

Coal tree: Check data

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1 User settings

Data path: `../data/coaldata.RData`

Period: 1960–2014

2 Preprocessed data

2.1 Variables

2.1.1 Variable definition

Table 1: Definition of selected variables.

| ID | variable | longname | unit | source |
|----|------------|--|------------------------------------|-------------------|
| 1 | E_CC | Coal consumption | Mt/yr | IEA2016 - WEB |
| 2 | E_CP | Coal production | Mt/yr | IEA2016 - WEB |
| 3 | E_CIm | Coal imports | Mt/yr | IEA2016 - WEB |
| 4 | E_CEx | Coal exports | Mt/yr | IEA2016 - WEB |
| 5 | Elec_C | Coal - Electricity Output | GWh | IEA2016 - WEB |
| 6 | E_CRe | Coal rents | %(GDP) | WDI 2016 |
| 7 | E_GC | Natural gas consumption | Mt/yr | IEA2016 - WEB |
| 8 | E_OC | Oil products consumption | Mt/yr | IEA2016 - WEB |
| 9 | E_NC | Nuclear consumption | Mt/yr | IEA2016 - WEB |
| 10 | E_HC | Hydro consumption | Mt/yr | IEA2016 - WEB |
| 11 | E_RC | Solar/wind/other consumption | Mt/yr | IEA2016 - WEB |
| 12 | E_BC | Biofuels and waste consumption | Mt/yr | IEA2016 - WEB |
| 13 | AP_pm25mae | PM2.5 air pollution (mean annual exposure) | micrograms per cubic meter | WDI 2016 |
| 14 | AP_pm25pe | PM2.5 air pollution (population exposed to levels) | % of total population | WDI 2016 |
| 15 | P_Ndep | Population ages 15-64 | % of total population | WDI 2016 |
| 16 | Manu | Manufacturing, value added | % of GDP | WDI 2016 |
| 17 | Manu_Ex | Manufactures exports | % of merchandise exports | WDI 2016 |
| 18 | P | Population | million Inhabitants | UN |
| 19 | GDP | Expenditure-side real GDP at chained PPPs | million (2011) US\$ | Penn World Tables |
| 20 | LEX | Life expectancy at birth | Total (years) | World Bank (WDI) |
| 21 | URB | Urban population | % | World Bank (WDI) |
| 22 | PDen | Population density | people per squared km of land area | World Bank (WDI) |
| 23 | GDP_Ag | Agricultural share of GDP | % of GDP | World Bank (WDI) |
| 24 | GDP_Ind | Industrial share of GDP | % of GDP | World Bank (WDI) |
| 25 | GDP_Ser | Services share of GDP | % of GDP | World Bank (WDI) |
| 26 | GDP_Tra | Trade share of GDP | % of GDP | World Bank (WDI) |
| 27 | CO2 | CO2 emissions | Gg(CO2)/yr | CDIAC |
| 28 | EnPri | Total primary energy consumption | GJ/yr | IEA |
| 29 | EnFin | Total final energy consumption | GJ/yr | IEA |
| 30 | GINI | Gini coefficient | | SWIID |
| 31 | Inst | Institution quality index | Unitless | UN |
| 32 | EE | Ratio of energy efficiency | | IEA |
| 33 | EF | Ratio of emission efficiency | | IEA |
| 34 | GDPpc | Expenditure-side real GDP at chained PPPs per capita | million (2011) US\$/Cap | Own |

2.2 Descriptive statistics

Table 2: Descriptive statistics of selected variables.

