

Air Pollution

An Analysis of State Intervention

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- 1** Contextualization and Research Objectives
- 2** Externalities and public intervention
- 3** The Case of Air Pollution
- 4** Conclusions and future research

Contextualization

- 1** The world has undergone many changes in recent decades, changes mainly derived from globalization, which takes business management and even the governance of the country to another level.
- 2** Globalization and the growing development felt worldwide lead to the economic and social development of states, increasingly concerned and focused on the good environmental practices of an economy.
- 3** Economic *trade off* between pure environment and economic growth

Objective

This study aims to present how the state became the main actor in the treatment of air pollution

To this end:

- (i) firstly, the field of public economy is briefly characterized and historically contextualized,**
- (ii) then presenting the market failures and**
- (iii) common correction methods.**

Emphasis on negative externalities, is the central theme of the work.

We delve into the case of air pollution by presenting the reason why it is considered an economic problem, analysing how environmental policies can affect GDP and presenting what has been done to combat this problem, both in the European Union and in Portugal.

Public Economics

- ❑ To Adam Smith the State was “minimalist”, attributing to it a select few roles.
- ❑ During decades it was found that free markets have no self-balancing mechanisms that lead to full employment and economic stability in general.
- ❑ Keynes defended an interventionist state economic policy, whereby governments would use fiscal and monetary measures to mitigate the adverse effects of economic cycles.
- ❑ We can observe how since the 18th century the State has been granted an increasingly larger role in the Economy and in societal issues.
- ❑ Musgrave (1996) claims that “the welfare state admits distributional concerns. The state now seeks to correct the market determined distribution of income and wealth, moving it towards what society views as efficient or fair (...) the state implements the choice of individuals and their preferences.”

Public Goods

Market power

Market Failures

**Asymmetric
information**

Externalities

Externality as a market failure

- Ledyard (1989) claims that “Market failure is said to occur (...) when the allocate achieved with markets are not efficient”.
- Externality theory is one of the most popular theory used to claim that markets fail.
- It is claimed that because of the existence of externalities, the market will provide too much or too little of a particular good, and that the government must step in and use taxes, subsidies, restrictions on the provision of the good, or take over the production of the good in order to remedy the situation.

Positive Externality

When an agent not involved in the production or consumption of a good receives a benefit for which he doesn't pay, he is said to be the recipient.

When an agent who has nothing to do with the sale or purchase of a good has a cost imposed on him for which he is not compensated.

Negative Externality

AIR POLLUTION

Represents a serious health risk.

Brunekreef and Holgate (2002)

“Exposure to pollutants such as airborne particulate matter and ozone has been associated with increases in mortality and hospital admissions due to respiratory and cardiovascular disease.”

