

# **Tax Compliance and Enforcement: An Overview of New Research and Its Policy Implications**

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**Abstract:**

This paper reviews recent economic research in tax administration, compliance, and enforcement and discusses the implications of the results of this research for realistic policy options.

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## **INTRODUCTION**

Policy attention to tax evasion and enforcement picked up after the financial crisis of 2008, the Great Recession, and the large deficits that followed. Particular attention on high-income individuals and corporations has accompanied heightened attention to income and wealth inequality. In the United States this momentum led to a major initiative aimed at reducing income tax evasion via unreported foreign accounts, albeit in the context of a shrinking IRS budget.

Academic research in tax evasion and enforcement has exploded in the new millennium, perhaps inspired by the renewed policy interest and certainly facilitated by increased academic access to administrative tax-return data and increased willingness of tax authorities to partner with researchers on randomized field trials that hold the promise of compelling identification of the impact of alternative enforcement strategies.

In this paper I review and discuss the policy implications of a selection of recent economic research on tax compliance and enforcement, mostly but not only regarding income tax issues related to individuals and small businesses.

### **1. The Economics of Tax Evasion**

Tax evasion is an important issue because it affects the distribution of the tax burden as well as the resource cost of raising taxes—bread-and-butter concerns of public economics. If the tax gap could somehow be costlessly eliminated and the true liability remitted, the additional money collected could be used to finance worthy government projects, or used to finance an

across-the-board cut in tax rates that would benefit most compliant taxpayers. But expanding government programs could be financed in a number of other ways, such as by raising tax rates or by broadening the income tax base, and a tax reduction could be financed by cuts in overall spending. The real question is whether curbing evasion would improve the equity and efficiency implications of the public finances.

Why would an individual or business evade taxes? To an economist, the natural starting point is to consider the private costs and benefits of evasion. And indeed the standard framework for considering whether and how much to evade taxes is a deterrence model. This was first formulated by Allingham and Sandmo (1972), who adapted Becker's (1968) model of criminal behavior to the economics of tax evasion. In this model, a risk-averse taxpayer decides whether and how much to evade taxes in the same way she would approach any risky decision or gamble. People are influenced by possible legal penalties no differently than any other contingent cost: there is nothing *per se* about the illegality of tax evasion that matters. Nor is there any intrinsic willingness to meet one's tax obligations, sometimes referred to as "tax morale." The model predicts that an increase in either the probability of detection or the penalty if detected will reduce evasion, but does not pin down how big these effects are, so it becomes the task of empirical analysis. The effect of a change in the marginal tax rate is less clear, and depends on the form of the penalty function, as shown by Yitzhaki (1974).

Some social scientists have argued that the deterrence framework misses important elements of the tax evasion decision, and its central assumptions that nothing *per se* about the illegality of evasion matters, and everyone acts as a free rider, so that there is no issue of intrinsic willingness

to pay, or “tax morale.” Some have gone further to suggest that, in thinking about tax evasion, it is necessary to abandon the standard expected utility maximization model and incorporate “behavioral” considerations. The models that abandon one or both of these assumptions take different tacks. One approach stresses that some people may fully comply with their legal obligation because of a sense of civic duty regardless of, or in addition to, the possible expected pecuniary gains and argue that the tendency to perform one’s duty is susceptible to aspects of the enforcement process. Another approach suggests that, rather than behaving as free riders, some individuals’ behavior depends on the process by which the tax and tax enforcement system are formulated and its features, holding constant the incentives the system provides.

Research by the IRS on the tax gap suggests that noncompliance is nontrivial. According to their most recent estimates, based on 2006 returns, the overall gross tax gap is estimated as \$450 billion.<sup>1</sup> The IRS expected to eventually collect \$65 billion of the \$450 billion gross tax gap estimate, which results in a “net tax gap” of \$385 billion, so that 14.5 percent of the estimated tax liability will never be paid. The noncompliance rate varies widely by the source of information reporting to the IRS. When there is little to no third-party-reported information (such as self-employment income), the noncompliance rate is as high as 56 percent. It is 11 percent when there is “some” reporting, 8 percent when there is “substantial” information reporting and

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<sup>1</sup> Of note is the fact that the IRS’ 2014-2017 strategic plan states a target voluntary compliance rate of 87 percent by 2017 (IRS, 2014).

as low as 1 percent when there is both withholding and substantial reporting (such as wages and salaries).<sup>2</sup>

## **2. METHODOLOGY—HOW HAVE WE LEARNED NEW THINGS?**

For policy purposes we are interested in the level and nature of noncompliance, in part to broadly guide where enforcement resources might go. Of more importance is the response of noncompliance to enforcement policy initiatives. To be sure, the empirical analysis of evasion is highly challenging due, fairly obviously, to tax evaders' concealment activities. The threat of punishment and perhaps social shame make taxpayers unwilling to respond accurately even to surveys. Almost all the empirical analyses of evasion, including the most credible ones, don't actually have a reliable measure of evasion, but instead rely on indirect measures of evasion. But scholars have risen to the challenge, and there are several promising developments in measuring tax evasion and, more importantly, measuring the determinants of tax evasion and how different policies might affect tax evasion. I discuss some of these developments next.

