

1. Public Finance – Basic Concepts, Ties and Aspects

Aim of this chapter

- to introduce to the issue of public finance;
- to present basic concepts of this topic and learn about their contents;
- to understand the linkages of public finance on economic theory.



Key words

Public finance, public sector, public revenues, public expenditures, functions of public finance, collectivism, individualism, allocation function, redistribution function, stabilization function, market failure, Lorenz curve, Gini coefficient, non-optional, non-refundable, non-equivalent.



Required entry skills

Basic orientation especially in macro and microeconomics, politics and related terms.



Study time requirements

Approximately 2–3 hours.



Outline

- 1.1 Basic concepts, ties and aspects
- 1.2 Linkages to economy of public sector
- 1.3 Public finance – causes of development
- 1.4 Development of fiscal theory

1.1 Basic Concepts, Ties and Aspects

Public finance as a concept may be understood on two levels – 1) as a practical activity of all components of public administration and 2) as a theoretical area.

The term “public finance“ may be **defined** as the identification of specific financial relationships and functions running between public administration bodies and institutions (i.e. public sector entities – the state) as one party and in mutual interaction with other entities of the economic system as the other party (i.e. private entities – households and companies).



These relationships and functions may be considered special as they include:

- **Procuring public goods** (production and provision);
- **arranging and funding various transfers** (particularly in the social area);
- **directing entities** existing in the economy towards **socially desirable behaviours**; for instance through taxes, penalties, subsidies and other stimuli and charges.

In order to arrange the funding of the above-mentioned areas, there is a **fiscal system (public budgeting system)** whose aim is to collect the required amount of **public revenue**. Public revenue serves, at various levels of public budgets (governmental, regional and local), to fund **public expenditures**.

Public expenditures, public revenue and particularly **taxes** may be considered to be the fundamental elements of public finance. Important terms derived from these three elements include **deficit, public debt, budgetary policy and fiscal policy**.

The development of public finance is connected with economic mechanisms that should ideally lead to the effective and fair allocation of limited resources.

Historically, allocation issues were dealt with through various allocation mechanisms. **Cultural traditions and customs** may be classified as initial allocation mechanisms. Later, with the advent of social and economic development, the role of customs and traditions was taken over by the **state**. It contributed to making the allocation of limited resources effective and fair.

Approximately since the 1930s, the state’s role in the economy has been noticeably gaining in importance; therefore the traditional functions of the state (legislative, social, security, etc.) have been supplemented with the **economic function** (sometimes called the **fiscal function** or the **public finance function**). This function includes **allocation, redistribution and stabilization** activities. The state uses legislative and executive powers, as well as its own public administration bodies and institutions (centralized and decentralized) to perform them. The state is also a special economic entity because of its enforcement powers. Not only does it determine rules, but it may also enforce their observance through the tools at its disposal.



The state’s economic function has become predominant particularly in the school, health care, social services and social security sectors. With regards to the role of the state in the economy, two approaches have emerged:

- 1) State interventions are undesirable for the economy; therefore they are rejected (individualistic views).
- 2) State interventions are advocated (collectivist views).

1.2 Linkages to Economy of Public Sector

Whereas public finance relates to financial operations, relationships and tools for implementing the provision of public goods, transfers and the stimulation of economic entities to follow a certain behaviour, the term **public sector** means a specific part of the national economy.



The institutions and organizations of the public sector are in whole or in part funded by public funds and are connected with the fiscal system. Other specific characteristics include their ownership, management system, provision of their products to consumers, etc. The public sector fills the gap unoccupied, for various reasons, by private companies within their business activities.

The public sector is a part of society that is in the public's ownership, in which decisions are made by public choice, is under continuous public control, and exists for the purpose of public interest fulfilment and common affair administration. The sector that is entirely or predominantly funded with private money and performs functions similar to those of the private sector is called the **non-profit non-governmental sector**.

In pluralistic democracies, the public sector coexists with the private sector. These two sectors permanently influence each other with respect to both size and activity. The state strongly influences the private sector through various restrictive measures. One of its control tools is **public finance**. Therefore, the public finance measures must be analysed and examined, including how impact the private sector.

1.3 Public Finance – Causes of Development

The reason for developing public funding is the state intention to soften the drawbacks resulting from economic decisions made by individual entities (households and companies). It uses fiscal tools (public revenue and expenditure) to accomplish this.

Certain behaviour is classified as the “quasi-fiscal funding principle”, where public-law goods are funded from off-budgetary resources (e.g. the public-law television in the Czech Republic is funded from television licence fees).

Another important term that relates to public finance, and that is also a strong argument for its development, is **market failure**.

The market system follows supply and demand through the price mechanism. It is a system that has developed itself, and that has strong ties with the interactions between people and companies. All these entities strive to maximize their benefit (welfare). The greatest benefit is strongly interconnected with reaching the economic optimum condition. A system that reaches the optimum is considered, in the neoclassical economics concept, to be **efficient, fair and stable**. The ideal condition is called the **Pareto optimum**. This exists in an economy when none of the involved entities can improve its position without worsening another entity's



position. If any of the entities intends to improve its position, it is possible for it to do so only to the detriment of another entity. The existence of **perfect competition** is a necessary requirement for reaching the optimum.

The three above-mentioned elements (efficiency, stability and fairness) are **connected with microeconomics** from the viewpoint of **efficiency**, connected **with macroeconomics** from the viewpoint of **stability**, and connected with **sciences outside economics** from the viewpoint of **fairness**. The perception of fairness is investigated by other social sciences, and is closely linked to ethics, etc.

If no conditions exist for reaching a market-efficient solution, or the conditions are simply violated for any reason, **market failure** will ensue. It consists of the following:

- the allocation of resources is not efficient,
- the economy in the area of macroeconomics indicators oscillates around the desired values and
- the distribution of wealth and income may diverge from the consensus on fairness.

It is then up to the state to perform its fiscal function (the public finance function) in those three areas in order to preferably eliminate or at least reduce market failure. Specifically, those are microeconomic failures from the allocation function perspective, macroeconomic failures from the stabilization function perspective, and the redistribution function then falls into the area of market failure caused by outside economies.

If the conditions for perfect competition are not met, a malfunction in the price mechanism will arise, which disturbs the allocation mechanism. Some failures can be eliminated without public finance intervention through auto-regulation (the internalization of externalities). However, others are part of the government's allocation function and its fiscal tools (taxes and governmental purchases or transfers).

Macroeconomic failure is indicated by instability in the economic system that usually suffers from cyclical inflation, a high rate of unemployment, low or even negative growth of production or problems in the foreign trade balance, etc.

The above-mentioned macroeconomic cases of instability are why governments perform **the state stabilization functions (stabilization fiscal functions)**.

The state uses several tools to perform the stabilization function. The basic classification is a division into **monetary** and **fiscal** tools. The monetary tools include open market operations, the setting of basic interest rates, determining the level of mandatory minimum reserves, etc. Fiscal tools may include public expenditure, public revenue and ways of funding deficits.

The **causes** of market failure **outside the economy** relate to reaching fairness in society through the distribution of wealth and income. With the distribution of wealth, the market does not practically perceive fairness. In this case, the state performs a redistributive role with 5h3 principles of solidarity, social conscience, charity, etc. based on the social consensus.

The state performs the redistribution function through two basic categories of tools. The first includes **revenue (tax)** and the other **expenditures** (transfers, grants and

subsidies). First, a tax transfer mechanism may be implemented through a combination of progressive taxation of high incomes and transfers (subsidies) in favour of low-income households. Secondly, this can occur through the taxation of luxury goods combined with subsidies on goods for the low-income population.

The question of fairness is further connected with **income inequality**. Its monitoring serves to seek necessary redistribution that will be perceived as fair by society. The most well-known tools are the **Lorenz curve** (see Fig. 1), the **Gini coefficient (G)** and others.

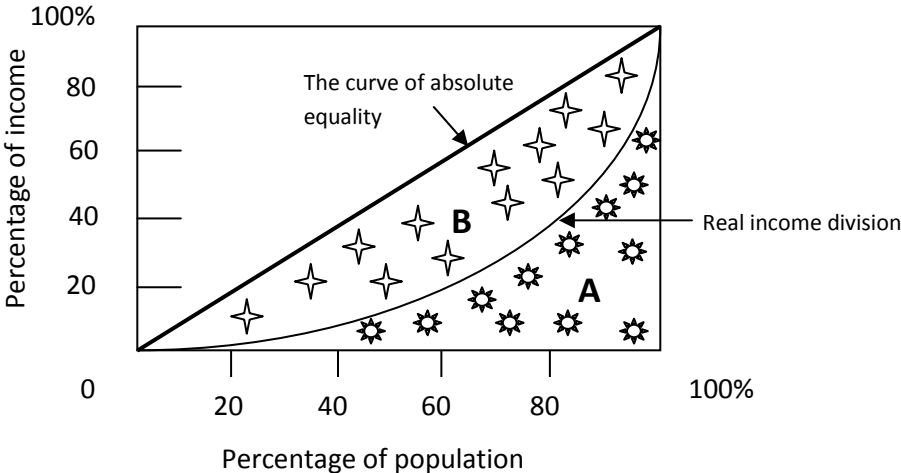


Fig. 1: Lorenz curve
Source: own based on Hamerníková (2010).

The formula for Gini coefficient is as follows:

$$G = \frac{B}{B+A} \tag{1}$$

G is a dimensionless number and from the formula (1) is obvious that may have values within the interval of <0;1>, where zero means absolute equality and G = 1 means absolute inequality. The usual range of this coefficient lies between 0.3 and 0.6.

Thus, with regards to absolute equality, the Lorenz curve is diagonal (see the curve of absolute equality in Fig. 1) and the Gini coefficient equals 0. In this case 20% of population has 20% of income, 40% of population 40% etc.

Regarding the situation in Fig. 1 named “Real income division”. The poorest 20% of the population receives approximately 2% of income; 40% of population approximately 10% and 60% of population receives approx. 20% of income.

The coexistence of economic relationships between households and companies and the economic relationships and operations with public administration bodies and institutions (public finance) give rise to a **mixed economy**. It lies at the frontier between an open market economy and its opposite – a non-market (controlled) economy. The mixed economy contains, besides **private ownership**, also **public ownership** (i.e. state, municipal, communal, etc.)



Three principles that public finance is based on are:

1) Non-optional – Economic entities are forced by law to contribute to the joint budget of national or local authorities. Although the entities must contribute, they are not guaranteed a sufficient amount of public goods.

2) Non-refundable – The “quid pro quo” relationship in other finance or trade transactions does not apply. It is not certain that the expended means will be returned to the entities at the expected amount.

3) Non-equivalent – Although the entities contribute to a joint fund, the benefit from the means expended by them is not equivalent (adequate) in view of the amount of expended means. Simply put, poor households contribute little, but the goods provided for them by the public sector are relatively large. With regards to rich households, the situation is reverse.

Government failure is a specific risk regarding public funding. The government usually fails in the following items:

- The impact of measures taken by the government is often very difficult to assess (the problem of time and implementation lag).
- Auditing the consequences of taken measures is limited.
- Government decisions are actually implemented by clerks who may have their own preferences.
- Political processes are special and may diverge from economic theories and needs.

1.4 Development of Fiscal Theory

With regards to terminology, at the beginning of the 20th century, public finance was often called “state” or “municipal” or even “local” finance. Thanks to the transfer of powers from the state to autonomous regions, *state administration* and *local administration* may be understood as two different spheres. They fall under the combined overall title of *public administration*. It is then possible to call financial operations and relationships between the components of public administration and their surroundings “*public finance*”.



From the public finance concept perspective, a shift from the **normative** approach to the **positive** approach exists. The normative approach is based more on the deduction method, and it tries to define a system of unquestionable bases for governmental policy from the public finance perspective and the public sector (which means defining an axiomatic system). The positive approach mainly uses the induction method when analysing the impacts of governmental measures on various economic entities.

The foundations of the public sector economy based on a neoclassical economy are, by their nature, microeconomic. Since the Great Depression at the end of the 1920s, the macroeconomic approach was more common, especially beginning in the 1930s (functional – Keynesian finance). The situation lasted until about the 1970s, when the contemporary crisis moved theoretical approaches again back to microeconomics.

2. Economic Analysis of Public Goods

Aim of this chapter

- to get acquainted with characteristics of public goods;
- to understand the division of public goods;
- to be aware of the difficulties in effective ensuring of public goods.



Key words

Public good, collective consumption, free goods, economic goods, private goods, divisibility, rivalry in consumption, free rider, consumer community, externalities, effect of overloading.



Required entry skills

Terminology, tools and graphical analysis of Microeconomics (preferably master level). Entry knowledge of public finance.



Study time requirements

Approximately 2–3 hours.



Outline

2.1 Economic specifics and characteristics of public goods

2.2 Classification of public goods

2.3 Effective provision of public goods in terms of partial and general equilibrium

2.1 Economic Specifics and Characteristics of Public Goods



Microeconomics theory states that the existence of public (goods of collective consumption) is one of the causes of market failure. To eliminate this failure, a fiscal allocation function should be implemented. A public goods analysis was performed by Paul Samuelson in 1954 with a specific focus on consumption. Public goods are not called public because of the way they are financed, i.e., they are paid for and distributed through public finances, but because they are consumed in a very specific way. A public good does not have to be provided by public finances, even if this definition is what first comes to people's minds.

Division of goods

Some goods have mass availability for their consumers and they are neither produced nor distributed. Their market price, naturally, is zero. Those are known as **free goods** (e.g. the air). This does not apply to most goods. The majority of goods have to be concerned with allocation, production and distribution. These goods are called **economic**.

They can be divided into **private goods** and **public goods**. For private goods, their important characteristics are their **divisibility of consumption (consumer rivalry)** and **exclusion from consumption**. Public goods are characterized by their indivisibility of consumption, zero marginal costs of consumption for each consumer and their non-exclusion from consumption. Assuming the above to be true, we differentiate between two marginal types of goods – **pure private and pure public**. **For more information, see subsection 1.2.**



Divisibility

A very important attribute of economic goods is their **divisibility** among individuals. Some of them are divisible by both quantity and quality. However, not all goods are divisible. Goods that have indivisibility of consumption share the following characteristics:

- they are consumed by all consumers together,
- if they are only consumed by one entity, the consumption of other consumers is not reduced.

Divisibility (quantitative and qualitative) can be defined as follows:

$$y_k = \sum_{i=1}^n x^{ki}, \quad (1)$$

where:

y_k = total consumption of a good k ,

x_{ki} = consumption of a good k by a consumer i .

The total consumption of good k equals the sum of partial consumption by all i -individuals.

There are many fully-divisible goods in everyday (food, clothes, cars, electronics, etc.)

On the other hand, full indivisibility means that every consumer consumes the same amount. Whereas total consumption does not equal the sum of their partial consumptions, as is the case for divisible goods, it equals partial consumptions. The relationship between total consumption and the consumption of particular users can be defined as follows:

$$y_g = x_{g1} + \dots + x_{gi} + \dots + x_{gn}, \quad (2)$$

where:

y_g = total consumption of fully indivisible good g ,

x_{gi} = consumption of a good g by a consumer i ,

x_{gn} = consumption of a good g by a consumer n .

This is true for goods such as defence, security, street lighting, etc.

Divisibility and indivisibility result in some microeconomic conclusions that are important for public finance. With regard to **full divisibility**, the following is important:

Under the conditions of partial and general balance, it is possible to achieve the economically optimal state.

For each pair of goods and pair of economic subjects, the following rule applies:

$$\text{MRSC}_{X,Y} = \frac{P_X}{P_Y} = \text{MRPT}_{X,Y} \quad (3)$$

where:

X a Y are two goods,

P_X a P_Y are market prices of these two goods,

$\text{MRSC}_{X,Y}$ is a marginal rate of substitution in consumption of the goods X a Y ,

$\text{MRPT}_{X,Y}$ is a marginal rate of transformation of the goods X a Y .

Because of the **full divisibility** of goods, the following applies:

- **The allocation of resources** for producing goods may be **effective** with the help of the system of prices.
- There is a **competition** among individual consumers. They cannot consume one good together which reveals their preferences at the same time. This means that at the same price, they will consume different amounts (the marginal utility MU from the last consumed unit by consumers A and B will equal the marginal costs MC for this unit of production, which will be conveyed by the price of this unit – market demand is defined as the horizontal sum of partial demands. The price mechanism then causes exclusion from the consumption of these fully-divisible goods.

$$MU_A = MU_B = MC \quad (4)$$

With **fully indivisible** goods, the consumption of other consumers is not decreased by the consumption of one consumer and the following applies:

- Consumption is **non-rivalry**; consumers do not reveal their preferences of their own accord (a **free rider** suppresses his or her preferences on purpose).

- It is either difficult or **impossible to make an effective allocation decision** through the price mechanism. Nevertheless, balance exists when the totals of the marginal utility of consumers A and B, MU_A and MU_B , from the consumption of a public good, equals the marginal costs MC of its production (demand for a public good is defined by its vertical sum of partial demands).

$$MU_A + MU_B = MC \quad (5)$$

From this relationship, it is obvious that unlike fully-divisible goods, the utility from consuming fully-indivisible goods by consumers A and B does not have to be the same.

If it is not possible to make a consumer reveal their preferences (their MU) through prices, then it is not possible to exclude those consumers who are not willing to “pay” for this public good from consumption. This is an example of the **free rider** problem.

Problems connected to this reality can be found on two basic levels. One of them is the **theoretical level**, which looks at the failure of market mechanisms in connection with the **non-effective** allocation of public goods due to a functionless price mechanism. The second level is **practical problems**, which are reflected in questions surrounding the proper amount and structure of public goods and next in questions concerning the allocation of production costs among all relevant consumers.

Another characteristic of public goods is their selection and consumption in particular **consumer communities**. This concerns various principles, i.e., **geographical** (the utility is for people in a particular area), **technical** (the good is used for a specific technology – e.g. TV signals, Wi-Fi net), **legal** (the public good is, under certain conditions, only available for some people who belong to a particular group).



Public goods and externalities

Pure public goods, which are indivisible in consumption, are in fact externalities. An externality is an internal relationship between two parties that unintentionally influences the utility of a third part – an uninvolved subject.

2.2 The Classification of Public Goods

There were two previously mentioned marginal types of goods from the point of view of their divisibility – **pure private goods** and **pure public goods**. But these two types are rather hypothetical examples. There are many goods that only somewhat meet these definitions. Such goods are called **mixed**. For example, the **effect of overloading** one consumer causes a decrease in consumption by the second consumer (e.g. the use of surface communications – overloading causes a decrease of travelling speed and safety).



The following two pictures demonstrate the division of goods into pure private, pure public and mixed goods with regard to consumption rivalry and exclusion from consumption (see Fig. 1). Second picture



presents the **function of overloading** as it relates to the effect of overloading during an increase if the amount of a public good being consumed (see Fig. 2).

		EXCLUSION	
		ACHIEVABLE	NOT ACHIEVABLE
CONSUMPTION	NOT RIVALRY	MIXED CLUB GOODS	PURE PUBLIC GOODS
	RIVALRY	PURE PRIVATE GOODS	MIXED POSITIONAL GOODS

Fig. 1: Four groups of goods according to Samuelsons' criteria
Source: own

If exclusion is achievable and the consumption is rivalry, we talk about **pure private goods**. In case of the second extreme when exclusion is not achievable and the consumption is not rivalry, we talk about **pure public goods**. If exclusion is achievable, but the consumption is non-rivalry, we talk about **mixed club goods**. And if exclusion is unachievable but the consumption is rivalry, we talk about **mixed positional goods**.

