7.Appendix



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure 1**Summary Statistics, using the observations 1991 – 2015

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mean | Median | S.D. | Min | Max |
| GDP | 1.24 | 1.34 | 1.53 | -1.42 | 4.24 |
| FDI | 1.41 | 0.854 | 1.81 | -0.900 | 6.08 |
| EXPORT | 23.5 | 22.9 | 3.71 | 18.5 | 32.1 |
| LIFE | 57.0 | 56.4 | 2.11 | 54.3 | 60.6 |
| DEBT | 1.47e+009 | 1.43e+009 | 3.68e+008 | 6.48e+008 | 2.19e+009 |
| AID | 3.93e+008 | 3.02e+008 | 1.71e+008 | 2.05e+008 | 6.89e+008 |
| RESSOUCES | 5.76 | 5.01 | 1.62 | 4.15 | 9.00 |
| UNEMPLOYE | 0.984 | 1.00 | 0.172 | 0.700 | 1.50 |
| ELECTRICITY | 24.1 | 24.4 | 9.27 | 8.60 | 38.4 |
| AGRICULTURE | 28.9 | 27.2 | 4.18 | 24.1 | 36.6 |
| POPULATION | 3.01 | 2.96 | 0.231 | 2.77 | 3.50 |

 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure 2** Correlation coefficients, using the observations 1991 - 20155% critical value (two-tailed) = 0.3961 for n = 25

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| FDI | EXPORT | LIFE | DEBT | AID |  |
| 1.0000 | 0.4426 | 0.1308 | 0.2175 | 0.1493 | FDI |
|  | 1.0000 | 0.1765 | 0.4425 | 0.0822 | EXPORT |
|  |  | 1.0000 | 0.4958 | 0.8793 | LIFE |
|  |  |  | 1.0000 | 0.2724 | DEBT |
|  |  |  |  | 1.0000 | AID |
|  |  |  |  |  |  |
| RESSOUCES | UNEMPLOYE | ELECTRICITY | AGRICULTURE | POPULATION |  |
| 0.2981 | 0.3348 | -0.0183 | 0.1339 | 0.0918 | FDI |
| 0.5105 | 0.1314 | 0.0160 | 0.1886 | -0.0295 | EXPORT |
| -0.4689 | 0.1236 | 0.9521 | -0.7272 | -0.8044 | LIFE |
| -0.0982 | -0.1263 | 0.4801 | -0.4349 | -0.3731 | DEBT |
| -0.4188 | 0.2328 | 0.8256 | -0.5816 | -0.6557 | AID |
| 1.0000 | 0.2565 | -0.6158 | 0.7768 | 0.5961 | RESSOUCES |
|  | 1.0000 | -0.0303 | 0.1274 | 0.2416 | UNEMPLOYE |
|  |  | 1.0000 | -0.8172 | -0.9065 | ELECTRICITY |
|  |  |  | 1.0000 | 0.7168 | AGRICULTURE |
|  |  |  |  |  |  |

 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure 3**Model 1: OLS, using observations 1991-2015 (T = 25)Dependent variable: GDPHAC standard errors, bandwidth 2 (Bartlett kernel)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| Const | 117.823 | 43.3410 | 2.719 | 0.0176 | \*\* |
| FDI | 0.376166 | 0.124213 | 3.028 | 0.0097 | \*\*\* |
| EXPORT | 0.427092 | 0.0731566 | 5.838 | <0.0001 | \*\*\* |
| LIFE | −2.90867 | 1.02251 | −2.845 | 0.0138 | \*\* |
| DEBT | −2.45024e-09 | 7.19530e-010 | −3.405 | 0.0047 | \*\*\* |
| AID | 2.64007e-09 | 2.79254e-09 | 0.9454 | 0.3617 |  |
| RESSOUCES | −0.635304 | 0.314910 | −2.017 | 0.0648 | \* |
| UNEMPLOYE | −2.33320 | 0.890754 | −2.619 | 0.0212 | \*\* |
| ELECTRICITY | 0.301094 | 0.129524 | 2.325 | 0.0369 | \*\* |
| AGRICULTURE | 0.108307 | 0.139997 | 0.7736 | 0.4530 |  |
| POPULATION | 9.29104 | 3.25315 | 2.856 | 0.0135 | \*\* |
| Time | 0.672993 | 0.354287 | 1.900 | 0.0799 | \* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var | 1.244480 |  | S.D. dependent var | 1.534162 |
| Sum squared resid | 24.76766 |  | S.E. of regression | 1.380292 |
| R-squared | 0.561538 |  | Adjusted R-squared | 0.190533 |
| F(11, 13) | 22.56101 |  | P-value(F) | 1.13e-06 |
| Log-likelihood | −35.35675 |  | Akaike criterion | 94.71350 |
| Schwarz criterion | 109.3400 |  | Hannan-Quinn | 98.77027 |
| Rho | −0.446339 |  | Durbin-Watson | 2.888818 |