### **2.1 Randomized Field Experiments**

Randomized field experiments have been heralded as being in the vanguard of the “credibility revolution” (Angrist and Pischke, 2010) in empirical economics because they

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<sup>2</sup> As a comparison, the HM Revenue & Customs (2015) recently calculated the overall tax gap in the United Kingdom as of 2013-2014 to be 6.4 percent of true liability: 5.0 percent for the individual income tax, 6.4 percent for the corporation tax, and 11.1 percent for the value-added tax. Small and medium-sized enterprises account for over half of the overall tax gap.

facilitate identification of the causal impact of, for example, a policy intervention. When implemented appropriately, the researcher need not worry about getting a control group, because the control group is built into the randomization: there are two otherwise statistically identical groups, one that gets the policy treatment of interest and the other that doesn't. Although tax rates and bases are unlikely to be randomized in the field, for other tax-system instruments policy randomization is possible and, more important, has become a reality.

## **2.2 Wider Availability of Administrative Data**

A very promising recent development is the wider availability for analysis of administrative tax-return data, sometimes linked to other administrative records, often on the whole population of a country. These kinds of data first became available in Nordic countries, but now they're available under varying protocols in Canada, in the United Kingdom, some other European countries, and the United States (here explicitly not generally linked to other administrative data). Compared to having small samples of tax-return data, when a researcher has *all* returns, she has much more (statistical) power to reach reliable conclusions about the effect of taxation and to investigate such issues as the heterogeneity among groups defined by geography or other demographic variables. The fact that tax-return data generally contain what the taxpayer reported, rather than the “truth,” is a particular advantage when studying the elasticity of taxable income, which crucially includes evasion and avoidance responses to tax policy instruments, although it can be a hindrance for other purposes, such as measuring the distribution of income when evasion is not distributionally benign.

## **2.3 Kinks, Notches, and Regression Discontinuity Research Designs**

The availability of administrative data has facilitated research designs that examine sharp breaks in tax policy parameters. In a regression discontinuity design, there is a cutoff or threshold above or below which a treatment is assigned. By comparing observations lying closely on either side of the threshold and therefore arguably quite similar, one can estimate the average effect of the treatment in that local area of the threshold, even in environments where randomization is not feasible. Note that it is crucial that the assignment of people to treatment is random, and that it is impossible for the people to manipulate their treatment status.

When policy introduces kinks in budget sets, so that the marginal tax rate changes discontinuously around the kink, identification of local behavioral response is credible because in many cases the people on either side of the kink are on average fairly similar. How many people “bunch” at the kink provides, under some assumptions, a measure of how elastic choices are on average with respect to the tax rate. Even more potentially powerful is the analysis of behavior in the presence of policy-induced notches, where the budget set itself is discontinuous, so for example reporting one additional dollar of income increases one’s tax liability by a few hundred dollars. What makes the study of notches particularly promising is that their presence implies that there is some region of behavior that is always dominated by another region, regardless of one’s preferences. The fact that in all cases so far examined there are some people residing in the dominated region sheds light on the constellation of reasons that might interfere with the kind of behavioral responses a standard price-theoretical model would apply: irrationality, cluelessness, adjustment costs, and so on.<sup>3</sup>

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<sup>3</sup> See Kleven and Waseem (2013).

## **2.4 Traces of True Income and Evasion with Micro Data**

In a traces-of-income approach, one identifies an indicator of the true tax base, say income, and compares that to reported income. The classic research design is due to Pissarides and Weber (1989), who use food consumption as an income indicator. They assume (reasonably) that how much food someone purchases is a function of income, but doesn't depend on what *kind* of income—salary versus self-employment—a person has. Next they look at what the ratio of food purchases to reported income is, separately for employees and self-employed people. Thus, they infer (relative) income from food, and compare this “trace” of true income to (relative) reported income. Under a traces-of-evasion approach, one looks for behavior that can reasonably only be explained by tax evasion, for example the hoarding of high-value currency.

## **3. WHAT HAVE WE LEARNED?**

### **3.1 The Extent and Nature of Evasion**

The apparent wide divergence between the compliance rates of employees and the self-employed has attracted a lot of research attention on the latter group. Pissarides and Weber (1989) estimated that self-employed people in the United Kingdom on average underreported their income by about one-third.<sup>4</sup> Feldman and Slemrod (2007) follow a similar approach, but

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<sup>4</sup> Tax evasion estimates for other countries using this method include Schuetze (2002) for Canada, Johansson (2005) for Finland, Engström and Holmlund (2009) and Engström and Hagen (2015) for Sweden, Martinez-Lopez (2013) for Spain, Paulus (2015) for Estonia, and Hurst et al. (2014) for the United States.

avoid the need to use survey data by instead using as the trace of income charitable donations reported on income tax returns. They find that, other things equal, reported positive self-employment income of \$1 is associated with the same level of contributions as \$1.54 of wage and salary income, which implies—assuming a negligible wage and salary noncompliance rate and that the self-employed are not inherently more charitable than others—a self-employment noncompliance rate of 35 percent ( $0.54/1.54$ ), very similar to the Pissarides-Weber estimate but below the IRS figure of 56 percent. Note that the key assumption, that the conditional charity-income ratio does not vary by employment status, is stronger than the equivalent assumption about food; for example, Glazer and Konrad (1996) argue that some people give to charities to signal wealth (or integrity), a motive that is arguably more relevant for self-employed people.

Gorodnichenko et al. (2009) employed a similar approach to estimate the effect of Russia's 2001 flat tax reform on the extent of evasion and find that the consumption-income gap fell by about 10 percent more for a treatment group that had a relatively large decline in marginal tax rates. Assuming that the true relative consumption-income gap did not change over this period, one can interpret this finding as indicating a relative increase in reported income by those whose tax rate declined. Cabral et al. (2014) find a similar pattern of underreporting among the self-employed in the United Kingdom; assuming that salaried workers report truthfully, self-employed workers' true income is on average 28 percent higher than what they report.

