Climate Change Law in the Asia Pacific

WORKING PAPER

Adapting Liability Rules to Cope with Climate-Change-Induced Disasters: The Case of the Wildfires and the Liability of Public Utility

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Adapting Liability Rules to Cope with Climate-Change-Induced Disasters: The Case of the Wildfires and the Liability of Public Utility in California

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Abstract

This paper concerns the cost allocation for rapidly growing damage from the natural disasters resulting from climate change. The damages from these natural disasters are growing far more rapidly than the efficacy of climate change mitigation technology and policy, highlighting the need for an organized and enhanced adaptation and disaster management scheme. This paper focuses on recent disastrous wildfires in California, which led the monopolist electricity utility in that region to declare bankruptcy, creating an unprecedented risk of unstable electricity supply and price. By examining the existing economic regulation of the utility's electricity pricing, the liability rules for the damages caused by the utilities in California, and the anticipated impact of the existing rules and regulations on future damages from similar events, this work seeks to find an alternative optimal liability rule to minimize the social cost of the wildfires in California by adjusting the allocation of the risk among the relevant agents.

Introduction

Over the past few years, California's disastrous wildfires triggered by powerlines and the remedial process for those wildfires have cast questions over the state's current disaster management scheme. The wildfire in Butte County in November 2018—which led to at least 86 casualties and $16.5 billion in damages—was recorded as the most devastating and costliest natural disaster event in the world that year.[2] The California Department of Forestry and Fire Protection (Cal Fire) concluded that the electrical transmission lines of Pacific Gas and Electricity (PG&E), Northern California's monopolist electricity and gas utility, caused the 2018 wildfire.[3] Although there have been numerous discussions about these wildfires with various focuses, this paper's concern is how to incentivize agents to minimize the damages from wildfires triggered by the utility facilities going forward.

The current scheme adopts a strict liability that makes a public utility liable for damages from a wildfire started at its facilities without negligence; this is according to inverse condemnation rule, a special takings theory based on California Constitution and California Supreme Court decisions.[4] Once a utility's liability is determined based on inverse condemnation, it will attempt to recoup the cost by passing the burden on to the ratepayers. The California Public Utilities Commission (CPUC), in governing the ratemaking process in California, adopts the legal standards for setting a fair rate of return for the utility. This rate is established by U.S. Supreme Court decisions that require the return to be "reasonably sufficient to assure

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[2] California Department of Forestry & Fire Protection, Top 20 Most Destructive Wildfires, at https://www.fire.ca.gov/media/5511/top20_destruction.pdf; Munich RE Group, The natural disasters of 2018 in figures, at https://www.munichre.com/topics-online/en/climate-change-and-natural-disasters/natural-disasters/the-natural-disasters-of-2018-in-figures.html (last visit August 14, 2019).

[3] Cal Fire, Press Release, May 15, 2019, https://www.fire.ca.gov/media/5038/campfire_cause.pdf (last visit September 8, 2019.)

[4] Art. 1, Sec. 19, California Constitution; Gay Law Students Association v. Pacific Telephone & Telegraph Co. (1979) 23 Cal.3d 458, 469; Barham v. Southern California Edison Company (1999) 74 Cal. App 4th 744. The inverse condemnation applies to investor-owned utility as well as government owned ones under California law.

confidence in the financial soundness of the utility," among others,[5] in order to secure a utility's stable and safe supply. Another criterion defining the utility's liability to be passed onto the ratepayers is whether the costs incurred by the utility are just and reasonable.[6] After the catastrophic wildfires in 2017, the California government passed a new legislation, SB 901, that focuses on preventing PG&E from filing for bankruptcy by passing the costs of liability on to all ratepayers.[7] Despite the arrangement enacted by SB 901, PG&E filed for bankruptcy protection in January 2019 after its liability grew larger following the even more destructive wildfires of November 2018.

