Lecture 1: Intro: Public Econ and the Tax & Transfer System

Stefanie Stantcheva

Fall 2019
Our Goals for this class

1. Learn skills and methods (theory and empirical).
2. Create a culture of key papers and read widely.
3. Get you inspired and ready for your own research.
Class Logistics

- Meet twice per week, 1 hour 15 mins.
- Regular schedule except classes from 10/23 and 10/30 replaced with a 2.5 hour block on 11/8, 9-11:30 am.
- One problem set.
- One final exam.
- Office hours posted on Ec2450A OH link on my website.
- What I expect from you.
My research:

I study the taxation of firms and individuals. I focus on three main issues:

1) The long-run effects of taxes on innovation, education & training, and wealth. How can we design the tax system to foster innovation?

2) The determinants of our social preferences, attitudes, and perceptions, which ultimately drive support for redistribution. To answer this, I conduct large-scale online surveys and experiments.

3) The effects of taxes in imperfect markets with informational frictions and rents.
PUBLIC ECONOMICS DEFINITION

Public economics = Study of the role of the government in the economy

Government is instrumental in most aspects of economic life:

1) Government in charge of huge regulatory structure

2) Taxes: governments in advanced economies collect 30–50% of National Income in taxes

3) Expenditures: tax revenue funds traditional **public goods** (infrastructure, public order and safety, defense), and **welfare state** (education, retirement benefits, health care, income support)

4) Macro-economic stabilization through central bank (interest rate, inflation control), fiscal stimulus, bailout policies
Total tax revenues were less than 10% of national income in rich countries until 1900-1910; they represent between 30% and 55% of national income in 2000-2010. Sources and series: see piketty.pse.ens.fr/capital21c.

Source: Piketty (2014)
Bigger view on government

Economists have a narrow minded view of individual behavior: selfish, rational, and utility based on own consumption only

But social interactions are critical for humans: we naturally cooperate at many levels: families, communities, nation states, global treaties

Governments are a formal way to organize cooperation

Archaic human societies depended on social cooperation for protection and taking care of the young, sick, and old

⇒ Explains best why our modern nation states have defense and provide education, health care, and retirement benefits

Replacing social institutions by markets does not always work

E.g., Retirement benefits: Saving for your own retirement is economically rational but in practice most people unable to do so unless institutions (employers/government) help them
For Economists: Two General Rules for Government Intervention

1) Failure of 1st Welfare Theorem: Government intervention can help if there are market or individual failures. Markets first, government second. Why?

2) Fallacy of the 2nd Welfare Theorem: Distortionary Government intervention is required to reduce economic inequality
Role 1: 1st Welfare Theorem Failure

1st Welfare Theorem: If (1) no externalities, (2) perfect competition, (3) perfect information, (4) agents are rational, then private market equilibrium is Pareto efficient.

Government intervention may be desirable if:

1) Externalities require government interventions (Pigouvian taxes/subsidies, public good provision)

2) Imperfect competition requires regulation (typically studied in Industrial Organization)

3) Imperfect or Asymmetric Information (e.g., adverse selection may call for mandatory insurance)

4) Agents are not rational (= individual failures) analyzed in behavioral economics, field in huge expansion): e.g., myopic or hyperbolic agents may not save enough for retirement.
1. Externalities

Markets may be incomplete (e.g., smoking, pollution).

Achieving the Coasian efficient solution requires a coordinating institution, such as a government.

Public goods (infrastructure, defense, education).

Important question: what public goods to provide, how to correct for externalities.
2. Imperfect competition

Role for government regulation when markets are not competitive.

We will see some of this when we study R&D policies and innovation.

Typically we leave this to IO, but we shouldn’t!
3. Imperfect and asymmetric information

Adverse Selection in health insurance (reason for mandated coverage).

Capital markets and credit constraints (subsidies for education).

Intergenerational issues (future generations may not be valued appropriately in today’s market).
4. Individual Failures

Behavioral issues, own-agency problems.

