Discretion in tax enforcement

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Abstract

This paper deals with the issue if the IRS should be allowed or even encouraged to negotiate settlement agreements with taxpayers subject to examination. We consider the case in which the IRS enjoys discretion at the settlement stage, its stance being guided by officers’ professional judgement. We show that discretionary settlements serve a desirable function, as they allow the IRS to better exploit taxpayer-specific information and to take advantage of the bargaining power it can wield at the negotiation stage.

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1 Introduction

In most countries, the Revenue Service enjoys the power to make discretionary settlements with suspected evaders. Amicable solutions serve the purpose of avoiding tax litigation, allowing both parties to save on the costs of adjudication. Settlements also allow the IRS to tailor the sanction to individual taxpayers (or tax evaders) according to all the information at its disposal, and to manage cases in a cost-effective way.

Settlements are the modal outcome of the examination activity of most Revenue Services (OECD 1990). In the UK, tax settlements are managed by the Board of the Commissioners for the Inland Revenue. In light of guidance IR 73, the Board has the discretionary power to reduce the penalty (which can be as high as 100% of the unpaid tax) for the following mitigating factors: disclosure (20%), co-operation (40%), and gravity (40%). Thus, in theory the penalty can be completely remitted. A settlement amount is usually agreed upon between the tax inspector and the taxpayer, and formally submitted by the latter to the Commission. If it is accepted, the Revenue forfeits the rights to recover the tax, interest, surcharge or penalties beyond what is agreed upon (see Rignell 1992). In the US, settlements are agreed upon by the taxpayer and the IRS at the appeals level. The US Dept. of Just. (2000) reports: “The courts are the apex of the controversy resolution structure within the IRS, which is very much geared to settlement if at all possible. Thus, settlement is a primary function of the Appeals Offices, and Appeals settles close to 90% of the cases it considers.” It is important to emphasise that settlements can also be negotiated on an informal basis: auditors can drop controversial items from the examination report so as to have it signed by the taxpayer.

This paper investigates the impact of discretionary settlements on the enforcement process, considering their effects on both the IRS examination policy and taxpayers compliance decisions. This allows us to shed light on the issue of the optimal amount of discretion for the IRS. In particular, we compare three broad policies: 1) in the

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1 Notice further that over 80% of cases that end in tax courts are settled without ever going before a judge (Daily 1999).
first, the IRS has the power to settle cases according to its own judgement, ii) in the second, it only has the power to drop/pursue cases; iii) in the third, it has no discretionary power. These policy alternatives are analysed on the assumption that IRS discretionary power cannot turn into forms of prevarication, for its decisions are subject to “judicial review”. In other words, we assume that taxpayers always have the chance to appeal to independent tax courts, which are able to administer perfect justice.

The model highlights a tension between the goal of the IRS to guide taxpayers’ behaviour through tough and unmodifiable rules (no discretion) and the opportunity to exploit tax officers’ judgement, i.e. their ability to tell the good from the bad case. In order to highlight the role of officers’s expertise, we assume that officers’ judgement cannot be directly incorporated into the law. In other words, the *modus operandi* of the tax officers cannot be replicated by a (sophisticated) administrative rule. For this purpose, we allow the information collected by the officers to be “soft” (non verifiable), i.e. to be different from the “hard” documentary evidence used in the courtroom.\(^2\) We take that officers’ ability to find and decipher soft information from the scrutiny of individual files defines their special contribution to the enforcement process. Inspectors’ professional judgement dictates the stance of the IRS on the settlement and determines its ability to manage cases in a cost-effective way.

The benefits of informed decision making have to be balanced against a well known cost of discretion, i.e. the loss of strategic leadership. Since the classic contribution of Kydian and Prescott (1977), it is known that policy makers acting in a discretionary way lose the “first mover advantage,” as they cannot commit to policies which are optimal ex-ante but not ex post. In contrast, a policy-maker deprived of discretion would have no chances to adjust ex-post its action plans, and would thus be able to stick to its (ex-ante) optimal plans. Like Homer’s Ulysses tied to the mast, it would

\(^2\)This is because IRS officers can usually rely on broad sets of information sources, including circumstantial evidence of several types (e.g. relating to taxpayer’s life style). Needless to say, the borderline between legal evidence and plain information is often blurred. Yet, this distinction is the subject of lengthy regulations, especially in common law jurisdictions.
be able to resist to the Sirens’ luring songs and keep its life.\footnote{From a different perspective, strict rules shift the decision power from the periphery to the central policy-maker.}

For simplicity, we assume that taxpayers’ liability can only be “high” or “low.” The IRS selects taxpayers for examination, depending on the liability reported. For each file selected, a first scrutiny provides information about the merits of the case. At this stage, settlement negotiations can take place. The faculty to make a take-it-or-leave-it settlement proposal is randomly allocated to one of the sides; the probability that this faculty is assigned to any party defines its ”bargaining power” in the negotiation stage. If no agreement is reached, the case is deferred to a perfect tax court.

We fully solve the game and show how net tax revenue is affected both by the precision of the information available to the IRS and the allocation of bargaining power. At equilibrium, a fraction of the high-liability taxpayers reporting a low liability are selected for examination; depending on the (exogenous) allocation of bargaining power, they end up paying a larger or smaller expected amount in settlement. In some cases, the negotiation fails and the case goes to court. We show that the probability of adjudication is lower when the information of the IRS is more precise. Thus, soft information de facto reduces enforcement costs.