Artavanis et al. (2012) employ a clever research design that takes advantage of household microdata from one of ten large banks in Greece to estimate the extent of underreported income

for self-employed Greek workers by type of occupation. They rely on the fact that financial-sector formalization coexists with widespread underreporting of income, and note that southern European banks have had to become skilled at inferring true income from reported income in order to remain competitive. Using this insight, and assuming that income is accurately reported for wage and salary earners, they estimate a credit supply equation for wage earners using reported income, hard information (such as credit history, borrower characteristics), and soft information (such as local economic growth) available to the bank. Supposing this credit supply equation to be valid for wage earners, they infer the “multipliers” that the bank implicitly applies to reported self-employment income. They estimate multipliers in excess of two for doctors, lawyers, engineers and scientists, and accountants and financial service agents, indicating that for these professions reported income is less than half of true income as inferred by the bank.

### **3.2 The Impact of Deterrence**

#### **3.2.1 Audits**

As already mentioned, one of the stimulants to the wave of recent empirical research in tax compliance has been the willingness of some tax authorities to partner with researchers to design and implement randomized controlled trials to learn about aspects of tax enforcement. The most prominent example is threat-of-audit letters, which I discuss next.<sup>5</sup>

In the first application to tax compliance of an RCT design, Slemrod et al. (2001) analyzed the results of a randomized controlled experiment conducted by the State of Minnesota

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<sup>5</sup> Hallsworth (2014) reviews several recent RCTs addressed to tax compliance.

Department of Revenue (MDOR). Randomly selected taxpayers who filed a return for tax year 2013 were sent a letter from the MDOR in January of 1995. A treatment group was informed that their 1994 federal and state income tax returns would be “closely examined” for any irregularities. The effect of this statement on the beliefs of the treatment group depends on their prior beliefs about the probability of an audit. If the individual expected that their returns were examined every year then there would be no change in behavior. Others may have correctly perceived the letter as increasing the probability of an audit. The letter was timed so that individuals generally could only respond by changing their reporting behavior. The authors compared the change in income reported by this treatment group to that of a control group that did not receive any communication from the MDOR. The study found that low- and middle-income taxpayers who received a letter promising a certain audit reported slightly more, but statistically significantly more, income than those who did not receive such a letter, and the difference was larger for those with greater opportunities to evade in the form of income not subject to information reporting. Strikingly, though, high-income taxpayers receiving an audit threat on average reported *lower* income. The authors speculate that sophisticated, high-income taxpayers (and their accountants) understand an audit to be a negotiation, and view reported taxable income as the opening (low) bid in a negotiation that does not necessarily result in the determination and penalization of all noncompliance; this implies that the initial lower tax liability report might not indicate that the eventual tax remittance was lower, as well. This result provides a caveat that the dynamics of tax evasion for very high-income individuals may be different than for others.

Kleven et al. (2011) conduct a similar audit experiment in Denmark. In the first year of their study, one-half of their sample was randomly chosen to be thoroughly audited (100 percent audit group) while the rest were not audited or contacted in any way (0 percent audit group). The following year, randomly chosen individuals from both groups received letters announcing either a 100 percent probability of audit or a 50 percent probability of audit. A control group received no letter. The initial unannounced audit found overall evasion equal to 2.2 percent of net income, but a much higher rate of 14 percent for self-employment income. The threat-of-audit experiment was conducted only on a sample of employees (i.e., it excluded any self-employed individuals) for administrative reasons. The individuals received the letter shortly after they received their pre-populated returns, and had one month to make adjustments to the return. The baseline probability of an adjustment to net income is 13.3 percent. Among the 0 percent audit group, those who received a letter were 1.5 percentage points more likely to make an upward adjustment to net income than those who didn't receive a letter. The effect of the threat was similar in the 100 percent audit group, raising the probability of adjustment of net income by 1.6 percentage points. The experiment also tests the effect of different probabilities of audit. Individuals who were threatened with a 50 percent probability of audit were about 1.1 percentage points more likely to adjust net income upwards than those who received no letter. Those who received the 100 percent probability of audit were 0.9 percentage points more likely than the 50 percent threat of audit to adjust net income upwards. Thus, although a positive audit probability influenced reporting behavior, going from a 50 percent to 100 percent probability had little apparent effect.

Many of the tax compliance RCT treatments involve letters about, for example, audit threats sent by the tax authority. Ortega and Scattascini (2015a) investigate the impact of the delivery mechanism. They conduct a field experiment in Colombia that varies the way the National Tax Agency contacts taxpayers with due payments for income, value-added, and wealth taxes (tax delinquencies). Taxpayers were randomly assigned to a control, or to one of three possible delivery mechanisms: letter, email, and personalized visit by a tax inspector. They find sizable differences across delivery methods. Personal visits by a tax inspector are more effective than the impersonal methods; they are, alas, also much more expensive. Ortega and Scattascini (2015b) find that the effect of phone calls falls between those of the impersonal methods and the personal visits.