 |

|  |
| --- |
| **Figure 4**Breusch-Pagan test for heteroskedasticityOLS, using observations 1991-2015 (T = 25)Dependent variable: scaled uhat^2 coefficient std. error t-ratio p-value --------------------------------------------------------------- const −99.9561 75.5840 −1.322 0.2088  FDI −0.568181 0.195639 −2.904 0.0123 \*\* EXPORT 0.319751 0.118912 2.689 0.0186 \*\* LIFE 1.73016 1.82209 0.9495 0.3597  DEBT −3.96355e-010 1.20201e-09 −0.3297 0.7468  AID −1.99395e-09 4.70341e-09 −0.4239 0.6785  RESSOUCES 0.0935576 0.325395 0.2875 0.7782  UNEMPLOYE −1.05918 1.95021 −0.5431 0.5962  ELECTRICITY 0.404999 0.211776 1.912 0.0781 \* AGRICULTURE −0.206929 0.173981 −1.189 0.2556  POPULATION 2.34757 6.48972 0.3617 0.7234  time −1.02693 0.672944 −1.526 0.1510  Explained sum of squares = 39.731Test statistic: LM = 19.865475,with p-value = P(Chi-square(11) > 19.865475) = 0.047220 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure 5**Model 2 : Heteroskedasticity-corrected, using observations 1991-2015 (T = 25)Dependent variable: GDP

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| Const | 114.239 | 45.4594 | 2.513 | 0.0259 | \*\* |
| FDI | 0.362216 | 0.125701 | 2.882 | 0.0129 | \*\* |
| EXPORT | 0.388693 | 0.0613545 | 6.335 | <0.0001 | \*\*\* |
| LIFE | −2.69745 | 0.937113 | −2.878 | 0.0129 | \*\* |
| DEBT | −2.52344e-09 | 6.01062e-010 | −4.198 | 0.0010 | \*\*\* |
| AID | 2.88035e-09 | 2.01819e-09 | 1.427 | 0.1771 |  |
| RESSOUCES | −0.429801 | 0.238023 | −1.806 | 0.0942 | \* |
| UNEMPLOYE | −2.44352 | 1.06264 | −2.299 | 0.0387 | \*\* |
| ELECTRICITY | 0.277068 | 0.103302 | 2.682 | 0.0188 | \*\* |
| AGRICULTURE | 0.0188960 | 0.150264 | 0.1258 | 0.9019 |  |
| POPULATION | 7.78815 | 1.98395 | 3.926 | 0.0017 | \*\*\* |
| Time | 0.598323 | 0.359538 | 1.664 | 0.1200 |  |

Statistics based on the weighted data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sum squared resid |  18.75117 |  | S.E. of regression |  1.200999 |
| R-squared |  0.952365 |  | Adjusted R-squared |  0.912058 |
| F(11, 13) |  23.62803 |  | P-value(F) |  8.60e-07 |
| Log-likelihood | −31.87822 |  | Akaike criterion |  87.75643 |
| Schwarz criterion |  102.3829 |  | Hannan-Quinn |  91.81320 |
| Rho | −0.426152 |  | Durbin-Watson |  2.852282 |

Statistics based on the original data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var |  1.244480 |  | S.D. dependent var |  1.534162 |
| Sum squared resid |  25.89613 |  | S.E. of regression |  1.411386 |

 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Figure 6Model 3: Heteroskedasticity-corrected, using observations 1991-2015 (T = 25)Dependent variable: GDP

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| Const | 71.5367 | 23.9693 | 2.985 | 0.0093 | \*\*\* |
| FDI | 0.313645 | 0.0850797 | 3.686 | 0.0022 | \*\*\* |
| EXPORT | 0.419784 | 0.0329249 | 12.75 | <0.0001 | \*\*\* |
| LIFE | −1.75324 | 0.477253 | −3.674 | 0.0023 | \*\*\* |
| DEBT | −2.52861e-09 | 5.03010e-010 | −5.027 | 0.0002 | \*\*\* |
| RESSOUCES | −0.526696 | 0.123777 | −4.255 | 0.0007 | \*\*\* |
| UNEMPLOYE | −2.27341 | 0.764532 | −2.974 | 0.0095 | \*\*\* |
| ELECTRICITY | 0.364951 | 0.0536154 | 6.807 | <0.0001 | \*\*\* |
| POPULATION | 5.63340 | 2.62577 | 2.145 | 0.0487 | \*\* |
| Time | 0.194430 | 0.161780 | 1.202 | 0.2481 |  |