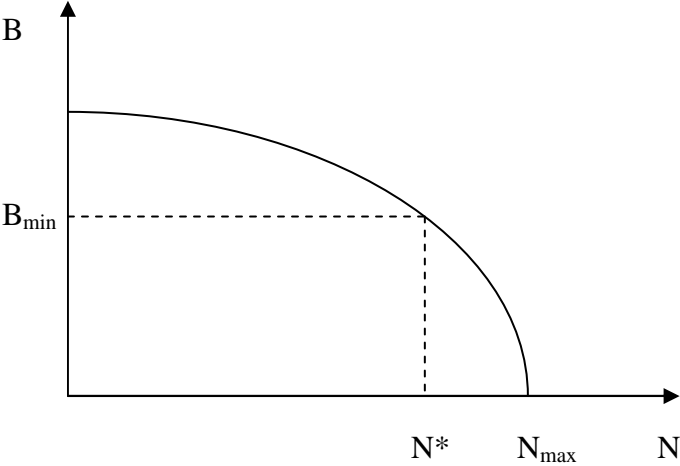


Fig. 2: Effect of overloading – mixed public good

- Note: N number of users,
- B the utility from a good for one user,
- B_{min} minimal utility from a good (a user still remains),
- N^* number of users with minimal utility.

In the previous traffic example, point K illustrates the state of minimal traffic safety. Behind this point to the right, the utility of consumers rapidly decreases till it reaches zero.

In assessing a **fee** for the use of mixed public good, the portion of users who will not be willing to use it under these conditions is excluded (e.g. highway tolls). This situation is illustrated in Fig. 3.

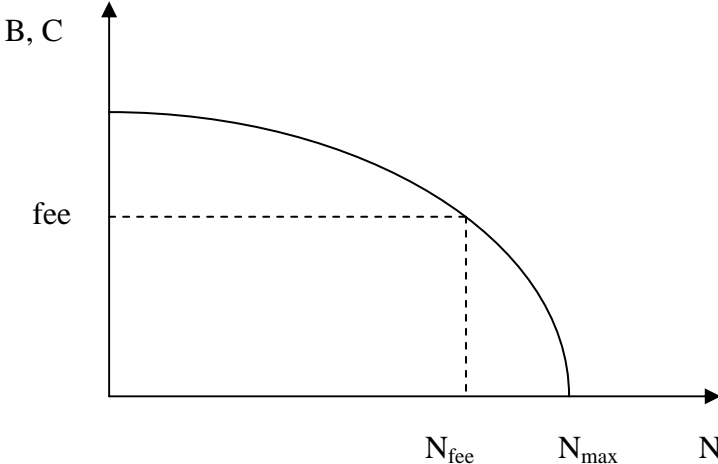
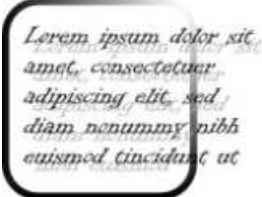


Fig. 3: Effect of introduction of a fee – mixed public good

Note: N number of users,
 B the utility from a good for one user,
 C the costs of a good for one user,
 N_{fee} number of users after introduction of a fee.

Other divisions of goods

Other possible divisions of goods exist according to **economic** and **institutional criteria**. The economic criteria were already described. Those were the criteria of exclusion and rivalry in consumption. With institutional criteria, goods can be divided into **pure market, impure market and non-market**. With pure market goods, the market price is assessed on the basis of supply and demand. In the case of non-market goods allocation, the price mechanism cannot be applied and the state intervenes. With such goods, price is assessed by some other way, not by the market (those are state discriminatory measures). Other divisions can exist according to the **spatial aspect** of public goods of **national and local importance**.



2.3 Effective Provision of Public Goods in Terms of Partial and General Equilibrium

The topic discussed in this chapter is one of the fundamental questions of public finance. We previously mentioned the problem with consumers who are not interested in revealing their preferences in the case of the full indivisibility of public goods. We do not know their individual demand curve and it is difficult to determine aggregate demand. In such



cases, it is extremely difficult and even impossible to make an effective allocation decision. From the practical point of view, it is a challenge for people who make public finance decisions to decide about:

- the proportion of the **public** or **private** security of goods,
- the subsequent **private and public production** of these goods,
- and last but not least, their **optimal supply (amount and price)**,
- **their optimal structure and provision** (the amount of a particular good and how to distribute it),
- or **the optimal tax burden** of individual consumers of these goods.

Thanks to theoretical undetectability of the above mentioned aspects, this leads to estimates, analysis of costs and benefits, etc.

Partial and general balance

In brief, a **partial balance** means the achievement of the optimal state; it is the equality of supply and demand on one (partial) market. A **general balance** means that the optimal state has been achieved across all partial markets. In other words, supply and demand are equal for every pair of goods and every pair of economic subjects.

Public goods under a condition of partial and general balance

Public goods are by their nature so specific that they cannot be placed into the models of partial and general balance. The ideal solution for optimizing public goods is to equal the marginal utility from the public good with the marginal loss caused by taxation.

And what does a partial balance mean? On the market of **private** good, it is the situation described in relationship (4).

$$MU_A = MU_B = MC \quad (4)$$

where: MU_A marginal utility of a consumer A,
 MU_B marginal utility of a consumer B,
 MC marginal costs on produced good.

We can again encounter the problem that for partial balance on the market with the **public good**, the following applies:

$$MU_A + MU_B = MC \quad (5)$$

All consumers pay the same price for a private good, but they consume them in different amounts. With a public good, all individuals consume the same amount for different “prices”. The total of these “different prices” should equal the costs of production of that public good.

The following graphic analysis (Fig. 4) should help to find the general balance in the consumption of private good (X) and public good (G).

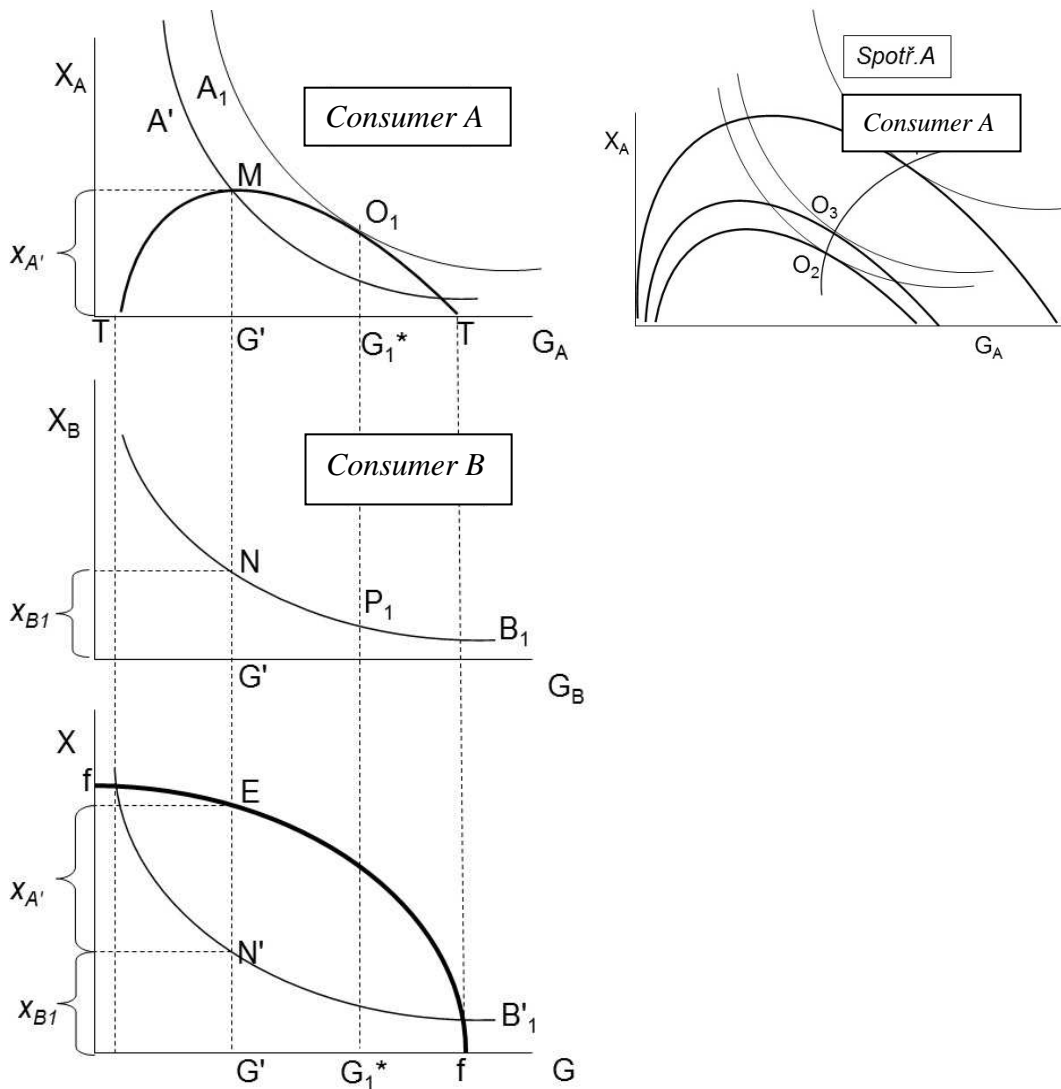


Fig. 4: Private and public good in general equilibrium

In the figure are two consumers, A and B, who have different preferences of consumption of private good X. That is why their indifference curves are different. The lower part of the graph describes the curve of a given society's production capacity. The curve f-f describes all the possible combinations of goods X and G that are available. The marginal rate of transformation (MRT) is the same for all goods. We will choose an arbitrary curve of consumer A called A'. Then we will choose the amount of public good G'. Now we can see that consumer A will consume the amount G'A (it is $X_{A'}$). We will find out from the limit of production capacity in the lower graph that in this case, consumer B will consume the amount corresponding to the difference (G'E-G'A); it is G'N. Then, we will identify the corresponding indifference curve for consumer B, curve B₁. You can see this curve in the lower graph as curve B'₁. Through this process, we will get the set of points that represent the consumption of private good X per consumer A with the changing preferences of consumer B on the indifference curve B₁. This one can be seen in the left lower graph as the curve TT and it is obvious that the optimal combination is the indifference curve A₁, which is the tangent to TT at point O₁.

The following can then be applied: $MRT = MRS^A_{XG} + MRS^B_{XG}$. The process repeats for different levels of indifference curves when the set of optimal points O_1 ($i = 1$ to n) arises – see the upper graph on the right.

In this case, the general balance enables us to define the amount of private and public goods, the price and the transfers.

Exclusion from the use of a public good – the loss of utility

In some cases, exclusion from the use of a good is possible. Implementing such a measure could be expensive or the utility could be reduced.

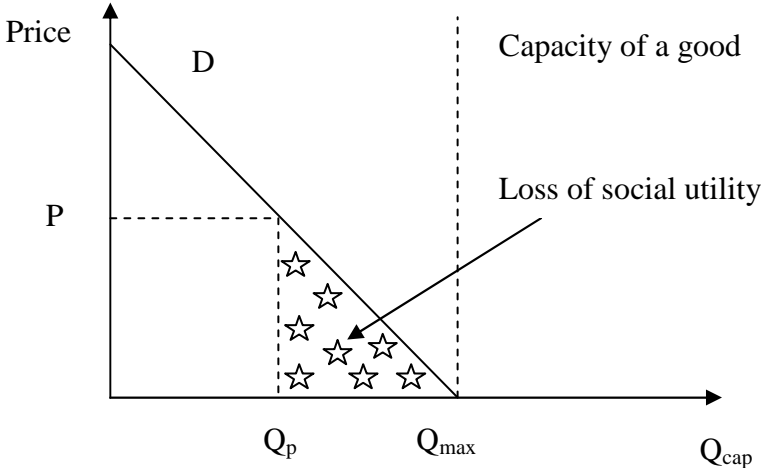


Fig. 5: Loss of utility because of introduction of a fee

Note: marginal costs are considered as zero.

The loss of utility was demonstrated by J.E. Stiglitz with a toll that was collected for crossing a bridge. If the capacity of the bridge is sufficient (Q_{max}), then the toll collection (P) will reduce the utility. See Fig. 5 (the space with stars). If there are zero marginal costs or the toll collection is too expensive, then it is better to eliminate the toll and to finance the bridge through a system of public budgets.

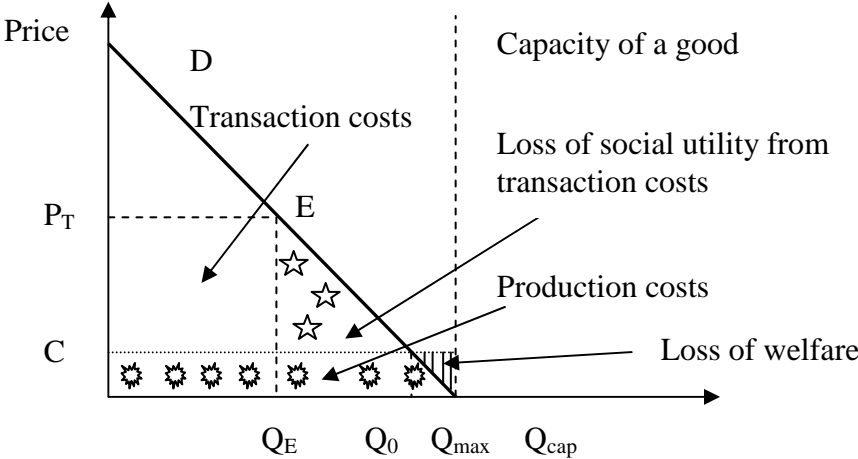


Fig. 6: Loss of social utility at non-zero transaction costs

In this case (Fig. 6), the marginal costs for every unit of production are unitary. The marginal costs of production are constant and the curve of marginal costs runs parallel with the horizontal axis at point C. When we also consider transaction costs, then the price will move to P_T , which corresponds to the consumed amount Q_E with balance at point E. If the government cancels all payments for this good, then the new consumed amount will be Q_{max} . In such a case, there would be social harm due to the loss of welfare as a result of waste (see the hatched space to the right of Q_0 “loss welfare”).

Another situation of a social loss demonstrates Fig. 7.

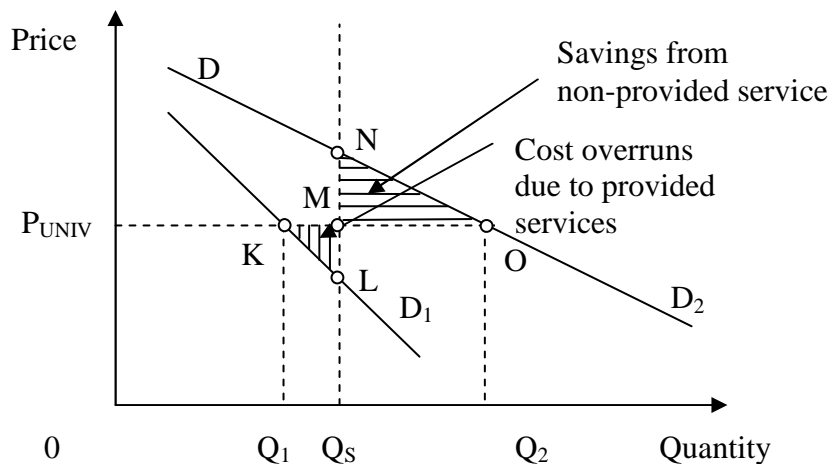


Fig. 7: Loss of social utility at non-zero transaction costs

This picture describes a situation of two consumers (demand D_1 and D_2), who, at the original price, demand the amounts Q_1 and Q_2 . For some reason, the state interferes and is interested in providing the same standard to all members of society (aims towards “fair redistribution”) or is interested in a certain consumption restriction. That is why the government chooses some amount in the Q_1 Q_2 interval, e.g., Q_S . This will be free of charge. Consumer 1 will achieve a higher amount than he or she consumed before and it causes **excessive consumption** (a loss of effectiveness amounting to KLM). On the contrary, the second consumer will consume less than he or she previously demanded. This means a **loss of welfare** even though he or she will achieve a certain amount of savings since they are not paying for the provided services (MNO). Even if the good is now free of charge and the utility of both consumers is positive, it leads to a loss of effectiveness.

Public provision of public goods

Public provision of public goods means how the production and provision of public goods are financed. They can also be produced by private companies (producers) on the basis of an agreement with public administration organs (financiers) – through public finance. But there is a danger of non-transparent decisions concerning the choice of good producers, corruption, disproportionate rises in costs during the contract’s term, etc. Some public goods can be provided privately. In some cases, their provision is provided by a mix of public and private security. It depends especially on the character of the intended good, i.e. which of the above alternatives will be more effective.

3. Public Choice

Aim of this chapter

- to get acquainted with the nature of public choice and its actors;
- to understand the differences in approach of public finance and economic theory to public choice;
- to be aware of the benefits and risks of public choice with regard to the designed rules.



Key words

Public choice, public interest, actor of public choice, collective action, median voter, interest group, bureaucracy, voting rules, dictator, consensus, majority rule, extortion by the individual, Condorcet rule, voting paradox, Arrow theorem.



Required entry skills

Terminology, tools and graphical analysis of Microeconomics (preferably master level). Entry knowledge of public finance.



Study time requirements

Approximately 2–3 hours.



Outline

- 3.1 The essence of public choice
- 3.2 The role of bureaucracy in public choice
- 3.3 Interest groups in public choice
- 3.4 Voting rules in public choice

3.1 The Essence of Public Choice

Public choice may be understood as a **theory** that deals with examining the decision-making process on public affairs as well as the **practical application** of public choice procedures in the public sector.



Public choice predominantly deals with the relationships based upon negotiations between individual participants. There are relationships between individual preferences and choices (private interest) of individual members in a given community as one factor and collective choices (action) made by the government as the other factor. The government tries to promote **public interest** based on public choice. The possibilities of promoting public interest by the government are different in various types of regimes (democracies, dictatorships, situations of anarchy, etc.) Public interest is usually known intuitively. The basic requirement for public choice consists in all participants **behaving rationally** in a given process. All participants try to maximize their benefit for a specific cost. The **participants** in public choice mainly include **politicians, voters, interest groups** and **bureaucracy**.

Median voter

The question of politicians' rationality is investigated through the **median voter** model. The graphic analysis can be seen in Figure 1.

Fig. 1: Voter's preferences – median voter

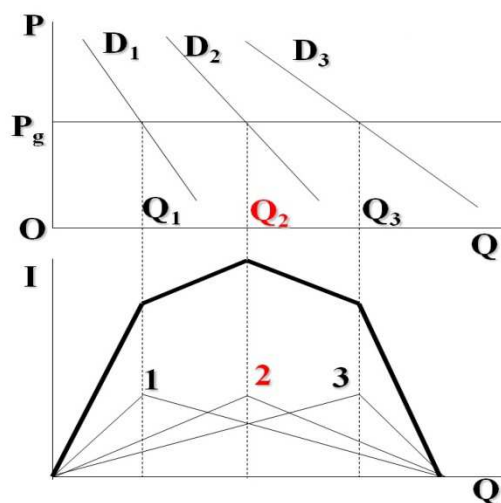


Fig. 1: Voter's preferences – median voter

Note: 1, 2, 3 voters,
 P_g price of a public good,
 Q quantity of a public good,
 I ordinal utility index.

