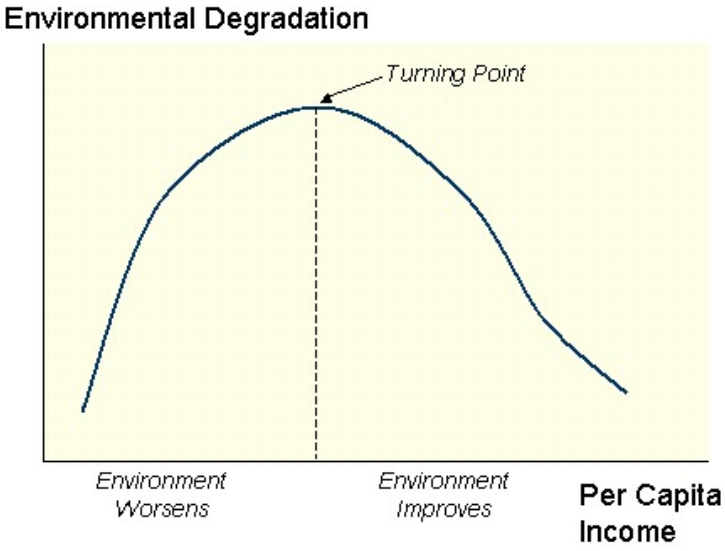
The EKC «fairytale»

The environmental Kuznets curve



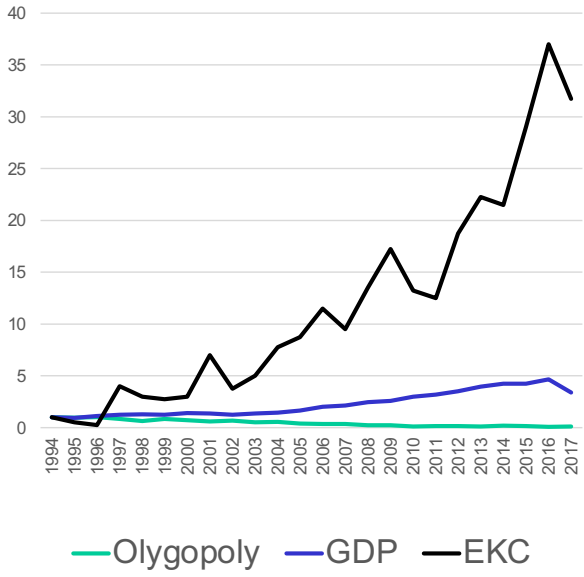
"Will continued economic growth bring ever **greater harm** to the earth's environment?
Or do increases in income and wealth
sow the seeds for the amelioration of ecological problems?"
(Grossman and Krueger, 1995: 353)

Source: Penn State University, David Abler
http://450.aers.psu.edu/development_environment.cfm

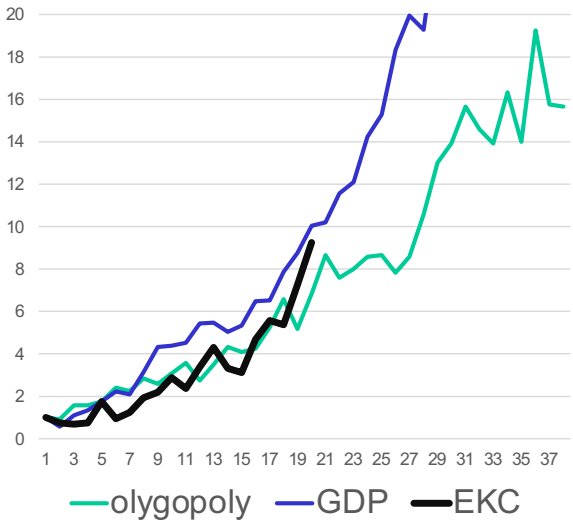
In the 1990s some economists have attempted to empirically show that economic growth is itself the means to environmental protection.

