
CHAPTER 17

Institutions and morale: the crowding-out effect

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1 Do economists have the right answers?

Consider the following two important policy areas:

Siting of NIMBY projects: The “Not in My Back-Yard” syndrome relates to projects which are socially desirable (they increase aggregate welfare) but which impose considerable net costs on the persons living in the vicinity where they are located. Examples include incinerators, airports, railway tracks and roads, prisons, clinics for the physically and mentally handicapped, and nuclear waste repositories. The citizens at the same time demand the completion of such projects but refuse to have them located in their vicinity. But building such a facility is not possible without local consent (see, e.g., Easterling and Kunreuther 1995; Portney 1991). In most countries, it is either extremely difficult or even impossible to find sites for NIMBY projects. In the United States, for example, hundreds of sites for hazardous waste repositories are urgently sought, but extremely few have been found (Gerrard 1994). The situation is similar in many European countries.1

Economists have a handy tool to deal with such a situation. As the aggregate net benefits of undertaking the project are positive, one must

1 I was able to discuss the ideas contained in this chapter with a large number of scholars, in particular Iris Bahuet, Isabelle Bassnhart, Hub Cooter, Reiner Eichenberger, Hartmut Kliemt, Allan Lind, Richard Masgrave, Felix Oberholzer-Gee, Margit Osterloh, Daniel Rubinfeld, Fritz Scharpf, Amartya Sen, Tim Tyler, Oliver Williamson, and Gordon Tullock. Financial support is acknowledged to the Swiss National Fund, Project No. 42–42480.94. Parts of this chapter draw on my Not Just for the Money: An Economic Theory of Personal Motivation (1997).

1 The search in the United States for locations for noxious facilities is discussed, e.g., in Hamilton (1993) and Mitchell and Carson (1986); the European situation is dealt with in Linneker-Bayer et al. (1994) and Oberholzer-Gee et al. (1995).
simply redistribute them in an appropriate way. The communities can be induced to accept the undesired project within their borders by offering a compensation large enough to make their net benefits positive, while the other communities must be taxed to raise the sum of compensation.  

The question is, Are compensations effective in overcoming the resistance to accept NIMBY projects?

*Tax Evasion:* In many countries, tax noncompliance is a rampant problem. Billions of dollars or Euros are lost each year to the government because the citizens cheat on taxes (see, e.g., Roth, Scholz, and Witte 1989; Pyle 1990; Slemrod 1992).

Again, economists have a straightforward suggestion to make: As the incentive to cheat negatively depends on expected punishment, the government should raise the probability of detection and/or the penalty for tax fraud.

The question is, Does increased deterrence raise (gross) tax revenue? This chapter argues, and will present empirical evidence, that these questions in general cannot be answered positively though they are based on the most fundamental proposition (Aleschian 1977, chap. 7; Becker 1976, p. 5) in economics, the relative price effect. Thus, according to Coase (1978, p. 35), "An economist will not debate whether increased punishment will reduce crime; he will try to answer the question, by how much." Indeed, in many circumstances, compensations do not help to overcome the NIMBY problem, nor does increased deterrence raise (gross) tax revenue.

The relative price effect states that, ceteris paribus, a price increase (compared to other relevant prices) systematically reduces the demand, and raises the supply, of a good or an activity. Institutions determine the size of the relative prices (see, e.g., North 1981, 1991; Eggertsson 1990). A change in institution systematically affects human behavior through an induced change in relative prices. An institutional change may take place over time, or across society at a given moment of time.

Institutions may be understood in various ways; they are manifestations of social regularities. They include (1) decision-making systems, e.g., market vs. democracy, or more narrowly, consensus vs. simple majority voting; (2) rules, which may be formal (legal) such as those included in constitutions, laws, or regulations, or they may be informal, such as social norms or traditions; and (3) organizations, such as firms, the government, or bureaucracies.

Four basic propositions concerning the relationship of institutions to human behavior shall be advanced.

*Proposition 1:* While the relative price effect is of great importance, it does not exhaust the determinants of human behavior. As a consequence, economists (or rational choice social scientists) risk making false predictions and offering erroneous policy advice.

*Proposition 2:* Noncalculative human motives and values, such as (work and tax) morale, civic virtue, social capital, trust, and intrinsic motivation need to be taken into account to account more satisfactorily for human behavior.

*Proposition 3:* (Generalized) relative prices affect noncalculative human motives; noncalculative motives therefore cannot be assumed to remain constant but are endogenously determined.

