

PSE\_Sep23Data\_SAIDI\_a COMBINEDdata.txt  
» run C:\work\THESL2\Specification\SAIDI2;

## RELIABILITY MODELS

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### RELIABILITY MODELS

7/14/2014 OUTPUT FILE: C:\work\THESL2\results\SAIDI2 16:35:01

Output using the data set C:\work\THESL2\th\_benchb\_July7.xlsx

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### DEFINITIONS OF VARIABLES:

var1 is const  
var2 is Retail Customers (yn)  
var3 is customer/DX miles (UDI)  
var4 is urban population above 1M

Time period used: 2002 through 2012

919.000

### REGRESSION WITH GROUPWISE HETEROSKEDASTICITY

|                |          |                     |          |
|----------------|----------|---------------------|----------|
| Valid cases:   | 912      | Dependent variable: | LSAIDI_A |
| Total SS:      | 1383.979 | Degrees of freedom: | 906      |
| R-squared:     | 0.142    | Rbar-squared:       | 0.138    |
| Residual SS:   | 1186.994 | Std error of est:   | 1.145    |
| F(6,906):      | 25.059   | Probability of F:   | 0.000    |
| Durbin-Watson: | 1.330    | Number of Firms:    | 116.000  |

| Variable | Estimate  | Standard Error | t-value    | Prob > t | Standardized Estimate | Cor with Dep Var |
|----------|-----------|----------------|------------|----------|-----------------------|------------------|
| CONST    | 5.221864  | 0.066014       | 79.102106  | 0.000    | 1.031683              | 0.987123         |
| LYN      | 0.120934  | 0.012994       | 9.306712   | 0.000    | 0.056823              | -0.529831        |
| LDENSITY | -0.712078 | 0.052258       | -13.626303 | 0.000    | -0.071958             | 0.363930         |
| URBAN_1M | -0.024035 | 0.004718       | -5.094801  | 0.000    | -0.025364             | 0.256687         |
| LDENSQ   | 0.129197  | 0.134798       | 0.958452   | 0.338    | 0.005632              | 0.570744         |
| TREND    | 0.016755  | 0.008881       | 1.886533   | 0.060    | 0.024695              | 0.920300         |

### OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE LAST THREE YEARS

| Actual      | Predicted | Difference | t_ratio   | p_value   | Utility          |                     |
|-------------|-----------|------------|-----------|-----------|------------------|---------------------|
| 2.719463    | 5.030186  | -2.310722  | -3.469281 | 0.000273  | WELLINGTON NORTH |                     |
| POWER INC.  | 2.917044  | 4.973527   | -2.056483 | -3.086193 | 0.001044         | PARRY SOUND POWER   |
| CORPORATION | 2.718576  | 4.590139   | -1.871563 | -2.810023 | 0.002530         | FORT FRANCES POWER  |
| CORPORATION | 3.628936  | 5.068401   | -1.439465 | -2.160016 | 0.015516         | ATIKOKAN HYDRO INC. |
|             | 4.394298  | 5.769172   | -1.374874 | -2.064799 | 0.019613         | Wisconsin Electric  |

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|                                |          |           |           |          |  |                      |
|--------------------------------|----------|-----------|-----------|----------|--|----------------------|
| Power Co (WEPCO)               |          |           |           |          |  |                      |
| 3.756992                       | 5.005174 | -1.248182 | -1.873416 | 0.030666 |  | ENERSOURCE HYDRO     |
| MISSISSAUGA INC.               |          |           |           |          |  |                      |
| 4.135637                       | 5.301665 | -1.166028 | -1.750133 | 0.040217 |  | POWERSTREAM INC.     |
| 3.414007                       | 4.542448 | -1.128440 | -1.693534 | 0.045349 |  | ST. THOMAS ENERGY    |
| INC.                           |          |           |           |          |  |                      |
| 3.482888                       | 4.545598 | -1.062710 | -1.595110 | 0.055518 |  | BRANTFORD POWER INC. |
| 3.672525                       | 4.709089 | -1.036564 | -1.555926 | 0.060037 |  | OAKVILLE HYDRO       |
| ELECTRICITY DISTRIBUTION INC.  |          |           |           |          |  |                      |
| 4.946763                       | 5.882521 | -0.935758 | -1.413193 | 0.078971 |  | Wisconsin Power and  |
| Light Co                       |          |           |           |          |  |                      |
| 3.761772                       | 4.692810 | -0.931038 | -1.397566 | 0.081293 |  | HYDRO ONE BRAMPTON   |
| NETWORKS INC.                  |          |           |           |          |  |                      |
| 4.001297                       | 4.871791 | -0.870493 | -1.306506 | 0.095856 |  | CAMBRIDGE and NORTH  |
| DUMFRIES HYDRO INC.            |          |           |           |          |  |                      |
| 3.937405                       | 4.807529 | -0.870124 | -1.306243 | 0.095900 |  | ESPANOLA REGIONAL    |
| HYDRO DISTRIBUTION CORPORATION |          |           |           |          |  |                      |
| 3.981867                       | 4.808248 | -0.826381 | -1.248751 | 0.106039 |  | Madison Gas and      |
| Electric Co                    |          |           |           |          |  |                      |
| 4.035195                       | 4.855527 | -0.820333 | -1.231160 | 0.109291 |  | MILTON HYDRO         |
| DISTRIBUTION INC.              |          |           |           |          |  |                      |
| 3.727414                       | 4.546167 | -0.818753 | -1.229817 | 0.109542 |  | NEWMARKET-TAY POWER  |
| DISTRIBUTION LTD.              |          |           |           |          |  |                      |
| 4.496515                       | 5.296020 | -0.799506 | -1.201115 | 0.115010 |  | Florida Power &      |
| Light Co                       |          |           |           |          |  |                      |
| 4.188353                       | 4.986366 | -0.798013 | -1.197562 | 0.115700 |  | NIAGARA-ON-THE-LAKE  |
| HYDRO INC.                     |          |           |           |          |  |                      |
| 4.118962                       | 4.916850 | -0.797889 | -1.197580 | 0.115697 |  | BURLINGTON HYDRO     |
| INC.                           |          |           |           |          |  |                      |
| 5.292851                       | 6.089332 | -0.796481 | -1.195264 | 0.116148 |  | Niagara Mohawk Power |
| Corp (National Grid)           |          |           |           |          |  |                      |
| 5.109422                       | 5.878514 | -0.769091 | -1.161624 | 0.122847 |  | Avista Corp          |
| 3.969382                       | 4.675960 | -0.706578 | -1.060455 | 0.144610 |  | WHITBY HYDRO         |
| ELECTRIC CORPORATION           |          |           |           |          |  |                      |
| 5.287357                       | 5.964983 | -0.677626 | -1.016282 | 0.154883 |  | Entergy Arkansas Inc |
| 4.733827                       | 5.410144 | -0.676317 | -0.589451 | 0.277853 |  | Florida Power Corp   |
| 4.168117                       | 4.822060 | -0.653943 | -0.981555 | 0.163291 |  | KITCHENER-WILMOT     |
| HYDRO INC.                     |          |           |           |          |  |                      |
| 4.860706                       | 5.512178 | -0.651472 | -0.984278 | 0.162621 |  | Rochester Gas and    |
| Electric Corp                  |          |           |           |          |  |                      |
| 4.469494                       | 5.077229 | -0.607735 | -0.918346 | 0.179341 |  | Indianapolis Power & |
| Light Co                       |          |           |           |          |  |                      |
| 4.574109                       | 5.171697 | -0.597588 | -0.896515 | 0.185108 |  | HALTON HILLS HYDRO   |
| INC.                           |          |           |           |          |  |                      |
| 4.224157                       | 4.764496 | -0.540339 | -0.811116 | 0.208756 |  | LONDON HYDRO INC.    |
| 5.026624                       | 5.550116 | -0.523492 | -0.791035 | 0.214565 |  | Southern California  |
| Edison Co                      |          |           |           |          |  |                      |
| 4.072828                       | 4.591458 | -0.518631 | -0.778333 | 0.218288 |  | COLLUS POWER         |
| CORPORATION                    |          |           |           |          |  |                      |
| 4.517652                       | 5.014379 | -0.496728 | -0.731336 | 0.232381 |  | TORONTO              |
| HYDRO-ELECTRIC SYSTEM LIMITED  |          |           |           |          |  |                      |
| 4.130957                       | 4.612083 | -0.481127 | -0.722085 | 0.235214 |  | GUELPH HYDRO         |
| ELECTRIC SYSTEMS INC.          |          |           |           |          |  |                      |
| 4.435876                       | 4.911940 | -0.476064 | -0.714498 | 0.237551 |  | WATERLOO NORTH HYDRO |
| INC.                           |          |           |           |          |  |                      |
| 4.086691                       | 4.487683 | -0.400992 | -0.601789 | 0.273732 |  | HYDRO HAWKESBURY     |
| INC.                           |          |           |           |          |  |                      |
| 5.158899                       | 5.549238 | -0.390339 | -0.586349 | 0.278894 |  | AmerenUE             |
| 4.240405                       | 4.627453 | -0.387048 | -0.580898 | 0.280727 |  | OSHAWA PUC NETWORKS  |
| INC.                           |          |           |           |          |  |                      |
| 4.376362                       | 4.754662 | -0.378301 | -0.567795 | 0.285157 |  | ORILLIA POWER        |
| DISTRIBUTION CORPORATION       |          |           |           |          |  |                      |
| 4.687669                       | 5.063588 | -0.375919 | -0.462081 | 0.322067 |  | Tampa Electric Co    |

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|--------------------------------|----------|-----------------------|------------------|----------|
| 4.380207                       | 4.752584 | -0.372378             | -0.558910        | 0.288181 |
| HYDRO INC.                     |          |                       |                  |          |
| 5.353206                       | 5.717536 | -0.364330             | -0.550395        | 0.291092 |
| Electric Co                    |          |                       |                  |          |
| 4.411516                       | 4.772969 | -0.361452             | -0.542544        | 0.293789 |
| 5.276219                       | 5.604290 | -0.328071             | -0.495648        | 0.310131 |
| and Electric Co (Vectern)      |          |                       |                  |          |
| 4.138091                       | 4.444444 | -0.306353             | -0.459777        | 0.322893 |
| ENERGY INC.                    |          |                       |                  |          |
| 4.679027                       | 4.946116 | -0.267089             | -0.400939        | 0.344280 |
| 4.475268                       | 4.690288 | -0.215020             | -0.322673        | 0.373509 |
| CORPORATION                    |          |                       |                  |          |
| 4.995589                       | 5.209888 | -0.214299             | -0.321826        | 0.373830 |
| ENERGY INC.                    |          |                       |                  |          |
| 4.470570                       | 4.653799 | -0.183229             | -0.275005        | 0.391688 |
| HYDRO-ELECTRIC SYSTEM CORP.    |          |                       |                  |          |
| 5.175708                       | 5.324640 | -0.148932             | -0.223610        | 0.411556 |
| Light Co (MO)                  |          |                       |                  |          |
| 5.240363                       | 5.385853 | -0.145489             | -0.218443        | 0.413567 |
| Electric Co                    |          |                       |                  |          |
| 4.559618                       | 4.703945 | -0.144327             | -0.216624        | 0.414275 |
| CORPORATION                    |          |                       |                  |          |
| 4.549317                       | 4.685627 | -0.136309             | -0.204536        | 0.418990 |
| INC.                           |          |                       |                  |          |
| 3.913455                       | 4.040561 | -0.127106             | -0.190748        | 0.424383 |
| EMBRUN INC.                    |          |                       |                  |          |
| 4.839545                       | 4.946480 | -0.106935             | -0.160512        | 0.436257 |
| INC.                           |          |                       |                  |          |
| 5.521336                       | 5.517717 | 0.003619              | 0.005432         | 0.497833 |
| HYDRO INC.                     |          |                       |                  |          |
| 5.363940                       | 5.349701 | 0.014238              | 0.021369         | 0.491478 |
| INC.                           |          |                       |                  |          |
| 4.880550                       | 4.837513 | 0.043037              | 0.064582         | 0.474260 |
| ELECTRICITY DISTRIBUTION INC.  |          |                       |                  |          |
| 5.603710                       | 5.461953 | 0.141757              | 0.212840         | 0.415750 |
| (First Energy)                 |          |                       |                  |          |
| 6.053607                       | 5.899875 | 0.153731              | 0.232118         | 0.408249 |
| Service Co                     |          |                       |                  |          |
| 4.678267                       | 4.497080 | 0.181187              | 0.271907         | 0.392878 |
| 5.026237                       | 4.839308 | 0.186929              | 0.280446         | 0.389600 |
| DISTRIBUTION LIMITED           |          |                       |                  |          |
| 4.775324                       | 4.575829 | 0.199494              | 0.299401         | 0.382351 |
| INCORPORATED                   |          |                       |                  |          |
| 5.759316                       | 5.557069 | 0.202247              | 0.303677         | 0.380722 |
| Illuminating Co (First Energy) |          |                       |                  |          |
| 4.749217                       | 4.523116 | 0.226101              | 0.339297         | 0.367232 |
| 5.302734                       | 5.068247 | 0.234487              | 0.351979         | 0.362468 |
| 5.697999                       | 5.427916 | 0.270084              | 0.407815         | 0.341753 |
| Energy IN)                     |          |                       |                  |          |
| 4.802373                       | 4.489537 | 0.312836              | 0.469446         | 0.319432 |
| DISTRIBUTION INC.              |          |                       |                  |          |
| 4.522444                       | 4.204429 | 0.318015              | 0.477268         | 0.316643 |
| INC.                           |          |                       |                  |          |
| 5.814559                       | 5.470808 | 0.343750              | 0.515977         | 0.302998 |
| and Power Co                   |          |                       |                  |          |
| 4.960997                       | 4.546224 | 0.414773              | 0.622457         | 0.266899 |
| ELECTRIC CORPORATION LTD.      |          |                       |                  |          |
| 5.360304                       | 4.934805 | 0.425499              | 0.638868         | 0.261535 |
| DISTRIBUTION INC.              |          |                       |                  |          |
| 5.711924                       | 5.268822 | 0.443102              | 0.664868         | 0.253152 |
| Corp                           |          |                       |                  |          |
| 5.933163                       | 5.443656 | 0.489507              | 0.735210         | 0.231201 |
| Co                             |          |                       |                  |          |

