

## LECTURE 2

# Design of Government: A Tax Theory Primer

**Leonid Polishchuk**

*Department of Economics, Higher School of Economics*

# Design of the Government

Once the role of government is understood and identified, the next question is how best to implement this role?

This question reflects a normative view of the government, whereby its functions, tools, and prerogatives are selected to optimally meet social needs and interests

# Normative vs. Positive

Normative analysis of government serves as a benchmark to assess functions and performance of government in real life. To explain the latter, one needs positive analysis, which explains government and their performance as outcomes of public choice

The society is almost never unanimous as to what government it wants and needs, and therefore governments are political equilibria shaped by various interests

# Issues and Questions

- (i) What functions and roles the government assumes upon itself (scope of government)
- (ii) At what scale are these functions implemented (size of government)
- (iii) What tools (taxes, laws and regulations, expenditure programs) the government deploys to implement these functions

# Taxes That We Pay

Modern nations use panoply of taxes:

- Income tax
- Sales taxes and VATs
- Payroll Taxes
- Property taxes
- Investment taxes

Each tax has its base (taxed activity) and schedule (formula to calculate tax liabilities)

# Optimal Taxation Principles

**General optimization of public finance:** design taxes and public expenditures which maximize social welfare

**Partial optimization of public finance:** design taxes which meet revenue collection target while minimizing social welfare loss caused by taxation

# 1<sup>st</sup> and 2<sup>nd</sup> Best

It is unrealistic to view governments to view governments as fully benevolent, omnipotent, and omniscient. Governments are faced with multiple constraints, including informational, administrative, and political. These constraints should be properly included in normative analysis

Optimal government design without the above constraints is known as the 1<sup>st</sup> best. More pragmatic approach is to look for 2<sup>nd</sup> best, i.e. search for optimum subject to these constraints

# What Constrains Tax Selection

- Informational constraints (asymmetric information)
- Administrative constraints (state capacity)
- Credibility constraint (time consistency)
- Political constraints (benevolent government or Leviathan)



# 1<sup>st</sup> Best: Nothing Beats Lump-Sum

Lump-sum is a fixed tax that a taxpayer is required to pay.

Representative taxpayer's utility:  $U(x, l)$

$x$  – income

$l$  – leisure

$$x = \omega(L - l) + x_0$$

$R$  – revenue collection per capita

# Lump-sum (mis)interpretation

... it does not affect behavior (gives you an idea, but generally not true)

... the tax amount does not depend on behavior (true)

Lump-sum tax base – everything

# Optimality of Lump-Sum

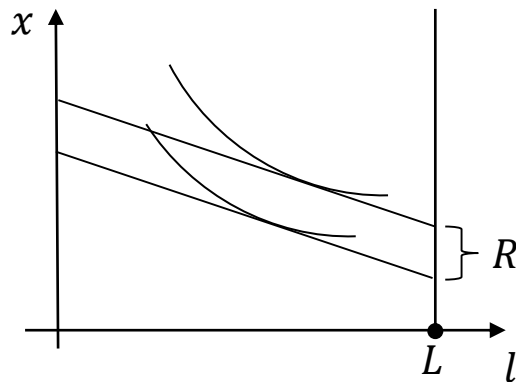
Optimal tax:  $T \equiv R$

Budget set with lump-sum tax:

$$x = \omega(L - l) + x_0 - R$$

After-tax outcome with any rule:

$$\tilde{x} = \omega(L - \tilde{l}) + x_0 - R$$



# Asymmetric Information

Agents differ in their productivities ( $\omega$ ) and non-labor income ( $x_0$ ), and these differences are usually not known to the government

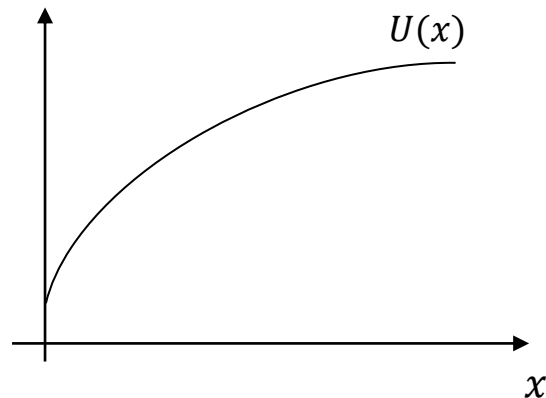
If the government selects the same lump-sum tax for all agents based on the poorest (least able) agent's ability to pay, tax revenues would be too low