If agents do not optimize, may be best to intervene. E.g.: mandated retirement savings.

Paternalism?

Currently very active area of research, theoretically and empirically.
Individual Failures vs. Paternalism

In many situations, individuals may not or do not seem to act in their best interests [e.g., many individuals are not able to save for retirement]

Two Polar Views on such situations:

1) Individual Failures [Behavioral Economics View] Individual Failures exist: Self-control problems, Cognitive Limitations

2) Paternalism [Libertarian Chicago View] Individual failures do not exist and govt wants to impose on individuals its own preferences against individuals’ will

Key way to distinguish those 2 views: Under Paternalism, individuals should be opposed to govt programs such as Social Security. If individuals understand they have failures, they will tend to support govt programs such as Social Security.
Role 2: 2nd Welfare Theorem Fallacy

Even with no market failures, free market might generate substantial inequality. Inequality is an issue because of people care about their relative situation.

2nd Welfare Theorem: Any Pareto Efficient outcome can be reached by (1) Suitable redistribution of initial endowments [individualized lump-sum taxes based on indiv. characteristics and not behavior], (2) Then letting markets work freely

⇒ No conflict between efficiency and equity [1st best taxation]

Redistribution of initial endowments is not feasible (information pb) ⇒ govt needs to use distortionary taxes and transfers ⇒ Trade-off between efficiency and equity [2nd best taxation]

This class will focus on both roles, but first on 2).
Illustration of 2nd Welfare Theorem Fallacy

Suppose economy is populated 50% with disabled people unable to work (hence they earn $0) and 50% with able people who can work and earn $100

**Free market outcome:** disabled have $0, able have $100

**2nd welfare theorem:** govt is able to tell apart the disabled from the able [even if the able do not work]

⇒ can tax the able by $50 [regardless of whether they work or not] to give $50 to each disabled person ⇒ the able keep working [otherwise they’d have zero income and still have to pay $50]

**Real world:** govt can’t tell apart disabled from non working able

⇒ $50 tax on workers + $50 transfer on non workers destroys all incentives to work ⇒ govt can no longer do full redistribution ⇒ Trade-off between equity and size of the pie
Normative vs. Positive Public Economics

**Normative Public Economics:** Analysis of How Things Should be (e.g., should the government intervene in health insurance market? how high should taxes be?, etc.)

**Positive Public Economics:** Analysis of How Things Really Are (e.g., Does govt provided health care crowd out private health care insurance? Do higher taxes reduce labor supply?)

Positive Public Economics is a required 1st step before we can complete Normative Public Economics

Positive analysis is primarily empirical and Normative analysis is primarily theoretical

Positive Public Economics overlaps with Labor Economics

**Political Economy** is a positive analysis of govt outcomes [public choice is political economy from a libertarian view]
Govt Redistribution with Taxes and Transfers

Government taxes individuals based on income and consumption and provides transfers: $z$ is pre-tax income, $y = z - T(z) + B(z)$ is post-tax income.

1) If inequality in $y$ is less than inequality in $z$ $\iff$ tax and transfer system is redistributive (or progressive)

2) If inequality in $y$ is more than inequality in $z$ $\iff$ tax and transfer system is regressive

a) If $y = z \cdot (1 - t)$ with constant $t$, tax/transfer system is neutral

b) If $y = z \cdot (1 - t) + G$ where $G$ is a universal (lumpsum) allowance, then tax/transfer system is progressive

c) If $y = z - T$ where $T$ is a uniform tax (poll tax), then tax/transfer system is regressive

Current tax/transfer systems in rich countries look roughly like b)
US Distributional National Accounts

Piketty-Saez-Zucman NBER’16 distribute both pre-tax and post-tax US national income across adult individuals.

Pre-tax income is income before taxes and transfers.

Post-tax income is income net of all taxes and adding all transfers and public good spending.

