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The Trade-Off Between Tax Administration and Tax Compliance

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Abstract

This paper revisits optimal tax enforcement policy, focusing on two elements of that policy: (1) the optimal mix of government-level tax administration and individual-level tax compliance; and (2) the optimal mix of this combination (together, tax enforcement) and tax rates. The standard view is that we should weight tax administration but not tax compliance by the government's cost of funds because we must pay for tax administration, but not compliance, through distorting taxes. As a result, we might want to rely on tax compliance measures even when using tax administration would otherwise be less expensive. Using a flexible model that allows the costs of tax administration and compliance to be imposed in arbitrary ways, I find instead that we should choose between administration and compliance costs purely on effectiveness grounds, without weighting. The reason is that tax administration and tax compliance impose equivalent types of costs and distortions. Both required forced exactions. Using this result, I derive a formula for the optimal mix of tax rates and the overall level of enforcement. Finally, I briefly comment on how the analysis may change in a redistributive income tax context.

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1 Introduction

The United States currently spends roughly an order of magnitude more on taxpayer-level compliance measures than on government-level tax administration. Estimates of tax compliance costs in the United States are about $150 billion per year, or just under 1% of GDP. Marcuss et al. (2013). The budget of the Internal Revenue Service is about $11 billion per year.

This ten-to-one ratio is not inevitable. We could easily shift some of the costs of tax enforcement to the government. For example, some countries have the government fill out initial tax returns, requiring taxpayers only to confirm their accuracy. Gale and Holtzblatt (1997). California experimented with a similar system known as Ready Return. Bankman (2008). The government could also spend more on taxpayer assistance, perform more information collection on its own, or reduce compliance costs in other ways.

Analyses of the trade-off between tax administration and compliance focus on the difference in how they impose costs. Tax administration is funded through tax revenues and, therefore, imposes costs through the higher taxes needed to fund government agencies. Tax compliance costs are imposed directly on taxpayers and do not require higher taxes. As a result of this difference, analysts have concluded that we should weight tax administration but not tax compliance by the government's cost of funds (or alternatively, by the marginal benefit of public goods). Keen and Slemrod (2017), Slemrod and Yitzhaki (2002), Slemrod and Yitzhaki (1996). This approach has begun to influence empirical studies of tax enforcement (e.g., Basri et al (2019)).

I re-examine the trade-off between tax administration and tax compliance. The core intuition is that there should be no *a priori* weighting against tax administration because of the taxes needed to pay for it. Both tax administration and tax compliance impose mandatory costs. The costs of tax administration are imposed through taxes. Tax compliance is funded through mandated expenditures. Both reduce resources available for private consumption through forced exactions. The question is not whether one is tax-like and the other not. Instead, it is how those costs distort behavior and which raises more revenue for a given distortion.

To illustrate, suppose that we increase compliance costs by requiring taxpayers to use a special, expensive kind of payment system (e.g., we ban cash and require electronic payments or require a special form of cash register). The goal of doing this is to increase the marginal cost of evasion, thereby reducing evasion. Taxpayers bear a cost. If they were previously using cash

rather than the mandated electronic payment system, moving to the electronic payment system makes them worse off. The marginal cost of evasion, however, hopefully goes up, and taxpayers evade less, generating a benefit from the new compliance obligation.

Compare that to the government raising taxes on the same sources of funds that taxpayers would have used to pay for the electronic payment system. The government uses the revenue to provide the identical payment system free of charge (and if needed, requiring its use). Once again, taxpayers pay a cost, this time in additional taxes. The marginal cost of evasion goes up, by construction, identically because the newly required electronic payment system is the same system in both cases. This means that taxpayers evade less, again by the same amount. The choice between using compliance or administration depends only on which is a less expensive method of providing the payment system. For example, there might be economies of scale in government provision of the payment system, or diseconomies due to inefficiencies in the government bidding process compared to private purchases. Weighting government by the cost of funds would distort the decision, possibly producing the wrong results.

To model the problem, I build off of the model in Keen and Slemrod (2017). I extend it by allowing a more flexible representation of tax compliance and tax administrative costs as well as considering a more general tax system that includes different tax bases and rates for different activities. The intuition described above holds in the model: given tax administration and tax compliance policies with the same nominal cost imposed on the same margin, we should pick the one that is most effective, defined as generating a larger increase in reported income.

The model brings out two additional features of the choice between tax administration and compliance. The first is what I call targeting. Well-targeted enforcement, in the sense used here, imposes costs only on evasion activities and not on other primary activities. For example, a compliance system that requires everyone to keep additional records or fill out forms just to catch a small number of tax evaders is not well-targeted because the costs are imposed broadly. Badly-targeted tax enforcement systems impose costs on primary activities, such as working or saving, much in the same way taxes do. A tax enforcement system that impacts only those who evade or are likely to evade is well targeted. It does not impose costs on primary activities.

Tax compliance measures and tax administration measures may differ in

how well they are targeted. Bad targeting imposes tax-like costs in that it raises the cost of engaging in activities such as working or saving, just like taxes do. Therefore, if one but not the other is badly targeted, we should weight the use of that instrument by the costs of the poor targeting. For example, if compliance obligations were perfectly targeted, imposing costs only on evasion, while the taxes used to pay for tax administration fall on general activities, we restore the intuition from prior literature that we should weight tax administration but not compliance by the cost of funds. This corner solution, however, need not, and generally will not, arise in practice. Instead, as anyone who has spent time filling out a tax return knows, compliance obligations impose costs on many activities other than evasion.

A second difference between tax administration and tax compliance is that the taxes used to pay for tax administration can be imposed on any margin while the costs of tax compliance measures tend to fall on the margin where compliance is sought. For example, if we want to reduce evasion through the use of Swiss bank accounts, we can increase audits of these accounts, paying for the audits through general taxes, through additional taxes on offshore bank accounts, or taxes on some other activity. If we attempt to reduce evasion through the use of Swiss bank accounts through compliance measures, such as by mandating additional reporting, the costs tend to fall on the use of Swiss bank accounts rather than on other activities.