*Proposition 4:* A specific, and crucial, interaction between relative prices and noncalculative motives is called the crowding-out effect. External interventions undermine intrinsic motivation under identifiable conditions. This effect is theoretically and empirically well grounded.

Provided these propositions are tenable, a so far disregarded relationship between institutions and (ethical and other) values is established without giving up the rational choice framework. Section 2 discusses noncalculative human motives and their relevance. The crowding-out effect is introduced in section 3. Section 4 presents empirical evidence and applies the crowding-out effect to the NIMBY and taxation issues introduced in the beginning. Section 5 draws conclusions.

2 Noncalculative motives

2.1 Various concepts

Human beings act in a noncalculative way when they are motivated by considerations beyond (short-run) benefits and cost. They act because

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1 The use of monetary compensation to overcome the siting problem was first suggested by O'Hare (1977). Since then this proposition has become standard; see, e.g., Kunreuther and Weindorfer (1986); Kunreuther and Fortney (1991).

2 The model on which this advice is based is due to Becker's (1968) economic theory of crime and has been applied to taxation by Allingham and Sandmo (1972).

3 Ingenious theoreticians have been able to construct cases in which this does not apply (e.g., when price is an indicator of quality), but these cases are rather irrelevant exceptions. The rational choice approach is used in economics, and parts of sociology, political science, and law (Becker 1976; Coleman 1990; Kirchhoffer 1991; Frey 1992).
they consider it to be ethically required, or even more simply because they just desire so to behave. This does not imply at all that (1) they are unresponsive to relative price changes. Noncalculative behavior is an additional motive perfectly compatible with what has so far been assumed in economic theory. (2) Noncalculative behavior is not inconsistent with rationality or with optimization behavior by individuals; and (3) there is no strict separation between calculative and noncalculative behavior. It is vain to seek a strict difference. It is always possible to interpret a particular motive as either calculative or noncalculative. What matters is that even a scholar who is devoted to attributing as much behavior as possible to (explicit or implicit) calculation will not be able to account for all that is observed satisfactorily. The same applies to a scholar who is committed to a program favoring the opposite. Most importantly, noncalculative motives exclude market and pseudo market exchanges (e.g., political vote trading). Reciprocity (e.g., Homans 1958; Blau 1964; Frehr, Gächter, and Kirchsteiger 1995) is also calculative because it is based on social exchange. On the other hand, noncalculative behavior is (for the time being) offered one-sidedly and does not depend on a quid pro quo response from other persons. Thus, true love is incompatible with calculative motives as has forcefully been argued by Nozick (1989, p. 78): "The intention of love is to form a we and to identify with it as an extended self. . . A willingness to 'trade up,' to destroy the we you largely identify with, would then be a willingness to destroy yourself in the form of your extended self." As with many other terms used in the social sciences (e.g., the distinction between consumption and investment) the productivity of its use does not depend on whether it is always possible neatly to separate the two; indeed in most cases it is rather obvious to an undogmatic observer whether a motive is more or less calculative along a continuum of possibilities.2

important instances of noncalculative human motives are the following:

1. Morality as it is used, e.g., when one speaks of work morale or tax morale.6
2. Civic virtue or public spirit.

Institutions and morale

(3) Social capital
(4) Trust
(5) Intrinsic motivation

No attempt is made here to assess exactly the relationships among these various concepts of noncalculative motives; the usefulness of each concept depends anyway on the use to which it is put. For the purpose here, noncalculative motives will be understood to be intrinsic motivation, while calculative motives are identified with extrinsic motivation. Among all the concepts mentioned, intrinsic and extrinsic motivation is best suited for an individualistic approach as employed here. Consequently, the term "civic virtue," which will be used in the empirical analysis of the NIMBY problem, and "tax morale," which will be used to analyze tax compliance, are looked at here as particular manifestations of intrinsic motivation.

2.2 Relevance

Is intrinsic motivation empirically relevant at all? Everyday experience and literary and historical evidence certainly point in that direction. Why did Emily Dickinson write poetry without any inclination to publish a single line? Why did Goethe seal Faust II for posthumous publication? Why did Cavendish undertake experiments in his private laboratory without any desire to announce his intentions to the public? Why did the mathematician Galois, facing death in a duel next morning, stay awake all night to write down his major discoveries in higher algebra? (He would certainly have been better off getting a good night’s sleep [Simonton 1994, p. 207].)

We economists are, however, rarely satisfied with commonsense observations. Perhaps rightly so, because such “evidence” may be illusionary, but perhaps wrongly so because it makes us overlook important

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6 See Coleman (1990), who takes it to be the norms and network of civic engagement, to which Tocqueville (1835–40) attributed the success of democracy in America. Putnam (1993) explains the differences in the working of regions in Italy. Most recently, efforts have been made to measure social capital over time and across countries; see Putnam (1995).