Both concepts add up to national income and provide a comprehensive view of the mechanical impact of government redistribution.
<table>
<thead>
<tr>
<th>Income group</th>
<th>Number of adults</th>
<th>Pre-tax income</th>
<th>Post-tax income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Population</td>
<td>234,400,000</td>
<td>$64,600</td>
<td>$64,600</td>
</tr>
<tr>
<td>Bottom 50%</td>
<td>117,200,000</td>
<td>$16,200</td>
<td>$25,000</td>
</tr>
<tr>
<td>Middle 40%</td>
<td>93,760,000</td>
<td>$65,400</td>
<td>$67,200</td>
</tr>
<tr>
<td>Top 10%</td>
<td>23,440,000</td>
<td>$304,000</td>
<td>$252,000</td>
</tr>
<tr>
<td>Top 1%</td>
<td>2,344,000</td>
<td>$1,300,000</td>
<td>$1,010,000</td>
</tr>
<tr>
<td>Top 0.1%</td>
<td>234,400</td>
<td>$6,000,000</td>
<td>$4,400,000</td>
</tr>
<tr>
<td>Top 0.01%</td>
<td>23,440</td>
<td>$28,100,000</td>
<td>$20,300,000</td>
</tr>
<tr>
<td>Top 0.001%</td>
<td>2,344</td>
<td>$122,000,000</td>
<td>$88,700,000</td>
</tr>
</tbody>
</table>
Top 10% national income share: pre-tax vs. post-tax

Source: Piketty, Saez, Zucman (2018)
US tax/transfer System: Progressivity and Evolution

0) US Tax/Transfer system is progressive overall: pre-tax national income is less equally distributed than post-tax/post-transfer national income

1) Medium Term Changes: Federal Tax Progressivity has declined since 1970 but govt redistribution through transfers has increased (Medicaid, Social Security retirement, DI, UI various income support programs)

2) Long Term Changes: Before 1913, US taxes were primarily tariffs, excises, and real estate property taxes [slightly regressive], minimal welfare state (and hence small govt)

http://www.treasury.gov/education/fact-sheets/taxes/ustax.shtml
The macro rate of tax rose until the 1960s and has been constant since then.

Source: Piketty, Saez, Zucman (2016)
Tax progressivity has declined since the 1960s

Average tax rates by pre-tax income group

Source: Appendix Table II-G1.

Source: Piketty, Saez, Zucman (2016)
Federal US Tax System: Overview

1) Individual income tax (on both labor+capital income) [progressive](40% of fed tax revenue)

2) Payroll taxes (on labor income) financing social security programs [about neutral] (40% of revenue)

3) Corporate income tax (on capital income) [progressive if incidence on capital income] (15% of revenue)

4) Estate taxes (on capital income) [very progressive] (1% of revenue)

5) Minor excise taxes (on consumption) [regressive] (3% of revenue)

Fed agencies (CBO, Treasury, Joint Committee on Taxation) and think-tanks (Tax Policy Center) provide distributional Fed tax tables
State+Local Tax System: Overview

Decentralized governments can experiment, be tailored to local views, create tax competition and make redistribution harder (famous Tiebout 1956 model) hence favored by conservatives

1) Individual + Corporate income taxes [progressive] (1/3 of state+local tax revenue)

2) Sales taxes + Excise taxes (tax on consumption) [regressive] (1/3 of revenue)

3) Real estate property taxes (on capital income) [slightly progressive] (1/3 of revenue)


US Census provides Census of Government data
Key question: Should government reduce inequality using taxes and transfers?

1) Governments use taxes to raise revenue

2) This revenue funds transfer programs:

a) Universal Transfers: Education, Health Care (only 65+ in the US), Retirement and Disability

b) Means-tested Transfers: In-kind (e.g., public housing, nutrition, Medicaid in the US) and cash (direct welfare and refundable tax credits)

Means-tested transfers relatively small relative to universal transfers

This lecture follows Piketty and Saez ’13 handbook chapter
GOAL: TAKE A LOOK AT ACTUAL TAX SYSTEM

Sometimes you are an optimal tax theorist and don’t know the actual top tax rates – it’s weird.

