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Holding distribution utilities liable for outage costs☆

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ABSTRACT

Storm-related service outages in electricity and telecommunications have created public controversies regarding the adequacy of ex ante efforts to prevent outages and ex post efforts to restore power. Product liability rules, used to promote quality of service throughout the economy, might seem to offer a solution to this problem in the utility context. Strict liability rules avoid the need for determining whether utilities were appropriately careful but increase ratepayer costs because of moral hazard and, in effect, force ratepayers to buy outage insurance from the utility. By leaving customers exposed to damage, negligence rules can avoid these shortcomings but force upon regulators and courts the need to make difficult decisions regarding efficient care levels. Profit regulation, risk aversion, regulatory commitment failures, and distributional considerations add further complications. Still, the consideration of liability rules may provide worthwhile reminders that increased reliability is neither free nor guaranteed by public provision of service.

"If a conservative is a liberal who's been mugged, a liberal is a conservative who's been arrested."—Tom Wolfe.

"If a conservative is a liberal who's been mugged, a liberal is a conservative whose power has gone out for three days."—updated version.

1. Introduction

Recent experience with storms and power outages, suggesting this paraphrasing of Tom Wolfe, leads one to ask whether and how to respond to beliefs that utilities are doing too little to reduce the chance of outages or to mitigate damages by quickly restoring service. Specifically, the focus here is on whether liability rules—when, if ever, to require utilities to compensate ratepayers for outage-related losses—would be a useful step toward creating incentives to prevent and restore that would otherwise be inadequate.

The primary motivating examples arise from hurricanes in recent years, the "derecho" in the summer of 2012 in the eastern United States and Superstorm Sandy along the New Jersey coast. These have engendered concern regarding whether distribution utilities did enough ex ante, to limit the scope and severity of outages, and ex post, to restore power following those outages.[1] Displeasure with the service of the local public utility led to calls in the Washington, DC, area for replacing Pepco, the local utility, with a publicly owned utility; one congressional primary campaign in the Maryland part of Pepco's service territory adopted "Replace Pepco" as a slogan, even though Pepco's status is primarily a matter of state rather than federal policy.[2]

☆ I very much appreciate comments from participants in the National Association of State Utility Consumer Advocates panel on Financing the Reliability, the Rutgers Center for Research in Regulated Industries (CRRI) Workshop on Regulation, Smart Grid and Reliability, the 32nd CRRI Eastern Workshop in Advanced Economics of Regulation and Competition, and the 11th International Industrial Organization Conference, with special thanks to Frank Felder, Stan Reynolds, Ingo Vogelsang, and Huan Zhao. Special thanks go to Paula Eckard and Deb Borland for helping to validate the attribution of the opening quotation. I also want to thank referees for many helpful comments that did much to improve the discussion. I am (strictly) liable for remaining errors.

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[1] In the electricity sector, most outages involve local distribution system failures. Wide-area outages due to failures at the transmission system level are far less frequent but can be notable; the August 2003 Northeast US blackout is an example. For a discussion of incentives to mitigate damages applied to the transmission sector, see Office of Gas and Electricity Markets (2004).

[2] Regarding the former, see Hensal (2012). Regarding the latter, I live in the Maryland part of that service area, and I wish I'd taken a picture of the sign bearing that slogan.

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Less widespread but notable, the 2013 Super Bowl football game was held up for over 20 min due to a power outage in the stadium caused by a failure of a relay installed by the local distribution company (Battista, 2013).

In a report issued three months after the derecho, the State of Maryland's Grid Reliability Task Force, created by the state's governor, said, "The current level of reliability and resiliency during major storms is not acceptable" (Office of Governor Martin O'Malley, 2012, 6). In the view of many, these problems are likely to become more frequent and severe as climate change affects the occurrence of storms and water levels (Office of Governor Martin O'Malley, 2012, 6–7). Among other recommendations, the report suggested that utilities get "tracker cost recovery", that is, contemporaneous recovery of the costs of accelerated investments to promote reliability beyond business-as-usual improvements (Id. at 80).

The response of the Maryland Public Service Commission (MDPSC) to the derecho outage indicates the nature of the specific behavioral responses regulators put in place (MDPSC, 2013). Although utilities were not found to have violated regulations so far (with restoration to be judged annually, not storm-by-storm), MDPSC ordered utilities to accelerate short-run reliability improvements and undertake cost–benefit studies regarding improvements necessary to restore power to 95% of customers within specified times after a major storm, including personnel needs and dispatch practices. More specific requirements included strengthening "poorest performing feeders" and improving communication systems internally, to customers with medical needs, and to the public at large.

The outage concern is not limited to electricity. Also in Maryland, the local telephone company has come under fire for poor performance of its 9-1-1 emergency calling system during storm outages (Flaherty and Stephens, 2012). The duration of the outage is not a factor, but short-run unavailability during a storm can have tragic consequences. The Federal Communications Commission (FCC) recently issued a report finding that such outages were "unacceptable" and the result of "avoidable planning and system failures" (FCC, 2013, 1). The FCC recommended specific practices, including circuit audits and testing, adequate central office backup power, and improved monitoring.