8 Individuals are intrinsically motivated when they undertake an activity for its own sake, i.e., “when one receives no apparent reward except the activity itself” (Deel 1971, p. 105). In contrast, extrinsic motivation is activated by rewards or punishment from outside the person.
aspects of real life. Fortunately, there is econometric evidence of the importance of intrinsic motivation for human behavior available. It has been well established that tax-paying behavior cannot satisfactorily be explained by the deterrence model à la Allingham and Sandmo (1972), despite great efforts by the scholars involved in tax research. The coefficients related to the probability of apprehension and the size of punishment in well-specified tax functions are far from robust (they are rarely statistically significant) and sometimes bear a “wrong” sign. Moreover, in the United States, one needs to explain why anybody pays taxes, and not why some people evade taxes. In view of the very low probability of being caught, and the low punishments normally administered, citizens would have to exhibit an enormous extent of risk aversion (an extent by far not observed in any other activity) to make it individually rational for a utility-maximizing person to pay any taxes (see Alm, McKee, and Beck 1990; Graetz and Wilde 1985). As a consequence, on the basis of an extensive analysis using the American Internal Revenue Service’s Taxpayer Compliance Maintenance program, Graetz and Wilde (1985, p. 358) conclude that “the high compliance rate can only be explained either by taxpayers’... commitment to the responsibilities of citizenship and respect for the law or to lack of opportunity for tax evasion.” The same authors (with Reinganum 1986) attribute the falling tax compliance in the United States to the erosion of tax morale. A whole literature dealing with the more general issue “Why people obey the law?” (Tyler 1990) seems to have been overlooked by economists. On the basis of both carefully designed experiments and surveys of behavior in real life situations, social psychologists have forcefully argued that the deterrence variables (probability of apprehension and size of punishment) are unable to account for various sorts of crime. Nonevaluative motives play a large role. It has, in particular, been empirically established that perceived procedural fairness induces individuals to follow the law even if the outcome for them is unfavorable, and even if it would be advantageous not to obey the law (see Lind and Tyler 1988; as well as several contributions in Kramer and Tyler 1996).

Counterarguments

It could well be argued that the whole discussion so far is of little relevance. If intrinsic motivation such as tax morale or civic virtue is indeed empirically relevant, it is no problem to introduce it into economic analysis. The marginalist analysis remains completely unchanged if a level effect of an exogenously given intrinsic motivation of one form or other is introduced. In a tax equation, for example, the amount of tax noncompliance is reduced by an empirically estimated constant term which can be associated with tax morale. Or if individuals enjoy work for intrinsic reasons, i.e., have a high work morale, they need ceteris paribus to be paid a lower wage – a phenomenon which is rampant, for instance, in the cultural sector (see Throsby 1994, p. 18, for corresponding quantitative estimates).

As will be argued in the following parts, the problem is not so simple. Intrinsic motivation is not exogenously given but rather determined endogenously. In particular, external policy interventions via pricing instruments or regulations systematically affect intrinsic motivation.

Crowding-out intrinsic motivation

Social psychologists have analyzed and empirically measured the “hidden cost of reward” (see, e.g., Deci and Ryan 1985; Pittman and Heller 1987) which appears when an external intervention in the form of a reward reduces individuals’ intrinsic incentives to act. The hidden cost of reward has, for instance, been observed in asylums where paying the patients to perform certain tasks (such as making the bed or cleaning their room) undermines their motivation to do it on their own (see, e.g., Lepper and Greene 1978). An everyday example would be an invitation for dinner to a friend’s home. Nobody would at the end of the evening make an attempt to pay him for the effort because this would destroy his intrinsic motivation (his friendship).

Two psychological processes have been identified to account for the “hidden cost of reward”:

1. When individuals perceive the external intervention to be controlling in the sense of reducing the extent to which they can determine actions by themselves, intrinsic motivation is substituted by extrinsic control. Following Rotter (1966), the locus of

Which, of course, has been done. See, for instance Becker’s (1991) use of altruism in the family, or North’s (1991) use of ideology. More general are Becker (1992) and Denzau and North (1994).
control has shifted from the inside to the outside of the person affected. Individuals who are forced to behave in a specific way by outside intervention would feel "overjustified" if they maintained their intrinsic motivation. Then, they behave rationally when reducing the motivational factor under their control, that is, intrinsic motivation.

