Tax Compliance, Informality and Contributive Pensions

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Introduction (1)

- Tax evasion is endemic in many countries, especially in developing ones.
- Moore and Mascagni, 2014: do not collect even 1/2 of what they should.
- However, it is key for development.
- How to solve the problem? Increasing and better focused enforcement, improving the collection and management of information, reducing the costs of complying with the law, providing incentives for those who comply, modifying tax bases and rates and sending messages.

Introduction (2)

Our research questions:

- The solution we explore is different: *we establish a close link between the amount of taxes paid and the benefits obtained.*
- Focus on income taxation.
- In particular, we study how a government that uses the pension system to redistribute towards the olds and the poors must design it when it faces evasion and political restrictions on the tax rate.
- Use a political economy model where taxation is chosen by majority voting and the level of redistribution is chosen at the constitutional level by a Rawlsian social planner.
- Evasion is possible but costly.
- The pension system is partly contributive (Bismarkian) and redistribute (Beveridgian).

Introduction (3)

Our results:

- *Without evasion costs,* agents comply with the tax system when they expect to obtain a higher return from the pension system than from the private saving system.

  They are *indifferent as to the level of taxation* as they can always adapt their level of compliance so as to transfer the exact amount they wish to the old age.

  It is optimal to have a contributory system: people report more income, it increases resources collected and thus the amount that can be redistributed.

Introduction (4)

Our results:

- *With evasion costs*, agents always comply at least partially, independently of the returns from private savings and public pensions.

  The tax rate and how much people report to the tax authorities are not perfect substitutes anymore so that the preferred tax rate now depends on income as well as on the relative returns from public pensions and private savings.
  Under some circumstances, we find that some agents may even vote for a tax rate rate that lies on the decreasing part of the Laffer curve.

  The majority voting tax rate is positive in general.

  The Bismarkian factor is positive for 2 reasons: 1) political support of richer agents 2) increase of the flat pension benefit thanks to higher compliance rates and a larger tax base.

Litterature

- Modelling of pensions : Casamatta et al. (2000)
- Tax evasion entails a cost with certainty $\neq$ Allingham and Sandmo (1972)
- Political economy of tax evasion: Borck (2009), Borck (2004), Traxler (2012), Alm et al. (1999), Kopczuk (2001).

The model (1)

- Two-period model
- Agents have different productivity, $y \in [y_{min}, y_{max}]$, with $y_m < \bar{y}$, and a density function denoted by $f(y)$.
- Expected utility is $u(c) + \pi u(d)$ with

$$\begin{aligned} c &= y - \tau\tilde{y} - s = (1-\tau\gamma)y - s \\ d &= \frac{\varepsilon}{\pi}s + P(\tau, \alpha; y) \end{aligned}$$

- Pension benefit:

$$\begin{aligned} P(\tau, \alpha; y) &= \frac{\tau}{\pi}\left(\alpha\tilde{y} + (1-\alpha)E(\tilde{y})\right) \\ &= \frac{\tau}{\pi}\left(\alpha\gamma y + (1-\alpha)E(\tilde{y})\right) \end{aligned}$$

with $\tilde{y} = \gamma y$ is the reported income, and $0 \leq \gamma \leq 1$ is the rate of compliance or the fraction of the true income reported.

The model (2)

Timing of the model:

- The Rawlsian government sets how contributive the pension system should be, i.e. the level of the Bismarkian factor, α.
- Agents then vote over the level of the tax rate τ that will finance the pension system.
- Finally, given the tax rate chosen at the majority voting equilibrium, they decide how much to comply with the tax system γ, and how much to save, s.

$\rightarrow$ we proceed backward.

A compliance-choice model with no cost of evasion (1)

- $\gamma^*(\tau, \alpha; y)$ and $s^*(\tau, \alpha; y)$ are defined by:

$$\begin{aligned} \frac{\partial U}{\partial s} &= -u'(c) + \varepsilon u'(d) \leq 0 \\ \frac{\partial U}{\partial \gamma} &= \tau y[-u'(c) + \alpha u'(d)] \leq 0 \end{aligned}$$

  $\Rightarrow$ Agents either save on private markets or comply with the tax system depending on whether $\varepsilon \gtrless \alpha$.

- Concentrate on $\alpha \geq \varepsilon$: all agents prefer public pensions to private savings: $s^*(\tau, \alpha; y) = 0$ and $\gamma^*(\tau, \alpha; y) \geq 0$.
  Agents with $y \leq \hat{y}(\tau, \alpha)$ prefer $\gamma^*(\tau, \alpha; y) = 0$ and rely exclusively on the flat part of the pension benefit.
  Those with $y > \hat{y}(\tau, \alpha)$ prefer $0 < \gamma^*(\tau, \alpha; y) \leq 1$.

