Q6.

From T stat we can conclude

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  | LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL |
|  |  |  |  |  |
|  |  |  |  |  |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_(-1) | 0.040436 | -0.697564 | -0.036730 | -0.307554 |
|  | (0.40641) | (0.43885) | (0.17121) | (0.42461) |
|  | [ 0.09950] | [-1.58953] | [-0.21454] | [-0.72432] |
|  |  |  |  |  |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_(-2) | -1.014435 | -0.946253 | -0.153518 | 0.249255 |
|  | (0.48924) | (0.52830) | (0.20610) | (0.51116) |
|  | [-2.07348] | [-1.79113] | [-0.74487] | [ 0.48763] |
|  |  |  |  |  |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL(-1) | -0.133359 | 0.985740 | -0.126527 | -0.018629 |
|  | (0.32985) | (0.35618) | (0.13896) | (0.34462) |
|  | [-0.40430] | [ 2.76751] | [-0.91056] | [-0.05406] |
|  |  |  |  |  |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL(-2) | 0.338373 | 0.196105 | 0.141715 | -0.017156 |
|  | (0.33615) | (0.36298) | (0.14161) | (0.35120) |
|  | [ 1.00662] | [ 0.54026] | [ 1.00075] | [-0.04885] |
|  |  |  |  |  |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE(-1) | 0.667676 | -0.020241 | 0.767755 | 0.463250 |
|  | (0.99757) | (1.07721) | (0.42024) | (1.04225) |
|  | [ 0.66930] | [-0.01879] | [ 1.82693] | [ 0.44447] |
|  |  |  |  |  |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE(-2) | 2.903046 | 2.348746 | 0.709838 | 0.171029 |
|  | (1.29971) | (1.40347) | (0.54753) | (1.35793) |
|  | [ 2.23360] | [ 1.67353] | [ 1.29644] | [ 0.12595] |
|  |  |  |  |  |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL(-1) | -0.065470 | -0.307003 | -0.030435 | 0.957375 |
|  | (0.42014) | (0.45369) | (0.17699) | (0.43896) |
|  | [-0.15583] | [-0.67669] | [-0.17196] | [ 2.18099] |
|  |  |  |  |  |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL(-2) | -0.480540 | 0.301375 | -0.272373 | -0.783235 |
|  | (0.45023) | (0.48617) | (0.18967) | (0.47040) |
|  | [-1.06732] | [ 0.61989] | [-1.43606] | [-1.66505] |
|  |  |  |  |  |
| C | -11.85726 | -8.847062 | -0.665308 | 0.868557 |
|  | (4.13146) | (4.46127) | (1.74045) | (4.31650) |
|  | [-2.87000] | [-1.98308] | [-0.38226] | [ 0.20122] |
|  |  |  |  |  |
|  |  |  |  |  |

lnOut\_of\_Pocket\_Health\_Expenditure\_Private has a causal impact on lnHealth\_Expenditure\_Total\_of\_GDP,

lnHealth\_Expenditure\_Total\_of\_GDP has a causal impact on lnHealth\_Expenditure\_per\_Capita

lnOut\_of\_Pocket\_Health\_Expenditure\_Private has a causal impact on lnHealth\_Expenditure\_per\_Capita

lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure are independence.

From Granger wald/Exogeneity Test

lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnHealth\_Expenditure\_per\_Capita has a causal impact on lnHealth\_Expenditure\_Total\_of\_GDP

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Dependent variable: LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | | | |
|  |  |  |  |
|  |  |  |  |
| Excluded | Chi-sq | df | Prob. |
|  |  |  |  |
|  |  |  |  |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | 13.66735 | 2 | 0.0011 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | 10.12732 | 2 | 0.0063 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL | 1.615942 | 2 | 0.4458 |
|  |  |  |  |
|  |  |  |  |
| All | 20.61989 | 6 | 0.0021 |
|  |  |  |  |
|  |  |  |  |

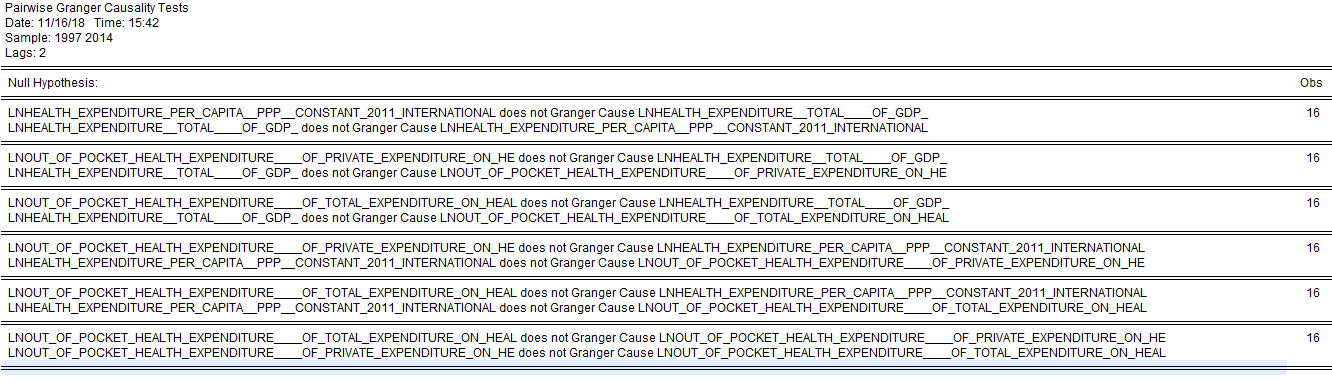
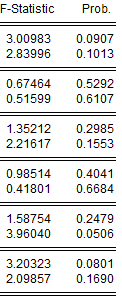
lnHealth\_Expenditure\_Total\_of\_GDP has a causal impact on lnHealth\_Expenditure\_per\_Capita, therefore lnHealth\_Expenditure\_per\_Capita and lnHealth\_Expenditure\_Total\_of\_GDP exhibit bidirectional causality.