Next we compare the results obtained to alternative policies, where IRS’s discretionary powers are reduced. First, we consider the case where the IRS can only drop or pursue cases (and not negotiate the penalty). We show that this policy option unambiguously reduces the net revenue to the IRS. In fact, the drop/pursue policy deprives the IRS of its bargaining power at the negotiation stage and prevents it from efficiently exploiting its information. Second, we contrast the full discretion regime with the case where the IRS is bound by strict rules (full commitment). We show that the discretionary policy can outperform full commitment when the information available to the IRS is sufficiently precise and the IRS has enough bargaining power. This result thus provides some support for the discretionary practices currently adopted by
most revenue services, which usually heavily exploit officers’ professional judgment.

Despite the prevalence of tax settlements over adjudication in most countries, the bulk of the literature on tax enforcement has assumed that audits are carried out by the administration without ever entering in contact with the taxpayer (see Slemrod and Yitzhaki 2000 and Cowell 1990).

Franzoni (2000) investigates the role of tax amnesties (a sort of generalised settlement) and shows how they may improve the ex-ante payoff to the IRS when the enforcement system has “inefficiencies” (such as an excessive tax differential and an unrefundable defence cost to honest taxpayers). In a related vein, Chu (1990) and Ueng and Yang (2001) study tax schemes where taxpayers paying a fixed amount are exempted from auditing. In the schemes analysed by these authors, taxpayers who do not pay the fixed amount or refuse the amnesty offer are subject to the “standard” audit program, with a predetermined audit rate. In contrast, the present paper builds on the assumption that settlement is pre-trial (rather than pre-audit) and that examination rates are endogenous. Thus, this paper follows the game-theoretic approach of Graetz, Reinganum and Wilde (1986), who model the IRS as a strategic actor. This paper extends that analysis by allowing for negotiated settlement and unverifiable information. Settlement models like ours are commonly used in the literature on pre-trial bargaining (see Daughety 1999), but they do not generally have a role for unverifiable information.

Finally, Scotchmer (1990) and Macho and Pérez (2000) develop models of auditing with signals, where the IRS can commit itself to the optimal audit policy and signals are used to select taxpayers for auditing. Scotchmer focuses on signals based on taxpayers’ observable features, Macho and Pérez on generic random signals. Both show that signals greatly improve the enforcement policy and the vertical equity of the tax system.

\footnote{One of the main issues addressed by the amnesty model is calculating the highest participation fee supported by any given audit rate.}

\footnote{The difference between the game-theoretic and the principal-agent approaches to tax enforcement is discussed in Franzoni (1999).}
Section 2 introduces the model, Sections 2.1 and 2.2 solving the settlement game when the upper hand in bargaining is held by taxpayer and IRS, respectively. In Section 3 the model is closed with an analysis of the examination policy and the taxpayer’s compliance decision. Section 4 assesses the impact of discretion in enforcement and Section 5 concludes.

2 The model

In this model, only taxpayers know their true liability. To simplify, we assume that liability is either “High” or “Low”. The ex-ante probability of the liability being high is denoted by $q$. Taxpayers may report “high” or “low,” possibly understating taxable income, overstating expenses or claiming undue deductions. Clearly, low-liability taxpayers have no incentive to report “high,” whereas high-liability taxpayers decide what to report on the basis of the expected costs and benefits. If they report correctly, they pay their tax $T$ in full; if they underreport, they save on $T$ but with the risk of examination and sanction. If their real liability is ascertained, they are liable for an additional payment $f$, including taxes and penalties due.

A fraction $a$ of taxpayers reporting low liability are selected for examination. For the time being, we assume that the selection process is purely random (see Appendix 1). The IRS examines selected taxpayers’ files and acquires taxpayer-specific information.$^6$ Without loss of generality, this information is condensed in a signal: a “red flag” suggesting that the taxpayers is non-compliant and that the case has merit or a “green flag” indicative of compliance. The taxpayer does not observe the colour of the flag. The precision of the signal is measured by the parameter $\sigma \in [1/2, 1]$, where $\sigma = \Pr(\text{red} | \text{non-compliance}) = \Pr(\text{green} | \text{non-compliance})$. When $\sigma = 1/2$, the signal is non-informative; when $\sigma = 1$, it is perfectly informative.

$^6$A more complex model would allow for both hard (i.e. verifiable) and soft (i.e. unverifiable) evidence upon examination. If the inspector finds hard evidence, the game is over (the taxpayer pays the penalty $f$). If he finds soft evidence, the game continues as in the model. The qualitative results of the paper would not be substantially affected. Note further that in this model the use of soft evidence does not damage honest taxpayers: they can always skip the settlement process and apply for a fair trial.
Let $\mu_r$ define the IRS’s confidence of winning in court given a “low” report and a red flag, and $\mu^g$ its confidence of winning in court given a “low” report and green flag. Given the belief that a taxpayer reporting a low liability is non-compliant, $\mu$, we have $\mu_r = \frac{\sigma \mu}{\sigma \mu + (1-\sigma)(1-\mu)}$ and $\mu^g = \frac{(1-\sigma)\mu}{(1-\sigma)\mu + \sigma(1-\mu)}$, with $\mu_r \geq \mu^g$.

After the signal has been captured, a negotiation between the IRS and the taxpayer takes place, the former seeking to maximize net revenue (from settlement or adjudication) and the latter to minimize expected payment. If no agreement is reached, the case goes to a perfect tax court (or a perfect audit is conducted by the IRS). Violators are liable for the amount $f$ and pay their own defence costs $d$; honest taxpayers are found not liable and are refunded their defence costs $d$. The IRS bears its own adjudication cost $c$.