A compliance-choice model with no cost of evasion (2)

- Note that choosing γ for a given τ is equivalent to letting the agent choose his preferred *effective* tax rate level, $t = \gamma\tau \in [0,1]$ such that

$$U(t;y) = u((1-t)y) + \pi u(\frac{1}{\pi}(\alpha t y + (1-\alpha)E(ty)))$$

$\Rightarrow$ we obtain the same FOC as for γ:

$$\frac{\partial U(t;y)}{\partial t} = y[-u'(c) + \alpha u'(d)] \leq 0$$

- $t^*(\alpha;y)$ is independent of τ: the agent will always pay his preferred amount of effective taxation $t^*(\alpha;y)$ by adapting exactly how much he reports, i.e. $\gamma^*(\tau,\alpha;y)$ to a variation in the level of the tax rate.
- The flat pension benefit, $b(\tau,\alpha) = (1-\alpha)\tau E(\tilde{y})/\pi = (1-\alpha)E(t^*(\alpha;y)y)/\pi$ is independent of the level of τ.

A compliance-choice model with no cost of evasion (3)

Preference for the tax rate:

- The indirect utility function of an agent with income y takes the following form:

$$\begin{aligned} V(\tau,\alpha;y) &= u((1-\gamma^*(\tau,\alpha;y)\tau)y) \\ &+ \pi u(\frac{\tau}{\pi}(\alpha\gamma^*(\tau,\alpha;y)y+(1-\alpha)E(\tilde{y}))) \end{aligned}$$

- The preferred tax rate is such that

$$\begin{aligned} \frac{\partial V(\tau,\alpha;y)}{\partial\tau} &= \gamma^*(\tau,\alpha;y)y(\alpha u'(d)-u'(c)) \\ &+(1-\alpha)u'(d)[E(\tilde{y})+\tau\frac{dE(\tilde{y})}{d\tau}] \leq 0 \end{aligned}$$

A compliance-choice model with no cost of evasion (4)

Preference for the tax rate:

- Second term is always zero as the flat part of the pension benefit is independent of τ.
- The first term is also always nil. If agents have $y \leq \hat{y}(\alpha)$, $\gamma^*(\tau, \alpha; y) = 0$. For agents with $y > \hat{y}(\alpha)$, $\gamma^*(\tau, \alpha; y) > 0$ and satisfies $\alpha u'(d) = u'(c)$.
- But, agents with $y > \hat{y}(\alpha)$ are indifferent to the tax rate as long as $\tau^*(\alpha; y)$ is above $\bar{\tau}(\alpha; y)$, so that $\gamma^*(\alpha; y) \in [0, 1]$.

Voting Equilibrium: there is unanimity in favor of $\tau^V \in [\bar{\tau}(\alpha; y_{max}), 1]$. Every agent obtains maximum utility, i.e. the level obtained at their preferred allocation $(\gamma^*(\tau^*(\alpha; y), \alpha; y), \tau^*(\alpha; y))$ or equiv. $t(\alpha^*; y)$.

A compliance-choice model with no cost of evasion (5)

Constitutional choice of the level of the Bismarkian factor:

- Social planner is Rawlsian and maximises:

$$\max_{\alpha} V(\tau^V, \alpha; y_{min}) = u(y_{min}) + \pi u(\frac{\tau^V}{\pi}(1-\alpha)E(\tilde{y}))$$

where τ^V is independent of α and $E(\tilde{y}) = E(\gamma^*(\tau^V, \alpha, y)y)$.

- The level of the Bismarkian factor maximises the uniform pension benefit:

$$(1-\alpha)\frac{dE(\tilde{y})}{d\alpha} = E(\tilde{y})$$

$\Rightarrow$ The only reason here for a positive α is related to the distortion effect through $E(\tilde{y})$.

$\Rightarrow$ No political support effect as in Casamatta et al. (2000) since agents are indifferent to the level of τ^V.

Introducing a cost of evasion (1)

Individual decisions

- *Cost of evasion:*

$$C(\gamma, \tau; y) = \frac{1}{2}\tau y(1-\gamma)^2,$$

$\Rightarrow$ First period consumption is now:

$$\begin{aligned} c &= y(1-\gamma\tau) - \frac{1}{2}\tau y(1-\gamma)^2 - s \\ &= y(1-\varphi(\gamma)\tau) - s \end{aligned}$$

with $\varphi(\gamma) = \frac{1}{2}(1+\gamma^2) > \gamma$, the overall cost of taxation.