Whether or not these responses on Maryland were reasonable and representative of other states, they invite an assessment of how to give utilities appropriate incentives for ex ante outage risk reductions and ex post service restorations. Focusing on electricity distribution, ex ante efforts to reduce the likelihood of an outage include relatively low-cost (but sometimes controversial) trimming of trees near aboveground lines and relatively high-cost burial of lines. Ex post practices that can reduce the severity of an outage by reducing outage durations include keeping a greater inventory of parts on hand, having more employees and equipment for restoration work, and contracting for supplemental repair crews and restoration equipment as a storm approaches. Some ex ante practices can reduce severity as well, including having more full-time personnel and equipment on hand and, perhaps most notably, installation of "smart meters" that can communicate outage information back to the utility when a customer loses power.

The purpose of this paper is to assess the value of using liability rules—holding utilities responsible in some fashion for losses suffered by ratepayers as the result of outages—as a method for providing incentives for efficient mitigation and restoration. The analogy is to the kinds of product and service liability rules employed in other sectors—such as consumer products and medical care—that, from an economic perspective, take the place of inadequate market incentives to provide the level of quality for which buyers are willing to pay (Daughety and Reinganum, 2013). Ideally, requirements to compensate ratepayers for outages could place the incentive to reduce the likelihood of outages and restore power with the utilities that have the information on the costs of doing so. My conclusion (at this juncture) is that this is either likely to be impractical or will fail to avoid controversial postoutage assessment of utility practices.

Ken Costello of the National Regulatory Research Institute has provided the closest substitute I am aware of for the argument constructed here (Costello, 2012b), which is an abbreviated version of Costello (2012a)). In contrast to the primary focus here on economic incentives, he introduces fairness concepts into the discussion (although the penultimate section here will focus on some distributional considerations he does not examine). He also treats as a fairness consideration the ability of the utility to recoup outage damage mitigation costs; I assume here that that is already required as part of the overall legal requirement that utilities are allowed to earn returns commensurate with those of similar firms with "business undertakings which are attended by corresponding risks and uncertainties."[3] He does note that promised compensation for all outages under strict liability can create moral hazard, as modeled below, but he does not address other potential deleterious effects described below under a full model incorporating relevant ratepayer and utility behavior.[4]

The paper proceeds as follows: Section 2 provides some background on incentives facing regulated firms and practices. Section 3 reviews the economic assessments of the two basic types of liability rules—strict liability and negligence—that might be imposed apart from letting customers bear outage costs in order to induce utilities to take more care to avoid and mitigate outage. Section 3 also outlines some of the considerations they present in both market and regulated settings. To illustrate specific implications of these rules in the electricity outage context, Section 4 presents a model in which a utility chooses the level of effort ex ante to reduce the likelihood of an outage and ex post to reduce its duration, and where consumers determine potential losses—for example, by deciding how much food to keep in their refrigerators and freezers. Section 5 examines the implications of this model for the strict liability and negligence rules. Section 6 adds other issues presented by liability rules, such as whether wealthier neighborhoods should get, or should be able to get, more reliable electricity service. Section 7 summarizes and offers two concluding observations on customer payment and public provision.

2. Quality incentives: background

Traditional regulation of utilities has involved essentially guaranteeing cost recovery by setting rates to cover operating costs, taxes, depreciation, and an allowed rate of return on an undepreciated rate base. Regulatory economics originally focused on the inefficient level of capital investment resulting from allowing a rate of return above the cost of raising that capital (Averch and Johnson, 1962). However, attention turned to the potential inefficiency when the rate of return is set correctly. In that case, absent cost disallowances or regulatory lag, the regulated firm earns zero economic profit regardless of its actions, making its investments in cost reduction or service quality, including outage avoidance, unlikely to be efficient or even predictable.

In response to this unpredictability and inefficiency, price-cap regulation has long been viewed as a method to provide utilities with incentives to produce efficiently, however essentially treating service quality as given (Brennan, 1989). The efficiency issue is primarily one of creating incentives to hold down costs, with some attention to the product mix. Incentives to control cost while leaving price fixed will lead to suboptimal product quality given price, as a firm cannot raise price to capture all of the gains from increasing quality (Sappington, 2005). However, reductions in quality also reduce demand, limiting the incentive to cut quality. Moreover, since the price in a price-cap regime is typically above marginal cost (for the utility to expect to be able to recover costs), there may be an excessive profit incentive to stimulate demand, making quality relative to the optimal level unclear. Joskow (2008) observed that price cap regulation is often accompanied by performance and quality standards to mitigate any incentive to reduce these in order to reduce costs. However, he

[3] Bluefield Water Works v. Public Service Commission, 262 US 679, 680 (1923).
[4] Costello (2012a) describes incentive plans in some of the states in the United States.