I will suggest analyzing this difference in how costs may be imposed by breaking the analysis into two steps. In the first, we can imagine that both tax administrative measures and tax compliance measures impose costs along the same margin (i.e., the margin where enforcement policy is being changed). The analysis of this first step is as above: we should look at targeting and effectiveness. The second step is just a tax swap: change the taxes imposed on the first step for the actual taxes imposed. The analysis of this second step can be done using standard public finance tools for analyzing the effects of taxes on different activities.

Finally, the results regarding the trade-off between tax administration and compliance inform the appropriate trade-off between enforcement actions and the use tax rates to raise revenue. Both additional enforcement and raising taxes can produce government revenue. They do so in different ways, however. As is well–recognized, changes to tax rates affect tax revenues through behavioral effects and mechanical effects. Due to envelope properties, small changes in behavior do not effect utility, so we can think of the behavioral effects generating as a fiscal externality (using language from

Hendren (2016)). Mechanical effects reduce utility and generate revenues. They are transfers. The net effect of mechanical changes to tax payments is the difference between the private value of funds and their social value.

Changes to tax enforcement policies also generate behavioral effects and fiscal externalities. They may also create mechanical effects. For example, taxpayers may incur additional costly recordkeeping obligations on all of their income. Mechanical effects in the case of enforcement obligations, however, are not transfers. They are pure losses. The mix between enforcement and tax rates accounts for these similarities and differences between the two instruments.

I proceed as follows. Part 2 presents the basic the model without evasion and tax enforcement, but with multiple income-producing factors, each of which can be taxed at different rates. It develops what can be thought of as an extended version of the elasticity of taxable income formula that accounts for multiple tax bases. It also includes an explicit representation of the mechanical effects of taxes (most often left out of ETI formulas). Mechanical effects are transfers to or from the government, and should be valued accordingly.

Part 3 adds evasion, compliance, and administration. A core difficulty in understanding and modeling the difference between tax administration and tax compliance is how each affects behavior. While tax administration is a government-level activity, to change behavior it has to enter the individual utility function, such as by changing the marginal cost of evasion. Tax compliance measures also seek to change the marginal cost of evasion. Part 3 starts by considering an example to develop intuitions for how these costs enter utility, and then uses those intuitions to complete the model.

It then examines and compares the welfare effects of marginal changes to tax compliance requirements and tax administration, generating the core result of the paper, which is that they should be compared to one another purely based on their effectiveness in generating revenue. The analysis also shows how targeting is central to the choice between the two instruments, and how, if they impose costs on different factors, they can be compared using the two-step breakdown suggested above.

Part 4 uses this framework to consider the optimal mix of taxes and enforcement. Finally, Part 5 considers aspects of the problem left out of the analysis. Most centrally, the analysis follows Keen and Slemrod in using a representative individual framework. Distributional considerations may change some of the conclusions. In particular, following the arguments in

Kaplow (2004, 2006a, 2006b, and 2012), as well as those in Jacobs (2018), the marginal cost of public funds may be taken to be 1 once distributional considerations are taken into account. If the marginal cost of public funds is 1, the differences between the standard weighting approach and the conclusions here is smaller. In addition, as discussed in Kopzcuk (2001), once we add distributional considerations, we need to consider the role of tax enforcement in assisting with the redistributive goals of the tax rate structure. Part 5 briefly discusses these issues. Part 6 concludes.

1.1 Prior literature

There is a substantial prior literature on tax enforcement. Surveys include Slemrod and Yitzhaki (2002), Alm (2012), and Slemrod (2019). Much of the prior work focuses on particular enforcement strategies, such as the trade-off between audits and penalties. Some of this work explicitly models compliance costs, usually referring to these costs as "concealment technologies" or costly sheltering efforts (e.g., Usher (1986), Kaplow (1990), Cowell (1990), and Mayshar (1991)). These models do not, however, separately account for the costs of government-level actions to reduce evasion and, therefore, do not inform the trade-off examined here.

More recent work has focused on understanding taxpayer responses to various enforcement strategies, often through randomized controlled trials conducted with government cooperation. This work often focuses on tax administrative measures such as threats of audit, but it does not seek to understand the differences between similar taxpayer-level and government-level strategies. In addition, in response to perceived (or real) increases in evasion, governments have experimented with numerous strategies, such as information sharing or additional reporting requirements, and we have been able to learn about the effectiveness of different approaches to enforcement by observing the results. Use of large scale administrative data has also allowed estimates of evasion elasticities (e.g., Best at al 2015.)

The primary work with implications for the trade-off between private concealment costs and government-level tax administration costs are Keen and Slemrod (2017) and Slemrod and Yitzhaki (1996). Keen and Slemrod (2017) assumes that mandatory compliance costs fall on evasion and not on what I will call primary activities, such as working or saving. That is, they make a particular assumption about targeting. An immediate implication of this assumption is that we should prefer mandating compliance costs over

raising taxes to pay for tax administration: it is better to raise the cost of evasion than to raise the cost of working or saving.

A similar result emerges in Slemrod and Yitzhaki (1996) (expression 8), where the costs of tax administration and the costs of tax compliance are assumed to enter utility differently. Basri et al (2019) use a model similar to Keen and Slemrod to study tax enforcement choices in Indonesia. Gemmell and Hasseldine (2014) is an exception to the assumptions about how the costs of tax compliance enter utility: they emphasize that enforcement may change effective tax rates. They do not, however, examine the questions explored here.