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|-------------------------------------------------|----------|-----------------------|------------------|---------------------|
| 5.089178                                        | 4.596175 | 0.493003              | 0.740215         | 0.229681            |
| POWER INC.                                      |          |                       |                  | CANADIAN NIAGARA    |
| 5.395302                                        | 4.873439 | 0.521863              | 0.783235         | 0.216847            |
| DISTRIBUTION LTD.                               |          |                       |                  | LAKELAND POWER      |
| 5.097884                                        | 4.575764 | 0.522119              | 0.783633         | 0.216730            |
| UTILITY CORPORATION                             |          |                       |                  | MIDLAND POWER       |
| 5.255602                                        | 4.725491 | 0.530111              | 0.795415         | 0.213290            |
| DISTRIBUTION CORPORATION                        |          |                       |                  | BLUEWATER POWER     |
| 6.290832                                        | 5.747748 | 0.543084              | 0.819906         | 0.206242            |
| Company                                         |          |                       |                  | Consumers Energy    |
| 6.074367                                        | 5.493601 | 0.580766              | 0.877047         | 0.190347            |
| Co of new York Inc (CONED)                      |          |                       |                  | Consolidated Edison |
| 5.221753                                        | 4.603933 | 0.617820              | 0.927112         | 0.177058            |
| INC.                                            |          |                       |                  | PUC DISTRIBUTION    |
| 5.231940                                        | 4.566932 | 0.665008              | 0.997970         | 0.159280            |
| INC.                                            |          |                       |                  | LAKEFRONT UTILITIES |
| 5.002443                                        | 4.332539 | 0.669904              | 1.012185         | 0.155860            |
| Electric Co                                     |          |                       |                  | San Diego Gas &     |
| 5.304662                                        | 4.586676 | 0.717986              | 1.078262         | 0.140602            |
| INC.                                            |          |                       |                  | TILLSONBURG HYDRO   |
| 6.360216                                        | 5.634779 | 0.725437              | 1.089252         | 0.138166            |
| 5.151567                                        | 4.413254 | 0.738314              | 1.108489         | 0.133972            |
| LIMITED                                         |          |                       |                  | Ohio Power Co (AEP) |
| 5.346428                                        | 4.571044 | 0.775384              | 1.163634         | 0.122439            |
| CORPORATION                                     |          |                       |                  | ORANGEVILLE HYDRO   |
| 5.764104                                        | 4.987032 | 0.777072              | 1.174118         | 0.120328            |
| Co                                              |          |                       |                  | OTTAWA RIVER POWER  |
| 6.212301                                        | 5.392647 | 0.819654              | 1.237623         | 0.108088            |
| 5.196418                                        | 4.371785 | 0.824633              | 1.237478         | 0.108115            |
| 6.066628                                        | 5.238615 | 0.828013              | 1.250709         | 0.105682            |
| Public Service Co                               |          |                       |                  | Northern Indiana    |
| 5.228737                                        | 4.393983 | 0.834755              | 1.252632         | 0.105331            |
| HYDRO LTD.                                      |          |                       |                  | CENTRE WELLINGTON   |
| 6.084748                                        | 5.227734 | 0.857014              | 1.287327         | 0.099154            |
| WIRES INC.                                      |          |                       |                  | NORTHERN ONTARIO    |
| 5.581461                                        | 4.681813 | 0.899648              | 1.350086         | 0.088663            |
| 4.564348                                        | 3.627361 | 0.936987              | 0.816536         | 0.207204            |
| 6.775079                                        | 5.837244 | 0.937835              | 1.408486         | 0.079665            |
| Electric Co                                     |          |                       |                  | WESTARIO POWER INC. |
| 6.259686                                        | 5.319939 | 0.939747              | 1.410815         | 0.079321            |
| Electric Co (Duke Energy OH)                    |          |                       |                  | Entegrus Powerlines |
| 5.211058                                        | 4.242917 | 0.968141              | 1.452632         | 0.073336            |
| DISTRIBUTION INCORPORATED                       |          |                       |                  | Oklahoma Gas and    |
| 6.710885                                        | 5.728334 | 0.982551              | 1.475021         | 0.070277            |
| 6.227470                                        | 5.217253 | 1.010217              | 1.522487         | 0.064118            |
| Utilities Inc (O&R)                             |          |                       |                  | Cincinnati Gas &    |
| 6.422220                                        | 5.405012 | 1.017208              | 1.536614         | 0.062368            |
| Massachusetts Electric Co (Northeast Utilities) |          |                       |                  | PETERBOROUGH        |
| 5.710806                                        | 4.629496 | 1.081310              | 1.622653         | 0.052506            |
| POWERLINES CORPORATION                          |          |                       |                  | ALGOMA POWER INC.   |
| 6.697521                                        | 5.610472 | 1.087048              | 1.632566         | 0.051454            |
| Co                                              |          |                       |                  | Orange and Rockland |
| 6.302029                                        | 5.214055 | 1.087974              | 1.632664         | 0.051443            |
| Power Co                                        |          |                       |                  | Western             |
| 6.877696                                        | 5.762868 | 1.114828              | 1.683929         | 0.046270            |
| Electric & Gas Corp (NYSEG)                     |          |                       |                  | ERIE THAMES         |
| 6.978886                                        | 5.813626 | 1.165260              | 1.749508         | 0.040271            |
| (AEP)                                           |          |                       |                  | Central Maine Power |
| 5.683636                                        | 4.445050 | 1.238586              | 1.858955         | 0.031679            |
| UTILITIES CORPORATION                           |          |                       |                  | Potomac Electric    |
| 6.340216                                        | 5.039321 | 1.300894              | 1.953556         | 0.025530            |
| Electric Co                                     |          |                       |                  | new York State      |
| 5.802630                                        | 4.385709 | 1.416921              | 2.126184         | 0.016879            |
|                                                 |          |                       |                  | Kentucky Power Co   |
|                                                 |          |                       |                  | CHAPLEAU PUBLIC     |
|                                                 |          |                       |                  | Louisville Gas and  |
|                                                 |          |                       |                  | ESSEX POWERLINES    |

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|                              |          |          |          |          |                      |
|------------------------------|----------|----------|----------|----------|----------------------|
| CORPORATION                  |          |          |          |          |                      |
| 7.154407                     | 5.499339 | 1.655068 | 2.485883 | 0.006551 | Empire District      |
| Electric Co (MO)             |          |          |          |          |                      |
| 6.913967                     | 5.243086 | 1.670881 | 2.507131 | 0.006173 | Baltimore Gas &      |
| Electric Co                  |          |          |          |          |                      |
| 6.369945                     | 4.667360 | 1.702585 | 2.555338 | 0.005385 | HEARST POWER         |
| DISTRIBUTION COMPANY LIMITED |          |          |          |          |                      |
| 7.379586                     | 5.669879 | 1.709707 | 2.582696 | 0.004979 | Central Hudson Gas & |
| Electric Corp (CHGE)         |          |          |          |          |                      |
| 6.092353                     | 4.320538 | 1.771815 | 2.658950 | 0.003988 | HYDRO 2000 INC.      |
| 7.658442                     | 5.404920 | 2.253522 | 3.403683 | 0.000347 | Connecticut Light &  |
| Power Co                     |          |          |          |          |                      |
| 7.093782                     | 4.814655 | 2.279128 | 3.442388 | 0.000301 | United Illuminating  |
| Co                           |          |          |          |          |                      |

CONFIDENCE INTERVAL OF THE THREE YEAR AVERAG SCORE: THESL2

|             |         |
|-------------|---------|
| Lower Bound | 63.011  |
| Predicted   | 150.563 |
| Upper Bound | 359.765 |

OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE BY YEAR

| Year     | Actual   | Predicted | %Difference | t_ratio | p_value |
|----------|----------|-----------|-------------|---------|---------|
| THESL2:  |          |           |             |         |         |
| 2005.000 | 104.893  | 126.764   | -0.189      | -0.164  | 0.435   |
| 2006.000 | 94.063   | 129.299   | -0.318      | -0.275  | 0.392   |
| 2007.000 | 117.000  | 131.893   | -0.120      | -0.104  | 0.459   |
| 2008.000 | 74.400   | 134.595   | -0.593      | -0.513  | 0.304   |
| 2009.000 | 174.169  | 136.563   | 0.243       | 0.210   | 0.417   |
| 2010.000 | 99.596   | 138.116   | -0.327      | -0.283  | 0.389   |
| 2011.000 | 85.800   | 150.916   | -0.565      | -0.488  | 0.313   |
| 2012.000 | 90.000   | 163.747   | -0.599      | -0.517  | 0.303   |
| 2013.000 | 1271.400 | 168.014   | 2.024       | 2.004   | 0.023   |
| 2014.000 | 71.400   | 170.715   | -0.872      | -0.863  | 0.194   |
| 2015.000 | 73.800   | 172.397   | -0.848      | -0.839  | 0.201   |
| 2016.000 | 70.200   | 173.969   | -0.908      | -0.897  | 0.185   |
| 2017.000 | 67.200   | 175.958   | -0.963      | -0.951  | 0.171   |
| 2018.000 | 64.800   | 177.938   | -1.010      | -0.997  | 0.159   |
| 2019.000 | 61.200   | 179.898   | -1.078      | -1.063  | 0.144   |

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# RELIABILITY MODELS

7/14/2014 OUTPUT FILE: C:\work\THESL2\results\SAIFI2 16:50:20

Output using the data set C:\work\THESL2\th\_benchb\_July7.xlsx

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## DEFINITIONS OF VARIABLES:

var1 is const

var2 is Retail Customers (yn)

var3 is customer/DX miles (UDI)

var4 is sum of wind days base 10kts

var5 is % electric DX in total electric net  
 plant

var6 is urban population above 1M

Time period used: 2002 through 2012

919.000

## REGRESSION WITH GROUPWISE HETEROSKEDASTICITY

|                |         |                     |          |
|----------------|---------|---------------------|----------|
| Valid cases:   | 912     | Dependent variable: | LSAIFI_A |
| Total SS:      | 747.957 | Degrees of freedom: | 902      |
| R-squared:     | 0.038   | Rbar-squared:       | 0.029    |
| Residual SS:   | 719.222 | Std error of est:   | 0.893    |
| F(10,902):     | 3.604   | Probability of F:   | 0.000    |
| Durbin-Watson: | 1.287   | Number of Firms:    | 116.000  |

| Variable | Estimate  | Standard Error | t-value   | Prob > t | Standardized Estimate | Cor with Dep Var |
|----------|-----------|----------------|-----------|----------|-----------------------|------------------|
| CONST    | 0.299130  | 0.033985       | 8.801759  | 0.000    | 0.551341              | 0.733870         |
| LYN      | 0.014127  | 0.008915       | 1.584598  | 0.113    | 0.042509              | -0.326767        |
| LDENSITY | -0.159258 | 0.028842       | -5.521779 | 0.000    | -0.194656             | 0.350972         |
| LWDD10   | 0.061220  | 0.028829       | 2.123551  | 0.034    | 0.158475              | -0.482114        |
| LPCTDST1 | 0.100835  | 0.029207       | 3.452406  | 0.001    | 0.095463              | -0.176181        |
| URBAN_1M | -0.030661 | 0.004292       | -7.144321 | 0.000    | -0.156431             | -0.051136        |
| LDENSQ   | 0.300863  | 0.083930       | 3.584691  | 0.000    | 0.171086              | 0.598215         |
| LWDD10SQ | 0.086653  | 0.024845       | 3.487766  | 0.001    | 0.282768              | 0.505391         |
| LPCTDSSQ | 0.032682  | 0.034460       | 0.948404  | 0.343    | 0.022331              | 0.257932         |
| TREND    | 0.011759  | 0.004333       | 2.713849  | 0.007    | 0.158377              | 0.706708         |

## OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE LAST THREE YEARS

| Actual                    | Predicted | Difference | t_ratio   | p_value  | Utility    |      |
|---------------------------|-----------|------------|-----------|----------|------------|------|
| -1.311537                 | 0.319877  | -1.631414  | -3.117146 | 0.000942 | 520.000000 | FORT |
| FRANCES POWER CORPORATION |           |            |           |          |            |      |

| PSE_Sep23Data_SAIFI_a COMBINEDdata.txt         |          |           |           |          |            |           |
|------------------------------------------------|----------|-----------|-----------|----------|------------|-----------|
| -1.076401                                      | 0.441020 | -1.517421 | -2.899687 | 0.001913 | 552.000000 | PARRY     |
| SOUND POWER CORPORATION                        |          |           |           |          |            |           |
| -1.133306                                      | 0.373901 | -1.507207 | -2.880423 | 0.002033 | 511.000000 |           |
| COOPERATIVE HYDRO EMBRUN INC.                  |          |           |           |          |            |           |
| -1.261445                                      | 0.010484 | -1.271929 | -2.460919 | 0.007022 | 40.000000  |           |
| Consolidated Edison Co of new York Inc (CONED) |          |           |           |          |            |           |
| -0.896420                                      | 0.372083 | -1.268503 | -2.423607 | 0.007781 | 517.000000 | ESPANOLA  |
| REGIONAL HYDRO DISTRIBUTION CORPORATION        |          |           |           |          |            |           |
| -0.761722                                      | 0.346419 | -1.108141 | -2.116757 | 0.017277 | 541.000000 |           |
| NEWMARKET-TAY POWER DISTRIBUTION LTD.          |          |           |           |          |            |           |
| -0.648926                                      | 0.445054 | -1.093980 | -2.090747 | 0.018415 | 543.000000 |           |
| NIAGARA-ON-THE-LAKE HYDRO INC.                 |          |           |           |          |            |           |
| -0.405241                                      | 0.475084 | -0.880324 | -1.682860 | 0.046374 | 201.000000 | Wisconsin |
| Electric Power Co (WEPCO)                      |          |           |           |          |            |           |
| -0.523162                                      | 0.325717 | -0.848879 | -1.644793 | 0.050180 | 99.000000  | Madison   |
| Gas and Electric Co                            |          |           |           |          |            |           |
| 0.208041                                       | 0.920166 | -0.712125 | -1.357564 | 0.087471 | 501.000000 | ATIKOKAN  |
| HYDRO INC.                                     |          |           |           |          |            |           |
| -0.255448                                      | 0.338528 | -0.593976 | -1.135273 | 0.128281 | 510.000000 | COLLUS    |
| POWER CORPORATION                              |          |           |           |          |            |           |
| -0.172917                                      | 0.388464 | -0.561381 | -1.073077 | 0.141762 | 568.000000 | WEST      |
| COAST HURON ENERGY INC.                        |          |           |           |          |            |           |
| -0.021767                                      | 0.538175 | -0.559942 | -1.085005 | 0.139104 | 202.000000 | Wisconsin |
| Power and Light Co                             |          |           |           |          |            |           |
| 0.127263                                       | 0.645443 | -0.518180 | -0.990724 | 0.161043 | 126.000000 | Niagara   |
| Mohawk Power Corp (National Grid)              |          |           |           |          |            |           |
| -0.090105                                      | 0.424948 | -0.515053 | -0.997120 | 0.159487 | 159.000000 | Rochester |
| Gas and Electric Corp                          |          |           |           |          |            |           |
| -0.009508                                      | 0.479895 | -0.489403 | -0.949040 | 0.171427 | 169.000000 | Southern  |
| California Edison Co                           |          |           |           |          |            |           |
| -0.112624                                      | 0.317141 | -0.429765 | -0.821234 | 0.205865 | 148.000000 | Portland  |
| General Electric Co                            |          |           |           |          |            |           |
| 0.072354                                       | 0.501790 | -0.429436 | -0.820874 | 0.205967 | 537.000000 | LAKELAND  |
| POWER DISTRIBUTION LTD.                        |          |           |           |          |            |           |
| -0.066965                                      | 0.328939 | -0.395904 | -0.756833 | 0.224674 | 89.000000  | Kansas    |
| City Power & Light Co (MO)                     |          |           |           |          |            |           |
| -0.024127                                      | 0.367167 | -0.391294 | -0.758837 | 0.224074 | 78.000000  |           |
| Indianapolis Power & Light Co                  |          |           |           |          |            |           |
| 0.006682                                       | 0.366243 | -0.359560 | -0.686950 | 0.246145 | 559.000000 | ST.       |
| THOMAS ENERGY INC.                             |          |           |           |          |            |           |
| 0.016365                                       | 0.375418 | -0.359053 | -0.685932 | 0.246466 | 540.000000 | MILTON    |
| HYDRO DISTRIBUTION INC.                        |          |           |           |          |            |           |
| 0.026627                                       | 0.375675 | -0.349048 | -0.667147 | 0.252424 | 547.000000 | OAKVILLE  |
| HYDRO ELECTRICITY DISTRIBUTION INC.            |          |           |           |          |            |           |
| -0.129984                                      | 0.169465 | -0.299449 | -0.576601 | 0.282176 | 163.000000 | San Diego |
| Gas & Electric Co                              |          |           |           |          |            |           |
| 0.046833                                       | 0.336354 | -0.289521 | -0.553175 | 0.290140 | 512.000000 | E.L.K.    |
| ENERGY INC.                                    |          |           |           |          |            |           |
| 0.232960                                       | 0.520512 | -0.287552 | -0.556864 | 0.288879 | 12.000000  | Avista    |
| Corp                                           |          |           |           |          |            |           |
| 0.636577                                       | 0.916015 | -0.279439 | -0.311547 | 0.377728 | 514.000000 | Entegrus  |
| Powerlines                                     |          |           |           |          |            |           |
| 0.117963                                       | 0.396066 | -0.278103 | -0.531482 | 0.297608 | 521.000000 | GREATER   |
| SUDBURY HYDRO INC.                             |          |           |           |          |            |           |
| 0.081452                                       | 0.357260 | -0.275808 | -0.527005 | 0.299160 | 8.000000   | AmerenUE  |
| 0.119620                                       | 0.366437 | -0.246818 | -0.471673 | 0.318637 | 550.000000 | OSHAWA    |
| PUC NETWORKS INC.                              |          |           |           |          |            |           |
| 0.101117                                       | 0.343833 | -0.242716 | -0.463850 | 0.321433 | 529.000000 | HYDRO     |
| HAWKESBURY INC.                                |          |           |           |          |            |           |
| 0.120435                                       | 0.357458 | -0.237022 | -0.452839 | 0.325387 | 570.000000 | WHITBY    |
| HYDRO ELECTRIC CORPORATION                     |          |           |           |          |            |           |
| 0.139903                                       | 0.372394 | -0.232491 | -0.450974 | 0.326058 | 46.000000  | Detroit   |
| Edison                                         |          |           |           |          |            |           |