You need to know institutional details. It’s not boring. It’s crucial.

You should not try to capture all institutional details in your models. But unless you know them, you cannot argue they are second-order. (Sometimes the devil is in the detail, sometimes not).

The tax system reflects

i) social judgements made by people and policy makers and

ii) lobbying, political economy, interest groups.

Understand the implicit social judgements behind the tax system.

Question them! Which constraints are truly “irremovable”?
FACTS ON US TAXES AND TRANSFERS

References: Comprehensive description in Gruber undergrad textbook (taxes/transfers) and Slemrod-Bakija (taxes)

http://www.taxpolicycenter.org/taxfacts/

A) Taxes: (1) individual income tax (fed+state), (2) payroll taxes on earnings (fed, funds Social Security+Medicare), (3) corporate income tax (fed+state), (4) sales taxes (state)+excise taxes (state+fed), (5) property taxes (state)

B) Means-tested Transfers: (1) refundable tax credits (fed), (2) in-kind transfers (fed+state): Medicaid, public housing, nutrition (SNAP), education (3) cash welfare: TANF for single parents (fed+state), SSI for old/disabled (fed)
FEDERAL US INCOME TAX

US income tax assessed on annual family income (not individual) [most other OECD countries have shifted to individual assessment]

Sum all cash income sources from family members (both from labor and capital income sources) = called Adjusted Gross Income (AGI)

Main exclusions: fringe benefits (health insurance, pension contributions and returns), imputed rent of homeowners, undistributed corporate profits, unrealized capital gains, interest from state+local bonds

⇒ AGI base is only 70% of factor national income
FEDERAL US INCOME TAX

Taxable income = AGI - deductions

deduction is max of standard deduction or itemized deductions

Standard deduction is a fixed amount ($12K for singles, $24K for married couple)

Itemized deductions: (a) state and local taxes paid (up to $10K), (b) mortgage interest payments, (c) charitable giving, various small other items

[about 10% of AGI lost through itemized deductions, called tax expenditures]
FEDERAL US INCOME TAX: TAX BRACKETS

Tax $T(z)$ is piecewise linear and continuous function of taxable income $z$ with constant marginal tax rates (MTR) $T'(z)$ by brackets.

In 2018+, 6 brackets with MTR 10%, 12%, 22%, 24%, 32%, 35%, 37% (top bracket for $z$ above $\$600K$), indexed on price inflation.

Lower preferential rates (up to a max of 20%) apply to dividends (since 2003), realized capital gains [in part to offset double taxation of corporate profits].

20% of business profits are exempt since 2018.

Tax rates change frequently over time. Top MTRs have declined drastically since 1960s (as in many OECD countries).
Individual Income Tax

T(z) is continuous in z

Slope 37%

Slope 12%

Slope 10%

T(z) is taxable income z

Slope 10%
$T'(z)$ is a step function.
In practice...
## 2018 US Personal Income Tax Code

<table>
<thead>
<tr>
<th>Rate</th>
<th>Individuals</th>
<th>Married Filing Jointly</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Up to $9,525</td>
<td>Up to $19,050</td>
</tr>
<tr>
<td>12%</td>
<td>$9,526 to $38,700</td>
<td>$19,051 to $77,400</td>
</tr>
<tr>
<td>22%</td>
<td>$38,701 to $82,500</td>
<td>$77,401 to $165,000</td>
</tr>
<tr>
<td>24%</td>
<td>$82,501 to $157,500</td>
<td>$165,001 to $315,000</td>
</tr>
<tr>
<td>32%</td>
<td>$157,501 to $200,000</td>
<td>$315,001 to $400,000</td>
</tr>
<tr>
<td>35%</td>
<td>$200,001 to $500,000</td>
<td>$400,001 to $600,000</td>
</tr>
<tr>
<td>37%</td>
<td>over $500,000</td>
<td>over $600,000</td>
</tr>
</tbody>
</table>
Historically, a 70 percent marginal tax rate is not unusual

