ENIRONMENTAL POLICY AND FIRMS’ DECISION-MAKING ABOUT LOCATION CHOICE:

Application of a Decision-Making Model to the Case of a Fertilizer Plant

Abstract. Firm-level decision making is a process in which multiple actors are involved with partly diverging interests, multiple objectives, and incomplete information. This chapter presents an existing process-oriented model, the “Conflict Model” developed by Bueno de Mesquita, which can be used to model such decision making processes and predict their outcomes. It is argued that decision-making as a reaction to environmental regulations can be better understood by paying attention to the social influence processes between the social and economic actors involved. As a case study, this Conflict Model is applied to decision making in a multinational about how to proceed with a certain fertilizer production plant in view of developments in the industry and increasingly tight environmental regulations. An initial analysis led to model this process as one in which eight actors are involved and where the crucial decision is dichotomous (whether or not to build a gypsum reworking plant). The model correctly predicted that the gypsum reworking plant would not be realized.

1. INTRODUCTION

During the last two decades there has been a growing awareness of actual and potential threats to the environment from pollution produced by firms. This has resulted in the introduction of increasingly more stringent environmental policies in the OECD countries and many industrializing countries. However, the introduction of proposed policies is often hampered by the fear that stringent environmental policy handles may trigger off environmental capital flight, which in its turn is likely to have a negative impact on, inter alia, profits, investments, and employment.

Environmental capital flight is usually defined as relocation of firms from a region with stringent environmental policy to regions with less stringent environmental policy. However, relocation is not the only response open to firms in case of increasingly stringent environmental regulations (cf. Jeppesen and Folmer 2001). They could also decide to close down a plant (totally or partially), or they could choose to comply with the environmental demands, e.g., by applying ‘end of pipe solutions’ or process innovations. It is likely that the decisions made by firms about how to respond to environmental policies depend not only on cost-benefit calculations. Reasons for the importance of non-economic considerations may be, e.g., the uncertainties inherent in the various options, which may preclude a

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compelling economic analysis, and pressures applied by government and interest groups.

Environmental capital flight has received extensive attention in the literature. Following Jeppesen and Folmer (2001), a distinction can be made between macro and micro studies. Macro studies deal with the impacts of environmental policy on trade and capital movements while micro studies focus on competitiveness and location behavior of firms. However, as far as we know, no attention was paid yet to the process of firm-level decision-making about responses to environmental regulations. Such studies are important because they are about the mechanisms which are at the basis of the effects of environmental regulations on location choice and, hence, on capital flight. The present chapter is a first report on a study of this decision-making process, based on the assumption that the firm management decides in interaction with other actors – such as, e.g., governmental agencies, trade unions, pressure groups, and other (competing or collaborating) firms. We employ a model deriving from political science (Bueno de Mesquita 1985) rather than economics, which postulates an influence process between the various actors, who will have diverging interests; this influence process precedes and affects the decision that is taken eventually by the firm’s management. Economic cost-benefit considerations are regarded as part of the background causes for the policy stances taken by the various actors, and these considerations are exogenous to the influence model that is the focus of this chapter. The economic considerations are not explicitly modeled; the focus is on the influence process.

The purpose of this chapter is to present this influence model together with a first case study of a firm’s response to environmental regulations. A wider set of cases will be presented in future work. This set of cases is constituted of firms operating in the following sectors: basic metal industry, chemical industry, petrochemical industry, leather industry, and agriculture. The firms in the basic metal industry and petrochemical industry considered process innovations, the firms in the chemical industry and agriculture considered closing down or international relocation, the firm in the leather industry thought about international relocation.

The present chapter presents an analysis of the response to environmental policy of a plant in the Dutch fertilizer industry facing the environmental requirement to rework its waste gypsum. The decision-making model that we apply is the so-called expected utility model or conflict model developed by Bueno de Mesquita (1985). This model has been applied in a variety of situations and has performed well in explaining and predicting the outcomes of collective decision-making processes. Independent audits for the accuracy of the model in making real-time predictions for the outcomes of collective decision-making processes (outcomes that were not known at the time the prediction was made) indicate that it has achieved an accuracy rate of around 90% (Bueno de Mesquita 2000).

The paper is organized as follows. In section 2 we present an overview of the conflict model. Section 3 starts with a brief description of the situation of the fertilizer industry and the restrictions it faces on the basis of environmental policy.

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2 For an overview of the macro literature see amongst other Jeppesen et al. (1999), and for the micro literature Jaffe et al. (1995), Adams (1997), and Jeppesen and Folmer (2001).