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Economists use the concept of relative price to explain institutional effects on a wide variety of behavior, including criminal activity and community acceptance of noxious facilities. Although the Relative Price Effect is a fundamental proposition in economics, it fails to explain many important behaviors that are driven by non-calculative motives such as intrinsic motivation. This paper demonstrates through empirical work on tax evasion and community acceptance of NIMBY (not-in-my-backyard) projects that the economic analysis of institutional effects must include factors that go beyond relative price. It is shown that under certain conditions, external interventions such as reward or punishment may result in a Crowding-Out effect that undermines the intrinsic motivation to perform socially desirable activity. Two questions are discussed: do compensations increase community acceptance of NIMBY projects and does increased deterrence raise (gross) tax revenue?

RELATIVE PRICE AND INSTITUTIONS

The Relative Price Effect asserts that price increases reduce demand for a good or activity and raise its supply, other things being equal. This implies that increasing the penalties of crime or the expectation of detection will lower crime rates and that offering compensation to communities will increase their tendency to accept projects, such as prisons and nuclear waste repositories, that are recognized to be socially desirable, but are undesirable in one's own neighborhood. Coase clearly makes the point: "An economist will not debate whether increased punishment will reduce crime; he will try to answer the question, by how much.[1]

Institutions determine the magnitude of relative prices, such as the size of a punishment. Institutions can be understood in a variety of ways, but they are essentially social regularities. These are manifested in the form of decision-making systems, such as democracies or markets; formal rules, such as those embodied in constitutions, laws and regulations; informal rules, such as social norms or traditions; and organizations, such as firms, government or bureaucracies.

ECONOMIC RELEVANCE OF NON-CALCULATIVE MOTIVES

Non-calculating behavior is motivated by considerations other than short-run benefits and costs. The existence of such behavior is clearly evidenced by Emily Dickinson's desire to write poetry without the intention to publish it, and the mathematician Galois, who forsook a good night's sleep before a duel to write down major discoveries in algebra. The hallmark of non-calculative

behavior is intrinsic motivation, which implies an interest in performing an activity for its own sake. Intrinsic motivation is different from but compatible with the calculating motivation underlying optimization behavior. Although conceptually distinct, calculating and non-calculating motivations are difficult if not impossible to distinguish in actual behavior. The most salient examples of non-calculative motives consist of morale, in the sense of work or tax morale; civic virtue or public spirit; social capital, which includes norms and networks of civic engagement; and, trust.

The relevance of intrinsic motivation to economic analysis is suggested by the failure of the deterrence model to provide a satisfactory explanation of tax paying behavior.[2] Despite the fact that the probability of apprehension and the size of punishment for tax evasion is low, there is a high compliance rate with tax payments in most countries. Some economists have attributed this seemingly non-optimizing behavior either to tax morale (a commitment to citizenship and respect for law) or to a lack of opportunity to evade taxes. An erosion in tax morale has been suggested as an important factor in the noted decline of tax compliance in the United States. Further support can be found in the vast literature on why people obey the law. Social psychologists have forcefully argued that criminal activity cannot be explained by deterrence variables and that individuals will engage in lawful behavior if procedures are considered fair, even if outcomes are unfavorable to them.

One might object that intrinsic motivation poses few problems for economic analysis so long as intrinsic motivation is considered to be exogenously given. As is argued below, this is not the case. Intrinsic motivation is determined endogenously and influenced systematically by pricing instruments and regulations.

THE CROWDING-OUT EFFECT

The main idea behind the Crowding-Out Effect is the notion that rewards can have hidden costs that reduce intrinsic incentives to perform an action. In one study, asylum patients who were paid to make their bed or clean their room were less inclined to do these activities on their own without payment. External rewards can undermine intrinsic motivation in two ways: if individuals perceive a reward as controlling in the sense that they perceive their actions to be determined by others; or if a reward fails to acknowledge a person's intrinsic motivation, and leads to impaired self-esteem. Paying a friend to come over for dinner, for example, would destroy the intrinsic motivation of friendship.

