Public Economics

Lecture: 07 Taxation I

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Outline of Lecture

Introduction

"At the end of every three years you shall bring out all the tithe [one-tenth] of your produce in the same year and lay it up within your towns" (Bible, Deuteronomy 14:28)

"In this world nothing is certain but death and taxes." (Benjamin Franklin 1789)

- Taxation existed throughout the history of mankind
- Taxation is compulsory (free-rider problem in the voluntary contribution for the public good)

Three Main Purposes

1. Funding of government activities
2. Market corrective taxes (e.g., Pigouvian taxes for externalities)
3. Redistribution

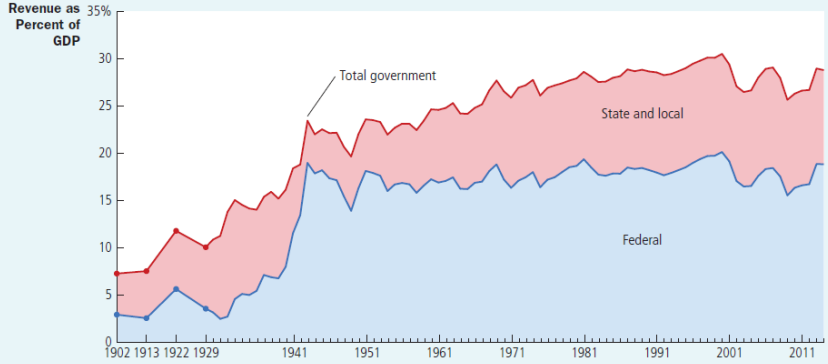
History of Taxation

This figure shows revenue of the federal government and of state and local governments as a percentage of gross domestic product (GDP), which measures total income in the economy. It shows that the government plays a large role in the U.S. economy and that its role has grown over time.

Source: *Historical Statistics of the United States*; Bureau of Economic Analysis; and author's calculations.

FIGURE 1

Government Revenue as a Percentage of GDP: Changes over Time



Source: (Mankiw, 2021)

Taxation in Different Countries

The percentage of income that governments take in taxes varies substantially from country to country.

Source: OECD. Data are for 2013.

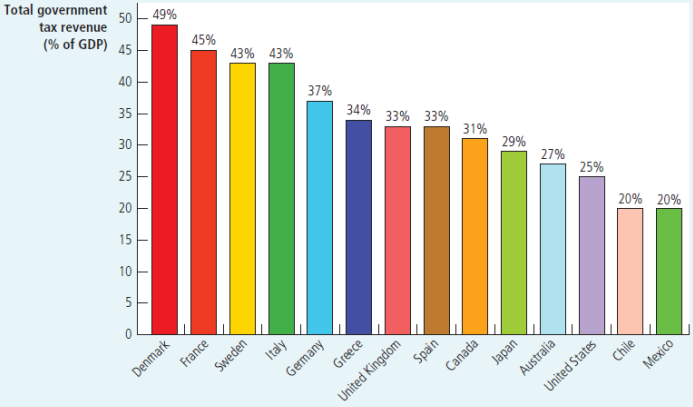


FIGURE 2

Government Revenue as a Percentage of GDP: International Comparisons

Source: (Mankiw, 2021)

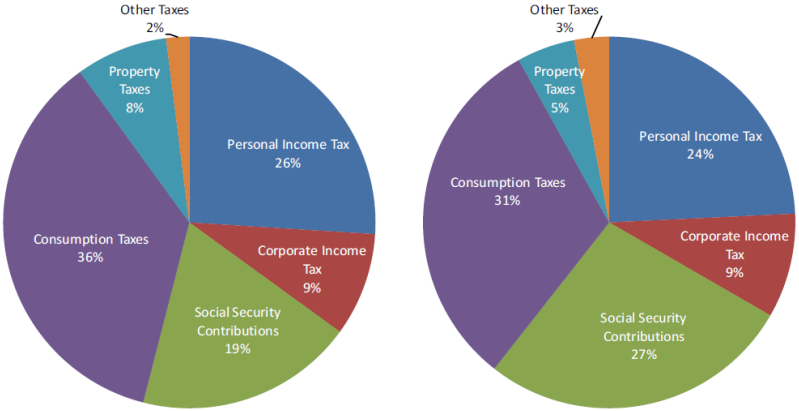
Forms of Taxation

1. Direct taxes
   - Individual income tax
   - Corporate income tax
   - Property tax
   - Estate and gift tax
   - Inheritance tax
   - Wealth tax

