Economics 2450A: Public Economics and Fiscal Policy I

Section 5: Commodity Taxation and Optimal Transfers

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Outline

1. Referee Report
2. Commodity Taxation
   - Atkinson-Stiglitz (1976)
   - Weak Separability
   - Atkinson-Stiglitz Extensions
   - Tagging
3. Optimal Transfers
   - Extensive Margin and the EITC
   - Family Income Taxation

Referee Report

Referee Report

- Referee report assignment posted on Canvas (see Announcements and Files tabs).
- Choose one of 4 papers, produce referee report (2-5 pgs.) and cover letter (< 1 pg)
- Looking for thoughtful commentary on paper that would help the authors strengthen the paper
- In practice, an important part of refereeing is determining 'fit' or importance. This is very much journal-specific, standards are higher at QJE relative to other journals. You are welcome to discuss this some and assume you are reviewing for a top general interest economics journal, but we will not really evaluate much on your commentary here.
- Report is due (file upload on Canvas -> Assignments) by the start of class, 1:30pm on Wednesday, October 12th.

Commodity Taxation

Atkinson-Stiglitz (1976)

- The Atkinson-Stiglitz theorem is a *very* strong result that establishes that commodity taxes are *redundant* in some settings when the government can also set a (nonlinear) income tax.

- In other words, Atkinson-Stiglitz provides conditions where a government who can set commodity taxes across k goods and a general income tax $T(z)$ will optimally (to maximize a SWF) choose to make the commodity taxes zero on all goods.

- Key assumption: weak separability between consumption and income / labor supply. Weak separability is important (and abstract) enough to merit its own slide.

Weakly Separable Preferences

- Suppose that households have preferences over k consumption goods and income z characterized by a utility function $u(c_1, c_2, ..., c_k, z)$.

- Household preferences are said to be **weakly separable across** c **and** z if there exists a sub-utility function v (common to everyone) and U such that:

$$u(c_1, c_2, ..., c_k, z) = U(v(c_1, c_2, ..., c_k), z) \quad \text{for all } c, z$$

- Intuition:
  - Marginal rate of substitution between any two goods independent of z.
  - Given z, consumption bundle **c** provides no information about ability.

Weak Separability: Looking Ahead to 2450B

- You will see commodity taxation, Atkinson-Stiglitz, and weak separability again in Nathan Hendren's fantastic 2450B course.

- Nathan loves digging into the intuition on weak separability. One of his favorite styles of questions is to consider goods and ask you to take a stand on whether weak separability between those goods and earnings is reasonable a priori.

- Review question: Suppose you have utility over two 'goods', a consumption good c and education e, and also earnings z: $u(c, e, z)$. Do you think it is reasonable to assume utility is weakly separable across (c, e) and z? Why or why not? Tell a story.

Atkinson-Stiglitz: Proof Sketch

- Simplified proof from Kaplow (2006). Sketched out (incomplete) here, worth reading!

- Start with arbitrary nonlinear income tax $T(z)$ and nonzero commodity **differentiated** ($t_i \neq t_j$ for some i, j) commodity tax vector t.

- Consider tax reform with $\bar{t} = 0$, $\bar{T}(z)$ chosen to leave indirect utility constant (restores value of original v: only requires continuity of U in z). Indirect utility being held constant implies earnings z also do not change as a result of the reform.

- Original bundle $c(t)$ cannot be affordable. If it was, household would choose different bundle (why? relative prices change), contradicting indirect utility being unchanged after reform.

Atkinson-Stiglitz: Proof Sketch (continued)

- If the original bundle cannot be affordable post-reform, we have $p \cdot c(t) > z - \bar{T}(z)$.
- Household's initial (pre-reform) budget constraint: $(p + t) \cdot c(t) = z - T(z)$.
- Substituting this into the inequality, cancelling terms on both sides, rearranging yields:

$$\bar{T}(z) > T(z) + t \cdot c(t)$$

- Tax revenue is higher under the reform! So our tax reform yields the same utility and earnings as the initial tax system (with commodity taxes), but with higher revenue.
- To generate Pareto improvement: redistribute excess revenue from reform. Kaplow (2006) handles how to think about this rigorously - should be easy to see.