| ID | variable | min | p05 | p25 | median | mean | p75 | p95 | max | NAs |
|----|------------|-----------|-----------|-----------|-----------|-----------|----------|----------|----------|-------|
| 1 | E_CC | 0e+00 | 0e+00 | 0e+00 | 5.46e+03 | 2.32e+05 | 5.51e+04 | 9.48e+05 | 2.53e+07 | 2025 |
| 2 | E_CP | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 7.42e+05 | 7.12e+04 | 3.56e+06 | 8.13e+07 | 1901 |
| 3 | E_CIm | 0e+00 | 0e+00 | 0e+00 | 2.93e+03 | 1.2e+05 | 5.95e+04 | 5.42e+05 | 7.63e+06 | 1883 |
| 4 | E_CEx | -1.05e+07 | -6.95e+05 | -2.08e+03 | 0e+00 | -1.18e+05 | 0e+00 | 0e+00 | 0e+00 | 1883 |
| 5 | Elec_C | 0e+00 | 0e+00 | 0e+00 | 3.4e+01 | 3.87e+04 | 8.97e+03 | 1.47e+05 | 4.12e+06 | 1991 |
| 6 | E_CRe | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 1.22e-01 | 9.95e-03 | 6.29e-01 | 2.29e+01 | 5222 |
| 7 | E_GC | 0e+00 | 0e+00 | 0e+00 | 9.96e+03 | 3.03e+05 | 1.19e+05 | 1.16e+06 | 1.54e+07 | 2025 |
| 8 | E_OC | 6.02e+02 | 8.89e+03 | 3.51e+04 | 1.34e+05 | 8.38e+05 | 4.81e+05 | 3.27e+06 | 3.53e+07 | 2025 |
| 9 | E_NC | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 2025 |
| 10 | E_HC | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 2025 |
| 11 | E_RC | 0e+00 | 0e+00 | 0e+00 | 0e+00 | 1.32e+03 | 0e+00 | 2.54e+03 | 7.84e+05 | 2025 |
| 12 | E_BC | 0e+00 | 0e+00 | 2.37e+03 | 3.23e+04 | 2.49e+05 | 1.48e+05 | 1.06e+06 | 8.57e+06 | 2025 |
| 13 | AP_pm25mae | 3.2e+00 | 6e+00 | 1.42e+01 | 1.99e+01 | 2.61e+01 | 3.35e+01 | 6.46e+01 | 1.31e+02 | 10221 |
| 14 | AP_pm25pe | 0e+00 | 0e+00 | 9.96e+01 | 1e+02 | 8.64e+01 | 1e+02 | 1e+02 | 1.01e+02 | 10221 |
| 15 | P_Ndep | 4.53e+01 | 4.94e+01 | 5.27e+01 | 5.75e+01 | 5.87e+01 | 6.51e+01 | 6.93e+01 | 8.6e+01 | 1477 |
| 16 | Manu | 1e-01 | 3.46e+00 | 8.02e+00 | 1.33e+01 | 1.4e+01 | 1.89e+01 | 2.75e+01 | 4.73e+01 | 5954 |
| 17 | Manu_Ex | 0e+00 | 8.24e-01 | 8.66e+00 | 3.03e+01 | 3.82e+01 | 6.82e+01 | 8.94e+01 | 9.91e+01 | 5604 |
| 18 | P | 6.44e+02 | 1.04e+04 | 2.65e+05 | 3.27e+06 | 2.1e+07 | 1.06e+07 | 7.17e+07 | 1.38e+09 | 0 |
| 19 | GDP | 1.85e+07 | 5.82e+08 | 6.03e+09 | 2.5e+10 | 2.55e+11 | 1.32e+11 | 1.1e+12 | 1.61e+13 | 5585 |
| 20 | LEx | 1.93e+01 | 4.19e+01 | 5.51e+01 | 6.64e+01 | 6.34e+01 | 7.21e+01 | 7.85e+01 | 8.41e+01 | 4423 |
| 21 | URB | 2.08e+00 | 1.15e+01 | 2.87e+01 | 4.89e+01 | 5e+01 | 7.02e+01 | 9.41e+01 | 1e+02 | 3236 |
| 22 | PDen | 9.86e-02 | 3.11e+00 | 1.85e+01 | 6.02e+01 | 3.23e+02 | 1.38e+02 | 5.65e+02 | 2.16e+04 | 3676 |
| 23 | GDP_Ag | 0e+00 | 1.15e+00 | 5.51e+00 | 1.51e+01 | 1.93e+01 | 3.02e+01 | 5.08e+01 | 9.48e+01 | 8195 |
| 24 | GDP_Ind | 2.53e+00 | 1.09e+01 | 1.96e+01 | 2.72e+01 | 2.86e+01 | 3.49e+01 | 5.28e+01 | 9.67e+01 | 8231 |
| 25 | GDP_Ser | 2.43e+00 | 2.7e+01 | 4.16e+01 | 5.16e+01 | 5.21e+01 | 6.34e+01 | 7.63e+01 | 1e+02 | 8238 |
| 26 | GDP_Tra | 2.1e-02 | 2.13e+01 | 4.46e+01 | 6.8e+01 | 7.84e+01 | 1e+02 | 1.62e+02 | 5.32e+02 | 6813 |
| 27 | CO2 | 0e+00 | 3.67e+04 | 5.54e+05 | 4.78e+06 | 1.03e+08 | 4.07e+07 | 3.98e+08 | 1.03e+10 | 3440 |
| 28 | EnPri | NaN | NA | NA | NA | NaN | NA | NA | NaN | 14850 |
| 29 | EnFin | NaN | NA | NA | NA | NaN | NA | NA | NaN | 14850 |
| 30 | GINI | 1.53e+01 | 2.28e+01 | 2.94e+01 | 3.65e+01 | 3.72e+01 | 4.4e+01 | 5.44e+01 | 7.16e+01 | 10299 |
| 31 | Inst | -2.49e+00 | -1.41e+00 | -6.86e-01 | -1.35e-01 | -1.52e-03 | 7.21e-01 | 1.62e+00 | 1.99e+00 | 10983 |
| 32 | EE | NaN | NA | NA | NA | NaN | NA | NA | NaN | 14850 |
| 33 | EF | NaN | NA | NA | NA | NaN | NA | NA | NaN | 14850 |
| 34 | GDPpc | 1.42e+02 | 8.32e+02 | 2.01e+03 | 5.34e+03 | 1.12e+04 | 1.38e+04 | 3.92e+04 | 2.45e+05 | 5585 |

2.3 Dependent variable Coal consumption

3 Processed data

3.1 Correlations

Main factors

Other coal variables

```
## Error in cor.test.default(mat[, i], mat[, j], ...): not enough finite observations
```

Structural effects

Substitution effects

```
## Error in cor.test.default(mat[, i], mat[, j], ...): not enough finite observations
```