The figure shows two political parties that offer different “selection baskets“. The first one offers the Q_1 quantity of public goods, which corresponds to the first preference of voter 1, i.e. D_1 . This party would probably be a supporter of a smaller state. In addition, we have an offer from the other party that intends to promote a selection of public

goods amounting to Q_3 . This would probably be a more social party supporting a larger role of the state in the economy. This political offer corresponds with the first preference of voter 3. The parties find out, upon conducting an analysis of the ordinal utility index, that Q_2 is the quantity that is most demanded. Thus, both parties will try to approach the Q_2 quantity from the Q_1 or Q_3 initial positions in order to address as many voters as possible, or rather the **median voter**. In other words, both parties' election platforms will be adjusted to address the median voter. The Q_2 quantity is the first preference of the greatest number of voters. The success of both political parties depends on how they manage to guess the median voter's position. The median voter most influences, at least in a democratic society, political attention and political behaviour.

Voters' demand for political programmes is based on the following three assumptions:

- the assumption of **completeness** – a voter is able to arrange all options through his or her own preferences;
- the assumption of **transitivity** – a voter is able to tell which of the preferences he or she prefers (for instance, he or she selects option A as the first, option B as the second and option C as the third; then, logically, he or she also prefers option A to option C)
- 3) the assumption of **choice** – a voter chooses the most preferred option (maximizes his or her benefit).



The rational ignoring of election attendance

A voter sometimes refuses to participate in elections. A voter will not vote if the cost connected with voting (from obtaining information about election programmes to entering a voting booth) exceeds his or her possible benefit. If the voter is the median voter and is aware of this, his or her vote has the chance to influence or even decide the elections. He or she will attend the election.

3.2 The Role of Bureaucracy in Public Choice

In addition to politicians and voters, another participant in public choice is the bureaucracy. A bureaucrat is an expert who implements political decisions. Bureaucrats also behave rationally and maximize benefit. Demonstrations of rational behaviour may be observed in the efforts of bureaucracy to reach **budget maximization**. This is the only way for bureaucrats to reach maximum satisfaction. Unfortunately, acts of bureaucracy tend to cause inefficiency in the allocation of public resources.



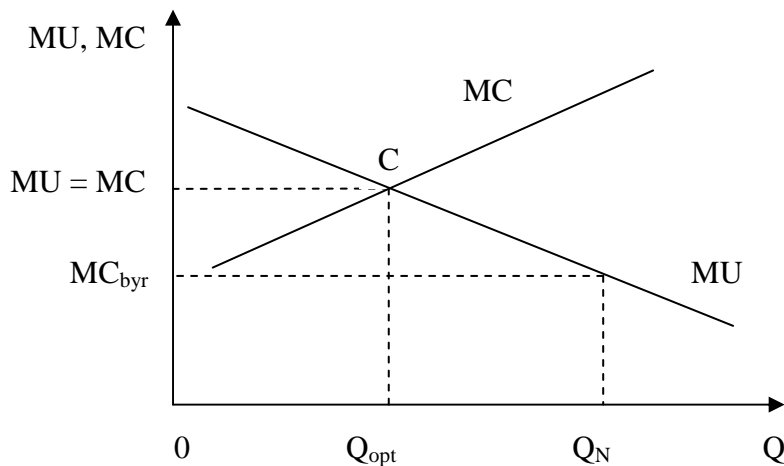


Fig. 2: The influence of bureaucracy on the effectiveness

Where: Q quantity of a public good

Figure 2 shows the decision-making process surrounding the quantity of public goods. The MU curve represents the demand for public goods as identified by a politician. The curve of marginal cost MC is known to bureaucrats. The optimum quantity of public goods lies at the intersection point of the curves MU and MC at point C. Quantity Q_{opt} corresponds with this. A bureaucrat has a certain information advantage over a politician because he knows the MC curve better. Bureaucracy tries to maximize its budget; therefore it persuades politicians of the necessity for the budget to be higher than necessary for the needs of Q_{opt} production. A politician is not sufficiently informed, so he or she satisfies the bureaucrats. In order to spend the budgeted funds, the bureaucrat starts to offer quantity Q_N regardless of the allocation efficiency. Q_N is greater than the Q_{opt} optimum. Thus, the allocation is inefficient.

3.3 Interest Groups in Public Choice

Interest groups are also involved in the public choice process. They are sometimes called “pressure groups” or generally “lobbyists”. Those persons or organizations act outside legislative bodies. They try to put pressure on various political entities, and thus they support their interests and objectives. They are focused on **maximizing their own benefit**. Interest groups often organize a social group or social groups with a common objective. It is possible to mention entrepreneur associations, trade unions, or certain special interest movements (human rights, environment protection, etc.).



The different objectives of interest groups divide them into two categories:

- **Supporting** – they support political objectives, and certain projects or interests (e.g. institutions struggling against motor way construction).
- **Protective** – their objective consists in protecting and representing certain social groups, often with a close social



status (trade unions).

Interest groups can also be divided into individual categories by how they can influence various political groups and other representatives of power in democratic processes. Possible ways include the following:

- **Utilizing information and expert activity** – interest groups take advantage of the knowledge they have in their professions, and try to protect or support their interests. For instance, financial experts' advisory activities advocating changes in the banking regulation system.
- **Entering active politics** – this is possible anytime during an election term. This is problematic with regards to the interconnection between genuine politics and interest groups' unambiguous intentions.
- **Utilizing economic power** – sometimes even in the form of pressure, for instance trade unions threatening with a work stoppage by the employees they represent.
- **Violent activities** – violent protests to enforce their own interests; for instance separatist groups, e.g. the Basque ETA.
- **Lawsuits** – Permanent attacks in court regarding public interest. They can even threaten to convey an issue to international institutions.

Interest groups thus belong to major actors playing a role in the process of public choice.

3.4 Voting Rules in Public Choice

Public choice with a voting method aims at changing the position of society from the viewpoint of benefitting individual groups. Figure 3 shows an economy without market failures under the conditions of *laissez faire*.

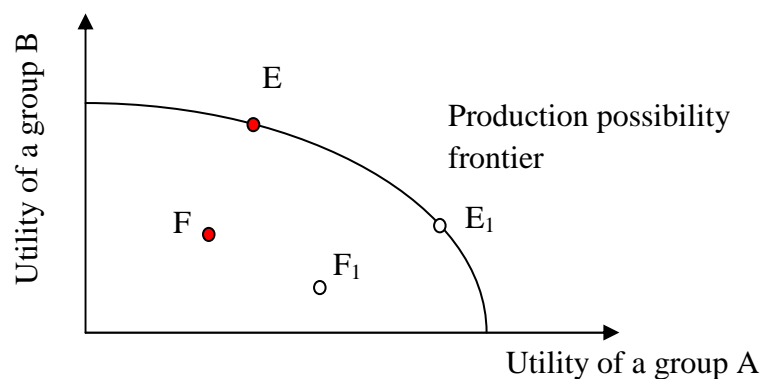


Fig. 3: Pareto optimum in a market economy without market failures

Point F shows the starting position of the initial condition of the economy. Under the influence of market forces in an economy without failure, the economy will move from point F to point E, which lies at the frontier of the production potential (the full utilization of economic resources). If the initial distribution of resources occurs, the

economy will first move from point F to point F₁, and then it will shift to point E₁ following the effect of market forces.

Another situation in the economy occurs with market failures.

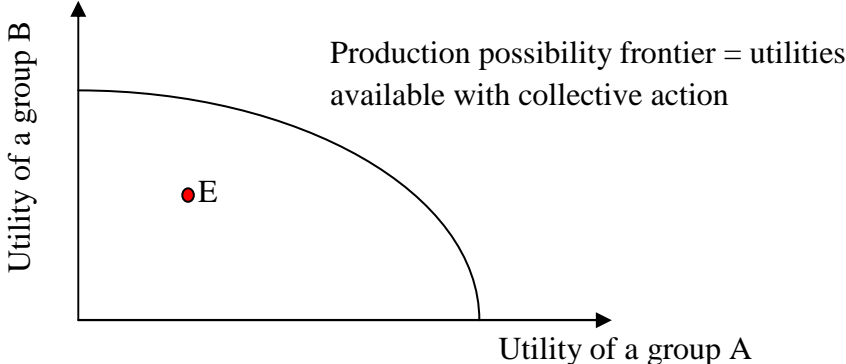


Fig. 4: Pareto optimum in a market economy with market failures

Point E in Figure 4 is, in this case, the Pareto point as a consequence of market failures. The impacts of market failures will not be eliminated without **collective action**, and the economy will not move towards the production possibility frontier. With collective action, i.e. the implementation of public choice results, each group’s benefit may increase upon the move to the frontier of its production potential. The impacts of collective action are shown in Figure 5.

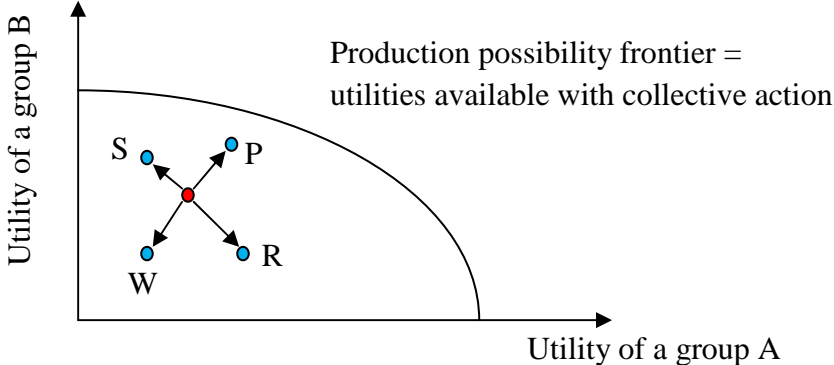


Fig. 5: Impacts of public action in market economy

Point E is the starting point in an economy with market failures. With collective action, the economy may move to four indicated points that lead to **3 results**:

- 1) a shift from E to P – everyone’s position will improve;
- 2) a shift from E to W – everyone’s position will worsen;
- 3) a shift from E to R or S – one group’s position will improve, while the other’s position will worsen (the redistribution effect).

Collective action is preceded by **public choice** brought into effect under certain rules.

Public choice distinguishes between three basic voting rules.

- **dictatorial (decisions made by a single person),**
- **consensus (unanimous agreement),** and
- **majority rule.**



Dictatorial

When decisions are made by a **dictator** (sometimes called a **social planner**), it is in reality a unanimous agreement. The voting result is in fact fully within one individual's powers (the decisions of a king, army commander, etc.). The advantage of this decision-making model consists in its low transaction cost.

Consensus

The most democratic way of public choice is represented by the **consensus rule** (also, the **unanimous agreement rule**). In this case, the party that has a majority does not have an advantage. A common action must **be agreed upon by both parties**. This means that A and B must agree on each decision. Thus, none of the parties can improve its position to the detriment of the other party. Both may minimally keep their positions. A set of points for unanimous decisions are shown in Figure 6 below. The set is defined by the line connecting points EXY.

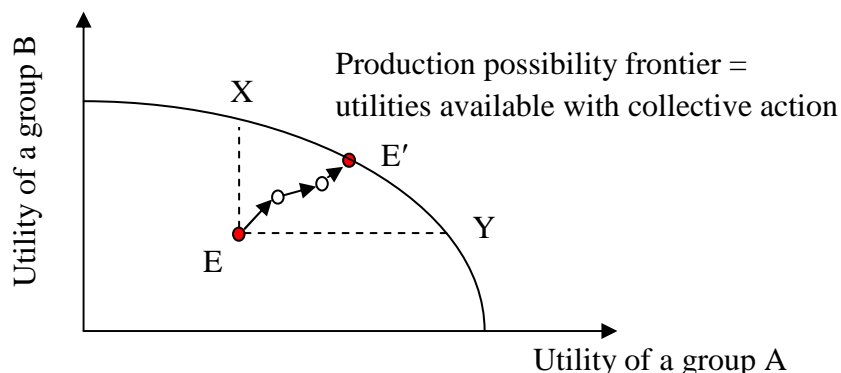


Fig. 6: Collective action based on consensus – unanimous agreement

The starting point lies at position E, which is not the Pareto optimal point. In this figure, an agreement upon negotiations between both parties will lead to point E'. The empty circles in the figure indicate that in order to reach a balance, 3 steps (elections) were necessary. Both parties have achieved a level of benefit higher than that in the initial state.

The unanimous agreement rule, even though it may lead to an effective solution, has its own pitfalls. The situation is **complicated** by the **greater number of parties involved**. Thus, negotiations become **costly**, which decreases the benefit from the given action. Another problem may consist in **time lags**. Last but not least, the difficulties connected with the negotiations contain **blackmailing by an individual**. He or she may have a

veto power and thus block the action as a whole. In the given case, it would mean stagnation in at point E.

The majority rule

The majority rule is a procedure often applied in public choice. Unlike consensus, it has the advantage of suppressing the threat of blackmailing by an individual. However, there is a threat of the dominant party abusing their position in making choices. The possible consequences of majority rule are shown in Figure 7.

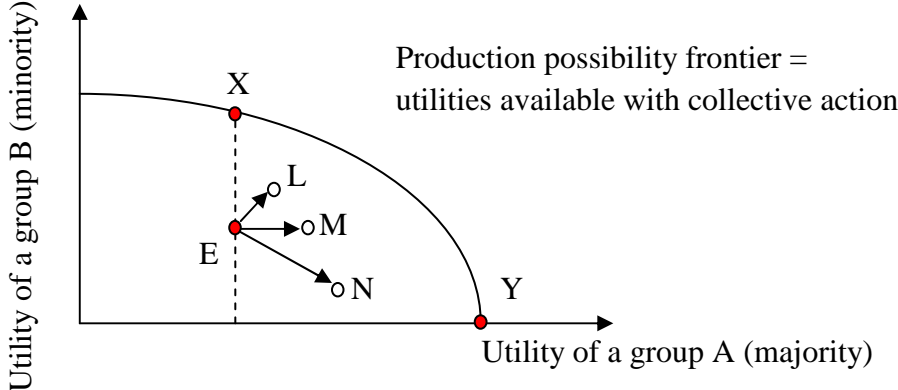


Fig. 7: Utilization of the majority rule

Point E is the starting point. Group A is a majority group. Group B is a minority group. All points on the right of the dashed line mean an increase in the benefit of group A. For three proposals - L, M and N - group A will rationally vote for its greatest benefit. In this case, option N will probably win, and the majority group A will considerably improve its position, however, partly to the detriment of minority group B. Redistribution in favour of group A will occur, even though the other two options mean stagnation to the benefit of group B (point M), or even growth in the benefit of the minority group (point L) with growth in the benefit for group A. Under situations L and M, the majority group would not improve its situation to the detriment of the minority group, and so it would be Pareto-improvement. When the majority rule applies, it may lead to **discrimination against minority groups**.

Majority voting rules

Majority voting may be organized in many ways. The most frequently cited examples include:

- **simple majority rule** – one vote is given to one option; the option with more than 50% of the votes wins; it is usually used where only two options exist (for more than two options, it is not certain that any of them will obtain more than 50%);
- **relative majority rule** – there are usually several options; the option with the greatest number of obtained votes wins (the winner takes everything), even if it is only by a single vote; there is a danger of the minority’s victory because the opposition may be of different opinions in the first option;

- the Condorcet rule** – this is again a majority rule; voters compare the options with one another; the option with a simple majority is considered to be the winner (on average, it is evaluated best); voters' preferences are reflected, which is an advantage; however, in certain cases, a **voting paradox** may occur, which means that none of the options is able to reach a majority. This happens when we have three options (A, B and C) and three voters. When the options are compared with one another, A beats B, B beats C, and C beats A. The cycling of voting occurs. In order for this paradox to occur, the following three conditions must be met: the voting is not arbitrary; the voting reflects the voters' preferences, and the voting does not disturb strategic behaviour. A non-arbitrary system means that the order of voting between options is not decisive. One vote does not influence the others. The other two conditions mean, in brief, that the voters vote in accordance with their preferences regardless of the expected election result. So, they do not vote for "the least of all evils" to avoid an accidental loss of their vote, but they vote for their best option. The voting paradox can be broken by an arbitrary decision for a certain election procedure. However, in that case, an election committee can influence the election result because one of the three voters has a **double-peaked preference**. This means that the first two of his or her three possible votes are extreme options.

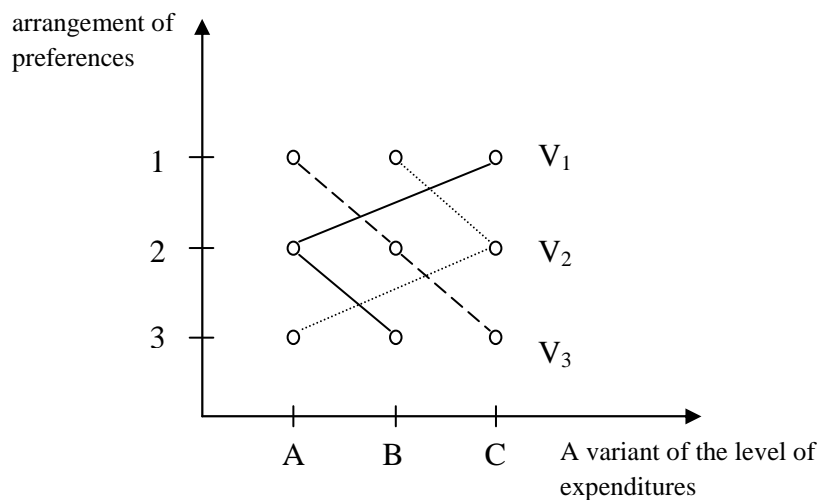


Fig. 8: Utilization of the majority rule
Source: own based on Hamerníková, 2010

Figure 8 shows three voters (V_1 , V_2 and V_3) and three voting options (A, B and C). Voter 1 (V_1) has a double-peaked preference. His or her curve has several peaks because it goes from an extreme (option A) to an extreme (option C), and the middle course B is only his or her third preference. If an election committee intends to influence the election, it usually determines rules in such a way that the options are discussed successively. This means that the supporters of option A first put options B and C against each other. B wins. B then competes against A, and A wins. If the election committee wishes another extreme (C) to be the result, it will first put A and B against each other, and A wins. Then C will beat A in the final voting. Out of all possible alternatives, whose number is 216 (6^3), only 12 situations lead to the paradox.

4. Public Expenditures – Analysis of Efficiency of Public Expenditures

Aim of this chapter

- to get acquainted with the nature of public expenditures;
- to understand the effects of public expenditures on macro- and microeconomic level;
- to get to know possibilities of funding of public expenditures;
- to introduce evaluating methods of public expenditures;
- to learn to monitor economy, efficiency and effectiveness;
- to be aware of risks that are connected with public contracts.



Key words

Public expenditures, public expenditure programmes, public projects, government expenditures, transfers, collective consumption, displacement effect, bearable taxation, income and substitution effect of public expenditures, actual recipient of public expenditure, dynamics of public expenditures, institutional and programme funding, allocation paradox of institutional funding, monocriterial a multicriteria evaluating methods of public expenditures, cost benefits methods of evaluation (CBA, CEA, CUA, CMA), economy, efficiency, effectiveness, X-inefficiency, public contract, corruption, transparency, transaction costs, tender methods.



Required entry skills

Terminology, tools and graphical analysis of Microeconomics (preferably master level). The knowledge of financial mathematics. Entry knowledge of public finance.



Study time requirements

Approximately 3–4 hours.



Outline

- 4.1 Public expenditures – characteristics, types and classification
- 4.2 Institutional versus programme funding
- 4.3 Methods of public expenditures evaluation
- 4.4 Public contracts

4.1 Public Expenditure – Characteristics, Types and Classification

Public expenditure, public projects and public expenditure programmes are economic processes connected with financial operations. Not only do they have consequences from the macro- and microeconomic viewpoint, but they also have a social aspect.