To combat sales and profit tax evasion by small firms and the self-employed, many developing countries have adopted some form of “reverse withholding,” where large firms remit to the tax authority a fixed share of their purchases from small firms and these sellers can apply the withheld amount as a credit against their self-reported income tax liability. While withholding does not affect the firms’ true tax liability, there is typically a discontinuity in the audit probability at the withholding rate; firms seeking tax refunds (because self-reported tax liability is lower than the withheld amount) are audited at a higher rate than firms making additional tax remittances. Examining data from Ecuador, Carrillo et al. (2011) find evidence of bunching in reported tax liability just above the 1 percent withholding threshold, suggesting firms manipulate their self-reported tax liability and possibly real economic choices to minimize tax payments subject to the discontinuity in the audit probability. Third-party data on sales and intermediate

input costs filed by large firms as withholding agents indicate bunching is indeed associated with tax evasion: self-reported sales are smaller than third-party reports for at least 10 percent of firms.

### **3.2.2 Specific Deterrence: The Impact of Audits**

To this point I have been discussing the impact on compliance of a change in the perceived probability of detection of noncompliance, usually referred to as general deterrence. Another issue of interest is the effect of audits on the audited, referred to as specific deterrence.<sup>6</sup> A priori taxpayers' behavior following an audit is ambiguous. On the one hand, a taxpayer may assume that the probability of getting audited a second time might be low, sometimes referred to as the "crater effect," which would mean that taxpayers are less likely to comply in the years following an audit. On the other hand, taxpayers may revise upwards their prior on the probability of an audit; these taxpayers would be more likely to comply in the years following an audit. Moreover, if taxpayers consider the possibility that past returns will be audited upon detection of current-year noncompliance, upon discovery of evasion future noncompliance becomes more attractive.<sup>7</sup>

Two recent studies have examined this issue. DeBacker et al. (2015), using IRS data from the random-audit National Research Program (NRP), found that an audit increases reported wage

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<sup>6</sup> It might be useful to define an intermediate concept of deterrence, which includes the impact on those taxpayers who learn of specific enforcement actions directed to others, and possibly thereby modify their behavior. The links may be by word-of-mouth via taxpayers through various networks, including tax preparers. Let me tentatively propose "network deterrence."

<sup>7</sup> Engel and Hines (1999) draw out the implications of this dynamic aspect of decision-making.

income of the audited individual over three years after the audit by 0.4 percent and increases reported Schedule C (self-employment) income by 7.5 percent. However, this large immediate effect on Schedule C income is short-lived; indeed, five or six years following the audit, the treated group actually reports lower Schedule C income as compared to the control group. The external validity of these results is somewhat problematic. Because taxpayers audited under the NRP are informed that they have been randomly selected for research purposes, these audits may not have the same impact on the perceived probability of a future audit as an operational audit. Moreover, these taxpayers are not representative of those who are typically subject to audit, and their behavior may not be representative of those who are normally targeted for operational audits.

Advani et al. (2015) pursue a similar research strategy using data from the United Kingdom. As DeBacker et al., they find that those who are audited increase their reported tax liability more than the control group in years following the audit. Allowing for the lag between when the return is selected for audit and when the audit is completed, four years after the audit there is a 26 percent increase in reported liabilities in the treatment group compared to the control group.

### **3.3 Third-party Information Reporting**

The previous section focused on attempts to understand the effect of increasing the perceived probability of detection via a direct communication from the tax authority to the taxpayer. Another set of studies makes explicit why the probability has gone up. Next I review research where the reason is increased information reporting.

Carrillo et al. (2014) examine the effect of a change of the tax authority's use of third-party information on reported firm revenues for the corporate tax in Ecuador. The government has a few sources to verify firms' self-reports of revenue, including other firms' reports of purchases from the firm in question, credit-card sales from credit-card companies, as well as exports and imports information from the Ecuadorian customs authority. For a few years, the revenue service had collected such third-party reports of firm revenues, but had not utilized this information to verify firms' self-reported revenue. In the episode they study, the Ecuadorian tax authority (SRI) informed some firms of the discrepancy between the two reports and offered them the opportunity to file an amended return. The authors compare the reporting behavior of firms before and after notification. They find that 24 percent of firms underreport revenue in years when the government did not use the third-party-verified information. They also find no bunching of reporting revenue around the third-party reported amount, suggesting that firms did not believe the government was using this information. In the three rounds of the experiment, between 11 and 19 percent of notified firms filed an amended return. In amended returns, firms correctly report their revenues but they increased their reported costs almost one-for-one with the increase in revenues (96 cents for each dollar!). The offset of reported expenses is similar to a finding regarding the U.S. 1099-K requiring credit-card companies to report business receipts, discussed next.

### **3.3.2 The Form 1099-K Initiative**

In an effort to reduce understatement of revenues, in 2011 the IRS began to require credit-card companies and other third-party payment organizations to report electronic payments

received by businesses. Analyzing administrative data on the universe of individual income tax returns that report sole proprietor income, Slemrod et al. (2015) find a large increase in the number of businesses reporting income that is exactly equal to the amount in the 1099-K report, consistent with a simple model of reporting behavior. Although the new reporting requirement increased reported receipts of this relatively small group by up to 24 percent, this was offset by a 13 percent increase in reported expenses. They also find that at least 20 percent of the group in 2011 were induced to file Schedule C by the introduction of Form 1099-K. Thus, information reporting seems to have had the intended effect of increasing compliance on the income that is subject to third-party reports, but the overall effect on evasion was dampened by increased reported expenses, which are not directly observable to the tax authority,<sup>8</sup> and may also have been offset by firms moving to cash receipts that are not covered by this information-reporting regime.