Atkinson-Stiglitz: Intuition

- Why does Atkinson-Stiglitz work? Let's put together the pieces with a couple discussion questions (my interpretation on the following slide).

- Review question: What assumptions in our Saez and Mirrlees models created a non-degenerate distribution of income, and therefore a motivation for redistribution for a SWF-maximizing policymaker?

- Review question: Suppose you, the policymaker, know an agent's consumption bundle $(c_1, ...c_k)$. If you also know their preferences are weakly separable across c and z, does knowing their consumption bundle tell you anything about latent ability or earnings? Why or why not?

- Review question: Taken together, what do the previous two questions imply about using commodity taxes to achieve redistribution across households if preferences are weakly separable?

Atkinson-Stiglitz: Intuition

- In our optimal income tax theories, non-degenerate income distribution is induced by heterogeneous ability (Mirrlees) or heterogeneous preferences across consumption and leisure (Saez). Only reason for redistribution.

- If preferences are weakly separable across $(c_1, ...c_k)$ and z, then knowing an agent's consumption bundle $(c_1, ..., c_k)$ only tells you about their MRS across consumption goods. Provides no additional information about latent earnings ability on top of z.

- Commodity taxes only distort the MRS across consumption goods. Policymaker choosing commodity taxes and income tax can 'do better' by focusing on income tax to achieve desired redistribution.

Atkinson-Stiglitz: Extensions

- All flavors of Atkinson-Stiglitz rely on something like weak separability.

- What may be more surprising is what it does not rely on. Here are some interesting extensions of Atkinson-Stiglitz that have been considered:
  1. **Kaplow (2006)**: Atkinson-Stiglitz holds even when the nonlinear income tax $T(z)$ is not social welfare-maximizing!
  2. **Deaton (1981)**: Atkinson-Stiglitz holds when income tax is linear if $v(\cdot)$ is homothetic.
  3. **Saez (2002)**: Atkinson-Stiglitz holds with heterogeneous (indexed by h) utility if, *conditional on earnings z*:

     3.1 g^h, c^h uncorrelated

     3.2 behavioral responses z_c^h, z_R^h independent of c_1^h, dc_1^h/dz.

     3.3 $E[\frac{dc_1^h}{dz}|z^h = z] = \frac{dC_1(z)}{dz}$

     all of which says that taxing a commodity is non-desirable with an income tax instrument, even with heterogenous utility, if consumption of that good doesn't inform us about earnings potential.

‘Tagging’ and Atkinson-Stiglitz

- One interpretation of the sub-optimality of commodity taxation in the presence of a nonlinear income tax (Atkinson-Stiglitz): weak separability implies that consumption bundles $(c_1, ..., c_k)$ provide no additional information about earnings ability than z.

- Naturally leads to the question: What if we could base the income tax on a person-specific characteristic X, i.e. $T(z, X)$? (i.e., marital status for income tax)

- If X cannot be manipulated by household, we say X is an immutable characteristic. Optimal $T(z, X)$ characterized by complete redistribution: average social marginal welfare weights equalized across X, conditional on z.

- If X can be manipulated by household (X can be chosen, or voluntarily reported by household): optimal $T(z, X)$ still generically depends on X, extent of redistribution across X depends on magnitude of behavioral response.

Mankiw-Wienzierl 2009: Tagging on Height

- Individuals are heterogeneous in two dimensions: either Tall or Short ($X \in \{T, S\}$) and with some unobserved ability n, as in Mirrlees, that dictates their wage. Height is an immutable characteristic that is observed by the policymaker.

- Suppose that expected (latent, unobserved) ability is higher for Talls than for Shorts. $\implies$ standard Mirrleesian optimal nonlinear income tax leads to $\bar{g}^T < \bar{g}^S$

- Optimal tax/transfer based on height characteristic X will equate marginal social welfare weights for Talls and Shorts: $\bar{g}^T = \bar{g}^S$

- Numerical simulations in paper: height transfer non-trivial in magnitude. Pareto improvement substantial (relative to standard income tax) in extreme case where height perfectly correlated with ability, small if weakly correlated. (why?)