Pollution

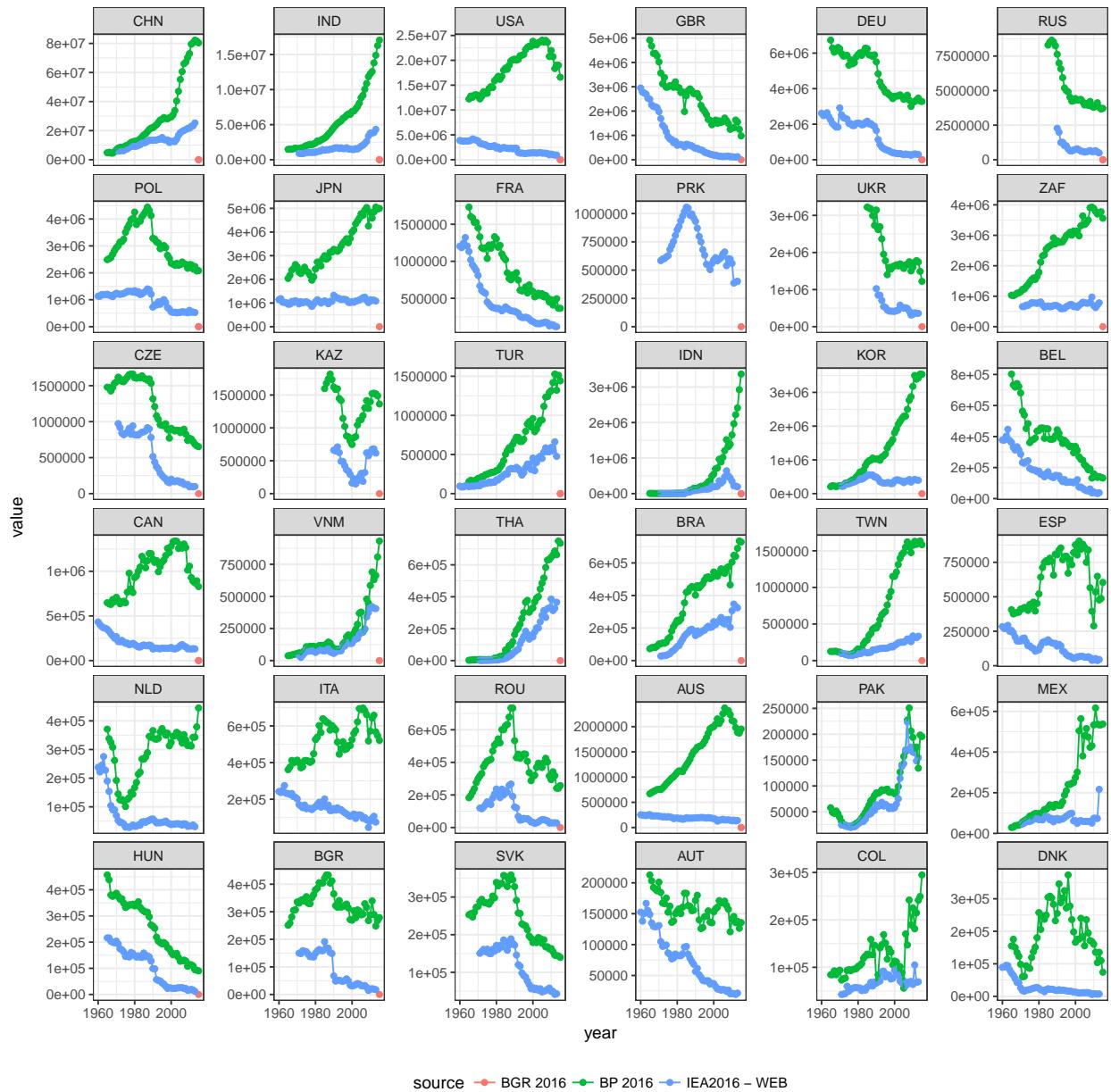
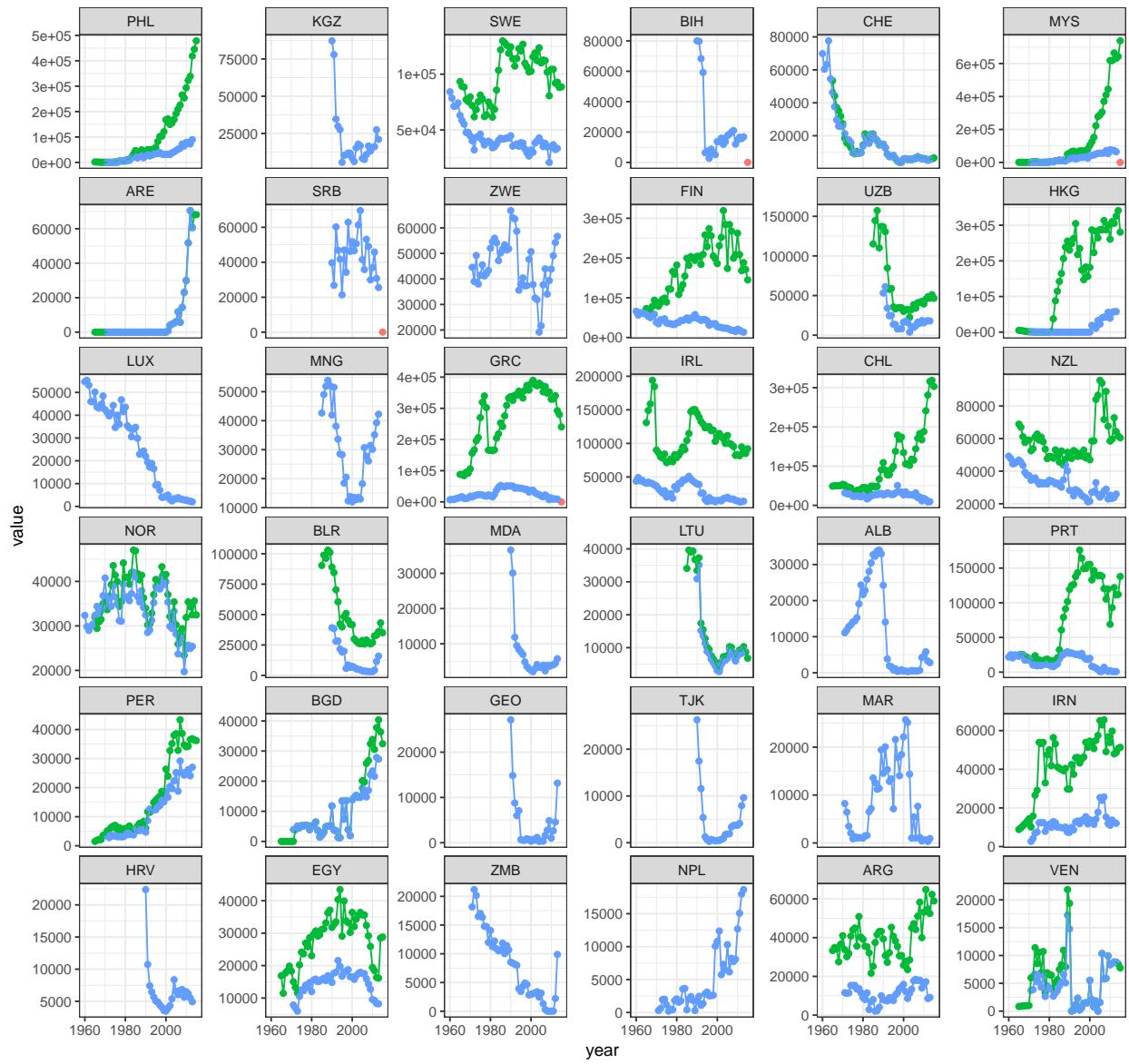


