Reducing Waste by Learning from Environmental Inspections: Empirical Evidence from Unconventional Wells in Pennsylvania

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Abstract

We examine whether firms reduce waste generated in their manufacturing operations by learning from their own inspection experience and from the inspection experience of other firms. Additionally, we explore how different aspects of inspection experience support waste reduction. When firms face environmental inspections, they typically review their operations with an environmental focus. This can create knowledge on the links between production, waste generation, and environmental issues. Firms can leverage such knowledge not only to improve environmental compliance but also to reduce manufacturing waste. Although studies have examined the impact of environmental inspections on compliance, hardly any research investigates the impact of inspection activity on waste generation. We extend knowledge by exploring how firms learn from environmental inspections and from the different facets of inspection experience to reduce waste in their manufacturing operations. We use econometric methods to analyze data on 15,243 unconventional wells and 69,707 environmental inspections from Pennsylvania, in the period 2004 to 2016. In our data, a typical unconventional well generated 743.75 tons of waste annually. We find that an unconventional well learns to reduce waste as it gains experience both with inspections that detect violations and confirm compliance. It also learns to reduce waste from the inspection experience of other units outside the organization. Here, the main driver of waste reduction are inspections that confirm compliance. By contrast, an unconventional well fails to learn from the inspection experience of other units within the organization. Finally, we find that an unconventional well learns to reduce waste when it faces penalties, but it does not reduce waste when other units within and outside the organization suffer penalties. Our results are relevant to operating managers and regulators because they highlight how inspection activity can affect waste generation in manufacturing.

Speaker Profile

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