| PSE_Sep23Data_SAIFI_a COMBINEDdata.txt  |          |           |           |          |            |           |
|-----------------------------------------|----------|-----------|-----------|----------|------------|-----------|
| 0.186499                                | 0.407602 | -0.221102 | -0.422557 | 0.336360 | 535.000000 |           |
| KITCHENER-WILMOT HYDRO INC.             |          |           |           |          |            |           |
| 0.163756                                | 0.381599 | -0.217843 | -0.416195 | 0.338683 | 505.000000 |           |
| BURLINGTON HYDRO INC.                   |          |           |           |          |            |           |
| 0.194418                                | 0.410942 | -0.216525 | -0.413689 | 0.339600 | 506.000000 | CAMBRIDGE |
| and NORTH DUMFRIES HYDRO INC.           |          |           |           |          |            |           |
| 0.196435                                | 0.403882 | -0.207447 | -0.396493 | 0.345918 | 565.000000 | WATERLOO  |
| NORTH HYDRO INC.                        |          |           |           |          |            |           |
| 0.222808                                | 0.420290 | -0.197482 | -0.382905 | 0.350940 | 142.000000 | Pacific   |
| Gas and Electric Co                     |          |           |           |          |            |           |
| 0.267146                                | 0.461123 | -0.193976 | -0.370827 | 0.355427 | 530.000000 | HYDRO ONE |
| BRAMPTON NETWORKS INC.                  |          |           |           |          |            |           |
| 0.219230                                | 0.409538 | -0.190308 | -0.363612 | 0.358116 | 554.000000 |           |
| POWERSTREAM INC.                        |          |           |           |          |            |           |
| 0.200721                                | 0.389163 | -0.188442 | -0.360040 | 0.359451 | 534.000000 | KINGSTON  |
| HYDRO CORPORATION                       |          |           |           |          |            |           |
| 0.134937                                | 0.318274 | -0.183337 | -0.287440 | 0.386921 | 178.000000 | Tampa     |
| Electric Co                             |          |           |           |          |            |           |
| 0.328138                                | 0.507093 | -0.178956 | -0.342031 | 0.366204 | 30.000000  | Cleveland |
| Electric Illuminating Co (First Energy) |          |           |           |          |            |           |
| 0.173500                                | 0.333899 | -0.160399 | -0.306665 | 0.379584 | 62.000000  | Florida   |
| Power & Light Co                        |          |           |           |          |            |           |
| 0.252720                                | 0.412828 | -0.160108 | -0.305992 | 0.379840 | 567.000000 |           |
| WELLINGTON NORTH POWER INC.             |          |           |           |          |            |           |
| 0.384417                                | 0.485492 | -0.101075 | -0.195997 | 0.422328 | 43.000000  | Consumers |
| Energy Company                          |          |           |           |          |            |           |
| 0.247432                                | 0.347990 | -0.100558 | -0.191953 | 0.423911 | 539.000000 | MIDLAND   |
| POWER UTILITY CORPORATION               |          |           |           |          |            |           |
| 0.443139                                | 0.540855 | -0.097716 | -0.189109 | 0.425025 | 203.000000 |           |
| Wisconsin Public Service Co             |          |           |           |          |            |           |
| 0.390036                                | 0.474591 | -0.084555 | -0.161454 | 0.435886 | 542.000000 | NIAGARA   |
| PENINSULA ENERGY INC.                   |          |           |           |          |            |           |
| 0.275077                                | 0.336174 | -0.061097 | -0.116733 | 0.453549 | 522.000000 | GRIMSBY   |
| POWER INCORPORATED                      |          |           |           |          |            |           |
| 0.555870                                | 0.607983 | -0.052113 | -0.099627 | 0.460331 | 138.000000 | Oklahoma  |
| Gas and Electric Co                     |          |           |           |          |            |           |
| 0.363998                                | 0.413474 | -0.049476 | -0.094574 | 0.462337 | 504.000000 | BRANTFORD |
| POWER INC.                              |          |           |           |          |            |           |
| 0.335007                                | 0.377826 | -0.042819 | -0.083036 | 0.466921 | 171.000000 | Southern  |
| Indiana Gas and Electric Co (Vectern)   |          |           |           |          |            |           |
| 0.267529                                | 0.285983 | -0.018455 | -0.035285 | 0.485930 | 509.000000 | CHAPLEAU  |
| PUBLIC UTILITIES CORPORATION            |          |           |           |          |            |           |
| 0.429047                                | 0.436119 | -0.007072 | -0.013226 | 0.494725 | 135.000000 | Ohio      |
| Edison Co (First Energy)                |          |           |           |          |            |           |
| 0.381454                                | 0.376198 | 0.005256  | 0.010047  | 0.495993 | 564.000000 | WASAGA    |
| DISTRIBUTION INC.                       |          |           |           |          |            |           |
| 0.320986                                | 0.312725 | 0.008261  | 0.015783  | 0.493706 | 557.000000 | RIDEAU    |
| ST. LAWRENCE DISTRIBUTION INC.          |          |           |           |          |            |           |
| 0.331404                                | 0.296702 | 0.034702  | 0.067249  | 0.473199 | 130.000000 | Northern  |
| Indiana Public Service Co               |          |           |           |          |            |           |
| 0.368462                                | 0.332329 | 0.036133  | 0.069987  | 0.472110 | 186.000000 | United    |
| Illuminating Co                         |          |           |           |          |            |           |
| 0.497002                                | 0.452388 | 0.044614  | 0.085282  | 0.466028 | 513.000000 |           |
| ENERSOURCE HYDRO MISSISSAUGA INC.       |          |           |           |          |            |           |
| 0.440582                                | 0.385333 | 0.055249  | 0.105598  | 0.457962 | 538.000000 | LONDON    |
| HYDRO INC.                              |          |           |           |          |            |           |
| 0.483100                                | 0.406832 | 0.076268  | 0.145730  | 0.442083 | 532.000000 | HYDRO     |
| OTTAWA LIMITED                          |          |           |           |          |            |           |
| 0.401763                                | 0.310103 | 0.091660  | 0.175118  | 0.430513 | 44.000000  | Dayton    |
| Power & Light Co                        |          |           |           |          |            |           |
| 0.669761                                | 0.559794 | 0.109968  | 0.210169  | 0.416791 | 558.000000 | SIoux     |
| LOOKOUT HYDRO INC.                      |          |           |           |          |            |           |
| 0.538662                                | 0.414030 | 0.124632  | 0.238297  | 0.405852 | 503.000000 | BRANT     |



## PSE\_Sep23Data\_SAIFI\_a COMBINEDdata.txt

|                                                 |          |          |          |          |          |            |           |
|-------------------------------------------------|----------|----------|----------|----------|----------|------------|-----------|
| COUNTY POWER INC.                               | 0.449423 | 0.324083 | 0.125340 | 0.239615 | 0.405341 | 136.000000 | Ohio      |
| Power Co (AEP)                                  | 0.491131 | 0.349828 | 0.141303 | 0.272387 | 0.392693 | 140.000000 | Orange    |
| and Rockland Utilities Inc (O&R)                | 0.538521 | 0.395320 | 0.143200 | 0.277541 | 0.390714 | 198.000000 | Western   |
| Massachusetts Electric Co (Northeast Utilities) | 0.616739 | 0.466087 | 0.150652 | 0.287928 | 0.386734 | 54.000000  | Entergy   |
| Arkansas Inc                                    | 0.482423 | 0.324718 | 0.157705 | 0.301508 | 0.381548 | 566.000000 | WELLAND   |
| HYDRO-ELECTRIC SYSTEM CORP.                     | 0.604044 | 0.440368 | 0.163676 | 0.311996 | 0.377558 | 527.000000 | HORIZON   |
| UTILITIES CORPORATION                           | 0.746879 | 0.579056 | 0.167823 | 0.320847 | 0.374200 | 553.000000 |           |
| PETERBOROUGH DISTRIBUTION INCORPORATED          | 0.808376 | 0.636688 | 0.171688 | 0.328226 | 0.371408 | 524.000000 | HALDIMAND |
| COUNTY HYDRO INC.                               | 0.535264 | 0.344872 | 0.190392 | 0.364112 | 0.357930 | 67.000000  | Green     |
| Mountain Power Corp                             | 0.479624 | 0.246709 | 0.232915 | 0.444944 | 0.328233 | 98.000000  |           |
| Louisville Gas and Electric Co                  | 0.705650 | 0.466490 | 0.239159 | 0.462797 | 0.321811 | 124.000000 | new York  |
| State Electric & Gas Corp (NYSEG)               | 0.534561 | 0.288699 | 0.245863 | 0.476400 | 0.316952 | 152.000000 | PSI       |
| Energy Inc (Duke Energy IN)                     | 0.641705 | 0.356632 | 0.285073 | 0.544919 | 0.292972 | 13.000000  | Baltimore |
| Gas & Electric Co                               | 0.587787 | 0.294554 | 0.293232 | 0.326873 | 0.371920 | 63.000000  | Florida   |
| Power Corp                                      | 0.721640 | 0.409814 | 0.311827 | 0.595931 | 0.275685 | 525.000000 | HALTON    |
| HILLS HYDRO INC.                                | 0.680964 | 0.362389 | 0.318575 | 0.608812 | 0.271401 | 508.000000 | CENTRE    |
| WELLINGTON HYDRO LTD.                           | 0.653707 | 0.327019 | 0.326688 | 0.624829 | 0.266121 | 549.000000 | ORILLIA   |
| POWER DISTRIBUTION CORPORATION                  | 0.696621 | 0.358450 | 0.338171 | 0.646329 | 0.259115 | 516.000000 | ERIE      |
| THAMES POWERLINES CORPORATION                   | 0.686528 | 0.339027 | 0.347501 | 0.664369 | 0.253312 | 523.000000 | GUELPH    |
| HYDRO ELECTRIC SYSTEMS INC.                     | 0.707572 | 0.344451 | 0.363121 | 0.703806 | 0.240868 | 36.000000  |           |
| Connecticut Light & Power Co                    | 0.609312 | 0.241571 | 0.367741 | 0.702464 | 0.241285 | 68.000000  | Gulf      |
| Power Co                                        | 0.849303 | 0.478889 | 0.370414 | 0.717575 | 0.236602 | 21.000000  | Central   |
| Hudson Gas & Electric Corp (CHGE)               | 0.788819 | 0.396332 | 0.392487 | 0.750121 | 0.226689 | 515.000000 | ENWIN     |
| UTILITIES LTD.                                  | 0.761199 | 0.365981 | 0.395217 | 0.755919 | 0.224948 | 544.000000 | NORFOLK   |
| POWER DISTRIBUTION INC.                         | 0.717670 | 0.320532 | 0.397138 | 0.759334 | 0.223926 | 548.000000 |           |
| ORANGEVILLE HYDRO LIMITED                       | 0.770333 | 0.364510 | 0.405824 | 0.775828 | 0.219027 | 563.000000 | VERIDIAN  |
| CONNECTIONS INC.                                | 0.770879 | 0.357474 | 0.413405 | 0.790441 | 0.214739 | 519.000000 | FESTIVAL  |
| HYDRO INC.                                      | 0.728100 | 0.303475 | 0.424625 | 0.811450 | 0.208661 | 195.000000 | Virginia  |
| Electric and Power Co                           | 0.746700 | 0.308946 | 0.437754 | 0.836776 | 0.201470 | 556.000000 | RENFREW   |
| HYDRO INC.                                      | 0.795382 | 0.321180 | 0.474202 | 0.906293 | 0.182511 | 536.000000 | LAKEFRONT |
| UTILITIES INC.                                  | 0.945284 | 0.468653 | 0.476631 | 0.911511 | 0.181135 | 546.000000 | NORTHERN  |
| ONTARIO WIRES INC.                              |          |          |          |          |          |            |           |

| PSE_Sep23Data_SAIFI_a COMBINEDdata.txt        |           |          |          |          |            |           |
|-----------------------------------------------|-----------|----------|----------|----------|------------|-----------|
| 0.852212                                      | 0.368084  | 0.484128 | 0.925164 | 0.177564 | 150.000000 | Potomac   |
| Electric Power Co                             |           |          |          |          |            |           |
| 0.971583                                      | 0.471576  | 0.500007 | 0.955522 | 0.169785 | 507.000000 | CANADIAN  |
| NIAGARA POWER INC.                            |           |          |          |          |            |           |
| 0.860299                                      | 0.323560  | 0.536739 | 1.025684 | 0.152658 | 528.000000 | HYDRO     |
| 2000 INC.                                     |           |          |          |          |            |           |
| 0.809632                                      | 0.238801  | 0.570831 | 1.091339 | 0.137707 | 27.000000  |           |
| Cincinnati Gas & Electric Co (Duke Energy OH) |           |          |          |          |            |           |
| 0.292006                                      | -0.300180 | 0.592186 | 1.148048 | 0.125626 | 32.000000  |           |
| Commonwealth Edison Co                        |           |          |          |          |            |           |
| 1.032380                                      | 0.422972  | 0.609408 | 1.164350 | 0.122295 | 53.000000  | Empire    |
| District Electric Co (MO)                     |           |          |          |          |            |           |
| 1.171141                                      | 0.525447  | 0.645694 | 1.233748 | 0.108809 | 91.000000  | Kentucky  |
| Power Co (AEP)                                |           |          |          |          |            |           |
| 0.980944                                      | 0.309323  | 0.671622 | 1.284282 | 0.099686 | 551.000000 | OTTAWA    |
| RIVER POWER CORPORATION                       |           |          |          |          |            |           |
| 1.089177                                      | 0.416000  | 0.673177 | 1.286641 | 0.099275 | 569.000000 | WESTARIO  |
| POWER INC.                                    |           |          |          |          |            |           |
| 1.118035                                      | 0.421759  | 0.696277 | 1.331061 | 0.091752 | 23.000000  | Central   |
| Maine Power Co                                |           |          |          |          |            |           |
| 0.539364                                      | -0.194257 | 0.733621 | 1.399533 | 0.080998 | 562.000000 | TORONTO   |
| HYDRO-ELECTRIC SYSTEM LIMITED                 |           |          |          |          |            |           |
| 1.104480                                      | 0.358351  | 0.746129 | 1.426624 | 0.077017 | 526.000000 | HEARST    |
| POWER DISTRIBUTION COMPANY LIMITED            |           |          |          |          |            |           |
| 1.113857                                      | 0.346948  | 0.766909 | 1.466321 | 0.071454 | 555.000000 | PUC       |
| DISTRIBUTION INC.                             |           |          |          |          |            |           |
| 1.250494                                      | 0.396448  | 0.854047 | 1.632679 | 0.051443 | 502.000000 | BLUEWATER |
| POWER DISTRIBUTION CORPORATION                |           |          |          |          |            |           |
| 1.329779                                      | 0.433800  | 0.895979 | 1.711556 | 0.043661 | 560.000000 | THUNDER   |
| BAY HYDRO ELECTRICITY DISTRIBUTION INC.       |           |          |          |          |            |           |
| 1.250983                                      | 0.310283  | 0.940700 | 1.797912 | 0.036262 | 533.000000 | KENORA    |
| HYDRO ELECTRIC CORPORATION LTD.               |           |          |          |          |            |           |
| 1.394845                                      | 0.348520  | 1.046325 | 2.000380 | 0.022879 | 518.000000 | ESSEX     |
| POWERLINES CORPORATION                        |           |          |          |          |            |           |
| 1.866272                                      | 0.794893  | 1.071378 | 2.048479 | 0.020401 | 500.000000 | ALGOMA    |
| POWER INC.                                    |           |          |          |          |            |           |
| 1.452752                                      | 0.377038  | 1.075714 | 2.056553 | 0.020008 | 545.000000 | NORTH BAY |
| HYDRO DISTRIBUTION LIMITED                    |           |          |          |          |            |           |
| 1.567219                                      | 0.341004  | 1.226215 | 2.343807 | 0.009652 | 561.000000 |           |
| TILLSONBURG HYDRO INC.                        |           |          |          |          |            |           |

#### CONFIDENCE INTERVAL OF THE THREE YEAR AVERAG SCORE: THESL2

|             |       |
|-------------|-------|
| Lower Bound | 0.420 |
| Predicted   | 0.823 |
| Upper Bound | 1.613 |

#### OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE BY YEAR

| Year     | Actual | Predicted | %Difference | t_ratio | p_value |
|----------|--------|-----------|-------------|---------|---------|
| THESL2:  |        |           |             |         |         |
| 2005.000 | 2.007  | 0.771     | 0.957       | 1.066   | 0.143   |
| 2006.000 | 2.169  | 0.789     | 1.011       | 1.126   | 0.130   |
| 2007.000 | 2.270  | 0.804     | 1.039       | 1.156   | 0.124   |
| 2008.000 | 1.760  | 0.807     | 0.780       | 0.869   | 0.193   |
| 2009.000 | 1.863  | 0.810     | 0.833       | 0.928   | 0.177   |
| 2010.000 | 1.946  | 0.805     | 0.882       | 0.983   | 0.163   |
| 2011.000 | 1.620  | 0.824     | 0.676       | 0.752   | 0.226   |
| 2012.000 | 1.600  | 0.841     | 0.643       | 0.716   | 0.237   |

|          | PSE_Sep23Data_SAIFI_a COMBINEDdata.txt |       |       |       |       |
|----------|----------------------------------------|-------|-------|-------|-------|
| 2013.000 | 2.910                                  | 0.867 | 1.211 | 1.228 | 0.110 |
| 2014.000 | 1.580                                  | 0.871 | 0.595 | 0.604 | 0.273 |
| 2015.000 | 1.550                                  | 0.880 | 0.566 | 0.574 | 0.283 |
| 2016.000 | 1.440                                  | 0.889 | 0.483 | 0.489 | 0.312 |
| 2017.000 | 1.360                                  | 0.898 | 0.415 | 0.421 | 0.337 |
| 2018.000 | 1.270                                  | 0.907 | 0.336 | 0.341 | 0.367 |
| 2019.000 | 1.190                                  | 0.917 | 0.261 | 0.264 | 0.396 |

»

PSE\_Sep23Data\_TC\_COMBINEDdata.txt  
» run C:\work\THESL2\Specification\TC;

\*\*\*\*\*

Date: 7/14/14 \*\*\*\*\* STANDARD SUR ESTIMATION RESULTS \*\*\*\*\* Time: 15:01:31

OUTPUT FILE:C:\work\THESL2\results\TC

DATA FILE:C:\work\THESL2\th\_benchb\_July14.xlsx

\*\*\*\*\*

#### DEFINITIONS OF OUTPUT VARIABLES:

Y1 is Retail Customers (yn)

Y2 is peak demand

#### DEFINITIONS OF BUSINESS CONDITION VARIABLES:

Z1 is urban population above 1M

Z2 is % residential deliveries

electric customers

Z3 is % electric customers in gas +

plant

Z4 is % electric DX in total electric gross

Z5 is customer/DX miles (UDI)

Model includes time trend.

Time period used: 2002 through 2012

1657

=====

|                                                        |           |         |
|--------------------------------------------------------|-----------|---------|
| SEEMINGLY UNRELATED REGRESSION WITH HETEROSKEDASTICITY | 7/14/2014 | 3:01 pm |
|--------------------------------------------------------|-----------|---------|

=====

Data Set: C:\work\THESL2\Temp\_3.dat

-----

DIVISOR USING N IN EFFECT  
RESTRICTIONS IN EFFECT

|           |   |                               |            |
|-----------|---|-------------------------------|------------|
| ITER. # = | 0 | LOG OF DETERMINANT OF SIGMA = | 0.29079722 |
| ITER. # = | 1 | LOG OF DETERMINANT OF SIGMA = | 0.26217548 |
| ITER. # = | 2 | LOG OF DETERMINANT OF SIGMA = | 0.26169982 |
| ITER. # = | 3 | LOG OF DETERMINANT OF SIGMA = | 0.26169185 |
| ITER. # = | 4 | LOG OF DETERMINANT OF SIGMA = | 0.26169172 |
| ITER. # = | 5 | LOG OF DETERMINANT OF SIGMA = | 0.26169172 |
| ITER. # = | 6 | LOG OF DETERMINANT OF SIGMA = | 0.26169172 |
| ITER. # = | 7 | LOG OF DETERMINANT OF SIGMA = | 0.26169172 |

-----

Equation: 1  
Dependent variable: C

PSE\_Sep23Data\_TC\_COMBINEDdata.txt

|                |          |                     |         |
|----------------|----------|---------------------|---------|
| Total cases:   | 1650     | Valid cases:        | 1650    |
| Total SS:      | 7908.284 | Degrees of freedom: | ----    |
| R-squared:     | 0.988    | Rbar-squared:       | 0.988   |
| Residual SS:   | 92.278   | Std error of est:   | 0.236   |
| Durbin-Watson: | 1.535    | N_Firms:            | 156.000 |

| Variable | Estimated Coefficient | Standard Error | t-ratio  | Prob > t |
|----------|-----------------------|----------------|----------|----------|
| CONST    | 19.56365331           | 0.01369536     | 1428.488 | 0.0000   |
| WK       | 0.53941466            | 0.00204235     | 264.114  | 0.0000   |
| Y1       | 0.96742580            | 0.02228406     | 43.413   | 0.0000   |
| Y2       | 0.11429434            | 0.02140767     | 5.339    | 0.0000   |
| WKWK     | 0.10218375            | 0.01002614     | 10.192   | 0.0000   |
| Y1Y1     | 0.02068926            | 0.01755796     | 1.178    | 0.2388   |
| Y2Y2     | 0.02870154            | 0.00609820     | 4.707    | 0.0000   |
| WKY1     | -0.01901742           | 0.00637842     | -2.982   | 0.0029   |
| WKY2     | 0.01658982            | 0.00610539     | 2.717    | 0.0067   |
| Y1Y2     | -0.02362045           | 0.01103609     | -2.140   | 0.0325   |
| Z1       | 0.00746059            | 0.00206416     | 3.614    | 0.0003   |
| Z2       | 0.01552050            | 0.00721220     | 2.152    | 0.0315   |
| Z3       | 0.10363696            | 0.02849572     | 3.637    | 0.0003   |
| Z4       | 0.06579519            | 0.01913618     | 3.438    | 0.0006   |
| Z5       | -0.14924360           | 0.01259479     | -11.850  | 0.0000   |
| TREND    | 0.00299872            | 0.00101896     | 2.943    | 0.0033   |

Equation: 2  
Dependent variable: SK

|                |        |                     |         |
|----------------|--------|---------------------|---------|
| Total cases:   | 1650   | Valid cases:        | 1650    |
| Total SS:      | 17.363 | Degrees of freedom: | ----    |
| R-squared:     | -0.117 | Rbar-squared:       | -0.117  |
| Residual SS:   | 19.402 | Std error of est:   | 0.108   |
| Durbin-Watson: | 1.580  | N_Firms:            | 156.000 |

| Variable | Estimated Coefficient | Standard Error | t-ratio | Prob > t |
|----------|-----------------------|----------------|---------|----------|
| CONST    | 0.53941466            | 0.00204235     | 264.114 | 0.0000   |
| WK       | 0.10218375            | 0.01002614     | 10.192  | 0.0000   |
| Y1       | -0.01901742           | 0.00637842     | -2.982  | 0.0029   |
| Y2       | 0.01658982            | 0.00610539     | 2.717   | 0.0067   |

Equation: 3  
Dependent variable: SLM

|          |                       |                     |         |          |
|----------|-----------------------|---------------------|---------|----------|
|          |                       | Valid cases:        | 1650    |          |
|          |                       | Degrees of freedom: | ----    |          |
| Variable | Estimated Coefficient | Standard Error      | t-ratio | Prob > t |
| -----    | -----                 | -----               | -----   | -----    |
| CONST    | 0.46058534            | 0.00204235          | 225.517 | 0.0000   |
| WK       | -0.10218375           | 0.01002614          | -10.192 | 0.0000   |
| Y1       | 0.01901742            | 0.00637842          | 2.982   | 0.0032   |

|    |                                   |            |        |        |
|----|-----------------------------------|------------|--------|--------|
|    | PSE_Sep23Data_TC_COMBINEDdata.txt |            |        |        |
| Y2 | -0.01658982                       | 0.00610539 | -2.717 | 0.0072 |

-----  
MEASURES OF GOODNESS-OF-FIT  
-----

|                               |       |
|-------------------------------|-------|
| AN UNCENTERED SYSTEM R-SQUARE | 0.984 |
| A CENTERED SYSTEM R-SQUARE    | 0.985 |

The results from the test of the null hypothesis that all slope coefficients in all equations are simultaneously equal to zero.

|                |          |
|----------------|----------|
| Test statistic | Prob > t |
| -----          | -----    |
| 6899.788       | 0.0000   |

-----  
VALIDATION OF REGULARITY CONDITIONS  
-----

Monotonicity of the Estimated Cost Function

The number of observations for which each of the following predicted cost share is nonpositive is listed below

|          |                     |
|----------|---------------------|
| Capital  | Labor and Materials |
| 0        | 0                   |
| (0.00 %) | (0.00 %)            |

Concavity of the Estimated Cost Function

The number of the observations for which the condition that the matrix of second order partial derivatives of the cost function with respect to input wages is negative semi-definite holds:

1437 (87.09 %)

Quasi-Concavity of the Estimated Cost Function

The number of observations for which the condition that the cost function is strictly quasi-concave in input prices holds:

1650 (100.00 %)

Second Order Condition for Cost Minimization

The number of the observations for which the condition that the bordered Hessian is negative definite holds:

1650 (100.00 %)

OUT-OF-SAMPLE PREDICTION OF TOTAL COST LEVEL PERFORMANCE last 3 years

|        |           |            |         |         |         |
|--------|-----------|------------|---------|---------|---------|
| Actual | Predicted | Difference | t_ratio | p_value | Utility |
|--------|-----------|------------|---------|---------|---------|

|                                |        |        | PSE_Sep23Data_TC_COMBINEDdata.txt |       |                        |
|--------------------------------|--------|--------|-----------------------------------|-------|------------------------|
| 19.640                         | 20.432 | -0.793 | -5.918                            | 0.000 | Ohio Edison Co (First  |
| Energy)                        |        |        |                                   |       |                        |
| 14.059                         | 14.765 | -0.706 | -5.116                            | 0.000 | HYDRO HAWKESBURY INC.  |
| 21.499                         | 22.078 | -0.578 | -3.884                            | 0.000 | Commonwealth Edison Co |
| 19.579                         | 20.088 | -0.509 | -3.733                            | 0.000 | Cleveland Electric     |
| Illuminating Co (First Energy) |        |        |                                   |       |                        |
| 21.402                         | 21.842 | -0.440 | -3.098                            | 0.001 | Florida Power & Light  |
| Co                             |        |        |                                   |       |                        |
| 20.281                         | 20.695 | -0.414 | -2.465                            | 0.007 | Public Service Co of   |
| Colorado                       |        |        |                                   |       |                        |
| 19.161                         | 19.574 | -0.412 | -2.949                            | 0.002 | Public Service Co of   |
| new Mexico (PNM)               |        |        |                                   |       |                        |
| 17.881                         | 18.274 | -0.392 | -2.813                            | 0.002 | LONDON HYDRO INC.      |
| 20.317                         | 20.697 | -0.381 | -2.313                            | 0.010 | Northern States Power  |
| Co (XCEL)                      |        |        |                                   |       |                        |
| 15.050                         | 15.429 | -0.380 | -2.733                            | 0.003 | WASAGA DISTRIBUTION    |
| INC.                           |        |        |                                   |       |                        |
| 18.304                         | 18.677 | -0.372 | -2.684                            | 0.004 | HORIZON UTILITIES      |
| CORPORATION                    |        |        |                                   |       |                        |
| 16.678                         | 17.033 | -0.354 | -2.593                            | 0.005 | OSHAWA PUC NETWORKS    |
| INC.                           |        |        |                                   |       |                        |
| 18.829                         | 19.183 | -0.354 | -2.575                            | 0.005 | POWERSTREAM INC.       |
| 17.791                         | 18.120 | -0.329 | -2.387                            | 0.009 | HYDRO ONE BRAMPTON     |
| NETWORKS INC.                  |        |        |                                   |       |                        |
| 19.158                         | 19.486 | -0.328 | -1.927                            | 0.027 | Southwestern Public    |
| Service (Xcel)                 |        |        |                                   |       |                        |
| 18.701                         | 19.027 | -0.326 | -2.366                            | 0.009 | HYDRO OTTAWA LIMITED   |
| 20.121                         | 20.445 | -0.324 | -2.367                            | 0.009 | Wisconsin Electric     |
| Power Co (WEPCO)               |        |        |                                   |       |                        |
| 19.714                         | 20.033 | -0.319 | -2.324                            | 0.010 | West Penn Power Co     |
| (Allegheny Power)              |        |        |                                   |       |                        |
| 17.553                         | 17.856 | -0.302 | -2.205                            | 0.014 | VERIDIAN CONNECTIONS   |
| INC.                           |        |        |                                   |       |                        |
| 14.954                         | 15.251 | -0.296 | -2.164                            | 0.015 | LAKEFRONT UTILITIES    |
| INC.                           |        |        |                                   |       |                        |
| 19.214                         | 19.499 | -0.285 | -2.068                            | 0.019 | Potomac Edison Co      |
| 17.359                         | 17.641 | -0.282 | -2.050                            | 0.020 | KITCHENER-WILMOT HYDRO |
| INC.                           |        |        |                                   |       |                        |
| 19.498                         | 19.776 | -0.278 | -2.006                            | 0.023 | Indiana Michigan Power |
| Co                             |        |        |                                   |       |                        |
| 15.091                         | 15.357 | -0.267 | -1.943                            | 0.026 | E.L.K. ENERGY INC.     |
| 15.963                         | 16.216 | -0.253 | -1.638                            | 0.051 | WELLAND HYDRO-ELECTRIC |
| SYSTEM CORP.                   |        |        |                                   |       |                        |
| 20.140                         | 20.371 | -0.231 | -1.669                            | 0.048 | Appalachian Power      |
| Company                        |        |        |                                   |       |                        |
| 19.136                         | 19.360 | -0.224 | -1.620                            | 0.053 | Indianapolis Power &   |
| Light Co                       |        |        |                                   |       |                        |
| 16.344                         | 16.567 | -0.224 | -1.626                            | 0.052 | NEWMARKET-TAY POWER    |
| DISTRIBUTION LTD.              |        |        |                                   |       |                        |
| 20.939                         | 21.155 | -0.216 | -1.564                            | 0.059 | Virginia Electric and  |
| Power Co                       |        |        |                                   |       |                        |
| 20.001                         | 20.216 | -0.215 | -1.395                            | 0.082 | TORONTO HYDRO-ELECTRIC |
| SYSTEM LIMITED                 |        |        |                                   |       |                        |
| 16.121                         | 16.331 | -0.211 | -1.526                            | 0.064 | ESSEX POWERLINES       |
| CORPORATION                    |        |        |                                   |       |                        |
| 15.555                         | 15.765 | -0.210 | -1.529                            | 0.063 | COLLUS POWER           |
| CORPORATION                    |        |        |                                   |       |                        |
| 21.735                         | 21.939 | -0.204 | -1.348                            | 0.089 | Consolidated Edison Co |
| of new York Inc (CONED)        |        |        |                                   |       |                        |
| 19.540                         | 19.741 | -0.201 | -1.458                            | 0.073 | Central Maine Power Co |
| 19.975                         | 20.174 | -0.199 | -1.448                            | 0.074 | Nevada Power Co        |
| 19.132                         | 19.325 | -0.193 | -1.407                            | 0.080 | Tucson Electric Power  |
| Co                             |        |        |                                   |       |                        |