Figure 1: Coal consumption (Countries 1-36)



source — BGR 2016 — BP 2016 — IEA2016 – WEB

Figure 2: Coal consumption (Countries 37-72)

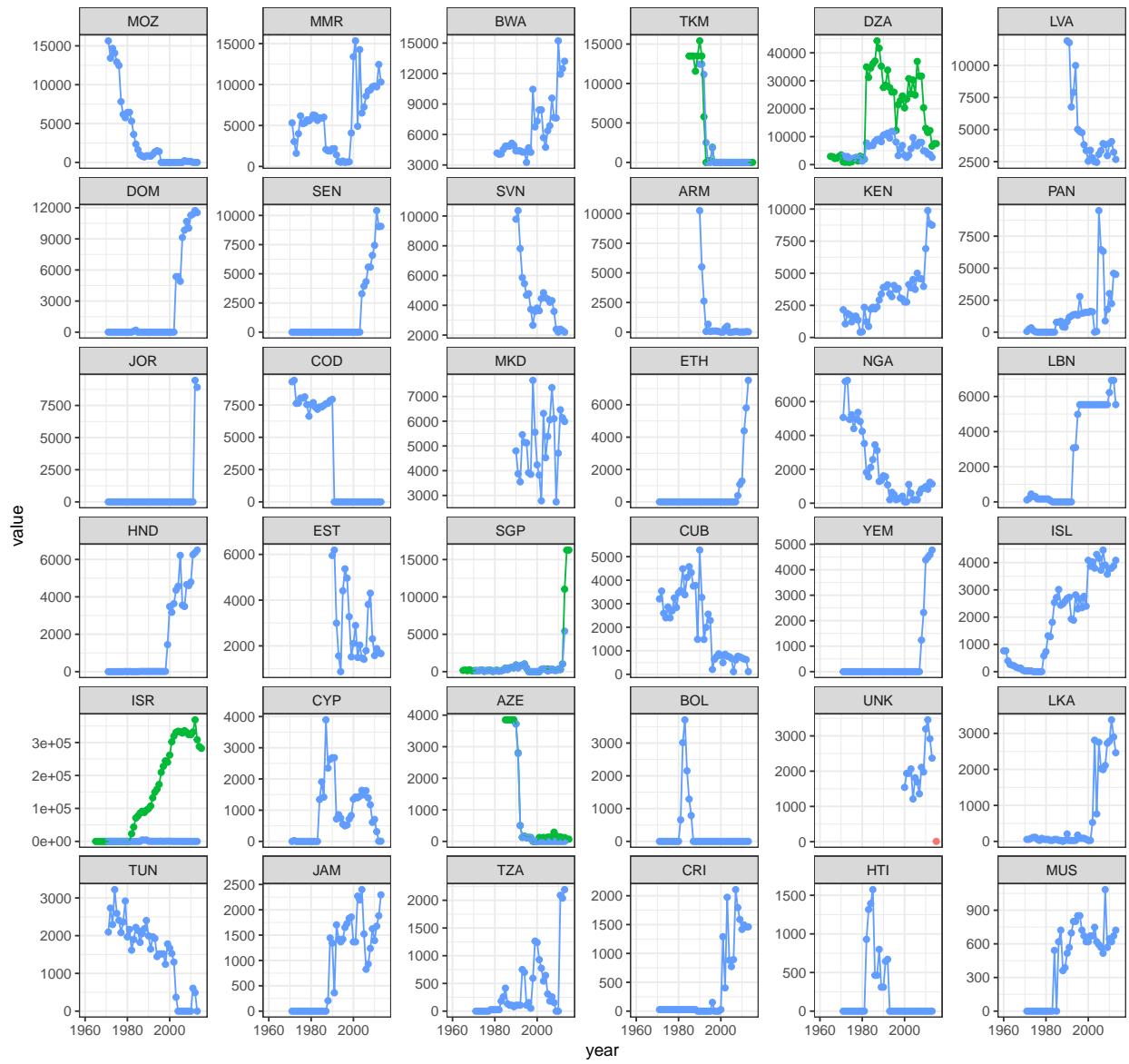


Figure 3: Coal consumption (Countries 72-108)