   $\rightarrow$ Affect labor supply, savings, investments, etc.
2. Indirect taxes
   - Consumption taxes
     - Value added tax (most countries)
     - Sales tax (in the US)
     - Excise taxes (fuel, alcohol, tobacco, luxuries, etc.)
   - Customs duties (tariff)

   $\rightarrow$ Affect consumption and production choices

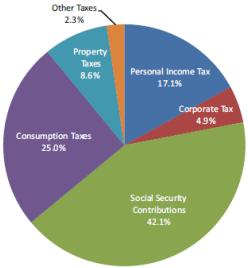
Structure of Government Revenue: OECD Average, 1965 vs. 2010



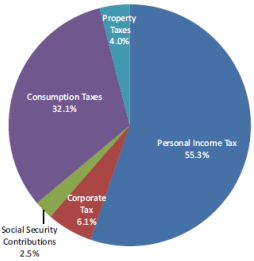
(a) 1965 (b) 2010

Source: OECD Revenue Statistics (2012), Table C

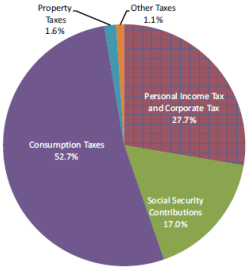
Structure of Government Revenue 2010



(a) France



(b) Denmark



(c) Mexico

Source: OECD Revenue Statistics (2012), Tables 6, 10 and 12

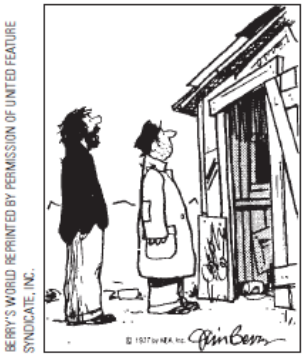
Outline of Lecture

Desirable Characteristics of Any Tax System

1. Economic efficiency
2. Administrative simplicity
3. Fairness
4. Flexibility
5. Transparent political responsibility
6. Corruption resistant

Economic Efficiency

Taxes may have **distortionary effects** – they create own economic incentives and may distort the efficient market outcome.



"I was gonna fix the place up, but if I did, the city would just raise my taxes!"

Economic Efficiency

Taxes may have **distortionary effects** – they create own economic incentives and may distort the efficient market outcome.

Examples

- May discourage work.
- May discourage savings.
- Substitution effects to less efficient use of production inputs (labor, capital).
- Substitution effects to the demand of less efficient products.

Other examples

- Window tax in Britain – houses were build without windows.
- Movable wall tax benefit in US – office spaces are build with movable walls.
- etc.

Economic Efficiency

Nondistortionary Taxation

- A tax is nondistortionary if (and only if) there is nothing an individual or firm can do to alter the tax liability.
  $\rightarrow$ **lump-sum taxes** are independent of one's income, wealth, productivity, etc.
  $\rightarrow$ no changes in behavior or reallocation of resources.

Corrective Taxation

- Impose taxes on activities, which generate negative externalities (e.g. Pigouvian taxes).
- Increase economic efficiency.
- *Example:* Tobacco taxes lead to less smoking and to better health (lower health costs) as well to the more efficient outcome (accounting for the negative externalities).

Economic Efficiency

Behavioral effects of taxation

- Work, education, retirement.
- Savings, investment, risk taking.
- Effort devoted to avoiding taxes.
- Marriage and divorce.

