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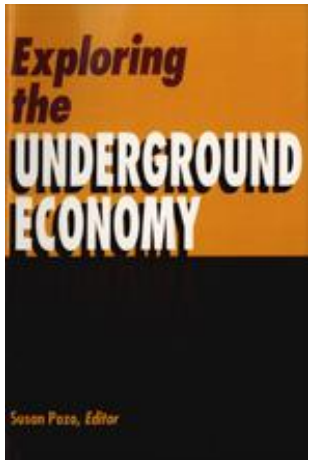
Explaining Tax Compliance



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Explaining Tax Compliance

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"Always try to be honest. It will gratify some, and astonish all the rest."
Mark Twain

The Puzzle of Tax Compliance

Tax evasion is an economic crime, perhaps the most common economic crime, and it appears to be a large and growing problem, both in the United States and elsewhere. Despite obvious difficulties in measurement, the Internal Revenue Service (1990) estimates for the United States that the tax gap, or the amount of unpaid federal income taxes, was between $83 billion and $93 billion in 1987 and had grown at an average annual rate of over 10 percent over the last two decades; more recent estimates by the Internal Revenue Service (1993) put the tax gap in 1991 at over $111 billion. Similar work for other countries suggests that tax evasion is an even more severe problem elsewhere (Tanzi 1982; Feige 1989). Such underreporting has a variety of harmful effects: it reduces the tax revenues of the government, it affects public provision of goods and services, it creates misallocations in resource use, it alters the distribution of income in unpredictable ways, it increases feelings of unfair treatment by government, and it generates disrespect for the law.

Still the puzzle of tax compliance (at least for economists) is not so much "Why is there so *much* cheating?" Instead, the real puzzle is "Why is there so *little* cheating?" This may seem surprising. However, most people pay most of their taxes most of the time, even though the chances of detection are quite small and the penalties on evasion are also extremely light. For example, in the United States in recent years less than 1 percent of all individual income tax returns are audited by the Internal Revenue Service, and the penalty on even fraudulent evasion is only 75 percent of unpaid taxes. Most economic models of taxpayer behavior conclude that there should be much more tax evasion than is

actually observed. The puzzle of tax compliance—and the challenge facing people working in this area—is to explain why people pay taxes.

The study of tax compliance has grown enormously in the last twenty years. Still, there is much about compliance that is not understood. My purpose in this lecture is to discuss some work my colleagues and I have done that attempts to explain the factors underlying tax compliance behavior. My basic conclusion is that the explanation of compliance requires us to recognize the myriad range of factors that motivate individual behavior, factors that go much beyond the standard economics-of-crime approach that economists typically invoke, to include theories of behavior suggested by psychologists, sociologists, and other social scientists. Admittedly, such a broadening in the scope of analysis is a difficult one for economists to make. However, unless this approach is taken—and experimental economics can help here—we will not be able to explain the levels of compliance actually observed or to devise policies to increase compliance.

The next section discusses the major elements that I believe must be included in any theory of tax compliance. It is followed by a section explaining one of the methods that many people have found useful in explaining compliance: experimental economics. The section after that presents some of the results of experimental studies performed by my colleagues and me. The last section discusses some conclusions and observations.

Theories of Tax Compliance

This section outlines the major elements that, I believe, enter the tax compliance decision of individuals. These factors include the standard elements of audit and penalty rates. However, they also include several factors suggested by alternative theories of behavior under uncertainty. They are summarized in table 1.

Table 1. Main Factors in Tax Compliance Behavior

- Detection and Punishment
- Overweighting of Low Probabilities
- Burden of Taxation
- Government Services
- Social Norms

Detection and Punishment

The dominant economics approach to the analysis of tax compliance follows the economics-of-crime methodology pioneered by Becker (1968) and first applied to tax compliance by Allingham and Sandmo (1972). In its simplest form, this approach assumes that an individual receives a fixed amount of income I, and must choose how much of this income to declare to the tax authorities and how much to underreport. The individual pays taxes at rate t on every dollar D of income that is declared, but pays no taxes on underreported income. However, the individual may be audited with some fixed probability p; if audited, then all underreported income is discovered, and the individual must pay a penalty at rate f on each dollar of deficient taxes, where f includes the unpaid taxes. If underreporting is detected, the individual's disposable income equals

$$I_C = I - tD - ft(I - D), \tag{1}$$

while if underreporting is not detected income is

$$I_N = I - tD. \tag{2}$$

Expected utility theory then suggests that the individual will choose declared income to maximize the expected utility $EU(I)$ of the evasion gamble

$$EU(I) = pU(I_C) + (1 - p)U(I_N), \tag{3}$$

where E is the expectation operator and utility $U(I)$ is assumed to be a function only of income.