# Imputed Lump-Sum Taxes

$$\begin{cases} \sum U(x_{0i} - t_i) \rightarrow \max \\ \sum t_i = R \end{cases}$$

Equation solution:

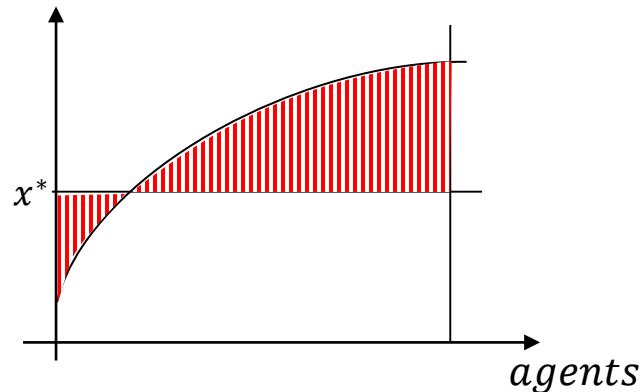
$$u'(x) = \text{const}; \quad x \equiv x^*$$



# Incentive Incompatibility

Truthful revelation of information  
would not be incentive-compatible

Way out: link taxes to observable  
behavior and outcomes



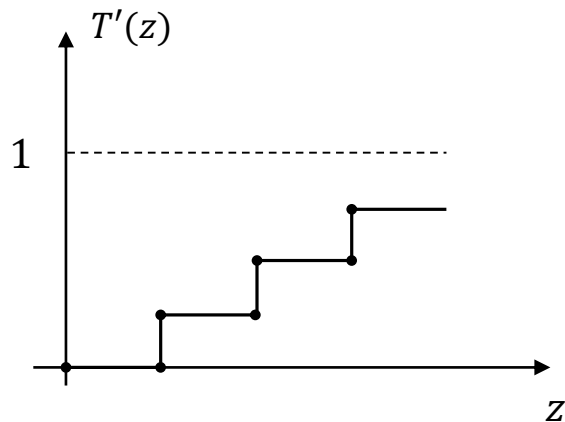
# Income Taxes

$z$  – income;  $T(z)$  – tax schedule;  $x = z - T(z)$

Linear (flat) income tax:  $T(z) = tz$

Progressive tax:  $T(z)/z$  - monotonically increasing; alternative formulation:  $T'(z)$  - monotonically increasing

Real-life tax schedules: income brackets and increasing tax rates



# How to Choose Income Tax Schedules

Main rationales:

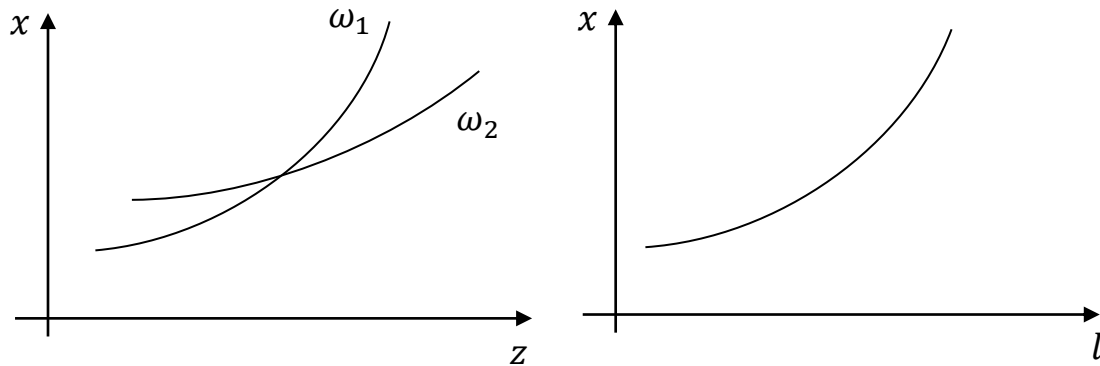
- (i) Redistribution (progressive taxation)
- (ii) Taxpayers incentives and informational asymmetry



# Mirrlees Economy

$U = U(x, l)$ ;  $x$  – consumption;  $l$  – labor;  
 $z = \omega l$  – income

$$\tilde{U}(x, z, \omega) = U(x, z/\omega)$$

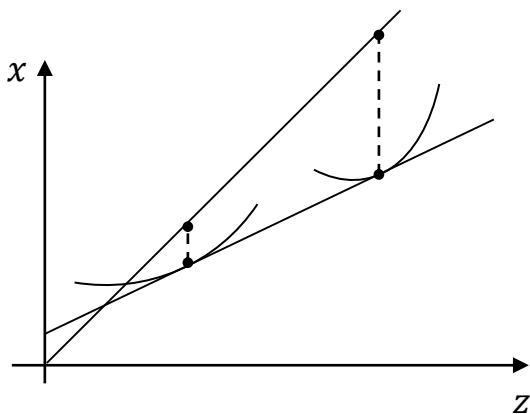


# Power of Non-Linear Taxes

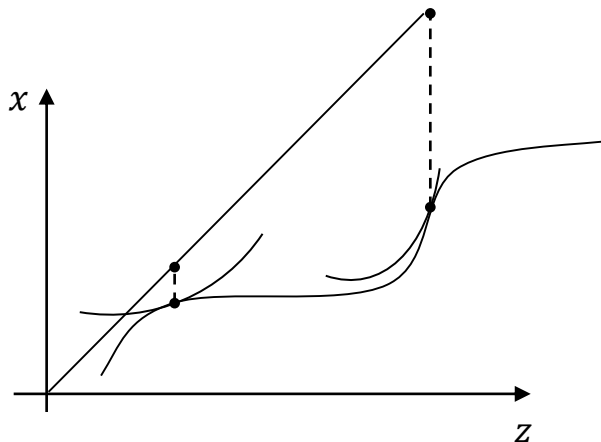
**Linear taxes:**

$$T(z) = -D + tz, 0 < t < 1$$

$$x = D + (1 - t)z$$



**Non-Linear taxes:**



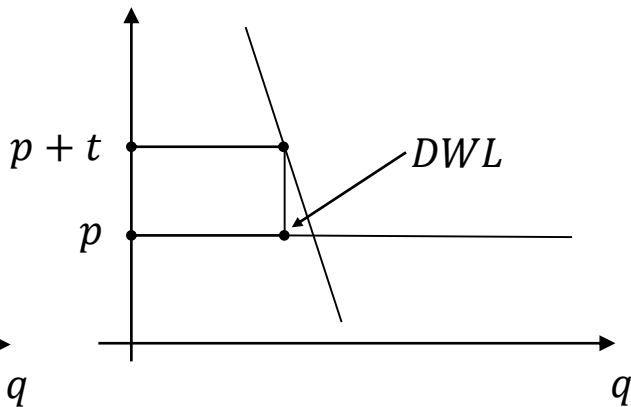
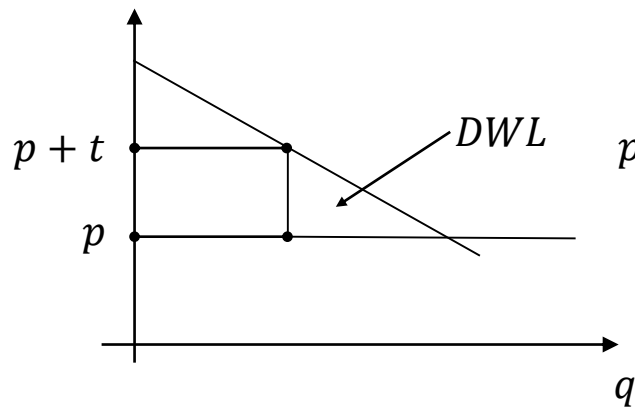
# **Limited State Capacity: Keep it Simple**

Flat rate income taxes are easier to administer, they have lower compliance costs and are better protected against tax evasion

Introduction of flat rate taxes with lower tax rate and broader tax base could increase revenue collection

# Sale Taxes: What Markets to Tax?

**General principle:** Collect revenue with lowest damage to the private sector



# Ramsey Rule

Confine taxes to less elastic markets:

$$\frac{t_i}{t_i + p_i} = \frac{a}{\varepsilon_i'}, \quad \varepsilon_i = \frac{-q_i D_i'(q_i)}{D_i(q_i)}$$

Motivation: get taxes as close as possible to lump-sum

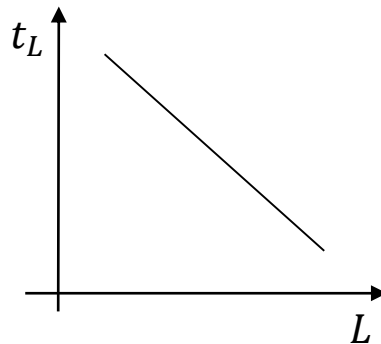
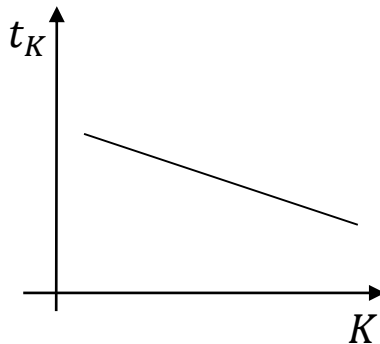
# Time (In)consistency Problem