Frequency of the term in abstract or title
(articles only, SCOPUS, index number)

Since 1994



Since articles >9



WHY EKC? *Scale, Composition, Tecnique*

Economic Development

SCALE

STRUCTRAL CHANGE (→ service economy)

Efficiency

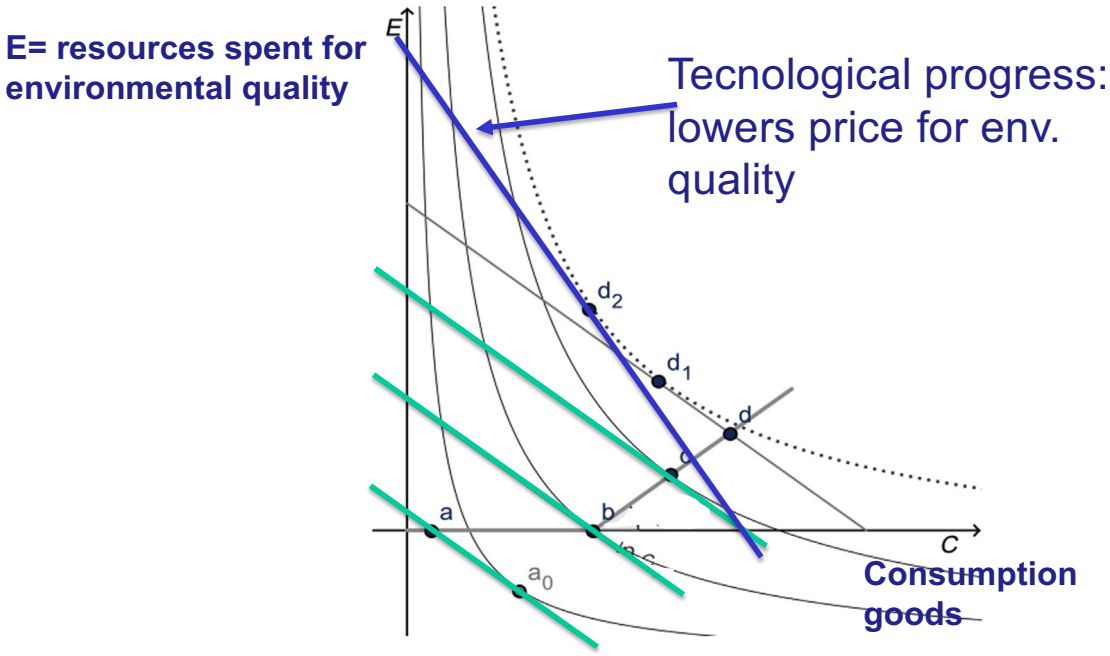
TECHNIQUE *Eco-friendly Materials/processes*

At higher levels of development,
structural change towards
information-intensive industries and **services**
coupled with
increased environmental awareness,
enforcement of env. regulations
better technology
higher environmental expenditures*
result in levelling off and gradual decline
environmental degradation."

Panayotou (1993, p. 1)

*The environment as a *LUXURY GOOD alas!)*

The environment as a luxury good and the «technique» effect



Some other quotes

"inverted U-shape relation between **environmental degradation** and income per capita" (Stern 1998: 173),

that is, about "a certain inevitability of **environmental degradation** along a country's development path at an earlier stage of development,
and a significant improvement at a later stage, both as a result of economic growth" (Panayotou 1993: preface).