One of the most notable aspects of this disaster management system is that, due to anthropogenic climate disorder, disasters with similar causes and patterns have recently recurred with significantly more damages. A recent scientific study by a group of bioclimatologists revealed that the burned area in California between 1972–2018 increased fivefold, and that plant drying caused by climate change is the critical factor increasing the rate of large wildfires in California.[8] It also seems that the utility's power distribution or transmission lines triggered the large wildfires more frequently. Among the 20 most destructive California wildfires, 10 incidents occurred in the 2010s (more specifically, between 2015 and 2018), and 14 took place between 2003 and 2018. Among the 10 incidents that occurred between 2015 and 2018, six incidents were found to have started from powerlines, and among the 14 incidents that took place between 2003 and 2018, seven were found to have started from powerlines.[9]

So, the current liability scheme makes the losses from the wildfires fully insured by the utility and fully (or partially, depending on the ex post financial status of the utility) reinsured by the ratepayers. As a result, neither the landowners[10] in the affected area nor the utility is incentivized to spend enough money on proper precautions. This cycle recurs with aggravated scale of damages, which leads to a growing burden on all ratepayers. The existing legal discussion over this liability scheme primarily focuses on whether to allow an exception for inverse condemnation for investor-owned, non-governmental utilities. The discussion may be meaningful in terms of examining how much the investors of a utility should share the burden of liability from wildfires; it does not, however, address the question of how to reduce the drastically increasing losses from wildfires in California, a more critical issue to explore. This paper focuses on this question and seeks to examine the reasonableness of the current liability rules for damages from wildfires triggered by utility facilities, as well as looking for compelling reasons to make changes to the rules based on a simplified model.

The State of the Art: The Law and the Problems

Utility, Landowner, and Ratepayer

The electricity rate scheme is usually subject to economic regulations and requires the government's approval. The economic regulation of electricity rates, similarly to other types of business with comparable levels of business risks, aims to maintain the rate of return from the utility business so as to secure stable utility supply at a just and reasonable price. In order to do this, the government approves the utility to reflect the investment and other business-related costs to the rates with certain standards, for example, reasonableness, as CPUC does.[11] So, when discussing the options to minimize the total losses from disastrous wildfires triggered

[5] Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia (1923) 262 U.S. 679.

[6] Public Utilities Code Section 455.

[7] Public Utilities Code Section 451.2 added by Stats. 2018, Ch. 626, Sec. 27. (SB 901) Effective January 1, 2019.

[8] A. Park Williams, et al., Observed Impacts of Anthropogenic Climate Change on Wildfire in California, Earth's Future, Vol. 7, Issue 8 (July 2019), https://doi.org/10.1029/2019EF001210.

[9] California Department of Forestry & Fire Protection, Top 20 Most Destructive Wildfires, at https://www.fire.ca.gov/media/5511/top20_destruction.pdf.

[10] Landowner here refers to the people who have the right to utilize and invest in the lands in the affected area.

[11] Public Utilities Code Section 455.

by the facilities of the utility, the incentives of three groups of agents should be considered: the ratepayers, the investors of the utility, and the landowners who suffered losses from the wildfires.

Between Utility and Landowner: Inverse Condemnation in California

Inverse condemnation refers to a rule that entitles a private property owner to sue the government to seek just compensation when the government takes his or her property without paying compensation as required by the Fifth Amendment of the U.S. Constitution. California's Constitution also includes a takings clause, which states that "private property may be taken or damaged for a public use and only when just compensation, ascertained by a jury unless waived, has first been paid to, or into court for, the owner."[12] California state courts have made a series of rulings to the effect that inverse condemnation applies to damages from wildfires that started from the facilities of a utility.[13] The primary reasoning behind the rulings is that condemning private property for the transmission of electrical power is generally a public use, and any damages from such use of private property should be subject to just compensation.[14] More specifically, the court in *Barham* explained that the rationale behind applying inverse condemnation is "to spread among the benefiting community any burden disproportionately borne by a member of that community, to establish a public undertaking for the benefit of all."[15]

In sum, by applying the inverse condemnation, the court made exceptions for the liability rules of damages from wildfires in two aspects: the strict liability standard is adopted instead of the negligence rule, and an investor-owned private utility is held responsible in the same way as a government-owned utility. The investor-owned utilities in California have attempted to change the second prong of the above without success thus far.[16] The controversy over the inverse condemnation pertaining to wildfire damages has primarily concerned whether it is justifiable to apply inverse condemnation to an investor-owned utility.

Between Utility and Ratepayer: Legislative Developments

The recently enacted statutes addressing the concerns raised about the wildfires in 2017 and 2018, SB 901 and AB 1054,[17] focus on the utility's financial stability and enhanced duty to exert due care. SB 901, enacted for the management of damages from the 2017 wildfires, requires that any costs and expenses that the utility wishes to pass on to the ratepayers should be just and reasonable. The statute mentions that the CPUC shall consider the maximum amount that the utility can bear without "harming ratepayers or materially impacting its ability to provide adequate and safe service."[18] AB 1054 imposes on the utility burden of proof to show that it acted reasonably unless it obtained a new safety certification.[19] These new legislative developments may be meaningful in that they began to establish a disaster response scheme, and imposing safety standards is often one of the most viable policy options that the government can take. The efficacy of those legislative measures without changing the liability rules, however, may be questionable, as we will see in Section III below.