In the settlement stage, the bargaining power is defined as the ability to make a take-it-or-leave-it proposal. If the proposal is rejected, the case is tried. With probability $\pi$, the IRS makes the take-it-or-leave-it proposal (Section 2.1); with probability $(1-\pi)$ the taxpayer makes such a proposal (Section 2.2). Thus, $\pi$ measures the share of bargaining power allocated to the IRS (and $1-\pi$ the share in the hands of the taxpayer).

### 2.1 Taxpayer offers a settlement amount

Let us consider the settlement stage and assume that taxpayer has the upper hand in bargaining. She makes a take-it-or-leave-it settlement offer to the IRS. If the offer is rejected, the case goes to tax court.

The equilibrium strategies define the amount offered by compliant and non-compliant taxpayers, the IRS’s beliefs upon observing any particular offer, and the rejection probabilities.

Under the assumption that the signal is sufficiently informative [i.e. $\sigma > (f - c)/(f + d)$] and that the probability of non-compliance is not too low [i.e. $\mu^r f - c -$  

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7 This assumption presumes that defense costs are allocated according to the English rule (loser pays all). However, something similar happens in the US, where litigation and administrative costs are awarded to taxpayers when the amount recovered in court is less than the amount offered in pre-trial negotiations.
(1 - \mu^r) d > 0, that is \mu > \mu^{tp} \equiv \frac{(1 - \sigma)(c + d)}{(1 - \sigma)(c + d) + \sigma(f - c)}, the unique equilibrium satisfying the Divinity refinement is as described below (proof and unrestricted case in the appendix).^8

**Proposition 1** Suppose that the taxpayer has the chance to make a take-it-or-leave-it settlement offer to the IRS. At the Divine equilibrium, non-compliers offer \( Q^{tp} = f - c \) with probability \( 1 - \tau \), and \( Q^{tp} = 0 \) with probability \( \tau = \frac{1 - \mu}{\mu} \frac{1 - \sigma}{\sigma} \frac{c + d}{f - c} \). Compliers offer \( Q^{tp} = 0 \) with certainty. The IRS believes any offer with \( Q^{tp} > 0 \) to be made by non-compliers. Independently of the signal observed, the IRS accepts with certainty any offer with \( Q^{tp} = f - c \), and rejects with certainty any offer with \( Q^{tp} \in (0, f - c) \). Offers with \( Q^{tp} = 0 \) are rejected with probability \( \rho^r = \frac{c}{f + d} \) if the signal is red, and accepted with certainty if it is green.

At equilibrium, non-compliers are either “aggressive” or “submissive.” In the “aggressive” stance, they pretend to be compliant and offer zero; in the “submissive” stance, they offer the smallest amount bound to be accepted. In turn, the IRS’s reply depends on the signal: with a green flag, any offer is accepted; with a red flag, only offers with \( Q^{tp} = f - c \) are accepted for sure. Offers with \( Q^{tp} \in (0, f - c) \) are rejected (as they are believed to be made by non-compliers), while offers with \( Q^{tp} = 0 \) are accepted with positive probability (as they come from both compliant and non-compliant taxpayers).

Unless all uncertainty is resolved, there is a chance that the case will be deferred to the tax court. The more informative the signal, the smaller this chance. In fact, the probability of the negotiation failing and the case going to court is

\[
\Pr (\text{court})^{tp} = [\mu \sigma \tau + (1 - \mu)(1 - \sigma)] \frac{1 - \sigma^r}{\sigma}, \tag{1}
\]

where the superscript “\( tp \)” reminds us that the take-it-or-leave it proposal is made by the taxpayer.

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^8**Uniqueness through Divinity in a related signalling game was first derived by Reinganum and Wilde (1986).**
At equilibrium, the expected payment by non-compliers is $f - c$; by compliers, zero.

The IRS’s expected revenue is

\[ R_{\text{red}} = \mu^r (1 - \tau) (f - c) = \mu^r f - c - (1 - \mu^r) d, \quad \text{when the signal is red,} \]

\[ R_{\text{green}} = \mu^g (1 - \tau) (f - c) = \mu^g \frac{\mu^r f - c - (1 - \mu^r) d}{\mu^r}, \quad \text{when the signal is green.} \]

Prior to the observation of the signal, the expected revenue is thus

\[ R_{\text{tp}} = [\mu \sigma + (1 - \mu) (1 - \sigma)] R_{\text{red}} + [\mu (1 - \sigma) + (1 - \mu) \sigma] R_{\text{green}} = \]

\[ = \mu (f - c) - (1 - \mu) \frac{1 - \sigma}{\sigma} (c + d), \quad (2) \]

which is clearly increasing in $\sigma$.

For $\sigma \to 1$ (perfect information), we have \( R_{\text{tp}} = \mu (f - c) \); for $\sigma \to 1/2$ (no information), we have \( R_{\text{tp}} = \mu (f + d) - (c + d) \).

### 2.2 The IRS demands a settlement amount

What if the power to make a take-it-or-leave-it proposal is in the hands of the IRS?

The amount demanded by the IRS will (optimally) be either \( Q_{\text{IRS}} = f + d \) (the highest amount non-compliers are willing to pay to avoid trial) or \( Q_{\text{IRS}} = 0 \) (the amount compliers are willing to pay).

The net intake for the IRS when it demands \( Q_{\text{IRS}} = f + d \) and has observed red is:

\[ R \left( Q_{\text{IRS}} = f \mid \text{red} \right) = \mu^r (f + d) - (1 - \mu^r) (c + d). \]

Thus the optimal amount is \( Q_{\text{IRS}} = f + d \) only if \( \mu^r \geq \frac{c + d}{(f + c) + (c + d)} \).