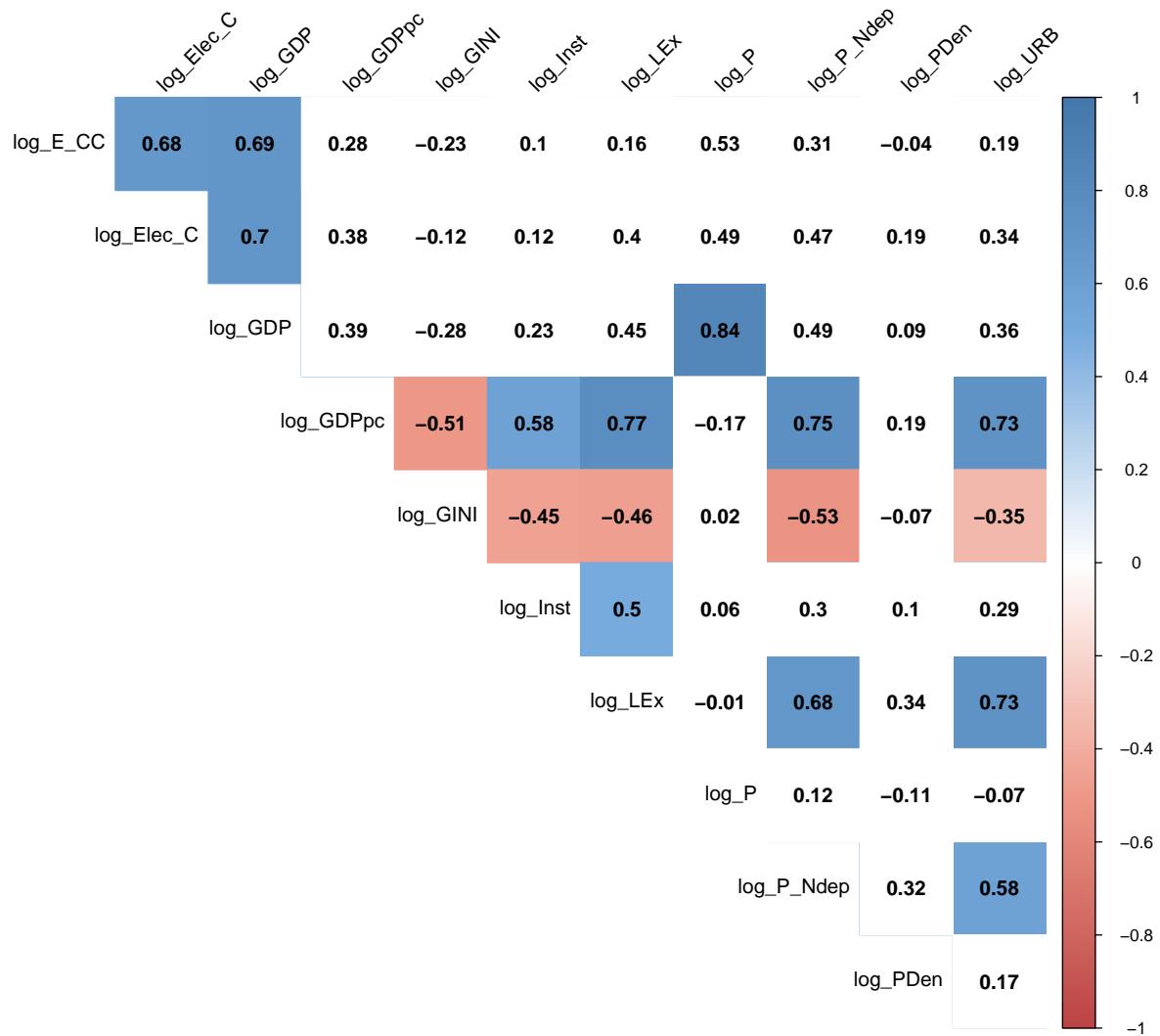


Figure 4: Correlation of selected variables

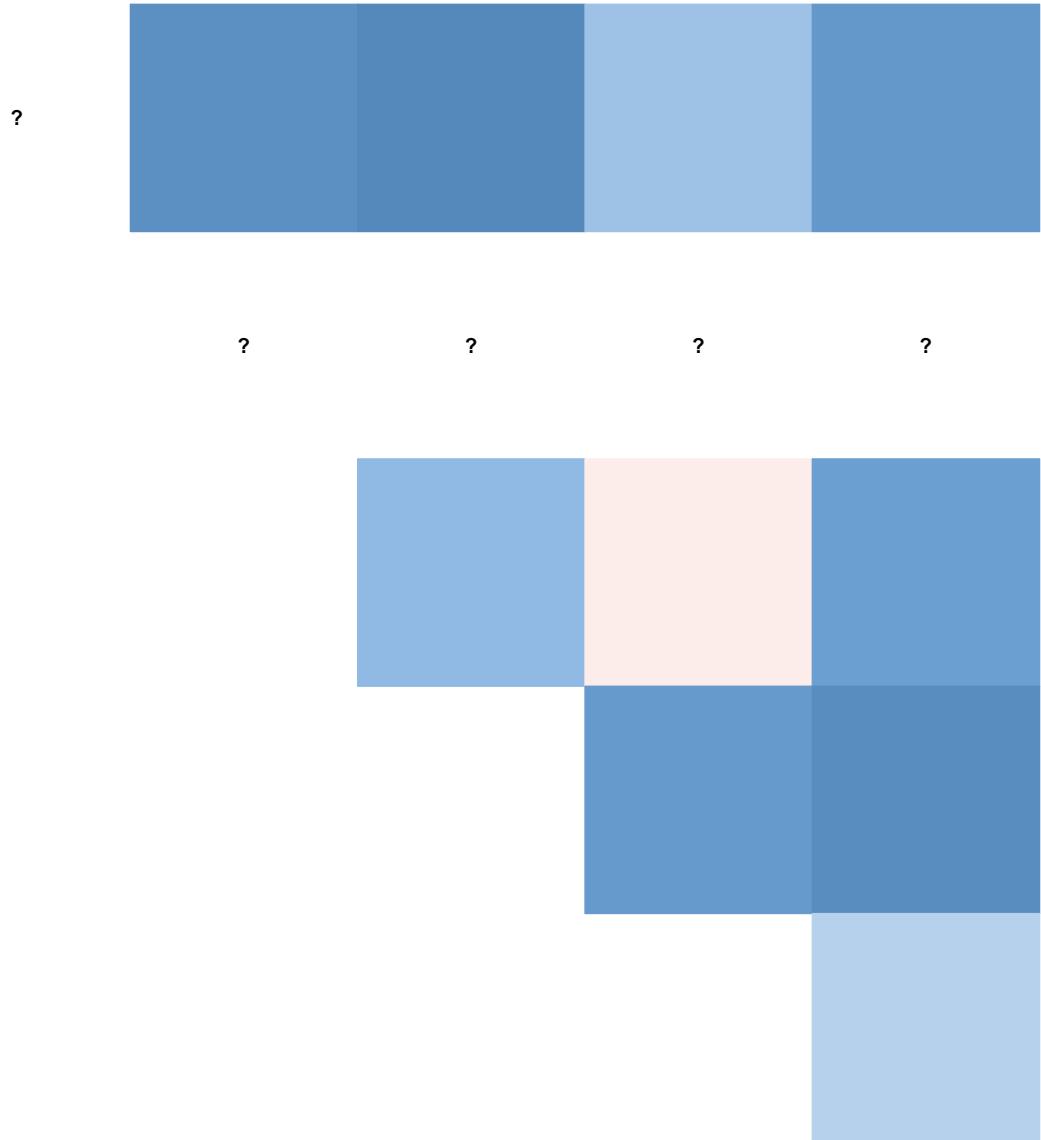