Financial effects of taxation

- Fringe benefits (e.g., additions to compensation that companies give their employees).
- Financial structure of firms (e.g., firms' decisions whether to fi nance additional investments by borrowing or by issuing new shares).

Administrative Simplicity

Administering taxation comes at a cost:

1. Costs of running the Internal Revenue Service
2. Compliance costs
   $\rightarrow$ time to fill out tax forms
   $\rightarrow$ costs of keeping record
   $\rightarrow$ costs of tax accountants/ lawyers

Trade-off between administrative simplicity (one tax for all) and fairness.

Fairness

Horizontal equity: Two individuals who are identical in all relevant aspects should be taxed the same.

Example: "Suppose the Smith and Jones families each have income of $100,000. The Smiths have no children, but Mr. Smith has an illness that results in medical expenses of $40,000. The Joneses are in good health, but they have four children. Two of the Jones children are in college, generating tuition bills of $60,000."

- Would it be fair for these two families to pay the same tax because they have the same income?
- Would it be fair to give the Joneses a tax break to help them with their tuition expenses?

Fairness

Horizontal equity: Two individuals who are identical in all relevant aspects should be taxed the same.

- Independent of race, color, sex, and creed.
- But what is identical in all aspects?
  - → Income, consumption pattern, saving pattern
  - → What about different tastes/ preferences?
    - Vanilla ice cream vs. chocolate ice cream?
    - Scotch vs. beer?
    - Beef vs. tofu?
    - Vacationing in own country compared to abroad?
  - → What about age or marital status?
  - → What about inequality of opportunities?

It is difficult to define the meaning of equal treatment, so perfect horizontal equity is difficult to establish.

Fairness

Vertical equity: Those who are in a position to pay higher taxes, should pay higher taxes.

TABLE 4

Three Tax Systems

	Proportional Tax		Regressive Tax		Progressive Tax	
Income	Amount of Tax	Percent of Income	Amount of Tax	Percent of Income	Amount of Tax	Percent of Income
$50,000	$12,500	25%	$15,000	30%	$10,000	20%
100,000	25,000	25	25,000	25	25,000	25
200,000	50,000	25	40,000	20	60,000	30

Source: Mankiw (2018)

Which of the three is most fair?

Fairness

Vertical equity: Those who are in a position to pay higher taxes, should pay higher taxes.

TABLE 5

The Burden of Federal Taxes

Source: Congressional Budget Office. Figures are for 2011.

Quintile	Average Income	Taxes as a Percentage of Income	Percentage of All Income	Percentage of All Taxes
Lowest	$24,600	1.9%	5.3%	0.6%
Second	45,300	7.0	9.6	3.8
Middle	66,400	11.2	14.1	8.9
Fourth	97,500	15.2	20.4	17.6
Highest	245,700	23.4	51.9	68.7
Top 1%	1,453,100	29.0	14.6	24.0

Source: Mankiw (2018)

Challenge: Those with the highest incomes have most resources (lawyers) to find loopholes in legislation to (legally) reduce their tax burden (e.g., income shifting, tax shelters, and offshoring assets) (Alstadsæter et al., 2019).

Cold Progression: A Numerical Example

Scenario: Inflation Without Real Income Growth

- Initial Income: \$50,000, taxed at 20% (bracket for \$40,000–\$50,000).
- Inflation: 10% increase in nominal income (\$55,000).

$\longrightarrow$ New Tax Bracket: 30% (bracket for \$50,000–\$70,000).

Tax Burden:

- Old Tax: \$10,000 (20% of \$50,000).
- New Tax: \$16,500 (30% of \$55,000).
- Real Income: No change (inflation offsets increase), but **higher tax liability**.

$\Longrightarrow$ Cold progression causes a hidden tax increase, reducing purchasing power despite no real income growth.

Flexibility

Automatic Stabilization: Tax systems can stabilize the economy by adjusting tax burdens automatically based on changes in income levels or economic conditions.

- **Progressive Tax Structure:** Automatically reduces tax burdens during recessions as incomes fall, providing stimulus for more investments.
- **Cold Progression:** Inflation (increase in nominal wages) pushes taxpayers into higher brackets, increasing tax burdens when real incomes stagnate.
  $\Longrightarrow$ Particularly harmful during stagflation (inflation + recession).

Flexibility

Indexation: Automatically adjusting tax brackets for inflation to prevent cold progression.

Indexation for income taxation is used by the following countries:

- USA, Canada
- Netherlands, Austria, Denmark

Other countries periodically pass **legislation to adjust taxes** for cold progressions:

- Germany, Belgium, France, Sweden, Finland

Political Challenges:

- Adjusting income tax rates often leads to debates on fairness.
- Cold-progression can help to increase the tax burden without passing legislation.
  $\longrightarrow$ **However:** deception of citizens

Transparent Political Responsibility

Transparency in Taxation: A good tax system makes clear who benefits and who bears the burden.

Examples:

- Individual income tax is usually very transparent.
- Corporate tax often obscures who pays (e.g., shareholders, workers, or customers).

Challenges for transparency:

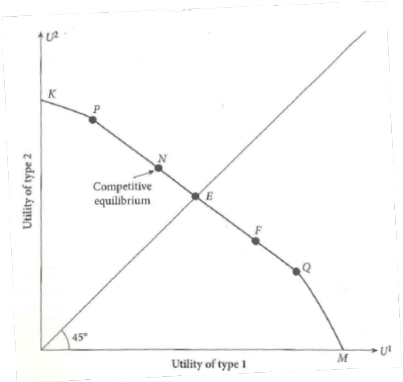
- Inflated tax revenues during inflationary periods without explicit legislation (i.e., through cold progression).
- Misrepresentation of costs (e.g., splitting Social Security taxes between employer and employee).

Corruption Resistant

- **Corruption Risks:** Complex tax systems with many specific rules (to improve fairnes) can lead to:
  - Legislative manipulation (bribery, lobbyism).
  - Finding 'legal' loopholes to reduce tax burdens.
- **Corruption Resistance:**
  - Simple, transparent systems with low rates reduce incentives to cheat.
  - Easily verifiable tax bases (e.g., number of cars produced) are harder to manipulate.
- **Trade-offs:** Corruption-resistant vs. flexibility/ fairness (i.e., simple vs. complex tax system).

Outline of Lecture

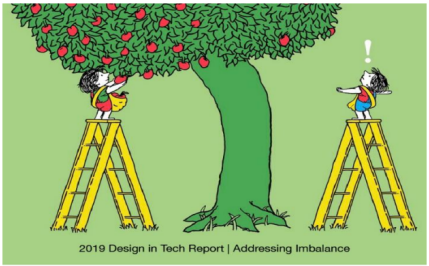
Welfare Theorem 2



- The utility possibility frontier represents the maximum attainable combinations of utility for the two households given the resources and technology available in an economy.
- How can we reach other Pareto efficient allocations on this possibility frontier, (e.g. point E)?

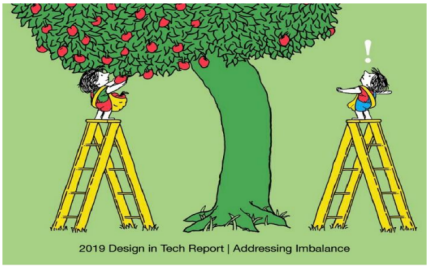
$\Longrightarrow$ **2nd Welfare Theorem:** every Pareto efficient resource allocation can be obtained through a competitive market process with an initial redistribution of wealth.

Why would we want to redistribute wealth?



Equality

Why would we want to redistribute wealth?



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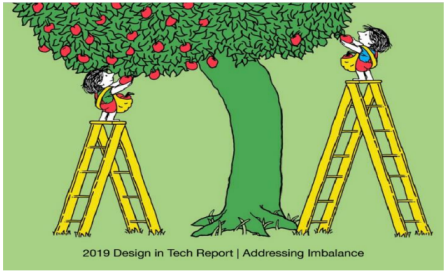

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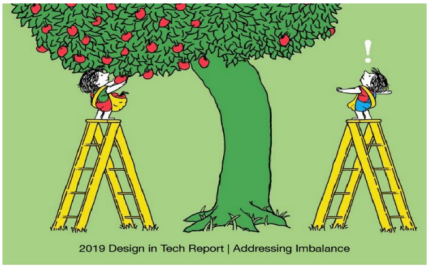
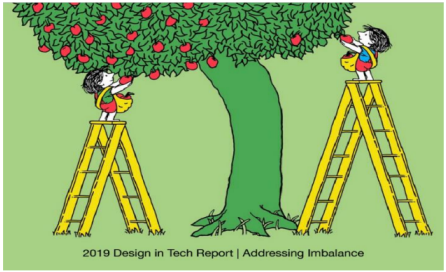


Equality



Equity

- Equality means each individual or group of people is given the same resources or opportunities.
- Equity recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome.

Social Welfare Functions

How can we evaluate, which point of the utility possibility frontier to select?

- **Social welfare function (SWF)**: A function that combines the utility functions of all individuals into an overall social utility function.
- **Social indifference curves** illustrate the SWF and describe how society trades-off utility levels of different individuals.
  $\Longrightarrow$ They show the combinations between which a society is indifferent.

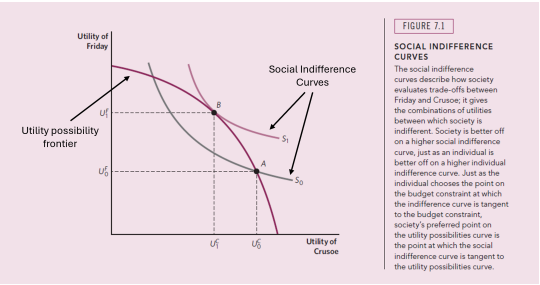


Figure 7.1 Stiglitz and Rosengard (2015)

Social Welfare Functions

Examples for different social welfare functions:

- Utilitarianism: $SWF = U_1 + U_2$
- Cobb-Douglas welfare function: $SWF = U_1^{\alpha} U_2^{\beta}$
- Rawlsianism: $SWF = min(U_1, U_2)$

Utilitarian Social Welfare Function

- With a utilitarian social welfare function, society's goal is to maximize the sum of individual utilities:

$$SWF = U_1 + U_2$$

- The utilities of all individuals are given equal weight, and summed to get total social welfare.

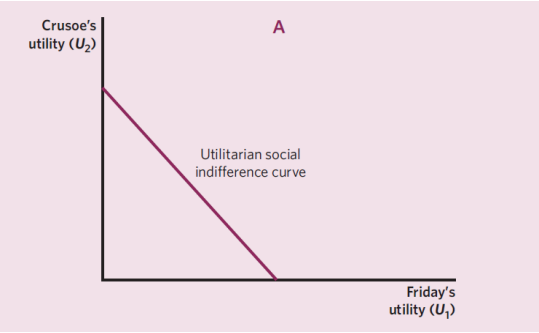


Figure 7.6 Stiglitz and Rosengard (2015)

Cobb-Douglas Welfare Function

- Society requires more than an equal increase in the utility of the rich (Crusoe) to compensate for a decrease of the poor (Friday):

$$SWF = U_1^{\alpha} U_2^{\beta}$$

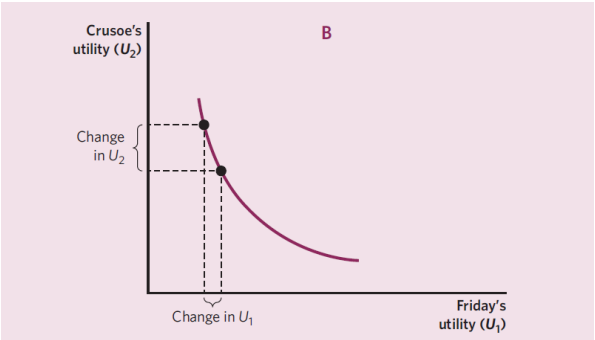


Figure 7.6 Stiglitz and Rosengard (2015)