The basic questions connected with this topic include:

- How do they differ from each other (**essence**)?
- For what **purpose** are they created, planned?
- How many of them should be established (**volume**)?
- What should they be covered / funded from (**resources**)?
- What is their **effect** (consequences)?

Public expenditure, public expenditure projects and public expenditure programmes are not identical terms. Each of them has its own aspects. They are not synonyms, even though they are often used as if they were.

Public expenditure is the flow of financial means within the public budget system. Thus, the funds are allocated within the state's fiscal functions. They stick to the principle of being non-refundable and non-equivalent. Public expenditure is covered by public income, possibly including debt tools.



As the role of the state increases, then in addition to funding state institutions, there is a higher need of also funding **public projects** or even completing **public expenditure programmes**. This is not related only to public fund operations, but they are also connected with a certain specific target. Thanks to their functioning, it is possible to put the following items into effect:

- a) specific goods and services, or investment units;
- b) corrections of unfair distribution of wealth towards an affected group;
- c) stimulating economic entities to behave in a certain way (e.g. developing a certain branch of the economy, etc.).

An expenditure programme is more complex than a project. A programme contains goals, procedures, timetables, and may also contain partial projects. Programmes usually have a longer-term character compared to projects.

Public expenditure classification

In relation with public expenditure, there are two groups:

- government expenditure (G),
- transfers (Tr).



Government expenditure (“devouring” public expenditure) is divided by its character into government **consumption** expenditure (C_G) and government **investment** expenditure (I_G). Both categories contain funds not only for funding institutions, but also for public projects and public expenditure programmes. In this case, the state performs its **allocation** fiscal function.

Transfers (“non-devouring” public expenditure) are flows of public funds flowing from the state to various economic entities. The state doesn’t expect any consideration, so this means non-equivalence in public finance. Therefore, transfers are sometimes also called “**negative taxes**”. Transfers may influence people’s behaviour regarding their efforts for reaching a certain level of income, either by work or by investment. Transfers mean the performance of the state **redistribution** fiscal function. A similar character as transfers is contained in **tax allowances**. It is in fact a tax income which the state doesn’t wish to collect and subsequently send back to a given economic entity in the form of transfer.

Government purchases and transfers in economy are shown in Figure 1 below.

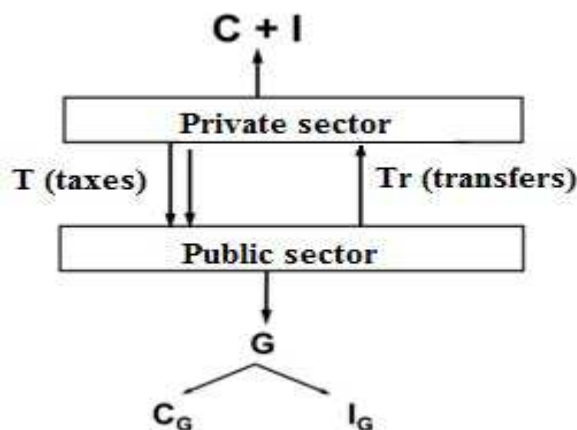


Fig. 1: The position of government expenditures and transfers in the economy

The letter C means private consumption, and I means investment. Both belong to the private sector. The figure clearly shows why transfers are often called negative taxes. If we subtract transfers (Tr) from taxes (T), we get “net taxes”. Net taxes are the means really taken away from private entities in favour of state funds. Two arrows leading from the private to the public sector and one arrow in the reverse direction indicate the quantitative difference in financial means flows.

Other classification of public expenditure

Public expenditure can also be classified by other criteria. For instance, **by the entity responsible for it** (central government, regions, autonomous areas,...), further **by the set of expenditure included in it** (total public expenditure, central or lower budget expenditure, public organization expenditure, etc.); from the viewpoint of **place** as domestic and international; and with respect to **time** as short-term, medium-term and long-term. Various elaborated classifications of public expenditure exist.

Macroeconomic relations

Public expenditure plays an important part in macroeconomics as a science, and also in practical macroeconomic impacts. The following macroeconomic relations are usually mentioned:

- public expenditure is a **necessary component of income and expenditure circulation** in economy;

- public expenditure for purchasing goods and services (G) forms **important part of aggregate demand**;
- public expenditure (G) may act as **multiplication factor** in the state fiscal policy;
- growth/drop in this expenditure and related growth/drop in the public sector **influences** the total **rate of employment** and **production** in economy;
- public expenditure exceeding public income give rise to **public debt**.



Public expenditure in fact means **collective consumption** of a certain community which public expenditure can be assigned to. On the opposite side, there is private consumption as we can see in Figure 1 above. By its policy, a government influences the amount of this expenditure, and consequently also the size of public sector in economy.

The macroeconomic analysis of the public expenditure influence on economy comes from the aggregate demand (AD) equation:

$$AD = C+I+G+NX, \quad (1)$$

where: C private consumption,
 I private investment,
 G government expenditures (C_G+I_G),
 NX net export.

Whereas government expenditure (G) at first sight directly influences aggregate demand (AD), transfers (Tr) are not so easily visible. Transfers in fact influence an individual's disposable income, and influence his consumption (C) and possibly investment (I). The total public expenditure is the sum of C and Tr. The rate of influencing AD through G is a matter of discussion between various economics theories (in particular Keynesian and Monetary).

Lots of economists have contributed to the analysis of economic relations by their research. For instance Alfred Wagner (1835–1917) is well-known for **Wagner's law**: "*As the income per head grows, the size of public sector in the economy grows as well.*" Wagner explained the growth in public expenditure by increased demand for public goods.



Another peculiar approach to reasoning the growing public expenditure lies in Peacock's and Wiseman's **displacement effect**. It is called displacement because changes in the state expenditure amounts occur in jumps. The jumps come in particular thanks to certain extraordinary events (wars, natural disasters, etc.). Displacement effect demonstrates figure 2.

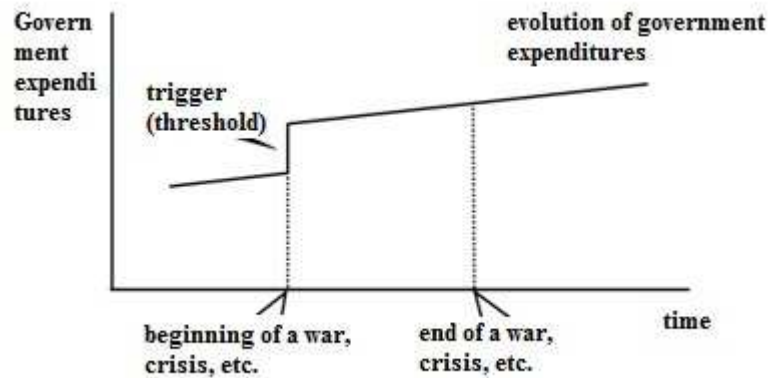


Fig. 2: Displacement effect

The horizontal axis serves for measuring time. The vertical axis shows state expenditure as percentage of the GDP. In the presented case, the beginning of a war is the trigger (threshold) of the displacement effect. Under these circumstances, society is willing to bear an increased burden of taxation (**bearable taxation**). Most of the extra collected means is spent on funding the war. After an end of this period, the level of public expenditure doesn't return to the initial level. On the contrary, during a period of peace (before and after the war) public expenditure permanently grows, though in a slow pace.

The extent of the tendency of public expenditure to grow as regards the amount and structure also depends on other relations. The following ones are often mentioned:

- social and demographic factors;
- threshold effects and war events (see the displacement effect – fig. 2);
- inflation tendency and higher cost rates of services;
- technological changes;
- soft budgeting;
- political interests and influence.

Some factors can be considered to be a relatively impartial reason for the public expenditure growth. It is possible to include social and demographic factors, threshold events, technological changes, etc. in this group. Interests of bureaucracy and requirements of pressure groups may be considered less impartial.

Microeconomic relations

Public expenditure and expenditure programmes and projects have their impacts on and aspects at the microeconomic level. In fact, the expenditure in a certain way influences economic entities.

Microeconomic effects resulting from public expenditure may be demonstrated on **substitution** and **income** effects.

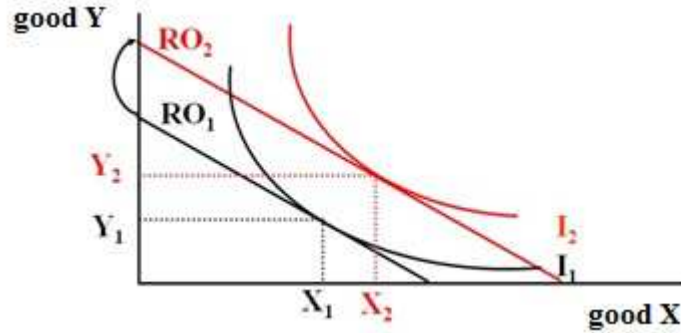


Fig. 3: Income effect

The income effect is shown in Figure 3. As a consequence of public expenditure (e.g. transfer), an economic entity's disposable income grows, thus its original budget constraint RO_1 moves up and right to RO_2 . Because of this, a consumer moves from the indifference curve I_1 to the higher level I_2 . So, it may consume more goods, both X and Y. Its preferences don't change at all.

As regards preferences, a different situation is presented in the substitution effect shown in Figure 4 below.

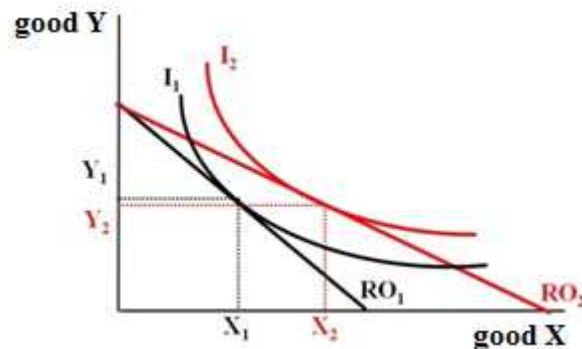


Fig. 4: Substitution effect

The starting situation is identical to that in case of income effect in Figure 3. Now, public expenditure means a subsidy on product X. Thus it becomes more available for a consumer within its budget constraint, so the budget constraint slope changes from RO_1 to RO_2 . The entity moves to a higher level of benefit represented by the indifference curve I_2 . Thus the consumer's preferences have changed in favour of the subsidized product X. The total effect is represented by the shift from X_1 to X_2 . The total effect may be split into substitution and income effects, e.g. by Hicks or Slutsky. Figure 5 shows Hicks analysis.

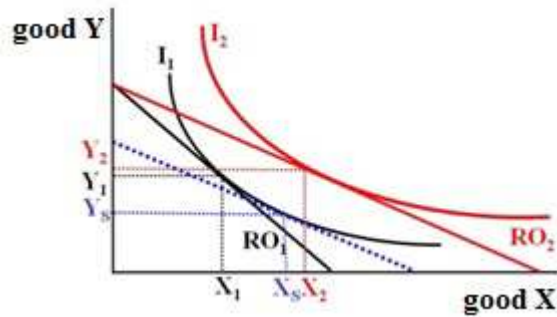


Fig. 5: Decomposition of total effect – Hicks analysis

The situation is similar to that in Figure 4. Since a subsidy on goods X changes its relative price, it is theoretically possible to present the budget constraint with the blue dotted line. Substitution effect means a shift along the original indifference curve to a new contact point (coordinates X_s and Y_s) with a relative budget constraint. Size X_1X_s represents the size of the substitution effect. The total effect is a sum of the substitution and income effects.

Actual recipients of public expenditure

Impacts of public expenditure are also analysed from the viewpoint of further reactions of private economic entities.

A short or long period of time may also influence the fact who will be the actual recipient of public funds. Short and long periods on the market are demonstrated in two following figures.

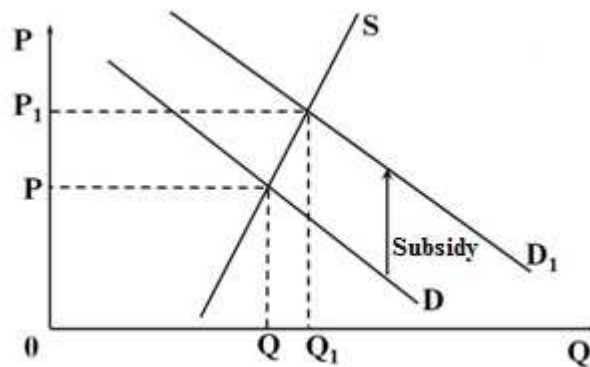


Fig. 6: The impact of an expenditure programme in short term

Thanks to a subsidy, the demand moves up from D to D_1 . With little elastic demand in a short period, it is more likely that the price of offered goods will move up from P to P_1 , than that its offered quantity will (from Q to Q_1). So the offer side is the actual recipient rather than the demand side.

During a long period of time, a larger quantity is offered as a consequence of more elastic supply. The supply curve S will be flatter, and so the situation of the demand side will improve (see fig. 7).

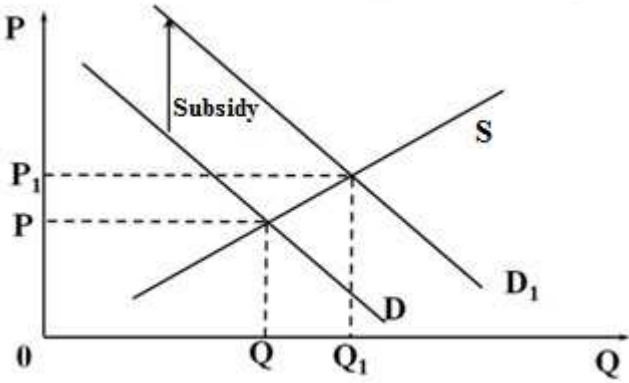


Fig. 7: The impact of an expenditure programme in long term

Public expenditure dynamics

Public expenditure dynamics can be measured in many various ways. Besides those with little information capability, among nominal amount and various proportional indicators (e.g. a share of public expenditure per inhabitant), there are also indicators that take better note of some other economic facts. For instance, the nominal amount says nothing about price development, changes in the number of inhabitants, etc. More impartial indicators include a share of public expenditure in GDP. A deeper insight into the dynamics of public finance is then analysed with **public expenditure elasticity in relation to GDP** or **marginal slope of expenditure to GDP**.

The calculation of **public expenditure elasticity in relation to GDP** is following:

$$E_{PE/GDP} = \frac{PE_{t+1} - PE_t}{\frac{vv_t}{GDP_{t+1} - GDP_t}}, \tag{2}$$

where *PE* are public expenditures in time *t* and *t+1*.

The value *E* states whether the public expenditure *vv* grows under-proportionally (*E*<1), proportionally (*E*=1) or non-proportionally (*E*>1) in relation to GDP.

The marginal quantity would then indicate how many times the public expenditure *vv* will change if GDP changes by a certain amount.

The dynamics of public expenditure also changes on the basis of alterations in factors mentioned above as factors influencing the size of public expenditure. Unlike the private sector, the public sector is less sensitive to some alterations, e.g. technical-technological development. Another important difference consists in the fact that the public sector has a worsened opportunity to substitute living labour with technology. It is now appropriate to cite Baumol’s law which reasons the growth in public expenditure as follows: “*Since the outputs from the public sector are measured by the inputs, price impacts are projected in the prices of outputs, and public sector employees press for*

wage increases similarly to what happens in the private sector, but without a corresponding growth in labour productivity. This causes growth in the price of a performance unit in the public sector.”

4.2 Institutional Versus Programme Funding

Institutional and programme funding differ from each other. Institutional funding is basically the overall funding of a partial institution without specific objectives. Alternatively, programme funding is the funding of special-purpose activities to achieve specific objectives.



Institutional funding

The essence of institutional funding is based on the certain budgeted institution existence itself. It is its existence that creates a claim for resources necessary for it to function. The actual need of public expenditure plays a secondary part. Thus, resources are consumed without a sufficient monitoring of efficiency, effectiveness and economic effects. From the formal viewpoint, resources are consumed correctly but economic justification often falls behind. Therefore current expenditure to maintain the operation of an institution usually prevails while capital expenditure (renovations and innovations) is restricted.

This may even lead to the **allocation paradox in institutional funding**, which means that an institution obtains resources because of its existence, and it exists because of the fact that it obtains the resources.

Institutional funding does not usually answer questions connected with efficiency, effectiveness, and economic effects. Those questions include:

- For what **purpose** were the resources spent?
- Do the **budget objectives** correspond with the **expenditure activities** carried out? With which?
- What **economic effects** have been reached by using the expenditure?
- Does a **relationship** between the input and output exist? What does it look like?

So it may happen that an institution, which in fact is not necessarily needed, is funded. Another accompanying fact in institutional funding consists in the technical and technological backwardness of those institutions. A possible change lies in transition from institutional funding to programme funding.

Programme funding

Programme funding is the opposite of institutional funding. It monitors special-purpose activities (in fact objectives) that are transformed public needs. The objectives are elaborated into programmes. Characteristic features of such programmes include:

- directly defined objectives;
- clearly defined cost leading to achieving the objectives;
- a calculation of resources made in advance;
- a subsequent check of cost compared with the benefits as the rate of achieving the objectives.

Funds are allocated by purpose and by individual objective priority. In case of a lack of funds, programmes are not reduced in an overall way as it usually happens in the institutional funding method. Programmes with the lowest priorities are reduced first.

Programme funding is very similar to private business activities upon the preparation, implementation and subsequent check of a project/programme. This includes the following activities:

- the identification of public needs;
- the transformation of public needs into specific objectives;
- the quantification of the objectives and determination of their priorities;
- an analysis and calculation of the resources needed to achieve the objectives;
- arranging the objectives in the form of programmes;
- implementing selected programmes taking the limited resources and different objective priorities into consideration.

As programme funding is an economically effective activity leading to achieving specific objectives, it is possible to measure its effectiveness and efficiency. This is possible also thanks to the fact that when applying programme funding, it is possible to answer questions of the following type:

- what was implemented (what allocation was used);
- what was the purpose;
- what cost utility effect was reached in connection with achieving the objectives;
- were resources spent economically, efficiently and effectively?

4.3 Public Expenditure Evaluation Methods

If more options of potential spending activities exist, it is necessary to evaluate them using a certain method. Various evaluation methods, of which there are several, can apply to spending activities.

The methods themselves are distinguished by how many evaluation criteria they use:

- **single-criterion** – only one indicator is observed as regards reaching objectives (this includes cost output methods – see below),
- **multiple-criteria** – besides the cost criterion, utility properties are also observed; and individual criteria are usually assigned points or weights (this includes various weighing methods and complex criteria).

The assessment methods for evaluating expenditure programmes are applied both before (ex ante) and after (ex post) the implementation of the programmes. Expected objectives and indicators are compared with actually reached results.

Cost-output methods

As stated above, these evaluation methods fall within the single-criterion methods. They are sometimes called **input-output methods**. Their advantage consists in an easy application of evaluation procedures. The information resulting from the evaluation is also of sufficiently high quality regarding its



economy, efficiency and effectiveness. The classification of cost output methods is presented in the following table.

Tab. 1: Cost benefit methods

Method	Method for measuring costs	Method for measuring benefits
CBA	value	value
CEA	value	natural
CUA	value	utility
CMA	value	none

Note: C Costs,
 B Benefits
 E Effectiveness
 U Utility
 M Minimal
 A Analysis

CBA – Cost Benefit Analysis

The **CBA** method (**Cost Benefit Analysis**) is the only mentioned method that investigates cost and revenue in values (i.e. monetarily). Its title is derived from this fact. The CBA is sometimes presented in a narrower concept (a difference between cost and contribution) and in a broader concept (a difference between social cost and social contribution). The narrower concept deals with the cost and contribution related specifically to the implemented action. The broader concept includes incidental effects in connection with the implemented action. This may include for instance decrease in unemployment and related reduction in unemployment benefit payment, growth/drop in prices of secondary immovable property, spared fuel, etc.