2 No evasion or enforcement

I start by presenting the model without evasion and enforcement and then, in the next section add these activities. Without evasion, the model is a generalized version of the elasticity of taxable income, similar to, though simpler than, the version found in Hendren (2016). The generalization of the usual ETI approach will be helpful for examining the differences between tax administration and compliance in the next section.

A representative individual supplies N factors, x_i, $i \in [0, N]$. The return per unit of factor i is w_i. Factors include labor in the formal sector, labor in the informal sector, provision of capital of various types, home production, or any other input. The government imposes tax rate t_i on factor i. The value of t_i can be negative, in which case the government is subsidizing the activity. If $t_i = 0$, the activity is not in the tax base.

Supplying factor i imposes an additively-separable cost of $\psi_i(x_i)$, with $\psi' > 0$, $\psi'' > 0$. The cost term is intended to be inclusive, encompassing lost leisure, time, deferred consumption, or any other cost.

The individual's problem is:

$$\max_{[x_i]} \sum_{i=1}^{n} (1 - t_i) w_i x_i - \psi_i(x_i).$$

The first order conditions for this problem are:

$$(1 - t_i) w_i = -\frac{d\psi_i}{dx_i}.$$

The Lagrangian (with R as the budget constraint) is:[1]

$$\mathcal{L} = \sum_{i=1}^{N} (1 - t_i) w_i x_i - \psi_i (x_i) + \lambda \left(\sum_{i=1}^{N} t_i w_i x_i - R \right).$$

The first order condition with respect to t_i (noting that because we differentiate with respect to i, we sum over j):

$$\frac{\partial \mathcal{L}}{\partial t_i} = -w_i x_i + v' w_i x_i + \sum_{j=1}^{N} (1 - t_j) w_j \frac{dx_j}{dt_j} - \frac{d\psi_j}{dx_j} \frac{dx_j}{dt_i} + \lambda \left(\sum_{j=1}^{N} t_j w_j \frac{dx_j}{dt_j} \right).$$

Using the individual first order conditions and simplifying gives:

$$\frac{\partial \mathcal{L}}{\partial t_i} = \lambda \sum_{j=1}^{N} t_j w_j \frac{dx_j}{dt_j} + (\lambda - 1) w_i x_i. \tag{1}$$

We can interpret (1) as the marginal change in welfare for a change in the tax rate. It is the multiple rate, multiple base analogue to the elasticity of taxable income approach of Feldstein (1995, 1999). With a single tax rate applicable to all taxed income, it becomes:

$$\frac{dL}{dt} = \lambda \frac{t}{1 - t} TI \varepsilon_{TI} + (\lambda - 1) TI,$$

where TI is taxable income and ε_{TI} is the elasticity of taxable income with respect to the net of tax rate. It is also a simplified version of Hendren (2016)'s policy elasticity. Hendren has a general utility function, an explicit representation of the production of public goods (compressed here into a budget constraint), and allows taxation of goods as well as factors. These features are not central to the analysis here, so they are omitted.

To understand expression (1), it is useful to focus on the difference between mechanical effects and behavioral effects of a change in tax rates. If we change rate t_i, both arise. The behavioral effect is the first term on the right

[1] Keen and Slemrod use the equivalent approach of maxinizing individual welfare where the value of government spending (other than on tax administration) is $v(.)$. I will instead use the Lagrange multiplier formulation. The two techniques yield the same results, interpreting the multiplier as v', and the derivative of the Lagrangian as marginal welfare with respect to a given variable.

hand side of (1). It reflects the change in the choice of each x_j when we change t_i. If this term is positive, the tax rate change generates a pure welfare gain. For example, if rates go down and individuals work more, the social benefit of the additional work can be measured by the change in tax revenue: the individual is no better or worse off because of the envelope theorem but, by working more, generates a fiscal externality reflected in government revenue.

The second term, $(\lambda - 1) w_i x_i$, is a mechanical effect of a tax rate change. Holding the choice of x_i constant, there is a change in revenue due to the change in the tax rate.

The mechanical effect is weighted in the marginal welfare calculation by $(\lambda - 1)$ while the behavioral effect is weighted by λ. The differences arises because the envelope theorem does not apply to the mechanical effect. The individual is worse off. Therefore, we need to weight it by $(\lambda - 1)$, the value to the government of the funds, λ, minus the value to the individual, 1.

Expression (1) is the multiple-base, multiple-rate analogue to the elasticity of taxable income. With only one factor of production and $\lambda = 1$, we get the usual elasticity of taxable income formulation. With more than one taxed factor, but $\lambda = 1$, we get the rule that marginal revenue effects are a sufficient statistic for welfare. In the more general case, we must account for mechanical transfers (the $(\lambda - 1) w_i x_i$ term), as well as changes to revenue due to behavioral changes (the first term on the right hand side).

Note that expression (1) solves the base-shifting problem of the ETI in a cleaner way than the suggestions in Chetty (2009) and Saez, Slemrod, and Giertz (2012). These authors suggest having separate ETIs for each tax base and adjusting them by shifting factors to reflect the movement of earnings across bases in response to taxation. Expression (1) shows how a single statistic can be used to capture all of these effects.

3 Evasion and Enforcement

3.1 Motivating example

We want to add tax enforcement to this model. Including evasion is standard in ETI models. The more difficult problem is how tax compliance and administration enter. Tax administration is thought of as a government-level expenditure but to change evasion levels, it has to enter the individual utility function. Care about how this occurs is central to the underlying model. To

develop intuitions for these terms, I start with a motivating example before turning to the formal presentation.

Consider an individual engaging in a taxed activity (the primary activity), such as working or investing. The model will allow for an arbitrary number of primary activities, but for purposes of developing intuitions, consider a single activity that is prone to evasion, such as investing in a Swiss bank account or working in a cash business.

