

Marginal Cost Pricing and Efficient Taking under Uncertainty*

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Abstract:

We describe a mechanism for government taking under uncertainty that provides incentives for governments to make efficient taking decisions and for property owners to use their properties efficiently. We argue that efficiency in takings requires that governments not only pay the value of property when it is taken but also pay the reduction in property value that they cause when identifying properties as potential targets of takings. This is a straightforward application of the general principle of marginal cost pricing. Unlike existing proposals to improve the efficiency of takings, our mechanism requires governments to pay amounts that are sufficient to fully compensate property owners for their losses.

* A more technical version of the ideas in this paper can be found in Florenz Plassmann and Nicolaus Tideman, "Fair and Efficient Compensation for Taking Property Under Uncertainty," *Journal of Public Economic Theory*, 7, No. 3 (2005) pp. 471-495.

1. Introduction

Governments often announce that they may take private property at some point in the future, and property owners need to determine the best use of their property in the meantime. If a government decides to take a property, then the commonly accepted standard of fairness requires that owners receive full compensation. Is there a procedure that leads to efficient taking and investment decisions under uncertainty while providing full compensation to owners?

In their seminal 1984 paper, Blume *et al.*¹ pointed out that paying compensation equal to the value of property at the time of a taking gives owners no incentive to take account of the prospect of a taking, leading to wasteful investment. If, on the other hand, compensation is not provided and governments are insensitive to the losses of private asset value that result from takings, then governments will take property wastefully. Over the past 20 years, a sizeable literature on the economics of government taking has analyzed compensation rules that improve social welfare, and the general consensus is that owners will invest efficiently only if they obtain at most partial compensation.²

We argue that existing analyses of taking have failed to develop mechanisms that lead to full compensation mainly because they do not consistently apply the principle of marginal cost pricing. Existing compensation rules follow the current state of the law and do not view a government's announcement of the possibility of a taking as itself a partial taking that requires compensation. However, if announcing the probability of a

¹ Blume, Lawrence, Daniel Rubinfeld, and Perry Shapiro. 1984. "The Taking of Land: When Should Compensation be Paid?" *Quarterly Journal of Economics*, **100**: 71-92.

² To our knowledge, the only exception is Hermalin, Benjamin. 1995. "An Economic Analysis of Takings." *Journal of Law, Economics, and Organization*, **11**: 64-86. This paper describes a mechanism that leads to full compensation by linking the owner's compensation to the social benefit of the taking.

taking lowers the property value and if governments are not required to take this reduction into account—that is, if governments do not have to bear the marginal costs of their actions—then they can be expected to make inefficient taking decisions that lead to at most partial compensation of owners.

In this paper we describe a simple mechanism based on the principle of marginal cost pricing that leads to efficient and fair takings. Section 2 reviews the general principle of marginal cost pricing and Section 3 applies this principle to taking events. Section 4 shows why the application of marginal cost pricing leads to full compensation for owners and Section 5 concludes.

2. The Principle of Marginal Cost Pricing

The principle of marginal cost pricing states that agents have an incentive to behave efficiently if they bear the full marginal costs of their actions. Economists characterize behavior as “efficient” if it is impossible to change the behavior in a way that would make some person better off without making another person worse off. If the agents who benefit from a change offer compensatory payments to everyone who is made worse off and those who are made worse off consider these payments adequate compensation, then the change improves efficiency. The highest payment that those who are better off are willing to make is the monetary equivalent of the marginal benefit of the change, and the lowest compensatory payment that those who are worse off consider adequate is the monetary equivalent of the marginal cost of the change.

An agent maximizes his utility if the marginal benefit that he obtains from an action (for example, the last bite of cake eaten, the last cigarette smoked, the last dollar

invested) equals his marginal cost. If he is the only one who receives the benefit and the only one who bears the cost of his activity, then individual utility maximization leads to social efficiency. But if someone else either receives part of the benefit or bears part of the cost, then individual utility maximization does not lead to social efficiency because the agent has no incentive to consider the shares of the marginal benefit and marginal cost that apply to the other party. For instance, if someone else bears part of the marginal cost, then the agent will continue with his activity until his marginal benefit equals his share of the marginal cost, rather than stopping earlier at the point when his marginal benefit equals the entire social marginal cost.

This suggests that socially inefficient behavior can be explained by the fact that someone does not bear the marginal cost of his action, and that social efficiency can be restored by ensuring that all parties bear the full marginal cost of their actions. The trick is to identify the instances in which someone pays something other than the full marginal cost and to assign an appropriate remedy.