Figure 5: Correlation of selected variables

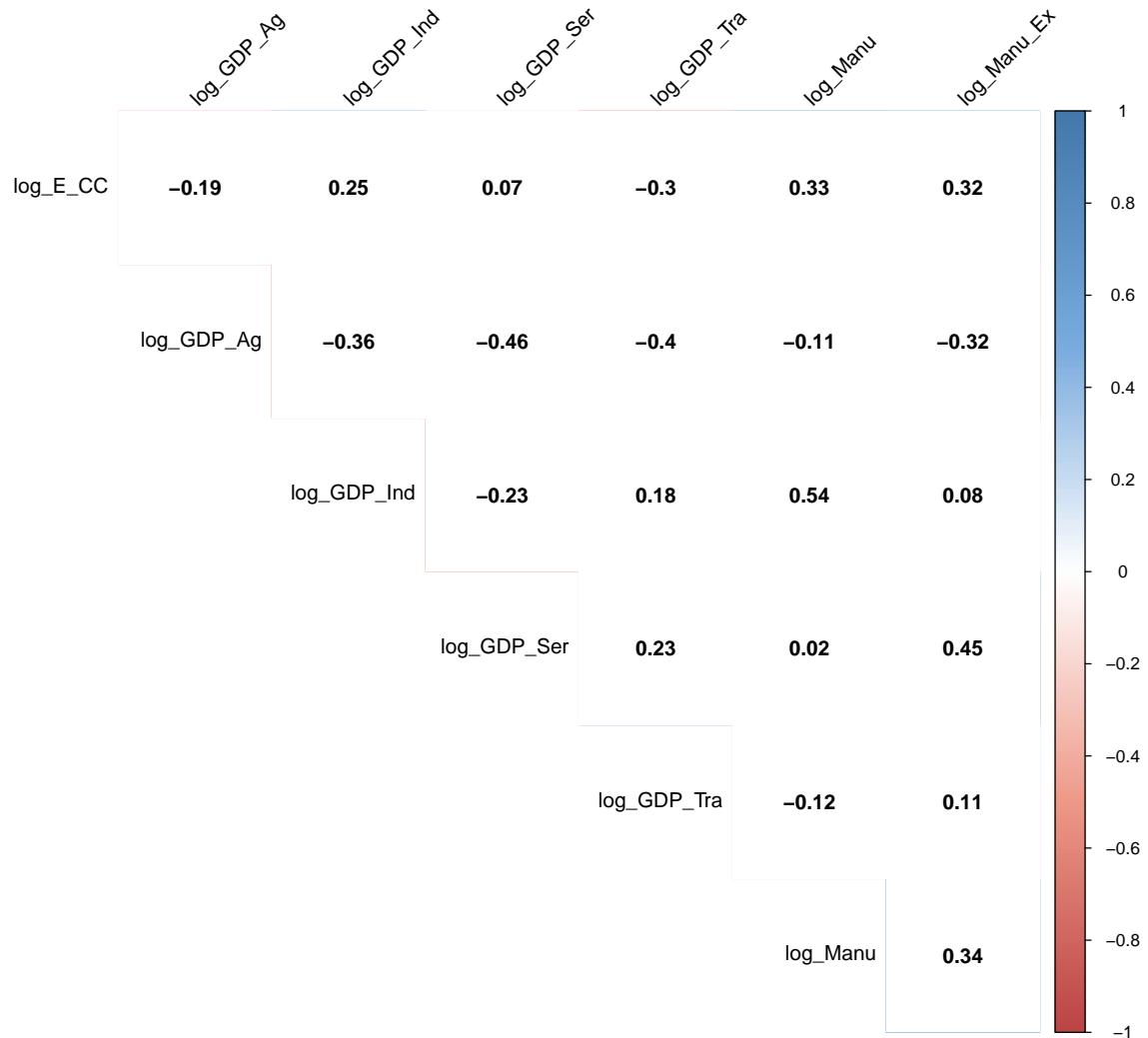


Figure 6: Correlation of selected variables