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[12] Art. 1, Sec. 19 (a), California Constitution

[13] Barham v. Southern California Edison Company (1999) 74 Cal. App 4th 744; Slemons v. Southern Cal. Edison Co. (1967) 252 Cal. App. 2d 1022, 1026 [60 Cal. Rptr. 785].

[14] California Public Utilities Code Section 612 provides ""An electrical corporation may condemn any property necessary for the construction and maintenance of its electric plant." The "electric plant" here includes various types of electrical facilities including transmission and distribution lines (Pub. Util. Code, § 217.)

[15] Barham v. Southern California Edison Company (1999) 74 Cal. App 4th 744; Belair v. Riverside County Flood Control Dist. (1988) 47 Cal. 3d 550, 558 [253 Cal. Rptr. 693, 764 P.2d 1070].

[16] The Southern California Edison Company (SCE) is the primary supplier of electricity in Southern California area. PG&E covering Northern California also argued for it until recently without success. See [##].

[17] Public Utilities Code Section 451.1, amended by Stats. 2019, Ch. 79, Sec. 6. (AB 1054), effective July 12, 2019.

[18] Public Utilities Code Section 451.2 (b) (Stats. 2018, Ch. 626, Sec. 27)

[19] Public Utilities Code Section 451.1(b), amended by Stats. 2019, Ch. 79, Sec. 6. (AB 1054)

Analysis: Are We Effectively Reducing the Damages in a Just Way?

A few questions remain for the newest scheme—a combination of adopting inverse condemnation and imposing new safety standards on the utility—to examine in which direction it should evolve going forward to function as an optimal liability scheme for the wildfires at issue.

First, under the current situation, either the utility or the landowner investing in the areas with enhanced wildfire risk should be considered as an agent that can spend precaution cost to prevent such fire. Applying inverse condemnation seems to assume that the utility is the least cost avoider, and for that reason allocating all risk to the utility is the optimal and most ethical option to address the damages from the wildfires.[20] The application of strict liability occurs when the injurer's act involves "significant danger" even with "reasonable care" and the injurer's activity is "uncommon."[21] Now, the risk factor of significant climate disorder is added as one of the most critical causes of the disastrous wildfires. The California government publishes information on wildfire risk, including Fire Hazard Severity Zones Maps.[22] Under these circumstances, not only the utility installing its equipment in the hazard zones but also the landowners investing in those zones are taking significant risks. On the other hand, the general ratepayers are not involved in any risk-creating activities but should bear an ever-increasing burden from the wildfires in some regions. So, the current system does not provide enough incentive to reduce the total losses from wildfires, while the likelihood of disastrous wildfires is rapidly growing and the chance to reduce the damages through lowering investment in more hazardous zones is increasing accordingly.

Second, the community interest mentioned by the court when applying inverse condemnation to the wildfires triggered by utility facilities may need to be reexamined. The court decisions assume a situation where a utility's facility used for a broader scope of people is located on or near a private property that is more easily damaged from wildfires ignited at the utility facility because of its close distance from the facility. It appears that the court believes that such allocation of risk serves distributive justice. Two factors, however, should be additionally considered: Under the principle of public utility regulations, a utility has a duty to serve the customers in the monopolized service area non-discriminatorily, which means that the utility cannot refuse to serve customers in more hazardous areas.[23] A utility does not have more incentives to install equipment for transmission at a location surrounded by forests on sloping land, because such installation work would be costlier and the risk associated with that equipment is far higher than other, similar types of equipment outside of the hazardous area. So, equipment that may contribute to damages on a private property is more likely to serve that specific private property or the community located in the adjacent area. These circumstances raise questions as to whether applying inverse condemnation without considering the precaution cost to be borne by the landowners conforms to distributive justice. The problem of distributive justice would be more significant given that the liability of a utility may be passed on to the general ratepayers all or in part, thus subsidizing the landowners in specific areas.

