

Information and Pollution Permit Markets

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August 2003

MIDDLEBURY COLLEGE ECONOMICS DISCUSSION PAPER NO. 03-21



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In a recent article Smith and Yates (Smith and Yates, 2003) argued that regulators could gain additional information about the optimal number of permits to issue from two-sided markets (in which consumers can decrease the number of permits) such as found in the EPA's acid-rain program. They argue that while one-sided markets (in which quantity is set and cannot be changed by participants) attain a type of productive efficiency, these markets will not attain "full social efficiency" unless the permit-issuing agency happens to issue the socially efficient number of permit. They argue that this can occur only if the agency has perfect information about the costs and benefits of pollution, which generally the agency does not have. They then argue that the existence of a two-sided pollution permit market offers "an easily observable indicator of inefficiency even when the regulator has imperfect information about the costs and benefits of pollution" and that "if any consumers are observed retiring permits, then the market equilibrium is not efficient." (Smith and Yates, pg.182)

If their argument were correct, it would suggest that two sided markets are always preferable to one-sided permit markets, because of the extra information gained from the two-sided market. In this short note I argue that their argument is incorrect, and that while, if there were no public good problems, some information might be gained from a "complete two-sided market", generally no useful information can be gained because of public good problems. I further argue that it is not the case that a regulatory agency would want to set prices at a level that will keep any consumer from retiring permits in an EPA acid rain type market.

My argument is a simple one—their structure of the problem makes the implicit assumption that individuals only want to decrease pollution, and thus what they call a two sided market only allows individuals to reduce the number of permits; it is more correctly called an asymmetric two-sided market. While that is the type of market that the EPA has set up with acid rain (for understandable reasons as I will argue below) such a market is not the symmetric two-sided market that regulators would need to create if their goal were to analyze the social efficiency quantity of pollution permits issued.

In a two-sided market relevant for social efficiency analysis one would have to allow individuals to both increase and decrease the number of pollution permits. The reason individuals might want to increase the number of pollution permits is not that they prefer more pollution, but because they prefer the actions that more pollution permits would allow. This demand to increase the number of permits is most likely to be expressed by the firms, acting as an agent for their consumers, but that demand to increase pollution permits must be taken into account in any analysis of the social efficiency of the pollution permit market.

The issue can be seen more clearly if one thinks not of a single pollution permit market--what they call a two-sided pollution permit market--but of a two-part market—a market in pollution rights and a separate market in changing the number of pollution permits issued. Thinking of it this way it is obvious that there will be both a supply of permits—where the individuals are willing to pay for an increase in the quantity of permits, and a demand for permits—where individuals are willing to pay for a decrease in the quantity of permits. (I speak

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of individuals rather than consumers because the issue is not one of consumers versus producers, but of consumers of the goods produced by firms and of consumers affected by the pollution that the production of goods causes; producers are simply operating as proxies for those consumers who want the products the production of which causes the pollution.)

Efficiency in the number of permits would be judged on the basis of equilibrium in that second market. Assuming no public goods problems (as Smith and Yates did in their initial model), the price of creating or destroying permits (the price in the first market) would have to be equal to the price of an additional unit of pollution created (the price in the second market) for there to be social efficiency. Put another way the price of changing the number of permits would equal the price of the permits themselves. A symmetric two-sided market appropriate for social welfare analysis would be a market in which these two markets are combined and individuals are allowed to increase the number of permits at the existing price or decrease the number of permits at the existing price as well as buy and sell the permits to others.

That is not the nature of the two-sided market Smith and Yates assume. Their two-sided market is asymmetric; it allows only those who want to decrease the number of permits to reveal their demand; it allows no expression of demand for those who want to increase the number of permits. This asymmetric market price is not useful in finding a social optimum since it has given no means of expression to those who want to increase the number of permits. Thus, contrary to Smith and Yates' conclusion one cannot say that "if consumers actually purchase permits, it indicates that the market equilibrium is inefficient."

One might be tempted to argue for a generalization of the Smith and Yates information gathering process and say that if traders are allowed both to create and destroy permits that the quantity of pollution permits will move to a socially efficient equilibrium. Thus, if the regulatory agency offered individuals the right to buy or sell permits at the existing market price of permits, regulators could look at whether additional permits were being created or destroyed, and decide whether the number of permits issued was too high or too low (subject, of course, to intertemporal incentive compatibility arguments discussed by Smith and Yates, pg. 188). In that case, assuming no public goods argument, (which is the assumption they make in their first example) if permits are being destroyed, then on efficiency grounds the number of permits issued is too high and the market price is too low; if permits are being created, then, on efficiency grounds, the market price is too high. If permits are being neither created nor destroyed, then the market price is socially efficient in the sense that Smith and Yates are using the term. Under these assumptions the regulatory agency could have a useful rule for determining the correct number of permits. (In fact, in the case of a symmetric two-sided market, issuing the correct number of permits would not be a problem since the quantity of permits would move to an efficient quantity even if the incorrect quantity were chosen and maintained. (Only the distributional effects would be different.)

I would not favor such a rule or such a generalization because of the public goods nature of pollution. Smith and Yates could downplay that public goods problem since they were looking only at one side of the market. In their asymmetric two-sided market they argued that any buying of additional permits in the market provided information that the price of pollution permits was too low from a social welfare point of view. For them, the fact that public goods arguments existed affected the quantity bought, but not the qualitative information whether price was too high or too low. In symmetric two-sided markets, in which both the creation and destruction of permits is allowed, the public goods nature of the problem of demand revelation is much more

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problematic since it means the market does not achieve the correct price unless the public good problem affects both suppliers and demanders equally. That is not likely to be the case.

Specifically, I would expect that the costs to those favoring pollution reduction (since they do not have organizations which solve those public good problems) of expressing their demand for reducing pollution permits to be much higher than it is for those favoring pollution permit increases (since firms solve part of the public good problem for them.) In that case if regulators allowed symmetric changing of the number of permits issued, the quantity of those pollution permits would likely be significantly raised as those favoring increasing permits would significantly outnumber those favoring decreasing permits. Thus, one can understand the EPA's acid rain program that only allows individuals to destroy permits and not create them. But that program is a reasonable program *only because the public goods problem are so severe on the demander's side* that the program does not significantly affect the number of permits. If it actually did significantly affect the price, it is likely that there would be too little pollution from a social welfare point of view.

It follows that since the EPA market in acid rain permits is asymmetric, and allows only one side of the preference group to reveal its preferences in the market, means that, contrary to Smith and Yates' claim, no efficiency information can be gained by whether consumers are observed retiring permits and that the EPA should not strive to issue permit levels that price consumers completely out of the market.

Bibliography

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Abstract

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In a recent article Smith and Yates (Smith and Yates, 2003) argued that regulators could gain additional information about the optimal number of permits to issue from two-sided markets. This paper argues that they are incorrect in their assertion because the market they refer to is an asymmetric two-sided market in which individuals are only allowed to decrease the number of permits. When a correct two-sided market is considered, the public good nature of the problem makes it unlikely that any useful information can come from a two-sided market