|  |  |  |  |
| --- | --- | --- | --- |
| Dependent variable: LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | | | |
|  |  |  |  |
|  |  |  |  |
| Excluded | Chi-sq | df | Prob. |
|  |  |  |  |
|  |  |  |  |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | 8.822369 | 2 | 0.0121 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | 3.958576 | 2 | 0.1382 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL | 0.588144 | 2 | 0.7452 |
|  |  |  |  |
|  |  |  |  |
| All | 15.41968 | 6 | 0.0172 |
|  |  |  |  |
|  |  |  |  |

lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure are independence.

|  |  |  |  |
| --- | --- | --- | --- |
| Dependent variable: LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | | | |
|  |  |  |  |
|  |  |  |  |
| Excluded | Chi-sq | df | Prob. |
|  |  |  |  |
|  |  |  |  |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | 0.813401 | 2 | 0.6658 |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | 1.214829 | 2 | 0.5448 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL | 2.849263 | 2 | 0.2406 |
|  |  |  |  |
|  |  |  |  |
| All | 6.494333 | 6 | 0.3701 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| Dependent variable: LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL | | | |
|  |  |  |  |
|  |  |  |  |
| Excluded | Chi-sq | df | Prob. |
|  |  |  |  |
|  |  |  |  |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | 0.586713 | 2 | 0.7458 |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | 0.384313 | 2 | 0.8252 |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | 0.393288 | 2 | 0.8215 |
|  |  |  |  |
|  |  |  |  |
| All | 6.287698 | 6 | 0.3917 |
|  |  |  |  |
|  |  |  |  |

Pairwise Granger Causality Test

Therefore we can conclude that there is unidirectional causality between lnHealth\_Expenditure\_per\_Capita and and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure

**Cointegration Test**

Since all the variables are I(1) process we go for Johansen Cointegration test

There is cointegration between the variables, HO: No cointegration

H1: Cointegration

P<0.05 so H0 rejected and H1 accepted, therefore there is cointegration is there

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Unrestricted Cointegration Rank Test (Trace) | | | |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Hypothesized |  | Trace | 0.05 |  |
| No. of CE(s) | Eigenvalue | Statistic | Critical Value | Prob.\*\* |
|  |  |  |  |  |
|  |  |  |  |  |
| None \* | 0.968663 | 72.19868 | 47.85613 | 0.0001 |
| At most 1 | 0.520552 | 16.79139 | 29.79707 | 0.6554 |
| At most 2 | 0.261147 | 5.029478 | 15.49471 | 0.8057 |
| At most 3 | 0.011618 | 0.186969 | 3.841466 | 0.6654 |
|  |  |  |  |  |
|  |  |  |  |  |

**lnHealth\_Expenditure\_Total\_of\_GDP as dependent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Normalized cointegrating coefficients (standard error in parentheses) | | | | |
| LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL |  |
| 1.000000 | -0.124203 | -1.482699 | -0.114608 |  |
|  | (0.00462) | (0.14537) | (0.05787) |  |

Therefore lnHealth\_Expenditure\_per\_Capita, lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure has a positive long run effect on lnHealth\_Expenditure\_Total\_of\_GDP

**lnHealth\_Expenditure\_per\_Capita as dependent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |
| Normalized cointegrating coefficients (standard error in parentheses) | | | | |
| LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL |  |
| 1.000000 | -8.051363 | 11.93775 | 0.922751 |  |
|  | (0.34447) | (0.93326) | (0.49746) |  |

Therefore lnHealth\_Expenditure\_Total\_of\_GDP has a positive longrun effect on lnHealth\_Expenditure\_per\_Capita.

lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure has a negative long run effect on lnHealth\_Expenditure\_per\_Capita

**lnOut\_of\_Pocket\_Health\_Expenditure\_Private as dependent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Normalized cointegrating coefficients (standard error in parentheses) | | | | |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE | LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL |  |
| 1.000000 | -0.674446 | 0.083768 | 0.077297 |  |
|  | (0.04493) | (0.00387) | (0.03494) |  |

Therefore lnHealth\_Expenditure\_Total\_of\_GDP has a positive longrun effect on lnOut\_of\_Pocket\_Health\_Expenditure\_Private.

lnHealth\_Expenditure\_per\_Capita, and lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure has a negative long run effect on lnOut\_of\_Pocket\_Health\_Expenditure\_Private

**lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure as dependent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Normalized cointegrating coefficients (standard error in parentheses) | | | | |
| LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_TOTAL\_EXPENDITURE\_ON\_HEAL | LNHEALTH\_EXPENDITURE\_\_TOTAL\_\_\_\_OF\_GDP\_ | LNHEALTH\_EXPENDITURE\_PER\_CAPITA\_\_PPP\_\_CONSTANT\_2011\_INTERNATIONAL | LNOUT\_OF\_POCKET\_HEALTH\_EXPENDITURE\_\_\_\_OF\_PRIVATE\_EXPENDITURE\_ON\_HE |  |
| 1.000000 | -8.725394 | 1.083716 | 12.93713 |  |
|  | (0.56148) | (0.06480) | (1.09680) |  |

Therefore lnHealth\_Expenditure\_Total\_of\_GDP has a positive longrun effect on lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure.

lnOut\_of\_Pocket\_Health\_Expenditure\_Private and lnHealth\_Expenditure\_per\_Capita has a negative long run effect on lnOut\_of\_Pocket\_Health\_Expenditure\_of\_Total\_Expenditure