-0.39902] | [ 0.66135] | [ 2.66008] | [-0.51916] | [ 0.17964] |
|  |  |  |  |  |  |
| D(LNGDP(-3)) | 25.78372 | -36.65655 | -0.135095 | -1.518004 | -14.47117 |
|  | (13.3170) | (34.9130) | (0.20401) | (0.78152) | (13.9726) |
|  | [ 1.93615] | [-1.04994] | [-0.66218] | [-1.94237] | [-1.03569] |
|  |  |  |  |  |  |
| D(LNGDP(-4)) | 56.39695 | 3.891860 | -1.132721 | -0.184992 | -10.90347 |
|  | (19.2025) | (50.3429) | (0.29418) | (1.12692) | (20.1478) |
|  | [ 2.93695] | [ 0.07731] | [-3.85045] | [-0.16416] | [-0.54117] |
|  |  |  |  |  |  |
| D(LNGDP\_C(-1)) | 12.21765 | 0.976512 | -0.275666 | -1.006852 | -6.481370 |
|  | (5.89054) | (15.4431) | (0.09024) | (0.34569) | (6.18049) |
|  | [ 2.07411] | [ 0.06323] | [-3.05475] | [-2.91257] | [-1.04868] |
|  |  |  |  |  |  |
| D(LNGDP\_C(-2)) | 14.50142 | -1.103512 | -0.361404 | -0.694817 | -5.829308 |
|  | (6.97311) | (18.2812) | (0.10683) | (0.40922) | (7.31635) |
|  | [ 2.07962] | [-0.06036] | [-3.38309] | [-1.69789] | [-0.79675] |
|  |  |  |  |  |  |
| D(LNGDP\_C(-3)) | 4.064394 | -0.599534 | -0.180536 | -0.408430 | -3.808139 |
|  | (4.82100) | (12.6391) | (0.07386) | (0.28292) | (5.05831) |
|  | [ 0.84306] | [-0.04743] | [-2.44441] | [-1.44360] | [-0.75285] |
|  |  |  |  |  |  |
| D(LNGDP\_C(-4)) | -0.067813 | -7.591567 | -0.033500 | -0.116640 | -1.673131 |
|  | (3.64449) | (9.55468) | (0.05583) | (0.21388) | (3.82389) |
|  | [-0.01861] | [-0.79454] | [-0.60001] | [-0.54535] | [-0.43755] |
|  |  |  |  |  |  |
| D(UNEMP(-1)) | 0.015881 | -0.902712 | -0.009101 | -0.040105 | -0.125266 |
|  | (0.33264) | (0.87208) | (0.00510) | (0.01952) | (0.34902) |
|  | [ 0.04774] | [-1.03512] | [-1.78597] | [-2.05442] | [-0.35891] |
|  |  |  |  |  |  |
| D(UNEMP(-2)) | 0.695482 | -1.159369 | 0.006090 | -0.031978 | -0.204394 |
|  | (0.27511) | (0.72124) | (0.00421) | (0.01614) | (0.28865) |
|  | [ 2.52805] | [-1.60747] | [ 1.44499] | [-1.98067] | [-0.70811] |
|  |  |  |  |  |  |
| D(UNEMP(-3)) | 2.018665 | 3.358300 | -0.037043 | 0.020478 | -0.342203 |
|  | (0.54402) | (1.42624) | (0.00833) | (0.03193) | (0.57080) |
|  | [ 3.71066] | [ 2.35465] | [-4.44473] | [ 0.64141] | [-0.59952] |
|  |  |  |  |  |  |
| D(UNEMP(-4)) | -0.287849 | -2.835094 | 3.62E-05 | -0.014565 | 0.134101 |
|  | (0.45759) | (1.19966) | (0.00701) | (0.02685) | (0.48012) |
|  | [-0.62905] | [-2.36324] | [ 0.00516] | [-0.54238] | [ 0.27931] |
|  |  |  |  |  |  |
| C | -7.228573 | 10.43928 | 0.189332 | 0.609313 | 4.523944 |
|  | (3.40393) | (8.92401) | (0.05215) | (0.19976) | (3.57149) |
|  | [-2.12360] | [ 1.16980] | [ 3.63070] | [ 3.05018] | [ 1.26668] |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| R-squared | 0.867722 | 0.898239 | 0.910939 | 0.876650 | 0.408549 |
| Adj. R-squared | 0.615191 | 0.703968 | 0.740912 | 0.641165 | -0.720584 |
| Sum sq. resids | 16.51793 | 113.5309 | 0.003877 | 0.056888 | 18.18412 |
| S.E. equation | 1.225410 | 3.212630 | 0.018773 | 0.071914 | 1.285730 |
| F-statistic | 3.436099 | 4.623637 | 5.357630 | 3.722736 | 0.361825 |
| Log likelihood | -35.40596 | -67.21184 | 102.4882 | 58.16735 | -36.99165 |
| Akaike AIC | 3.479149 | 5.406778 | -4.878072 | -2.191961 | 3.575251 |
| Schwarz SC | 4.476821 | 6.404450 | -3.880400 | -1.194289 | 4.572923 |
| Mean dependent | -0.410318 | 1.522325 | 0.048340 | 0.145151 | 0.096667 |
| S.D. dependent | 1.975416 | 5.904611 | 0.036882 | 0.120052 | 0.980193 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Determinant resid covariance (dof adj.) | | 2.87E-07 |  |  |  |
| Determinant resid covariance | | 1.18E-09 |  |  |  |
| Log likelihood | | 105.0452 |  |  |  |
| Akaike information criterion | | 0.603319 |  |  |  |
| Schwarz criterion | | 5.818421 |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Appendix 8. Responses of POVR to other variable**