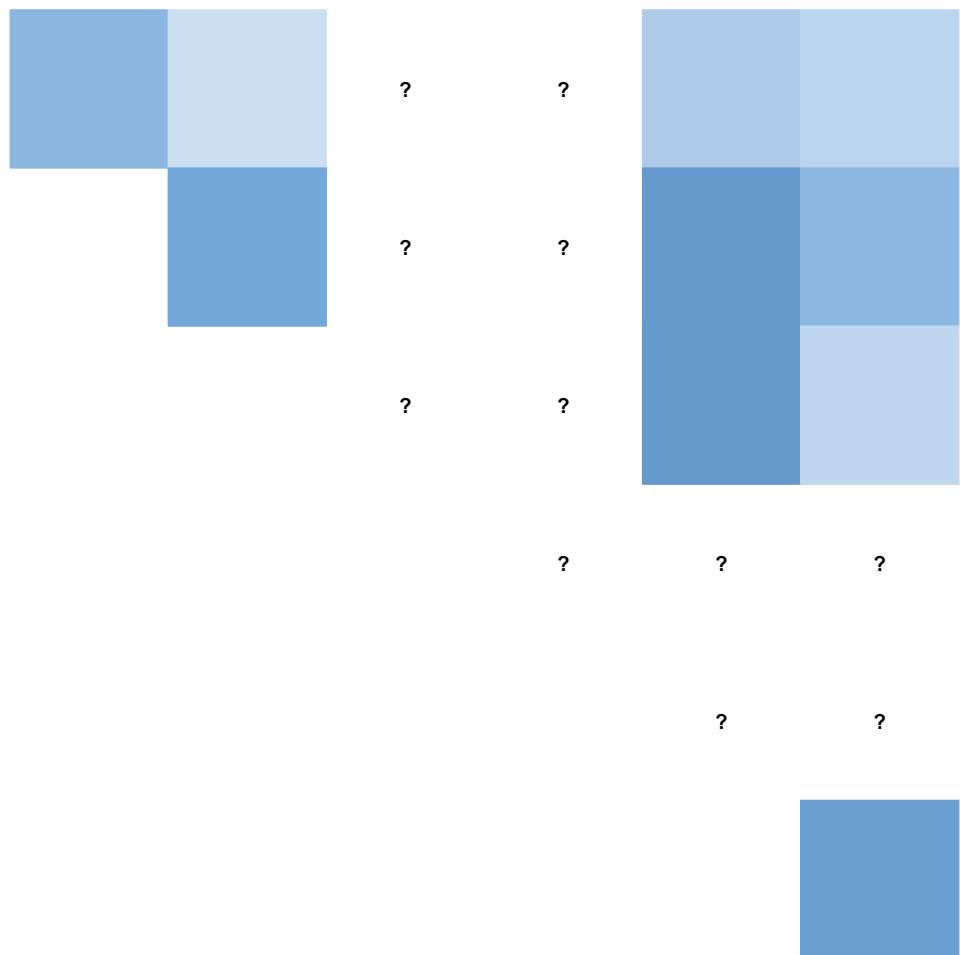


Figure 7: Correlation of selected variables

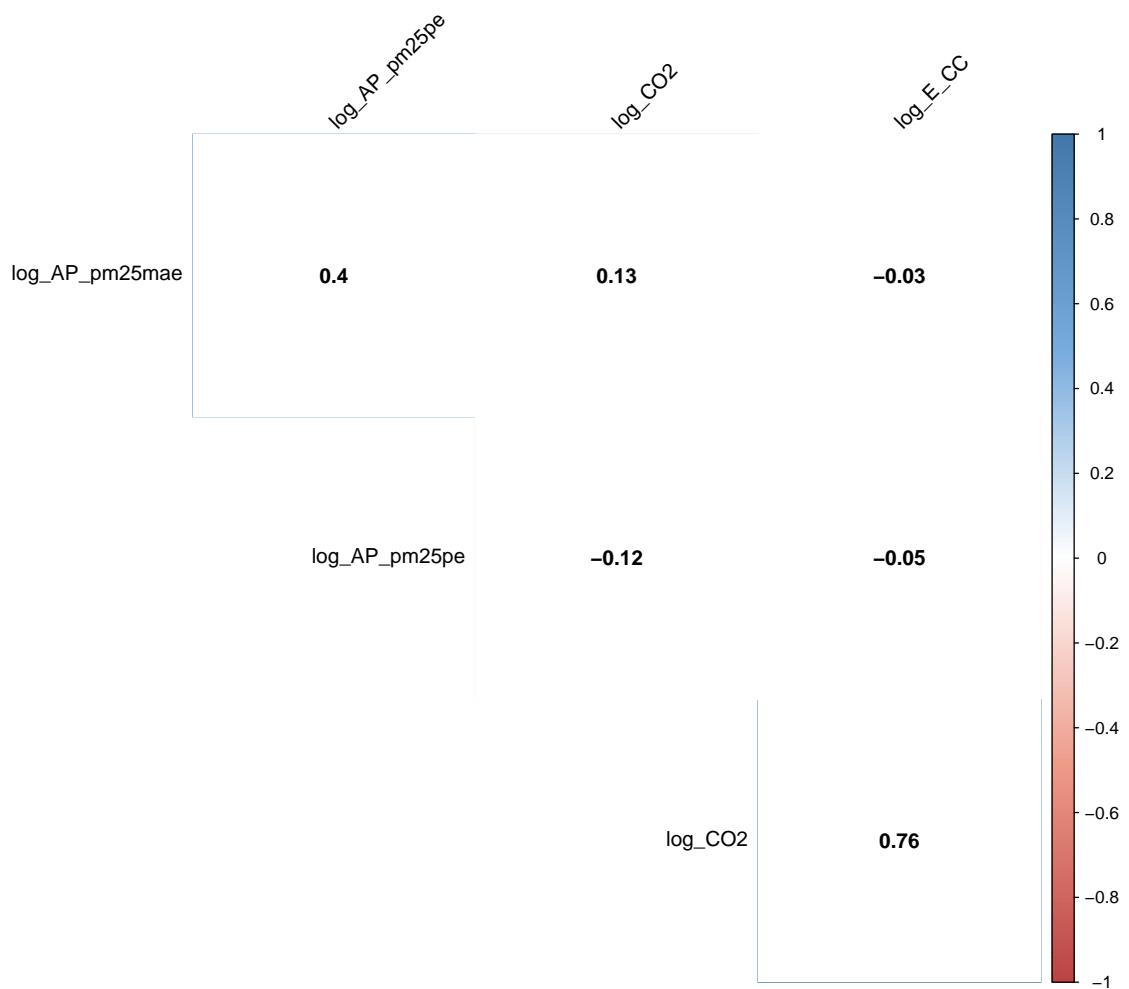
