

Environmental Enforcement and Compliance: Lessons from Pollution, Safety, and Tax Settings

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Abstract

Environmental monitoring and enforcement are controversial and incompletely understood. This survey reviews what we do and do not know about the overall effectiveness, as well as the cost effectiveness, of pollution monitoring and enforcement. We ask five key questions: what do environmental monitoring and enforcement actions look like in the real world? How do we assess environmental compliance and deterrence? Do environmental monitoring and enforcement actions get results? How, why, and when do inspections and sanctions achieve compliance and reduce pollution? And, what do the answers to the preceding questions tell us about designing and implementing more effective and more cost effective public policies for the environment? A key contribution is drawing lessons from diverse sources, including insights from theoretical, empirical, and experimental contributions in environmental, tax, and safety settings. We conclude that traditional environmental monitoring and enforcement actions generate important deterrence effects. However, there are limits to such deterrence, and deterrence itself cannot fully explain all patterns of environmental behavior. Encouraging compliance requires both traditional tools and additional tools.

1

Introduction

Policymakers commonly argue that regulations require regular monitoring and enforcement. Scholars have considered the general subject of the public enforcement of law since at least Bentham [1789]. Local, state, and federal authorities spend billions of dollars annually on inspections and sanctions in a wide range of regulatory and other settings.

Nevertheless, the overall effectiveness and the cost effectiveness of environmental monitoring and enforcement are controversial and incompletely understood. Many observers believe that rigorously enforced regulations explain dramatic reductions in point source emissions of conventional air, water, and waste pollution over the past four decades.¹ Still, stakeholders frequently push for reductions in the frequency and intensity of environmental oversight. For example, members of the U.S. Congress pushed for reduced overall pollution enforcement during the early 1990s [Mintz, 2012]. The U.S. Environmental Protection Agency (EPA) itself recently proposed a strategic plan that involved substantive cuts in inspections and sanction numbers [USEPA,

¹See, for example, relevant qualitative survey results of Kagan et al. [2003], Khanna and Anton [2002], Doonan et al. [2005], and Delmas and Toffel [2008].

2014]. Environmental economists most often just assume compliance in their models and regularly ignore the role of monitoring and enforcement in regulatory design and implementation [Cropper and Oates, 1992]. Scholars who do consider pollution monitoring and enforcement often increasingly spurn traditional instruments in favor of more novel cooperative, voluntary, and information dissemination approaches.

This survey reviews what economists do and do not know about the effectiveness, as well as the cost effectiveness, of pollution monitoring and enforcement. We focus mainly on lessons for and from the U.S. policy environment, but we also discuss especially important research findings from international settings as well. We draw most of our insights from a subjective assessment of the existing theoretical, experimental, and empirical environmental economics literature. However, where appropriate and helpful, we also draw lessons from criminal, tax compliance, and occupational health and safety settings. We examine the criminal literature because the historical law and economic foundations of the environmental enforcement literature were developed in this context. We consider the tax context because the availability of data has generated an especially rich and diverse theoretical, empirical, and experimental literature, a literature that has also been often applied to environmental compliance. We draw on the health and safety literature because the Occupational Safety and Health Administration (OSHA) and the EPA have similarly broad regulatory authority and often share institutional features. Moreover, comparisons between safety and environmental regulation are made in the extant literature [e.g., Deily and Gray, 2007]. We do not investigate enforcement and compliance lessons from other settings like food safety, nuclear safety, and health care fraud, although we acknowledge that examining parallels between these contexts and the environmental context represents promising future research.

Our present focus is on five questions: *What do environmental monitoring and enforcement actions look like in the real world? How do we assess environmental compliance and deterrence? Do environmental monitoring and enforcement actions get results? How, why, and when do inspections and sanctions achieve compliance and reduce pollution?*

And, what do the answers to the preceding questions tell us about designing and implementing more effective and more cost effective public policies for the environment?

We begin in the next section by reviewing key institutions. Section 3 discusses measuring environmental performance and compliance, paying particular attention to the perils and promise of assessing compliance in the presence of self-reported pollution. Section 4 summarizes how inspections and sanctions might influence compliance and Section 5 reviews the existing evidence on the deterrence effects of environmental monitoring and enforcement. Section 6 investigates lessons from occupational safety and tax compliance settings. We explore mechanisms and motivations for compliance in Section 7, focusing on both rational-actor models and more recent socio-behavioral models. Section 8 highlights key lessons for policy, and Section 9 briefly concludes with directions for future research.

This review extends surveys by Cohen [1998], Heyes [2000], Gray and Shimshack [2011], Stranlund [2013], and Shimshack [2014]. Key insights from law and economic, tax compliance, and occupational safety literatures draw frequently from Polinsky and Shavell [2000], Alm [2012], and Leeth [2012]. This monograph excludes some issues. Most notably, we do not survey the large literature on optimal enforcement theory, nor do we review the many attempts to explain divergences between real world regulator behavior and optimal regulator behavior. We refer the interested reader to Polinsky and Shavell [2000], Shavell [2004], Cohen [1998], Heyes [2000], and Shimshack [2014].

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