Environmental risk and extended liability: The case of green technologies

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Abstract

We analyze the effect of extending environmental risk to banks. We assume that the firm needs external funds to invest in green technology and reduce the risk of environmental damage. Prevention may affect the distribution of both environmental losses and operating revenues. We show that, under moral hazard, the firm does not always invest less in prevention than the optimal social level. We also show that extending liability may improve both the level of prevention and the level of compensation. However, extended liability always leads to an increased probability of bankruptcy for the firm. We also obtain that partial extended liability improves social welfare, while full extended liability does not.

Key words: Environmental risk, limited liability, extended liability, investment in prevention, moral hazard
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1 Introduction

Environmental risks display several specific dimensions in addition to those presented by more "standard" risks. First, an environmental risk is often related to very high levels of disaster but to low probabilities of accident (e.g., nuclear power plants). Second, the agent responsible for an accident is not the sole victim and the accident's impact may persist over several years. Fighting against environmental risks has now become an international priority. Governments agree that this must be done through a precise definition of respon-

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sibility and accurate attribution of the liabilities to all actors involved directly or indirectly in risky activities [1] .

Extending liability to partners of the firm has two principal aims: it should lead to better prevention *ex ante* and to better compensation *ex post*. The United States Congress adopted CERCLA (*Comprehensive Environmental Response, Compensation and Liability Act*, 1980-1985) which extends liability to banks financing firms guilty of environmental damage, provided such banks are sufficiently involved in the activities of the former. The intent of this legislation was to increase funds set aside for compensation, knowing that firms are often protected by the limited liability rule. Furthermore, implicating banks would motivate them to use instruments such as suitable financial contracts to give firms more incentives to invest in prevention.

Some European countries have also created compensation funds [2] , similar to the Superfund related to CERCLA in the United States, to provide for quick clean-up and compensation. Furthermore, the European Commission's DG XI - Environment, Nuclear Safety and Civil Protection, is currently working on "The role of the financial sector in achieving sustainable development". The European community's *Fifth Environmental Action Programme* [3] (European Community, 1993) states that "financial institutions which assume the risk of companies and plants can exercise considerable influence - in some cases control - over investment and management decisions which could be brought into play for the benefit of the environment". Hence, focusing on the impact banks have on the activities of their clients is becoming an important practice when dealing with corporations whose operations yield environmental risks.

Boyer and Laffont (1997) show that, under full information, extending all the liability to the bank is a first-best strategy in inducing firms to adopt adequate measures of prevention. The socially optimal level of prevention is attained and victims are well compensated if damage does occur. Reality, however, lags woefully behind such optimal conditions, and banks often have only partial information about the preventive measures adopted by the firms they finance. Thus, financial institutions cannot easily link the terms of the financial contract with the desired level of prevention when making loans. In the current context, Boyer and Laffont show that partial liability may be a

[1] This claim was first discussed at the 1972 Conference of Stockholm and has been ratified by the Convention of Lugano (Council of Europe, 1993). The 1992 Conference of Rio de Janeiro (Earth Summit, 1992) also played a large part in this ratification.

[2] For instance, FIPOL has been created in France and the *Umwelthaftungsgesetz* in Germany. Such public funds also exist in England and in Italy (see Bianchi (1994) for more information on European compensation funds).

[3] See also the *Progress Report in Implementation of the 5th Action Programme* (European Community, 1996), and the *Report to the European Commission by DELPHI International LTD in Association with Ecologic GMBH* (European Commission, 1997).