On IRS’s Servicing and Auditing Taxpayers

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IRS’s missions

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- The conventional approach on tax compliance focuses on enforcement through audit.
- In 1984, the declared purpose of the IRS is “to collect tax revenue at the least cost.”
IRS’s missions

- In fiscal year 2008, the IRS budget request includes 3.6 billion for taxpayer service and 7.2 billion for enforcement.
Introduction

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▶ “Government Accountability Office” highlights: “enforcement efforts should be combined with taxpayer service because both affect compliance.” (2008)
Introduction

IRS’s missions

- In fiscal year 2008, the IRS budget request includes 3.6 billion for taxpayer service and 7.2 billion for enforcement.
- “Government Accountability Office” highlights: “enforcement efforts should be combined with taxpayer service because both affect compliance.” (2008)
- To our knowledge, there is no formal model to address the interaction of service and enforcement in the framework of tax compliance.
Model

Taxpayers

- There is a 1 + q mass of continuum taxpayers; 1 unit of them have income \( y \), and \( q \) unit of them do not have \( y \) income. Income information is private to taxpayers.
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- With a portion $\phi$, those who have income $y$ may be eligible for deduction or exemption.
- However, the true status is uncertain to taxpayers, and the IRS’s service can mitigate the uncertainty.
- Three types of taxpayers: (i) those who do not have $y$ income, (ii) those who have income $y$ but it is deductible, and (iii) those who have income $y$ but it is not deductible. Only in third case they need to pay tax $T$. 
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\[ \Pr(s = 0 | \theta = 0) = \Pr(s = y | \theta = y) = r \in [\frac{1}{2}, 1], \]
\[ \Pr(s = 0 | \theta = y) = \Pr(s = y | \theta = 0) = 1 - r. \]
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- IRS’s technology:

\[
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Timing

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- Taxpayers who do not have \( y \) always report 0. Taxpayers who have \( y \), after consulting the IRS, simultaneously and independently choose whether to report \( y \) or 0.
- The IRS randomly chooses to audit a fraction of taxpayers who report 0.
Equilibrium

**Taxpayer’s best response when** \( s = 0 \):

- if he files \( y \), he obtains \( u(y - T) \).

\[
\begin{align*}
\text{The best response given IRS's audit probability } & \hat{\alpha}_0(\beta; r) = \\
& \begin{cases} 
1 & \text{if } \beta < \bar{\beta}_0(r) \\
(0, 1) & \text{if } \beta = \bar{\beta}_0(r) = [1 + (1 - \phi) r \phi (1 - r)]^{\frac{1}{\mu}}; \\
0 & \text{if } \beta > \bar{\beta}_0(r). 
\end{cases}
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\]
Taxpayer’s best response when \( s = 0 \):

- if he files \( y \), he obtains \( u(y - T) \).
- if he instead files 0, he obtains:

\[
\beta \frac{\phi (1 - r)}{(1 - \phi) r + \phi (1 - r)} u(y - T - F) + \left[ \beta \frac{(1 - \phi) r}{(1 - \phi) r + \phi (1 - r)} + 1 - \beta \right] u(y).
\]
Equilibrium

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- The best response given IRS’s audit probability $\beta$:

$$\hat{\alpha}_0(\beta; r) = \begin{cases} 
1 & \text{if } \beta < \bar{\beta}_0(r); \\
(0, 1) & \text{if } \beta = \bar{\beta}_0(r) = [1 + \frac{(1 - \phi)r}{\phi(1-r)}] \mu; \\
0 & \text{if } \beta > \bar{\beta}_0(r).
\end{cases} \quad (1)$$
Equilibrium

Taxpayer’s best response when $s = y$:

- if he follows the advice, he obtains $u(y - T)$. 

Lemma. For a given $\beta$, $\hat{\alpha}_0(\beta) \geq \hat{\alpha}_y(\beta)$. 