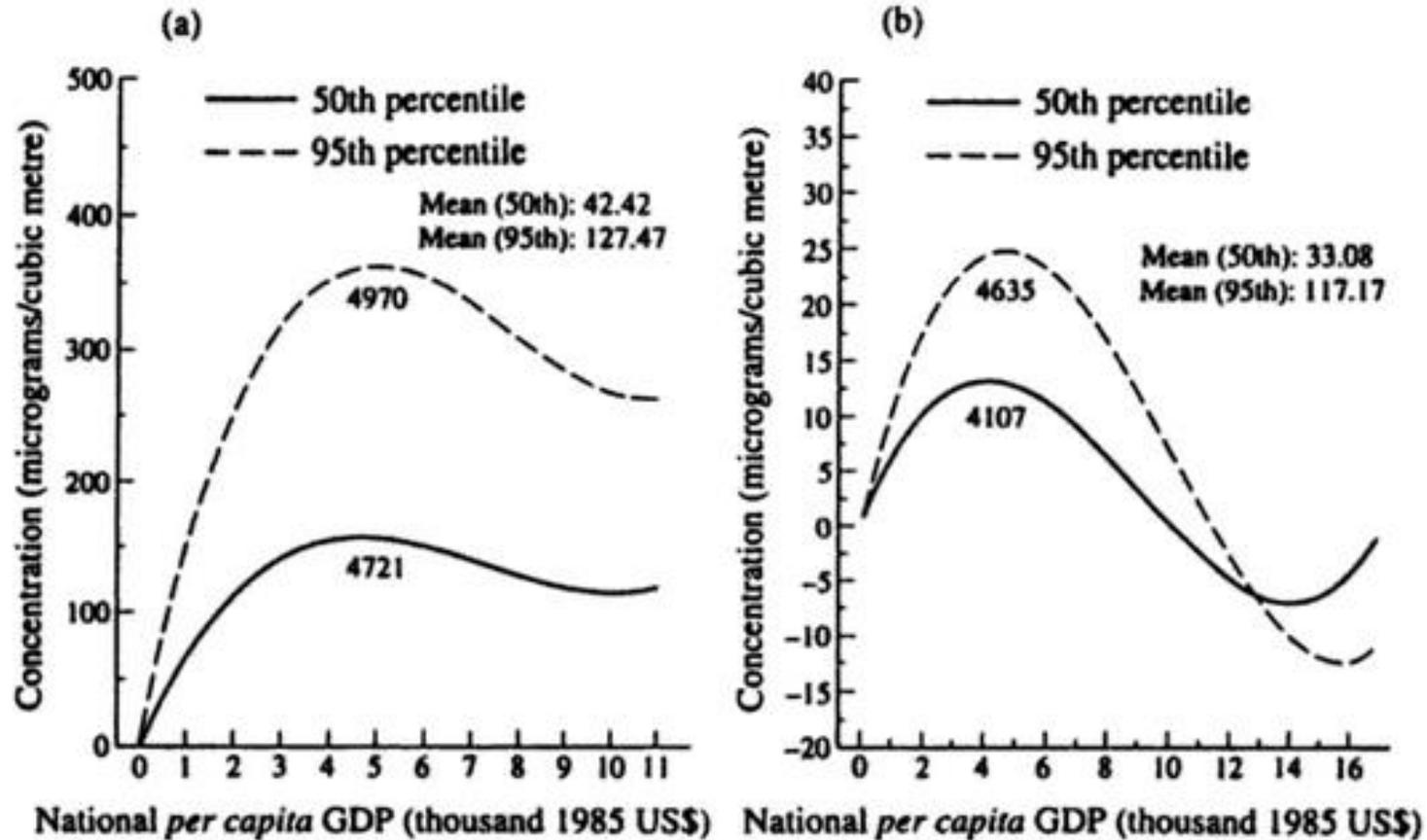


Negative
Externality

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graph LR; A[Negative Externality] --> B[Public Intervention]; B --- C["• Taxation (pigouvian tax)"]; B --- D["• Regulation"]
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Public
Intervention

- **Taxation**
(pigouvian tax)
- **Regulation**



Urban air quality

(a) Suspended particulates (dark matter)

(b) Sulphur dioxide

Source: Grossman and Krueger (1993b).

OBSERVE:
how national
GDP *per capita*
correlates to
pollution levels

CONCLUSION:
after a certain
level of wealth
the pollution-
level actually
decreases.