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[20] The discussion over morality of strict liability has been made primarily assuming cases where an injurer group and a victims group exists. See, e.g., Jules L. Coleman, The Morality of Strict Tort Liability, William & Mary Law Review, Vol. 18, Issue 2, 259-286 (1976); and David G. Owen, Moral Foundations of Products Liability Law Toward First Principles, Notre Dame Law Review, Vol. 68, 427 (1992-93). So, the wildfires cases at issue might need another fresh view from the existing discourse.

[21] Restatement (Third) of Torts: Phys. & Emot. Harm § 20 (2010); Steven Shavell, The Mistaken Restriction of Strict Liability to Uncommon Activities, Journal of Legal Analysis, Vol. 10 (2018), https://doi.org/10.1093/jla/lay004.

[22] Cal Fire, Fire Hazard Severity Zones Maps, at https://osfm.fire.ca.gov/divisions/wildfire-prevention-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/ (last visit September 10, 2019.)

[23] See, for one of the decisions of the CPUC stating this principle, Decision 95-12-063 (as modified in D.96-01-009), 1996 Cal. PUC LEXIS 28, at *55–56 (Jan. 10, 1996).

Alternative Options to Liability Rules

The following simplified model is prepared to find an alternative to the current strict liability scheme adopting inverse condemnation and passing the burden from the wildfires on to the general ratepayers. The assumptions for the exercises are as follows:

i. p denotes the probability of a wildfire taking place ($0 < p \leq 1$). If it happens, the entire value of the property of landowners is lost.
ii. p is a decreasing function of the landowner's precaution cost (C_L) and the utility's precaution cost (C_U) ($\frac{\partial p}{\partial C_L} < 0, \frac{\partial p}{\partial C_U} < 0$). p is convex due to the law of diminishing return ($\frac{\partial^2 p}{\partial C_L^2} > 0, \frac{\partial^2 p}{\partial C_U^2} > 0$). There is no evidence for the hypothesis that p is an increasing function of the ratepayers' demand.
iii. R, which denotes the revenue from the land investment, is an increasing function of the landowner's investment (I) ($\frac{\partial R}{\partial I} > 0$). R is concave due to the law of diminishing return ($\frac{\partial^2 R}{\partial I^2} < 0$).
iv. The landowner is risk neutral.[24]

With the assumptions, the social planner's problem to maximize social welfare will be worked out based on the following formula.

Social planner's Problem (maximizing social welfare):

$$\max_{I,C_L,C_U} \big(1 - p(C_L, C_U)\big)R(I) - (I + C_L + C_U)$$

Solutions:

$$I^*: MR_I = \frac{\partial R}{\partial I} = \frac{1}{1-p(C_L^*, C_U^*)} > 1 \text{ and } C_L^*, C_U^*: \frac{\partial p}{\partial C_L} = \frac{\partial p}{\partial C_U} = -\frac{1}{R(I^*)}$$

Under the existing rule where the damages from wildfires are fully insured by the utility under the inverse condemnation and the burden is fully reinsured by the ratepayers, the rule incentivized neither the landowner nor the utility to spend precaution cost. (Each agent's problem is how to maximize each agent's private net benefit.)

Landowners' problem is:

$$\max_{I,C_L} R(I) - (I + C_L)$$

Solution:

$$I_0^*: MR_I = \frac{\partial R}{\partial I} = 1, \; C_{L\,0}^* = 0$$

Utility's problem is:

$$\min_{C_U} C_U$$

Solution:

[24] If the landowner is risk averse, the insurance market clears efficiently, and the risk premium is zero.

$$C_{U_0}^* = 0$$

Result is:

$$I_0^*\left(sol\ of\ \frac{\partial R}{\partial I} = 1\right) > I^*\left(sol\ of\ \frac{\partial R}{\partial I} = \frac{1}{1-p(C_L^*, C_U^*)}\right) \text{ (overinvested) } \left(\because \frac{\partial^2 R}{\partial I^2} < 0, \frac{1}{1-p(C_L^*, C_U^*)} > 1\right)$$

$$C_{L_0}^*(= 0) < C_L^* \quad \text{(underinvested)}$$

$$C_{U_0}^*(= 0) < C_U^* \text{ (underinvested)}$$

Strict Liability Only

In case the damages from wildfires are fully insured by the utility but not reinsured by the ratepayers at all, the landowners will make overinvestment and will not spend any precaution cost. On the other hand, the utility will make overinvestment in precaution cost.