| PSE_Sep23Data_TC_COMBINEDdata.txt |        |        |        |       |                         |
|-----------------------------------|--------|--------|--------|-------|-------------------------|
| 17.191                            | 17.382 | -0.191 | -1.387 | 0.083 | BURLINGTON HYDRO INC.   |
| 17.735                            | 17.925 | -0.190 | -1.342 | 0.090 | MDU Resources Group,    |
| Inc.                              |        |        |        |       |                         |
| 19.277                            | 19.444 | -0.167 | -1.214 | 0.113 | Wisconsin Public        |
| Service Co                        |        |        |        |       |                         |
| 16.565                            | 16.730 | -0.165 | -1.196 | 0.116 | BRANTFORD POWER INC.    |
| 15.215                            | 15.373 | -0.159 | -1.154 | 0.124 | GRIMSBY POWER           |
| INCORPORATED                      |        |        |        |       |                         |
| 16.072                            | 16.223 | -0.150 | -1.092 | 0.138 | WESTARIO POWER INC.     |
| 20.790                            | 20.936 | -0.146 | -1.049 | 0.147 | Consumers Energy        |
| Company                           |        |        |        |       |                         |
| 13.960                            | 14.103 | -0.142 | -1.023 | 0.153 | HEARST POWER            |
| DISTRIBUTION COMPANY LIMITED      |        |        |        |       |                         |
| 20.611                            | 20.753 | -0.142 | -1.025 | 0.153 | Florida Power Corp      |
| 16.643                            | 16.783 | -0.140 | -1.014 | 0.155 | WHITBY HYDRO ELECTRIC   |
| CORPORATION                       |        |        |        |       |                         |
| 18.350                            | 18.489 | -0.139 | -1.008 | 0.157 | Pennsylvania Power Co   |
| 19.511                            | 19.648 | -0.137 | -0.989 | 0.162 | Kentucky Utilities Co   |
| 14.656                            | 14.791 | -0.135 | -0.978 | 0.164 | RIDEAU ST. LAWRENCE     |
| DISTRIBUTION INC.                 |        |        |        |       |                         |
| 15.727                            | 15.861 | -0.134 | -0.978 | 0.164 | ST. THOMAS ENERGY INC.  |
| 19.435                            | 19.567 | -0.132 | -0.953 | 0.170 | Dayton Power & Light Co |
| 18.992                            | 19.123 | -0.131 | -0.939 | 0.174 | El Paso Electric Co     |
| 18.469                            | 18.593 | -0.124 | -0.901 | 0.184 | ENERSOURCE HYDRO        |
| MISSISSAUGA INC.                  |        |        |        |       |                         |
| 16.451                            | 16.570 | -0.119 | -0.864 | 0.194 | MILTON HYDRO            |
| DISTRIBUTION INC.                 |        |        |        |       |                         |
| 16.358                            | 16.473 | -0.115 | -0.837 | 0.201 | KINGSTON HYDRO          |
| CORPORATION                       |        |        |        |       |                         |
| 15.278                            | 15.390 | -0.111 | -0.810 | 0.209 | OTTAWA RIVER POWER      |
| CORPORATION                       |        |        |        |       |                         |
| 20.351                            | 20.461 | -0.110 | -0.792 | 0.214 | Ohio Power Co (AEP)     |
| 17.031                            | 17.133 | -0.101 | -0.737 | 0.231 | CAMBRIDGE and NORTH     |
| DUMFRIES HYDRO INC.               |        |        |        |       |                         |
| 19.701                            | 19.790 | -0.089 | -0.644 | 0.260 | Cincinnati Gas &        |
| Electric Co (Duke Energy OH)      |        |        |        |       |                         |
| 21.131                            | 21.214 | -0.083 | -0.601 | 0.274 | Duke Energy Corp        |
| 21.005                            | 21.084 | -0.079 | -0.571 | 0.284 | Detroit Edison          |
| 16.243                            | 16.314 | -0.072 | -0.521 | 0.301 | HALDIMAND COUNTY HYDRO  |
| INC.                              |        |        |        |       |                         |
| 20.631                            | 20.700 | -0.069 | -0.498 | 0.309 | Carolina Power & Light  |
| Co                                |        |        |        |       |                         |
| 16.190                            | 16.256 | -0.066 | -0.481 | 0.315 | HALTON HILLS HYDRO INC. |
| 19.987                            | 20.049 | -0.063 | -0.454 | 0.325 | Portland General        |
| Electric Co                       |        |        |        |       |                         |
| 16.458                            | 16.516 | -0.058 | -0.420 | 0.337 | PETERBOROUGH            |
| DISTRIBUTION INCORPORATED         |        |        |        |       |                         |
| 19.320                            | 19.373 | -0.054 | -0.391 | 0.348 | Monongahela Power Co    |
| 21.883                            | 21.937 | -0.054 | -0.380 | 0.352 | Southern California     |
| Edison Co                         |        |        |        |       |                         |
| 19.082                            | 19.131 | -0.049 | -0.353 | 0.362 | Louisville Gas and      |
| Electric Co                       |        |        |        |       |                         |
| 16.716                            | 16.763 | -0.047 | -0.345 | 0.365 | BLUEWATER POWER         |
| DISTRIBUTION CORPORATION          |        |        |        |       |                         |
| 20.653                            | 20.694 | -0.041 | -0.300 | 0.382 | PP&L Inc                |
| 20.171                            | 20.211 | -0.040 | -0.287 | 0.387 | Puget Sound Energy      |
| 16.980                            | 17.017 | -0.037 | -0.269 | 0.394 | GREATER SUDBURY HYDRO   |
| INC.                              |        |        |        |       |                         |
| 19.549                            | 19.584 | -0.035 | -0.255 | 0.399 | Wisconsin Power and     |
| Light Co                          |        |        |        |       |                         |
| 19.577                            | 19.609 | -0.032 | -0.232 | 0.408 | Kansas City Power &     |
| Light Co (MO)                     |        |        |        |       |                         |
| 20.001                            | 20.033 | -0.032 | -0.231 | 0.409 | PSI Energy Inc (Duke    |



PSE\_Sep23Data\_TC\_COMBINEDdata.txt

|                               |        |        |        |       |  |                         |
|-------------------------------|--------|--------|--------|-------|--|-------------------------|
| Energy IN)                    |        |        |        |       |  |                         |
| 17.036                        | 17.064 | -0.029 | -0.208 | 0.418 |  | THUNDER BAY HYDRO       |
| ELECTRICITY DISTRIBUTION INC. |        |        |        |       |  |                         |
| 19.742                        | 19.765 | -0.023 | -0.164 | 0.435 |  | Duquesne Light Co       |
| 19.975                        | 19.997 | -0.022 | -0.160 | 0.436 |  | Entergy Arkansas Inc    |
| 16.351                        | 16.370 | -0.019 | -0.135 | 0.446 |  | NORTH BAY HYDRO         |
| DISTRIBUTION LIMITED          |        |        |        |       |  |                         |
| 20.106                        | 20.124 | -0.017 | -0.126 | 0.450 |  | Oklahoma Gas and        |
| Electric Co                   |        |        |        |       |  |                         |
| 15.390                        | 15.401 | -0.011 | -0.078 | 0.469 |  | ORANGEVILLE HYDRO       |
| LIMITED                       |        |        |        |       |  |                         |
| 15.598                        | 15.598 | 0.001  | 0.005  | 0.498 |  | ORILLIA POWER           |
| DISTRIBUTION CORPORATION      |        |        |        |       |  |                         |
| 19.754                        | 19.752 | 0.002  | 0.017  | 0.493 |  | Tampa Electric Co       |
| 19.194                        | 19.187 | 0.007  | 0.047  | 0.481 |  | Avista Corp             |
| 15.306                        | 15.296 | 0.010  | 0.072  | 0.471 |  | LAKELAND POWER          |
| DISTRIBUTION LTD.             |        |        |        |       |  |                         |
| 13.124                        | 13.111 | 0.014  | 0.097  | 0.461 |  | HYDRO 2000 INC.         |
| 22.019                        | 22.001 | 0.018  | 0.124  | 0.451 |  | Pacific Gas and         |
| Electric Co                   |        |        |        |       |  |                         |
| 19.654                        | 19.634 | 0.020  | 0.141  | 0.444 |  | Southwestern Electric   |
| Power Co (AEP)                |        |        |        |       |  |                         |
| 21.185                        | 21.165 | 0.020  | 0.145  | 0.442 |  | Georgia Power Co        |
| 20.441                        | 20.418 | 0.024  | 0.174  | 0.431 |  | Jersey Central Power &  |
| Light Co                      |        |        |        |       |  |                         |
| 15.031                        | 15.007 | 0.025  | 0.179  | 0.429 |  | NORTHERN ONTARIO WIRES  |
| INC.                          |        |        |        |       |  |                         |
| 17.210                        | 17.181 | 0.029  | 0.212  | 0.416 |  | NIAGARA PENINSULA       |
| ENERGY INC.                   |        |        |        |       |  |                         |
| 20.186                        | 20.154 | 0.032  | 0.229  | 0.410 |  | new York State Electric |
| & Gas Corp (NYSEG)            |        |        |        |       |  |                         |
| 19.532                        | 19.496 | 0.037  | 0.265  | 0.396 |  | Public Service Co of    |
| new Hampshire                 |        |        |        |       |  |                         |
| 19.683                        | 19.644 | 0.038  | 0.280  | 0.390 |  | Atlantic City Electric  |
| Co                            |        |        |        |       |  |                         |
| 19.648                        | 19.603 | 0.046  | 0.330  | 0.371 |  | Idaho Power Co          |
| 17.363                        | 17.318 | 0.046  | 0.332  | 0.370 |  | OAKVILLE HYDRO          |
| ELECTRICITY DISTRIBUTION INC. |        |        |        |       |  |                         |
| 19.710                        | 19.665 | 0.046  | 0.331  | 0.370 |  | Public Service Co of    |
| Oklahoma                      |        |        |        |       |  |                         |
| 20.560                        | 20.513 | 0.046  | 0.336  | 0.369 |  | AmerenUE                |
| 16.675                        | 16.623 | 0.052  | 0.374  | 0.354 |  | PUC DISTRIBUTION INC.   |
| 19.339                        | 19.273 | 0.067  | 0.482  | 0.315 |  | Gulf Power Co           |
| 20.807                        | 20.740 | 0.067  | 0.484  | 0.314 |  | Alabama Power Co        |
| 17.237                        | 17.169 | 0.067  | 0.487  | 0.313 |  | WATERLOO NORTH HYDRO    |
| INC.                          |        |        |        |       |  |                         |
| 19.790                        | 19.716 | 0.074  | 0.536  | 0.296 |  | Metropolitan Edison Co  |
| 20.605                        | 20.529 | 0.076  | 0.506  | 0.307 |  | San Diego Gas &         |
| Electric Co                   |        |        |        |       |  |                         |
| 16.165                        | 16.085 | 0.079  | 0.576  | 0.282 |  | NORFOLK POWER           |
| DISTRIBUTION INC.             |        |        |        |       |  |                         |
| 17.133                        | 17.049 | 0.084  | 0.610  | 0.271 |  | GUELPH HYDRO ELECTRIC   |
| SYSTEMS INC.                  |        |        |        |       |  |                         |
| 16.110                        | 16.018 | 0.091  | 0.665  | 0.253 |  | ERIE THAMES POWERLINES  |
| CORPORATION                   |        |        |        |       |  |                         |
| 19.530                        | 19.439 | 0.092  | 0.667  | 0.252 |  | Entergy Mississippi Inc |
| 16.135                        | 16.041 | 0.094  | 0.684  | 0.247 |  | FESTIVAL HYDRO INC.     |
| 20.508                        | 20.405 | 0.103  | 0.694  | 0.244 |  | Arizona Public Service  |
| Co                            |        |        |        |       |  |                         |
| 20.539                        | 20.429 | 0.109  | 0.790  | 0.215 |  | Baltimore Gas &         |
| Electric Co                   |        |        |        |       |  |                         |
| 17.705                        | 17.588 | 0.117  | 0.851  | 0.197 |  | ENWIN UTILITIES LTD.    |
| 15.038                        | 14.920 | 0.118  | 0.858  | 0.196 |  | MIDLAND POWER UTILITY   |

PSE\_Sep23Data\_TC\_COMBINEDdata.txt

|                                   |        |        |       |       |       |                         |
|-----------------------------------|--------|--------|-------|-------|-------|-------------------------|
| CORPORATION                       | 14.538 | 14.411 | 0.126 | 0.908 | 0.182 | RENFREW HYDRO INC.      |
|                                   | 19.507 | 19.381 | 0.126 | 0.903 | 0.183 | Northern Indiana Public |
| Service Co                        | 20.628 | 20.495 | 0.133 | 0.966 | 0.167 | Connecticut Light &     |
| Power Co                          | 14.982 | 14.835 | 0.147 | 1.066 | 0.143 | CENTRE WELLINGTON HYDRO |
| LTD.                              | 18.333 | 18.183 | 0.149 | 1.073 | 0.142 | Southern Indiana Gas    |
| and Electric Co (Vectern)         | 14.889 | 14.724 | 0.164 | 1.188 | 0.117 | KENORA HYDRO ELECTRIC   |
| CORPORATION LTD.                  | 19.267 | 19.101 | 0.166 | 1.206 | 0.114 | Sierra Pacific Power Co |
|                                   | 19.954 | 19.779 | 0.174 | 1.267 | 0.103 | South Carolina Electric |
| & Gas Co                          | 15.137 | 14.963 | 0.174 | 1.260 | 0.104 | TILLSONBURG HYDRO INC.  |
|                                   | 18.806 | 18.619 | 0.186 | 1.347 | 0.089 | Kentucky Power Co (AEP) |
|                                   | 14.554 | 14.352 | 0.202 | 1.454 | 0.073 | WEST COAST HURON ENERGY |
| INC.                              | 14.445 | 14.242 | 0.203 | 1.459 | 0.072 | ESPANOLA REGIONAL HYDRO |
| DISTRIBUTION CORPORATION          | 19.204 | 18.975 | 0.229 | 1.657 | 0.049 | Cleco Corp              |
|                                   | 19.431 | 19.197 | 0.234 | 1.698 | 0.045 | Rochester Gas and       |
| Electric Corp                     | 13.711 | 13.470 | 0.241 | 1.709 | 0.044 | COOPERATIVE HYDRO       |
| EMBRUN INC.                       | 20.085 | 19.842 | 0.243 | 1.769 | 0.039 | Pennsylvania Electric   |
| Co                                | 15.440 | 15.195 | 0.245 | 1.770 | 0.038 | NIAGARA-ON-THE-LAKE     |
| HYDRO INC.                        | 18.342 | 18.096 | 0.246 | 1.773 | 0.038 | Entergy new Orleans Inc |
|                                   | 19.773 | 19.505 | 0.268 | 1.976 | 0.024 | Delmarva Power & Light  |
| Co                                | 19.273 | 19.003 | 0.269 | 1.962 | 0.025 | Central Hudson Gas &    |
| Electric Corp (CHGE)              | 16.798 | 16.525 | 0.273 | 1.976 | 0.024 | Entegrus Powerlines     |
|                                   | 14.653 | 14.378 | 0.275 | 1.975 | 0.024 | WELLINGTON NORTH POWER  |
| INC.                              | 18.108 | 17.829 | 0.279 | 2.035 | 0.021 | Green Mountain Power    |
| Corp                              | 15.686 | 15.401 | 0.285 | 2.069 | 0.019 | BRANT COUNTY POWER INC. |
|                                   | 18.926 | 18.622 | 0.304 | 2.214 | 0.013 | Western Massachusetts   |
| Electric Co (Northeast Utilities) | 20.995 | 20.688 | 0.307 | 2.234 | 0.013 | Niagara Mohawk Power    |
| Corp (National Grid)              | 14.622 | 14.307 | 0.315 | 2.264 | 0.012 | FORT FRANCES POWER      |
| CORPORATION                       | 14.512 | 14.192 | 0.321 | 2.288 | 0.011 | SIOUX LOOKOUT HYDRO     |
| INC.                              | 16.729 | 16.407 | 0.323 | 2.354 | 0.009 | CANADIAN NIAGARA POWER  |
| INC.                              | 13.555 | 13.226 | 0.330 | 2.322 | 0.010 | CHAPLEAU PUBLIC         |
| UTILITIES CORPORATION             | 18.376 | 18.002 | 0.373 | 2.690 | 0.004 | Madison Gas and         |
| Electric Co                       | 19.104 | 18.730 | 0.374 | 2.724 | 0.003 | Orange and Rockland     |
| Utilities Inc (O&R)               | 20.401 | 20.019 | 0.381 | 2.769 | 0.003 | Potomac Electric Power  |
| Co                                | 14.641 | 14.256 | 0.385 | 2.659 | 0.004 | PARRY SOUND POWER       |
| CORPORATION                       | 19.331 | 18.935 | 0.396 | 2.890 | 0.002 | United Illuminating Co  |
|                                   | 18.829 | 18.407 | 0.422 | 3.080 | 0.001 | Empire District         |