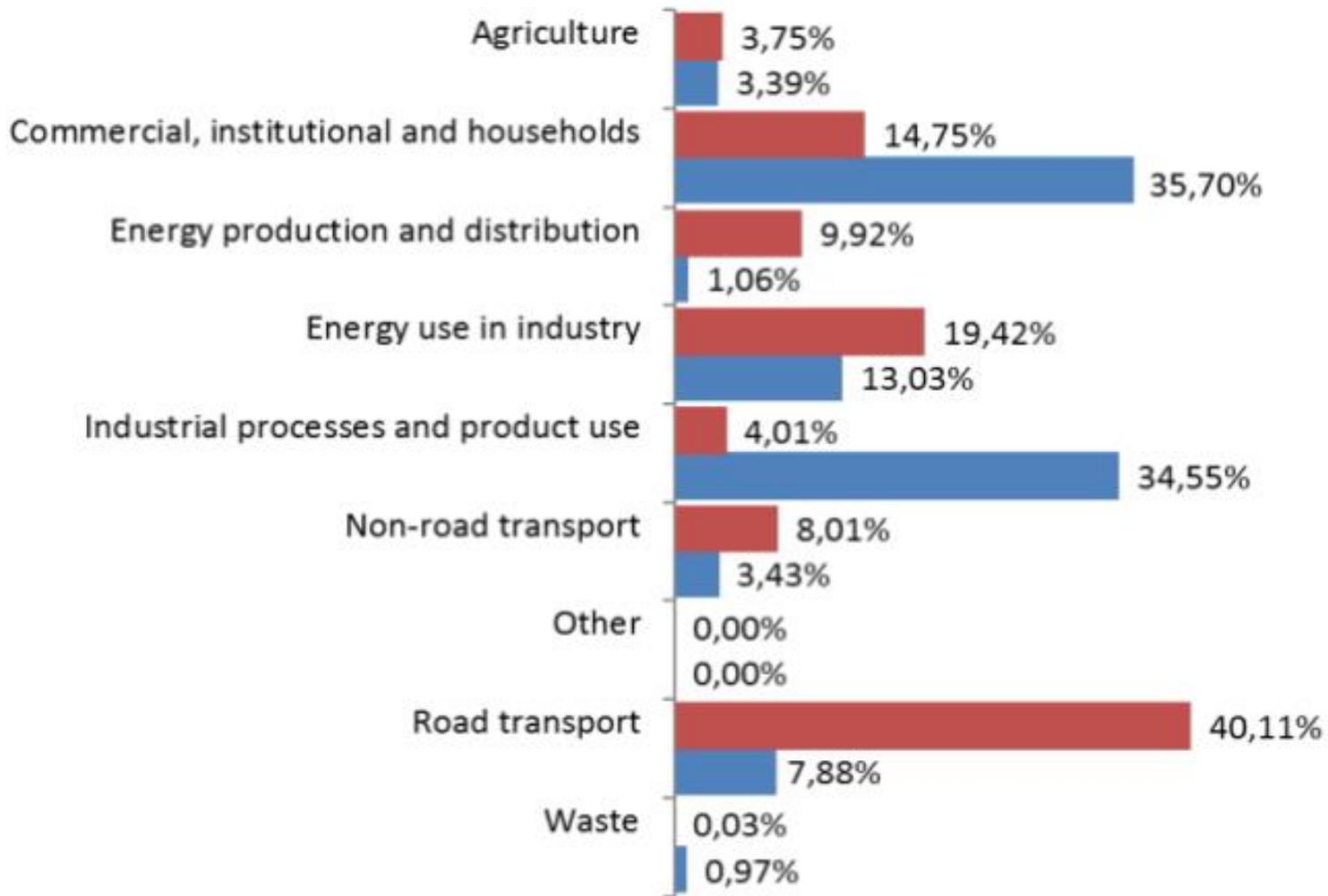
- ✓ Shapiro (2018) concluded that “between 1990 and 2008, air pollution emissions from US manufacturing fell by 60 percent despite a substantial increase in manufacturing”.

Conclusion: US air quality has improved dramatically with economic growth

- ✓ Fu and Geng (2019) claims that the improvement of corporate regulatory compliance can promote green development. Meanwhile, public participation plays an essential role in achieving green development.