Landowners' problem is:

$$\max_{I, C_L} R(I) - (I + C_L)$$

Solution:

$$I_1^*: MR_I = \frac{\partial R}{\partial I} = 1,\ C_{L_1}^* = 0$$

Utility's problem is:

$$\min_{C_U} p(C_U)R(I^*) + C_U$$

Solution:

$$C_{U_1}^*: \frac{\partial p}{\partial C_U} = -\frac{1}{R(I_1^*)}$$

Result is:

$$I_1^* > I^* \text{ (see above) (overinvested)}$$

$$C_{L_1}^*(= 0) < C_L^* \text{ (underinvested)}$$

$$C_{U_1}^*\left(sol\ of\ \frac{\partial p}{\partial C_U} = -\frac{1}{R(I_1^*)}\right) > C_U^*\ \left(sol\ of\ \frac{\partial p}{\partial C_U} = -\frac{1}{R(I^*)}\right) \text{ (overinvested)}$$

$$\left(\because \frac{\partial^2 p}{\partial C_U^2} > 0, -\frac{1}{R(I_1^*)} > -\frac{1}{R(I^*)}\left(\because \frac{\partial R}{\partial I} > 0, I_1^* > I^*\right)\right)$$

No Liability

In case the damages are not insured by the utility at all and thus there is no burden to be reinsured by the ratepayers, the utility will not spend precaution cost. The acts of the landowner are not certain either for investment or spending precaution cost because those will be determined endogenously.

Landowners' problem is:

$$\max_{I,C_L} \big(1 - p(C_L, 0)\big)R(I) - (\, I + C_L)$$

Solution:

$$I_2^*: MR_I = \frac{\partial R}{\partial I} = \frac{1}{1 - p(C_{L_2}^*, 0)}$$

$$C_{L_2}^*: \frac{\partial p}{\partial C_L} = -\frac{1}{R(I_2^*)}$$

Utility's problem is:

$$\min_{C_U} C_U$$

Solution:

$$C_{U_2}^* = 0$$

Result is:

$C_{U_2}^* (= 0) < C_U^*$ (underinvested)
$I_2^*,\ C_{L_2}^*$: not certain (due to endogeneity: if $p\big(C_{L_2}^*, 0\big) > p(C_L^*, C_U^*)$, then $I_2^* < I^*, C_{L_2}^* < C_L^*$.
If $p\big(C_{L_2}^*, 0\big) < p(C_L^*, C_U^*)$, then $I_2^* > I^*, C_{L_2}^* > C_L^*$) but suboptimal

Optimal Negligence Rule

In case we adopt a negligence rule to allocate the damages between the landowners and the utility and does not have the ratepayer to reinsure the damages, the utility will increase precaution cost spending while the utility can more efficiently reduce the probability of wildfires than the landowner does. The landowner will do the same for precaution cost and make investment under that condition.

Landowners' problem is:

$$\text{If } \frac{\partial p}{\partial C_L} \le \frac{\partial p}{\partial C_U}: \ \max_{I,C_L} \left(1 - p\big(C_L, C_{U_3}^*\big)\right) R(I) - (\, I + C_L)$$

$$\text{If } \frac{\partial p}{\partial C_L} > \frac{\partial p}{\partial C_U}: \ \max_{I,C_L} R(I) - (\, I + C_L)$$

Solution:

$$I_3^*: MR_I = \frac{\partial R}{\partial I} = \frac{1}{1 - p(C_{L_3}^*, C_{U_3}^*)}$$

$$C_{L_3}^*: \ \frac{\partial p}{\partial C_L} = -\frac{1}{R(I_3^*)}$$

Utility's problem is:

$$\text{If } \frac{\partial p}{\partial C_L} < \frac{\partial p}{\partial C_U}\text{: } \min_{C_U} C_U$$
$$\text{If } \frac{\partial p}{\partial C_L} \geq \frac{\partial p}{\partial C_U}\text{: } \min_{C_U} p(C_U)R(I_3^*) + C_U$$

Solution:

$$C_{U_3}^*: \frac{\partial p}{\partial C_U} = -\frac{1}{R(I_3^*)}$$

Result is:

$$I_3^* = I^* \text{ (optimal)}$$
$$C_{L_3}^* = C_L^* \text{ (optimal)}$$
$$C_{U_3}^* = C_U^* \text{ (optimal)}$$

New Rules

The current scheme with the recently enacted legislation maintains the strict liability and requires the utility to take due care in order to pass the burden on to the ratepayers. So, the wildfires damages are fully insured, and the burden will be reinsured only if the utility takes due care ($\frac{\partial p}{\partial C_U} = -\frac{1}{R(I_4^*)}$). The result would not be optimal without adjusting the strict liability scheme. The landowner is not incentivized to spend precaution cost and will make overinvestment.