(2) An intervention from the outside undermines the actor's intrinsic motivation if it carries the notion that the actor's intrinsic motivation is not acknowledged. The person affected feels that his or her competence is not appreciated, and that perception leads to an impaired self-esteem,\(^{19}\) resulting in a reduced effort.

On the basis of these psychological processes, the "hidden cost of reward" can be generalized in two respects:

(1) All outside interventions can affect intrinsic motivation: In addition to rewards the same effect can come about by external regulations (commands).

(2) External interventions crowd-out intrinsic motivation if they are perceived to be controlling and they crowd-in intrinsic motivation if they are perceived to be acknowledging.

So far, crowding theory only relates to the effect on intrinsic motivation (in which psychologists are particularly interested). In order to make the concept useful for our purpose, it is necessary simultaneously to take into account the disciplining or (generalized) relative price effect normally considered in economics. This is best done in a principal–agent setting.

An (representative) agent adjusts his or her performance considering the benefits \(B\) and the cost \(C\) induced. Both benefits and costs increase in performance \(P\), i.e., \(\delta B/\delta P = B_p > 0\), and \(\delta C/\delta P = C_p > 0\). Higher performance exhibits diminishing marginal returns \((B_{pp} < 0)\) and has increasing marginal cost \((C_{pp} > 0)\). Benefits and cost are also influenced by the principal's external intervention \(E\)

\[
B = B(P, E); \quad B_p > 0, \quad B_{pp} < 0 \tag{1}
\]

\[
C = C(P, E); \quad C_p > 0, \quad C_{pp} > 0 \tag{2}
\]

A rational agent chooses that level of performance \(P^*\) that maximizes net benefits \((B - C)\), which yields the first-order condition

\[ B_p = C_p \tag{3} \]

Differentiating this utility-maximizing condition with respect to \(E\) shows how the agent's optimal performance \(P^*\) is affected when the principal changes the extent of external intervention

\[
B_{pp} + B_{pr} \frac{dP^*}{dE} = C_{pp} + C_{pr} \frac{dP^*}{dE}, \quad \text{or}
\]

\[
\frac{dP^*}{dE} = \frac{B_{pr} - C_{pr}}{C_{pp} - B_{pp}} \leq 0 \tag{4}
\]

Following standard principal–agent theory (e.g., Alchian and Demsetz 1972; Fama and Jensen 1983), external intervention raises performance by imposing higher marginal cost on shirking or, equivalently, by lowering the marginal cost of performing, \(C_{pp} < 0\). This is the disciplining effect of external intervention. As the crowding effect is neglected, i.e., a change in external intervention does not affect the marginal utility of performing \((B_{pp} = 0)\), the orthodox economic theory predicts that external intervention raises performance \((dP^*/dE > 0)\).

This positive effect is strengthened if the external intervention bolsters intrinsic motivation (crowding-in effect, \(B_{pp} > 0\)). On the other hand, the crowding-out effect \((B_{pp} < 0)\) and the disciplining effect \((C_{pp} < 0)\) of an external intervention work in opposite directions, so that the outcome \(dP^*/dE\) depends on the relative (absolute) size of \(C_{pp}\) and \(B_{pp}\).

The following propositions on the size of the crowding effect can be formulated on the basis of the relevant literature (e.g., Lane 1991; Frey 1993, 1994). The crowding-out effect is the larger (i.e., \(B_{pp}\) is the more negative)

(1) the more personal the relationship between a principal and his or her agent is

(2) the larger the agent's participation possibilities are

(3) the more uniform the external intervention is, i.e., the less individual differences in intrinsic motivation are acknowledged by the principal

(4) the more the external intervention (in particular the rewards extended) is contingent on specific performance instead of being directed at general behavior.

External interventions may moreover have an indirect damaging effect on intrinsic motivation. The crowding-out effect may spread to further areas, even into those in which the external intervention has not been applied. If intrinsic motivation is crowded out in areas in which it is a major (or even the only) behavioral incentive, the overall outcome of
an external intervention tends to be even more strongly against the principal's interest. There may thus be an indirect motivational spill-over effect which has to be added to the direct crowding-out effect. An example is provided by policy instruments such as effluent charges or tradable permits. They work efficiently where they are applied, but an induced substitution of environmental ethics by monetary incentives may well lead people to protect the environment less in areas where no external incentives exist. This undesired spill-over effect takes place not only with monetary incentives but also with rules and regulations.