### **3.4 Take-up**

Although IRS enforcement efforts (and this paper) focus mainly on tax evasion, what limits take-up of credits and other tax benefits is also of both policy and intellectual interest. Bhargava and Manoli (2015) address the determinants of incomplete take-up with the Earned Income Tax Credit (EITC) in the United States with a comprehensive randomized field experiment involving 35,050 eligible individuals. They investigate, using alternative mailings, the role of program information (regarding benefits, costs, and rules), informational complexity, and stigma. They

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<sup>8</sup> Note, though, that in an audit the burden of proof for expenses rests on the taxpayer, while it rests on the IRS for receipts.

find that the take-up rate increases due to the mere receipt of a plain-vanilla mailing, suggesting—consistent with other studies discussed here—that routine contact from the tax authority can have a significant effect on taxpayer behavior, at least in the short run. In addition, both simplification and the visual display of benefits increase take-up. All in all, Bhargava and Manoli suggest that the tested interventions could reduce incomplete EITC take-up by about 25 percent. Notably, though, a follow-up study by Manoli and Turner (2014) found little to no long-term increases in EITC take-up. Guyton et al. (2015) extend this work to non-filers using an RCT to induce filing among non-filers who are eligible to receive credits, even if they owe tax on net. They find similar results: there is a concurrent effect, but one that does not persist in future years when the mailed reminders stop.

### **3.5 Non-Deterrence Policies to Reduce Noncompliance**

Many of the threat-of-audit letter RCTs discussed so far also contained a non-deterrence treatment. Blumenthal et al. (2001) find no evidence that either of two written appeals to taxpayers' consciences had a significant effect on compliance. One letter stressed the beneficial effects of tax-funded projects, while the other conveyed the message that most taxpayers were compliant. Torgler (2004), using a controlled field experiment in Switzerland, also found that moral suasion has hardly any effect on taxpayers' compliance behavior, nor did Fellner et al. (2013). Pomeranz (2015) found that a mailing appealing to tax morale, but promising no increased enforcement, had little effect on VAT remittances. In Castro and Scartascini (2015), messages that emphasized fairness (taxes are used to pay for public services, which the individuals benefit from) or equity (most citizens fulfill their tax obligations) do not have a

significant effect. Bhargava and Manoli (2015) also find the social stigma does not affect take-up of the EITC. In sum, it has been difficult to find evidence that appeals to tax morale, defined broadly, affect taxpayer behavior in the short run when delivered via a one-time mailing. As discussed below, part of the reason could be the wording of these appeal-to-conscience letters; psychological research suggests that using terms such as “cheater,” as in “Please don’t be a cheater,” might affect behavior more than the standard letter-based appeal to conscience wording such as “the entire community suffers.” Whether any government would be willing to employ such loaded terms remains to be seen.

Recently a few studies have broken the solid set of field-experimental evidence finding no effect of such appeals. Bott et al. (2014) reports the results from a randomized field experiment in Norway conducted with 18,000 taxpayers who the tax authority deemed were likely to have misreported their foreign income, and find that including a moral appeal in a letter almost doubled the average foreign income reported compared to a base letter without such an appeal; the moral appeal mainly worked on the intensive margin, by increasing the amount reported of those who report any foreign income. Hallsworth et al. (2014) ran two large natural field experiments using administrative data from more than 200,000 individuals in the United Kingdom, and conclude that including social norms and public goods messages in standard tax payment reminder letters can considerably enhance tax compliance; wording that emphasized that the individual was in the minority of non-payers was the most effective in getting individuals to remit their taxes. They also find that mentioning financial penalties and remittance plans significantly increased the likelihood of compliance. Note, though, that Hallsworth et al.’s

outcome is the timing of payment of *already reported* liabilities, while most letter-based interventions look at the effect on truthful reporting behavior. It might be that a taxpayer who is simply procrastinating on paying their taxes is more likely to be persuaded by social norms than one who is evading taxes. Second, Hallsworth et al. (like Perez-Truglia and Troiano, 2014 discussed below) specifically study taxpayers who missed payment deadlines. Finally, there are important differences in how the treatment could have been perceived by the recipients. In Hallsworth et al. the letter informs the taxpayer that the U.K. tax authority (HMRS) is aware of their delinquency. It says, “Nine out of ten people in the U.K. remit their tax on time. You are currently in the very small minority of people who have not paid us yet.” In contrast, for example, the letter in the Blumenthal et al. (2001) Minnesota experiment says, “people who file tax returns report correctly and pay voluntarily 93% of income taxes they owe [...] a small number of tax payers who deliberately cheat owe the bulk of unpaid taxes.” In this case, the letter does not convey to the taxpayer that the IRS is aware of any wrong-doing by the individual. Thus the difference in results could be due to the difference between informing an individual that the government has evidence of their actual evasion and appealing to their sense of duty without conveying any information on their avoidance behavior.

This set of results has somewhat moved my pre-2013 prior that the evidence overwhelmingly supported that deterrence inhibits noncompliance but that manipulation of norms has no measurable effect. In some settings norm-directed letter interventions seem to matter. It now behooves us to understand better why this can work in some settings, but not others.

