An Exploration of the Environmental Crime Kuznets Curve in Italy

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Abstract

In this paper, we revisit the well-known environmental Kuznets Curve (EKC) hypothesis, which postulates an inverted U-shaped relationship between the level of environmental degradation and income, extending the relative framework to study the relationship between income and environmental crimes in Italy, calling the inverted U shape we found the "Environmental Crime Kuznets Curve" (ECKC). We document the existence of an inverted U-shaped relationship between environmental crimes and income in the Italian provinces for the period 2010-2015. Environmental crimes increase with per capita income until they reach a maximum, and then decrease as income keeps rising.

Keywords: environmental crimes, Kuznets curve, Italian provinces.

JEL classifications: Q56, K32.

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1. Introduction

Environmental crime is currently one of the most profitable forms of criminal activity and eco-mafia has become a big business in Italy, where organized criminal networks are involved in many sectors (i.e., waste, agri-food sector, illegal construction, forest fires, wildlife, cultural heritage) and are often linked to the exploitation of disadvantaged communities, human rights violations, money laundering and corruption (UNEP and INTERPOL, 2013). The eco-criminality is characterized by its markedly economic trait, which puts at risk the societal environmental matrices, damaging the healthy economy and especially the most innovative one. Environmental crimes are typically economic crimes, in the sense that it is, above all, the expectation of easy earnings to move the criminal action. To fight the illicit practices, it is necessary to intervene on this front in a systemic way, recognizing the limitations deriving, inter alia, from the presence of i) incoherent and sometimes criminogenic features of laws (meaning by this that norms or regulations might contain elements that can be viewed as a

potential source of inspiration and justification in committing illicit actions); ii) eco-criminal structures (also mafia-like organizations) that offer huge shores to eco-criminals; iii) diffusely high levels of corruption; iv) weak and often inadequate enforcement of environmental laws. Moreover, in addition to these circumstances, in Italy there has been not only a lack of economic resources devoted to environmental crime prevention and control but also a problem of collusion between political parties and industrial lobbies that has affected, for several years, the criminal environmental legislation and its effective enforcement. These circumstances have created the prevalence of a system that has allowed to generate easy private profits with huge environmental and social costs. The illegal trafficking of waste is an emblematic example of such a system, which in turn has been encouraged by a weak degree of social perception, given that eco-crimes are usually defined as "*crimes without victims*" (Skinnider, 2011; White, 2015), due to the not immediate identification of the victims.

However, even though organised crime plays a significant role in the environmental criminality (particularly in the area of illegal dumping and international illegal trafficking of hazardous waste) organised mafia-like criminals are not the only players. Indeed, although a simplistic view often prevails in the public domain according to which environmental violations are mainly attributable to mafia clans, a more substantial explanation of the phenomenon is articulated around the interplay of mafia-like groups, businessmen, firms and administrative officers (D'Alisa *et al*., 2015). Such a linkage between environmental crime and corporate crime should be taken into account in developing an effective deterrence strategy.

While criminologists have long studied the relationship between economic conditions and crime (Cook and Zarkin, 1985; Cantor and Land 1985, 2001; Arvanites and Defina, 2006), pointing to a negative association between economic performance and criminal outcomes, there is no evidence, to the best of our knowledge, on the relationship between economic conditions and environmental crimes. This study attempts to fill this gap in the empirical literature by trying to establish the existence (or not) of an inverted U-shaped relation between environmental crimes and income among the Italian provinces.

2. Key References in the Literature and Empirical Methodology

Drawing on the well-known Kuznets Curve (KC) (Kuznets, 1955), which claims that economic growth first increases and then reduces income inequality in a society, we revisit the hypothesis of the so called Environmental Kuznets Curve (EKC) which postulates an inverted-U-shaped relationship

between a measure of environmental quality (such as, CO_2 emissions per capita) and the gross domestic product (GDP) per capita and then we extend the relative framework to study the relationship between income and environmental offenses in Italy. Since Grossman and Krueger's (1995) seminal paper, a large volume of scientific research has been conducted to investigate this hypothesis, assuming that in the early steps of a country's economic growth, pollution tends generally to increase rapidly because the country's priority is production and minor attention is devoted to the environmental impact of growth. This implies that increases in economic production determine, throughout a "scale effect", more pollution and environmental degradation (Dinda, 2004; Bousquet and Favard, 2000; Beckerman, 1992). However, in the following phases of growth, as national GDPs keep rising, the need of a cleaner environment increases as individuals, businesses and institutions are willing to invest for improving the environmental quality (Dinda, 2004; Kijima *et al*., 2010; Bhagawati, 1993).