|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Period | POVR | TOI | LNGDP | LNGDP\_C | UNEMP |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 1.225410 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 1.601254 | 0.364817 | -0.208981 | 0.947384 | -0.029627 |
| 3 | 1.441341 | 0.044827 | -0.218358 | 1.572101 | 0.175313 |
| 4 | 1.558986 | -1.327615 | -0.265580 | 0.411762 | 0.672505 |
| 5 | 2.503971 | -2.305387 | -0.076051 | -1.047135 | 0.886214 |
| 6 | 2.752448 | -2.259830 | 0.138765 | -1.265504 | 0.784437 |
| 7 | 2.188839 | -1.997118 | 0.343962 | -0.996720 | 0.697734 |
| 8 | 1.585512 | -1.721785 | 0.422342 | -1.080303 | 0.606599 |
| 9 | 1.581188 | -1.430394 | 0.392471 | -1.001970 | 0.498081 |
| 10 | 1.920198 | -1.304718 | 0.265956 | -0.644422 | 0.467172 |
|  |  |  |  |  |  |
| Cholesky Ordering: POVR TOI LNGDP LNGDP\_C UNEMP | | | | | |

**Appendix 9. Variance Decompositions of POVR**



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Period | S.E. | POVR | TOI | LNGDP | LNGDP\_C | UNEMP |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 1.225410 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 2.267338 | 79.08548 | 2.588909 | 0.849534 | 17.45900 | 0.017074 |
| 3 | 3.125734 | 62.87590 | 1.382781 | 0.935018 | 34.48275 | 0.323559 |
| 4 | 3.828257 | 58.50031 | 12.94842 | 1.104605 | 24.14501 | 3.301648 |
| 5 | 5.303573 | 52.77118 | 25.64171 | 0.596098 | 16.47859 | 4.512425 |
| 6 | 6.561004 | 52.08145 | 28.61840 | 0.434238 | 14.48790 | 4.378008 |
| 7 | 7.309232 | 50.93209 | 30.52470 | 0.571336 | 13.53308 | 4.438801 |
| 8 | 7.785669 | 49.03644 | 31.79378 | 0.797814 | 13.85276 | 4.519198 |
| 9 | 8.158976 | 48.40760 | 32.02449 | 0.957868 | 14.12225 | 4.487789 |
| 10 | 8.524236 | 49.42235 | 31.68155 | 0.974882 | 13.50943 | 4.411790 |