The individual chooses the extent of that activity, such as how much to invest in the Swiss bank account or how many hours to devote to the cash business. The activity generates earnings such as investment returns or wages. Engaging in the activity imposes a cost, such as lost leisure time, deferred consumption, or fees paid to Swiss bankers for their discretion. The individual reports some portion of the earnings, and pays taxes on the reported amount. The unreported amount, evasion, is tax free.

The government has two tools to reduce evasion. It can impose compliance obligations or costs on the individual and it can use administrative tools. Compliance obligations are requirements that the individual do certain things that make evasion more difficult. They include reporting, keeping records, using special traceable forms of payment, and hiring private monitors such as accountants and lawyers. Compliance costs also include costs incurred to conceal income, such as engaging in elaborate tax shelters, what prior literature has modeled as the costs of concealment technology, or what we might call non-compliance costs.

Compliance obligations are costly. As noted, in the United States, they are on the order of 1% of GDP. If they were perfectly targeted at evasion, the individual would bear the costs only to the extent of evasion. They may, however, fall on the primary activity. For example, we might require special and expensive reporting for all holders of Swiss bank accounts even though only a fraction of them evade taxes. Or we might impose onerous rules on all cash businesses to prevent evasion by a few. The reason for this poor targeting is that we do not know in advance which activities generate evasion, which individuals engaging in those activities will evade, and how much they will evade. We cannot simply say, report your evasion. Instead, the nets used to catch evasion have to be cast broadly, which means that to some extent, compliance costs fall on primary activities as well as evasion. I will refer to the extent that compliance costs fall only on evasion as the level of targeting.

The government's other tool is tax administration, which includes things

such as returns processing, audits, levies, and collection.[2] These tax administration activities are also designed to reduce evasion. To reduce evasion, they have to affect the individual's return from evasion. In the terminology used here, administrative actions change marginal compliance costs just like the rules directly governing compliance obligations do.

To illustrate, suppose that the government has an administrative tool, such as an evasion detection technology. To reduce evasion, the technology has to impose costs on evasion. For example, if the detection technology is additional audits, taxpayers will incur compliance costs responding to those audits or incur additional costs to conceal income from the auditors. To reduce evasion, the audits should increase the marginal cost of evasion, such as by increasing the ability of the government to detect and sanction evasion.

One may object that the additional costs taxpayers incur beause of changes to tax administraiton are private costs and, therefore, best classified as tax compliance. But note that the only way tax administration has any effect on evasion is by changing private costs, so classifying all such costs as compliance costs would leave no role for tax administration.

The distinction between compliance and administration, therefore, is not purely whether private or public entities incur the cost. It is whether the cost arises because of a change in government-level activity, such as more audits, or because of taxpayer obligations, such as a requirement to keep more records. To illustrate, suppose that a taxpayer spends money on an elaborate evasion technique designed to avoid detection. That expenditure may be classified as a tax compliance cost—the technique may, for example, avoid reporting requirements. It may also be classified as due to tax administration—it may avoid government-level information collection efforts. The costs are most likely jointly caused. We care about setting optimal levels of administration and compliance, which means we care about how a marginal change in policy affects these costs. As a result, it is not necessary to choose which is the single or most important reason why the taxpayer incurred the cost. Instead, we care about how changing government-level activity such as information processing affects taxpayer activities.

As with compliance costs more generally, the additional compliance costs

[2]In 2018, the IRS spent about $4.7 bilion (of of $11.7 billion) on activities it labels enforcement, inlcuding investigations ($600 million), examinations and collections ($3.8 billion) and regualtory ($170 million). It spent $2.5 on what it labels taxpayer services, such as pre-filing assistance and filing and account services. The rest of its budget is operations supporting such as information services. (IRS Budget Table 28, irs.gov)

generated by tax administration may be well-targeted or not. For example, the evasion detection technology considered above might perfectly locate and prevent evasion, imposing no costs on non-evaders. It might, however, be badly targeted. For example, it might involve audits of all Swiss bank accounts. In this case the costs of tax administration fall on the primary activity more generally.

A key distinction between tax administration and compliance is that tax administration (at least the government component of tax administration) is funded through taxes. Taxes affect the the ability of the government to provide public goods. The analysis below holds spending on public goods constant to allow a clean comparison between tax compliance and administration.

Finally, note that as with direct compliance costs and the private costs of tax administration, taxes used to pay for tax administration may be well, or badly, targeted. Taxes to pay for administration are well-targeted if they fall on evasion, increasing the cost of evasion without increasing the costs of primary activities such as working. For example, fines, penalties, or additional taxes on evasion can be used to pay for tax administration, in which case the tax is well-targeted. Even modest taxes on evasion would more than pay for all tax administrative activities in the United States.[3] Alternatively, general taxes, such as taxes on labor income or on Swiss bank accounts (generally, not limited to those used for evasion), might be used, in which case the tax is badly targeted. The model below will only examine the use of general taxes to fund tax administration but could be extended to allow targeted taxes.

3.2 Model setup

Using this motivation, allow the individual to choose to evade or not report an amount e_i along each margin i. Reported income along margin i is:

$$z_i = w_i x_i - e_i$$

After-tax income along margin i is $(1 - t_i) z_i + e_i = (1 - t_i) w_i x_i + t_i e_i$.

Government policy imposes compliance obligations, c_i, on the individual. They are costly and, therefore, reduce the amount otherwise available for consumption.

[3]The IRS assessed $29 billion in civil penalities in 2018, more than double its entire budget and six times the portion of its budget labeled enforcement. See Table 17, irs.gov/statistics.

To be effective, they need to be a function of evasion, $c_i = c_i(e)$, with $c_i' > 0$, $c_i'' > 0$. If compliance obligations were perfectly targeted at evasion, the individual would bear the costs only to the extent of evasion. As noted, they may, however, fall on primary activities. This means that $c_i = c_i(e_i, x_i)$.

