Homework assignment #?

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MPP-C6: Statistics 2

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Project Description

You aim to reproduce the results of Stern and Common (2001) which sought to investigate the presence of an environmental Kuznets curve (EKC) for sulfur emissions. The EKC hypothesis "proposes that there is an inverted U-shape relation between various indicators of environmental degradation and income per capita"[1].

Dataset

The dataset stern2.dat contains country data from 1960-1990. The dataset contains the following variables

- *year* is the year in which the country was observed
- *country* gives a numerical code that uniquely identifies each country (see table 1)
- *pop* gives the population of the country in the given year
- *so* describes SO_2 emissions
- *gdpppp* describes the GDP per capita (purchasing power parity) in real 1990 interantional dollars
- *sopc* describes SO_2 per capita
- *oe* is a dummy variable describing oecd membership where 1000 represents membership and 2000 represents non-membership

Questions

1. Load the data into Stata. Make sure that the variables correspond to those given above.
2. Start by examining your data. What sort of distribution do our variables of interest display? What transformations could we apply to the data? If necessary, create new variables that are appropriately transformed.
3. Plot GDP per capita against sulfur emissions per capita (transformed if necessary). Describe the relationship you can see.
4. Write the equation for a model that could estimate an EKC for sulfur emissions. Create any extra variables that would be necessary to run this.
5. Carry out a pooled regression using the equation described in question 3. Interpret the coefficients.
6. Use stata's -rvfplot- command to visually inspect the results of your pooled OLS model for evidence of heteroskedasticity. Report your impression.
7. Run fixed-effects and random-effects models and interpret the results.
8. Discuss which of the three models run would be preferable.
9. Discuss why first-differencing may be a more appropriate method for the data.
10. Estimate the model using first-differences and interpret the results.
11. Comment on any differences between the models you have run.
12. Discuss whether we can observe an EKC for sulfur emissions with reference to your results.

References

[1] David I Stern and Michael S Common. Is there an environmental kuznets curve for sulfur? *Journal of Environmental Economics and Management*, 41(2):162–178, 2001.

Table 1: Country Codes

1	ALGERIA	95	JAPAN
14	EGYPT	97	KOREA,
18	GHANA	98	KUWAIT
22	KENYA	100	MALAYSIA
25	MADAGASCAR	102	MYANMAR
30	MOROCCO	106	PHILIPPINES
31	MOZAMBIQUE	108	SAUDI ARABIA
32	NAMIBIA	109	SINGAPORE
34	NIGERIA	110	SRI LANKA
41	SAFRICA	111	SYRIA
44	TANZANIA	112	TAIWAN
46	TUNISIA	113	THAILAND
48	ZAIRE	116	AUSTRIA
49	ZAMBIA	117	BELGIUM
50	ZIMBABWE	119	CYPRUS
52	BARBADOS	120	CZECHOSLOVAKIA
54	CANADA	121	DENMARK
60	GUATEMALA	122	FINLAND
62	HONDURAS	123	FRANCE
64	MEXICO	125	WGERMANY
65	NICARAGUA	126	GREECE
71	TRINIDAD&TOBAGO	129	IRELAND
72	U.S.A.	130	ITALY
73	ARGENTINA	131	LUXEMBOURG
74	BOLIVIA	133	NETHERLANDS
75	BRAZIL	134	NORWAY
76	CHILE	136	PORTUGAL
77	COLOMBIA	137	ROMANIA
81	PERU	138	SPAIN
83	URUGUAY	139	SWEDEN
84	VENEZUELA	140	SWITZERLAND
88	CHINA	141	TURKEY
89	HONG KONG	142	U.K.
90	INDIA	143	USSR
91	INDONESIA	144	YUGOSLAVIA
92	IRAN	145	AUSTRALIA
94	ISRAEL	147	NZ