Similarly, given a green signal, the optimal amount is \( f + d \) only if \( \mu^g \geq \frac{c + d}{(f + c) + (c + d)} \).

**Proposition 2** Suppose that the IRS has the chance to make a take-it-or-leave-it settlement proposal to the taxpayer. The amount demanded upon observation of the red signal is \( Q_{\text{IRS}} = f + d \) if \( \mu > \frac{(1 - \sigma)(c + d)}{\sigma(f + d) + (1 - \sigma)(c + d)} \), and \( Q_{\text{IRS}} = 0 \) otherwise. The amount demanded with a green signal is \( Q_{\text{IRS}} = f + d \) if \( \mu > \frac{\sigma(c + d)}{(1 - \sigma)(f + d) + \sigma(c + d)} \), and \( Q_{\text{IRS}} = 0 \) otherwise.
At equilibrium, the IRS takes either an “aggressive” or a “submissive” stance: if aggressive, it demands the highest amount that a non-complier is willing to pay to avoid adjudication; if submissive, it demands zero, dropping the case. Noncompliant taxpayers accept offers of both types; compliant taxpayers accept only offers with $Q = 0$. The IRS adopts the aggressive strategy when it is convinced it has a good chance of prevailing in court. This is most likely to occur when the signal is red and the non-compliance probability is high (see Figure 1)

![Figure 1. The stance taken by the IRS.](image)

Given any level of precision $\sigma \geq 1/2$, let $\mu^{IRS-r}$ and $\mu^{IRS-g}$ be the non-compliance probabilities that trigger an aggressive stance on the IRS’ side given red and green signals, respectively. Thus, $\mu^{IRS-r} \equiv \frac{(1-\sigma)c}{(1-\sigma)c+\sigma(f+d)}$, and $\mu^{IRS-g} \equiv \frac{\sigma c}{(1-\sigma)(f+d)+\sigma c}$.

Prior to the observation of the signal the expected revenue is

$$R^{IRS}_{\mu} = \begin{cases} 
0 & \text{if } \mu < \mu^{IRS-r} \\
\sigma\mu(f+d) - (1-\sigma)(1-\mu)(c+d) \equiv R^{IRS-r}(\mu) & \text{if } \mu^{IRS-r} < \mu < \mu^{IRS-g} \\
\mu(f+d) - (1-\mu)(c+d) \equiv R^{IRS-g}(\mu) & \text{if } \mu^{IRS-g} < \mu,
\end{cases}$$

which is weakly increasing in $\sigma$.

For $\sigma \to 1$ (perfect information), we have $R^{IRS} = \mu(f+d)$ [as $\mu^{IRS-r} \to 0$, $\mu^{IRS-g} \to 1$]; for $\sigma \to 1/2$ (no information), we have $R^{IRS} = \mu(f+d) - (1-\mu)(c+d)$ [as $\mu^{IRS-r} \to \mu^{IRS-g}$].
At equilibrium, the expected payment by non-compliant taxpayers is

\[
\text{Exp. payment by non-compliers} = \begin{cases} 
0 & \text{if } \mu < \mu_{\text{IRS}-r}, \\
\sigma (f + d) & \text{if } \mu_{\text{IRS}-r} < \mu < \mu_{\text{IRS}-g}, \\
f + d & \text{if } \mu_{\text{IRS}-g} < \mu.
\end{cases}
\]

The probability of negotiation failure is (when the proposal is made by the IRS)

\[
\Pr(\text{court})_{\text{IRS}} = \begin{cases} 
0 & \text{if } \mu < \mu_{\text{IRS}-r}, \\
(1 - \mu)(1 - \sigma) & \text{if } \mu_{\text{IRS}-r} < \mu < \mu_{\text{IRS}-g}, \\
(1 - \mu) & \text{if } \mu_{\text{IRS}-g} < \mu.
\end{cases}
\]

Figure 2 shows the probability of negotiation failure (i.e. adjudication) when the settlement proposal is made by any of the two parties.

\[
\text{Fig. 2: IRS makes the proposal; taxpayer makes the proposal.}
\]

For \( \mu = 0 \) (certain compliance) and \( \mu = 1 \) (certain non-compliance), the negotiation cannot fail. When the proposal is made by the IRS, the negotiation can fail for \( \mu > \mu_{\text{IRS}-r} \) (the IRS demands a large settlement amount upon observation of the red signal and the taxpayer rejects it), as well as for \( \mu > \mu_{\text{IRS}-g} \) (the IRS demands a large settlement amount independently of the signal and the taxpayer rejects it). When the proposal is made by the taxpayer, the negotiation can fail for \( \mu > \mu_{\text{tp}} \) (the taxpayer offers zero and the IRS rejects the offer).
It is interesting to note that shifting the bargaining power in favour of any one party will not unambiguously decrease the probability of negotiation failure. For $\mu^{\text{IRS}-r} < \mu < \mu^{\text{tp}}$ and $\mu^{\text{IRS}-g} < \mu$, the negotiation is more likely to fail if the IRS makes the proposal; and the other way around for $\mu^{\text{IRS}-g} < \mu^{\text{tp}} < \mu^{\text{IRS}-r}$. Note however that proposals made by the taxpayers have greater chances to be accepted only if the signal is informative: for $\sigma \to 1/2$, we have $\mu^{\text{IRS}-g} \to \mu^{\text{IRS}-r} < \mu^{\text{tp}}$ and IRS’s proposals always have better chances to be accepted (as in standard pre-trial bargaining, see Daughety 1999).

