

Trackers, Pipe Replacements and Leaks: An Analysis of the Effectiveness of Accelerated Pipe Replacement Program Cost Recovery Mechanisms.

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Overview

After recent natural gas pipeline explosions, many natural gas utilities across the United States have requested approval for accelerated pipe replacement programs that allow the utilities to get reimbursed for their pipe replacements outside of the usual regulatory process. This paper examines the impact of these pipe replacement programs on (a) the rate of pipe replacement and (b) on the number of leaks reported by these utilities. Both a regression based differences-in-differences approach as well as synthetic control methods are used to test whether these programs are effective at achieving these goals.

Methods

We employ a differences-in-differences (DD) estimation technique that estimates the effect of these accelerated infrastructure replacement programs on pipe replacements and leaks. The selection of a control group is extremely important, though, as the identifying assumption required for an unbiased estimate of the treatment effect is that the treated group *would have been the same* as the control group holding all covariates constant post treatment had the treatment not been implemented.

There are 42 companies that have had accelerated pipe replacement programs approved over the last two decades that are considered the “treatment group” in this analysis. There are an additional 37 utilities that have at least 10 percent of their mains considered “priority mains” and are therefore plausible candidates to be considered for a tracker, but who have not received a tracker.

There have been substantial critiques to empirical literature that employs DD estimation. (Bertrand et al. 2004; Abadie et al., 2010) Due to critiques primarily about non-robustness to placebo tests especially when the number of treated units is relatively small, researchers have been pushed to conduct additional robustness checks to assure that results from DD estimation are indeed valid. Due to these critiques, we also employ an additional control group using synthetic control methods pioneered by Abadie et al. 2010.

Results

Using both the “high priority mains” control group and synthetic control group, we find little evidence that trackers have been effective in increasing pipe replacements or leak repairs. In addition we employ placebo treatments to non-treated companies to test whether these lack of results are due to statistical power. We find no evidence that this is the case, as the estimated average treatment effects for companies with trackers and placebo treatments show no consistent patterns.

Conclusions

Examining treatment effects for policies that have been implemented a small finite number of times and for which the treatment was not implemented randomly serves great challenges for empirical microeconomists. The first challenge is finding an appropriate control group--one that is very similar to the treated group in all ways except for the treatment. The second challenge is statistical power. Unlike micro-data that is increasingly available with tens or even hundreds of thousands of observations, large data is simply not available when examining questions such as the one in this paper. These difficulties do not, though, warrant ignoring important questions that have very pertinent policy implications.

Using a number of empirical specifications and robustness checks, this paper finds very little evidence that trackers have been effective in increasing leak repairs and/or increasing pipe replacements. This does not mean that natural

gas utilities are not repairing leaks and replacing pipes; the data clearly shows they are. What this research does indicate, however, is that there is very little meaningful difference in the replacement and leak repair practices of utilities with and without special regulatory cost recovery mechanisms. The absence of any meaningful difference in these replacement/leak practices, therefore, raises serious questions about the policy efficacy of the use of capital replacement trackers. These special regulatory mechanisms, rather than serving as effective means of “expediting” the replacement of risky and leaky natural gas pipes, may, instead, represent uncompensated shifts in financial risk away from utilities and their shareholders, and towards captive monopoly ratepayers.

References

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Bertrand, Marianna, Esther Duflo, and Sendhil Mullainathan, “How Much Should We Trust in Differences-in-Differences Estimates?,” *The Quarterly Journal of Economics*, February 2004, *119(1)*, 249-275.