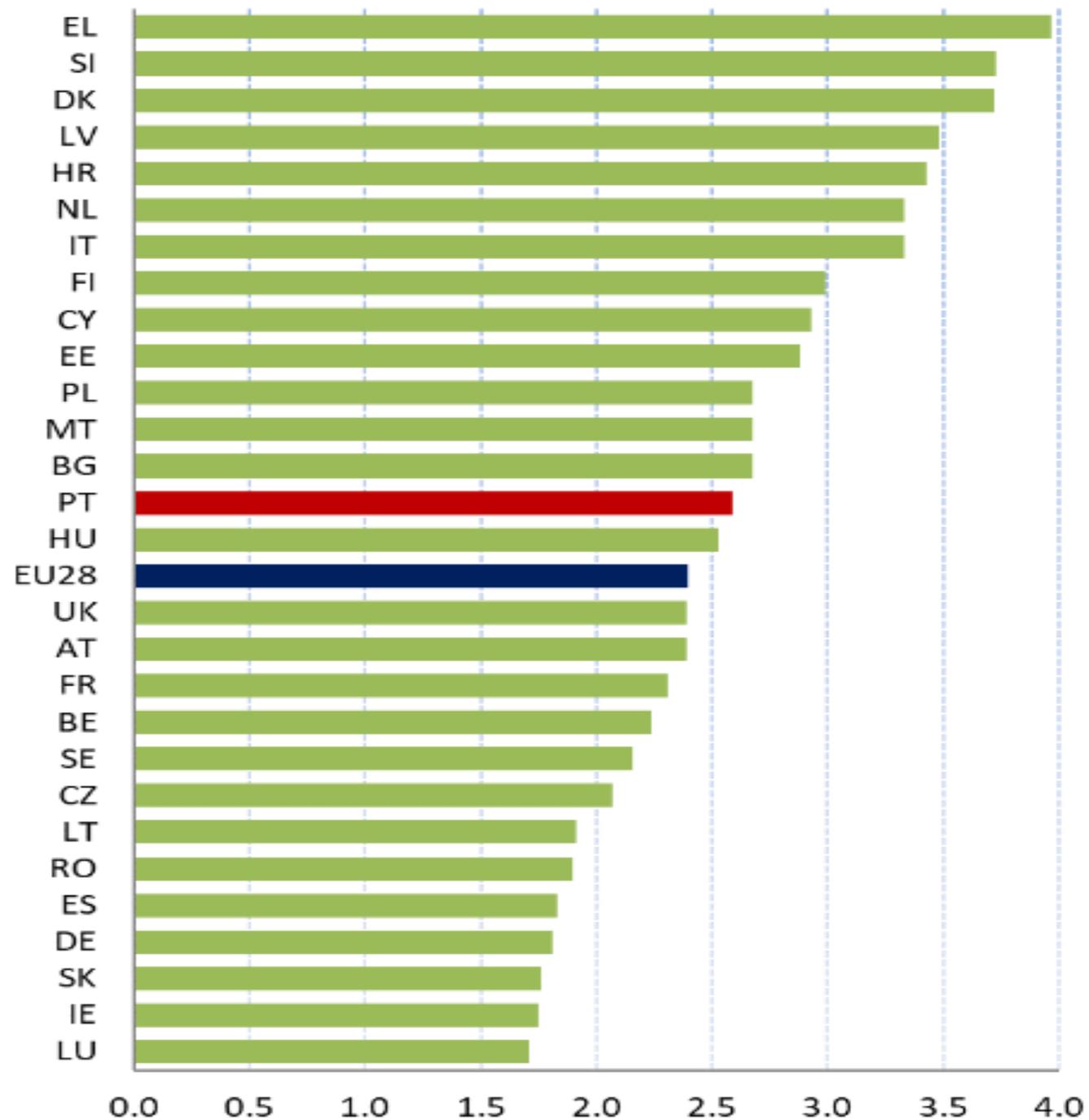
European Union

- The European Union has been developing a lot of legislation regarding air quality for its member-states to follow, established health-based standards and objectives regarding certain air pollutants.
- European Commission (2019) writes “The main objectives of EU policy on industrial emissions are to:
 - (i) protect air, water and soil;
 - (ii) prevent and manage waste;
 - (iii) improve energy and resource efficiency; and
 - (iv) clean up contaminated sites.
- One of the most iconic policies of the European Union to combat air pollution was the creation of the EU Emissions Trading System (EU ETS), the world's first major carbon market and also the biggest



■ NOx emissions by sector - 2016 ■ PM2.5 emissions by sector - 2016

Legend:
 $M_{2,5}$ e NO_x
 emissions by
 sector, in Portugal



Legend:
**Environmental tax revenues as
% of GDP, in Portugal, in 2017**

Conclusions

- 1** World Health Organization consider policies to reduce air pollution, therefore, offer a “win—win” strategy for both climate and health, lowering the burden of disease attributable to air pollution, as well as contributing to the short and long-term mitigation of climate change.
- 2** State plays an important part in guiding economic activity towards sustainability, in this case environmental sustainability — for the short-term and long-term.
- 3** Through incentivizing the use and development of alternative technology and techniques by having the economic agents internalize the cost of pollution, the market can be guided to provide higher living standards while at the same time lowering pollution-levels.

Conclusions

- 4** The European Union has made very significant strides in this sense, and it's safe to say it is the preeminent organization when it comes to such matters.
- 5** Portugal, being a part of it, benefits a lot from its legislature and funds. While the heavy investment in renewable energies is commendable, there is still a lot of work to be done inasmuch as three major urban areas (Lisbon, Porto and Braga) have air pollution levels above the EU's quality standards.
- 6** The fact that environmental tax revenue as % of GDP is so high in comparison to industrial giants such as Germany is also concerning and must be investigated, along with alternative policies to cover polluting activities with higher precision.

Future research

Using OLS, we regress the per capita emissions for each emission class on per capita income.

THANK YOU VERY MUCH