Figure 3 depicts the net examination revenue as a function of the probability of non-compliance $\mu$.

\begin{figure} 
\centering 
\includegraphics[width=\textwidth]{figure3.pdf} 
\caption{Examination revenue} 
\end{figure}

$R^{\text{IRS}}$ plots the net revenue when the IRS makes the take-it-or-leave-it proposal; $R^{\text{tp}}$ the net revenue when the taxpayers makes the take-it-or-leave-it proposal. In between, we have $R$, which plots the expected net revenue when the bargaining power is shared by the two parties.

Recall that $\pi$ is the probability that the proposal is made by the IRS. Supposing that $\mu^{\text{tp}} < \mu^{\text{IRS}-g}$, we have
\[ R(\mu) = \begin{cases} 0 & \text{if } \mu < \mu^{IRS-r}, \\ \pi R^{IRS-r} & \text{if } \mu^{IRS-r} < \mu < \mu^{tp}, \\ \pi R^{IRS-r} + (1 - \pi) R^{tp} & \text{if } \mu^{tp} < \mu < \mu^{IRS-g}, \\ \pi R^{IRS-g} + (1 - \pi) R^{tp} & \text{if } \mu^{IRS-g} < \mu. \end{cases} \]  

(5)

In turn, non-compliers’ expected payment is

\[ p(\mu) = \begin{cases} 0 & \text{if } \mu < \mu^{IRS-r}, \\ \pi \sigma (f + d) & \text{if } \mu^{IRS-r} < \mu < \mu^{tp}, \\ \pi \sigma (f + d) + (1 - \pi) (f - c) & \text{if } \mu^{tp} < \mu < \mu^{IRS-g}, \\ \pi (f + d) + (1 - \pi) (f - c) & \text{if } \mu^{IRS-g} < \mu, \end{cases} \]  

(6)

which is stepwise increasing in \( \mu \).

3 Examination

Let us now consider the problem of the IRS in the selection stage.

For each file, the IRS compares its possible net revenue with the relevant costs, i.e. those associated with filing and handling the case (and acquiring specific information). The overall filing cost for each case is denoted by \( s \).

Let \( a \) be the probability of the taxpayer being selected for examination. The optimal selection policy is

\[ a = \begin{cases} 0 & \text{if } R(\mu) < s, \\ \in [0,1] & \text{if } R(\mu) = s, \\ 1 & \text{if } R(\mu) > s, \end{cases} \]

where \( R(\mu) \) denotes the expected net revenue produced by the examination (see eq. 5).

On the other side of the table we have the taxpayer, who has to decide whether to report his liability correctly or not.

The expected payment of a high-liability taxpayer who decides to underreport is equal to \( ap(\mu) \), i.e. the expected payment upon selection (see eq. 6) scaled down by the examination probability. Thus, high-liability taxpayers decide to underreport only if \( T \geq ap(\mu) \). Let \( \beta \) be the probability that a high-liability taxpayer will underreport.
In order to characterize the equilibrium, let us start with a simple remark. Under reasonable assumptions, we can exclude both $a^* = 0$ and $\beta^* = 1$. If $a = 0$, then high-income taxpayers would choose not to comply with probability one: the net revenue form the settlement stage would be very large and $a$ should not be set to zero (this is true insofar as A1: $qf > d + c$). Similarly, if $\beta = 1$, the IRS would extract a large amount in the settlement stage, it would set $a = 1$, and non-compliance would not be a profitable strategy (A2: $f - c > T$).

The equilibrium values will depend on the configuration of the parameters.\(^9\)

**Proposition 3** Let $\bar{\mu}$ be such that $R(\bar{\mu}) = s$.

1. Let $\bar{\mu} > \mu^p$. At equilibrium we have $\mu^* = \bar{\mu}$ and $a^* p(\bar{\mu}) = T$ : high-income taxpayers are non-compliant with probability $\beta^* = \frac{\mu^*}{1 - \mu^*} \frac{1 - a}{q}$, and they are selected for examination with probability $a^* = T/p(\bar{\mu})$. Upon selection, the settlement stage proceeds as described in Proposition 1 or 2, depending on who makes the proposal.

2. Let $\bar{\mu} < \mu^p$. If $p(\bar{\mu}) = \pi \sigma (f + d) > T$, then at equilibrium, we have $\mu^* = \bar{\mu}$ and $a^* p(\bar{\mu}) = T$ as before. If $p(\bar{\mu}) = \pi \sigma (f + d) < T$, then at equilibrium, we have $\mu^* = \mu^p$, $a^* = 1$ and $p(\mu^p) = T$. In other words, high-income taxpayers are non-compliant with probability $\beta^* = \frac{\mu^*}{1 - \mu^*} \frac{1 - a}{q}$ and they are all selected for examination. If taxpayers make the offer, then they all offer $Q = 0$. The IRS accepts always if the signal is green, and with probability $1 - \frac{T}{\pi (f + d)}$ if it is red. If the IRS makes the offer, the settlement stage proceeds according to Proposition 2 (demand $Q = f + d$ if signal is red, demand 0 if green).

If the sanction for non-compliance is sufficiently large (Case 1), the equilibrium strategy entails underreporting with probability $\beta^*$ by high-liability taxpayers. A fraction $a^*$ of taxpayers reporting low liability are selected for examination. The negotiation outcome depends on bargaining power: the larger the share in the hands of the IRS and the higher the expected settlement payment for the taxpayer.

\(^9\)Note: for $\bar{\mu} > \mu^p$, we have $p(\bar{\mu}) \geq \pi \sigma (f + d) + (1 - \pi) (f - c) \geq f - c$ since $\sigma \geq \frac{f - c}{f + d}$. Thus, $p(\bar{\mu}) \geq T$ as far as $f - c > T$. 