Statistics based on the weighted data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sum squared resid |  19.55417 |  | S.E. of regression |  1.141758 |
| R-squared |  0.983941 |  | Adjusted R-squared |  0.974306 |
| F(9, 15) |  102.1200 |  | P-value(F) |  8.12e-12 |
| Log-likelihood | −32.40237 |  | Akaike criterion |  84.80474 |
| Schwarz criterion |  96.99350 |  | Hannan-Quinn |  88.18539 |
| Rho | −0.407879 |  | Durbin-Watson |  2.815726 |

Statistics based on the original data:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var |  1.244480 |  | S.D. dependent var |  1.534162 |
| Sum squared resid |  26.15602 |  | S.E. of regression |  1.320505 |

 |

|  |
| --- |
|  **Figure 7**Variance Inflation FactorsMinimum possible value = 1.0Values > 10.0 may indicate a collinearity problem FDI 2.081 EXPORT 3.235 LIFE 245.190 DEBT 3.263 AID 10.719 RESSOUCES 4.650 UNEMPLOYE 1.883 ELECTRICITY 64.218 AGRICULTURE 8.789 POPULATION 37.336 time 408.495VIF(j) = 1/(1 - R(j)^2), where R(j) is the multiple correlation coefficientbetween variable j and the other independent variablesBelsley-Kuh-Welsch collinearity diagnostics: --- variance proportions --- lambda cond const FDI EXPORT LIFE DEBT AID RESSOUCES UNEMPLOYE ELECTRIC~ AGRICULT~ POPULATI~ time 10.981 1.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.643 4.132 0.000 0.017 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.292 6.132 0.000 0.054 0.000 0.000 0.000 0.001 0.000 0.000 0.000 0.000 0.000 0.000 0.053 14.372 0.000 0.000 0.002 0.000 0.027 0.027 0.000 0.009 0.000 0.000 0.000 0.000 0.014 27.825 0.000 0.106 0.002 0.000 0.028 0.007 0.023 0.096 0.002 0.001 0.000 0.000 0.007 38.413 0.000 0.065 0.048 0.000 0.068 0.001 0.044 0.093 0.002 0.002 0.000 0.001 0.005 48.111 0.000 0.017 0.025 0.000 0.081 0.209 0.008 0.469 0.000 0.001 0.000 0.003 0.003 60.960 0.000 0.123 0.157 0.000 0.019 0.233 0.089 0.024 0.023 0.002 0.000 0.003 0.001 122.276 0.000 0.000 0.063 0.000 0.056 0.006 0.009 0.065 0.215 0.030 0.014 0.048 0.000 253.714 0.000 0.000 0.295 0.000 0.452 0.005 0.667 0.228 0.319 0.878 0.007 0.082 0.000 430.464 0.014 0.000 0.347 0.003 0.050 0.180 0.059 0.002 0.391 0.038 0.329 0.001 0.000 3655.779 0.986 0.618 0.060 0.997 0.220 0.332 0.102 0.014 0.047 0.048 0.649 0.863 lambda = eigenvalues of X'X, largest to smallest cond = condition index note: variance proportions columns sum to 1.0 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Figure 8**Model : OLS, using observations 1991-2015 (T = 25)Dependent variable: GDPHAC standard errors, bandwidth 2 (Bartlett kernel)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Coefficient* | *Std. Error* | *t-ratio* | *p-value* |  |
| Const | 40.0371 | 19.2375 | 2.081 | 0.0550 | \* |
| EXPORT | 0.438376 | 0.120104 | 3.650 | 0.0024 | \*\*\* |
| LIFE | −1.01210 | 0.487913 | −2.074 | 0.0557 | \* |
| DEBT | −1.63980e-09 | 9.52833e-010 | −1.721 | 0.1058 |  |
| AID | 3.45352e-010 | 3.30648e-09 | 0.1044 | 0.9182 |  |
| RESSOUCES | −0.698112 | 0.239556 | −2.914 | 0.0107 | \*\* |
| UNEMPLOYE | −1.59426 | 1.03401 | −1.542 | 0.1439 |  |
| ELECTRICITY | 0.257625 | 0.172951 | 1.490 | 0.1571 |  |
| AGRICULTURE | 0.0100538 | 0.105260 | 0.09551 | 0.9252 |  |
| POPULATION | 3.30002 | 3.34065 | 0.9878 | 0.3389 |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mean dependent var |  1.244480 |  | S.D. dependent var |  1.534162 |
| Sum squared resid |  30.09567 |  | S.E. of regression |  1.416467 |
| R-squared |  0.467217 |  | Adjusted R-squared |  0.147547 |
| F(9, 15) |  23.10056 |  | P-value(F) |  3.20e-07 |
| Log-likelihood | −37.79228 |  | Akaike criterion |  95.58456 |
| Schwarz criterion |  107.7733 |  | Hannan-Quinn |  98.96520 |
| Rho | −0.150463 |  | Durbin-Watson |  2.266677 |

 |