In addition, there may be *indirect* damaging effects from external intervention. A *motivational spill-over effect* may lead people to lose intrinsic motivation when they observe rewards or penalties being applied elsewhere. For example, effluent charges or tradable permits may be effective where they are applied, but may reduce intrinsic motivations to control pollution in areas where no external incentives exist.

EMPIRICAL EVIDENCE

In 1992, the Swiss government considered four different communities as possible sites for an underground repository to store low to mid-level radioactive wastes. The author and three other

researchers conducted a survey in one community to discover its civic interest in accommodating the facility. The survey took place one week prior to a referendum on a regional constitutional amendment to permit the construction of underground facilities. This survey, which consisted of in-person interviews, in effect asked respondents to say how they would vote on permitting a nuclear waste dump in their community. Slightly more than half the respondents (51%) agreed to the repository, while 45% opposed the sitting, (4 percent did not care where the facility was built).

Subsequently, these respondents were asked the same question but were given the additional information that the Swiss parliament would compensate all residents of the host community. The compensation was substantial: while the median income of respondents was CHF 5250 per month, the amounts offered ranged from CHF 2500 (N=117), to CHF 5000 (N=102), to CHF 7500 (N=86) per individual per year. With compensation, only 25 percent of the respondents agreed to the facility in their community -- a significant reduction from the 51 percent majority who agreed to the facility without compensation. Increasing the compensation amounts by half led only a single respondent to accept the higher offer. Similar results were found in a survey among communities that were being considered for a second repository for highly radioactive wastes.

Other research supports the hypothesis that financial incentives do not necessarily increase acceptance of hazardous and nuclear waste repositories. In the United States, hefty compensation has failed to persuade communities to accept such facilities, and states that rely on compensation-based siting have been no more successful than those that do not.[3]

Econometric analysis of tax compliance suggests that the intrinsic motivation to pay taxes depends on citizen trust in the political system. In Switzerland, research that utilized various methods to assess tax fraud indicates that tax morale is high in those cantons where political participation (popular initiatives and referenda) is extensive, and low where opportunities for political participation are few. Further, rates of tax evasion were not significantly affected by detection probability (as measured by audits per 1000 tax payers) or by the penalty tax rate. Corresponding evidence exists for tax compliance in the United States.

The empirical results presented here are consistent with the Crowding-Out Effect. While the Relative Price Effect remains important, it is not the only relevant link between institutions and behavior. These results suggest that an effect working in exactly the opposite direction should also be taken into account. Crowding-Out Theory allows empirical testing of a connection between institutions, ethical values, and human behavior.

Notes

1. Ronald H. Coase, "Economics and Contingent Disciplines," Journal of Law, Economics and Organization (Spring 1978,*4*, 33-47).

2. The deterrence model was first proposed in Michael Allingham and Agnar Sandmo, "Income Tax Evasion: A Theoretical Analysis," Journal of Public Economics (November 1972, *1*, 323-338). Surveys of empirical evidence showing the limitations of the deterrence model appear in Jeffrey Roth, John T. Scholz, and Ann Dryden Witte eds., Taxpayer Compliance (Philadelphia: University of Pennsylvania Press, 1989); D.J. Pyle, "The Economics of Taxpayer Compliance," Journal of Economic Surveys (1990, *5*, 163-198); and Joel Slemrod, ed., Why People Pay Taxes: Tax Compliance and Enforcement (Ann Arbor: University of Michigan Press, 1992).

3. See for example Michael B. Gerrard, Whose Backyard, Whose Risk: Fear and Fairness in Toxic and Nuclear Waste Siting (Cambridge, Mass.: MIT Press, 1994); Howard Kunreuther and Douglas Easterling, "Gaining Acceptance for Noxious Facilities with Economic Incentives," in Daniel W. Bromley and Kathleen Segerson, eds., The Social Response to Environmental Risk: Policy Formulation in an Age of Uncertainty (Boston: Kluwer, 1991); and Kent E. Portney, Siting Waste Treatment Facilities: the NIMBY Syndrome (New York: Auburn House, 1991).