It has been much debated in recent decades whether or not economic growth can be achieved without degrading the environment in an unsustainable way, because we have become aware of the fact that economic growth, at the current rate of impoverishment and degradation of environmental resources, cannot continue indefinitely. Opposing visions have become established over the years. On the one hand, some proponents of the neoclassical approach to environmental issues believe that the environmental regulation policies of production processes have negative consequences on the economic growth of a country and consequently on the wellbeing of the population (Gray 1987, Haveman and Christiansen 1981; Norsworthy, Harper et al., 1979). On the other hand, there are also more optimistic positions: economic growth and technological development have created opportunities and resources to invest in new environmentally friendly technologies (Porter 1991, Sinclair-Desgagné, 1999).

We aim to investigate, for the first time, the existence of an inverted U-shaped relationship between environmental crime and income within Italian provinces for the period 2010-2015, calling this relationship as the Environmental Crime Kuznets Curve (ECKC) and looking to investigate whether illegal environmental offences might initially deteriorate but then improve as the economy develops. As we can see from Table 1, on a provincial scale, Naples is the most affected province, followed by Salerno, Bari, Rome, Cosenza and Reggio Calabria. From Table 2, it is easy to observe the role of the eco-mafia in the Southern regions; the four regions with a traditional mafia-settlement are among the first for numbers of offenses. Campania is at the top of the regional classification of offenses. Lazio is the first region of Central Italy. Liguria is the first in the North of the country.

Table 1. Total number of environmental violations by province (2010-2015)

Provincia	Infrazioni
Napoli	1746.67
Salerno	1430.00
Bari	1238.17
Roma	1232.50
Cosenza	994.33
Reggio Calabria	931.33
Palermo	786.67
Foggia	748.00
Latina	682.33
Catania	609.83
Trapani	602.67
Messina	559.50
Sassari	558.17
Avellino	512.67
Livorno	510.17
Crotone	507.00
Lecce	500.50
Cagliari	493.00
Genova	491.17
Potenza	477.17

Source: author's elaboration on Legambiente data

Table 2. Total number of environmental violations by region (2010-2015)

Regione	Infrazioni
Campania	4396
Sicilia	3689
Puglia	3300
Calabria	3108
Lazio	2508
Sardegna	2079
Toscana	2041
Liguria	1395
Lombardia	1264
Veneto	942
Emilia Romagna	881
Abruzzo	861
Marche	743
Basilicata	732
Piemonte	674
Umbria	612
Friuli Venezia Giulia	607
Trentino	413
Molise	308
Val d'Aosta	39

Source: author's elaboration on Legambiente data

To estimate whether there is an inverted U-shaped relationship between income and environmental crime, we run the following benchmark specification in which we include a quadratic polynomial of income:

$$Envcrime_{it} = b_0 + \beta_1 Income_{it} + b_2 Income^2_{it} + b_3 X_{it} + \varepsilon_{it}$$

where $Envcrime_{it}$ is the measures of environmental crime in province i at time t; $Income_{it}$ is the GDP per capita in province i at time t; X_{it} is a vector containing province-specific time-varying controls (it is a set of socio-economic and demographic variables such as unemployment, level of education, gender, age, density, etc.); ε_{it} is the error term. We will also account in our regression model for law enforcement. Specifically, we'll include two variables: *judicial inefficiency* which accounts for the average length (expressed in years per 10,000 population) of completed criminal proceedings – this is to be considered as a measure of the judicial inefficiency; *judicial efficiency* which considers the per capita number of overall criminal proceedings (pending and completed) in the courts located in the Italian provinces – this is to be considered as a measure of the efficiency of law enforcement.

As well as for the environmental Kuznets curves, where the benefits of growth could be used to develop better technologies that create less pollution, the verification of the existence of the ECKC could suggest that investing in crime prevention and repression can be profitable since, once a certain level of income will be attained, society might start to prefer environmental quality and legality.

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