THE PRICE OF LAND AND THE PROCESS OF EXPROPRIATION**

A GAME THEORETIC ANALYSIS OF THE DUTCH SITUATION

BY

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1 INTRODUCTION

When the Dutch government wants to initiate a new public project, it often has to buy land from citizens. In cases like these, the citizen in question and the government face a situation of bilateral monopoly and the price the government has to pay in exchange for the ownership of the land depends on the bargaining power of the two agents. This paper focuses on the price the Dutch government pays to farmers in situations in which land of several farmers is bought in order to create a new public project (as a highway, or a recreation area—as explained in e.g. Visser, 1994).

Situations of bilateral monopoly between the government and a citizen in which the government wants to obtain (part of) the property of the citizen occur so often that the Dutch law specifies a procedure the government has to follow. The law also determines that in case of disagreement about the price of land, the court decides what the price of the land will be. Given this legal framework, a natural setting in which to analyze the bargaining problem is an asymmetric information model in which the government makes a number of sequential price offers to the farmers (whose private valuations are unknown to the government) before it goes to court.

Starting from Rubinstein (1982) there has been a rapidly growing non-cooperative game theoretic literature in which the offers (and counter-offers) of the bargaining parties are explicitly modelled as sequential moves. The literature that is closest to the situation we want to analyze in this paper has two features: (i) one party makes a finite number of sequential offers and the other party can only accept or reject these offers and (ii) the party that makes the offers is uninformed about the private valuation of the other party. Examples of this type of model include a durable good monopolist setting prices in a market in which it does not know the different consumers’ willingness to pay (see e.g. Stokey, 1981)

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and Fudenberg and Tirole, 1991: pp. 400–416) and a union, making sequential wage offers to a firm whose profitability is unknown to the union (see e.g. Gibbons, 1992: pp. 218–224). Generally speaking, the above literature has yielded two relatively robust conclusions. First, most equilibria show a ‘skimming property,’ which means that high-valuation agents accept price offers before low-valuation agents. Second, some equilibria of these models exhibit what is called ‘Coasian dynamics,’ i.e. price offers decline over time. Another interesting property is that the monopoly power of the party that makes the offers disappears if it can make offers arbitrarily fast (see e.g. Gul et al., 1986). This property is sometimes referred to as the Coase conjecture. For a recent survey on bargaining with private information the reader is referred to Kennan and Wilson (1993).

The structure of the model that we will present is, from a mathematical point of view, equivalent to models that are studied in the above mentioned literature; in particular see Fudenberg and Tirole (1983) and Sobel and Takahashi (1983). The main difference is that in our case, the party who makes the offers (the government) is the buyer of the product (land), whereas in the earlier literature it is the seller (the monopolist or the union) who makes the offers. Consequently, as we will see, the skimming property and (in the case most commonly considered) the Coasian dynamics property are reversed.

Due to the fact that administrative procedures and the Dutch law determine a procedure that has to be followed our model is not subject to some of the criticisms that are launched against the non-cooperative bargaining literature. A first point of critique is that the outcome of the model is very sensitive to the assumed structure of offers and counter-offers. In many applications there seems to be no good reason to assume a particular structure of offers and counter-offers. We will see that in our case the structure of offers is determined by the Dutch law insisting that the government should have made enough attempts to come to a settlement by agreement. Second, in many models it is not clear why there is a finite number of bargaining rounds (cf. the monopoly case) and/or what happens when the bargaining is over and no offer is accepted (cf. the union case). As the Dutch law specifies that the government can go to court after having followed a specific administrative procedure that takes approximately three years, this critique also does not bear to our situation to the same degree. Third, as we will see, there are good reasons to believe that at the end of the bargaining process the government cannot make offers arbitrarily fast. This means that administrative procedures and the Dutch law can be regarded as commitment devices that make it possible for the government to benefit to some extent from its monopoly power.1 When discussing the legal framework and the way we have modelled the bargaining situation, we will discuss these points in more depth.

1 In this respect it might be interesting to note that a common point of view is that democratic governments have problems in making binding commitments (see e.g. Stiglitz, 1989). The case considered here might be regarded as a counterexample to this claim.