Case 2 is similar to Case 1, except for the possibility that all taxpayers reporting a low liability are selected for examination (when the expected payment associated with the audit process is particularly low).

In the following, we will concentrate on Case 1 ($\bar{\mu} > \mu^{bp}$).

Let us now consider the net tax and penalty intake to the IRS

$$Net\ tax\ revenue: \ \Omega^* = q(1 - \beta^*) T + [1 - q + q\beta^*] a^* \left[ R(\mu^*) - s \right] = \frac{q - \mu^*}{1 - \mu^*} T,$$

which is clearly decreasing in $\mu^*$.

Recall that at equilibrium, we have $R(\mu^*) = s$. Since $\frac{\partial R(\mu)}{\partial \sigma} > 0$, $\frac{\partial R(\mu)}{\partial \pi} > 0$, $\frac{\partial R(\mu)}{\partial f} > 0$ and $\frac{\partial R(\mu)}{\partial c} < 0$, we must have $\frac{\partial \mu^*}{\partial \sigma} < 0$, $\frac{\partial \mu^*}{\partial \pi} < 0$, $\frac{\partial \mu^*}{\partial f} < 0$, $\frac{\partial \mu^*}{\partial c} > 0$, as well as $\frac{\partial \mu^*}{\partial s} > 0$. Thus

**Remark 1** The net tax revenue is greater when the penalty for misreporting is higher, the IRS has more bargaining power, the signal available to the IRS is more precise, enforcement costs for the IRS are lower, and the defence cost for the taxpayer is lower (the latter, only if the non-compliance rate is relatively high$^{10}$).

4 The optimal amount of discretion

In this section, we investigate the impact of “discretion” on the enforcement process.

We first consider the case for ruling out negotiated settlements and just granting the IRS the power to drop or pursue cases. Secondly, we consider the case for imposing strict rules on the enforcement process, providing no leeway for discretionary decisions.

**Weak discretion.** Settlements may give the taxpayer bargaining power, providing leeway for substantial “discounts” at the negotiation stage. This may ultimately foster additional non-compliance or weaken the enforcer’s incentives.$^{11}$ We therefore

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$^{10}$The defence cost acts as a supplement to the sanction with respect to non-compliers (when the IRS has bargaining power) and as an increase in enforcement costs with respect to compliers. The first aspect tends to fosters compliance, the latter non-compliance.

$^{11}$This first argument is advanced, with respect to settlements in civil liability cases, by Polinsky and Rubinfeld (1988). For the latter, in a general law enforcement model, see Franzoni (1999).
address the question whether officers should be deprived of the power to negotiate the sanction.

Figure 4 shows noncompliers’s effective payment upon examination in three different cases:

i) the IRS makes the settlement proposal;

ii) the taxpayer makes the proposal;

iii) the IRS cannot negotiate the settlement.

Taxpayers’s expected payment when the negotiation is allowed will lie between cases i) and ii), depending on the distribution of the bargaining power between the parties. If the taxpayers has enough bargaining power, then the negotiation effectively reduces her expected payment upon examination. This, however, should not be a concern. What matters is the expected penalty for non-compliance, \( a^* p^* (\mu^*) \), which remains unchanged: in view of the settlement process, the IRS selects a larger fraction of taxpayers for examination.

Fig. 4: IRS makes offer; No Settlement; taxpayer makes offer.

Let us now compare the net revenue (per examination) when the IRS can settle cases and has zero bargaining power, \( R^{\text{IP}} \), with the case when settlements are not allowed (and the IRS can only decide whether to drop the case or take it to court), \( R^{\text{NS}} \):
\[ R^{tp} - R^{NS} = \]

\[
\begin{cases} 
0 & \text{for } \mu < \mu^{tp} \\
\frac{1-\sigma}{\sigma} \left[ \mu \sigma (f - c) - (1 - \mu) (1 - \sigma) (c + d) \right] > 0 & \text{for } \mu^{tp} \leq \mu < \mu^{NS-g} \\
(1 - \mu) (c + d) \frac{2\sigma}{\sigma} > 0 & \text{for } \mu^{NS-g} \leq \mu,
\end{cases}
\]

where \( \mu^{NS-g} = \frac{\sigma (c + d)}{(1 - \sigma)(f - c) + \sigma (c + d)} \) is the non-compliance level that induces the IRS not to drop the case upon observation of a green signal (when settlements are not allowed). See Figure 5.

Note that the settlement negotiation does not increase the net revenue to the IRS if the signal is not informative and the taxpayer holds all the bargaining power (\( \pi = 0 \)). For \( \sigma \rightarrow 1/2 \), we have \( \mu^{NS-g} \rightarrow \mu^{tp} \) and \( R^{tp} = R^{NS} \).

For \( \sigma > 1/2 \) (the signal is informative), the increase in the net revenue associated with each examination makes the IRS more aggressive and induces a lower non-compliance rate. If \( \pi > 0 \) (the IRS has some bargaining power), the net examination revenue is even greater, and the non-compliance rate has to further decrease.

The following proposition relates to the desirability of settlement negotiations (as opposed to the simple option of dropping/pursuing cases).