- First order conditions are now:

$$\begin{aligned} \frac{\partial U}{\partial s} &= -u'(c) + \varepsilon u'(d) \leq 0 \\ \frac{\partial U}{\partial \gamma} &= y\tau[-\gamma u'(c) + \alpha u'(d)] \leq 0. \end{aligned}$$

Introducing a cost of evasion (2)

Individual decisions

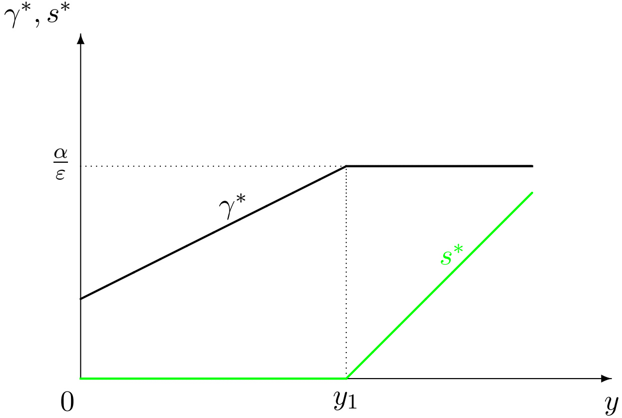
- $\gamma^*(\tau, \alpha; y) > 0$ always and $s^*(\tau, \alpha; y) \geq 0$.
- $s^*(\tau, \alpha; y) = 0$ for income levels such that

$$\frac{\alpha}{\gamma^*(\tau, \alpha; y)} > \varepsilon.$$

- Independently of the relation between α and ε, it is now possible to have both partial compliance and positive savings.
- Individuals decisions depend on income y and on the relation between α and ε.

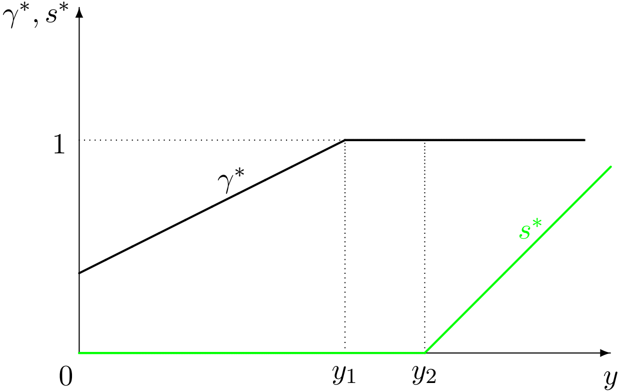
Introducing a cost of evasion (3)

(Proposition 3) When $\alpha < \varepsilon$:



Introducing a cost of evasion (4)

When $\alpha \geq \varepsilon$:



Introducing a cost of evasion (5)

Individual's preferred tax rate

- The indirect utility function of an agent with income y writes:

$$\begin{aligned} V(\tau,\alpha;y) &= u(y(1-\varphi(\gamma^*(\tau,\alpha;y))\tau)-s^*(\tau,\alpha;y)) \\ &\quad +\pi u\Big(\frac{\tau}{\pi}[\alpha\gamma^*(\tau,\alpha;y)y+(1-\alpha)E(\tilde{y})]+\frac{\varepsilon s^*(\tau,\alpha;y)}{\pi}\Big) \end{aligned}$$

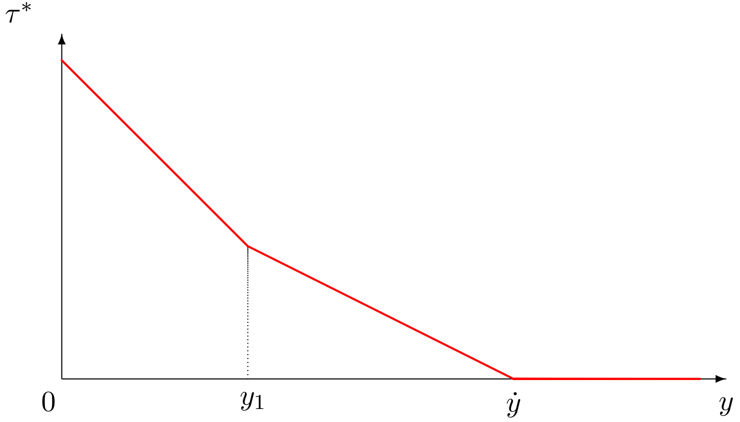
- FOC with respect to τ:

$$\begin{aligned} \frac{\partial V(\tau,\alpha;y)}{\partial \tau} &= -u'(c)y\varphi(\gamma^*(\tau,\alpha;y)) \\ &\quad +u'(d)\Big[\alpha\gamma^*(\tau,\alpha;y)y+(1-\alpha)E(\tilde{y})+\tau(1-\alpha)\frac{dE(\tilde{y})}{d\tau}\Big] \\ &\quad \leq 0 \end{aligned}$$

- Distinguish between $\alpha < \varepsilon$ and $\alpha \geq \varepsilon$.