The top marginal income tax rates from 1913 to 2018

1981
Reagan took office

Source: Tax Policy Center

FiveThirtyEight
FEDERAL US INCOME TAX: AMT AND CREDITS

Alternative minimum tax (AMT) is a parallel tax system (quasi flat tax at 28%) with fewer deductions: actual tax = \( \max(T(z), AMT) \) (hits < 1% of taxpayers in 2018+)

Tax credits: Additional reduction in taxes

(1) Non refundable (cannot reduce taxes below zero): foreign tax credit, child care expenses, education credits, energy credits

(2) Refundable (can reduce taxes below zero, i.e., be net transfers): EITC (earned income tax credit, up to $3.5K, $5.7K, $6.5K for working families with 1, 2, 3+ kids), Child Tax Credit ($2K per kid, partly refundable)
FEDERAL US INCOME TAX: TAX FILING

Taxes on year $t$ earnings are withheld on paychecks during year $t$ (pay-as-you-earn)

Income tax return filed in late January–April 15th, year $t + 1$ [filers use either software or tax preparers, huge private industry]

Most tax filers get a tax refund as withholdings $>$ net taxes owed

Payers (employers, banks, etc.) send income information to IRS (US tax administration) (3rd party reporting)

Third party reporting + withholding at source is key for successful enforcement
MAIN MEANS-TESTED TRANSFER PROGRAMS

1) **Traditional transfers:** managed by welfare agencies, paid on monthly basis, high stigma and take-up costs ⇒ low take-up rates

Main programs: Medicaid (health insurance for low incomes), SNAP (former food stamps), public housing, TANF (traditional welfare), SSI (aged+disabled)

2) **Refundable income tax credits:** managed by tax administration, paid as an annual lumpsum in year \( t + 1 \), low stigma and take-up cost ⇒ high take-up rates

Main programs: EITC and Child Tax Credit [large expansion since the 1990s] for low income working families with children
Figure 1
EITC refunds by family size and income (CBPP 2013)

Source: Center on Budget and Policy Priorities.
BOTTOM LINE ON ACTUAL TAXES/TRANSFERS

1) Based on current income, family situation, and disability (retirement) status ⇒ Strong link with current ability to pay

2) Some allowances made to reward / encourage certain behaviors: charitable giving, home ownership, savings, energy conservation, and more recently work (refundable tax credits such as EITC)

3) Provisions pile up overtime making tax/transfer system more and more complex until significant simplifying reform happens (such as US Tax Reform Act of 1986, or TCJA 2018)
KEY CONCEPTS FOR TAXES/TRANSFERS

1) Transfer benefit with zero earnings $-T(0)$ [sometimes called demogrant or lumpsum grant]

2) Marginal tax rate (or phasing-out rate) $T'(z)$: individual keeps $1 - T'(z)$ for an additional $1$ of earnings (intensive labor supply response)

3) Participation tax rate $\tau_p = \left[ T(z) - T(0) \right] / z$: individual keeps fraction $1 - \tau_p$ of earnings when moving from zero earnings to earnings $z$ (extensive labor supply response):

$$z - T(z) = -T(0) + z - \left[ T(z) - T(0) \right] = -T(0) + z \cdot (1 - \tau_p)$$

4) Break-even earnings point $z^*$: point at which $T(z^*) = 0$
Budget Set

c = z - T(z)

after-tax and transfer income

slope = 1 - T'(z)

pre-tax income z
$c = z - T(z)$

$\tau_p =$ participation tax rate

$z$ - pre-tax income

$(1 - \tau_p)z$
US Tax/Transfer System, single parent with 2 children, 2009

Gross Earnings (with employer payroll taxes)

Disposable Earnings

Welfare: TANF+SNAP

Tax credits: EITC+CTC

Earnings after Fed+SSA taxes

45 Degree Line

Source: Federal Govt
Source: Piketty, Thomas, and Emmanuel Saez (2012)
FAMILY TAXATION: MARRIAGE AND CHILDREN

Two important issues in policy debate:

1) Marriage: What is the optimal taxation of couples vs. singles? Should secondary earnings be treated differently?