I do not impose a sign on $\partial c_i/\partial x_i$. The central case I will examine is when compliance obligations impose a tax-like cost, so $\partial c_i/\partial x_i > 0$. Slemrod (2001) focuses on the case where $\partial c_i/\partial x_i < 0$, an effect which he calls the evasion facilitating effect of income. Keen and Slemrod (2017) assume $\partial c/\partial x = 0$, which is part of the reason for their conclusions about the differences between tax administration and compliance.

We will want to consider policies that change compliance obligations, which, following Keen and Slemrod, I will denote as a continuous variable α: $c_i = (e_i, x_i, \alpha)$. A change in α may change the overall level of compliance costs: $\partial c_i/\partial \alpha$ need not be zero. The goal of compliance policy changes, however, is to change evasion choices, which means the goal of changing α is to change $\partial c_i/\partial e_i$. That is, we care about $\partial^2 c_i/\partial e_i \partial \alpha$. In addition, changes to compliance policy may how compliance costs effect primary activities, $\partial^2 c_i/\partial x_i \partial \alpha$. Better targeting means increasing $\partial c_i/\partial e_i$ and reducing $\partial c_i/\partial x_i$. I will leave α without a subscript because α could be a complex policy that changes many things at once. For the most part, however, I will assume that α changes policy along the margin being considered (generically, margin i in the analysis below).

The second tool to reduce evasion is tax administration, A. Tax administration is paid for out of the government budget, which means that spending on (other) public goods is net of the cost of tax administration.[4]

As discussed, to reduce evasion, tax administration has to affect the individual's cost of evasion. Government-level activities must enter the individual's utility function. In particular, to work, tax administration has to change the effectiveness of compliance costs in making evasion more expensive: $c_i = c_i(e_i, x_i, A_i, \alpha)$.

In particular, to reduce evasion, tax administration has to impose costs on evasion. This means that the core effects of tax administration is $\partial^2 c_i/\partial e_i \partial A$, parallel to the goals of tax compliance policy.

[4]In 2018, the IRS spent about \$4.7 bilion (of \$11.7 billion) on activities it labels enforcement, including investigations (\$600 million), examinations and collections (\$3.8 billion), and regulatory (\$170 million). It spent \$2.5 billion on what it labels taxpayer services, such as pre-filing assistance and filing and account services. The rest of its budget is operations supporting such as information services. (IRS Budget Table 28, irs.gov)

As with compliance costs more generally, the additional compliance costs generated by tax administration may be well-targeted or not, as reflected by the value of $\partial^2 c_i/\partial x_i \partial A$. For example, the evasion detection technology might perfectly locate and prevent evasion, imposing no costs on non-evaders: $\partial^2 c_i/\partial x_i \partial A = 0$. It might, however, be badly targeted. For example, it might involve audits of all Swiss bank accounts rather than just those used for evasion. In this case the costs of tax administration fall on the primary activity more generally. Therefore, we can think of the value of $\partial^2 c_i/\partial x_i \partial A$ as a measure of how well targeted administrative expenditures are.

Because both compliance policy and tax administration policy affect what I have labeled compliance costs, it is useful to clarify the terminology. Compliance obligations or costs, c, are all the things taxpayers have to do, or are caused to do, to comply with the tax system. There are two related but distinct policy levers that change compliance obligations or costs. The first is α, which changes what we might think of as direct obligations, such as records, forms, and payments to service providers such as accountants to keep the record or file the forms. The second is tax administration, A. Changes to tax administration indirectly change c. For example, if the government cross-checks records (when it previously didn't), evasion may be more difficult, increasing $\partial c/\partial e$. Or the government might increase audits and depending on how well the audits are targeted, this may increase, $\partial c/\partial x$ and $\partial c/\partial e$.

In most cases, whether a policy changes α or A will be relatively clear but in some cases the distinction between the two will be unclear. For example, an increase in audits is clearly a change in tax administration. I will interpret the the costs of responding to the new audits as a cost of tax administration. They are costs induced by a change in administration, so they are $\partial c/\partial A$. In other cases, the distinction between tax administration and compliance will break down. Ultimately, what matters are the effects of a policy, not whether it is classified as tax administration or compliance. Notwithstanding these boundary cases, the distinction is often clear and worth understanding.

With these additions, utility is now:

$$U = \sum_{i=1}^{N} \left[(1 - t_i) w_i x_i - \psi_i (x_i) + t_i e_i - c_i (e_i, x_i, A_i, \alpha) \right].$$

Individual maximization gives:

$$x_i : (1 - t_i) w_i = -\frac{d\psi_i}{dx_i} - \frac{\partial c_i}{\partial x_i},$$
$$e_i : t_i = \frac{\partial c_i}{\partial e_i}.$$

Note that the choice of x_i and e_i are simultaneous because both x_i and e_i affect c_i.

The budget now must account for administrative costs. Setting units so that we are spending A on tax administration, government spending is $\sum_i t_i z_i + A$.

The Lagrangian is:

$$\mathcal{L} = \sum_{i=1}^{N} \left[(1 - t_i) w_i x_i + t_i e_i - \psi_i (x_i) - c_i (e_i, x_i, A_i, \alpha) \right] + \lambda \left(\sum_{i=1}^{N} t_i z_i + A - R \right) \tag{2}$$

For the choice of t_i, differentiate with respect to a change in tax rate i (summing over j):

$$\frac{\partial \mathcal{L}}{\partial t_i} = -z_i - \sum (1 - t_j) \frac{dz_j}{dt_i} - \frac{d\psi_j}{dx_j} - \frac{\partial c_j}{\partial x_j} - \frac{\partial c_j}{\partial e_j} + \lambda z_i + \lambda \sum t_j \frac{dz_j}{\partial t_i}$$

Substituting the individual first order conditions yields:

$$\frac{\partial \mathcal{L}}{\partial t_i} = (\lambda - 1) z_i + \lambda \sum t_j \frac{dz_j}{dt_i}. \tag{3}$$

This is the same generalized version of the ETI give above except substituting reported income Σz_i for true income $\Sigma w_i x_i$. ("Taxed" income is a better description than the standard term, "taxable." All income is taxable. Only reported reported income is taxed.) It is the mechanical change in tax revenue, multiplied by $(\lambda - 1)$ and the social value of the behavioral change.