It is straightforward to show that an increase in the probability of detection p and the penalty rate f unambiguously increase declared income D. Surprisingly, an increase in the tax rate t generally has an ambiguous effect on declared income; however, under standard assumptions about an individual's attitudes toward risk, a higher tax rate actually increases declared income.

This basic model has been extended in a variety of dimensions (Cowell 1990). In particular, the assumption that the probability of

detection is fixed for an individual (a random audit strategy) can be relaxed by allowing the audit agency to use information from the taxpayers' returns in determining whom to select for audit and by examining the interaction of the taxpayers and the government collection agency in a game theory setting. Such "endogenous audit selection rules" are a central part of the enforcement strategies of many countries. Nevertheless, the essential features of this economics-of-crime model have largely remained the same.

Now this approach gives the sensible result that compliance depends upon enforcement. It is essential to recognize, however, that this approach also concludes that an individual pays taxes because—and *only* because—of the fear of detection and punishment. Again, this is a plausible and productive insight, with the obvious policy implication that the government can encourage greater tax compliance by increasing the audit and penalty rates. However, I know of no serious student of tax compliance who believes that tax compliance can be explained entirely by the level of enforcement. As noted earlier, the levels of audit and penalty rates are set at such low levels in most all countries that a purely economic analysis of the tax evasion gamble implies that most individuals would evade if they are "rational" because it is unlikely that cheaters will be caught and penalized. However, such behavior is simply not observed, even in the most evasion-ridden economy.

Put differently, the standard economics approach to the analysis of tax compliance has some serious flaws as an explanation for observed compliance choices of individuals because it concludes that individuals should pay far less in taxes than they in fact do. It is clear that the individual compliance decision either must be affected by other factors not mentioned by expected utility theory or must be affected in ways not captured by the theory.

Overweighting of Low Probabilities

Another factor is suggested by recent theoretical work by Kahneman and Tversky (1979) and others, who argue that many individuals can overweight low probabilities, such as those relevant for tax compliance. Suppose, for example, that the true probability of an audit is 1 percent. In making their decision, however, many individuals, even when fully informed, will systematically behave as if they think the

probability exceeds 1 percent, at least when their behavior is viewed from an expected utility perspective. Overweighting of low probabilities may therefore provide an additional explanation for tax compliance. If taxpayers give more weight to the probability of an audit than they ought to relative to an expected utility model, then compliance will be greater than the level suggested by the standard economics approach.

In fact, there is overwhelming empirical and experimental evidence that many (though not all) individuals overweight low-probability events: in their purchase of flood and earthquake insurance, in their willingness to pay to avoid exposure to hazardous substances, in their purchase of lottery tickets, and so on (Machina 1987; Davis and Holt 1993). It can be shown that such overweighting leads to greater compliance than predicted by expected utility theory.

The Burden of Taxation

A standard explanation for the rise of the underground economy is the general increase in the burden of taxation that has characterized most modern economies (Tanzi 1982; Feige 1989). In the face of higher burdens on reported income, it is argued that individuals will respond by reporting less income.

Now it must be remembered that the economics-of-crime approach does in fact conclude that tax compliance is affected by the level of tax rates. However, the theoretical and empirical strands of literature give different answers about the response of declared income to tax rates. As noted earlier, the typical *theoretical* result is that compliance actually rises as the tax rate rises. On the other hand, most *empirical* work finds that a higher tax rate discourages tax compliance (Clotfelter 1983; Alm, Bahl, and Murray 1990). Although there is no doubt that compliance depends in some way on the burden of taxation, the precise way in which compliance responds to changes in the burden of taxation needs further analysis.

Government Services

Another factor in the compliance decision is the use of the taxes. However, the role of government expenditures in the tax compliance decision has until recently been neglected. As emphasized by Cowell

and Gordon (1988, p. 305), "this seems a curious oversight, since while the government taketh away, it also giveth back, and the latter activity surely exerts some influence on evasion." The compliance decision of an individual therefore seems likely to depend in some way on the individual's receipt of government expenditures.

There is some work that is relevant here. A standard argument in public economics is that voluntary private provision of public goods will be inefficiently low because each individual will have an incentive to "free ride" on the private purchase of others (Samuelson 1954). In the context of tax compliance, this result suggests that most people will cheat. However, casual observation suggests that the likelihood of complete free riding is greatly overstated because instances of voluntary provision of public goods are widespread. Perhaps based upon these examples, there is now a large and growing literature (Axelrod 1984; Bagnoli and McKee 1991) that argues that voluntary provision of public goods may not always play as a "prisoners' dilemma" game; that is, in many instances, individuals will in fact voluntarily contribute to a public good, or pay their taxes. This generally occurs when provision is both repeated and interdependent. In such a setting, *one* individual's decision to contribute—or to comply—depends upon his or her perception of what *others* will contribute, both now and in the future. If the individual believes that his or her contribution is in some sense essential (or "pivotal") to the provision of the public good, then free riding is no longer the unique dominant strategy for the individual. Instead, cooperation may become optimal.

This approach suggests that individuals may voluntarily pay taxes in part because they recognize that payment is necessary to get others to contribute and so to get government services that are valued.

Social Norms

A last factor is "social norms," which I believe may well be the most important factor. It is clearly difficult to be very precise on the exact meaning of social norms (Roth, Scholz, and Witte 1989). However, there is overwhelming evidence that many countries with roughly the same fiscal system also have far different compliance experiences. The only possible explanation that I can suggest is that these countries have different notions of what is socially acceptable behavior; that is, they exhibit different social norms.

To illustrate, there is much survey evidence (Westat 1980; Yankelovich, Skelly, and White 1984) that suggests that compliance is strongly affected by the strength of and commitment to the social norm of compliance. These surveys conclude that:

- those who comply tend to view tax evasion as "immoral"
- compliance is higher if a "moral appeal" to taxpayers is made
- the low social standing of tax evaders may be a more effective deterrent than formal sanctions
- individuals with tax evaders as friends are more likely to be evaders themselves
- compliance decreases with perceptions of unfair treatment
- evasion is associated with feelings of distrust and alienation
- compliance is greater in societies with a strong sense of social cohesion.

Further, anecdotal evidence suggests that some people won't pay their taxes if they dislike the way their taxes are spent, if they feel they have no say in the decision process, or if they feel that government is unresponsive to their wishes. Some quotes from taxpayers illustrate these feelings (Yankelovich, Skelly, and White 1984):

- "I wouldn't mind it so much if I could designate where my tax dollars went to. I resent having to find out why frogs in South America croak and things like that."
- "When we pay taxes, we like to know what it's going for."
- "Allow people to earmark a portion of their tax payments. Give them choices."

It seems clear to me that such sentiments pay an important, perhaps a dominant, role in tax compliance.

Social norms can be affected by a variety of government institutions and policies. There is much behavioral science evidence that implies that greater individual participation in the decision process will foster an increased level of compliance, in part because participation implies some commitment to the institution and such commitment in turn

requires behavior that is consistent with words and actions. This notion implies that one dimension by which social norms can be affected is via individual participation in the decision process, say, by voting. Compliance seems likely to be higher when the use of tax revenues is decided by majority rule than when the (same) use is imposed on the group; further, knowing the outcome of the vote reveals information to each taxpayer about the level of group support for the collective decision, and this information may be useful to individuals in projecting the group behavior. Government decisions that are imposed are unlikely to generate such feelings of participation or to provide such information. Consequently, if taxpayers feel that they have voice in the way their taxes will be spent, then they are likely to feel more inclined to pay their taxes.

Another dimension by which social norms may be affected is the level of popular support for the government program. Widespread support tends to legitimize the public sector, and so imposes some social norm to pay taxes. This support may be obviously revealed through the voting process. However, the level of support seems likely to affect compliance even when the choice of the public good is imposed on members of the group. Consequently, it seems likely that there will be more tax compliance when the public good imposed on a community is popular, even if individuals are unable to articulate directly their support via voting.

Still another dimension by which social norms can be changed is the community commitment to enforcing the tax laws. If the perception becomes widespread that the government is not willing to detect and penalize evaders, then such a perception legitimizes tax evasion. The rejection of sanctions sends a signal to each individual that others do not wish to enforce the tax laws and that tax evasion is in some sense socially acceptable. The social norm of compliance disappears. Such an outcome is common in many countries, such as the Philippines and Italy where it seems to be accepted that tax evasion is the norm.

Summary

These factors are clearly only some of the elements in the individual compliance decision, and there are numerous other factors that affect this decision: uncertainty about the fiscal system, the use of paid pre-

parers and advisors, the withholding of taxes, rewards for honest declarations, the potential for tax amnesties, the joint choice of tax avoidance and tax evasion, and so on. Nevertheless, I believe that these factors together play dominant roles in tax compliance. Methods to investigate the importance of their roles are discussed next.

Experimental Methods and Experimental Design

There are essentially two broad methodological alternatives to the use of experimental methods in the study of tax compliance: theoretical and empirical methods. Each has generated insights, but each is also subject to some serious problems. Before discussing the experimental approach to compliance, it is useful to begin by outlining the strengths and, more important, the limitations of theoretical and empirical analyses as a way of justifying the use of experimental methods as an additional tool in the study of tax compliance.

Theoretical Approaches

Virtually all theoretical work on tax compliance relies in some form on the expected utility model. This approach has generated many insights, especially regarding how an individual responds to greater enforcement activities and how government can optimally choose its enforcement strategy. However, this literature is in a sense too complex. It is only in the simpler models that clear-cut analytical results can be generated on the compliance impact of basic policy parameters. When more complex dimensions of individual behavior are introduced, the theoretical results generally become ambiguous. It is doubtful that theoretical analysis will yield more meaningful results in the future.

Paradoxically, the theoretical models of individual choice are also too simple. There are numerous factors that affect the reporting decisions of individuals, but theoretical models are capable of including only a few.

Most important, and as emphasized above, the limited ability to incorporate many relevant factors or to incorporate them in a meaningful way has meant that theories based upon expected utility theory are unable to explain the *level* of tax reporting. In particular, these models

generally imply that rational individuals should pay far less in taxes than they actually do. This is not a mere quibble. It goes to the heart of the standard approach to explaining compliance.

Empirical Literature

The obvious difficulty in applied work is the absence of reliable information on individual reporting behavior. This information is hard to come by, either for the Untied States or for other countries: it is difficult to measure something that by its very nature people want to conceal. This difficulty has not stopped researchers. However, there are obvious problems with the data that make much of this empirical work somewhat suspect.

For example, most empirical work for the United States has utilized data provided by the IRS through its Taxpayer Compliance Measurement Program (TCMP), which contains a detailed line-by-line audit of a stratified random sample of roughly 50,000 individual tax returns conducted on a three-year cycle. These audits yield an IRS estimate of the taxpayer's "true" income so that a measure of individual tax evasion can be calculated. However, until recently most researchers have not had access to the individual data, and instead have been forced to use TCMP data aggregated to the three-digit zip code level, an aggregate measure likely to comprise disparate elements of underreporting that reflect very different motivational factors. TCMP data also have some well-recognized deficiencies: the audits do not detect all underreported income, nonfilers are not captured, honest errors are not identified, final audit adjustments are not included, and there are few noneconomic factors to which the data can be linked. The use of TCMP data for empirical estimation of the determinants of compliance behavior is therefore problematic. Data for other countries are even more flawed.

To avoid the problems with the TCMP data, some researchers have used aggregate measures of evasion, such as the gap between income reported on tax returns and income in the national income accounts. By necessity, these studies focus on the aggregate, not the individual, response. Other researchers have used surveys of taxpayers, in part to assess factors such as perceptions of the probability of detection, the fairness of taxation, and the responsiveness of government in the

respondent's reporting decision. Unfortunately, these surveys are also subject to a number of methodological problems. Individuals may not remember their reporting decisions, they may not respond at all, or they may not respond truthfully. Surveys are also unable to control for many relevant determinants of compliance, and, given their response rates, surveys may not be representative of the population at large. Finally, they cannot determine the direction of causality between compliance and its determinants; that is, statements regarding the unfairness of a tax may result from a rationalization of noncompliance rather than be the cause of noncompliance.

Experimental Economics

Difficulties with the existing theoretical and empirical literatures have led to the use of experimental economics in compliance research, not so much as the only approach but as an additional approach. The use of laboratory experiments in economics began in the early 1960s with the work of Smith (1962, 1964) on resource allocation under alternative forms of market organization. Growth in its applications came with the establishment of a well-defined framework for experimental work by Smith (1976, 1982) and Wilde (1980), and it is now widely accepted as a methodological approach in the analysis of theory and policy. Davis and Holt (1993) survey much of the experimental literature.

As discussed by Alm (1991), laboratory experiments seem particularly well suited for the study of some aspects of the taxpayer reporting decision. Unlike theoretical work, experiments are not as constrained by the same degree of simplification required in analytical studies of reporting, which allows the impact of numerous factors not amenable to theoretical work to be examined. Unlike empirical work, experiments generate data under different settings in which there is control over extraneous influences. As discussed below, there are some obvious limitations of experimental methods. However, given the weaknesses of other methodologies, there are compelling reasons for the use of experiments.

Creating a microeconomic system: induced value theory

Experimental economics involves the creation of a real microeconomic system in the laboratory, one that parallels the naturally occur-

ring world that is the subject of investigation. The essence of such a system is control over the environment, the institutions, and the preferences that subjects face. Of these, control over preferences is particularly crucial. As stated by Smith (1976, p. 275), "such control can be achieved by using a reward structure to induce prescribed monetary value on actions."

Smith (1982) identifies several (sufficient) conditions that must be satisfied for control over preferences to be established: (1) "nonsatiation"—subjects must prefer more to less; (2) "saliency"—the rewards received by subjects must be related to their decisions, so that subjects recognize that their actions affect their outcomes; (3) "reward dominance"—rewards must be large enough to offset any subjective costs or benefits that subjects place on participation in the experiment, which requires the payment to subjects of an amount comparable to what they could earn outside the laboratory; and (4) "privacy"—each subject must know only his or her own payoffs so that they do not receive any subjective value from the payoffs of other subjects.

Several procedures should also be followed in experimental economics. For example, the experiment should be administered in a uniform and consistent manner to allow replicability. The experiment should not be excessively long or complicated, since subjects may become bored or confused. Subjects must believe that the procedures described to them are the procedures actually followed. The instructions provided to subjects should be understandable, should avoid the use of examples that lead subjects to anchor on certain choices that are the subject of the experiment, and should be phrased in "neutral" rather than "loaded" terms, to mask the context of the experiment and to avoid direct reference to the real-world phenomena under investigation. Neutrality increases the experimenter's control over subject preferences and avoids leading subjects to invoke different "mental scripts," which may enable them to fill in (potentially) missing information in the instructions but which also may unpredictably influence their choices. It is sometimes claimed that the use of neutral instructions limits the ability to generalize from the experimental to the naturally occurring setting. In fact, however, it is not possible to generalize beyond the laboratory unless one uses neutral instructions, since the experimenter cannot control (or induce) the values that subjects associate with loaded terms.

Experimental work on taxpayer compliance

The basic design of most compliance experiments is similar, and is summarized in table 2. Human subjects in a controlled laboratory are told that they should feel free to make as much income as possible. At the beginning of each round of the experiment, each subject is given income and must decide how much income to report. Taxes are paid at some rate on all reported, but not on underreported, income. However, underreporting is discovered with some probability, and the subject must then pay a fine on unpaid taxes. This process is repeated for a given number of rounds. At the completion of the experiment, each subject is paid an amount (the accumulated earnings) that depends on his or her performance during the experiment. Into this microeconomic system, various policy changes can be introduced: changes in audit probabilities or audit rules, in penalty rates, in tax rates, in public good provision, and in institutions that affect social norms. Some results from experiments run by my colleagues and me are discussed in the next section.

Table 2. Basic Design of Tax Compliance Experiments

- Student subjects are used.
- Subjects are fully informed.
- Subjects are organized into groups that stay together throughout the experiment.
- The known number of rounds is predetermined but unannounced.
- Subjects receive income in each round.
- Subjects must choose in each round how much income to declare.
- Declared income is taxed; in those experiments with a public good, all taxes finance the public good.
- Undeclared income is not taxed, but subjects face some chance of audit and penalty.
- Subjects are paid their accumulated earnings at the end of the experiment, generally $10 to $30 depending upon their performance.
- Parameters are set at their "real-world" levels.
- Experiments are fully computerized, and last one hour.
- Variations include changes in audit rates and rules, in fine rates, in tax rates, in public good provision, and in subject participation via voting on the fiscal system.

Limitations of experimental economics

There are sound reasons for caution in interpreting and generalizing experimental results. Some early compliance experiments did not follow now widely accepted procedures of the experimental paradigm, such as the use of repeated experiments and neutral instructions. Much early work also lacked realism because values of the various policy parameters did not approximate real-world values.

Although more recent experimental research has generally addressed these problems, some concerns remain, some of which are more real than others. A common criticism of experimental economics is that the student subjects typically used may not be representative of taxpayers. However, there is now much evidence that the experimental responses of students are no different from the responses of other subject pools (Plott 1987); there is also no reason to believe that the cognitive processes of students are different from "real" people. Another common criticism is that it is not possible to control for many relevant factors in the laboratory. However, if one cannot control for such factors in the laboratory where the experimenter establishes the institutions, the rules, and the reward structure, then one cannot hope to control for these factors in the "naturally occurring world."

Of more legitimate concern, the results may well be sensitive to the specific experimental design, so that replication is crucial. It is also possible that subjects may modify their behavior simply because they know that they are participating in an experiment. Most important, there is a certain artificiality in a laboratory setting. A decision to report $2 in an experiment is clearly different from a decision to report actual income on an annual tax return, even if the laboratory incentives are salient. In particular, the laboratory setting cannot capture a catastrophic loss such as jail, and it cannot capture the social stigma that some surveys suggest is an important factor in taxpayer reporting. In short, one must use the results from laboratory experiments with some care. However, such use depends largely upon the purpose of the experiment. According to Roth (1987), experiments can be classified into three broad categories that depend upon the dialogue in which they are meant to participate. "Speaking to Theorists" includes those experiments designed to test well-articulated theories. "Searching for Facts" involves experiments that examine the effects of variable about

which existing theory has little to say. "Whispering in the Ears of Princes" identifies those experiments motivated by specific policy issues. To date, most experiments on taxpayer reporting fall into the first two categories. Although this now seems to be changing somewhat, it is likely to be some time before a serious and ongoing dialogue with the princes of the IRS is established.

Experimental Evidence on Tax Compliance

There are a number of excellent experimental analyses of tax compliance, such as Beck, Davis, and Jung (1991), Collins and Plumlee (1991), and Webley et al. (1991). However, I will limit my discussion to some experimental results from papers by my colleagues and myself. It is somewhat difficult to compare these results because the specific experimental design often differs for the papers. For example, the number of periods subject to audit varies over the studies, the penalty rates also varies, and tax payments are sometimes used to provide a public good. Nevertheless, in their entirety these papers give, I believe, a good indication of the importance of the various factors discussed above in the tax compliance behavior of individuals. The experimental results are summarized in table 3.

The Impact of Detection and Punishment

Audit rates and rules

Several papers have varied the probability of detection p, in which the probability is assumed to be random and independent of any taxpayer decisions (Alm, McClelland, and Schulze 1992; Alm, Jackson, and McKee 1992b; Alm, Cronshaw, and McKee 1993). In general, the results for these "random audit rules" clearly indicate that compliance increases with a greater audit rate, with an estimated declared income-audit rate elasticity of 0.17. However, the increase in compliance appears to be small and nonlinear. This suggests the important result that there are limits to how much government can increase compliance by increasing the probability of detection.

Table 3. Experimental Results: Average Compliance Rate

Audit rates and rules

$p = 0$	$p = .02$	$p = .10$	Paper-design
20.0%	50.3%	67.5%	A: Public good/single period audits/$f = 15/t = .40$
$p = .02$	$p = .04$	$p = .06$	Paper-design
31.7%	33.2%	37.6%	B: No public good/back audits/$f = 2/t = .30$
$p = .05$	$p = .30$	$p = .50$	Paper-design
27.7%	34.3%	49.2%	C: No public good/single period audits/$f = 2/t = .30$
CO	CFA	CBA	Paper-design
80.8%	51.6%	55.9%	C: No public good/$f = 2/t = .30$

Penalty rates

$f = 1$	$f = 2$	$f = 3$	Paper-design
32.1%	33.2%	36.5%	B: No public good/back audits/$p = .04/t = .30$

Overweighting

There is substantially greater compliance at low probabilities than is predicted by risk-neutral behavior in papers A, B, C, D, E, and F.

Tax rates

$t = .10$	$t = .30$	$t = .50$	Paper-design
37.6%	33.2%	20.0%	D: No public good/back audits/$f = 2/p = .04$

Government services

$m = 0$	$m = 2$	$m = 6$	Paper-design
43.5%	53.7%	59.2%	A: Single period audits/$f = 15/p = .02/t = .40$

$m = 0$	$m = 2$	Lottery	Reward	Paper-design
33.2%	37.4%	51.3%	44.8%	B: Back audits/$f = 2/p = .04/t = .03$

Social norms

MRD	MRS	IFC	INC	NPG	Paper-design
45.2	41.1	33.7	8.1	33.7	E/back audits/$f = 2/p = .04/t = .30$

Voter rejection of greater enforcement via majority rule is followed by near-zero compliance, while voter acceptance of greater enforcement via majority rule with "cheap talk" is followed by near-complete compliance, in paper F.

Paper A: Alm, McClelland, and Schulze (1992).
Paper B: Alm, Jackson, and McKee (1992b).
Paper C: Alm, Cronshaw, and McKee (1993).
Paper D: Alm, Jackson, and McKee (1992a).
Paper E: Alm, Jackson, and McKee (1993).
Paper F: Alm, McClelland, and Schulze (1993).

Another paper has varied the nature of the audit rule (Alm, Cronshaw, and McKee 1993). A central and obvious feature of the compliance process in most countries is that the government tax agency uses information from the tax returns to determine strategically whom to audit. Such a policy means that the probability of audit is not fixed and random but instead is variable and endogenous, dependent in part on the behavior of the taxpayer (and the tax agency).

Different "endogenous audit rules" are examined in experiments in this paper. One rule assumes that an audited individual found to be noncompliant in the current period will be audited with certainty for a number of future periods ("Conditional Future Audit" rule, or CFA). Another rule requires that an audited individual will face some back audits if found to be noncompliant in the current period ("Conditional Back Audit" rule, or CBA). A third rule imposes a cutoff ("Cutoff" rule, or CO); a taxpayer who reports less than some cutoff level of income will be audited with certainty.

Experimental results indicate that endogenous audit rules are able to generate compliance significantly greater than random audit rules, even when the random audit rate is 30 or 50 percent. The cutoff rule CO is the most effective in increasing compliance, although it requires a large number of audits. Making back audits conditional on current declarations (or CBA) is also able to increase compliance significantly, and the audit rate is far lower than the cutoff rule. A conditional future audit rule CFA appears to be the least effective of the endogenous rules, although compliance still exceeds that under all random audit rules.

These results suggest that:

> In the relevant range of audit rate changes, compliance increases marginally and nonlinearly with increases in the probability of detection. Also, compliance is significantly greater with endogenous audit selection rules than with random audit rules.

Work by other experimentalists generally gives similar results.

Penalty rates

Variations in the penalty rate f are also examined in Alm, Jackson, and McKee (1992b). Experimental results indicate that individuals pay

slightly more in taxes when the penalty on detected evasion increases. Therefore:

> In the relevant range of penalty rate changes, compliance increases marginally with increases in the fine rate on unpaid taxes.

However, the impact is quite small, with a reported income-fine rate elasticity of only 0.04.

The Impact of Overweighting

Several experiments across all studies are designed explicitly to test for the presence of overweighting of low probabilities. In these experiments the parameters—especially the probability of detection—are sometimes chosen such that the optimal strategy for a risk-neutral individual is to report zero income. Nevertheless, the experimental results clearly indicate that there is far more compliance than is predicted by expected utility theory, a result consistent with overweighting.

These results suggest that:

> Many individuals substantially overweight low probabilities.

Although greater compliance may well be implied by other factors as well, these results are similar to much other experimental work on behavior at low probability events.

The Impact of Taxation

Another set of experiments varies the tax rate t on declared income, from 10 to 30 to 50 percent, and the level of compliance falls significantly with tax rate increases (Alm, Jackson, and McKee 1992a). The declared income-tax rate elasticity is estimated to equal -0.52. Therefore:

> Compliance decreases with increases in the tax rate.

These results are consistent with most empirical evidence, even though much theoretical work concludes that compliance should rise with greater tax rates.

The Impact of Government Services

In several papers a public good is present whose magnitude depends upon the tax payments of all subjects (Alm, McClelland, and Schulze 1992; Alm, Jackson, and McKee 1992b). These tax payments are summed across the subjects, this sum is increased by some multiple m to reflect the (potential) consumers' surplus that individuals derive from government provision of a public good, and the resulting amount is then divided equally among the subjects. Note that a multiplier greater than 1 implies that individuals as a group receive more than they pay in taxes.

All experiments clearly indicate that compliance is greater in the presence of the public good than in its absence; also, compliance increases in a nonlinear way with the multiplier m.

Some additional experiments also vary the nature of the positive inducement given to taxpayers: by making audited and fully compliant taxpayers eligible for a "Lottery" whose expected value equals the average subject per round income, or by giving audited and fully compliant taxpayers an immediate "Reward" of comparable value. In both cases the presence of a positive inducement leads to greater compliance.

These results suggest that:

> Compliance increases when individuals receive something for their tax payments.

There is some evidence that tax agencies around the world are starting to pursue such a "kinder, gentler" strategy.

The Impact of Social Norms

Manipulating social norms is perhaps the most difficult task facing experimentalists, and there are few studies in which such control has been achieved. Nevertheless, some of my work has, I believe for the first time, been able to induce predictable changes in social norms, with resulting impacts on tax compliance.

One study examines the effects on compliance of the uses of tax revenues and the decision process by which these uses are chosen (Alm, Jackson, and McKee 1993). In some experiments subjects must choose between using their tax payments on one of two alternative public

goods; the level of support for the public good alternatives also varies between strong and weak support for the public good. These experiments are denoted MRD (for "Majority Rule over Diverse" choices, in which the level of support for the preferred outcome is known to be quite strong) and MRS (for "Majority Rule over Similar" choices, in which the level of support for the preferred outcome is known to be quite weak). In other experiments subjects are not allowed to vote on public good provision, and a public good of variable popularity is instead imposed on the group. These experiments are denoted IFC (for "Imposed Favored Choice," in which the imposed public good is known to be popular) and INC (for "Imposed Nonfavored Choice," in which the imposed public good is known to be unpopular). Finally, in one experiment there is no public good (or NPG, for "No Public Good"). The experiments are structured so that the same use of tax revenues occurs in all experiments except INC and NPG.

These experimental results indicate that compliance is significantly greater when subjects choose via voting the use of their taxes than when the identical use is imposed upon them; compare MRD versus IFC and MRS versus IFC. Further, compliance is somewhat greater when the vote is decisive than when the vote is close (MRD versus MRS). Finally, compliance is significantly lowered by the imposition of an unpopular program (IFC versus INC); in fact, compliance is lower with an imposed, unpopular public good than in the complete absence of any public good (INC versus NPG). These results clearly show that government can change the social norm of compliance by ensuring that individuals have a say in the decision process and by spending taxes in ways consistent with citizen preferences. Such policies have seldom been thought to be part of general strategy for tax compliance, but nonetheless they appear to be effective tools.

A second study allows subjects to vote via majority rule on the enforcement regime that they face, such as the tax, audit, and penalty rate (Alm, McClelland, and Schulze 1993). These results are still somewhat tentative. However, I believe that this voting allows the subjects to alter the social norm of compliance. In particular, in all cases (except one, as discussed in a moment) subjects vote against greater enforcement such as higher audit or penalty rates, even when it is individually and socially optimal to increase enforcement. Following these votes tax compliance falls virtually to zero, even though compliance

prior to the vote is quite substantial. Rejection by the group of greater enforcement sends a clear signal to each individual that tax evasion will be tolerated and accepted; that is, rejection changes the social norm of compliance, and individuals respond accordingly.

Social norms can also be affected by communication among members of the group, however. In an additional experiment in this paper, subjects are allowed to talk with one another before the vote on enforcement is taken (or "cheap talk"). In these discussions subjects quickly discover that it is in their interests to impose strict sanctions on free-riders, in order to increase their share of the public good. They then vote overwhelmingly in favor of greater enforcement, and tax compliance following the vote approaches 100 percent. Again, I believe that the cheap talk in combination with the vote allows individuals to change the social norm, in this case to demonstrate that evasion will not be accepted.

These conclusions are striking:

> Social norms can be changed by fiscal institutions. Compliance is increased when individuals participate via voting in the process by which the use of tax revenues is decided, when the outcome of the vote reveals widespread support for the program, and when the use of tax revenues is popular even if imposed. Also, compliance is decreased when there is a social expression via voting of a willingness to tolerate tax evasion, and compliance is increased when there is a social expression via voting of an unwillingness to tolerate tax evasion.

There is also some experimental evidence that tax amnesties may change social norms (Alm, McKee, and Beck 1990).

These conclusions suggest a variety of alternative government policies toward tax compliance that are only now beginning to be used.

Summary and Conclusions

People exhibit much diversity in their behavior, and they are motivated by a variety of factors. There are individuals who always cheat and those who always comply, some who maximize the expected utility of the tax evasion gamble, others who seem to overweight low

probabilities, individuals who respond in different ways to changes in their tax burden, some who are at times cooperative and at other times free-riders, and many who are guided by social norms.

These findings in total suggest that a government compliance strategy based only on detection and punishment may well be a reasonable *starting* point but not a good *ending* point. Instead, what is needed is a multifaceted approach that emphasizes enforcement, but that also emphasizes such things as positive rewards from greater tax compliance, the wise use of taxpayer dollars, and individual participation in the decision process. What is also needed, however, is a theory of tax compliance that incorporates the remarkable diversity in individual behavior exhibited by these experimental analyses of taxpayer compliance. Whether any such theory can be developed that explains the behavior of all individuals at all times, or even one that explains the actions of the same person at all times, is hard to determine. However, until this effort is made, I think it unlikely that we will come much closer to explaining the puzzle of tax compliance.

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