That intrinsic motivations (in the broadest sense) may be linked across areas has been observed by various economists (though they have not related this linkage to crowding-out). Akerlof (1989, p. 6) notes that "sociologists and anthropologists have asserted that problems of thought concerning one area are duplicated in other seemingly unrelated areas." Sugden (1989, p. 53) stresses that norms can be spread by analogy. If an analogy can be drawn between an area in which a norm is valid and another area where the norm is not yet applied, its validity can expand to the latter area too. Williamson (1975, p. 37) uses the concept of "attitudinal spill-over," while Jensen (1992) focuses on "reputational spillovers." Neurological research suggests that the molecular construction of the brain limits the power to differentiate between varying circumstances. In our case between these areas in which external interventions produce overjustification and those where a similar type of intrinsic motivation applies, but no external intervention takes place. In psychology, this is known as the "spread effect" (Thorndike 1933).

4 Empirical evidence on crowding-out

4.1 Experimental and econometric analyses

Experiments are a useful method of empirically observing the crowding-out effect under controlled conditions. We undertook such an experiment at the University of Zurich in autumn 1994 using the framework of the dictator game (developed by Kahneman et al. 1986). The purpose was to test the extent to which individuals are prepared to share with others, a particular kind of civic virtue. The students (N = 14) initially received an endowment of Swiss Francs (CHF) 7.00 and in the first treatment condition were asked to pass on at least CHF 2.50 to an anonymous other person. Under these conditions the median amount given was CHF 3.00. When the same persons thereafter were again endowed with CHF 7.00 but without any minimum sharing rule imposed, the median amount allocated to the second person was CHF 1.80. This reduction in the amount shared is especially surprising as subjects confronted with the sharing decision without any prior enforcement passed on CHF 3.00. The difference between CHF 3.00 (unforced treatment) and CHF 1.80 (forced treatment) is consistent with the crowding-out effect. The same experiment (N = 14) was repeated with a mandatory donation of CHF 4.00 to be given. In this situation the median amount passed on was CHF 4.00, and when the rule was lifted it dropped to CHF 2.00, which is again clearly lower than the CHF 3.00 given in the unforced treatment. The experimental result is again consistent with the crowding-out effect: The subjects' "civic virtue" of giving to other persons was undermined when they were forced to share.

This result is supported by those of a large number of experiments applied to other settings, undertaken by social psychologists (see, e.g., Deci and Ryan 1985; Pittman and Heller 1987; Lane 1991). Econometric analyses of real life behavior also present evidence in favor of the crowding-out effect. A particularly important study by Borkema (1995) looks at firms in which the intensity of the personal relationship between the principals and agents depends on the form of supervision. For the case of managers as agents of a certain firm, one can distinguish three major types of supervision: (1) The managers are controlled by the parent company. This corresponds to a rather impersonal relationship, so that, following our earlier proposition, a positive influence of monitoring managers' performance is expected, because intrinsic motivation is little or not at all affected. (2) The managers are controlled by their firm's chief executive officer, a personalized relationship. According to our proposition, monitoring in this case tends to reduce the agents' effort, as an external intervention shifts the locus of control away from their intrinsic work motivation, and the agents perceive that their competence is not acknowledged by their superior. (3) The managers' behavior is regulated by the board of directors. The crowding-out effect, according to our hypothesis, is expected to be greater than in case (1) but smaller than in case (2). Borkema's data set refers to 116 managers in medium-sized Dutch firms in 1985. They range from fewer than 100 to more than 30,000 employees and cover a wide variety of industries. The managers' individual effort is, in line with Holmstrom and Milgrom (1991), operationalized as the number of hours invested. The intensity of regulating is captured by three aspects: the regularity with which the managers' performance is evaluated, the degree of formality of the evaluation procedure, and the degree to which the managers are evaluated by well-defined criteria. A measurement model is used to establish empirically
that these variables meaningfully represent the latent variable "regulating." A structural model is then applied to measure the influence of so-defined external intervention on managers' performance. The empirical results are consistent with the theoretical proposition advanced. The econometrically estimated parameters capturing the effect of external intervention on work performance turn out to be positive and statistically significant in case (1) of impersonal control. In case (2) of personal control, on the other hand, the corresponding parameter is statistically significant and negative; regulating strongly crowds out intrinsic motivation, so that the net effect of control on performance is counterproductive. In the intermediate case (3) of somewhat personalized control, the estimated parameter does not deviate from zero in a statistically significant way.