The core problem is comparing changes to tax compliance, $\frac{\partial \mathcal{L}}{\partial \alpha}$, to changes in tax administration $\frac{\partial \mathcal{L}}{\partial A}$. For a change in compliance policy, we have:

$$\frac{\partial \mathcal{L}}{\partial \alpha} = -\sum \left((1 - t_i) w_i x_i + t_i e_i \right) \frac{\partial c_i}{\partial \alpha} + \lambda \sum t_j \frac{dz_j}{d\alpha}$$

$$= -y \frac{\partial c_i}{\partial \alpha} + \lambda \sum t_j \frac{dz_j}{d\alpha}, \tag{4}$$

where y is after-tax income, $y = \sum ((1 - t_i) z_i + e_i)$. The first term reflects mechanical costs from changes to compliance policy. Unlike for mechanical effects of tax changes, these costs do not show up in the government budget as a transfer (seen in the $(\lambda - 1) z$ term in expression (3)). They are pure losses. Mechanical compliance costs may apply to evasion as well as reported income, and to keep the expression simple, I have applied them equally to both. In many cases, they may apply differently to evasion and reported income, and a straightforward generalization would allow that.

The second term, which uses short-hand notation (discussed below) reflects how changes to compliance policy change evasion and primary activities. These changes have no first order effect on utility but show up in the government budget.

The first order condition with respect to administrative costs has the same form, except differentiating with respect to A. Note, however, that a pure change in administrative costs changes the budget constraint, generating:

$$\frac{\partial \mathcal{L}}{\partial A} = -y \frac{\partial c_i}{\partial A} + \lambda \sum \left(t_j \frac{dz_j}{dA} - 1 \right).$$

To keep spending on public goods (other than tax administration) constant, we need to adjust tax rates to offset this change in the government budget. To allow the most informative comparisons to changes in compliance, it is helpful to change tax rates so that they generate a change in government revenue of 1 even though government revenues change by $\sum \left(t_j \frac{dz_j}{dA} - 1 \right)$. That is, we want to change tax rates to pay for the costs of changes to tax administration but not to offset the effects of the change in tax administration. The reason is that the first order condition for changes in compliance costs allowed government revenue to change because of changes in z. We want the allow the same for changes to tax administration, which means we want a tax increase to pay only for the mechanical costs of changing A.

A small tax rate change of t_i yields government revenue of $z_i + \Sigma_j t_j \frac{dz_j}{dt_i}$ and a utility loss to the individual of z_i. A tax change that yields 1, therefore, generates a utility loss of $z_A = z_i / \left(z_i + \Sigma_j t_j \frac{dz_j}{dt_i} \right)$. Combing this tax change with the change in tax administration yields:

$$\frac{\partial \mathcal{L}}{\partial A} = -y \frac{\partial c_i}{\partial A} - z_A + \lambda \sum t_j \frac{dz_j}{dA}. \tag{5}$$

3.3 Analysis

To compare changes to compliance policy to changes in tax administration, set the marginal welfare effects equal to one another:

$$y\frac{\partial c_i}{\partial A} + z_A - y\frac{\partial c_i}{\partial \alpha} = \lambda \sum t_j \left(\frac{dz_j}{dA} - \frac{dz_j}{d\alpha} \right). \tag{6}$$

The left hand side is the difference in mechanical costs of a policy. The right hand side is the difference in the effects on reported income.

Start by comparing policies that have the same nominal cost. This sets the left hand side of (6) to zero. The nominal cost of the tax administration policy is reflected in the change in taxes plus any individual-level costs that arise due to the policy. The comparable costs of the tax compliance policy are borne directly by the individual.

If these are the same, the choice between the two depends entirely on their effectiveness at increasing taxable income. At the optimum, we want

$$\sum t_j \frac{dz_j}{dA} = \sum t_j \frac{dz_j}{d\alpha}. \tag{7}$$

Note, centrally, for policies that have the same nominal cost, there should be no weighting of one policy or the other for the cost of government funds. As in the example in the introduction, both policies impose costs. Equally expensive policies impose equal costs, so weighting one policy by those costs and not the other would distort the choice between the two.

Policies with same nominal cost might have different real costs because of targeting: they differentially fall on primary activities. Rewrite expression (7) as

$$\sum t_j \left(\frac{w_j dx_j}{dA} - \frac{de_j}{dA} \right) = \sum t_j \left(\frac{w_j dx_j}{d\alpha} - \frac{de_j}{d\alpha} \right).$$

The terms $\frac{dx}{dA}$ and $\frac{dx}{d\alpha}$ reflect how changes in enforcement policy affect primary activities. Recall that the individual's choice of primary activities sets $(1 - t_i)\, w_i = -\frac{d\psi_i}{dx_i} - \frac{\partial c_i}{\partial x_i}$. The ordinary costs of engaging in the activity, ψ, are not affected here. Changes in the level of the activity due to changes in enforcement policy are determined by the values of $d^2c/dxdA$ and $d^2c/dxd\alpha$, that is by how well targeted the policies are. If these are positive, (the policies are badly targeted) the level of primary activities go down, increasing the social cost of the policy.