**Proposition 4** Settlements have a beneficial impact on tax enforcement. They allow the IRS to better exploit its information and to benefit from its bargaining power at the negotiation stage.
Thus, one can think of two fundamental roles served by settlements: a) provide the IRS with some bargaining power, b) allow the IRS to benefit from soft information. In the tax reporting stage, all the power is *de facto* allocated to the taxpayer: the IRS can only accept the return or reject it (i.e. examine it). In the settlement stage, the bargaining power can be more evenly distributed: the IRS can determine a new liability, which the taxpayer can in turn accept or reject. If the IRS does not engage into settlement negotiations, it misses the opportunity to exploit its bargaining power (which pertains to the allocation of the surplus generated by avoiding costly litigation) and the information available at the settlement stage (signal+offer).

- *No discretion.* Let us now consider the case where the IRS has no discretion. Here the enforcement process is bound by strict rules preventing the IRS to deviate ex-post from the ex-ante optimal policy.\(^{12}\) Strict rules provide the IRS with a greater policy set ex-ante (the IRS can implement any examination rate), but prevents it from benefiting from officers’ professional judgement.\(^{13}\) One then has to contrast the strategic costs of discretion (**loss of leadership**) with its advantages (**professional judgement**).

Let us consider the net tax revenue under a policy of perfect leadership (full commitment). Here audits are used as a pure threat: all taxpayers comply and settlements are precluded. Cases cannot be dropped. In order to ensure deterrence, the IRS sets \(\hat{\alpha} = \frac{T}{f+a}\) and gets

\[
\Omega^{\text{full comm.}} = qT - (1-q)(c+s+d) \hat{\alpha} = qT - (1-q)(c+s+d) \frac{T}{f+d}
\]

Simple calculations show that \(\Omega^{*}_{\sigma=1/2} < \Omega^{\text{full comm.}}\). Thus, \(\Omega^{*}\) can be greater than \(\Omega^{\text{full comm.}}\) only if \(\sigma\) is large.

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\(^{12}\)This assumption characterises the so called principal-agent approach to law enforcement, recently surveyed by Polinsky and Shavell (2000).

\(^{13}\)By definition, “rules” cannot be conditioned on unverifiable information. In other words, one can motivate inspectors to gather and use taxpayer-specific information in order to enhance net recovery (ex-post perspective), but not to provide general deterrence, which can hardly be credited to individual officers (ex-ante perspective).
Take the extreme case where discretion displays its greatest efficacy, i.e. where the signal is perfectly informative. With $\sigma \to 1$, we have $R(\mu)_{\sigma \to 1} = \mu f + \pi \mu d - (1 - \pi) \mu c$, $\mu_{\sigma \to 1}^* = \frac{s}{f + \pi d - (1 - \pi) c}$, and

$$\Omega_{\sigma \to 1}^* = \frac{q(f + \pi d - (1 - \pi) c) - s}{f + \pi d - (1 - \pi) c - s} T.$$ 

Note that $\Omega_{\sigma \to 1}^*$ converges to the First Best ($\Omega = qT$) only if $s \to 0$.

We have

$$\Omega_{\sigma \to 1}^* > \Omega_{\text{full comm.}} \iff \pi > \bar{\pi} = \frac{s(1 - q)(c + s + d) - q(f + d)(s - c)}{d(1 - q)(c + s + d) + qc(f + d)},$$

where $\bar{\pi} > 0$ only if $s(1 - q)(c + s + d) > q(f + d)(s - c)$, and $\bar{\pi} < 1$ only if $(d - s)(1 - q)(c + s + d) + q(f + d)s > 0$. Thus, if $d > s$, then $\bar{\pi} < 1$, and $\Omega_{\sigma \to 1}^* > \Omega_{\text{full comm.}}$ whenever the bargaining power of the IRS is sufficiently high.

We can then conclude that

**Proposition 5** The optimal enforcement policy may entail discretion (i.e. it may allow the IRS to make decisions on an ex-post basis). Discretion is preferable only if the IRS can rely on precise information at the settlement stage and it has a large share of bargaining power.

This result provides a theoretical argument in favour of discretion in tax enforcement: despite its adverse strategic effect, it allows the IRS to exploit soft case-specific information. Thus standard enforcement procedures, which usually aim to maximize post-selection intake are not necessary “irrational:” they simply assume that professional judgement serves a valuable function in the enforcement process.

## 5 Final remarks

In this model, law enforcement is guided by three types of information: equilibrium beliefs, soft information, and legal/documentary evidence. The first type of information, usually statistical (“x% of population are likely to cheat”) guides the IRS’s
selection decision: how many taxpayers to select and, possibly, which categories first. The second, jointly with the first (and often the third), shapes the stance of the IRS in the settlement process. The third type alone guides the court’s decision. This distinction seems to capture important features of the enforcement process.

The emphasis on soft information has allowed us to bring out the impact of officers’ professional judgement on the performance of the enforcement system. In particular, it is shown that professional judgement yields the greatest benefits when officers have the power to make discretionary settlements. In turn, and not surprisingly, the net impact of settlement is larger when: i) officers have access to precise information, and ii) they hold greater bargaining power in the negotiation. When no information is available and the bargaining power fully rests in the hands of the taxpayer, settlements produce no positive effect. They only contribute to the disruption of the IRS’s ability to commit itself to deterrence.

Our analysis sets aside other important issues that may bear on the enforcement process. First, contamination between the different types of evidence is likely. The most serious problems arise when loose “statistical” evidence or unsubstantiated opinions affect adjudication. Here, the increased probability of erroneous decisions is likely to affect individuals’ behaviour, as well as the integrity of the enforcement process, adversely.14 A second complication arises when the enforcer’s incentives are wrongly specified, i.e. when it pursues private goals (an extreme example would involve corruption). Discretion amplifies the power of the enforcer, for good and evil. It is therefore important that the enforcer’s incentives are properly defined before it is granted additional power.

