



## Analysis

## A duration analysis of environmental alternative dispute resolution in Japan

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## ABSTRACT

The use of alternative dispute resolution (ADR) to solve environmental disputes is expected to increase in the near future. Therefore, it is important to evaluate the effectiveness of environmental ADR empirically. However, the majority of empirical literature of environmental ADR provides merely descriptive case studies. Using a large micro-level database from Japan, this paper identifies the characteristics of pollution disputes addressed by ADR and correlates those characteristics to the duration of disputes. Using the strike analysis for reference, we estimate the standard duration models of environmental ADR. The analyses demonstrate that pollution disputes involving health damage are resolved promptly. Air pollution problems affecting multiple households are also expeditiously resolved. Moreover, we find that representative actions prolong the settlement of environmental disputes.

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## 1. Introduction

Environmental disputes have traditionally been resolved through litigation in which a court determines liability for environmental damage and the compensation for victims is based on the evidence presented. Because trials are expensive and time-consuming, alternative dispute resolution (ADR) techniques have increasingly been applied, in recent years, to settle environmental disputes (Andrew, 2001).

ADR is a non-adversarial process for resolving disputes with the assistance of a neutral third party. The most common forms of ADR are mediation and arbitration. In the mediation process, a third party does not decide the case but rather facilitates negotiation between disputing parties to reach a mutual solution. In the arbitration process, disputing parties agree to abrogate their right to trial and appeals and agree to abide by the third party's decision. If both processes disputing parties can save time and money, maintain confidentiality, preserve their relationship, and use expert evaluation.<sup>1</sup>

Many countries have promoted the use of ADR techniques for dispute resolution due to these attractive features. In the United States, the use of environmental ADR has steadily increased since the successful resolution of the difficult dispute over flood control measures on the Snoqualmie River in Washington State. Over the past two decades, the U.S. Congress has encouraged federal agencies to increase the use of consensual dispute resolution processes. This movement has been accelerated by Executive Order 13353–Cooperative

Conservation.<sup>2</sup> The U.S. Environmental Protection Agency recently has stated that it will strongly support use of ADR to deal with disputes and potential conflicts (US EPA, 2000).

In Europe, environmental ADR had rarely been employed (Holzinger, 2000). However, the European Commission established basic principles for its practice in October 2004 and submitted a draft directive on mediation to the European parliament and the council. The directive declared the commission's belief that mediation holds untapped potential for resolving disputes and providing access to justice for individuals and businesses (Commission of the European Communities 2002).

Japan's rapid economic growth in the 1960s was accompanied by serious environmental pollution. Many pollution disputes were resolved in courts, but trials typically took a large amount of time during which damage by pollution continued to expand. Seeking more expeditious resolution of environmental disputes, the Japanese government introduced its ADR system in 1970 and has encouraged its use ever since.

The growth of environmental ADR techniques has been explosive, but ADR is no panacea for environmental disputes. Some disputes require substantial time to reach a consensual resolution; others require the coercive power of the state for resolution. It is worthwhile to evaluate the effectiveness of ADR in environmental disputes, but few analytical studies have been conducted for this purpose (Campbell and Floyd, 1996).<sup>3</sup> The majority of empirical literature provides merely descriptive case studies, but a notable exception is Sipe (1998). Focusing

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E-mail address: [t71092@aoyamagakuin.jp](mailto:t71092@aoyamagakuin.jp).<sup>1</sup> The advantages of environmental ADR have been discussed by many scholars. *The Promise and Performance of Environmental Conflict Resolution* edited by O'Leary and Bingham (2003) provides an excellent survey.<sup>2</sup> See Office of Management and Budget and President's Council on Environmental Quality, Memorandum on Environmental Conflict Resolution (November 28, 2005).<sup>3</sup> Environmental Protection Agency, Policy on Alternative Dispute Resolution [FRL-6923-1], Federal Register 65, No. 249 (December 27, 2000) argues that more cross-sectional empirical research is required.

on environmental enforcement at the Florida Department of Environmental Protection, Sipe examines whether mediation ADR settles environmental disputes more successfully, and he demonstrates that mediated cases settle more frequently than cases using traditional legal and administrative methods.<sup>4</sup>

In general, there have been few analytical studies because data are scarce. Environmental ADR is still somewhat uncommon in Europe, so adequate records are not available. In the U.S., where the private sector has taken the initiative for developing environmental ADR, standardized records are not available (Sipe, 1998).<sup>5</sup> In Japan, however, the public sector has led the development of environmental ADR, and volumes of records are available to analyze.

This paper uses the micro-level data set of environmental disputes obtained from the Environmental Dispute Coordination Commission (EDCC) of Japan to evaluate statistically the effectiveness of environmental ADR in bringing environmental disputes to a speedy resolution. Pollution is a multi-national problem and thus ADR technique have a multinational relevance in addressing them. Hence, we believe our empirical findings may apply to environmental ADR in other countries as well.

In many environmental pollution disputes, the polluter and its victims are located near each other and will remain in place and maintain an ongoing relationship after their dispute is resolved. These features of environmental disputes and their resolution resemble those of strike resolution (Katz and Kochan, 1992). Much research concerning strikes have focused on identifying the determinants of strike duration (Flynn, 2000), and it is assumed that duration follows a stochastic process. Subsequently, its distribution is estimated empirically.