4.2 Crowding-out in NIMBY problems

The undermining effect of the use of the price system—the offer of monetary compensation—on intrinsic motivation—the civic virtue to accept an unwanted project within one's community—has been empirically analyzed for the case of a nuclear waste site in Switzerland.9

The Swiss government intends to build a repository to store low-level and mid-level radioactive wastes. It has proved to be extremely difficult to find a site because of strong local opposition. In June 1993, it was proposed to build the repository in Wolfenschisssen, a small village (population 2100) of 640 families located in central Switzerland. Half a year before this announcement was made, we conducted a one-hour personal interview with 305 persons living in Wolfenschisssen. At that time, four communities were still under consideration as possible sites. Many respondents found it likely that Wolfenschisssen would be chosen. In order to test the theory, it seemed ideal to conduct a survey. As at the polls, moral behavior is inexpensive in interviews. The respondent knows that his answers are not binding and that he is unlikely to influence the aggregate outcome. Carefully conducted personal surveys are thus generally thought to represent how people would vote in an actual referendum (Arrow et al. 1993).

We asked all respondents whether they would vote in favor of building the Swiss low-level and mid-level radioactive waste repository in their community if the developer and the federal parliament proposed this. The procedure we described was identical to the one actually employed in Switzerland. In order to build a repository, the developer, the federal parliament, and the local town hall meeting all have to agree on the project.

The in-person interviews were conducted on the basis of contingent valuation (CV) questions utilizing the referendum format, which is superior to other frames used in earlier CV studies (Portney 1994; Hanemann 1994). The present study is best thought of as representing how people would vote if they had to decide on siting a nuclear waste repository in their home community. Proponents of the CV approach, as well as some of its critics, all agree that a CV study should be considered "essentially a self-contained referendum" (Arrow et al. 1993, 20). Indeed, careful CV studies have correctly predicted ballot votes (Carson, Hanemann, and Mitchell 1986). The survey contained a detailed description of the siting procedure and the compensation mechanism. Moreover, the survey was undertaken in the week before the respondents had to decide in a referendum on an amendment to the canton constitution regarding the construction of underground facilities. At the time of the survey, the issue had been debated extensively.

A good number of social scientists object to the use of attitudes and opinions elicited in surveys, arguing that they are not relevant to behavior (Braden and Kolstad 1991; Zaller and Feldman 1992; Neill et al. 1994; for a more favorable view of the contingent valuation method, see Mitchell and Carson 1989). In our case, this point does not seem to be valid for two reasons: Comparisons between the results of contingent valuation studies and research on revealed preferences indicate that most individuals answer questions as if they had to bear the consequential costs of their statements (Cummings, Brookshire, and Schulze 1986; Pommerehne 1988; Jones-Lee 1989). Moreover, in his study of siting decisions for obnoxious facilities, Hamilton (1993) points to the potential for political protest as the key determinant for location choice. Since the Swiss authorities were about to decide where to locate the low-level radioactive waste facility, participants had real incentives to state their preferences in order politically to influence the siting decision correspondingly.

All respondents were asked whether they were willing to permit the construction of a nuclear waste repository for short-lived, low-level and mid-level radioactive waste on the grounds of their community. More than half of the respondents (50.8 percent) agreed to have the nuclear waste repository built in their community, 44.9 percent opposed the siting, and 4.3 percent did not care where the facility was built. Thus, this NIMBY project is widely supported in spite of the fact that a nuclear waste repository is mostly seen as a heavy burden for the residents of the

9 The study and results are more fully reported (in German) in Oberholzer-Gee et al. (1995). See also Frey and Oberholzer-Gee (1996).
host community. This is shown by the fact that nearly 40 percent of all respondents believed the risk of serious accidents in the facility and groundwater contamination to be considerable; 34 percent were convinced that some local residents would die as a result of any environmental contamination, and close to 80 percent believed that many local residents would suffer long-term effects should an accident occur.

To test the effect of external compensation, the same question was repeated, asking respondents whether they were willing to accept the construction of a nuclear waste repository. This time, however, we added that the Swiss parliament had decided to compensate all residents of the host community. The amount offered varied from CHF 2500 per individual and year (N = 117), to CHF 5000 (N = 102), and CHF 7500 (N = 86). While 50.8 percent of the respondents agreed to accept the nuclear waste repository without compensation, the level of acceptance drops to 24.6 percent when compensation is offered. About one-quarter of the respondents seem to reject the facility simply because financial compensation is attached to it. The amount of compensation has no significant effect on the level of acceptance. There is further evidence which suggests that it is not the level of compensation which caused so many individuals to decline the offer. Everyone who rejected the first compensation was made a better offer, thereby raising the amount of compensation from CHF 2500 to 3750, from 5000 to 7500, and from 7500 to 10,000. Despite this marked increase, only a single respondent who declined the first compensation was now prepared to accept the higher offer.