PSE\_Sep23Data\_TC\_COMBINEDdata.txt

Electric Co (M0)

|        |        |       |       |       |                         |
|--------|--------|-------|-------|-------|-------------------------|
| 19.035 | 18.601 | 0.434 | 3.101 | 0.001 | Mississippi Power Co    |
| 20.954 | 20.503 | 0.451 | 3.265 | 0.001 | HYDRO ONE NETWORKS INC. |
| 17.896 | 17.401 | 0.495 | 3.611 | 0.000 | Black Hills Power Inc   |
| 14.177 | 13.536 | 0.642 | 4.555 | 0.000 | ATIKOKAN HYDRO INC.     |
| 16.789 | 15.774 | 1.015 | 7.633 | 0.000 | ALGOMA POWER INC.       |

OUT-OF-SAMPLE PREDICTION OF TOTAL COST LEVEL PERFORMANCE by Year

| Year           | Actual         | Predicted      | Difference | t_ratio | p_value |
|----------------|----------------|----------------|------------|---------|---------|
| Toronto Hydro: |                |                |            |         |         |
| 2002.000       | 435010368.000  | 582282815.451  | -0.292     | -1.180  | 0.119   |
| 2003.000       | 450339136.000  | 594901426.833  | -0.278     | -1.126  | 0.130   |
| 2004.000       | 454122880.000  | 603751749.032  | -0.285     | -1.153  | 0.125   |
| 2005.000       | 449667584.000  | 629242188.989  | -0.336     | -1.359  | 0.087   |
| 2006.000       | 457014912.000  | 634717092.813  | -0.328     | -1.329  | 0.092   |
| 2007.000       | 484482944.000  | 664037429.599  | -0.315     | -1.276  | 0.101   |
| 2008.000       | 518147392.000  | 683185631.674  | -0.277     | -1.119  | 0.132   |
| 2009.000       | 535624544.000  | 702537116.946  | -0.271     | -1.098  | 0.136   |
| 2010.000       | 586112768.000  | 731354150.842  | -0.221     | -0.896  | 0.185   |
| 2011.000       | 637697472.000  | 762017432.522  | -0.178     | -0.721  | 0.236   |
| 2012.000       | 598313344.000  | 763710990.149  | -0.244     | -0.988  | 0.162   |
| 2013.000       | 657159296.000  | 780468084.590  | -0.172     | -0.696  | 0.243   |
| 2014.000       | 729767040.000  | 844616783.326  | -0.146     | -0.591  | 0.277   |
| 2015.000       | 824746240.000  | 882807348.471  | -0.068     | -0.275  | 0.392   |
| 2016.000       | 887888000.000  | 934275899.573  | -0.051     | -0.206  | 0.418   |
| 2017.000       | 949368896.000  | 983648464.933  | -0.035     | -0.144  | 0.443   |
| 2018.000       | 1003643904.000 | 1035898257.853 | -0.032     | -0.128  | 0.449   |
| 2019.000       | 1067738240.000 | 1091155420.326 | -0.022     | -0.088  | 0.465   |

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PSE\_Sep23Data\_SAIDI\_a USdata.txt  
 » run C:\work\THESL2\Specification\SAIDI2;

## RELIABILITY MODELS

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### RELIABILITY MODELS

7/07/2014 OUTPUT FILE: C:\work\THESL2\results\SAIDI2 14:09:52

Output using the data set C:\work\THESL2\th\_benchb\_July7.xlsx

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### DEFINITIONS OF VARIABLES:

var1 is const  
 var2 is Retail Customers (yn)  
 var3 is sum of wind days base 10kts  
 var4 is customer/DX miles (UDI)  
 var5 is % forestation using GIS area1

Time period used: 2002 through 2012

391.000

### REGRESSION WITH GROUPWISE HETEROSKEDASTICITY

|                |         |                     |          |
|----------------|---------|---------------------|----------|
| Valid cases:   | 384     | Dependent variable: | LSAIDI_A |
| Total SS:      | 386.507 | Degrees of freedom: | 375      |
| R-squared:     | 0.132   | Rbar-squared:       | 0.113    |
| Residual SS:   | 335.623 | Std error of est:   | 0.946    |
| F(9,375):      | 6.317   | Probability of F:   | 0.000    |
| Durbin-Watson: | 1.530   | Number of Firms:    | 47.000   |

| Variable | Estimate  | Standard Error | t-value   | Prob > t | Standardized Estimate | Cor with Dep Var |
|----------|-----------|----------------|-----------|----------|-----------------------|------------------|
| CONST    | 5.404551  | 0.084412       | 64.025591 | 0.000    | 1.001992              | 0.991514         |
| LYN      | 0.025494  | 0.036264       | 0.703001  | 0.482    | 0.004718              | -0.258194        |
| LWDD10   | 0.168133  | 0.091284       | 1.841871  | 0.066    | 0.021433              | -0.447888        |
| LDENSITY | -0.172855 | 0.081745       | -2.114553 | 0.035    | -0.015128             | -0.333485        |
| LPFGIS1  | 0.517214  | 0.110014       | 4.701365  | 0.000    | 0.051240              | -0.189751        |
| LWDD10SQ | 0.157068  | 0.147000       | 1.068493  | 0.286    | 0.015037              | 0.421538         |
| LDENSQ   | -2.116168 | 0.313441       | -6.751402 | 0.000    | -0.065393             | 0.635045         |
| LPFGISSQ | -0.243654 | 0.282981       | -0.861027 | 0.390    | -0.011854             | 0.509600         |
| TREND    | 0.048448  | 0.010802       | 4.485034  | 0.000    | 0.057333              | 0.899714         |

### OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE LAST THREE YEARS

| Actual   | Predicted | Difference | t_ratio   | p_value  | Utility                             |
|----------|-----------|------------|-----------|----------|-------------------------------------|
| 4.394298 | 5.703171  | -1.308873  | -2.334477 | 0.010048 | Wisconsin Electric Power Co (WEPCO) |
| 4.860706 | 6.054332  | -1.193625  | -2.174080 | 0.015161 | Rochester Gas and Electric Corp     |

| PSE_Sep23Data_SAIDI_a USdata.txt                |          |           |           |          |                      |
|-------------------------------------------------|----------|-----------|-----------|----------|----------------------|
| 4.469494                                        | 5.611284 | -1.141790 | -2.081007 | 0.019055 | Indianapolis Power & |
| Light Co                                        |          |           |           |          |                      |
| 4.496515                                        | 5.509823 | -1.013308 | -1.805681 | 0.035884 | Florida Power &      |
| Light Co                                        |          |           |           |          |                      |
| 4.517652                                        | 5.439662 | -0.922011 | -1.623783 | 0.052630 | TORONTO              |
| HYDRO-ELECTRIC SYSTEM LIMITED                   |          |           |           |          |                      |
| 4.733827                                        | 5.628702 | -0.894874 | -0.938259 | 0.174357 | Florida Power Corp   |
| 3.981867                                        | 4.738806 | -0.756939 | -1.382386 | 0.083837 | Madison Gas and      |
| Electric Co                                     |          |           |           |          |                      |
| 5.353206                                        | 6.054287 | -0.701081 | -1.271061 | 0.102246 | Pacific Gas and      |
| Electric Co                                     |          |           |           |          |                      |
| 4.687669                                        | 5.365513 | -0.677844 | -0.994749 | 0.160249 | Tampa Electric Co    |
| 5.240363                                        | 5.853413 | -0.613050 | -1.096557 | 0.136768 | Portland General     |
| Electric Co                                     |          |           |           |          |                      |
| 5.158899                                        | 5.752444 | -0.593546 | -1.054723 | 0.146115 | AmerenUE             |
| 5.026624                                        | 5.590237 | -0.563613 | -1.024638 | 0.153096 | Southern California  |
| Edison Co                                       |          |           |           |          |                      |
| 4.946763                                        | 5.402335 | -0.455572 | -0.830039 | 0.203522 | Wisconsin Power and  |
| Light Co                                        |          |           |           |          |                      |
| 5.759316                                        | 6.108190 | -0.348874 | -0.622446 | 0.267013 | Cleveland Electric   |
| Illuminating Co (First Energy)                  |          |           |           |          |                      |
| 5.302734                                        | 5.622952 | -0.320218 | -0.568450 | 0.285034 | Gulf Power Co        |
| 5.109422                                        | 5.348450 | -0.239028 | -0.435187 | 0.331838 | Avista Corp          |
| 5.711924                                        | 5.945884 | -0.233960 | -0.419218 | 0.337648 | Green Mountain Power |
| Corp                                            |          |           |           |          |                      |
| 5.287357                                        | 5.486828 | -0.199471 | -0.355748 | 0.361114 | Entergy Arkansas Inc |
| 5.603710                                        | 5.788807 | -0.185097 | -0.331014 | 0.370409 | Ohio Edison Co       |
| (First Energy)                                  |          |           |           |          |                      |
| 5.292851                                        | 5.458972 | -0.166121 | -0.296905 | 0.383352 | Niagara Mohawk Power |
| Corp (National Grid)                            |          |           |           |          |                      |
| 5.175708                                        | 5.283806 | -0.108098 | -0.193228 | 0.423442 | Kansas City Power &  |
| Light Co (MO)                                   |          |           |           |          |                      |
| 5.814559                                        | 5.882594 | -0.068035 | -0.121272 | 0.451770 | Virginia Electric    |
| and Power Co                                    |          |           |           |          |                      |
| 5.276219                                        | 5.266675 | 0.009543  | 0.017339  | 0.493088 | Southern Indiana Gas |
| and Electric Co (Vectern)                       |          |           |           |          |                      |
| 6.074367                                        | 5.868968 | 0.205399  | 0.373486  | 0.354499 | Consolidated Edison  |
| Co of new York Inc (CONED)                      |          |           |           |          |                      |
| 5.697999                                        | 5.479126 | 0.218874  | 0.396879  | 0.345841 | PSI Energy Inc (Duke |
| Energy IN)                                      |          |           |           |          |                      |
| 6.227470                                        | 5.988339 | 0.239131  | 0.432696  | 0.332742 | Orange and Rockland  |
| Utilities Inc (O&R)                             |          |           |           |          |                      |
| 6.422220                                        | 6.063156 | 0.359063  | 0.654007  | 0.256753 | Western              |
| Massachusetts Electric Co (Northeast Utilities) |          |           |           |          |                      |
| 6.053607                                        | 5.645446 | 0.408161  | 0.742565  | 0.229105 | Wisconsin Public     |
| Service Co                                      |          |           |           |          |                      |
| 6.290832                                        | 5.800371 | 0.490461  | 0.893533  | 0.186072 | Consumers Energy     |
| Company                                         |          |           |           |          |                      |
| 6.302029                                        | 5.804186 | 0.497843  | 0.890424  | 0.186904 | Potomac Electric     |
| Power Co                                        |          |           |           |          |                      |
| 6.259686                                        | 5.670575 | 0.589111  | 1.052598  | 0.146601 | Cincinnati Gas &     |
| Electric Co (Duke Energy OH)                    |          |           |           |          |                      |
| 6.066628                                        | 5.464288 | 0.602340  | 1.093698  | 0.137394 | Northern Indiana     |
| Public Service Co                               |          |           |           |          |                      |
| 6.360216                                        | 5.670539 | 0.689677  | 1.233008  | 0.109172 | Ohio Power Co (AEP)  |
| 5.933163                                        | 5.199555 | 0.733608  | 1.302768  | 0.096726 | Dayton Power & Light |
| Co                                              |          |           |           |          |                      |
| 6.212301                                        | 5.431163 | 0.781138  | 1.422160  | 0.077904 | Detroit Edison       |
| 5.764104                                        | 4.976654 | 0.787450  | 1.433308  | 0.076300 | Commonwealth Edison  |
| Co                                              |          |           |           |          |                      |
| 6.697521                                        | 5.796272 | 0.901248  | 1.606622  | 0.054488 | Central Maine Power  |
| Co                                              |          |           |           |          |                      |
| 6.877696                                        | 5.905523 | 0.972173  | 1.768925  | 0.038859 | new York State       |

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|                             |          |          |          |          |          |                      |
|-----------------------------|----------|----------|----------|----------|----------|----------------------|
| Electric & Gas Corp (NYSEG) | 6.340216 | 5.338806 | 1.001409 | 1.774842 | 0.038367 | Louisville Gas and   |
| Electric Co                 | 5.002443 | 3.936652 | 1.065791 | 1.915850 | 0.028071 | San Diego Gas &      |
| Electric Co                 | 6.913967 | 5.694458 | 1.219509 | 2.179377 | 0.014962 | Baltimore Gas &      |
| Electric Co                 | 6.978886 | 5.382420 | 1.596465 | 2.832915 | 0.002431 | Kentucky Power Co    |
| (AEP)                       | 7.379586 | 5.764133 | 1.615454 | 2.931299 | 0.001791 | Central Hudson Gas & |
| Electric Corp (CHGE)        | 7.154407 | 5.492822 | 1.661584 | 2.949141 | 0.001693 | Empire District      |
| Electric Co (MO)            | 7.658442 | 5.964228 | 1.694214 | 3.081482 | 0.001106 | Connecticut Light &  |
| Power Co                    | 6.775079 | 5.062750 | 1.712329 | 3.052554 | 0.001215 | Oklahoma Gas and     |
| Electric Co                 | 7.093782 | 5.100017 | 1.993765 | 3.622489 | 0.000166 | United Illuminating  |
| Co                          |          |          |          |          |          |                      |

CONFIDENCE INTERVAL OF THE THREE YEAR AVERAG SCORE: THESL2

|             |         |
|-------------|---------|
| Lower Bound | 111.129 |
| Predicted   | 230.364 |
| Upper Bound | 477.531 |

OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE BY YEAR

| Year     | Actual   | Predicted | %Difference | t_ratio | p_value |
|----------|----------|-----------|-------------|---------|---------|
| THESL2:  |          |           |             |         |         |
| 2005.000 | 104.893  | 169.889   | -0.482      | -0.502  | 0.308   |
| 2006.000 | 94.063   | 189.375   | -0.700      | -0.726  | 0.234   |
| 2007.000 | 117.000  | 205.328   | -0.562      | -0.582  | 0.280   |
| 2008.000 | 74.400   | 208.254   | -1.029      | -1.068  | 0.143   |
| 2009.000 | 174.169  | 210.136   | -0.188      | -0.195  | 0.423   |
| 2010.000 | 99.596   | 201.500   | -0.705      | -0.735  | 0.231   |
| 2011.000 | 85.800   | 234.120   | -1.004      | -1.046  | 0.148   |
| 2012.000 | 90.000   | 259.138   | -1.058      | -1.101  | 0.136   |
| 2013.000 | 1271.400 | 297.520   | 1.452       | 1.443   | 0.075   |
| 2014.000 | 71.400   | 302.899   | -1.445      | -1.436  | 0.076   |
| 2015.000 | 73.800   | 315.912   | -1.454      | -1.444  | 0.075   |
| 2016.000 | 70.200   | 329.067   | -1.545      | -1.533  | 0.063   |
| 2017.000 | 67.200   | 343.341   | -1.631      | -1.617  | 0.053   |
| 2018.000 | 64.800   | 358.007   | -1.709      | -1.693  | 0.046   |
| 2019.000 | 61.200   | 373.028   | -1.808      | -1.788  | 0.037   |

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 » run C:\work\THESL2\Specification\SAIFI2;

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# RELIABILITY MODELS

7/07/2014 OUTPUT FILE: C:\work\THESL2\results\SAIFI2 14:11:36

Output using the data set C:\work\THESL2\th\_benchb\_July7.xlsx

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## DEFINITIONS OF VARIABLES:

var1 is const  
 var2 is Retail Customers (yn)  
 var3 is customer/DX miles (UDI)  
 var4 is % forestation using GIS area1  
 var5 is elevation stdev  
 var6 is lightning strikes/service territory