One recent paper investigates the impact of shaming on tax compliance. Twenty-three U.S. states currently try to encourage tax delinquents to remit their tax by publishing their names and amount owed online. Perez-Truglia and Troiano (2015) compare the effect of shaming to the effect of financial penalties through an experiment where letters sent to delinquents are worded to emphasize one or the other. They contact all delinquents with names and addresses published online in 3 states: Kentucky, Kansas, and Wisconsin. In theory, individuals will be more likely to pay off their debt if their perceived shaming adversely impacts their social capital, but shaming might shift their motivation to pay from an intrinsic to an extrinsic one and therefore decrease the likelihood that they remit. The authors find that both shaming and financial penalties increase the likelihood of payment within ten weeks of receiving the letter. The effect of shaming varies by the size of their initial debt, and matters most for those with small amounts of debt (between \$250 and \$2,273), increasing the likelihood of payment by 2.1 percentage points. The effect declines for higher amounts of debt suggesting that there is a limit to the value of preventing social stigma. Because tax authorities warn individuals and give them an opportunity to clear their debts before publishing their names online, one may consider this effect as a lower bound.

### **3.6 Public Disclosure**

Public disclosure of tax information is designed to reduce the attractiveness of tax noncompliance as well as aggressive, but arguably legal, tax avoidance. Disclosure may complement deterrence by encouraging people with relevant information about others' true tax liability to come forward, and the fear of that and subsequent tax noncompliance penalties (explicit and shaming) dampens such behavior. Disclosure may also affect tax reporting because

taxpayers reduce reported taxable income in order to minimize the attention of the press and of unsavory characters wishing to take advantage of their economic situation. On the other hand, some people might get satisfaction (bragging rights, if you will) from public appreciation of their level of affluence, and may be willing to pay for it in the form of a higher tax liability. The empirical evidence on public disclosure in the income tax context is sparse, but growing. Hasegawa et al. (2013) study the effect of the Japanese income tax disclosure system that was abolished in 2004/2005 on tax reports of individuals and businesses. They take advantage of the abolition and the fact that disclosure applied only to taxable incomes above 40,000,000 yen (about \$400,000). They find strong evidence based on bunching of observations right below the disclosure threshold that, on average, individuals and businesses prefer to avoid disclosure; for the latter, this is consistent with the local characterization of so-called “39 companies,” whose reported taxable income is kept below the disclosure threshold so as not to provide evidence about their profitability, which might affect the deals they can make with other companies. However, the authors uncover no evidence that disclosure increased reported business taxable income generally.

Bø et al. (2015) explore the effect of public disclosure in Norway, which has a long history of disclosing tax filings, and beginning in 2001 anyone with access to the Internet could obtain individual information on other Norwegians’ taxable income and income tax liability. They exploit this change in the degree of exposure to identify the effects of public disclosure on income reporting. Identification of the deterrence effects of public disclosure is facilitated by the fact that, prior to the shift to the Internet in 2001, in some municipalities something close to the

Internet type of public disclosure existed because tax information was distributed widely through paper catalogues that were locally produced and disseminated. Bo et al. observe income changes that are consistent with public disclosure deterring tax evasion: an approximately 3 percent higher average increase in reported income is found among business owners living in areas where the switch to Internet disclosure represented a relatively large change in access.

#### **4. WHAT SHOULD BE DONE?**

In what follows I summarize what I conclude about policy from the recent academic literature and observations about policies in place in other countries, plus the unquantifiable value judgments that all policy pronouncements unavoidably involve and the unquantifiable non-pecuniary values, such as privacy and intrusiveness that come into play under some enforcement strategies.

##### **4.1 Increase the IRS Budget**

I can't prove it's optimal, but I believe the IRS budget should be increased. If the budget was anywhere close to optimal in 2010, it must be too small now. Since then the budget has declined by more than 10 percent, while the responsibilities of the IRS have expanded, due to the Affordable Care Act, the FATCA, and other new initiatives. To cope with the budget cuts, the IRS has had to reduce their workforce by 12.3 percent in the last year. This smaller workforce is also less prepared because the training budget is 83 percent lower than what it was in 2010.<sup>9</sup>

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<sup>9</sup> OECD (2015, p. 173). Not that this makes it right or wrong, but tax agencies in many countries have also been facing cuts. For example, staffing at the U.K. tax authority, the HMRC, fell from 91,167 in 2005 to 61,370 in 2014.

## **4.2 Focus on Deterrence**

The recent evidence has strengthened my belief that deterrence remains the most crucial policy instrument in addressing noncompliance, and thus attention must focus on one of its two crucial parameters: the probability that evasion will be detected and punished.<sup>10</sup> By saying this I do not intend to dismiss the importance of the non-deterrence aspects of tax administration. IRS agents should treat taxpayers with respect and civility. The IRS should provide taxpayers with education through its website, phone services, and outreach, and should provide taxpayers with information about what purposes tax revenues are used. I doubt, though, that a tax authority can do much at the margin to enhance such potentially important factors such as the legitimacy of government. The recent literature, with recent exceptions noted earlier, does not find compelling evidence that sending letters emphasizing the duty to be tax-compliant or stressing the civic duty aspects affects tax compliance. What provides the biggest deterrence bang per buck?

## **4.3 Expanded Information Reporting**

The United States is probably not ready to, for example, reintroduce<sup>11</sup> public disclosure of income tax information, although the evidence suggests that in other countries, this has at least modest pro-compliance effects. The 1099-K initiative regarding credit-card receipts apparently

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<sup>10</sup> The severity of punishment is the other crucial parameter, but little empirical research has been devoted to this topic. Blank (2014) and Paramonova (2015a, b) discuss “collateral tax sanctions” such as revoking from tax evaders drivers’ licenses, professional licenses, and passports.