Tax policies are announced ahead of time on the assumption that the taxpayers will take such announcements at their face values. This might not be the case if taxpayers have reasons to believe that by the time it comes to implementing the promise, the government might have the incentive to change its mind. This could be expected e.g. with capital taxation due to differences in investment elasticity ex ante and ex post. As a result capital taxation could be excessively high.

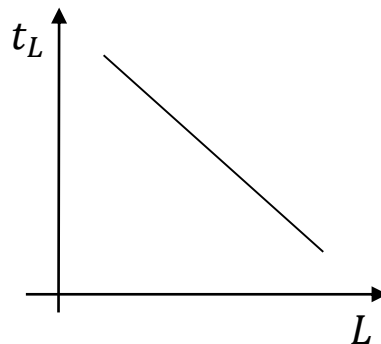
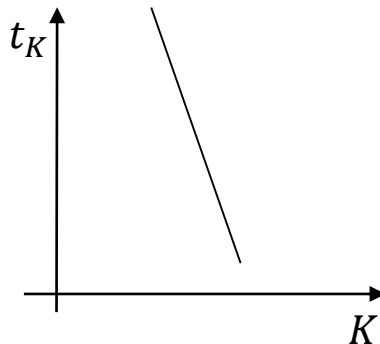
# Credibility of Tax Policies

## Capital and Labor Supply

Ex ante:



Ex post:



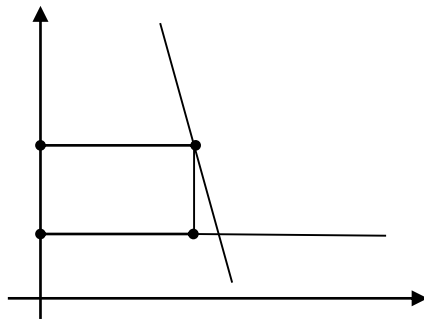
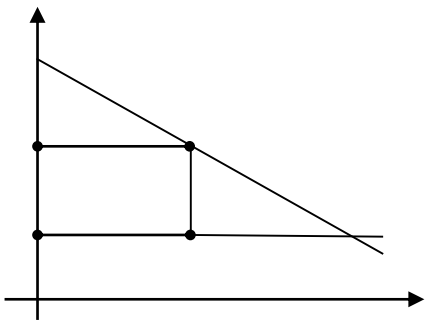
# Protection from Predatory Government

Government's fiscal appetites could exceed what is reasonable, let alone socially optimal. The society could protect itself against such abuse by restricting under the "veil of ignorance", government's choice of taxes. This could lead to restricting the government to *less* efficient tax tools, e.g. by confining taxation to higher elasticity markets where it is easier to seek refuge from excessive taxation

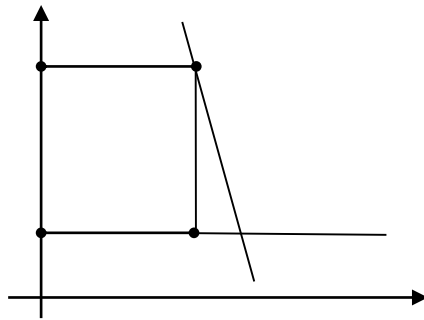
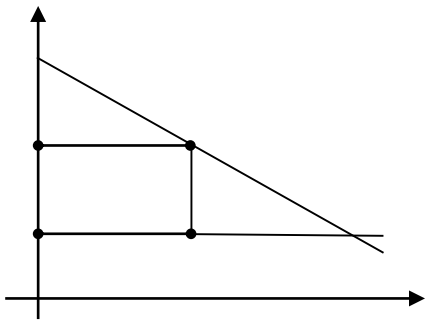


# Protection from Leviathan

Benevolent government:



Leviathan:



# **Variations of Tax Systems Around the World**

The above incentives, constraints and concerns apply in different combinations in countries and jurisdictions around the world. This, in addition to culture, tradition, economic structure, and political economy, explains the observed variations of tax systems in the modern world.