Time period used: 2002 through 2012

391.000

## REGRESSION WITH GROUPWISE HETEROSKEDASTICITY

|                |        |                     |          |
|----------------|--------|---------------------|----------|
| Valid cases:   | 384    | Dependent variable: | LSAIFI_A |
| Total SS:      | 98.189 | Degrees of freedom: | 373      |
| R-squared:     | 0.192  | Rbar-squared:       | 0.170    |
| Residual SS:   | 79.363 | Std error of est:   | 0.461    |
| F(11,373):     | 8.044  | Probability of F:   | 0.000    |
| Durbin-Watson: | 1.265  | Number of Firms:    | 47.000   |

| Variable | Estimate  | Standard Error | t-value   | Prob > t | Standardized Estimate | Cor with Dep Var |
|----------|-----------|----------------|-----------|----------|-----------------------|------------------|
| CONST    | 0.423245  | 0.042616       | 9.931687  | 0.000    | 0.957457              | 0.705161         |
| LYN      | -0.027404 | 0.015397       | -1.779832 | 0.076    | -0.065634             | -0.217873        |
| LDENSITY | -0.153592 | 0.033069       | -4.644671 | 0.000    | -0.155447             | -0.211588        |
| LPFGIS1  | 0.240563  | 0.045964       | 5.233717  | 0.000    | 0.315660              | -0.042566        |
| LELEVSTD | 0.109400  | 0.024784       | 4.414074  | 0.000    | 0.353183              | -0.424810        |
| LLIGHT1  | 0.217116  | 0.022016       | 9.861728  | 0.000    | 0.607499              | 0.109392         |
| LDENSQ   | -0.970382 | 0.108947       | -8.906946 | 0.000    | -0.339797             | 0.291002         |
| LPFGISSQ | 0.210702  | 0.117231       | 1.797326  | 0.073    | 0.134665              | 0.315845         |
| LELEVSQ  | 0.035407  | 0.019158       | 1.848172  | 0.065    | 0.125431              | 0.429202         |
| LLIGHTSQ | 0.060519  | 0.014702       | 4.116324  | 0.000    | 0.234880              | 0.189354         |
| TREND    | 0.007685  | 0.004250       | 1.808084  | 0.071    | 0.117274              | 0.633920         |

## OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE LAST THREE YEARS

| Actual                                         | Predicted | Difference | t_ratio   | p_value  | Utility    |
|------------------------------------------------|-----------|------------|-----------|----------|------------|
| -1.261445                                      | 0.283364  | -1.544809  | -5.766407 | 0.000000 | 40.000000  |
| Consolidated Edison Co of new York Inc (CONED) |           |            |           |          |            |
| -0.405241                                      | 0.281258  | -0.686499  | -2.540886 | 0.005730 | 201.000000 |
|                                                |           |            |           |          | Wisconsin  |

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|                                                 |           |           |           |           |          |            |           |
|-------------------------------------------------|-----------|-----------|-----------|-----------|----------|------------|-----------|
| Electric Power Co (WEPCO)                       | -0.112624 | 0.562868  | -0.675492 | -2.506853 | 0.006302 | 148.000000 | Portland  |
| General Electric Co                             | -0.090105 | 0.531792  | -0.621897 | -2.325498 | 0.010290 | 159.000000 | Rochester |
| Gas and Electric Corp                           | 0.081452  | 0.590462  | -0.509009 | -1.885713 | 0.030054 | 8.000000   | AmerenUE  |
|                                                 | -0.066965 | 0.439264  | -0.506229 | -1.882381 | 0.030280 | 89.000000  | Kansas    |
| City Power & Light Co (MO)                      | -0.523162 | -0.073355 | -0.449808 | -1.680346 | 0.046863 | 99.000000  | Madison   |
| Gas and Electric Co                             | 0.134937  | 0.493855  | -0.358918 | -1.094757 | 0.137164 | 178.000000 | Tampa     |
| Electric Co                                     | -0.024127 | 0.299882  | -0.324009 | -1.207357 | 0.114029 | 78.000000  |           |
| Indianapolis Power & Light Co                   | -0.009508 | 0.264522  | -0.274030 | -1.021687 | 0.153795 | 169.000000 | Southern  |
| California Edison Co                            | -0.021767 | 0.225000  | -0.246767 | -0.911782 | 0.181235 | 202.000000 | Wisconsin |
| Power and Light Co                              | 0.328138  | 0.449617  | -0.121480 | -0.451402 | 0.325981 | 30.000000  | Cleveland |
| Electric Illuminating Co (First Energy)         | 0.127263  | 0.239340  | -0.112077 | -0.414058 | 0.339535 | 126.000000 | Niagara   |
| Mohawk Power Corp (National Grid)               | 0.491131  | 0.570797  | -0.079666 | -0.298066 | 0.382909 | 140.000000 | Orange    |
| and Rockland Utilities Inc (O&R)                | 0.173500  | 0.246165  | -0.072665 | -0.269594 | 0.393810 | 62.000000  | Florida   |
| Power & Light Co                                | 0.335007  | 0.390396  | -0.055388 | -0.205592 | 0.418611 | 171.000000 | Southern  |
| Indiana Gas and Electric Co (Vectern)           | 0.587787  | 0.632412  | -0.044625 | -0.096448 | 0.461608 | 63.000000  | Florida   |
| Power Corp                                      | 0.535264  | 0.566058  | -0.030795 | -0.114485 | 0.454457 | 67.000000  | Green     |
| Mountain Power Corp                             | 0.538521  | 0.567274  | -0.028753 | -0.107134 | 0.457370 | 198.000000 | Western   |
| Massachusetts Electric Co (Northeast Utilities) | 0.139903  | 0.164890  | -0.024987 | -0.092340 | 0.463239 | 46.000000  | Detroit   |
| Edison                                          | 0.222808  | 0.224516  | -0.001708 | -0.006381 | 0.497456 | 142.000000 | Pacific   |
| Gas and Electric Co                             | 0.616739  | 0.604027  | 0.012712  | 0.047079  | 0.481238 | 54.000000  | Entergy   |
| Arkansas Inc                                    | 0.331404  | 0.283774  | 0.047630  | 0.177143  | 0.429746 | 130.000000 | Northern  |
| Indiana Public Service Co                       | 0.555870  | 0.502709  | 0.053162  | 0.197681  | 0.421701 | 138.000000 | Oklahoma  |
| Gas and Electric Co                             | 0.449423  | 0.375603  | 0.073819  | 0.274621  | 0.391880 | 136.000000 | Ohio      |
| Power Co (AEP)                                  | 0.429047  | 0.342141  | 0.086906  | 0.323333  | 0.373312 | 135.000000 | Ohio      |
| Edison Co (First Energy)                        | 0.384417  | 0.292004  | 0.092413  | 0.344798  | 0.365220 | 43.000000  | Consumers |
| Energy Company                                  | 0.479624  | 0.379037  | 0.100587  | 0.374199  | 0.354234 | 98.000000  |           |
| Louisville Gas and Electric Co                  | 0.534561  | 0.425046  | 0.109516  | 0.407602  | 0.341900 | 152.000000 | PSI       |
| Energy Inc (Duke Energy IN)                     | 0.401763  | 0.284830  | 0.116933  | 0.434756  | 0.331995 | 44.000000  | Dayton    |
| Power & Light Co                                | 0.292006  | 0.173530  | 0.118475  | 0.440534  | 0.329903 | 32.000000  |           |
| Commonwealth Edison Co                          | 0.609312  | 0.487834  | 0.121479  | 0.451379  | 0.325989 | 68.000000  | Gulf      |
| Power Co                                        | 0.443139  | 0.284763  | 0.158376  | 0.592704  | 0.276869 | 203.000000 |           |
| Wisconsin Public Service Co                     | 0.728100  | 0.568643  | 0.159457  | 0.593722  | 0.276528 | 195.000000 | Virginia  |



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|                                               |           |           |          |          |          |            |           |
|-----------------------------------------------|-----------|-----------|----------|----------|----------|------------|-----------|
| Electric and Power Co                         | 0.232960  | 0.008042  | 0.224919 | 0.837923 | 0.201305 | 12.000000  | Avista    |
| Corp                                          | 0.641705  | 0.375983  | 0.265722 | 0.988074 | 0.161878 | 13.000000  | Baltimore |
| Gas & Electric Co                             | 0.705650  | 0.434710  | 0.270940 | 1.015403 | 0.155285 | 124.000000 | new York  |
| State Electric & Gas Corp (NYSEG)             | 0.707572  | 0.429775  | 0.277797 | 1.034428 | 0.150802 | 36.000000  |           |
| Connecticut Light & Power Co                  | -0.129984 | -0.435246 | 0.305262 | 1.135764 | 0.128391 | 163.000000 | San Diego |
| Gas & Electric Co                             | 0.849303  | 0.529721  | 0.319583 | 1.194118 | 0.116594 | 21.000000  | Central   |
| Hudson Gas & Electric Corp (CHGE)             | 0.368462  | -0.006784 | 0.375246 | 1.396025 | 0.081767 | 186.000000 | United    |
| Illuminating Co                               | 0.809632  | 0.419840  | 0.389792 | 1.449814 | 0.073974 | 27.000000  |           |
| Cincinnati Gas & Electric Co (Duke Energy OH) | 0.852212  | 0.418058  | 0.434153 | 1.613085 | 0.053785 | 150.000000 | Potomac   |
| Electric Power Co                             | 0.539364  | 0.043991  | 0.495373 | 1.832048 | 0.033870 | 562.000000 | TORONTO   |
| HYDRO-ELECTRIC SYSTEM LIMITED                 | 1.032380  | 0.525231  | 0.507149 | 1.885754 | 0.030051 | 53.000000  | Empire    |
| District Electric Co (MO)                     | 1.171141  | 0.498163  | 0.672979 | 2.502160 | 0.006385 | 91.000000  | Kentucky  |
| Power Co (AEP)                                | 1.118035  | 0.389309  | 0.728726 | 2.709569 | 0.003524 | 23.000000  | Central   |
| Maine Power Co                                |           |           |          |          |          |            |           |

CONFIDENCE INTERVAL OF THE THREE YEAR AVERAG SCORE: THESL2

|             |       |
|-------------|-------|
| Lower Bound | 0.738 |
| Predicted   | 1.045 |
| Upper Bound | 1.479 |

OUT-OF-SAMPLE PREDICTION OF RELIABILITY LEVEL PERFORMANCE BY YEAR

| Year     | Actual | Predicted | %Difference | t_ratio | p_value |
|----------|--------|-----------|-------------|---------|---------|
| THESL2:  |        |           |             |         |         |
| 2005.000 | 2.007  | 1.070     | 0.629       | 1.356   | 0.088   |
| 2006.000 | 2.169  | 0.973     | 0.801       | 1.727   | 0.043   |
| 2007.000 | 2.270  | 0.989     | 0.830       | 1.789   | 0.037   |
| 2008.000 | 1.760  | 1.026     | 0.540       | 1.163   | 0.123   |
| 2009.000 | 1.863  | 1.000     | 0.622       | 1.341   | 0.090   |
| 2010.000 | 1.946  | 0.931     | 0.737       | 1.587   | 0.057   |
| 2011.000 | 1.620  | 1.120     | 0.369       | 0.795   | 0.213   |
| 2012.000 | 1.600  | 1.095     | 0.380       | 0.817   | 0.207   |
| 2013.000 | 2.910  | 1.128     | 0.948       | 0.990   | 0.162   |
| 2014.000 | 1.580  | 1.133     | 0.333       | 0.347   | 0.364   |
| 2015.000 | 1.550  | 1.134     | 0.312       | 0.326   | 0.372   |
| 2016.000 | 1.440  | 1.135     | 0.238       | 0.248   | 0.402   |
| 2017.000 | 1.360  | 1.137     | 0.179       | 0.186   | 0.426   |
| 2018.000 | 1.270  | 1.139     | 0.109       | 0.113   | 0.455   |
| 2019.000 | 1.190  | 1.141     | 0.042       | 0.044   | 0.482   |

>>

PSE\_Sep23Data\_TC\_USdata.txt  
run C:\work\THESL2\Specification\TC;

\*\*\*\*\*

Date: 7/14/14 \*\*\*\*\* STANDARD SUR ESTIMATION RESULTS \*\*\*\*\* Time: 15:04:06

OUTPUT FILE:C:\work\THESL2\results\TC

DATA FILE:C:\work\THESL2\th\_benchb\_July14.xlsx

\*\*\*\*\*

#### DEFINITIONS OF OUTPUT VARIABLES:

Y1 is Retail Customers (yn)

Y2 is peak demand

#### DEFINITIONS OF BUSINESS CONDITION VARIABLES:

Z1 is urban population above 1M

Z2 is % residential deliveries

electric customers

Z3 is % electric customers in gas +

plant

Z4 is % electric DX in total electric gross

Z5 is % plant UG

Z6 is elevation stdev

Z7 is % forestation using GIS area1

Model includes time trend.

Time period used: 2002 through 2012

887

=====

|                                                        |           |         |
|--------------------------------------------------------|-----------|---------|
| SEEMINGLY UNRELATED REGRESSION WITH HETEROSKEDASTICITY | 7/14/2014 | 3:04 pm |
|--------------------------------------------------------|-----------|---------|

=====

Data Set: C:\work\THESL2\Temp\_3.dat

DIVISOR USING N IN EFFECT  
RESTRICTIONS IN EFFECT

|           |   |                               |            |
|-----------|---|-------------------------------|------------|
| ITER. # = | 0 | LOG OF DETERMINANT OF SIGMA = | 0.18418796 |
| ITER. # = | 1 | LOG OF DETERMINANT OF SIGMA = | 0.14871343 |
| ITER. # = | 2 | LOG OF DETERMINANT OF SIGMA = | 0.14825417 |
| ITER. # = | 3 | LOG OF DETERMINANT OF SIGMA = | 0.14824839 |
| ITER. # = | 4 | LOG OF DETERMINANT OF SIGMA = | 0.14824832 |
| ITER. # = | 5 | LOG OF DETERMINANT OF SIGMA = | 0.14824831 |
| ITER. # = | 6 | LOG OF DETERMINANT OF SIGMA = | 0.14824831 |

-----  
Equation: 1  
Dependent variable: C  
-----

|              |     |              |     |
|--------------|-----|--------------|-----|
| Total cases: | 880 | Valid cases: | 880 |
|              |     | Page 1       |     |

PSE\_Sep23Data\_TC\_USdata.txt

|                |         |                     |        |
|----------------|---------|---------------------|--------|
| Total SS:      | 689.791 | Degrees of freedom: | ----   |
| R-squared:     | 0.952   | Rbar-squared:       | 0.952  |
| Residual SS:   | 32.908  | Std error of est:   | 0.193  |
| Durbin-Watson: | 1.572   | N_Firms:            | 86.000 |

| Variable | Estimated Coefficient | Standard Error | t-ratio  | Prob > t |
|----------|-----------------------|----------------|----------|----------|
| CONST    | 20.09759298           | 0.01310600     | 1533.465 | 0.0000   |
| WK       | 0.55517861            | 0.00386462     | 143.657  | 0.0000   |
| Y1       | 0.73184137            | 0.02387565     | 30.652   | 0.0000   |
| Y2       | 0.21983182            | 0.02465614     | 8.916    | 0.0000   |
| WKWK     | 0.07045799            | 0.01681458     | 4.190    | 0.0000   |
| Y1Y1     | 0.27046243            | 0.08261547     | 3.274    | 0.0011   |
| Y2Y2     | 0.14147774            | 0.08434567     | 1.677    | 0.0938   |
| WKY1     | -0.01000131           | 0.00979043     | -1.022   | 0.3073   |
| WKY2     | 0.01274697            | 0.00997272     | 1.278    | 0.2015   |
| Y1Y2     | -0.17661677           | 0.08038591     | -2.197   | 0.0283   |
| Z1       | 0.01608966            | 0.00282917     | 5.687    | 0.0000   |
| Z2       | 0.03933424            | 0.01510692     | 2.604    | 0.0094   |
| Z3       | 0.13201853            | 0.02754192     | 4.793    | 0.0000   |
| Z4       | 0.12188330            | 0.01604666     | 7.596    | 0.0000   |
| Z5       | -0.03481037           | 0.01510330     | -2.305   | 0.0214   |
| Z6       | 0.01314543            | 0.00614414     | 2.140    | 0.0327   |
| Z7       | 0.01971245            | 0.00564917     | 3.489    | 0.0005   |
| TREND    | 0.00319701            | 0.00111307     | 2.872    | 0.0042   |

-----  
Equation: 2  
Dependent variable: SK  
-----

|                |        |                     |        |
|----------------|--------|---------------------|--------|
| Total cases:   | 880    | Valid cases:        | 880    |
| Total SS:      | 6.370  | Degrees of freedom: | ----   |
| R-squared:     | -0.022 | Rbar-squared:       | -0.021 |
| Residual SS:   | 6.511  | Std error of est:   | 0.086  |
| Durbin-Watson: | 1.447  | N_Firms:            | 86.000 |

| Variable | Estimated Coefficient | Standard Error | t-ratio | Prob > t |
|----------|-----------------------|----------------|---------|----------|
| CONST    | 0.55517861            | 0.00386462     | 143.657 | 0.0000   |
| WK       | 0.07045799            | 0.01681458     | 4.190   | 0.0000   |
| Y1       | -0.01000131           | 0.00979043     | -1.022  | 0.3073   |
| Y2       | 0.01274697            | 0.00997272     | 1.278   | 0.2015   |