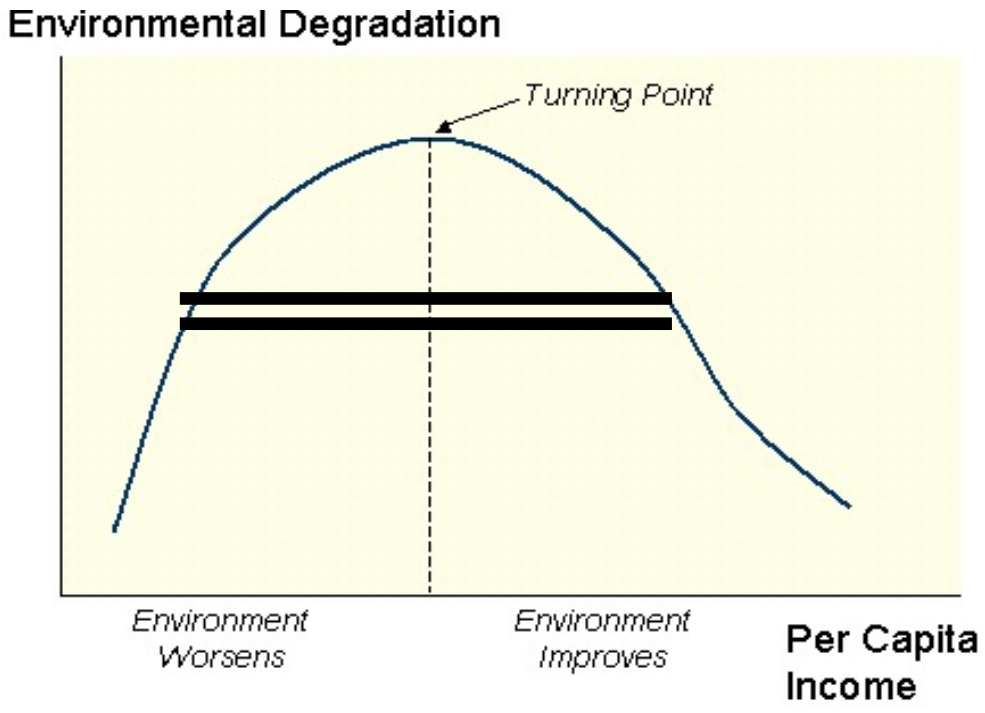
Stern DI. Progress on the environmental Kuznets curve? Environment and Development Economics 1998;3:175-198.
Panayotou T. Empirical tests and policy analysis of environmental degradation at different stages of economic development.; Working Paper WP238, Technology and Environment Programme, International Labour Office, Geneva, 1993.
Grossman GM, Krueger AB. Economic growth and the environment. Quarterly Journal of Economics 1995;110:353–377.

The **evidence** is actually mixed.

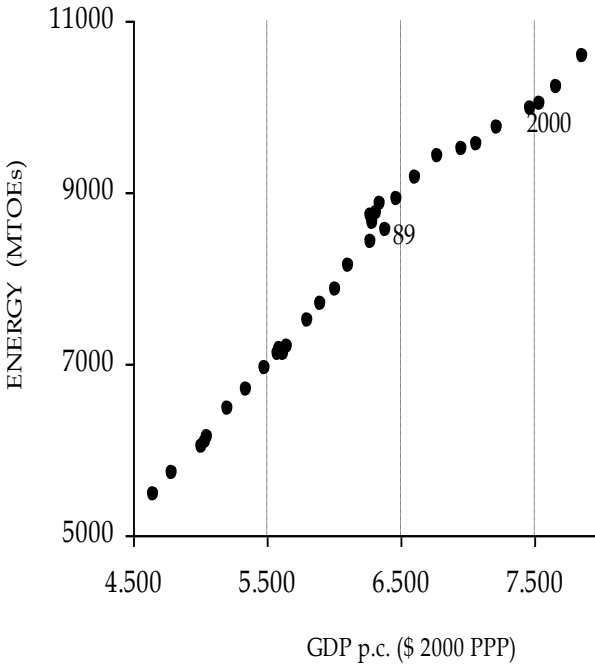
Data are consistent with the hypothesis for some forms of damage with **local short-lived** effects (sulphur emissions, particulates, faecal coliforms)

but not for more dispersed and long-lived pollutants such as carbon dioxide.

TIPPING POINTS? → Tunneling through the EKC



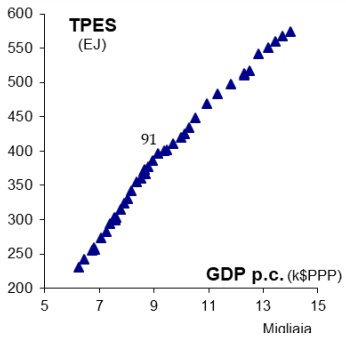
At the global level?