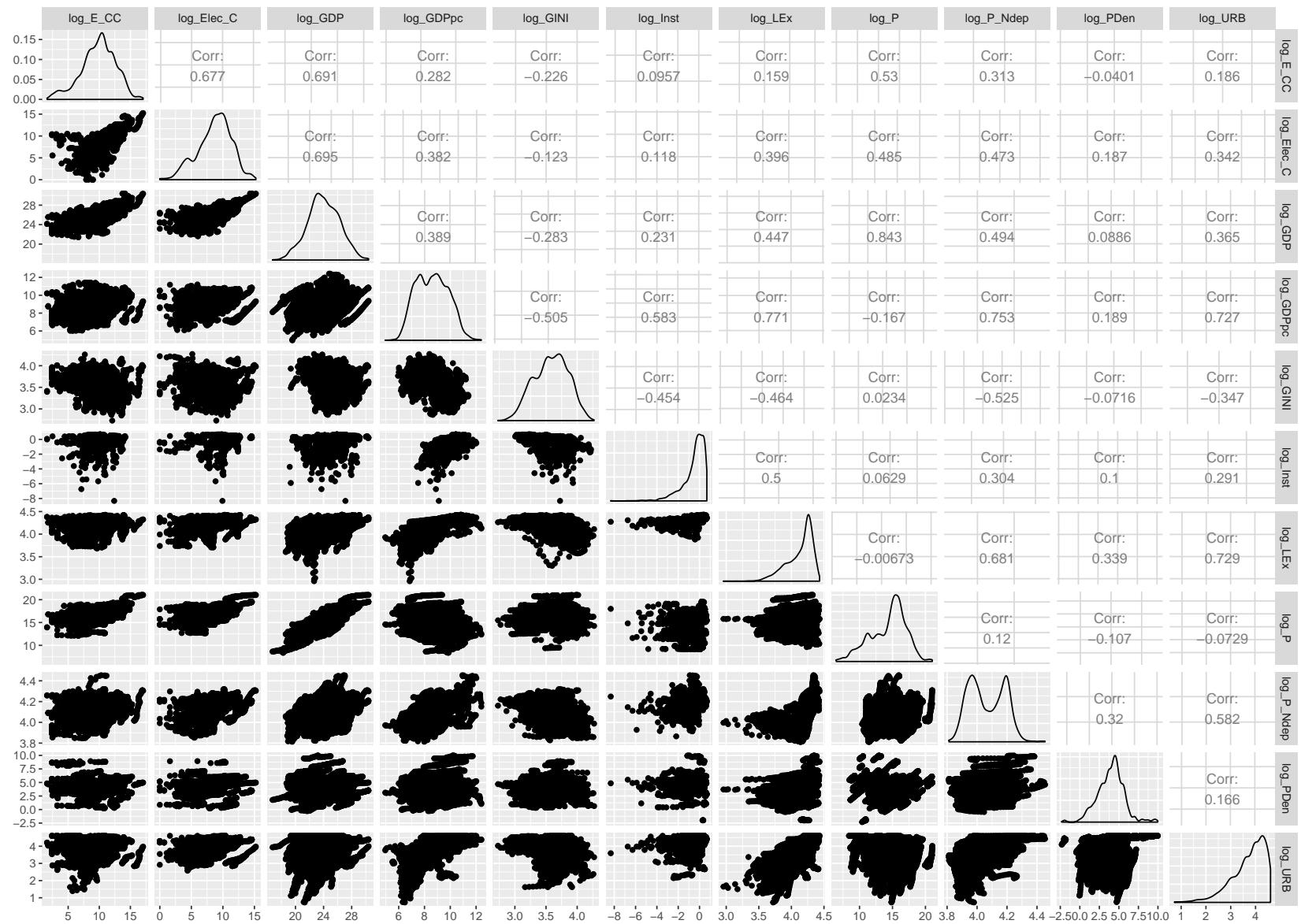


Figure 8: Correlation of selected variables



4 Statistical tests

4.1 Hausman test