-----  
Equation: 3  
Dependent variable: SLM  
-----

|          |                       |                |                     |          |
|----------|-----------------------|----------------|---------------------|----------|
|          |                       |                | Valid cases:        | 880      |
|          |                       |                | Degrees of freedom: | ----     |
| Variable | Estimated Coefficient | Standard Error | t-ratio             | Prob > t |
| -----    | -----                 | -----          | -----               | -----    |
| CONST    | 0.44482139            | 0.00386462     | 115.101             | 0.0000   |
| WK       | -0.07045799           | 0.01681458     | -4.190              | 0.0000   |
| Y1       | 0.01000131            | 0.00979043     | 1.022               | 0.3082   |
| Y2       | -0.01274697           | 0.00997272     | -1.278              | 0.2027   |

-----  
 MEASURES OF GOODNESS-OF-FIT  
 -----

|                               |       |
|-------------------------------|-------|
| AN UNCENTERED SYSTEM R-SQUARE | 0.955 |
| A CENTERED SYSTEM R-SQUARE    | 0.958 |

The results from the test of the null hypothesis that all slope coefficients in all equations are simultaneously equal to zero.

|                |          |
|----------------|----------|
| Test statistic | Prob > t |
| 2783.325       | 0.0000   |

-----  
 VALIDATION OF REGULARITY CONDITIONS  
 -----

Monotonicity of the Estimated Cost Function

The number of observations for which each of the following predicted cost share is nonpositive is listed below

|          |                     |
|----------|---------------------|
| Capital  | Labor and Materials |
| 0        | 0                   |
| (0.00 %) | (0.00 %)            |

Concavity of the Estimated Cost Function

The number of the observations for which the condition that the matrix of second order partial derivatives of the cost function with respect to input wages is negative semi-definite holds:

591 (67.16 %)

Quasi-Concavity of the Estimated Cost Function

The number of observations for which the condition that the cost function is strictly quasi-concave in input prices holds:

880 (100.00 %)

Second Order Condition for Cost Minimization

The number of the observations for which the condition that the bordered Hessian is negative definite holds:

880 (100.00 %)

OUT-OF-SAMPLE PREDICTION OF TOTAL COST LEVEL PERFORMANCE last 3 years

| Actual | Predicted | Difference | t_ratio | p_value | Utility               |
|--------|-----------|------------|---------|---------|-----------------------|
| 19.640 | 20.379    | -0.739     | -7.112  | 0.000   | Ohio Edison Co (First |

## PSE\_Sep23Data\_TC\_USdata.txt

|                                |        |        |        |        |       |                         |
|--------------------------------|--------|--------|--------|--------|-------|-------------------------|
| Energy)                        | 19.579 | 20.063 | -0.484 | -4.423 | 0.000 | Cleveland Electric      |
| Illuminating Co (First Energy) | 21.499 | 21.960 | -0.461 | -3.780 | 0.000 | Commonwealth Edison Co  |
|                                | 18.350 | 18.767 | -0.417 | -3.819 | 0.000 | Pennsylvania Power Co   |
|                                | 17.735 | 18.113 | -0.378 | -3.178 | 0.001 | MDU Resources Group,    |
| Inc.                           | 19.214 | 19.585 | -0.371 | -3.296 | 0.001 | Potomac Edison Co       |
|                                | 19.714 | 20.077 | -0.363 | -3.235 | 0.001 | West Penn Power Co      |
| (Allegheny Power)              | 19.136 | 19.464 | -0.328 | -2.923 | 0.002 | Indianapolis Power &    |
| Light Co                       | 21.402 | 21.729 | -0.327 | -2.729 | 0.003 | Florida Power & Light   |
| Co                             | 19.158 | 19.470 | -0.312 | -2.139 | 0.016 | Southwestern Public     |
| Service (Xcel)                 | 20.001 | 20.312 | -0.311 | -2.589 | 0.005 | TORONTO HYDRO-ELECTRIC  |
| SYSTEM LIMITED                 | 19.161 | 19.440 | -0.279 | -2.457 | 0.007 | Public Service Co of    |
| new Mexico (PNM)               | 19.498 | 19.749 | -0.252 | -2.223 | 0.013 | Indiana Michigan Power  |
| Co                             | 19.511 | 19.741 | -0.230 | -2.033 | 0.021 | Kentucky Utilities Co   |
|                                | 20.281 | 20.470 | -0.190 | -1.385 | 0.083 | Public Service Co of    |
| Colorado                       | 19.082 | 19.267 | -0.185 | -1.646 | 0.050 | Louisville Gas and      |
| Electric Co                    | 19.540 | 19.722 | -0.182 | -1.547 | 0.061 | Central Maine Power Co  |
|                                | 20.121 | 20.290 | -0.169 | -1.504 | 0.066 | Wisconsin Electric      |
| Power Co (WEPCO)               | 18.806 | 18.959 | -0.154 | -1.302 | 0.097 | Kentucky Power Co (AEP) |
|                                | 20.317 | 20.454 | -0.138 | -1.004 | 0.158 | Northern States Power   |
| Co (XCEL)                      | 20.140 | 20.276 | -0.136 | -1.191 | 0.117 | Appalachian Power       |
| Company                        | 18.342 | 18.475 | -0.133 | -1.144 | 0.127 | Entergy new Orleans Inc |
|                                | 19.277 | 19.400 | -0.123 | -1.084 | 0.139 | Wisconsin Public        |
| Service Co                     | 18.108 | 18.228 | -0.121 | -1.005 | 0.158 | Green Mountain Power    |
| Corp                           | 18.333 | 18.452 | -0.119 | -1.034 | 0.151 | Southern Indiana Gas    |
| and Electric Co (Vectern)      | 19.435 | 19.543 | -0.108 | -0.959 | 0.169 | Dayton Power & Light Co |
|                                | 19.320 | 19.423 | -0.104 | -0.903 | 0.184 | Monongahela Power Co    |
|                                | 18.992 | 19.069 | -0.076 | -0.640 | 0.261 | El Paso Electric Co     |
|                                | 20.939 | 21.007 | -0.068 | -0.600 | 0.274 | Virginia Electric and   |
| Power Co                       | 19.683 | 19.750 | -0.067 | -0.598 | 0.275 | Atlantic City Electric  |
| Co                             | 19.339 | 19.399 | -0.060 | -0.522 | 0.301 | Gulf Power Co           |
|                                | 20.611 | 20.666 | -0.056 | -0.488 | 0.313 | Florida Power Corp      |
|                                | 19.975 | 20.017 | -0.042 | -0.365 | 0.358 | Nevada Power Co         |
|                                | 19.530 | 19.570 | -0.040 | -0.351 | 0.363 | Entergy Mississippi Inc |
|                                | 19.654 | 19.689 | -0.035 | -0.308 | 0.379 | Southwestern Electric   |
| Power Co (AEP)                 | 19.754 | 19.787 | -0.033 | -0.286 | 0.387 | Tampa Electric Co       |
|                                | 20.441 | 20.474 | -0.032 | -0.286 | 0.387 | Jersey Central Power &  |
| Light Co                       | 19.701 | 19.731 | -0.030 | -0.263 | 0.396 | Cincinnati Gas &        |
| Electric Co (Duke Energy OH)   | 19.742 | 19.771 | -0.029 | -0.252 | 0.400 | Duquesne Light Co       |
|                                | 19.987 | 20.015 | -0.029 | -0.250 | 0.401 | Portland General        |
| Electric Co                    |        |        |        |        |       |                         |

| PSE_Sep23Data_TC_USdata.txt       |        |        |        |       |                         |
|-----------------------------------|--------|--------|--------|-------|-------------------------|
| 20.351                            | 20.376 | -0.025 | -0.216 | 0.415 | Ohio Power Co (AEP)     |
| 20.171                            | 20.185 | -0.014 | -0.122 | 0.452 | Puget Sound Energy      |
| 20.605                            | 20.615 | -0.010 | -0.086 | 0.466 | San Diego Gas &         |
| Electric Co                       |        |        |        |       |                         |
| 19.975                            | 19.985 | -0.010 | -0.091 | 0.464 | Entergy Arkansas Inc    |
| 19.532                            | 19.541 | -0.009 | -0.080 | 0.468 | Public Service Co of    |
| new Hampshire                     |        |        |        |       |                         |
| 20.001                            | 20.009 | -0.008 | -0.071 | 0.472 | PSI Energy Inc (Duke    |
| Energy IN)                        |        |        |        |       |                         |
| 20.653                            | 20.650 | 0.003  | 0.024  | 0.490 | PP&L Inc                |
| 19.790                            | 19.786 | 0.004  | 0.031  | 0.488 | Metropolitan Edison Co  |
| 19.549                            | 19.539 | 0.010  | 0.088  | 0.465 | Wisconsin Power and     |
| Light Co                          |        |        |        |       |                         |
| 19.577                            | 19.547 | 0.030  | 0.262  | 0.397 | Kansas City Power &     |
| Light Co (MO)                     |        |        |        |       |                         |
| 18.376                            | 18.344 | 0.031  | 0.269  | 0.394 | Madison Gas and         |
| Electric Co                       |        |        |        |       |                         |
| 19.710                            | 19.674 | 0.037  | 0.323  | 0.373 | Public Service Co of    |
| Oklahoma                          |        |        |        |       |                         |
| 19.194                            | 19.156 | 0.038  | 0.332  | 0.370 | Avista Corp             |
| 20.790                            | 20.746 | 0.044  | 0.384  | 0.351 | Consumers Energy        |
| Company                           |        |        |        |       |                         |
| 21.005                            | 20.960 | 0.045  | 0.398  | 0.345 | Detroit Edison          |
| 20.106                            | 20.031 | 0.075  | 0.665  | 0.253 | Oklahoma Gas and        |
| Electric Co                       |        |        |        |       |                         |
| 19.104                            | 19.021 | 0.082  | 0.722  | 0.235 | Orange and Rockland     |
| Utilities Inc (O&R)               |        |        |        |       |                         |
| 21.735                            | 21.652 | 0.083  | 0.671  | 0.251 | Consolidated Edison Co  |
| of new York Inc (CONED)           |        |        |        |       |                         |
| 19.035                            | 18.952 | 0.084  | 0.693  | 0.244 | Mississippi Power Co    |
| 20.631                            | 20.546 | 0.086  | 0.749  | 0.227 | Carolina Power & Light  |
| Co                                |        |        |        |       |                         |
| 19.204                            | 19.113 | 0.091  | 0.805  | 0.211 | Cleco Corp              |
| 20.186                            | 20.084 | 0.101  | 0.878  | 0.190 | new York State Electric |
| & Gas Corp (NYSEG)                |        |        |        |       |                         |
| 19.507                            | 19.403 | 0.104  | 0.915  | 0.180 | Northern Indiana Public |
| Service Co                        |        |        |        |       |                         |
| 19.648                            | 19.540 | 0.108  | 0.956  | 0.170 | Idaho Power Co          |
| 19.132                            | 19.014 | 0.118  | 0.908  | 0.182 | Tucson Electric Power   |
| Co                                |        |        |        |       |                         |
| 17.896                            | 17.777 | 0.119  | 0.942  | 0.173 | Black Hills Power Inc   |
| 21.131                            | 21.009 | 0.121  | 1.057  | 0.145 | Duke Energy Corp        |
| 20.539                            | 20.415 | 0.124  | 1.095  | 0.137 | Baltimore Gas &         |
| Electric Co                       |        |        |        |       |                         |
| 21.883                            | 21.756 | 0.127  | 1.083  | 0.140 | Southern California     |
| Edison Co                         |        |        |        |       |                         |
| 19.273                            | 19.144 | 0.128  | 1.116  | 0.132 | Central Hudson Gas &    |
| Electric Corp (CHGE)              |        |        |        |       |                         |
| 20.560                            | 20.431 | 0.129  | 1.155  | 0.124 | AmerenUE                |
| 19.773                            | 19.637 | 0.136  | 1.226  | 0.110 | Delmarva Power & Light  |
| Co                                |        |        |        |       |                         |
| 18.926                            | 18.787 | 0.139  | 1.206  | 0.114 | Western Massachusetts   |
| Electric Co (Northeast Utilities) |        |        |        |       |                         |
| 20.508                            | 20.354 | 0.154  | 1.277  | 0.101 | Arizona Public Service  |
| Co                                |        |        |        |       |                         |
| 19.267                            | 19.093 | 0.175  | 1.554  | 0.060 | Sierra Pacific Power Co |
| 19.331                            | 19.154 | 0.177  | 1.561  | 0.059 | United Illuminating Co  |
| 18.829                            | 18.652 | 0.177  | 1.557  | 0.060 | Empire District         |
| Electric Co (MO)                  |        |        |        |       |                         |
| 19.431                            | 19.252 | 0.180  | 1.600  | 0.055 | Rochester Gas and       |
| Electric Corp                     |        |        |        |       |                         |
| 20.628                            | 20.447 | 0.181  | 1.603  | 0.055 | Connecticut Light &     |
| Power Co                          |        |        |        |       |                         |

| PSE_Sep23Data_TC_USdata.txt |        |       |       |       |                         |
|-----------------------------|--------|-------|-------|-------|-------------------------|
| 20.085                      | 19.876 | 0.208 | 1.848 | 0.033 | Pennsylvania Electric   |
| Co                          |        |       |       |       |                         |
| 21.185                      | 20.971 | 0.214 | 1.879 | 0.030 | Georgia Power Co        |
| 19.954                      | 19.732 | 0.221 | 1.967 | 0.025 | South Carolina Electric |
| & Gas Co                    |        |       |       |       |                         |
| 20.807                      | 20.573 | 0.234 | 2.066 | 0.020 | Alabama Power Co        |
| 22.019                      | 21.708 | 0.311 | 2.608 | 0.005 | Pacific Gas and         |
| Electric Co                 |        |       |       |       |                         |
| 20.401                      | 20.065 | 0.335 | 2.988 | 0.001 | Potomac Electric Power  |
| Co                          |        |       |       |       |                         |
| 20.995                      | 20.532 | 0.463 | 4.173 | 0.000 | Niagara Mohawk Power    |
| Corp (National Grid)        |        |       |       |       |                         |

#### OUT-OF-SAMPLE PREDICTION OF TOTAL COST LEVEL PERFORMANCE by Year

| Year           | Actual         | Predicted      | Difference | t_ratio | p_value |
|----------------|----------------|----------------|------------|---------|---------|
| Toronto Hydro: |                |                |            |         |         |
| 2002.000       | 435010368.000  | 654130889.259  | -0.408     | -2.063  | 0.020   |
| 2003.000       | 450339136.000  | 666570520.727  | -0.392     | -1.983  | 0.024   |
| 2004.000       | 454122880.000  | 667326818.051  | -0.385     | -1.946  | 0.026   |
| 2005.000       | 449667584.000  | 705597289.946  | -0.451     | -2.280  | 0.011   |
| 2006.000       | 457014912.000  | 709515569.855  | -0.440     | -2.225  | 0.013   |
| 2007.000       | 484482944.000  | 751555058.778  | -0.439     | -2.227  | 0.013   |
| 2008.000       | 518147392.000  | 764992423.111  | -0.390     | -1.976  | 0.024   |
| 2009.000       | 535624544.000  | 794504990.028  | -0.394     | -1.998  | 0.023   |
| 2010.000       | 586112768.000  | 822010906.673  | -0.338     | -1.715  | 0.043   |
| 2011.000       | 637697472.000  | 840308338.582  | -0.276     | -1.399  | 0.081   |
| 2012.000       | 598313344.000  | 823661668.502  | -0.320     | -1.621  | 0.053   |
| 2013.000       | 657159296.000  | 840160388.116  | -0.246     | -1.245  | 0.107   |
| 2014.000       | 729767040.000  | 906636031.079  | -0.217     | -1.100  | 0.136   |
| 2015.000       | 824746240.000  | 937303016.802  | -0.128     | -0.648  | 0.258   |
| 2016.000       | 887888000.000  | 993501766.263  | -0.112     | -0.569  | 0.285   |
| 2017.000       | 949368896.000  | 1045532750.232 | -0.096     | -0.489  | 0.313   |
| 2018.000       | 1003643904.000 | 1100328749.673 | -0.092     | -0.466  | 0.321   |
| 2019.000       | 1067738240.000 | 1157991949.575 | -0.081     | -0.411  | 0.341   |

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