2) Children: What should be the net transfer (transfer or tax reduction) for family with children (as a function of family income and structure)?

Theoretical literature is not great in part because utilitarian framework is not satisfactory
TAXATION OF COUPLES

1) Economies of scale and sharing in consumption within families ⇒ Welfare best measured by family income relative to size [≡ normalized income]

⇒ Taxes/Transfers should be based on normalized family income which can create a marriage penalty / subsidy

Note: Impossible to have a tax/transfer system that

(1) is family income based \( T(z^h + z^w) \)

(2) has marriage neutrality \( T(z^h, z^w) = T(z^h) + T(z^w) \)

(3) is progressive (i.e., not strictly linear)

Proof: (1)+(2) ⇒ \( T(z^h + z^w) = T(z^h) + T(z^w) \) ⇒ \( T(z) = \tau \cdot z \)
TAXATION OF COUPLES

2) If marriage responds to tax/transfer differential ⇒ better to reduce marriage penalty and move toward individualized system

Particularly important cohabitation is close substitute to marriage (Scandinavian countries)

3) Labor supply of secondary earners more elastic than labor supply of primary earner ⇒ Secondary earnings should be taxed less (standard Ramsey intuition, Boskin-Sheshinski JpubE’83)

But labor supply elasticity differential is decreasing as earnings gender gap decreases [Blau and Kahn JOLE’07]

In OECD countries: income tax systems have become individual based but means tested transfers have remained family based
TRANSFERS OR TAX CREDITS FOR CHILDREN

1) Children reduce **normalized income** ⇒ Transfer for children $T_{kid}$ should be positive

In practice, transfers for children are always positive

2) Should $T_{kid}(z)$ increase with income $z$?

**Pro:** they reduce normalized income most for upper earners [e.g., France computes taxes as $N \cdot T(z/N)$ where $N$ is # family members, kids count as $.5 \Rightarrow T_{kid}(z)$ increases with $z$].

**Cons:** lower earners need child transfers most [most OECD countries have means-tested transfers conditional on number of kids ⇒ $T_{kid}(z)$ decreases with $z$, US has $T_{kid}(z)$ inverted U-shape due to EITC and Child Tax Credit]
TRANSFERS OR TAX CREDITS FOR CHILDREN

3) Family does not make decisions as a single unit (Chiappori JPE’92): transfers to mothers has bigger effects on children’s consumption than transfers to fathers [Lundberg et al. ’97, Duflo ’03]

4) Children create externalities [positive: pay-as-you-go retirement programs, negative: global warming]. If fertility responds to transfers, case for subsidizing/taxing children

5) Child care costs are positively related to work ⇒ Such costs should be subsidized by Atkinson-Stiglitz [often they are in practice]:

Public pre-kindergarten in Europe is a huge in-work subsidy for mothers ⇒ Large effect on mothers’ labor force participation (bigger effect than US EITC)
CHILDREN AND LIMITS OF UTILITARIAN MODEL

If fertility decisions unrelated to children tax/transfers ⇒ Social marginal utility should be equated across families with 0 children, families with 1 child, etc.

If ability uncorrelated with children ⇒ Families with kids will get fully compensating transfers

If ability positively correlated with children ⇒ Families with kids might be taxed more heavily [as in the height tax case]

Seems an absurd model to think about transfers for children ⇒ Need to come up with more realistic alternative
REFERENCES CITED


Alvaredo, F., Atkinson, A., T. Piketty, E. Saez, and G. Zucman *World Inequality Database*, (web)


GENERAL BOOK REFERENCES

Graduate Level


REFERENCES ON EMPIRICAL METHODS:


