**DESCRIPTIVE STATISTICS TABLE**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Mean | Std.Dev. | Min | Max | Observations |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| gpr overall | 34.230 | 12.978 | 17.410 | 50.030 | N | = | 50 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| between | 13.854 | 17.873 | 50.030 | n | = | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| within | 3.427 | 25.996 | 41.049 | T | = | 10 |

|  |
| --- |
|  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| d\_e overall | 3.103 | 2.212 | .44 | 5.935 | N | = | 50 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| between | 2.011 | 0.661 | 4.995 | n | = | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| within | 1.262 | -1.452 | 4.916 | T | = | 10 |

|  |
| --- |
|  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| d\_a overall | 0.721 | 0.146 | .5 | .85 | N | = | 50 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| between | 0.083 | 0.602 | 0.798 | n | = | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| within | 0.125 | 0.431 | 0.969 | T | = | 10 |

|  |
| --- |
|  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| icr overall | 2.176 | 0.865 | 1.060 | 3.1 | N | = | 50 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| between | 0.715 | 1.587 | 3.014 | n | = | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| within | 0.575 | 0.340 | 3.652 | T | = | 10 |

|  |
| --- |
|  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| gr overall | 0.592 | 0.376 | 0 | .9300000000000001 | N | = | 50 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| between | 0.138 | 0.425 | 0.753 | n | = | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| within | 0.355 | -0.161 | 1.097 | T | = | 10 |

**FIXED EFFECT(WITHIN)REGRESSION  
Regression results**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| d\_e | .119 | | .456 | 0.26 | | .795 | -.802 | | 1.041 | |  |
| d\_a | 5.472 | | 4.577 | 1.20 | | .239 | -3.77 | | 14.715 | |  |
| icr | 1.161 | | .957 | 1.21 | | .232 | -.771 | | 3.093 | |  |
| gr | -.104 | | 1.531 | -0.07 | | .946 | -3.196 | | 2.987 | |  |
| Constant | 27.447 | | 4.486 | 6.12 | | 0 | 18.388 | | 36.506 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 34.230 | | | SD dependent var | | | 12.978 | |
| R-squared | | 0.063 | | | Number of obs | | | 50 | |
| F-test | | 0.694 | | | Prob > F | | | 0.694 | |
| Akaike crit. (AIC) | | 270.781 | | | Bayesian crit. (BIC) | | | 280.341 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
| **RANDOM EFFECT GLS REGRESSION** | | | | | | | | | | | |

**Regression results**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| d\_e | 3.313 | | .896 | 3.70 | | 0 | 1.557 | | 5.069 | | \*\*\* |
| d\_a | 2.019 | | 11.056 | 0.18 | | .855 | -19.649 | | 23.688 | |  |
| icr | -3.432 | | 2.146 | -1.60 | | .11 | -7.638 | | .774 | |  |
| gr | -4.04 | | 3.529 | -1.14 | | .252 | -10.957 | | 2.877 | |  |
| Constant | 32.352 | | 10.708 | 3.02 | | .003 | 11.365 | | 53.34 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 34.230 | | | SD dependent var | | | 12.978 | |
| Overall r-squared | | 0.557 | | | Number of obs | | | 50 | |
| Chi-square | | 56.541 | | | Prob > chi2 | | | 0.000 | |
| R-squared within | | 0.000 | | | R-squared between | | | 0.819 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**HAUSMAN FE RE**

**Hausman (1978) specification test**

|  |  |
| --- | --- |
|  | Coef. |
| Chi-square test value | 0 |
| P-value | . |

**TEST FOR HETEROSKEDASTICITY – WITH FIXED EFFECT MODEL**

**Regression results**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| d\_e | .119 | | .322 | 0.37 | | .729 | -.773 | | 1.012 | |  |
| d\_a | 5.472 | | 6.238 | 0.88 | | .43 | -11.847 | | 22.791 | |  |
| icr | 1.161 | | 1.531 | 0.76 | | .49 | -3.088 | | 5.411 | |  |
| gr | -.104 | | 2.532 | -0.04 | | .969 | -7.133 | | 6.924 | |  |
| Constant | 27.447 | | 5.865 | 4.68 | | .009 | 11.164 | | 43.731 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 34.230 | | | SD dependent var | | | 12.978 | |
| R-squared | | 0.063 | | | Number of obs | | | 50 | |
| F-test | | 7.210 | | | Prob > F | | | 0.043 | |
| Akaike crit. (AIC) | | 268.781 | | | Bayesian crit. (BIC) | | | 276.429 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**TEST FOR HETEROSKEDASTICITY – WITH RANDOM EFFECT MODEL**

initial: log likelihood = -<inf> (could not be evaluated)  
feasible: log likelihood = -4681.5986  
rescale: log likelihood = -243.53153  
rescale eq: log likelihood = -152.27524  
Iteration 0: log likelihood = -152.27524 (not concave)  
Iteration 1: log likelihood = -143.34664 (not concave)  
Iteration 2: log likelihood = -142.24968 (not concave)  
Iteration 3: log likelihood = -139.51056 (not concave)  
Iteration 4: log likelihood = -137.54838 (not concave)  
Iteration 5: log likelihood = -136.85189 (not concave)  
Iteration 6: log likelihood = -136.24348 (not concave)  
Iteration 7: log likelihood = -135.73962 (not concave)  
Iteration 8: log likelihood = -135.27286 (not concave)  
Iteration 9: log likelihood = -134.84695 (not concave)  
Iteration 10: log likelihood = -134.45584 (not concave)  
Iteration 11: log likelihood = -134.09783 (not concave)  
Iteration 12: log likelihood = -133.75334 (not concave)  
Iteration 13: log likelihood = -133.42503 (not concave)  
Iteration 14: log likelihood = -133.1043 (not concave)  
Iteration 15: log likelihood = -132.79652 (not concave)  
Iteration 16: log likelihood = -132.48993 (not concave)  
Iteration 17: log likelihood = -132.19101 (not concave)  
Iteration 18: log likelihood = -131.89135 (not concave)  
Iteration 19: log likelihood = -131.59828 (not concave)  
Iteration 20: log likelihood = -131.30273 (not concave)  
Iteration 21: log likelihood = -131.012 (not concave)  
Iteration 22: log likelihood = -130.71776 (not concave)  
Iteration 23: log likelihood = -130.42804 (not concave)  
Iteration 24: log likelihood = -130.13421 (not concave)  
Iteration 25: log likelihood = -129.84406 (not concave)  
Iteration 26: log likelihood = -129.54934 (not concave)  
Iteration 27: log likelihood = -129.25797 (not concave)  
Iteration 28: log likelihood = -128.96171 (not concave)  
Iteration 29: log likelihood = -128.6686 (not concave)  
Iteration 30: log likelihood = -128.37039 (not concave)  
Iteration 31: log likelihood = -128.07584 (not concave)  
Iteration 32: log likelihood = -127.77591 (not concave)  
Iteration 33: log likelihood = -127.47868 (not concave)  
Iteration 34: log likelihood = -127.1762 (not concave)  
Iteration 35: log likelihood = -126.87732 (not concave)  
Iteration 36: log likelihood = -126.57286 (not concave)  
Iteration 37: log likelihood = -126.27131 (not concave)  
Iteration 38: log likelihood = -125.96443 (not concave)  
Iteration 39: log likelihood = -125.66122 (not concave)  
Iteration 40: log likelihood = -125.35244 (not concave)  
Iteration 41: log likelihood = -125.04699 (not concave)  
Iteration 42: log likelihood = -124.73614 (not concave)  
Iteration 43: log likelihood = -124.42902 (not concave)  
Iteration 44: log likelihood = -124.11646 (not concave)  
Iteration 45: log likelihood = -123.80751 (not concave)  
Iteration 46: log likelihood = -123.4932 (not concave)  
Iteration 47: log likelihood = -123.18281 (not concave)  
Iteration 48: log likelihood = -122.86699 (not concave)  
Iteration 49: log likelihood = -122.55516 (not concave)  
Iteration 50: log likelihood = -122.23812 (not concave)  
Iteration 51: log likelihood = -121.92512 (not concave)  
Iteration 52: log likelihood = -121.60686 (not concave)  
Iteration 53: log likelihood = -121.29287 (not concave)  
Iteration 54: log likelihood = -120.9737 (not concave)  
Iteration 55: log likelihood = -120.65886 (not concave)  
Iteration 56: log likelihood = -120.33893 (not concave)  
Iteration 57: log likelihood = -120.02329 (not concave)  
Iteration 58: log likelihood = -119.70259 (not concave)  
Iteration 59: log likelihood = -119.38672 (not concave)  
Iteration 60: log likelihood = -119.06567 (not concave)  
Iteration 61: log likelihood = -118.74882 (not concave)  
Iteration 62: log likelihood = -118.42717 (not concave)  
Iteration 63: log likelihood = -118.11061 (not concave)  
Iteration 64: log likelihood = -117.78895 (not concave)  
Iteration 65: log likelihood = -117.47176 (not concave)  
Iteration 66: log likelihood = -117.14974 (not concave)  
Iteration 67: log likelihood = -116.83266 (not concave)  
Iteration 68: log likelihood = -116.51066 (not concave)  
Iteration 69: log likelihood = -116.19356 (not concave)  
Iteration 70: log likelihood = -115.87163 (not concave)  
Iteration 71: log likelihood = -115.55446 (not concave)  
Iteration 72: log likelihood = -115.23249   
Iteration 73: log likelihood = -108.50607 (not concave)  
Iteration 74: log likelihood = -105.55363 (not concave)  
Iteration 75: log likelihood = -103.08614 (not concave)  
Iteration 76: log likelihood = -102.12468 (not concave)  
Iteration 77: log likelihood = -101.38521 (not concave)  
Iteration 78: log likelihood = -100.91241 (not concave)  
Iteration 79: log likelihood = -100.42994 (not concave)  
Iteration 80: log likelihood = -99.322983 (not concave)  
Iteration 81: log likelihood = -98.781472 (not concave)  
Iteration 82: log likelihood = -97.966575 (not concave)  
Iteration 83: log likelihood = -97.133029 (not concave)  
Iteration 84: log likelihood = -96.757629 (not concave)  
Iteration 85: log likelihood = -96.279088 (not concave)  
Iteration 86: log likelihood = -95.612173 (not concave)  
Iteration 87: log likelihood = -95.313303 (not concave)  
Iteration 88: log likelihood = -94.99412 (not concave)  
Iteration 89: log likelihood = -94.676183 (not concave)  
Iteration 90: log likelihood = -94.359432 (not concave)  
Iteration 91: log likelihood = -94.050446 (not concave)  
Iteration 92: log likelihood = -93.735525 (not concave)  
Iteration 93: log likelihood = -93.423734 (not concave)  
Iteration 94: log likelihood = -93.108447 (not concave)  
Iteration 95: log likelihood = -92.798581 (not concave)  
Iteration 96: log likelihood = -92.484102 (not concave)  
Iteration 97: log likelihood = -92.174034 (not concave)  
Iteration 98: log likelihood = -91.859815 (not concave)  
Iteration 99: log likelihood = -91.550419 (not concave)  
Iteration 100: log likelihood = -91.236526 (not concave)  
convergence not achieved  
==============================================================================  
\* MLE Random-Effects Panel Data Regression (Normal Distribution)  
\* Multiplicative Heteroscedasticity  
==============================================================================

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample Size = 50 | Cross | Sections | Number | = | 5 |
| Wald Test = 3.0524 | P-Value | > | Chi2(4) | = | 0.5491 |
| F-Test = 0.7631 | P-Value | > | F(4 | , | 41) | = | 0.5554 |
| (Buse 1973) R2 = 0.0635 | Raw | Moments | R2 | = | 0.6898 |
| (Buse 1973) R2 Adj = -0.1192 | Raw | Moments | R2 | Adj | = | 0.6293 |
| Root MSE (Sigma) = 22.4874 | Log | Likelihood | Function | = | -91.2365 |
|  | | | | | |

- R2h= 0.0635 R2h Adj=-0.1192 F-Test = 0.76 P-Value > F(4 , 41) 0.5554  
- R2v= 0.0000 R2v Adj=-0.1951 F-Test = 0.00 P-Value > F(4 , 41) 1.0000

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | Std.Err. | | z | P>z | [95%Conf. | Interval] |
| gpr | | |
| d\_e | 0.001 | 0.002 | | 0.310 | 0.756 | -0.004 | 0.005 |
| d\_a | -0.017 | 0.043 | | -0.400 | 0.688 | -0.102 | 0.068 |
| icr | -0.001 | 0.005 | | -0.210 | 0.833 | -0.012 | 0.010 |
| gr | -0.000 | 0.004 | | -0.100 | 0.917 | -0.008 | 0.007 |
| \_cons | 50.043 | 0.037 | | 1347.530 | 0.000 | 49.970 | 50.116 |
| Hetero | | |
| gpr | 0.232 | 0.014 | | 16.090 | 0.000 | 0.203 | 0.260 |
| d\_e | -2.409 | . | | . | . | . | . |
| d\_a | -0.255 | . | | . | . | . | . |
| icr | 1.714 | 0.327 | | 5.240 | 0.000 | 1.073 | 2.355 |
| gr | -1.906 | 0.674 | | -2.830 | 0.005 | -3.227 | -0.586 |
| /Sigu | 0.128 | 0.113 | | 1.130 | 0.260 | -0.094 | 0.349 |
| /Sige | 0.034 | 0.027 | | 1.250 | 0.212 | -0.019 | 0.086 |
|  | | | | | | | |