3. Marginal Cost Pricing and Taking under Eminent Domain

We characterize a taking event as a series of actions undertaken by a government and a property owner. If one assumes that the government always acts for the benefit of the whole society, then the government will use society's resources efficiently and designers of taking mechanisms only need to consider the incentives of owners to invest efficiently during the time of uncertainty. But if it is possible that government officials pursue alternative goals—for example, to minimize the budget costs of projects that they

undertake—then it is essential to ensure that governments as well as property owners have incentives to behave efficiently.

To understand the characteristics of efficient taking and investment decisions, consider the case when a government owns the property. The government will consider using one of its properties for a new public project if society's expected benefit from the property's new use exceeds society's expected benefit from the current use. Assume that the government can choose among several of its properties for the new project. The government must decide whether and where to implement the project, while using all of its properties efficiently in the meantime. The higher the probability that it will use a particular property for the new project, the smaller is the optimal investment in this property. Efficiency therefore requires that the government (1) identify the probabilities with which it may use any of its properties for the new project, given the properties' different efficient uses, (2) invest the efficient amount in each property, given the probability that it may use this property for the new project, and (3) eventually identify the appropriate property for the new project, given the value of each property at the time when the decision to implement the project is made.

1. Requiring governments to bear the marginal cost of their actions

Now consider the case when the government does not own the property. The government affects the use of resources at three occasions. First, when it determines that, at some point in the future, it may need to take certain private properties under eminent domain. Second, when it announces the probability of a taking to the owners. Third,

when it decides whether to take the different properties. Consider these actions in reverse order.

It is evident that a government's decision to take a property imposes a cost on its owner and thereby on society at large. A government will make an efficient taking decision only if it considers the current value of the property at the time of the taking. This is most easily achieved by requiring governments to actually pay an amount equal to this value, and represents the efficiency aspect of "fair compensation." Because governments need to take the actual property value into account to make an efficient taking decision, this payment cannot be a lump-sum payment that is independent of the owner's investment up to this point. But because efficiency also requires that the owner not be compensated for inefficiently large investments that might prevent an otherwise socially desirable taking, the owner will not necessarily receive the entire payment as compensation (see below).

A cost minimizing government that seeks to pay a minimum amount at the time of the taking has an incentive to make the property owner invest as little as possible during the time of uncertainty. Because owners will invest less if a government announces a higher probability of a taking, governments have an incentive to announce the largest believable probability. But if the government induces owners to invest too little, then it may make an inefficient taking decision because it might take a property that it would not have taken had the owner invested the efficient amount. In such a case, the government's taking decision would be efficient *ex post* but not *ex ante*: the government would make an efficient taking decision given the owner's actual investment, but the social benefit would

have been higher had the owner invested the efficient amount and had the government taken a different property.

To provide the governments with the incentive to announce the correct probability, we begin by noting that governments impose costs on property owners when they announce the possibility that they may take property at some future time. Efficient use of a property that may be taken and whose improvements will be destroyed at that time is likely to differ from the efficient use of a property whose improvements can generate a longer stream of revenues. Whenever the probability of a taking lowers the return from efficient use of the property and thereby lowers the property's value, efficiency requires that governments take this reduction into account by paying an amount equal to the reduction in property value.

The requirement that governments pay for the reduction in property value that they cause by announcing probabilities of takings is essential for efficient taking decisions because it provides governments with the incentive to identify and announce the correct probability of a future taking. A government minimizes its costs of the taking event when the expected decrease in the announcement payment due to additional investment equals the expected increase in the taking payment. Because announcement payments ensure that governments bear the full marginal cost of their actions, such payments give them the same incentive to act when someone else owns the property as they have when they own the property themselves. It is always in an owner's best interest to correctly identify and act upon the probability of using his own property differently in the future. Hence requiring governments to make announcement payments equal to the reduction in property value caused by the announcements, together with the

requirement to pay an amount equal to the value of the property at the time of the taking, provides the appropriate incentive to identify and announce the correct probability of a taking.