The evaluation criterion is defined as the **net contribution**, i.e. the difference (B-C) between the current value of cost (C) and the current value of contribution (B). The result of this numeric operation is an amount expressed in money (currency). An alternative is defined as the **efficiency per cost unit spent** calculated as the quotient of the current values of B and C (i.e. B/C). In this case, the result contains a dimensionless number. This alternative is acceptable from the economic viewpoint if (B-C)>0, or (B/C)>1.

Broader social contribution and cost also include **intangible items**. However, it is more complicated to measure their values; therefore they are observed for instance by means of non-monetary quantification. Increased/decreased noise level, dust level, mortality on roads, time savings, etc. may be included in such intangible items.

CEA – Cost Effectiveness Analysis

The abbreviation itself clearly shows that this method is based on the observation of effectiveness. The cost per output unit (e.g. cost per pupil, clerk, etc.) is observed. When using this method, the following must apply: 1) comparability of spending activities (homogeneity of objectives); 2) just one programme objective being formulated; and 3) the given objective achieved when being checked ex post.

There are various constructions of CEA indicators. It is possible to monitor effectiveness through 1) cost per output unit; 2) effectiveness as an inverse value of cost; and 3) cost productivity (how many output units are produced by one input unit – cost).

CUA – Cost Utility Analysis

This is mainly used in two cases of evaluating spending programmes. First, it is necessary to test the output sensitivity in relation to an input unit (a change in the degree of satisfaction in relation to the cost spent). Second, decisions are made on several similar programmes when there are additional resources – a solution to the problem of reaching as great gain in satisfaction as possible by means of the cost spent. The alternative for which applies that one input unit brings the biggest gain in satisfaction wins.

CMA – Cost Minimum Analysis

This is the simplest of the analyses mentioned. The observed criterion is the minimization of cost; the economy is observed. The alternative i.e., the lowest cost for reaching the expected objectives wins. Failure to reach the objectives is a frequent reason for rejecting an alternative (e.g. rejection regarding a public contract).

Economy, efficiency and the effectiveness of spending activities

These three criteria are sometimes called the 3Es (economy, efficiency, effectiveness).



Economy means spending public resources at as low a cost (used resources) as possible while achieving the objectives. **Efficiency** means spending public resources in such a way that brings as great a range, quality and contribution of the given objectives as possible. **Effectiveness** is the highest criterion. This aspect consists in the degree of reaching objectives with respect to the rationality of the resources spent. The objectives and actual results are compared with the resources needed to achieve the given objectives.

When we interfere in an efficient system, we talk about **allocation inefficiency**. It may be caused by taxes, subsidies, etc. In addition to this viewpoint, we also use the term **X- inefficiency** (the inefficiency of the offer side). It may be caused by a wrong choice of technology, wrong management decision, bureaucracy, low productivity of labour in the public sector, etc.

A spending activity may be economical and efficient, and yet not effective (it is unreasonable). Useless public expenditure is called a **white elephant**.

4.4 Public Contracts

In order to perform its functions, the public sector needs to procure lots of goods and services. It either produces them on its own or purchases them from the private sector. Those are either **internal** or **external** procurements. The public sector should choose

between these two alternatives in particular from the viewpoint of necessary public expenditure. External procurement is shown in the following figure.

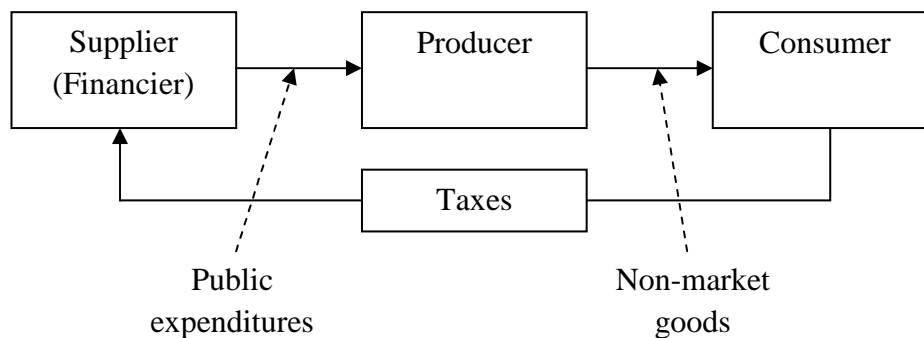


Fig. 8: External procurement of goods and services

The **public contract** alternative is used in situations where the state (an entity of the public sector) intends to produce certain goods or services, and the private sector is able to provide them more cheaply. In this case, the state assigns the production of the goods or services (contract) to a private sector entity. The private entity can usually produce the required goods and services cheaper because the profit motive plays an important part. Public institutions usually lack the profit motive. So, there is not sufficient pressure to reduce costs in the public sector. An important aspect is the fact that a public institution essentially cannot go bankrupt.

The quantity of public contracts in an economy depends on the size and significance of the public sector in the economy. Another factor influencing the number of public contracts lies in the extent of the willingness to transfer production from the public sector to the private sector.

A public contract, even if it is performed by a private entity, is substantially different from contracts between private sector entities, in particular because of the following attributes:

- the contracting authority (purchaser) is not usually the end consumer;
- the purchase (public contract award) is usually decided by a group of people;
- the amount of the deal is usually more compared to cases between ordinary consumers;
- the decision process is usually very formalized.

Nevertheless, the objective of a public contract should lie in reaching as great a benefit as possible for a price that is as low as possible. One possible danger in achieving public contract objectives is the existence of **corruption** and **collusion cartels**. Therefore, maximum **transparency** during all steps of tender procedures is desirable. Transparency has a positive impact on the quality of offers submitted leads to an increase in the efficiency and the number of applicants for a public contract. Because of transparency, there is decrease in the **transaction cost** for the companies putting out the tender. Those are other costs



connected with involvement in a public contract (e.g. searching for information on the tender procedure and requirements for a public contract, etc.). Those costs may mean a significant obstacle for being involved in public contracts, especially for small companies. The costs of implementing a public contract are called production costs. Transaction costs in the public sector are incurred in a similar way. Those are again all other costs connected with performing a public contract, besides production costs.

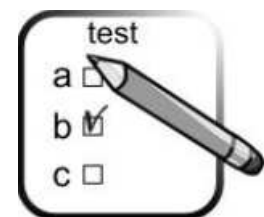
The **tender methods** connected with public procurement may be distinguished as follows:



- **Public tenders** – this is an “open tender” with notice given to an unlimited number of potential suppliers stating the intention to award a public contract. It is considered to be the most transparent. However, there are high administrative costs. It seems to be unsuitable in cases where goods or services must be provided quickly, or when it is necessary to create, develop or investigate them. It is questionable to use this method for military, police and similar contracts, where it is necessary to maintain certain secrets.
- **Restricted procedures** – this “narrower procedure” is connected with lower transparency. Only a few companies are addressed. Not everyone may apply.
- **Procedures without competition** – a contract is awarded to one party without a competitive procedure. It may be used when there is the need for the quick provision of goods or services, or when procuring goods and services for state security institutions (the army, police, etc.).
- **Individual negotiation** – again, just one entity is addressed as the supplier to a contract. Subsequently, the price and characteristics of the contract are negotiated. This method is used in cases where announcing the public contract would be uselessly demanding and expensive in relation to the required services. It is often used for low-value contracts. The transparency is again very low in this case.

Review questions

- 1) Why are distinguished terms “public spending”, “public projects” and “public expenditure programmes”?
- 2) What basic issues are resolved in the context of public expenditure?
- 3) What’s the difference between “government expenditures” and “transfers”? Which one is connected with allocation function and which one is connected with redistribution?
- 4) What’s the meaning of a term “collective consumption”?
- 5) Write a formula of aggregate demand (AD) and explain how is AD influenced by “government expenditures” and “transfers”?
- 6) Draw and explain Displacement effect. How does this model explain increasing public expenditures?
- 7) Draw and explain Income and Substitution effect relating public expenditures.
- 8) Draw and explain the term “Actual recipient of public expenditures”.
- 9) How can be measured dynamics of public expenditures? Do you know any indicators?



6. Public Revenues

Aim of this chapter

- to get acquainted with the nature of public revenues;
- to get to know types of public revenues;
- to understand the tax system;



Key words

Public revenues, tax and non-tax revenues, current and capital revenues, taxes, non-refundability, non-equivalence, non-assignment, net and compound tax quota, tax system, direct and indirect taxes, tax ad valorem, tax in rem, corporate income tax, personal income tax, property tax, value added tax (VAT), excise taxes, custom tax, social insurance contribution, fee / charges, credit revenue.



Required entry skills

To be familiar with the content of the first chapter. Basic knowledge about taxes and tax system. To be aware of the most popularized taxes and its Czech rates (especially personal income tax, corporate income tax, VAT).



Study time requirements

Approximately 3 hours.



Outline

- 6.1 Public revenues**
- 6.2 Taxes – defining the concept and classification**
- 6.3 Direct taxes in Czech taxation mix**
- 6.4 Indirect taxes**
- 6.5 Other tax revenues**

6.1 Public Revenues

In general, public revenue may be considered to include any revenue flowing to the public budgets. Among those public budgets there may be budgets of governments, lower regional administration units (districts and municipalities), parafiscal funds and also budgets of health insurance funds.



The most substantial item on the revenue side of public budgets is **taxes**. It further contains **non-tax** public revenue (interest revenue, charges, and revenue from selling and renting out state or municipal property). The division between tax and non-tax revenue is part of the basic public revenue classification.

From another viewpoint, public revenue is divided into:

- **non-credit** – also called non-refundable, it includes taxes, social security and charges;
- **credit** – meaning refundable credits of various types;
- **other revenue** – revenue from selling property.

Other classifications may consist in the division into:

- **current** – recurring revenue;
- **capital** – which is accidental, exceptional and irregular. It contains revenue from selling public property, charges and loans.

More types of classifications exist: **fiscal** vs. **parafiscal**; **state** vs. **municipal**; **obligatory** vs. **facultative** and **refundable** vs. **non-refundable**.

6.2 Taxes – Defining the Concept and Classification

The most substantial part of public revenue is tax revenue. **A tax is a payment to public budgets that is obligatory, determined by law, non-refundable, non-equivalent and usually of no special purpose.** Taxes create approximately 90% of all public budget revenue.

The most important economic characteristics of taxes are the following:

- **non-refundability** – the amount assessed as a tax is never paid back to the person that has paid it. It doesn't contain any title for repayment, i.e., a return of means similar to credits or bonds. "Remuneration" for paying taxes consists in the state providing public goods. A tax may be understood to be the "price" for using public goods to a very limited extent. Using public goods is not in fact subject to paying taxes (see the stowaway problem, and the issue also includes foreign tourists using the security of a visited state, etc.);
- **non-equivalence** – this means that there is no proportion between the amount of taxes paid and the actual quantity of public goods provided;
- **non-assignation** – it is neither predetermined nor clear that a certain specific tax is collected for funding predetermined public goods.



Total tax liability – net and compound tax quota



An entity (a citizen or company) may be levied with several taxes together. Therefore, we observe the **total tax liability** indicator. This is the sum of all payments a person contributes to public budgets. In view of the differences in economic and practical understanding of taxes, the **tax quota** indicator is observed for measuring tax liability. The tax quota is distinguished as **net** or **compound**. The **net tax quota** means the burden from the “legal viewpoint”. It is only composed of taxes that have the term “tax” in their titles. The **compound tax quota** is a broader term that is composed of all taxes within the economic meaning. That also includes other compulsory levies, among them social security and health insurance contributions. The tax quota (TQ), both net and compound, is the sum of taxes in relation to Gross Domestic Product (GDP).

Different results for the net and compound tax quota arise from different values in the numerator in formula 1.

$$TQ = \Sigma \text{taxes} / \text{GDP} \quad (1)$$

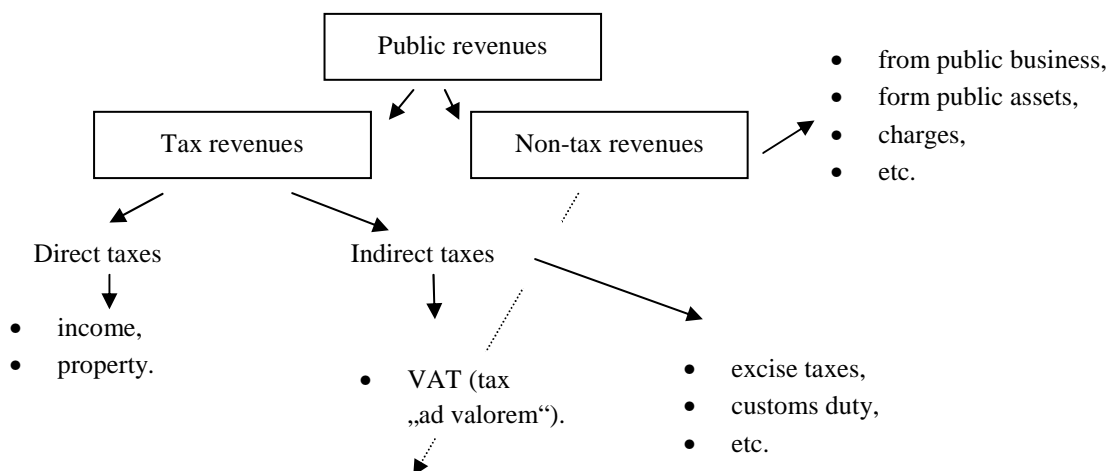
The double inclusion of public revenue should be eliminated through the **consolidated compound tax quota**. This means eliminating tax revenue that the state in fact pays to itself. It is possible to include there the payment of health insurance of persons for whom this insurance is paid by the state (the state insured).

A tax system within the public revenue system



Tax revenue is composed many taxes. See the numerator in formula (1). Therefore we speak about the **tax scheme** or **tax system** (possibly the “tax mix”), which is comprised of individual taxes. Individual taxes have a diverse tax influence on economic entities’ behaviour. Therefore, taxes are not observed only in total, but also their structure is taken into consideration. **A tax system thus means the sum and structure of tax revenue in a certain territory.**

The position of the tax system including its structure is demonstrated in Figure 1.



Non-tax with a character of a tax – social security contribution

Fig. 1: Tax system in a system of public revenues

The figure clearly shows that the tax system is relatively complex with many types of taxes. The text will now focus on classifying taxes by various characteristics. The classification into direct and indirect taxes (see Figure 1) is only one of the alternatives.

Tax classification

Taxes are classified by the **object** of the tax that is levied on and include **income** taxes (receipts – income is taxed), **excise** taxes (consumption is taxed), **property** taxes (property is taxed), **lump sum** taxes (physical existence of a subject is taxed) and **poll** tax (in this case, the physical existence of a subject is taxed; the tax object is also the tax payer). Poll taxes ignore the taxpayer's property situation and income. The tax amount is identical for everyone. Other taxes falling into this classification may include **revenue** taxes (a certain type of revenue is an object of the tax) and **labour tax or wage tax**.



The further option means classification **by the rate of targeting**, in other words how taxes take a taxpayer's ability to pay taxes into consideration. If the ability to pay is considered, then this is a **personal tax** (the income tax is probably the best example – it usually even considers the subject's social status). Other taxes include taxes **“on things”** (“in rem” in Latin).

Classification **by the type of applied rate** has substantial importance for state finance. If the rate is derived **from value** (ad valorem), the revenue from such a tax is automatically connected with the object's price changes (inflation). If the price of the taxed object goes up, the tax collection also increases, and vice versa (e.g. VAT – Value Added Tax). Tax rates used for these purposes are relative and are usually defined as a percentage. In addition, there are rates that apply to pieces or other quantities (physical units) that are objects of the tax. Such taxes are called **specific**. The rate of such taxes is determined regardless of the object's price and often expressed at a fixed amount (called a fixed tax rate). In this case, the development of a price level has no impact on specific tax collection.

Depending on whether a tax payer and payer are a single entity within the tax collection process, or whether they are two different entities, we distinguish between **direct** and **indirect** taxes. With **direct taxes**, the tax payer (who really pays the tax) and the payer (who remits the payment of tax) are a single person. This group contains income and property taxes. Concerning **indirect taxes**, there is basically a “mediator” between the tax payer and tax administrator. The “mediator” is called a payer. In fact, the payer collects a tax from the tax payer and remits it to the tax administrator. Well-known indirect taxes include VAT and withholding tax (taxes on dividends, etc.). From the tax collection viewpoint, indirect taxes are considered to be more efficient since direct tax collection is usually connected with higher administrative costs. The direct and indirect character of a tax is also distinguished by whether a tax burden can be transferred to another subject (this directness criterion basically only supplements the above-stated logic). Direct taxes cannot be transferred by a taxed subject; it pays them directly. Indirect taxes may be transferred by a taxed subject indirectly to someone else (e.g., by increasing prices). Since in reality it is possible to transfer any tax, this classification is not entirely precise.

For a clear demonstration of a tax system applied in practice, we present below the tax system of the Czech Republic.

The tax system of the Czech Republic

The tax system in general shown in Figure 1 is not basically different from the tax system really applied in the Czech Republic. With regards to the tax mix, the Czech Republic is a typical state, at least concerning the quantity of taxes.



6.3 Direct Taxes in the Czech Taxation Mix

Direct taxes are advantageous for the state because, in addition to tax collection itself, they also help to change social policy. Direct taxes are addressed, so it is known what object a tax is levied on. Thus, the state can support a certain social group and disadvantage another group. The main advantage of direct taxes is their transparency. They are not, unlike indirect taxes, hidden in the prices of various goods. Another of their advantages is that they can consider the subjects' ability to pay the taxes ("those who have more shall pay more"). However, direct taxes are considered to be a factor that discourages people from working and thus decreases the supply of labour, and they also have a negative impact on savings and their creation.

Direct taxes are divided into **income taxes** and **property taxes** (see Figure 2). Income taxes are among the most significant resources of state tax revenue in the Czech Republic and elsewhere. The current structure of direct taxes is demonstrated in Figure 2.

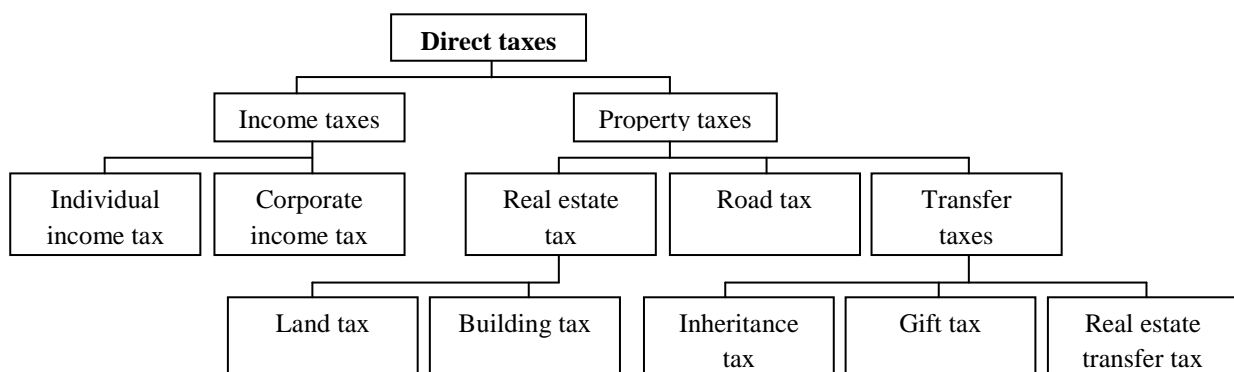


Fig. 2: Direct taxes in Czech tax mix

The two most significant taxes from the collection viewpoint – the **corporate income tax and individual income tax** – are presented over the course of time in Figure 3 below. Individual income tax is further divided into income from self-employment (green) and income from employment (dependent activity).