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$$\beta \frac{\phi r}{\phi r + (1 - \phi)(1 - r)} u(y - T - F) + \left[\beta \frac{(1 - \phi)(1 - r)}{\phi r + (1 - \phi)(1 - r)} + 1 - \beta\right] u(y).$$
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- The best response given IRS’s audit probability \( \beta \):  
  
  \[
  \hat{\alpha}_y(\beta; r) = \begin{cases} 
  1 & \text{if } \beta < \bar{\beta}_y(r); \\
  (0, 1) & \text{if } \beta = \bar{\beta}_y(r) = \left[ 1 + \frac{(1 - \phi)(1 - r)}{\phi r} \right] \mu; \\
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  0 & \text{if } \beta > \bar{\beta}_y(r).
  \end{cases}
  \]

- **Lemma.** For a given \( \beta \), \( \hat{\alpha}_0(\beta) \geq \hat{\alpha}_y(\beta) \).
IRS’s best response:

- Given \( r, \alpha_y \) and \( \alpha_0 \), the IRS’s profit is

\[
\pi(\beta; r) = \beta[p(T + F) - c]
\]

where

\[
p \equiv \frac{\phi[r\alpha_y + (1-r)\alpha_0]}{\{\phi[r\alpha_y + (1-r)\alpha_0] + (1-\phi)[(1-r)\alpha_y + r\alpha_0]\} + q},
\]

which is the probability of detecting an evader.
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- The best response of the IRS is

\[
\hat{\beta}(\alpha_y, \alpha_0; r) = \begin{cases} 
1 & \text{if } p > \kappa; \\
(0, 1) & \text{if } p = \kappa = \frac{c}{T + F}; \\
0 & \text{if } p < \kappa.
\end{cases}
\]
Equilibrium outcome

\[ \hat{\alpha}_0(\beta; r) \]

\[ \hat{\beta}(\alpha_0, \alpha; r) \]
**Proposition 1.** Let $\bar{r} \equiv \frac{\phi(1-\kappa)-q\kappa}{\phi(1-\kappa)+(1-\phi)\kappa}$. Given $\kappa$, then in equilibrium:

1. If $\kappa < \frac{\phi}{1+q}$ and $r < \bar{r}$, then
   \[
   \alpha_0^* = \frac{q\kappa}{\phi(1-\kappa)-[\phi(1-\kappa)+(1-\phi)\kappa]r}, \quad \alpha_y^* = 0, \text{ and } \beta^* = \bar{\beta}_0.
   \]

2. If $\kappa < \frac{\phi}{1+q}$ and $r \geq \bar{r}$, then
   \[
   \alpha_0^* = 1, \quad \alpha_y^* = \frac{[\phi(1-\kappa)+(1-\phi)\kappa]r-\phi(1-\kappa)+q\kappa}{[\phi(1-\kappa)+(1-\phi)\kappa]r-(1-\phi)\kappa}, \text{ and } \beta^* = \bar{\beta}_y.
   \]

3. If $\kappa \geq \frac{\phi}{1+q}$, then
   \[
   \alpha_0^* = \alpha_y^* = 1, \text{ and } \beta^* = 0.
   \]
Equilibrium outcome

\[ \kappa \]

\[ \frac{\phi}{1 + q} \]

\[ \frac{\phi}{1 + 2q} \]

\[ \alpha_0^* = \alpha_y^* = 1, \beta^* = 0 \]

\[ \alpha_0^* = 1, \alpha_y^* \in (0,1), \quad \beta^* = \bar{\beta}_y \]

\[ \alpha_0^* \in (0,1), \alpha_y^* = 0, \quad \beta^* = \bar{\beta}_0 \]
Important Properties:

When $\kappa < \frac{\phi}{1+q}$:

1. Both $\alpha_0^*$ and $\alpha_y^*$ are non-decreasing in $r$.

2. If $r < \bar{r}$, $\beta^* = \bar{\beta}_0$ is increasing in $r$;
   if $r \geq \bar{r}$, $\beta^* = \bar{\beta}_y$ is decreasing in $r$. 
IRS’s preferred size of taxpayer service

- Net tax revenue:

\[
\Pi = \left\{ \phi [r(1-\alpha_y^*) + (1-r)(1-\alpha_0^*)] + (1-\phi) [(1-r)(1-\alpha_y^*) + r(1-\alpha_0^*)] \right\} T
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- IRS’s profit from enforcement per se is equal to zero in equilibrium.
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IRS’s profit from enforcement per se is equal to zero in equilibrium. All the net tax revenues are from those taxpayers who voluntarily report \( y \) to the IRS.

Since \( \alpha_0^* \) and \( \alpha_y^* \) are non-decreasing in \( r \) \( \Rightarrow \frac{\partial \Pi}{\partial r} < 0 \).
Optimal size of taxpayer service

IRS’s preferred size of taxpayer service

- Net tax revenue:

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- IRS’s profit from enforcement per se is equal to zero in equilibrium. All the net tax revenues are from those taxpayers who voluntarily report \( y \) to the IRS.

- Since \( \alpha^*_0 \) and \( \alpha^*_y \) are non-decreasing in \( r \) ⇒ \( \frac{\partial \Pi}{\partial r} < 0 \).
Proposition 2. The IRS’s preferred size of taxpayer service is minimal, that is, \( r^* = \frac{1}{2} \).
Society’s preferred size of taxpayer service

- Excess burden of tax evasion, or risk premium, $C(\beta(r))$:
  \[ u(y - C) = \phi \beta u(y - T - F) + (1 - \phi \beta) u(y). \]
Optimal size of taxpayer service

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- Excess burden of tax evasion, or risk premium, $C(\beta(r))$:
  \[ u(y - C) = \phi \beta u(y - T - F) + (1 - \phi \beta) u(y). \]
- Social welfare function:
  \[ W = v(\Pi) - C \]

where $v' > 0, v'' < 0$. 
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- $C(r)$ is increasing (decreasing) in $r$ if $r < \bar{r}$ ($r \geq \bar{r}$).
Optimal size of taxpayer service

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- Excess burden of tax evasion, or risk premium, $C(\beta(r))$:
  \[ u(y - C) = \phi \beta u(y - T - F) + (1 - \phi \beta) u(y). \]

- Social welfare function:
  \[ W = \nu(\Pi) - C \]
  where $\nu' > 0$, $\nu'' < 0$.

- $C(r)$ is increasing (decreasing) in $r$ if $r < \bar{r}$ ($r \geq \bar{r}$).
- $C(1/2) > C(1) \Rightarrow r = 1$ minimizes $C(\beta(r))$. 
Proposition 3. If there exists an interior solution for the social optimal size of taxpayer service $r^{**}$, then $r^{**} \geq \bar{r}$. 
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- There exists a conflict between the IRS and the society.
- In 1998, the declared mission of the IRS was changed to “provide taxpayers top-quality service by helping them understand and meet their tax responsibilities.”
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Extensions

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- Uninformed taxpayers: who do not utilize the service provided by the IRS.
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- Not all taxpayers who have income $y$ are assumed to seek advice from the IRS.
- Uninformed taxpayers: who do not utilize the service provided by the IRS.
- Informed taxpayers: who seek the private agency, which provides more informative service than the IRS does.
The gap between the IRS’s and the society’s optimum is larger with a higher fraction of uninformed taxpayers, but is smaller with a higher fraction of informed taxpayers.
The gap between the IRS’s and the society’s optimum is larger with a higher fraction of uninformed taxpayers, but is smaller with a higher fraction of informed taxpayers.

The IRS prefer more uninformed but less informed taxpayers. The society prefers less uninformed taxpayers; but may also prefer less informed taxpayers sometimes.