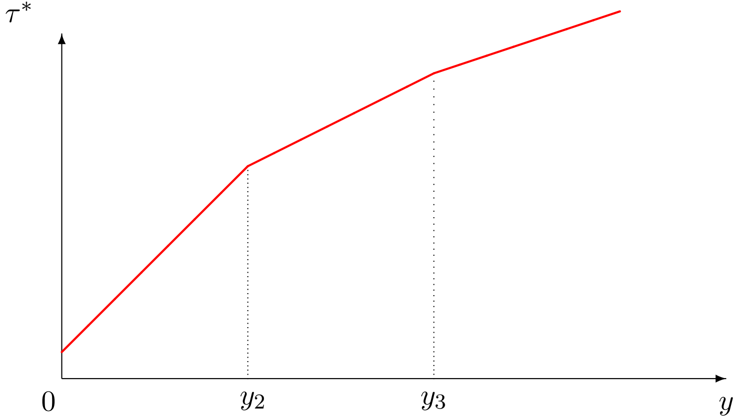
Introducing a cost of evasion (6)

When $\alpha < \varepsilon$:



Introducing a cost of evasion (7)

When $\alpha \geq \varepsilon$:



Introducing a cost of evasion (8)

Some comments:

- When $y \leq y_1(\tau, \alpha)$ or $y_2(\tau, \alpha)$: $d\tau^*(\alpha; y)/dy < 0$ (resp. > 0) as long as the elasticity of compliance with respect to income $\nu_{\gamma^*,y} = d\gamma^*(\tau, \alpha; y)/dy \times y/\gamma^*(\tau, \alpha; y) > 0$ is small (resp. high).

- When $\alpha \geq \varepsilon$, agents with income $y > y_2(\tau, \alpha)$ most-prefers a value of the tax rate that lies on the decreasing part of the Laffer curve.
  $\rightarrow$ direct consequence of the rate of compliance being constrained to be at most equal to 1.

Introducing a cost of evasion (9)

Majority voting equilibrium (modified Proposition 4): Assume a population of agents with income $y \in [y_{min}, y_{max}]$ who have the possibility to save on private markets and to choose the fraction of income they wish to report so as to finance a public pension system.

The majority voting equilibrium tax rate, $\tau^V(\alpha)$ is such that

1. If $\alpha < \varepsilon$:
    1. If $y_m \leq \max\{y_1(\tau,\alpha), \dot{y}(\alpha)\}$, $\tau^V(\alpha) = \tau^*(y_m) > 0$
    2. If $y_m > \max\{y_1(\tau,\alpha), \dot{y}(\tau,\alpha)\}$, $\tau^V(\alpha) = 0$.
2. If $\alpha \geq \varepsilon$, $\tau^V(\alpha) = \tau^*(y_m) > 0$

Introducing a cost of evasion (10)

Constitutional choice of α:

- The FOC with respect to α:

$$\frac{dV(\tau^V(\alpha),\alpha;y_{min})}{d\alpha} = \frac{\partial V(\tau^V(\alpha),\alpha;y_{min})}{\partial \alpha} + \frac{\partial V(\tau^V(\alpha),\alpha;y_{min})}{\partial \tau}\frac{d\tau^V(\alpha)}{d\alpha} \leq 0$$

where

$$\frac{\partial V(\tau^V(\alpha),\alpha;y_{min})}{\partial \alpha} = u'(d)\tau^V(\alpha)\big[\gamma^*(\tau^V(\alpha),\alpha;y_{min})y_{min} - E(\tilde{y}) + (1-\alpha)\frac{dE(\tilde{y})}{d\alpha}\big]$$

represents the direct impact of increasing the Bismarkian factor on the utility of the poorest agent.

Introducing a cost of evasion (11)

- The second term accounts for the indirect impact of α on the utility of the poorest agent, through the majority-voting tax rate.
  $\rightarrow$ How the level of the Bismarkian factor affects the support for the pension system and in turn, the utility of the worst-off agent at the voting equilibrium.

- No reason to believe that the pension system chosen at the constitutional level should be fully contributive ($\alpha^R = 1$) or fully redistributive ($\alpha^R = 0$).
  $\Rightarrow$ *With evasion costs,* $0 < \alpha^R < 1$ *depending on the size of the different effects described above.*

Conclusion

- In many less advanced economies, informality and self-employment make it difficult to enforce a workable tax system.
- In this paper, we show that, even under those circumstances, public resources mobilization is possible and politically sustainable if taxes are at least partially related to benefits and if the government supplies services for which there are no good substitutes in private markets.
- This is the case of retirement saving whose market returns are often not attractive because of the absence of annuity markets and of the high loading costs of the financial institutions.

- *The policy implication of this paper is obvious:* if one wants to design a sustainable tax system in developing countries and to increase tax compliance, it is important to at least partially link individual contributions to individual benefits.