<sup>11</sup> The United States had public disclosure of income tax returns in its Civil War income tax, and again in 1923 and 1924.

increased compliance of a small segment of sole proprietors, but its effectiveness was reduced by its lack of coverage of expenses or of cash receipts. The Foreign Account Tax Compliance Act (FATCA) initiative takes information reporting to another level, by requiring/inducing foreign financial institutions to report to the IRS, directly or through their home government, about the foreign accounts of U.S. citizens.

#### **4.4 Better DIF Scores**

One of the methods the IRS uses to select returns for examination is computer scoring. The Discriminant Function System (DIF) provides numeric scores for each return that rates the potential for change in tax liability upon audit, based on past IRS experience with similar returns. The Unreported Income DIF (UIDIF) score rates the return for the potential of unreported income. This score is a principal criterion, supplemented by many “compliance filters,” used by IRS personnel to select returns for audit and identifying the items on these returns that are most likely to need review. The IRS puts considerable effort into getting the right formula.

Because the DIF and UIDIF are tightly guarded secrets (but see just below), I have no standing to say that the IRS could do better. But I do have a suggestion. The suggestion is that the IRS make available to academics and private firms (on a controlled basis, of course) a large sample of anonymized returns as filed and as “corrected” by auditors, indicate a menu of possible objective functions (e.g., maximize dollars of noncompliance discovered, number of noncompliant returns discovered, number of noncompliant returns with the amount above a certain threshold discovered), and let them submit a new discriminant formula (NDIF). The IRS

would then evaluate these NDIFs on a separate large sample of tax returns as filed and as amended by audit. The reward for discovering a better NDIF is to be specified. I suggest that this would, at relatively small cost, lead us to a better DIF.<sup>12</sup> There is substantial precedent for such a venture, the most famous being the Netflix Prize, a \$1 million prize offered (and awarded in 2009) by Netflix to the algorithm that provided the most accurate predictions about how much someone is going to enjoy a movie based on their movie preferences. The idea of an open competition for predictive modelling is now institutionalized in the form of kaggle.com, which provides a platform for several such competitions, recently including predicting who survived the Titanic sinking.<sup>13</sup>

#### **4.5 Getting the Money**

Although public finance textbooks pooh-pooh its importance, the remittance system can be of first-order importance in efficiently enforcing and administering a tax system. Getting the money from what Logue and Slemrod (2009) call the “low-cost remitters” matters. This lesson has been recognized most clearly in the system of employer withholding most countries use for income and payroll taxes: it is cheaper to deal with collecting the tax liability from a small number of organizations with relatively efficient bookkeeping done for non-tax reasons. As mentioned earlier, we now have evidence from diesel taxes that shifting the remittance

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<sup>12</sup> A team of computer scientists claims that artificial intelligence techniques can ascertain whether a corporation has used a particular sophisticated tax shelter. See Browning (2015).

<sup>13</sup> See also the survey on forensic economics by Zitzewitz (2012).

responsibility can affect the volume of tax evasion.<sup>14</sup> A primary tax difference between classifying, say, Uber drivers as employees or as independent contractors is that only in the former case would Uber be responsible for withholding (i.e., remitting) an approximation of the income tax liability the driving produces. Recently, Airbnb, Inc. has entered into agreements with certain cities that it would remit the hotel tax liability, rather than the property hosts themselves.<sup>15</sup> The policy message is that, for tax compliance reasons, the borders between efficient and inefficient remittance responsibility need to be defended.

Another aspect of getting the money is collection of undisputed taxpayer debts to the tax authority. After all, the deterrence model focuses on the perceived probability that an evading taxpayer will be penalized, which includes ultimately having to pay up. The field experiments recently done suggest that frequent contact, shaming, and face-to-face contact can accelerate payments. The IRS is to be commended for its participation in field experiments to help determine optimal collection strategy. This is an area where more creative efforts might be rewarded; for example, several states publish the names of the biggest debtors, and believe it helps with payments.

#### **4.6 Informal Economy**

A nontrivial fraction of tax evasion in the United States is tied to the informal economy, although that fraction is probably lower than in most other countries. Because other countries have a bigger informal economy problem than the United States (and have different standards

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<sup>14</sup> Kopczuk et al. (forthcoming).

<sup>15</sup> Wilking (2015) examines the impact of these agreements on the prices of Airbnb properties.

about permissible government intrusion), some enforcement strategies have been tried elsewhere already. As of 2012, it is illegal in Norway to purchase cleaning services from companies not approved by the labor inspectorate. In many European certified cash registers have been used. Since 2010 in Sweden, businesses selling for cash (including debit cards) must have a certified cash register that includes a special black box that only can be accessed by the tax authority; this is in part to counter the use of zappers, software installed on electronic cash registers or other electronic point of sales that allows users to erase recorded transactions.<sup>16</sup> Since 2008 for home renovation and domestic services consumers can apply for a scheme where they pay the supplier for materials but only half of the labor portion of the fee. The company performing the work then applies to the tax authority for the other half, thus revealing to the tax authority their existence and some of their taxable income and VAT base. Introducing similar policies on a pilot basis would reveal whether they can be effective in limiting noncompliance.