Past studies concerning the duration of strikes have focused on a myriad of variables. The size of the firm is the variable most often included in analysis (Tracy, 1986). Studies have found that larger firms tend to have shorter strikes (e.g., Flynn, 2000). Tracy (1986) found that industries featuring capital-intensive technologies tend to have more frequent and longer strikes. Ondrich and Schnell (1993) examine how differences in the number of points of disagreement and the magnitude of a disagreement at the start of a strike can predict its duration. They show that disputes with more points of disagreement and a greater discrepancy between bargaining positions of both parties last longer. Some strike duration studies have revealed that the involvement of prominent unions prolong negotiations because unions tend to engage in gaming behavior (Flynn, 2000). Kennan (1985), Jaggia (1991), and Efaw (1998) studied the effect of the business cycle on strike durations and found that strike duration is countercyclical. They find that the level of industrial production has a significant positive effect on the hazard rate, which determines the length of the strike. Strikes are shorter when output is increasing.

Drawing on the extensive literature concerning strikes, this paper conducts a duration analysis to identify the types of issues involved in environmental ADR and examines how those issues affect the duration of ADR negotiations. Although disputes brought to the ADR process involve many types of pollution, we focus those involving air pollution, noise, and offensive odor.

Studies demonstrate that the size and characteristics of a strike affect its duration; we also examine how the size and characteristics of a pollution dispute affect its duration. In particular, we investigate whether disputes involving serious pollution damage are resolved promptly.

In industrial strikes, a union representative negotiates salary and working conditions with an employer. Similarly, pollution victims occasionally arrange for a representative to negotiate on their behalf

in environmental disputes, believing they enhance their bargaining power. However, they need to spend time for consensus building. Thus, victims would trade-off increasing likelihood of an acceptable settlement and prolonging the process, which is associated with higher transaction costs.<sup>6</sup>

The literature of the Coase Theorem has discussed the effects of transaction costs generated by multiplying the number of agents engaged in bargaining (Baumol, 1972). Theoretical papers predict that the likelihood of bargaining success decreases as the group grows (Cooter, 1982). In contrast, experimental studies demonstrate that a bargaining solution provides an efficient resource allocation even for a dispute involving many agents (Hoffman and Spitzer, 1982, 1986). Although opposite predictions about the applicability of bargaining solutions for the dispute resolution involving many agents are provided among theoretical and experimental studies, the bargaining solutions of environmental disputes have not been fully analyzed in empirical literature. Using a large data set of pollution dispute settlements, we have examined whether the involvement of additional negotiators prolongs reaching a settlement. We have determined that they do. This result implies that ADR process (bargaining solutions) becomes slower and less efficient as the number of participants increases.

The paper is structured as follows. Section 2 summarizes environmental ADR in Japan. In Section 3, we summarize the data. Section 4 presents the empirical model. Section 5 reports the estimation results. Section 6 concludes.

## 2. Environmental ADR in Japan

When an environmental pollution problem arises, Japanese residents file complaints with their local government. If the local government decides to handle the case, Environment Pollution Complaint Counselors hear residents' complaints and initiate the settlement process. Local governments received 93,016 environmental complaints in 2000, and pollution counselors resolved 76,931 of them. Of the remaining 16,085 complaints, 426 were transferred to the police; 1184 were transferred to the EDCC; and 10,295 were carried into the next fiscal year. The date of the resolution of 1685 complaints was not recorded, and the status of 2495 complaints was not reported.

When pollution compliant counselors fail to resolve the problem, the Environmental Dispute Coordination Commission (EDCC) or the Prefectural Pollution Examination Commission (PPEC) assists the negotiation between the parties in the dispute. EDCC is an administrative commission established as an external agency of the Prime Minister's Office and consists of a chairman and six commissioners appointed by the Prime Minister. Most prefectures set up PPEC in accordance with the regulation. EDCC and PPEC can appoint experts such as lawyers, engineers, and scholars to investigate technical issues. EDCC handles inter-prefectural cases, grave cases, and cases with nationwide implications. PPEC handles the remaining cases.

In the settlement of pollution disputes, EDCC provides conciliation, mediation, arbitration, and adjudication services; PPEC provides conciliation, mediation, and arbitration services. In conciliation services, conciliators appointed by EDCC or PPEC assist the negotiation, and as the most frequently used service, a committee consisting of the commission members provide mediation. If the disputants accept the committee's proposed solution, the agreement becomes a legally binding contract. Arbitration is provided by a committee consisting of the commission members. In the arbitration process, the disputants are asked to waive their right to judicial appeals and to obey the judgment of the arbitration committee. Adjudication is available only from EDCC. Although conciliation, mediation, and

<sup>4</sup> Although he argues that time is a crucial component in dispute settlement, he does not analyze the time spent for mediation.

<sup>5</sup> Some studies focus on the states that institutionalize environmental ADR. For example, mediation practices in Florida are analyzed by Berry et al. (2003).

<sup>6</sup> We thank the anonymous referee for pointing this out to us.

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