Landowners' problem is:

$$\max_{I, C_L} R(I) - (I + C_L)$$

Solution:

$$I_4^*: MR_I = \frac{\partial R}{\partial I} = 1, \; C_{L_4}^* = 0$$

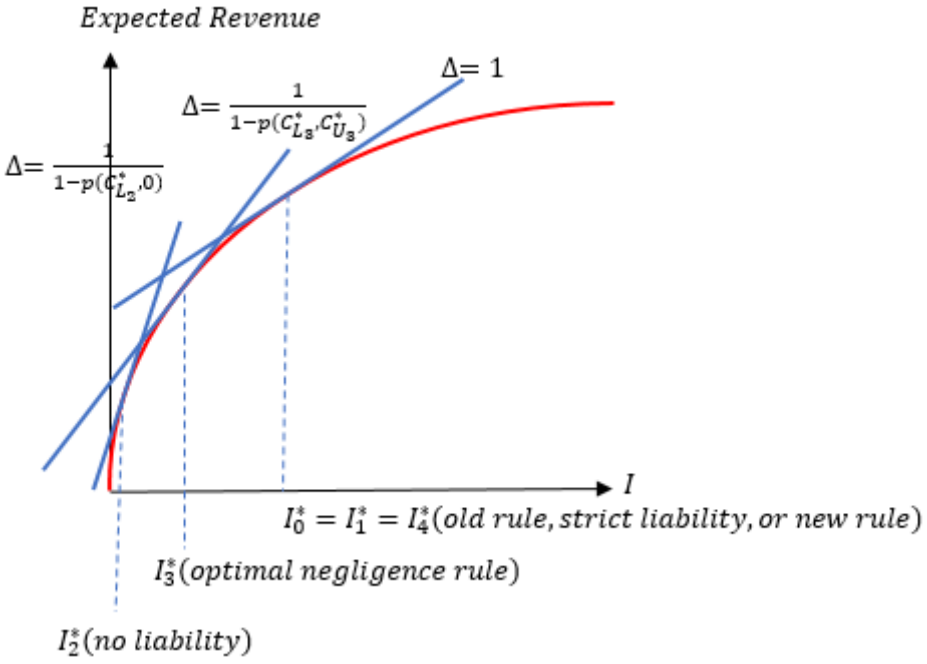
Utility's problem is:

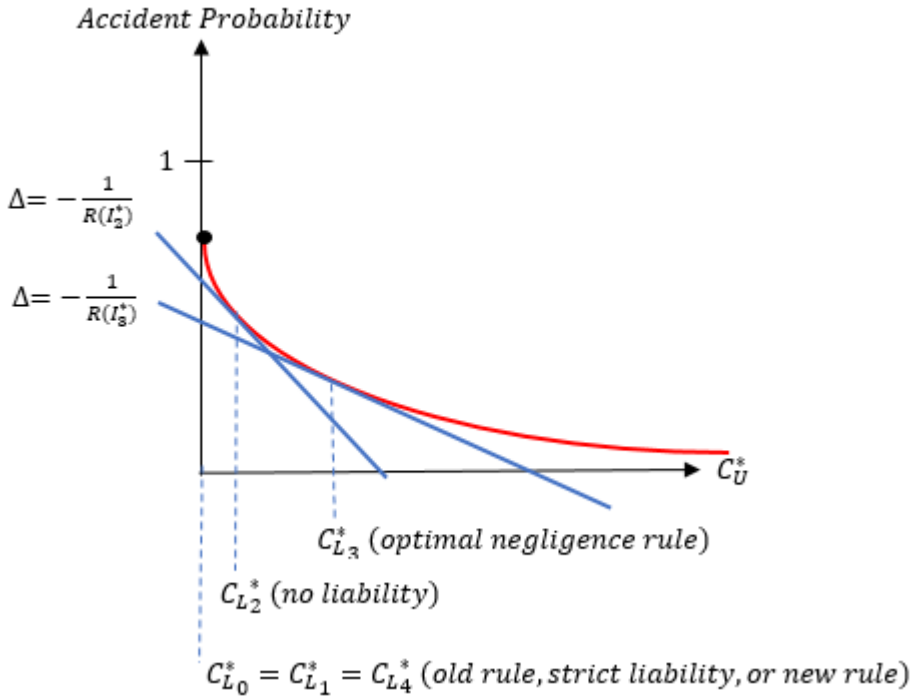
$$\text{If } \frac{\partial p}{\partial C_U} > -\frac{1}{R(I_4^*)}\text{: } \min_{C_U} C_U$$
$$\text{If } \frac{\partial p}{\partial C_U} \leq -\frac{1}{R(I_4^*)}\text{: } \min_{C_U} p(C_U)R(I_4^*) + C_U$$
$$\text{Sol: } C_{U_4}^*: \frac{\partial p}{\partial C_U} = -\frac{1}{R(I_4^*)}$$