We can think of poor targeting as imposing tax-like costs. As with changes to tax rates, poorly-targeted enforcement increases the marginal cost of engaging in an activity. While Keen and Slemrod do not have the type of targeting examined here in their model, we can think of them as assuming that $d^2c_i/dx_i d\alpha = 0$: compliance obligations or costs do not impose any tax-like effects. We can hope that this is true, but in general it will not be. We cannot, or perhaps only rarely, target evasion with precision.

For equally well-targeted compliance and administrative policies, we care only about how they effect the marginal cost of evasion. This is determined by the values of $d^2c_i/de_i dA$ and $d^2c_i/de_i d\alpha$. We prefer policies that increase the marginal cost of evasion more. Again, there is no a priori preference for compliance over administration. Instead, the values of these derivatives depends on the particular technologies that are employed.

An assumption in the analysis above is that the tax change used to pay for the change in tax administration was along the same margin as the change in tax administration. That is, to pay for audits of Swiss banks, we increase taxes on Swiss banks. This assumption need not be, and in general will not be, true. We can pay for audits on Swiss banks by raising taxes on labor income.

By contrast, the costs of tax compliance almost inevitably fall on the margin where additional compliance is mandated. Compliance obligations to reduce evasion by holders of Swiss banks likely fall on Swiss bank accounts. Increasing reporting requirements for labor income would not change evasion by holders of Swiss bank accounts.

The utility losses from the tax used to pay for tax administration, $z_A = z_i / \left(z_i + \Sigma_j t_j \frac{dz_j}{dt_i} \right)$, depend on which margin they fall on. Both z_i and $\frac{dz_j}{dt_i}$ will be different for different choices of i. The size and effects of a tax on labor income to pay for tax administration will be different than for a tax on Swiss banks. As a result, expression (6), and by implication, expression (7), depend on the choice of i (the latter because it implicitly sets the left hand side of (6) to zero).

This difference between tax administration and compliance, however, is more illusory than real. Consider an increases in taxes imposed on activity j to pay for an increase to tax administration on activity i. We can restate this policy as (1) taxes imposed on activity i to pay for the tax administration and (2) a reduction in those taxes on activity i and an increase in taxes on activity j. The first step is analyzed as above. The second step is analyzed

like any other change in tax rates on different activities, using standard tools.

We can make similar adjustments on the compliance cost side. To the extent compliance obligations along margin i increase the costs of engaging in that activity, we can lower taxes to hold those constant. To keep the budget fixed, we can then raise taxes on activity j. That is, we can go in either direction to ensure comparability. We can always analyze enforcement policy along a given margin by treating it as imposing all costs along that margin. If some of the costs, such as the taxes used to pay for tax administration, are actually imposed along a different margin, we can then analyze that difference using the usual tools of public finance.

4 The choice between tax rates and tax enforcement

Another central question is the optimal trade-off between enforcement and tax rates. That is, if we want to raise an additional dollar of revenue, is it better to raise tax rates or increase enforcement? Keen and Slemrod (2017) address this question, though under their restrictive assumptions about how compliance cost affect utility.

To address this question, suppose that enforcement uses optimal mix of tax administration and tax compliance tools. This means that the welfare effects of (1) a small increase in compliance obligations and (2) a small increase in administration along with the taxes needed to pay for that increase, are the same. Both increase revenue (net of the costs of tax administration) by reducing evasion. Because compliance and administration impose the same marginal cost, we can compare an increase in either one to an increase in taxes.

Setting the marginal cost of a small increase in tax rates equal to the marginal cost of an increase in compliance costs equal to one other, we get:

$$z_i - y\frac{\partial c_i}{\partial \alpha} = \lambda\left(z_i + \sum t_j\left(\frac{dz_j}{dt_i} - \frac{dz_j}{d\alpha}\right)\right). \tag{8}$$

To understand this expression, compare a small increase in a tax rate, t_i, to a small increase in enforcement, in this case, α. The tax rate increase generates a negative behavioral effect $\left(\frac{dz_i}{dt_i} < 0\right)$, and a transfer with social

value $(\lambda - 1)\, z_i$. An increase in compliance obligations and costs has an ambiguous effect on tax revenues. Depending on targeting, it may reduce x_i while also reducing evasion, e_i. The net effect is ambiguous. Nevertheless, short of being on the wrong side of the evasion Laffer curve, it increases tax revenue, $\frac{dz_i}{d\alpha} > 0$. This, however, is offset by a pure resource loss, $y\frac{\partial c_i}{\partial \alpha}$. There is no offsetting transfer to the government.

The implications are not dissimilar to Keen and Slemrod's expression (15), in that both expression (8) and Keen and Slemrod's equivalent expression focus on the relative revenue productivity of each instrument. A key difference from Keen and Slemrod is the focus here on the difference in mechanical costs of the two instruments. That is, both instruments can produce revenue and, not surprisingly, we care about how effectively they do so. Holding that fixed, the difference between taxes and enforcement is that taxes also generate mechanical revenue (λz_i) while compliance costs do not.

5 Discussion

5.1 An aggregate measure

It might be useful for policy purposes to have an aggregate measure of how an arbitrary policy intervention, whether to tax rates, tax base, or tax enforcement, affects welfare, a measure Hemel and Weisbach (2019) call the Behavioral Elasticity of Tax Revenue. The measure effectively combines expressions (3), (4), and (5) to give the change in social welfare for a change in an arbitrary tax policy.

Consider an arbitrary marginal change in tax policy. Regardless of whether it is a tax rate change, tax base, or enforcement, the change in tax receipts due to changes in behavior is a change in social welfare, weighted by the value of government funds. These are fiscal externalities from behavioral changes. The private effects of these changes in behavior do not affect social welfare because of envelope properties. For example, an increase in reporting costs by taxpayers due to a decision to conceal less income because of a change in reporting rules does not affect social welfare.