The **individual income tax** is a universal tax. All income, after deducting the income that is exempt and freed, is taxable. A positive characteristic of this tax, from the state viewpoint, consists in its sufficient return (it performs a fiscal function), but it is also a suitable redistribution tool. The socially weak are usually taxed less than rich individuals.

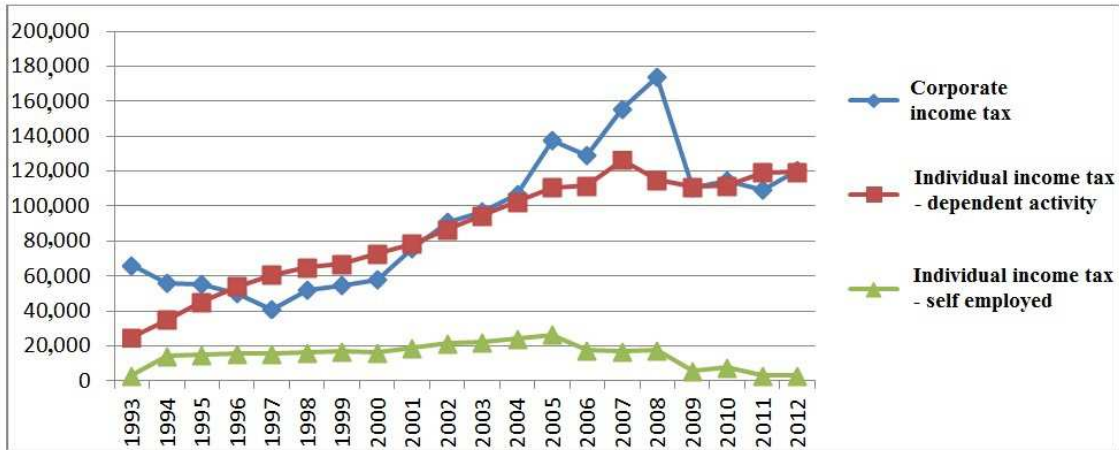


Fig. 3: Collection of direct taxes in the Czech Republic (mil. CZK)

Source: MFCR, 2013 (<http://www.financnisprava.cz/cs/dane-a-pojistne/analyzy-a-statistiky/udaje-z-vyberu-dani>)

The amount of individual income tax is calculated through a tax base. In the Czech Republic, it is composed of five partial tax bases. The partial tax bases are observed for monitoring the effectiveness of individual tax collection. Tax-deductible items are then subtracted from the calculated tax base, the tax is calculated, tax allowances are subtracted from it, and we get a result which is the assessed tax. In 2014, the rate is relatively flat (15%), but from the absolute viewpoint, this is still a progressive tax. As the tax base increases, the tax liability increases as well.

Corporate income tax is imposed on all legal entities in the Czech Republic. The corporate income tax rate is tending towards slightly decreasing and thus supporting business activities. However, it is always among the most significant domestic taxes (see Figure 3). This tax should be better called tax on profit rather than income tax. The tax base is in fact an accounting profit adjusted to a tax profit (in particular, tax non-deductible costs are added). The tax rate is now (in 2014) flat, 19%. It is among one of the international aspects of where to place society.

Property taxes are not a significant resource of public revenue or tax revenue. Property taxes are divided into **general** and **selective** taxes. However, general taxes are not practically used. Selective property taxes include all property taxes in the Czech Republic. This means the **real estate tax**, **road tax** and **transfer taxes**. **Real estate taxes** are collected based on the location the real estate is located in. The tax revenue belongs to the relevant municipality. The objects that are subject to real estate tax are land (farm land, building plots and other land) and structures. **The road tax** is connected with operating a road motor vehicle. Its tax rate varies depending on the engine capacity for regards passenger cars, and weight and number of axles for utility vehicles. **Inheritance tax and gift tax** are transfer taxes and are nonrecurring. They are paid upon the transfer of property without consideration. Their tax base equals the value of transferred property. **The real estate transfer tax** is another transfer tax. It is also a nonrecurring tax paid upon a real estate transfer with consideration. Its tax base equals the purchase price or valuation by law. The tax is assessed at a linear rate.

6.4 Indirect Taxes

Indirect taxes include a tax payer and payer. This means that the entity that really pays the tax and the entity that remits its payment are usually two different persons. Indirect taxes are also called **taxes on consumption**. Indirect taxes in the Czech Republic are demonstrated in Figure 4 below.

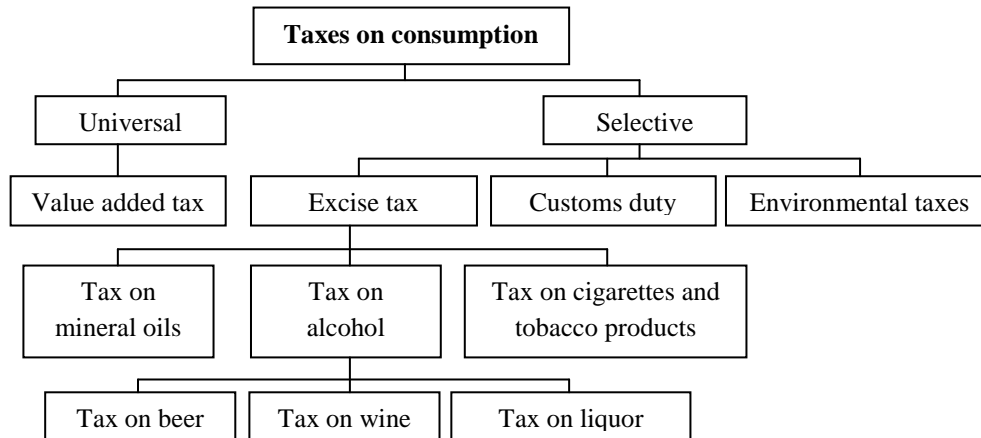


Fig. 4: Indirect taxes in the Czech Republic

Value Added Tax (VAT) is a universal indirect tax. It is a relatively new tax. Various goods and services are subject to it. Its rate is linear and differential. It is calculated as a percentage of the price of goods excluding tax. Currently (2014) there are standard and reduced rates of value added tax in the Czech Republic. The reduced rate (the lower VAT rate) is usually imposed on basic consumption products and social and cultural goods.

Excise taxes fall into the selective indirect tax category. They are selective because they are targeted at a relatively narrow group of goods. These include commodities such as mineral oil, spirit and spirits, wine, beer, and tobacco products. The tax amount is assessed on the basis of certain physical units of these goods. The tax rates differ and are fixed.

A customs duty is usually classified as a selective consumption tax. It is relatively special as it is collected when goods cross a border, but only a border between states that apply customs duties to each other. The EU customs policy is unified outwards, and no customs duty exists inside.

6.5 Other Revenue

The other tax revenue category includes social security contribution. It holds a very significant share of the overall tax revenue (about 40%). The structure in the Czech Republic is the following: a) contribution to the pension scheme (the funding of old-age, disability and inheritance pensions); the insurance applies



to employees and self-employed persons, b) public health insurance – these levies are used for funding medical care, including medicines, medical devices and equipment, the remuneration of doctors and other medical staff, etc.; everyone with permanent residence in the Czech Republic is insured; the insured mainly include employees, self-employed persons and the state insured (children, pensioners and students) and c) sickness insurance that pays benefits during an illness (sickness benefits).

What is characteristic of these contributions is the fact that they do not entirely comply with the definition of taxes. With regards to pensions, the non-equivalence condition does not apply because pensions are at least slightly calculated equivalently to the contribution that has been paid. Furthermore, that money is directly assigned for the purpose of pension payment. The public health insurance contribution goes directly to the budgets of private health funds, so it is not entirely public revenue.

Charges

Charges are not taxes. Their collection directly relates to providing certain services by the public sector. However, these are not significant resources of the public budget's revenue. A charge is a person's direct service for provided services or goods, therefore the person can compare it with a benefit. A charge is an equivalent and assigned payment.

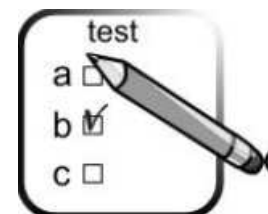
Credit Revenue

Supplementary, and above all refundable revenue of public finance is called **credit revenue** (also called loans). This revenue is refundable; therefore the public sector has to repay it to the creditor within a certain period of time. The creditor is usually rewarded for providing financial means through interest paid. Both a domestic and foreign entity, and both a private (a natural person or legal entity) and public entity, may be the creditor.

Loans are mainly used in periods of unexpected events (natural disasters, etc.). They may bring assigned and non-assigned revenue. Non-assigned loan revenue includes the revenue from bonds issued for the purpose of covering a state budget deficit. From the time perspective, this revenue can be divided into short-term (e.g. government treasury securities and short-term credits) and long-term (government bonds and long-term credits).

Review questions

- 1) Define public revenues. Specify some classifications and briefly describe them.
- 2) Which three principles define taxes from the point of view of economists?
- 3) What is the difference between net and compound tax quota? What these indicators express?
- 4) Look up and compare present rates of the following taxes in your country and the Czech Republic: individual income tax, corporate income tax. Find a development in time. Is there any trend?



7. Introduction to Tax Theory

Aim of this chapter

- to get acquainted with the taxation principles;
- to understand the content of tax justice;
- to be aware of efficiency issues related to imposition and collection of a tax;
- to become familiar with tax shift and tax impact.



Key words

Taxation principles, principle of justice, principle of effectiveness, principle of benefit, principle of financial solvency, horizontal and vertical justice, tax effectiveness, administrative costs, excessive tax burden (deadweight loss), negative deadweight loss, direct and indirect administrative costs of taxation, relationship between justice and effectiveness, Laffer curve, tax shift and impact, forwards shift, backwards shift, proportional, progressive and regressive impact.



Required entry skills

To be familiar with the content of the first chapter. Knowledge of macro and microeconomic analysis. Basic tax terminology (see chapter 6).



Study time requirements

Approximately 3 hours.



Outline

7.1 Taxation principles

7.2 Tax justice

7.3 Tax effectiveness

7.4 Justice and effectiveness

7.5 Tax shift and impact

7.6 Measuring tax redistribution

7.1 Taxation Principles

Taxation principles are both a set of claims for “correct” tax system as a whole and a claim for individual taxes in this system. Well-known principles are **Adam Smith's Canons of Taxation**. Smith's timeless tax principles include principles “to tax according to solvency”, “to tax with accuracy (according to clear rules)”, “to tax with a merit of reimbursement (when it is most suitable for a taxpayer)” and “to tax with minimal costs of administration”.



Understanding taxation theories lead to the development of several **principles**. One of them is the principle of effectiveness, justice, tax utilization, flexibility, simplicity of choice, stability of the tax law (tax bond), harmonization (the Czech situation with the European Union), etc. One of the most important requirements for a modern tax system is that taxes must be applied generally – taxes should be paid by all members of society no matter what their social status is.

Two principles are commonly agreed upon by experts:

- **the principle of justice,**
- **the principle of effectiveness.**



There is also agreement as to how to levy taxes so that they are politically transparent and legitimate. It should be obvious who pays what taxes and these taxes should be specified in law.

Other taxation principles more or less arise from the two previously-mentioned principles.

7.2 Tax Justice

It can generally be claimed that taxes are considered fair when they correspond with the populous' idea of the division of the tax burden among individual tax subjects. When this exists, the redistribution of social utility is considered fair.

There are two claims for the principle of justice:

- **The principle of benefit** – is fulfilled when the personal burden of a taxpayer caused by taxes is balanced by the utility gained from public goods that are financed by these taxes; the change of total utility is zero. The question is whether the rich or the poor receive greater benefit from government spending. The poor derive benefit both from the security that cannot be provided by themselves and from various social services that they could hardly afford. The rich derive relatively more benefit from tax bonds because they help them to protect their property. The principle of benefit fails. The tax most commonly associated with this principle is the real estate tax. Paid real estate taxes should be used for improving the environment where the real estate is located. This should assure a fair increase in the value of the real estate or at least it should maintain its attractiveness.
- **The principle of financial solvency** – every taxpayer should pay taxes in the amount that they are able to pay. In connection with this principle, there are two

conditions of justice that have to be satisfied: **horizontal** and **vertical**. Horizontal justice is fulfilled when taxpayers with the same standard of living pay the same level of taxes. Vertical justice is fulfilled when one with a higher standard of living pays more taxes. Because the state has no idea of individual levels of utility for every single citizen, it makes do with their level of income, property, consumption, etc.



7.3 Tax Efficiency

The tax efficiency is the taxation system with the lowest costs. The existence of taxation system involves two types of costs:

- **administrative costs**
- **excessive tax burden** (also called deadweight loss).



These two groups mean that except for the financing of public goods, a certain portion of the revenue goes to costs connected with the functioning of the taxation system. Administrative costs are part of the public sector; however excessive tax burden means a loss both for the private and the public sector.

Excessive Tax Burden

The term excessive tax burden is connected with the development of taxes and their types. In medieval England, taxes were raised according to the number of glass windows in each house. A glass window was a symbol of financial solvency because they were not cheap. As a result, people started to brick in their windows to avoid paying taxes. It meant a detriment to their personal utility. On the other hand, the state lost a part of its tax yield. In connection with this, the term **excessive tax burden** (deadweight loss) started to be used.

We talk about the excessive tax burden when there is a change of price and level of demand as a result of price distortion caused by taxes. Levied taxes raise a seller's costs and cause higher costs to produce goods. A consumer will react by reducing their consumption of this good and they will substitute part of their consumption. The subjects will achieve a new balance at higher price and lower amount. The situation of excessive tax burden is demonstrated in Fig. 1.

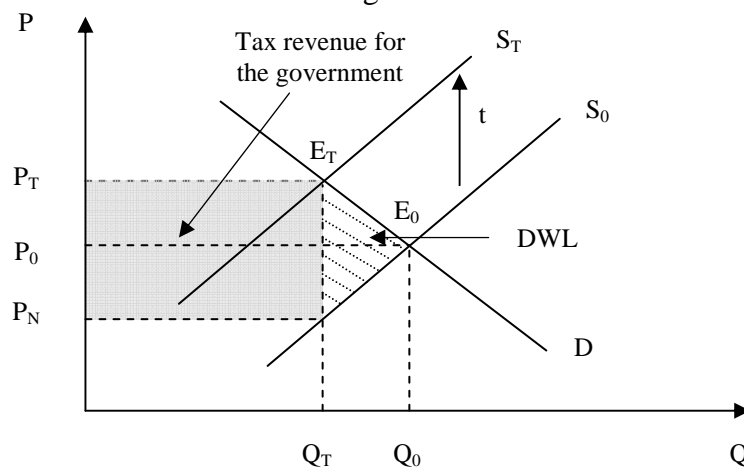


Fig. 1: Excessive tax burden (deadweight loss – DWL)

In this case, it is the manufacturer's obligation to pay the tax while a specific tax is levied on the product. As a result of a tax being assessed, the supply will move from S_0 to S_T . Consumers will look for a new optimum at a higher price and it means lower consumption Q_T . The total tax yield of the state is represented by the grey area ($P_T E_T A P_N$). The upper section of this grey area demonstrates the consumers' reduced utility in favour of public goods. The lower section demonstrates the loss sustained by the private sector (producers) in favour of the public sector. The crosshatched area represents deadweight costs. A similar situation exists when a tax is imposed on consumers. The demand curve stays the same, but the supply curve moves to down and to the left. A new balance would be achieved at the amount of Q_T , but at price P_N . The actual price paid by a consumer would be increased by the subsequent state tax levied to the level P_T , no matter where the tax was assessed.

Deadweight costs increase together with increasing taxes. This is demonstrated in Fig. 2.

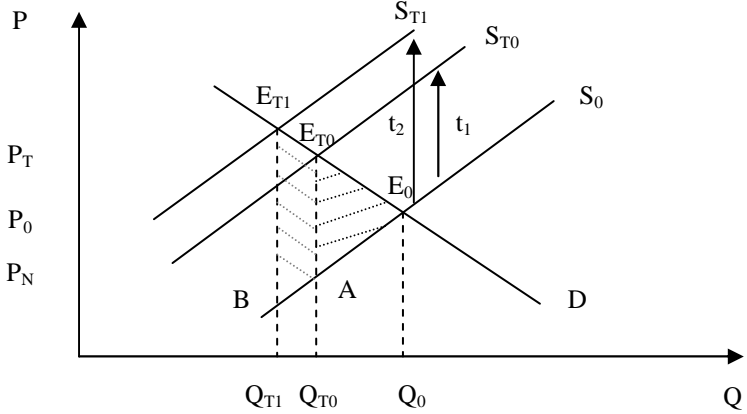


Fig. 2: Excessive tax burden (deadweight loss – DWL) when changing the tax imposed

At a lower tax rate, the amount of excessive tax burden is defined by the triangle AE_0E_{T0} . At a higher tax rate, it is defined by the triangle BE_0E_{T0} . When assessing taxes, the state has to take into account the fact that excessive tax burdens increase faster than taxes. From the point of view of deadweight costs, fewer lower taxes are less effective than one high tax. On the other hand, this means that increasing the number of taxes brings higher administrative costs.

The amount of excessive tax burden and how high the utility detriment consumers or the producers of the taxed good it cause will depend on the elasticity of the curves of supply and demand. When the elasticity of supply or demand is zero, then the excessive tax burden also equals zero.

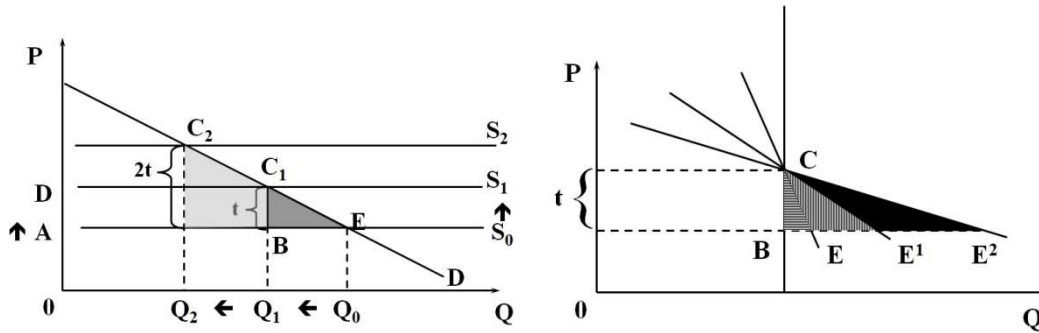


Fig. 3: Excessive tax burden (deadweight loss – DWL) – different elasticity of supply

In the figure (Fig. 3) on the left, the elasticity of supply equals infinity. When taxes increase, the excessive tax burden also increases. The supply on the right part of figure 3 is perfectly inelastic. Even taxes assessed at amount t will not cause the formation of a tax burden.

An excessive tax burden is formed because consumers try to avoid taxes. Tax assessment not only prevents consumer to consume invariable amounts of taxed goods, but it also stimulates consumers to substitute them with some other goods. Tax assessments result in the **substitution** and **income effects**.