Warning: convergence not achieved  
==============================================================================  
\* Panel Model Selection Diagnostic Criteria - Model= (xtmlh)  
==============================================================================  
- Log Likelihood Function LLF = -91.2365

|  |
| --- |
| - Akaike Information Criterion (1974) AIC = 697.4691 |
| - Akaike Information Criterion (1973) Log AIC = 6.5475 |
|  |

- Schwarz Criterion (1978) SC = 1146.6319  
- Schwarz Criterion (1978) Log SC = 7.0446

|  |
| --- |
| - Amemiya Prediction Criterion (1969) FPE = 637.1600 |
| - Hannan-Quinn Criterion (1979) HQ = 842.8311 |
| - Rice Criterion (1984) Rice = 863.8744 |
| - Shibata Criterion (1981) Shibata = 630.2827 |
| - Craven-Wahba Generalized Cross Validation (1979) GCV = 757.2310 |
|  |

==============================================================================  
\* Panel Groupwise Heteroscedasticity Tests  
==============================================================================  
 Ho: Panel Homoscedasticity - Ha: Panel Groupwise Heteroscedasticity  
- Lagrange Multiplier LM Test =1125.5708 P-Value > Chi2(4) 0.0000  
- Likelihood Ratio LR Test = 6.2277 P-Value > Chi2(4) 0.1828  
- Wald Test =3313.0741 P-Value > Chi2(5) 0.0000

**MULTICOLLINEARITY**

**Matrix of correlations**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | (1) | (2) | (3) | (4) | (5) | |
| (1) gpr | 1.000 |
| (2) d\_e | 0.719 | 1.000 |
| (3) d\_a | 0.463 | 0.574 | 1.000 |
| (4) icr | -0.624 | -0.710 | -0.503 | 1.000 |
| (5) gr | 0.019 | 0.183 | -0.014 | -0.147 | 1.000 | |
|  | | | | | | |

**REGRESSION MODEL   
Linear regression**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| d\_e | 3.313 | | .896 | 3.70 | | .001 | 1.508 | | 5.117 | | \*\*\* |
| d\_a | 2.019 | | 11.056 | 0.18 | | .856 | -20.248 | | 24.286 | |  |
| icr | -3.432 | | 2.146 | -1.60 | | .117 | -7.754 | | .89 | |  |
| gr | -4.04 | | 3.529 | -1.14 | | .258 | -11.148 | | 3.068 | |  |
| Constant | 32.352 | | 10.708 | 3.02 | | .004 | 10.785 | | 53.92 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 34.230 | | | SD dependent var | | | 12.978 | |
| R-squared | | 0.557 | | | Number of obs | | | 50 | |
| F-test | | 14.135 | | | Prob > F | | | 0.000 | |
| Akaike crit. (AIC) | | 366.516 | | | Bayesian crit. (BIC) | | | 376.076 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**VIF TEST**

|  |  |
| --- | --- |
| VIF | 1/VIF |
| 2.370 | 0.422 |
| 2.080 | 0.481 |
| 1.570 | 0.637 |
| 1.060 | 0.943 |
| 1.770 |

If VIF is greater than 10 in a large sample, then the multicollinearity could be exists in the variables.

**AUTOCORELATION**

Wooldridge test for autocorrelation in panel data  
H0: no first-order autocorrelation  
 F( 1, 4) = 25.723  
 Prob > F = 0.0071

**Regression results**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| gpr | Coef. | | St.Err. | t-value | | p-value | [95% Conf | | Interval] | | Sig |
| d\_e | .119 | | .322 | 0.37 | | .729 | -.773 | | 1.012 | |  |
| d\_a | 5.472 | | 6.238 | 0.88 | | .43 | -11.847 | | 22.791 | |  |
| icr | 1.161 | | 1.531 | 0.76 | | .49 | -3.088 | | 5.411 | |  |
| gr | -.104 | | 2.532 | -0.04 | | .969 | -7.133 | | 6.924 | |  |
| Constant | 27.447 | | 5.865 | 4.68 | | .009 | 11.164 | | 43.731 | | \*\*\* |
|  | | | | | | | | | | | |
| Mean dependent var | | 34.230 | | | SD dependent var | | | 12.978 | |
| R-squared | | 0.063 | | | Number of obs | | | 50 | |
| F-test | | 7.210 | | | Prob > F | | | 0.043 | |
| Akaike crit. (AIC) | | 268.781 | | | Bayesian crit. (BIC) | | | 276.429 | |
| *\*\*\* p<.01, \*\* p<.05, \* p<.1* | | | | | | | | | | | |
|  | | | | | | | | | | | |

**TEST FOR CROSS-SECTIONAL DEPENDENCE**

Pesaran's test of cross sectional independence = -1.284, Pr = 0.1993  
Average absolute value of the off-diagonal elements = 0.432