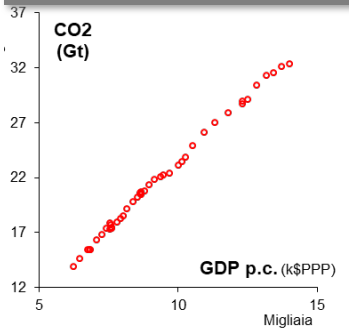
As discussed by Stern et al. (1996), even where data are consistent with the hypothesis, the pattern of per capita income levels and growth rates across the nations of the world can be such that, **at the global level**, growth and damage are positively correlated over the medium-term future.

The World as a single country (2/3)
EKC hypothesis

Energy



CO2



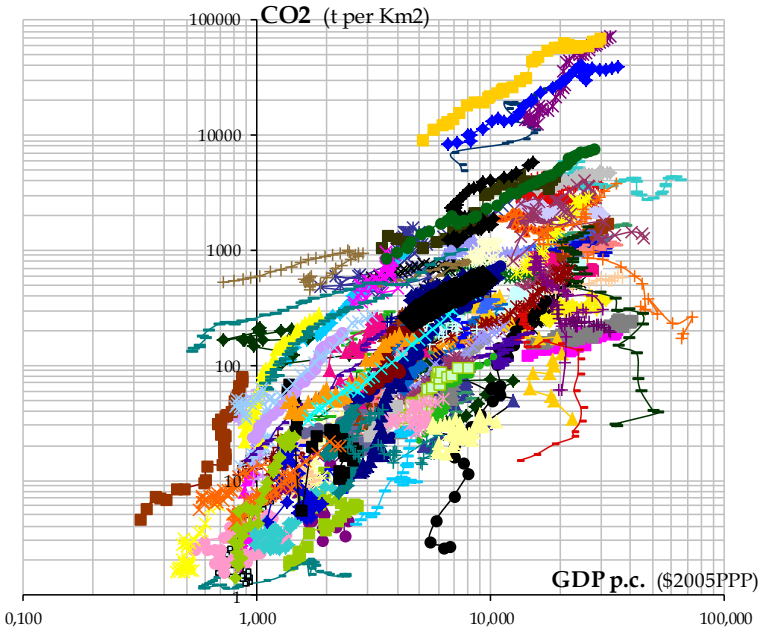
Key messages

- **an inverted-U relationship is not plausible**
- **linear relationship with per capita income until 1990** and slightly concave after
- **elasticities are larger than one**, energy and CO2 emissions increased more than proportionally with income

Pooled countries: a first look (1/2)

Country comparison in a single graph by standardizing:

- with respect to area with population density in 1995>5sqkm
- with respect to mean population



Mixed empirical results … due to

Methodological reasons:

indicators (and databases) used

units included in the sample (OUTLIERS!?!)

shape of the relation tested (quadratic, cubic, non-parametric)

the use of control variables other than income as regressors

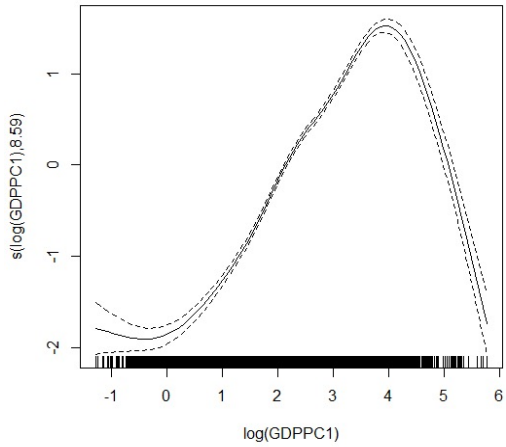
econometric bad practices (or even 'mistakes') (time series!!!)