Fig. 4 demonstrates the situation when good X has a tax levied against it. As a result, there is a change in the budget constraint from RO_1 to RO_2 . It enables consumers to consume less of good X and they can also partially substitute it with good Y.

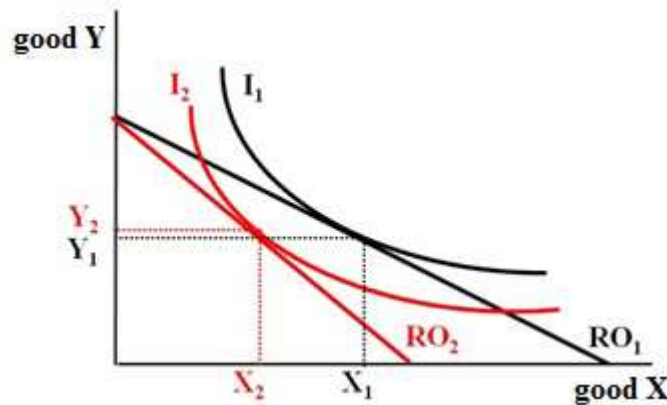


Fig. 4: Substitution and Income effect emerging because of taxation

The impact of certain types of taxes

So far, we have demonstrated the impacts of selective tax assessments. It is irrelevant whether the tax was paid by a producer or a customer, it resulted in a shift of the relevant curve. With the **ad valorem** tax, there is only a slight bending of the curve. Fig. 5 shows this graphically.

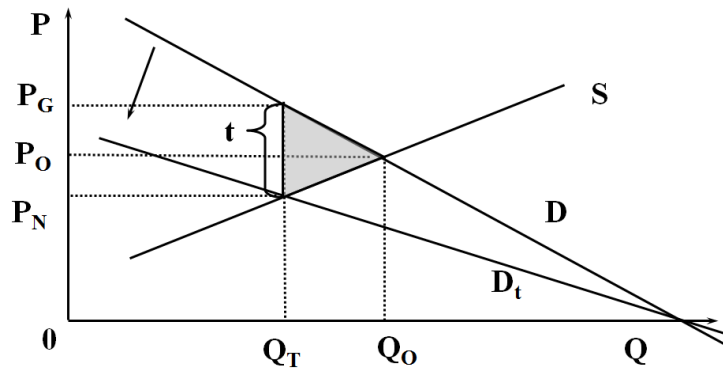


Fig. 5: Tax imposition – “ad valorem”

If the price was zero, then the paid ad valorem tax was also zero. The higher the price that is paid for goods, the higher the tax that should be paid. That is why the supply curve turned around the point where the supply curve intersects the horizontal axis. Overall, it descends at a slower pace than the original supply curve D . A new balance happens at the amount Q_T , when the price including the tax for a paid good is P_G . The amount of $P_G P_N$ is the amount of tax. Deadweight costs are represented by the grey triangle.

Negative Deadweight Loss

Sometimes, state intervention is necessary so that a situation similar to excessive tax burden is eliminated. This is especially true in the case of market failure when there is a higher production of some goods than is desirable (e.g. pollution). Or, on the contrary, there could be decreased production of a good (research projects). In such cases, an assessed tax / subsidy can help to increase efficiency. These policies also give rise to **negative deadweight loss**.

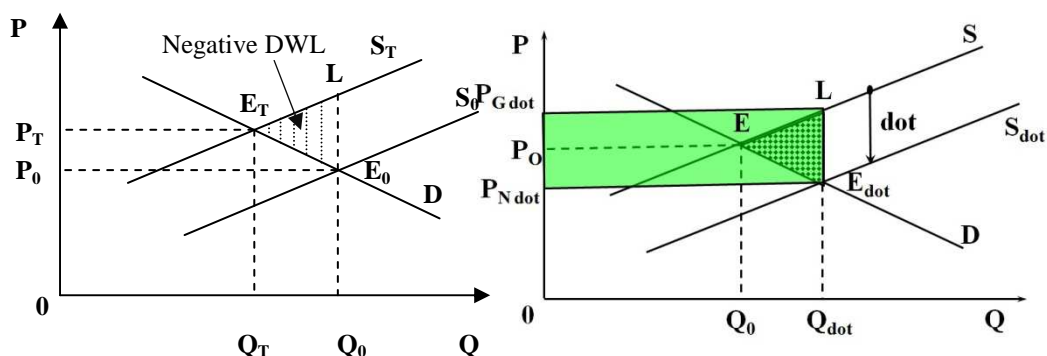


Fig. 6: Negative excessive tax burden (negative deadweight loss)

Source: own based on Hamerníková, 2010

The left section of Fig.6 demonstrates the situation when because of market failure, there was too high production of a good. Taxation limited the production because it increased the producer’s costs and the supply was decreased from S_0 to S_T . The demanded amount has adapted to the new situation on the market and there is a new balance at amount Q_T and price P_T . Negative deadweight loss is given by the triangle E_0

LE_T. On the right side is a similar situation with the difference that the market failure causes a lower production of a good. Then the state starts to subsidize this good's production. The amount of the subsidy is demonstrated by the colour green. Because of the subsidy, there will be amount Q_{dot} at price P_{Ndot} or rather P_{Gdot} produced and demanded. In this case, the negative deadweight loss is given by the triangle $E_{dot}LE$.

The Administrative Costs of Taxation

The administrative costs of taxation are the second largest group of costs connected to taxation and its subsequent collection after deadweight costs. Based on who carries the administrative costs, these costs can be divided into **direct** and **indirect**.



Direct administrative costs affect the public sector. There are classified various costs for administration connected to taxes and their collection (from the creation of laws to statistical monitoring, etc.)

Indirect costs concern taxpayers. These include the costs connected with tax consultants, accounting management (profits or expenses) for purposes of filing tax returns and administration connected with the filing of tax returns.

At the end of this chapter, Fig.7 shows the position of administrative costs and the excessive tax burden in a taxpayer's total tax burden.

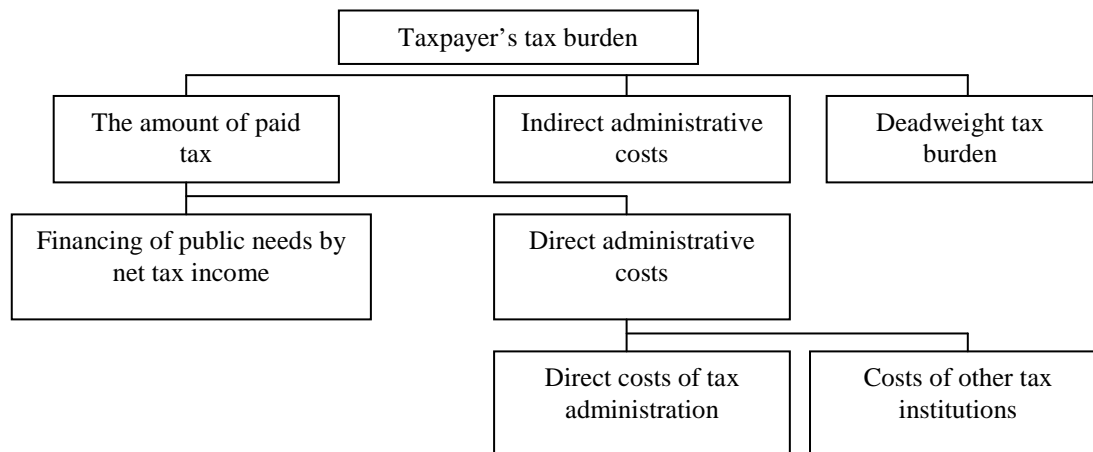


Fig. 7: Composition of a taxpayer's tax burden

Source: own based on Hamerníková, 2010

7.4 Justice and Effectiveness

Increasing tax fairness and efficiency is a difficult task for the government. This means tax redistribution within the limited options available to the state. Every redistribution means a deviation from the market division and a reduction of efficiency. Distortions increase, leading to higher costs and system inefficiency. On the other hand, if the aim is to eliminate distortions by avoiding some tax measures, it is not possible to achieve fewer differences in taxpayer incomes. The relationship between fairness and efficiency is the relationship of "something for something else". This "trade-off" is demonstrated in the following figure.



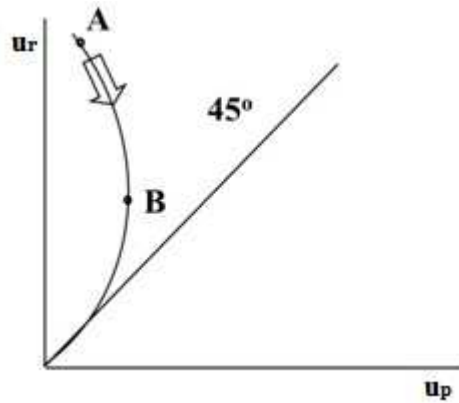


Fig. 8: Composition of a taxpayer's tax burden
 Note: u_r – utility of a rich person; u_p – utility of a poor person

Fig. 8 demonstrates the initial situation A, a combination of a rich consumer utility u_r and poor consumer utility u_p . It is assumed that a rich individual has higher utility than a poor individual. A straight line under 45° demonstrates a set of potential points where the utilities of the rich and the poor would be equal. Society will decide to redistribute the property from the rich towards the poor. This movement is demonstrated by an arrow pointing towards A. The poor individual's utility rises to the detriment of the rich individual, towards point B. After that, the redistribution falls beyond the limits of the rich individual. The tax burden will be too high. The rich individual neither starts to avoid paying taxes nor to work less, etc. So from this point onward, the utility decreases for both subjects. As a result of an increasing grey economy and tax avoidance, the state does not have any means for implementing a redistribution policy towards the poor. An absolute equality of utilities can be achieved by high tax rates. But both individuals would finally fall under worse conditions. It is even possible that their utility would be zero. Equality would be achieved at the cost of very high inefficiency.

An efficient and fair system could theoretically be achieved through the application of the principle of utility. However, society would then have to resign itself to help groups with low or even zero income.

An analytical instrument that accompanies the situation demonstrated in Fig.8 is the **Laffer curve** (see Fig.9). It demonstrates the relationship between a tax rate and tax collection. Tax collection rises to the particular tax burden. But beyond a certain tax rate, the willingness of people to pay taxes decreases. In spite of the increased tax rate, tax collection decreases. The Laffer curve complements the reasonings and conclusions on the relationship between efficiency and fairness.

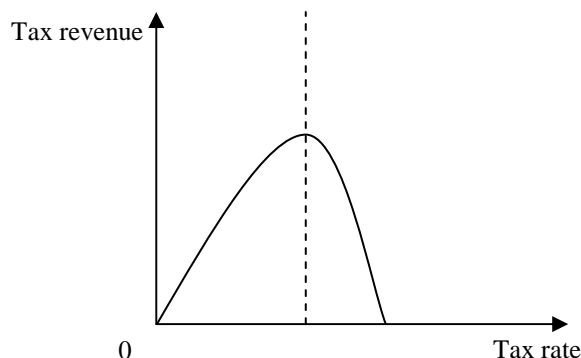


Fig. 9: Laffer curve

7.5 Tax Shift and Impact

In the following cases, we will concentrate on the impact of a new tax assessment or a change to the current tax on the participants to transactions. In other words, we will look at how every side loses utility and how it deals with a tax impact.



Taxes are assessed on transactions between a seller and a buyer. The law specifies which side has the duty to levy the tax. On the labour market, the tax is levied either by the buyer (employer) or the seller (employee). On the commodity market, the tax is levied by the seller (producer, seller). This duty is not imposed on consumers. The word “levy” is used intentionally. The “pay” hides the division of payment between the two parties. For this reason, **tax transfers** and **tax impact** will be analysed, i.e., who really pays and who is impacted by a tax. A **transfer** can shift “forwards” or “backwards”. This differentiates a real tax impact from the statutory one. A **forwards** shift means that a tax imposed on a producer will in fact be held by a consumer. A **backwards** shift exists in situation when a change in tax be borne by the producer's suppliers (the producer will demand a decrease in the price of material,...) or the producer's employees, etc.



A graph demonstrating forwards and backwards tax shifts is shown in the following figure on the next page (see Fig.10).

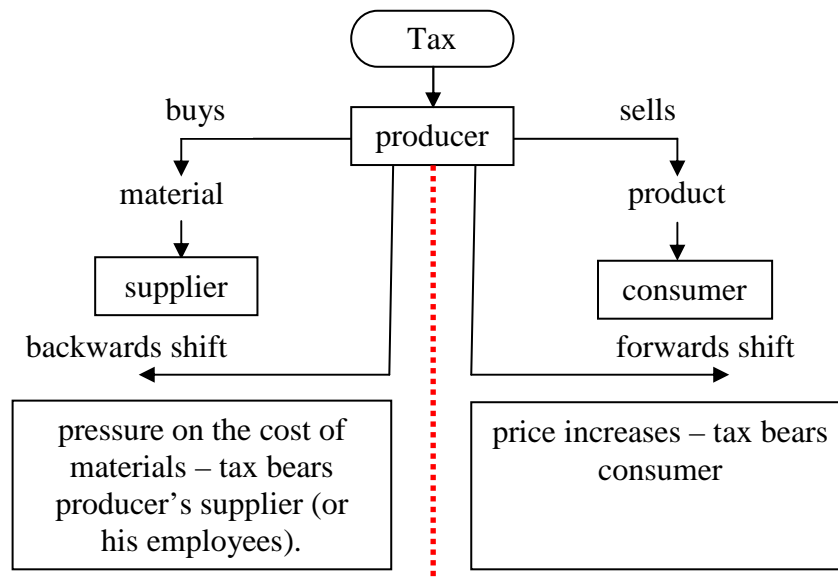


Fig. 10: Tax shift

A tax shift and its subsequent impact depends on the course of supply and demand curves on a particular market. The more elastic one side's curve is, the less tax impact it has and it is easier to shift the tax to another subject.

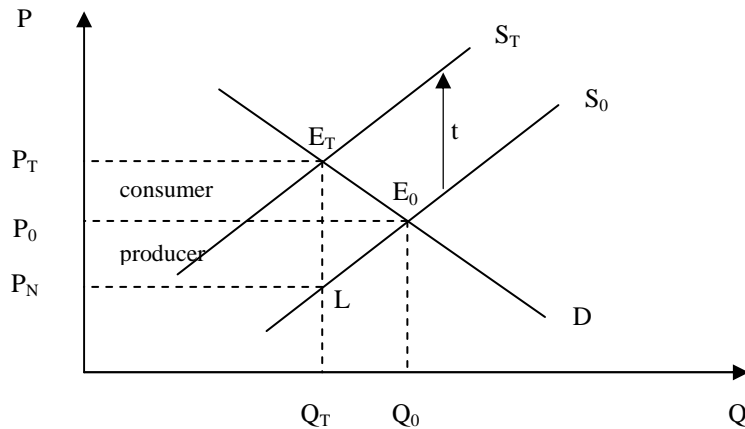


Fig. 11: Imposition of a tax, tax shift and impact

In this case (Fig 11), the elasticity of both curves is nearly the same. The assessment of a specific tax at amount t on a producer will be reflected in a shift of the supply curve from S to S_T . The required amount will decrease to Q_T at price P_T . The producer realizes the net price $P_N = P_T - t$. Because of nearly the same form of supply and demand, the tax impact on both sides is nearly the same. A different result is achieved when the elasticity of demand attains the two extreme values (Fig.12).

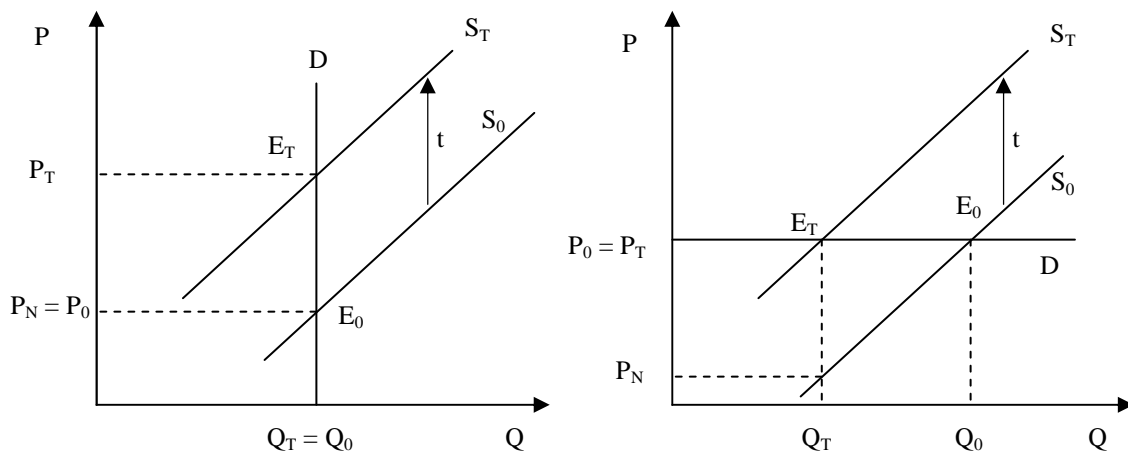


Fig. 12: Imposition of a tax, tax shift and impact – extreme elasticities of demand

When **demand elasticity is zero** ($E_D = 0$), the demand curve is vertical (see Fig. 12 on the left). If a specific tax is imposed on a producer, then there is a similar shift in the supply as is shown in Fig. 11. But in this case, the situation is different. The consumers do not adapt their shopping behaviour to such situation by changing the demanded quantity. An increased in production costs will be reflected in the price that is paid by a buyer. The tax shift was the maximal forward shift, so the tax fully burdened the consumer. The situation where **demand elasticity equals infinity** ($E_D = \infty$) is analogical. The demand curve is horizontal, which is demonstrated in Fig. 12 on the



right. There will be the same shifts in connection with the tax assessed to the producer. The demand does not change on the consumer's side, only the demanded quantity changes from Q_0 to Q_T . The tax shift will be zero and the entire tax impact will move to the producer.

7.6 Measuring Tax Redistribution

Tax redistribution is connected with enforcing the solvency principle. This concerns the redistribution of pensions from the rich towards the poor. It also concerns a certain equation of wealth distribution in society.

The tax impact on various income groups can be **proportional**, **progressive** or **regressive**. With proportional taxation, the tax burden impacts all groups equally. Taxes impacting rich individuals more than the poor individuals are called progressive. On the other hand, taxes impacting poor individuals more than rich individuals are called regressive. A graphic demonstration of tax redistribution is illustrated by the **Lorenz curve**. It demonstrates the actual income division in a society where the tax system has an essential influence.