2. Requiring property owners to bear the marginal cost of their actions

It remains to ensure that property owners have the incentive to invest socially efficient amounts. A standard result in the taking literature is that the owner will invest efficiently as long as he does not receive any benefit from inefficient overinvestments, which is the case when he receives no compensation at all if his property is taken. Part of the literature has also asserted that, if society requires that compensation be paid, such compensation must be a lump-sum payment that is independent of the owner's actual investment. However, a lump-sum payment may lead to inefficient taking decisions. If the lump-sum payment exceeds the value of the property at the time of the taking (for example, because the owner has invested inefficiently little), then the government would not be basing its taking decision on the actual property value and might therefore be unwilling to take a property when it would be socially desirable to do so.³ To ensure efficient taking decisions, the government must pay an amount equal to the actual value of the property that it takes, while any compensation payment that an owner receives at the time of the taking must be equal to the smaller of the actual property value at the time of the taking and the value of the property that would have resulted from efficient investment. If the owner has invested too much, so that the property is worth more than

³ To be sure, the requirements that the government pay the actual value of the property and the owner receive a lump sum payment that exceeds the actual value would lead to efficient taking and investment decisions, but such a policy would not lead to overall efficiency if the budget shortfall has to be financed through distortive taxation.

it would have been had the owner invested efficiently, then the government should pay, to someone other than the owner, the difference between the actual property value and the value that would have result from efficient investment.

The owner's return to efficient investment if the probability of a taking is positive is likely to be lower than his return to investment if this probability is zero. Because the amount that the owner can receive as compensation is limited by the value of the property after efficient investment, he has an incentive to overinvest if such overinvestment (1) lowers the probability with which the government takes his property and thereby (2) increases his expected return to investment beyond the amount that he expects to receive as compensation if he invests efficiently and his property is taken. Such overinvestment leads to social inefficiency because it induces the government to forego a socially worthwhile taking and either take a different property whose taking leads to a smaller net social benefit or not implement the public project at all. Efficiency will again be restored if the owner is required to bear the marginal cost of his action, that is, if he has to pay a penalty equal to the reduction in social benefit caused by his investment. This solution is somewhat unsatisfying from a practical point of view because it ties the owner's fee for investing to the reduction in social benefit, which may be difficult to determine. A less elegant but operational solution is to simply set the fee equal to the amount that the owner expects to gain from overinvestment.

4. Full Compensation for Taking Private Property

A general conclusion in the literature on government taking has been that efficient compensation must be less than full compensation, where "full compensation" is an

amount equal to the value that the property would have had at the time of the taking if the owner had invested the efficient amount based on the expectation that he would keep his property. Because governments reduce the value of property at two distinct moments in time—first when they announce probabilities of takings, and second when they take property—it is not surprising that a compensation payment at the time of the taking that leads to an efficient taking can account only for the second reduction in value but not for the first. At the time of the taking, the reduction in property value that results from the earlier announcement of a taking is a sunk cost, and governments will only make efficient taking decisions if they do not have to pay amounts that exceed the actual marginal costs of actual takings.

However, it is intuitive that the requirement that governments pay the marginal costs of their actions should generate sufficient funds to pay full compensation to property owners, because the reduction in property value caused by the possibility of a taking plus the property value at the time of the taking if the property owner has invested efficiently equals, by definition, the value that the property would have had at the time of the taking if the owner had invested the efficient amount based on the expectation that he would keep his property. If one considers the announcement of the probability of a taking that reduces property value already a partial taking of private property that requires compensation,⁴ then it is appropriate that the owner receive the government's announcement payment. The requirement that the government pay announcement compensation to the owner therefore not only leads to efficient taking decisions but also ensures that owners can be fully compensated for their losses.

⁴ See Epstein, Richard. 1985. *Takings: Private Property and the Power of Eminent Domain*. Cambridge: Harvard University Press.

5. Conclusion

The conventional wisdom in the literature on government taking under eminent domain has been that all taking procedures require a trade-off between efficiency and equity. We have shown that this result is a consequence of not considering the announcement of a taking as a partial taking in itself. If one assumes that governments always act in the social interest, then this omission does not affect the efficiency of the taking procedure. But if government officials want to minimize the amount they have to pay as compensation for the actual taking, then efficiency requires that they be required to pay the social marginal cost of their decision to possibly take private property at a later point in time.

It is useful to emphasize the dichotomy between efficient and fair decisions. Efficiency requires that everybody bear the marginal cost of his actions. Fairness is a much more controversial concept. A procedure can be efficient without being fair, and it can also be fair without being efficient. To provide the incentive for efficient behavior, our taking procedure requires that government pay an amount equal to the full value of the property that it takes. This implies that sufficient funds for full compensation are available. But efficiency itself does not require that the owner receive this amount. How much the owner ought to receive depends on the socially accepted standard of fairness. Fairness as we understand it requires that everyone receive full compensation for his losses. Because our procedure permits full compensation of property owners, we consider it “fair.”