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14 See Schrag and Scotchmer (1994) for an important contribution on this point. Overviews of the economics of evidence law can be found in Posner (1998) and Packer and Kobayashi (1998).
Appendix 1. Signal prior to selection

Let us briefly consider the possibility that an informative signal is used by the IRS to select taxpayers for examination.

Let $\sigma_s$ be the precision of this signal.

Clearly, the IRS will first select taxpayers whose signal is adverse (see Macho and Pérez 2000). Let $\tilde{\mu}^r$ be the probability that a taxpayer with a Red flag is non-compliant. The expected revenue upon selection is $R(\tilde{\mu}^r)$ (see eq. 5). The solution to the game is as in Section 2, with the substitution of $\tilde{\mu}^r$ for $\mu$, with $\tilde{\mu}^r > \mu$. In fact, the more precise the signal, the larger the expected net yield of each examination.

At equilibrium (Case 1), we have $R(\tilde{\mu}^r^*) = s$, and

$$\tilde{\Omega}^* = q \left( 1 - \tilde{\beta}^* \right) T + \left[ (1 - q) (1 - \sigma_s) + \left( q \tilde{\beta}^* \right) \sigma_s \right] a^* \left[ R(\tilde{\mu}^r^*) - s \right] = 0$$

with $\tilde{\beta}^* = \frac{1 - \sigma_s}{\sigma_s} \frac{(1-q)(1-R^{-1}(s))}{q R^{-1}(s)} < \beta^* = \frac{1 - q}{q} \frac{(1-R^{-1}(s))}{R^{-1}(s)}$, and $\lim_{\sigma_s \to 1} \beta^* = 0$.

Thus, first best is achieved when the signal is perfect.

The continuation of the game remains as described in Sections 2 and 3.

Appendix 2. Characterization of the equilibrium

Let us consider the settlement game in which the taxpayer has the bargaining power. There are two possible cases.

Case A: $\sigma > (f - c) / (f + d)$. When the signal is Green, offers with $Q^{tp} = 0$ are accepted with probability 1. When the signal is Red, they are rejected with probability $\rho^r = \frac{\tilde{\mu}^r}{\sigma S(\sigma)} > 0$ if $\mu > \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d)+\sigma(f+c)}$, and with probability 0 otherwise. In the latter case, the non-compliance probability is too low to ever support a rejection.

Thus let $\mu > \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d)+\sigma(f+c)}$. Compliant taxpayers always offer $Q^{tp} = 0$. Non-compliers are indifferent between offering $Q^{tp} = 0$ and $Q^{tp} = f - c$ insofar as

$$f - c = \rho (f + d),$$

which holds true for $\rho = \rho^r$. In turn, the IRS is indifferent between rejecting and not
rejecting an offer with \( Q^{lp} = 0 \), insofar as

\[ 0 = \mu^e \tau (f-c) - (1 - \mu^e) (c + d). \]

Thus, non-compliers have to offer \( Q^{lp} = 0 \) with probability \( \tau^* = \frac{1 - \mu^e}{\mu} \frac{c + d}{f - c} \), i.e. \( \tau^* = \frac{1 - \mu - \sigma}{\sigma f + d} \).

Offers with \( Q^{lp} \in (0,f-c) \) are not accepted, independently of the signal received. Here, Divinity comes into play. The question is what the IRS should assume when it observes an offer with \( Q^{lp} \in (0,f-c) \). Under the Divinity requirement (D1) of Banks and Sobel (1987), the right belief is that which attributes the deviation to the type who is likely to benefit from it, i.e. the non-complier. Under this assumption, the IRS is better off not accepting such offers.

The same logic is used to eliminate all perfect Bayesian equilibria different from the one described.

**Case B**: \( \sigma > (f-c)/(f+d) \). For \( \mu < \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d) + \sigma(f-c)} \), offers with \( Q^{lp} = 0 \) are rejected with certainty, independently of the signal. For \( \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d) + \sigma(f-c)} < \mu < \frac{\sigma(c+d)}{\sigma(c+d) + (1-\sigma)(f-c)} \), they are accepted with certainty if the signal is Green and rejected with probability \( \rho^r \) if the signal is Red.\(^{15} \) For \( \mu > \frac{\sigma(c+d)}{\sigma(c+d) + (1-\sigma)(f-c)} \), they are rejected with probability \( \rho^g \) if the signal is Green and rejected with certainty when the signal is Red.

For \( \mu < \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d) + \sigma(f-c)} \) and \( \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d) + \sigma(f-c)} < \mu < \frac{\sigma(c+d)}{\sigma(c+d) + (1-\sigma)(f-c)} \), the equilibrium configuration is the same as in Case A.

For \( \mu > \frac{\sigma(c+d)}{\sigma(c+d) + (1-\sigma)(f-c)} \), upon observing Green the IRS rejects offers with \( Q^{lp} = 0 \) with probability \( \rho^g = \frac{(f-c) - \sigma}{(1-\sigma)(f+d)} \) (thus making non-compliers indifferent between offering 0 and \( f-c \)). Noncompliers offer \( Q^{lp} = 0 \) with probability \( \tau^* = \frac{1 - \mu^e}{\mu} \frac{c + d}{f - c} \), i.e. \( \tau^* = \frac{1 - \mu - \sigma}{\sigma f + d} \) (thus making the IRS indifferent between rejecting and accepting upon observing Green).

\(^{15} \)We are implicitly assuming that \( \frac{(1-\sigma)(c+d)}{(1-\sigma)(c+d) + \sigma(f-c)} < \frac{\sigma(c+d)}{\sigma(c+d) + (1-\sigma)(f-c)} \).
References