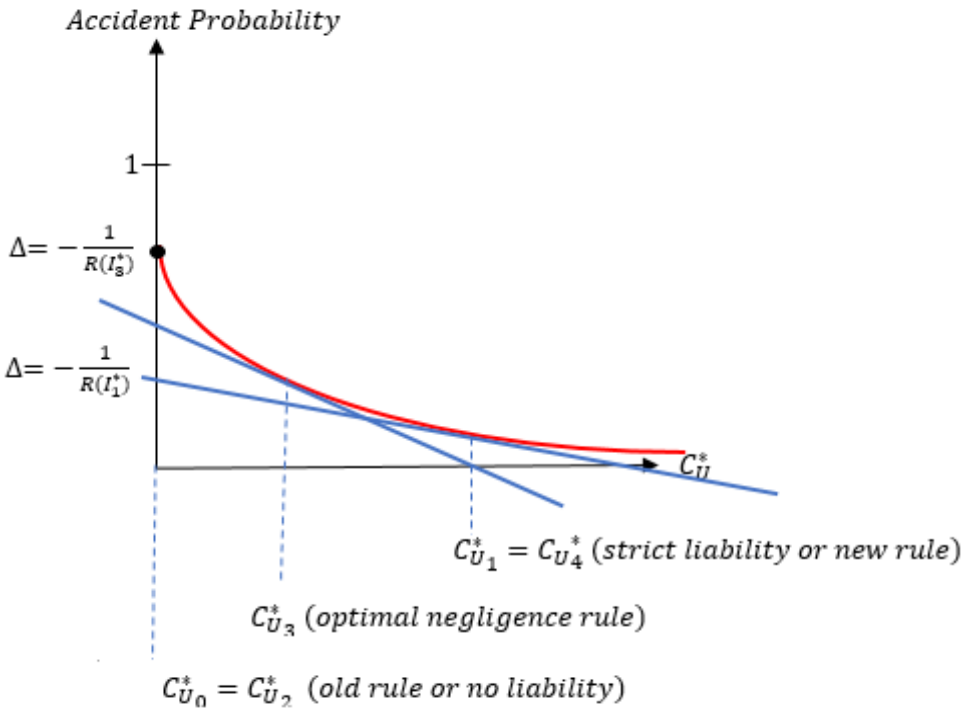
Result is:

$$I_4^* > I^* \text{ (see 1 above) (overinvested)}$$
$$C_{L_4}^*(= 0) < C_L^* \text{ (underinvested)}$$
$$C_{U_4}^* > C_U^* \text{ (see 1 above) (overinvested)}$$

The above exercises can be depicted in graphs as following with the assumption of $p\left(C_{L_2}^*, 0\right) > p(C_L^*, C_U^*)$.







Closing Observations

The factors to consider when deciding how to allocate risk in the case of disastrous wildfires and the utility's liability are different from what we saw decades ago. Climate change has drastically increased the likelihood of more dangerous wildfires. It is evident that human efforts to mitigate greenhouse gas emissions are far slower than the progress of climate change. The development of proper adaptation schemes is indispensable in order to minimize the damage from climate change. Thus, disaster management policy addressing wildfires needs to widen its primary focus from how to help the disaster-affected people and areas to quickly recover from the damage to how to reduce the anticipated damage from climate-change-induced disasters. It is a matter of how a society survives the disasters through finding the least cost avoider and reducing the overall damages rather than which interest group shall bear the cost to what extent based on purely normative arguments.

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The conference was co-sponsored by the Center for Law, Energy & Environment, the Sho Sato Program in Japanese and U.S. Law, and the Korea Law Center.

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