Rawlsian Social Welfare Function

- Rawls (1971) proposed that society's goal should be to maximize the well-being of its worst-off member. The Rawlsian SWF has the form:

$$SWF = min(U_1, U_2)$$

- Since social welfare is determined by the minimum utility in society, the goal is to maximize the well-being of the worst-off individual (maxi-min principle).
- The Rawlsian criterion is redistributive: Society aims to extract the maximum possible tax revenue from the middle class and the wealthy in order to make transfers to the poor as large as possible.

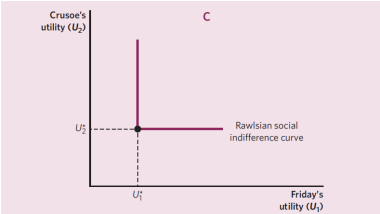


Figure 7.6 Stiglitz and Rosengard (2015)

Other Social Justice Principles

- **Standard welfarist approach** focuses on individual utilities, but fails to capture key elements in debates on redistribution and fairness:
  1. **Just deserts:** Individuals should receive compensation in line with their contributions (libertarian).
  2. **Commodity egalitarianism:** Society should ensure individuals meet basic needs (considered as rights), but income distribution beyond this point is irrelevant.
     - Rich countries today view free K-12 education, universal healthcare, and decent retirement/disability benefits as rights.
  3. **Equality of opportunity:** Society should ensure equal opportunities for success.
     - Individuals should be compensated for inequalities they are not responsible for (e.g., family background, inheritance, intrinsic ability), but not for those they are responsible for (e.g., being hard working vs. preference for leisure).

Testing People Social Preferences

Saez and Stantcheva (2016) survey people online (using Amazon MTurk) by asking hypothetical questions to elicit social preferences.

Key Insights:

- People typically do not have "utilitarian" social justice principles (consumption lover not seen as more deserving than frugal person)
- People put weight on whether income has been earned through effort vs. not (hard working vs. leisure lover)
- People put a lot of weight of what people would have done absent a government transfers to low-income households (deserving poor vs. free loaders)

Testing People Social Preferences

Saez and Stantcheva (2016) survey people online (using Amazon MTurk)

General conclusion: People favor redistribution if they feel inequalities are "unfair," but *unfair* means different things to different people.

- Redistribution is supported when people lack control:
  - Education for children
  - Health insurance for the sick
  - Retirement/disability benefits for the elderly/disabled or unable to work
- Redistribution receives less support when people have some or full control:
  - Unemployment
  - Being low income

Conservatives: Individuals have control (personal responsibility); government should enforce rules.
Liberals: Many societal forces are beyond individuals' control ("we are all in this together"); society should provide nurturing.

Readings for Next Lecture

Lecture 8: Taxation II

Stiglitz and Rosengard (2015)

- Chapter 18: Tax Incidence

Mankiw (2021)

- Chapter 8: Application: The Costs of Taxation

Gruber (2005)

- Chapter 19.1: The Three Rules of Tax Incidence

Thank you and see you next week!
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References I

Alstadsæter, A., Johannesen, N. and Zucman, G. (2019). Tax evasion and inequality, *American Economic Review* **109**(6): 2073–2103.

Gruber, J. (2005). *Public Finance and Public Policy*, Worth Publishers.

Mankiw, N. G. (2021). *Principles of economics*, Cengage Learning.

Saez, E. and Stantcheva, S. (2016). Generalized social marginal welfare weights for optimal tax theory, *American Economic Review* **106**(01): 24–45.

Stiglitz, J. E. and Rosengard, J. K. (2015). Economics of the public sector (4th edition).