#### **4.7 Discouraging Cash and Encouraging Engagement with the Financial Sector**

Some types of tax evasion are facilitated by transacting in cash. In response, many governments have introduced a ceiling for cash transactions. Others have required POS terminals in, for example, taxis. Alternatively, one could consider providing incentives to use cards; Argentina offers a 5 percent VAT discount on debit-card transactions and a 3 percent discount on credit-card purchases, while South Korea offers a lump-sum refund if card usage exceeds 20

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<sup>16</sup> These policies are discussed in greater detail in Williams (2014, pp. 101-103). Zappers and appropriate policy responses are discussed by Ainsworth (e.g., 2010).

percent of individual gross income for credit cards and 25 percent for debit cards.<sup>17</sup> Either a tax on cash or a subsidy to the use of electronic payment could be justified as a Pigouvian policy to address the marginal social cost of difficult-to-monitor-for-tax-purposes transactions. Note that the United States has recently gone in the opposite direction, due to the District Court ruling that allowed stores to charge purchasers a surcharge of up to 4 percent for using a credit card.<sup>18</sup>

It is, however, wrong to think that electronization of payments always facilitates tax enforcement. A case in point is electronic cash and cryptocurrencies, such as Bitcoin. According to its press clippings, cryptocurrency is about privacy and resistance to oversight, but it also becomes difficult to enforce certain taxation and financial regulations when online transactions cannot be tracked.<sup>19</sup> The 1099-K initiative discussed earlier also has this disadvantage, cracking down on underreporting of credit-card sales while leaving cash sales untouched.

#### **4.8 Process**

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<sup>17</sup> See Williams (2014, p. 104).

<sup>18</sup> Note that most credit cards now offer purchasers rewards related to usage. These rewards programs offset to some degree any surcharge for credit-card use, and it is notable that the reward percentage is often higher for purchases at gas stations, where cash discounts abound. In-kind rewards for cash payments extend to Ann Arbor, MI, where my favorite take-out Chinese restaurant offers a free eggroll with a cash payment and, most recently, exempts the cash-paying customer from a 49-cent “convenience charge.”

<sup>19</sup> See Marian (2013).

The IRS is now fully on board with electronic filing, as a way to process returns at lower cost. About 65 percent of all returns processed by the IRS in 2014 were filed electronically. It could do more. Two options stand out. The first is the system known alternatively as pre-filled or pre-populated returns, already used to some extent in at least 26 countries, and piloted in California. It provides, at no cost to taxpayers upon filing, the information the government already has access to through information returns. It has been attacked as an unwarranted intrusion into the private tax preparation software business; on these arguments, see Holtzblatt (2007) and Bankman (2008). Indirectly it would help compliance if it freed up IRS resources to devote to enforcement, and if it provided taxpayers with a warm glow that ignited their intrinsic motivation to comply (don't hold your breath on that). As discussed earlier, the direct effect of pre-population on compliance is unclear, but saving in collection costs is almost certain.

Another option, discussed by Bankman (2008) and Ventry (2011), would involve a centralized database maintained by the federal government containing most of the information required to file a tax return such as wages information, common deductions, and taxes paid. Taxpayers, professional preparers, and authorities could all access this shared source of information to file taxes. Some filers would still need to input information like charitable deductions. For most taxpayers, however, the “data retrieval system” would considerably simplify the process because they would no longer have to gather the information required from disparate sources.

The IRS could also take advantage of improved information technology by offering a “smart” tax return. Bankman et al. (forthcoming) discuss three ways that a smart return could

improve compliance. The first involves changing the wording on existing returns to increase the psychological cost of evasion and increase the perceived expectation of detection by, for example, placing the attestation of honesty to the top of the form. The second builds appeals to morality in the return itself through the use of a short phrase containing a "self-relevant" noun, such as "cheater," as in "please don't be a cheater." Research suggests that this approach might affect behavior more than the standard letter-based appeal to conscience wording such as "the entire community suffers" from evasion or referring to the "compliant majority." The third uses online

"conversational agents" to ask adaptive questions that incorporate information known about the taxpayer, including information from answers to previous questions. This would allow the IRS to ask more focused questions, which should reduce evasion and audit costs and it could also benefit taxpayers by reducing filing time and eliminating the risk of subsequent audit. Adaptive questioning that is part of a data-driven system allows for continuous experimentation and real-time modification of algorithms to incorporate the results of that experimentation.

## **5. AN EXCERPT FROM THE STATE OF THE UNION ADDRESS OF 2017<sup>20</sup>**

"My tax system proposals do not end with bringing the income tax rate structure in line with our values and eliminating unfair and inefficient loopholes. The fairness of the tax system and its impact on economic growth also depend on how well the laws are enforced. Whatever the top tax rate is, it does not contribute to progressivity if high-income people park their money in

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<sup>20</sup> In recent decades, newly inaugurated presidents have chosen to deliver speeches to joint sessions of Congress but have not officially considered them State of the Union addresses.

foreign financial accounts and don't report the income, and it does not help the economy if investment is diverted from Main Street USA."

"Law-abiding Americans should not have to pay the bills left unopened and unpaid by those who do not play by the rules. That goes for most owners of small businesses, whose contribution to the U.S. economy is so important. The thousands of honest housepainters should not have to struggle to compete with others who shirk their tax obligations and can thereby underprice the honest service providers. Complying with the tax laws is an obligation of all citizens."

"The government has an obligation, as well, to make the tax system as simple and efficient as possible while fairly enforcing the laws. Here are some concrete steps we will take. First, the IRS will be allocated a budget that allows it to do its job well, and continue to do it while respecting taxpayers and providing them with the information they need to comply. Modern data analysis techniques will be employed to identify honest taxpayers and leave them be, while bringing to justice those who are not honest. American taxpayers will also benefit by a modernization of the tax-filing process that will save time and money, and will have the opportunity to go to a highly secure, password-protected website that contains the information the government already has; for most, tax filing will require just a click of a button to prepare as well as file their return."

(Standing ovation from both sides of the aisle.)

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