Mechanical costs of changes to tax rates (including changing the base, which can be thought of as a change in rates) and changes in enforcement policy, however, enter social welfare differently. Mechanical changes in tax payments due to changes in tax rates are a transfer from individuals to the

government. Their social value is simply the difference, if any, between a dollar in private hands and a dollar in public hands. Mechanical changes to enforcement, reduce social welfare. They are a pure loss in resources. Mechanical changes to enforcement includes compliance costs that are incurred even without behavioral changes, and changes to costs of tax administration.

5.2 Distribution

An important limitation of the analysis is its use of a representative individual framework. This framework can provide insight into efficiency effects of taxes but ignores distributive effects. There are two ways central ways a fuller framework might affect the analysis.

First, one of the central differences between the conclusions here and those in piror work is the marginal cost of funds, λ. Keen and Slemrod would weight tax administration but not compliance by λ. The analysis here suggests that this weighting is not warranted.

Adding distributive considerations has important implications for the value of λ. In particular, at the optimum, the marginal social benefit of redistribution equals the marginal deadweight loss from taxation, implying $\lambda = 1$. In addition, away from the optimum, Kaplow (2004, 2006a, 2006b, and 2014) has argued that under certain assumptions about the utility function, we should choose public goods as if $\lambda = 1$. The reason is that we can adjust taxes so that the financing of the public good and the benefits of the public good offset. Jacobs (2018) argues, if the government has a lump sum tax available (in addition to an income tax), $\lambda = 1$ even in restricted setting such as a linear income tax. Either way, with $\lambda = 1$, the approach suggested by Keen and Slemrod and the approach suggested here are more similar.

Second, the representative individual framework eliminates the potential distributive effects of enforcement. These were addressed in Kopczuk (2001). A useful starting place to understand these issues is to make the simplifying assumption that while individuals differ with respect to their earning ability, there is no additional heterogeneity in evasion (controlling for earning capacity). Under this assumption, the mix of tax rates and tax enforcement should be set efficiently. The reason is that we cannot gain any additional redistributive leverage by using inefficient enforcement. The tax rate and enforcement are redundant instruments.[5] The results suggested above would

[5]The conclusion also follows from Kaplow (2006). To illustrate, suppose the tax rate

then apply.

Note that this does not imply that the level of enforcement is unrelated to distributive concerns. As emphasized by Slemrod and Kopczuk (2002), enforcement and higher tax rates tend to be complements. When we want to redistribute more, we want both higher tax rates and more intense enforcement.

Evasion and underreporting, however, likely vary within ability levels. For example, those who work in cash businesses may have less expensive evasion opportunities than those who work for larger enterprises but earn the same income. Individuals may also vary in their taste for evasion or avoidance. Access to the black-market may be related to where one lives or who one knows.

When we introduce heterogeneity in evasion, the analysis changes. As emphasized by Kopczuk (2001), the effectiveness of redistribution through tax rates depends on how reliable taxable income is as a measure of the need for redistribution. Evasion and underreporting can make that signal stronger or weaker depending on how they co-vary with ability to earn. If low taxable income can indicate either low ability or a high level of evasion, tax rates become less useful as a means of redistributing to those in need. On the other hand, we may want more progressive rates if evasion opportunities are concentrated among those with low ability.

We may be able to use the level of enforcement in this situation to improve redistribution. In particular, if avoidance or evasion serves as a useful "tag" in the language of Ackerlof (1978) of those with a particular ability level, then we can use enforcement to relax the incentive constraints on redistribution. For example, (as Kopczuk (2001) shows in a number of examples), if avoidance is more accessible to those to whom we want to redistribute, we may want to allow more avoidance than otherwise. The resulting redistributive gains may outweigh the revenue losses. The reverse is true if avoidance is more accessible to those who we want to redistribute from. The optimal mix of tax rates and enforcement may vary from expression (8).

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too low and enforcement too high on an income class. Raise the rate, lower enforcement in a way that holds their utility precisely fixed. For people in that income class, they are no better or worse off but there is additional revenue because we have made the tax system more efficient. Do this at each income level. Because utility levels stay the same at each income level, there is no incentive to change work effort, which means that the redistributive effects of the tax system remain the same. By construction, however, there is additional tax revenue, which can be used to make everyone better off.

Without a better understanding of the nature of evasion and underreporting, it not clear whether those who evade are more deserving or less. The first thing that comes to mind when we think of evasion might be wealthy people using off-shore bank accounts, but people may also evade if they experience a significant bad shock and need resources. (A widely known type of evasion is small businesses not remitting payroll taxes of their employees in order to stave off bankruptcy.) The poor may have better access to black markets than the rich and, therefore, view evasion as less costly than the rich. A propensity to evade may also reflect a distaste for paying taxes, and it is not clear how or whether we should take such a distaste into account in social welfare. Evasion practices may vary widely and have many causes. The use of evasion as a tag to identify individuals does not, without substantially more study, tell us which way to make adjustments.

6 Conclusion

The central question addressed is how to choose enforcement policies focusing on (1) the mix of individual-level and government-level policies, and (2) the mix of overall enforcement and tax rates. The core idea is that both tax administration and tax compliance impose costs on taxpayers. Tax administration requires taxes to pay for government operations while tax compliance requires taxpayer time and expenditures. If these costs fall on the same factors, they have the same effects and, as a result, we should choose the mix of compliance and administration purely on effectiveness grounds.

The optimal mix of overall enforcement and tax rates in the representative individual setting must take into account how these two instruments raise rates. Both affect reported taxable income, though in different ways. In general, increases in tax rates reduce reported income, while increases in enforcement has ambiguous sign (though we may take it to increase reported income in most cases). In addition, increases in tax rates generate transfers for inframarginal behavior while increases in enforcement does not. Finally, resources spent on enforcement are lost. The optimal mix of enforcement and tax rates takes all of these factors into account.

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