Optimal Transfers

Optimal Transfers

- Our optimal tax models also described theories of transfers, so in some sense, we've already covered them without stating so!

- Review question: What is the transfer to an individual with 0 income in a nonlinear tax model? What about a linear tax model with a lump-sum rebate?

- This component of class: take a breather after Mirrlees, consider a few very high-level lessons about the form that transfers take in Mirrlees and in related models/extensions, how these relate to real-world tax policy.

- There is a lot of fact-based content about real-world transfer systems in the lecture slides, worth memorizing.

Earned Income Tax Credit and Participation Responses

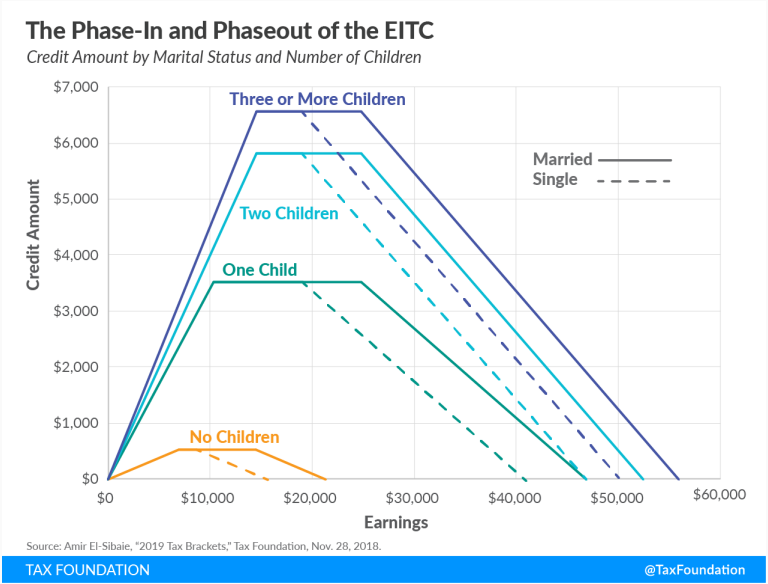
- The Earned Income Tax Credit (EITC) is an important welfare program in the U.S. that functions as a refundable tax credit for low-income tax filers, particularly those with children. Very well studied program (decades of good empirical, theoretical work).

- EITC schedule for a given tax filer depends on their filing status and # kids (next slide).

- At the bottom of the income distribution, the EITC is effectively a negative income tax rate.... which in our Mirrlees model never made sense ($0 \leq T' \leq 1$ in Mirrlees, generally). Is the EITC tax schedule sub-optimal?

- No! In an optimal tax model with an extensive labor supply margin (work/don't work), negative marginal tax rates can be optimal.

EITC Schedule



Family and Child Taxation

- Should the tax and transfer system treat cohabitating adults/families different from single filers? Tagging?

- What about children? How should we treat children?

- Theoretically, these questions are an ambiguous mess. Easy to come up with dozens of economic trade-offs, externalities, market failures, redistributive concerns, and efficiency conerns. Extremely difficult to write down a model that attempts to trade off all of these concerns.

- Few general normative results on these topics, but some stark lessons in positive economics.

No Progressive, Marriage-Neutral Family Income Tax

- There is a nice, useful "impossibility result" for family taxation. Suppose that individuals face an income tax schedule $T(z)$ and two-person households face a "family" tax schedule $T_f(z_1, z_2)$
- It is impossible to have a family tax schedule that is simultaneously:
  1. Based on family income: $T_f(z_1, z_2) = T_f(z_1 + z_2, 0) = T_f(0, z_1 + z_2)$ for all z_1, z_2
  2. Marriage-neutral: $T_f(z_1, z_2) = T(z_1) + T(z_2)$ for all z_1, z_2
  3. Progressive: $T_f' > 0, T_f'' > 0$ everywhere
- Why can't we have all three? (1) and (2) imply linear tax rate τ, violating (3) (why?)
- Review: which of these the US tax system does not satisfy (broadly)?
- *Note: my notation here is intentionally a bit different from lecture slides, for clarity!*