Different environmental phenomena

- Local (YES) vs global (NO)
- Easy (YES) vs difficult to tackle (NO)

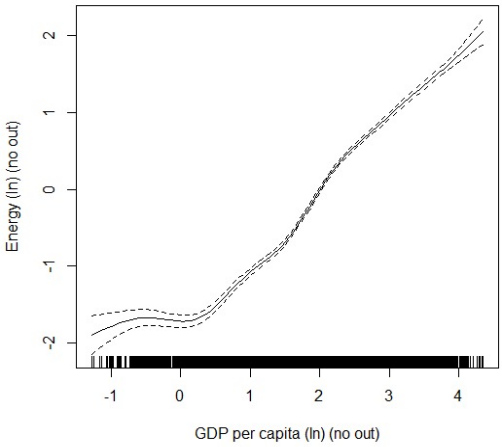
Pooled Countries:
NON parametric analysis - ENERGY

WE GOT IT! The EKC!!!

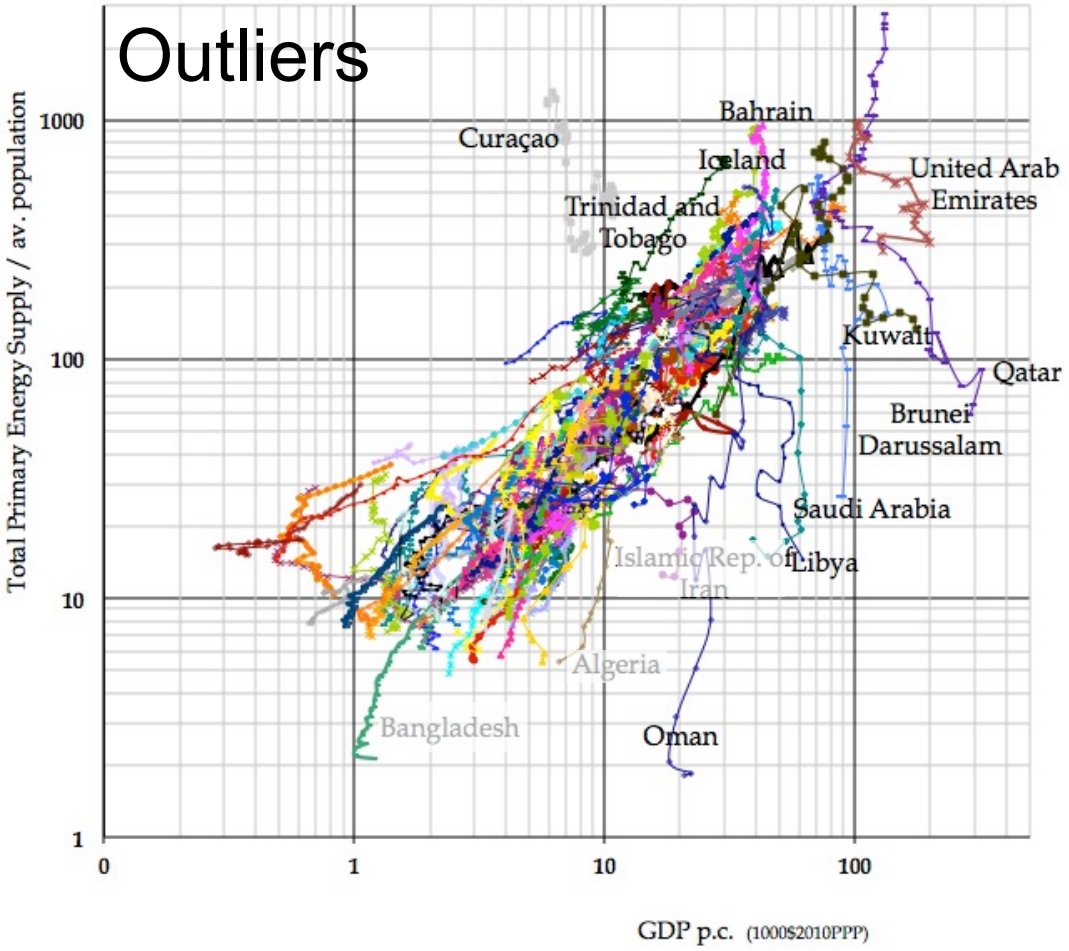


ALL COUNTRIES (115)

WE LOST IT!