To test the crowding-out effect further, we conducted an identical survey in northeastern Switzerland, namely, in six communes which are designated as potential sites for the second repository the Swiss government intends to build. This is a facility for long-lived highly radioactive wastes. In these communes 206 interviews were conducted. The sampling procedure and survey methodology were identical to the one described. Of these respondents 41 percent stated they would vote for the high level radioactive waste facility, 56.4 percent would vote against it, and 2.6 percent did not care. When they were offered compensation, the level of acceptance drops to 27.4 percent. Again, variations of the financial incentives do not result in significant changes of the supportive votes.

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*The compensation offered here is quite substantial. Median household income for our respondents is CHF 5250 per month.

Unfortunately, there was no pending referendum in northeastern Switzerland. Thus, the information level of respondents may not have exactly corresponded to the one right before a referendum. However, seismic measurements conducted by the developer in all six communes before the survey was conducted caused considerable discussion among the residents.

The hypothesis that financial incentives do not necessarily increase stated levels of acceptance is also supported by other research. Siting procedures based on price incentives have rarely been successful in reality. The search for hazardous waste landfills and nuclear waste repositories in the United States provides a good example. Despite the use of hefty compensation, only one small radioactive waste disposal facility and a single hazardous waste landfill (located in -- nomen est omen -- at Last Chance, Colorado) have been sited since the mid-1970s (Garrard 1994). States that rely on compensation-based siting have experienced no greater success than those using other methods (Portney 1991, pp. 28-29). Kunreuther and Easterling (1990) also find that increased tax rebates do not elicit an increased willingness to accept a nuclear waste facility in Nevada. They explicitly reject the possibility that the rebates offered were simply too small.

While the results correspond to the crowding theory, there are two alternative interpretations of the observations:

1. **Strategic behavior:** Since the observations relate to a real-world problem, we cannot rule out that the respondents answered strategically. In order to maximize the amount of compensation received from the central government, the citizens could underrate their willingness to accept the repository. This could account for the observed rejection of the compensation offered. This incentive to underrate the support should be greatest at zero compensation. But we observe that the stated support was higher when no compensation was offered. This is incompatible with a strategic interpretation of the observed behavior. The rejection of this competing explanation is corroborated by additional questions included in the survey. When asked why they declined the compensation offered, only 4.9 percent of the respondents indicated that the amount was insufficient to win their approval. Therefore, for the majority of the respondents, strategic behavior can be ruled out.

2. **Signaling:** Citizens may take the offer of a generous compensation as an indication that the facility is more hazardous than they previously thought. If this is true, a higher compensation leads to a higher risk evaluation and, ceteris paribus, to a lower level of acceptance. This competing explanation was tested by directly asking the respondents whether they perceived a link between the size of the compensation and the level of risk. Only 6.3 percent agreed with this connection. This clearly refutes the signaling hypothesis.
4.3 Crowding-out in taxation

The intrinsic motivation to pay one's taxes – or tax morale – depends strongly on the extent of trust the citizens have in the political system. When individuals are alienated from government and do not think that they are treated fairly by the political process, they are more inclined to pursue their selfish interests, i.e., to evade taxes, taking into account only the expected probability of being punished (see Lind and Tyler 1988; Kramer and Tyler 1996). A crucial factor which increases trust in government is the extent to which the citizens can actively participate in the political process (see, e.g., Mansbridge 1994; Barber 1983).

Switzerland presents a suitable test case because the various cantons have different degrees of political participation possibilities. It is hypothesized that the more extended political participation possibilities in the form of citizens’ meetings and obligatory and optional referenda and initiatives are, and the broader the respective competencies are, the higher is tax morale and (ceteris paribus) tax compliance. On the basis of these characteristics, about one-third of the 26 Swiss cantons are classified as pure direct democracy ($D$), another third as pure representative democracies ($R$); the rest satisfy only some of the characteristics (see, more fully, Frey and Pommerehne 1993). There are at least a dozen methods to estimate the extent of tax fraud (an extensive survey is given in Frey and Pommerehne 1984; see also Pommerehne 1994). In this case, several different methods were combined, including small-scale surveys, results of tax audits, and extensive interviews with tax experts from various cantonal tax offices (see Weck-Hannemann 1983; Schneider 1994). A cross section/time series (for the years 1965, 1970, 1978, i.e., 78 observations) multiple regression explaining the part of income not declared $Y_{nd}$ yields the following results\footnote{Because of multicolinearity between $D$ and $R$ ($r = 0.6$) two separate equations including $D$ and $R$ have been estimated.}: \[
Y_{nd} = 7.17 - 3.52p - 2.42f + 0.79t - 0.36d - 2.72Y(\ln)
\begin{pmatrix}
-1.98 & -0.62 & 2.10 & -2.51 & -0.30 \\
\end{pmatrix}
+ 0.57NY - 1.09A - 7.70D
\begin{pmatrix}
2.98 & -2.53 & -3.80** \\
\end{pmatrix}
\]
(5)

where $R^2(\text{adj.}) = 0.69$, d.f. = 41, $F = 11.08$, and * and ** indicate statistical significance at the 95 percent and 99 percent levels, respectively.

The explanatory variables are as follows:

- $p$ = probability of detection (the number of individual income tax audits per 1000 taxpayers)
- $f$ = penalty tax rate
- $t$ = mean marginal tax rate
- $d$ = income deduction possibilities
- $Y(\ln)$ = per capita income (in natural log)
- $NY$ = nonwage income
- $A$ = old-age taxpayers’ share (reflecting experience in tax matters)

The coefficients of the variables indicating the type of democracy ($D$, $R$) – the other variables are used to control for other influences\footnote{It may be observed that while many coefficients are statistically highly significant and have the theoretically expected signs, the probability of detection $p$ and the size of the fine $f$ are not statistically significant at the conventional levels; i.e., it cannot be presumed that deterrence is effective.} – have the theoretically expected signs. In cantons with a high degree of direct political control ($D$), tax morale is (ceteris paribus) higher. The part of income concealed falls short of the mean of all cantons by 7.7 percentage points, or in absolute terms the average amount of income concealed is about CHF 1600 (per taxpayer) less than the mean income concealed in all cantons. In contrast, in cantons with a low degree of political control ($R$), tax morale is (ceteris paribus) lower. The part of concealed income is 4 percentage points higher than the average income gap, and the mean income undeclared exceeds the mean of all cantons by about CHF 1500. The estimation results are consistent with the hypothesis that greater democratic participation possibilities lead to higher civic virtue as reflected in taxpayer behavior (for corresponding evidence for the United States, see, e.g., Smith 1992; Kinskey 1992).

The empirical evidence collected for Switzerland can be generalized. In a broad sense, two kinds of democratic tax institutions can be distinguished: One is based on the premise that the citizens are responsible persons, and that in principle they are prepared to contribute to the
provision of public goods and the redistribution of income by the state, provided this process is reasonably efficient and fair (see, e.g., Smith 1992). The corresponding tax laws allow the citizens to declare their own income and to make generalized deductions. The tax statements are in principle accepted as trustworthy, and the tax authority bears the burden of proof if it doubts the declarations.

The second type of tax institution starts from the assumption that all citizens want to exploit the tax laws to the fullest and cheat whenever they can. The corresponding tax laws deduct the taxes directly from gross income, and the citizens must claim a refund from the government, depending on the deductions granted by the tax authorities. In the whole process the burden of proof always lies with the individual citizen.

5 What follows?

In the introduction to this chapter, two questions were raised:

(1) Are compensations effective to overcome the resistance to accept NIMBY projects?

(2) Does increased deterrence raise (gross) tax revenue?

As has been pointed out, economic theory based on the relative price effect suggests a resounding yes.

This chapter advises a more careful answer: It may be yes, but under relevant and politically important conditions the answer is no. Indeed, we have presented econometric evidence that in industrial, democratic societies the answer has actually been no. The offer of compensation to the citizens of the prospective host community of a NIMBY project in Switzerland has strongly decreased the level of acceptance (from 50.8 percent down to 27.4 percent). Swiss taxpayers do not systematically react to deterrence (probability of being caught and size of fine when cheating on taxes). But they are prepared to comply more fully when their tax morale is high as a result of more developed institutions of direct political participation (popular initiatives and referenda).

The empirical results presented are consistent with the crowding-out effect stating that (under identifiable and relevant conditions) external interventions induced by institutions undermine intrinsic motivation in the form of civic virtue or tax morale.

In the context of economics, our theoretical and empirical analysis suggests that the relative price effect on which our arguments are founded presents an important, but not the only relevant link between institutions and human behavior. An effect working in exactly the opposite direction, crowding-out intrinsic motivation, should be taken into account. Crowding-out theory allows the establishment of connections among institutions, ethical values, and human behavior in a well-defined context, amenable to empirical testing.

REFERENCES