WITHOUT OIL economies and and other potential
OUTLIERS (103)



Standard approach

$$\textit{Per capita pressures} \overset{?}{=} f(\textit{pc income})$$

This is wrong and misleading

Appropriate approach

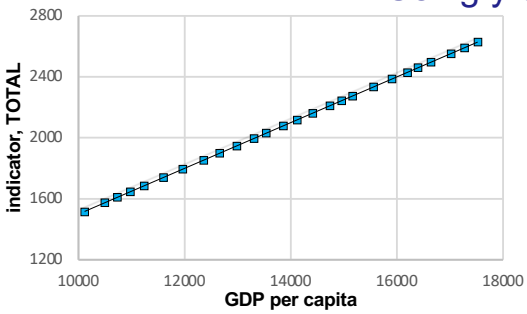
$$\textit{Total pressures} \overset{?}{=} f(\textit{pc income})$$

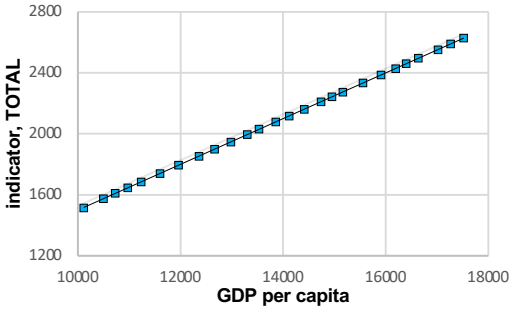
- **Nature "does not care"** about **per capita** emissions →
  TOTAL emission are relevant

Who would use concentrations in per capita term?

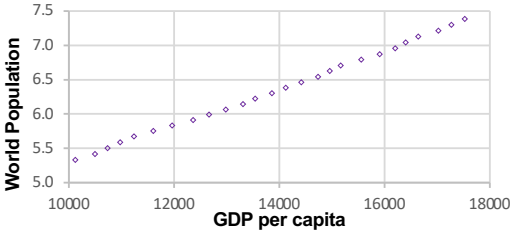
Indicator per capita: misleading messages …

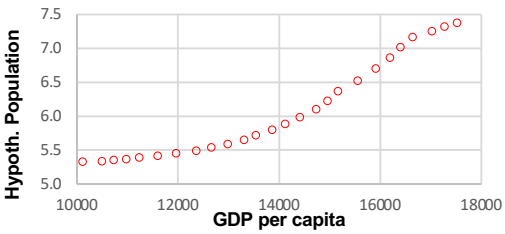
Using y-axis indicator in **ABSOLUTE terms**

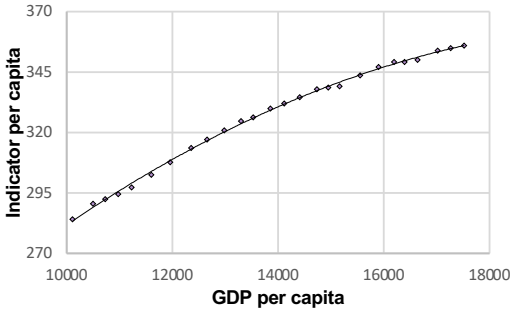


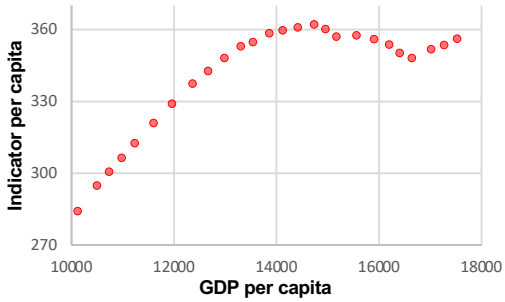


when converting y-axis indicator in **PER CAPITA** terms …









The purpose of per capita terms is comparison!

useful when looking at raw data or pictures

However

better to standardize environmental indicators using scalars (e.g. inhabited area, population in a given year)

rather than time series (population).

❖ In regression analysis:

NO COMPARABILITY PROBLEMS → **intercept!**