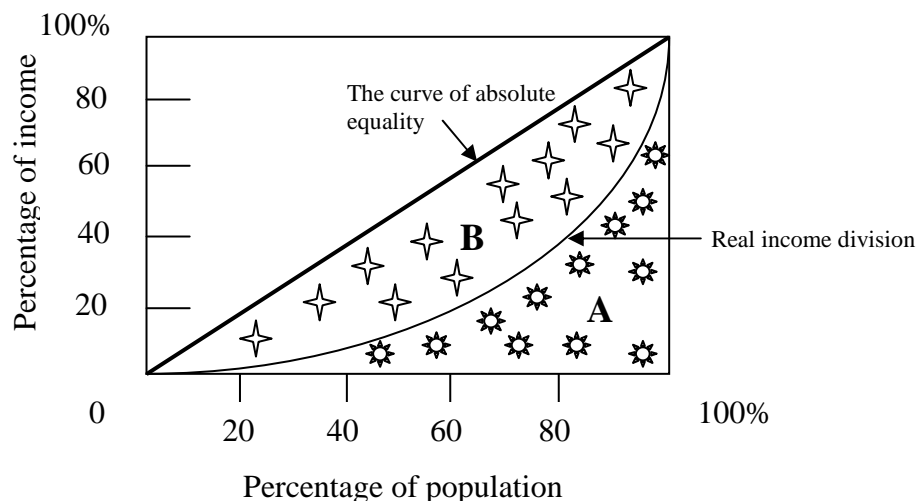


Fig. 13: Lorenz curve

The horizontal axis in Fig. 13 shows the percentage of population from the poorest towards the richest, which is measured cumulatively. The vertical axis measures the income distribution for a certain percentage of the population. Under normal conditions, just a small part of the population controls the vast majority of the wealth. The diagonal demonstrates the extreme situation where the income distribution is absolutely equal (see “the curve of absolute equality”). The curve of actual income distribution divides the part under the curve of absolute equality into part A and part B. They are used for a different analysis. The Lorenz curve, as a graphic instrument, is often accompanied by a mathematical calculation – the **Gini coefficient (G)**, which is calculated as follows:

$$G = \frac{B}{B+A}, \quad (1)$$

where: G Gini coefficient,
 B space limited by the curves of Real income division and Curve of absolute equality,
 A space under the curve of Real income division and horizontal axis (see fig. 13).

G is a dimensionless number and as it demonstrates the relationship (1) that it can reach values at the interval $<0; 1>$, where zero equals absolute equality. On the contrary, $G = 1$ means absolute inequality. The normal range of this coefficient is limited. Several equal values of G can result in the same number of possibilities for income distribution. See the following figure with two different situations.

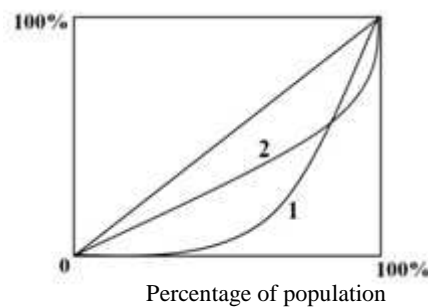
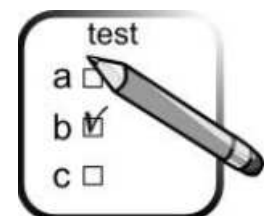


Fig. 14: The same values of Gini coefficient for two different situations

In these situations, both possibility 1 possibility 2 would reach the same value of G. However, it is evident in Fig.14 that the income distribution among the population is considerably different. A situation where the government decides to introduce progressive taxation (see Fig.15) is demonstrated in the last graphical analysis. The former distribution is demonstrated by Lorenz curve 1 with Gini coefficient G_1 . After introducing progressive taxation and subsequent pension redistribution, the Lorenz curve will change and will shift to position 2. This corresponds to Gini coefficient G_2 . $G_1 > G_2$. Introducing progressive taxes decreases the inequality in income distribution and the new Lorenz curve is closer to the curve of absolute equality.

Review questions

- 1) Which two principles connected with taxation are generally considered as basic? What is their content?
- 2) What or which effects decrease effectiveness of taxation?
- 3) Draw and comment the development of excessive tax burden in different situations.
- 4) Draw and comment the development of negative excessive tax burden.
- 5) What relationship does exist between justice and effectiveness? Explain this task using Laffer curve?
- 6) What does it mean tax Forwards shift and Backwards shift? Explain it with an example.



9. Spatial Aspects of Public Finance

Aim of this chapter

- to get to know the issues of spatial aspects of public finance;
- to get acquainted with the models that deals with optimal size of clubs;
- to be aware of advantages and disadvantages of decentralization and de-concentration.



Key words

Spatial aspect, market failure, users' preferences, returns to scale, mobility grade, vote with one's feet, cross-border effect, decentralization, de-concentration, Tiebout model, Buchanan theory of clubs, Oates decentralisation theorem, loss of centralization, Leviathan hypothesis, local finance, local budget, current and capital financing, shared taxes, exclusive taxes, local taxes.



Required entry skills

To be familiar with basic knowledge and terms of economics, especially knowledge of market failure and indifference analysis. The knowledge of previous chapters of public finance particularly public goods and tax theory.



Study time requirements

Approximately 3 hours.



Outline

9.1 Spatial aspects of public finance

9.2 Fiscal decentralization

9.3 Local finances

9.1 Spatial Aspects of Public Finance

The spatial aspects of public finances are very important. They have influence over the effective allocation, redistribution and stabilization of public finances. The spatial aspects of public finances predetermine the form of fiscal decentralisation and local finances.



The public sector, similar to the private sector, resolves questions surrounding effective allocation and resource redistribution. The situation for the public sector is more difficult because of market failures. It cannot use the self-regulating market and the price mechanism. Hence, it tries to use other methods and instruments to achieve the market optimum – e.g., the spatial aspect.

An effective-functioning public sector is influenced by many factors.

The most essential are:

- The existence of **public goods** – primarily, their amount and type is important. Public goods then influence the existence of externalities and cross-border effects. **The diversity of user preferences and local information advantage** together with **returns to scale** are the two factors that most strongly influence how efficiently public goods are provided.
 - **The diversity of user preferences and local information advantage** show the diversity of preferences for provided public goods based on the region or the state, etc. The preference diversity principle vs. decentralisation can be defined as follows: In cases of high diversity of preferences for a single public good in particular regions (heterogeneous preferences across the regions), then a decentralized provision of public goods is more effective. On the contrary, if there is a low preference diversity among the users of public goods in particular regions (homogeneous preference), a centralized provision of these goods is more advantageous.
 - **Returns to scale** are formed with the centralized provision of public goods. With heterogeneous preferences, returns to scale are irrelevant and a decentralized provision of public goods is more effective.
- **The preferences of users** – are related to the heterogeneity and homogeneity mentioned above. The level of these preferences is also important.
- **The mobility grade** of users of public goods also significantly influences the public sector's efficiency. It helps policy makers to decide about centralization or decentralisation. The mobility stage is also one of the prerequisites for the proper functioning of a spatial economy and for the fiscal federalism theory. A high mobility grade enables “**voting with one's feet**” – the possibility to move among regions, which will satisfy the portfolio of public service preferences. But there can also be a different situation when mobility causes inefficiencies connected to the existing externalities and border effects. This means that an individual has permanent residency in one region where he or she spends a part of his or her income and he or she also regularly uses public goods in another region.
- **A fiscal decentralisation system** – it involves the division of competences concerning profits and expenses and also the instruments within single



government levels. Existence of this system radically influences the total efficiency of the public sector.

The cross-border effect is in fact a type of externality. It exists at the borders between two or several regions. Effects occurring on one side of the border cause changes on the other side of the border.



Spatial aspects can be differentiated into **decentralized** and **de-concentrated**.

- **Decentralisation** is the transfer of powers and responsibilities of executed public functions from the central government to lower levels of government or to the public sector.
- **De-concentration** retains the former grade of centralization. Public goods are, at lower levels, provided by de-concentrated departments of the central government. The central government retains control of the range and quality of the public goods that are provided.



9.2 Fiscal Decentralization

Fiscal decentralisation can be differentiated into three models.

- **Full decentralisation** – all income of state budgets is the income of the central budget. It then distributes them to local budgets according to how the central government sees fit.
- **Full centralization** – both central budgets and local budgets have their own income and expenses.
- **A combined model** – central and local budgets have their own income and expenses, but a portion of the local budget's income is provided by the central budget.



9.2.1 Theoretical Aspects of Fiscal Decentralization

A spatial economy is based on many theoretical approaches. Among them are **theoretical solutions of fiscal decentralisation** based on normative economics or on the theory of public choice. The most common models are

- the Tiebout model,
- the Buchanan theory of clubs,
- the Oates decentralisation theorem and
- the Brennan-Buchanan decentralisation hypothesis.



The Tiebout model (vote with one's feet model)

The Tiebout model has, similar to the majority of economic models, many prerequisites (see Tab.1 below).

Why the **vote with one's feet model**? It assumes the existence of many districts that offer public goods. Each of them offers different services. People vote among these districts according to their preferences. Through this, they reveal their secret preferences with regard to public goods. They vote by the fact of moving – they vote with their feet.

This model has its own critics. The barriers that exist during the vote are mainly the unwillingness to move, transactional costs connected with moving, etc. The criticism not only refers to economic aspects, but also to psychological and social motives.

For more about prerequisites and criticism of the model, see Tab.1.

Tab. 1: Prerequisites and criticism of Tiebout model

The Tiebout model (1956) – revealing preferences of users of public goods based on their mobility	
Prerequisites of the model	Criticism of model's prerequisites
<ul style="list-style-type: none"> • full mobility of users of public good (spatial aspect). 	<ul style="list-style-type: none"> • not all of the users are mobile, • costs incur when moving, • there are social ties that users do not want to interrupt, • there are problems of housing policy.
<ul style="list-style-type: none"> • perfect information about local revenues and expenditures. 	<ul style="list-style-type: none"> • not all of the users are comprehensively informed, • existence of users'/residents' fiscal ignorance.
<ul style="list-style-type: none"> • a large number of competing communities. 	<ul style="list-style-type: none"> • a large number of communities may lead to loss of returns to scale.
<ul style="list-style-type: none"> • users do not have troubles with employment. 	<ul style="list-style-type: none"> • users do have troubles with employment in particular community; employment even may be the reason of users why to move.
<ul style="list-style-type: none"> • community has optimal size. 	<ul style="list-style-type: none"> • optimal size of a community solves the Theory of clubs (Buchanan, 1965). • optimal size changes with provided public good, i.e. for one community exist several optimal sizes in relation to the provision of public goods.
<ul style="list-style-type: none"> • externalities do not exist. 	<ul style="list-style-type: none"> • when providing public goods externalities and cross-border effects occur.

Source: own based on Hamerníková, 2010

As is evident from the table, some parts of the Tiebout model have been expanded on by other authors. The **Buchanan theory of clubs** solves the optimal size of a community (club).

Buchanan theory of clubs

This looks for the optimal number of club members, i.e., the optimal capacity of a club whose members use a particular good. The number of members is final and higher than one. The capacity of the club is optimal when the marginal utility from the public good equals the marginal costs for the entry of another member. It is then possible to determine both the needed amount of the offered good and the optimal number of members. Non-members can be excluded from the good consuming club (see exclusion) and then the club members do not compete in good's consumption (the consumption is not rivalry). The graphic analysis of finding the **optimal capacity of a club** is illustrated in Fig.1.

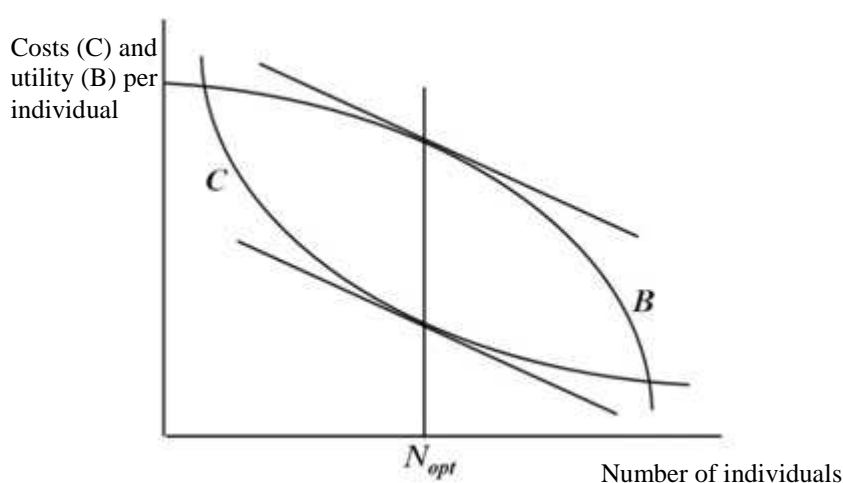


Fig. 1: Finding the optimal number of club members

Source: own based on Hamerníková (2010, p. 193)

Fig.1 illustrates the situation for the specific capacity of a public club good. A downward trend of the descending curve **C** demonstrates the costs for a service per one member. An upward trend of the descending curve **B** then demonstrates the utility per individual. Whereas the reduction of costs per individual with a rising number of members is a rather positive feature, the decreasing utility per individual with an entry of each subsequent member is acceptable only to a certain extent, to N_{opt} . With this number of members, the vertical difference between costs (C) and utility (B) per person is the greatest. The club's capacity is optimal. The slope of the tangents to both curves is identical.

Finding the **optimal size of a service** for a given number of club members is a similar step. This graphic analysis is illustrated in Fig. 2.

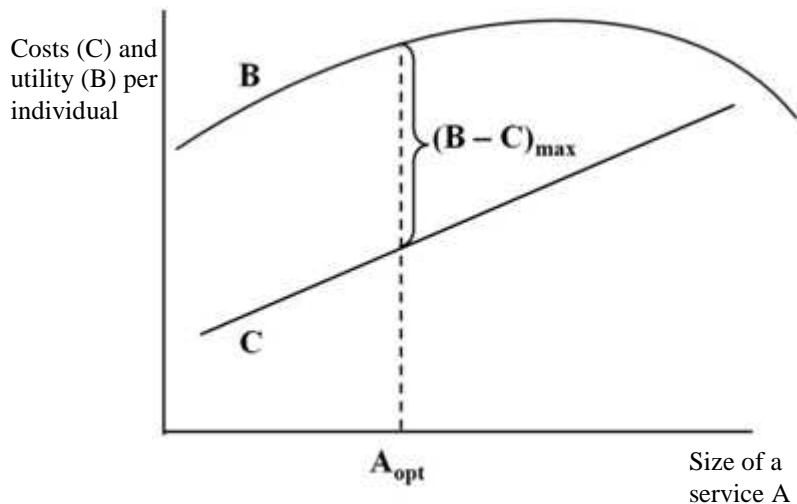


Fig. 2: Finding the optimal size of a service
Source: own based on Hamerníková (2010, p. 194)

An analogous situation exists with the search for the optimal number of members. In this case, it is to determine the amount of good A_{opt} where the vertical differences between curves B and C is the greatest.

After finding the derivation of the curves for the optimal number of members and the optimal amount of a good, it is possible, after combining them into one graph, to determine the total optimum (Fig. 3). Curve N_{opt} is the set of points that demonstrates the optimal club capacity for a particular amount of a good (Fig.1 demonstrates finding of one point from the set). Curve A_{opt} is then a set of points illustrating the optimal amount of goods for a particular number of members; it shows the various capacities of a club. We can determine the optimal point *Opt* at the intersection of these two curves. At this point, the club has, with regards to costs and utility, optimal capacity (the number of members) and it provides the optimal amount of the good.

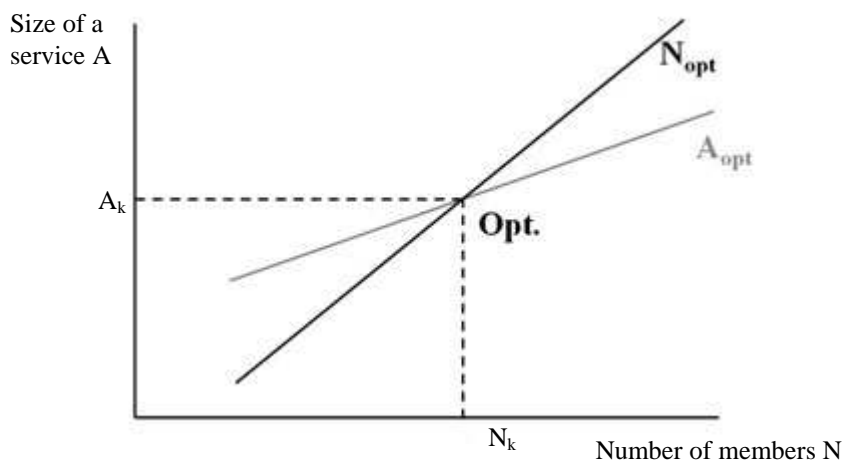


Fig. 3: Finding the optimal size of a service
Source: own based on Hamerníková (2010, p. 194)

The Buchanan theory of clubs has many prerequisites and many reviews based on that. They regulate and limit the applicability of the model.

Tab. 2: Prerequisites and criticism of the Theory of clubs

Theory of clubs (1965) – determination of Pareto optimum amount of public good for optimal number of its users – club members	
Prerequisites of the model	Criticism of model’s prerequisites
<ul style="list-style-type: none"> • homogeneity of users’ preferences 	<ul style="list-style-type: none"> • heterogeneity of users’ preferences • requested homogeneity causes grouping (“zoning”) individuals with the same preferences and incomes to one community (members with different preferences a incomes are extruded from the community)
<ul style="list-style-type: none"> • number of club members is fixed, members are not too mobile 	<ul style="list-style-type: none"> • the size of a club changes according to a type of a public good (even within one community)
<ul style="list-style-type: none"> • marginal costs of increasing quantity of public good are increasing 	<ul style="list-style-type: none"> • when providing public good returns to scale occur

Source: own based on Hamerníková (2010, p. 196)

Oates decentralisation theorem

The merits of the W. E. Oates decentralisation theorem is based on having knowledge of the impacts (benefit/loss) of decentralisation or centralization on the local public sector. These benefits or losses are caused by users’ different preferences and needs.



Fig. 4 illustrates the example of two local public sectors and provides a graphic analysis of the theorem.

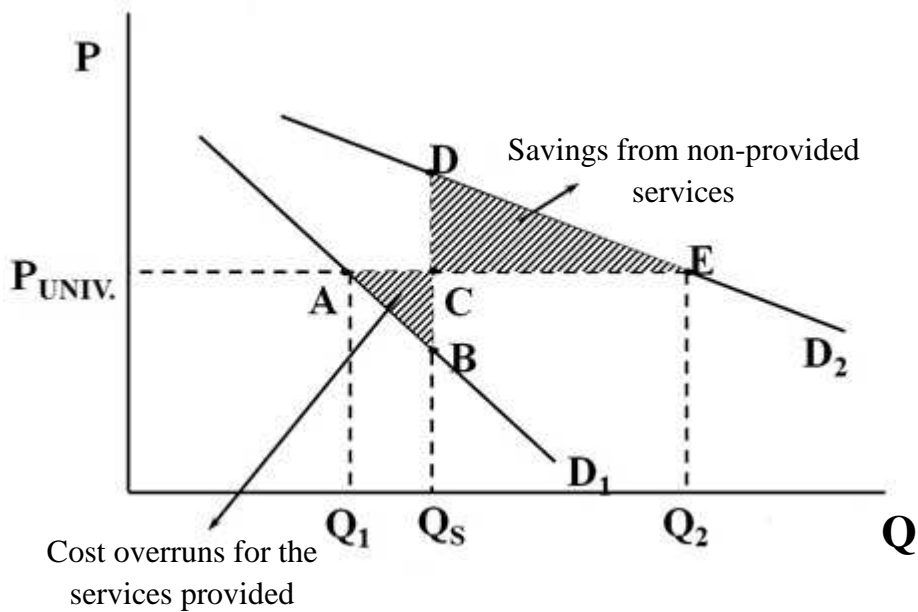


Fig. 4: Oates decentralisation theorem (losses from centralization)

Source: own

The initial curves are D_1 and D_2 . They illustrate the demand for two local public goods. Another important initial line (illustrated by the dashed line running parallel to the horizontal axis) is the straight line that illustrates the universally set price (P_{univ}) for a public good in both localities. At this input and enforced decentralisation, the first community would demand amount Q_1 and the second community Q_2 . If the public good is procured centrally, the situation will change. It will lead to the loss of prosperity. At a centrally set amount Q_s , community 1 still demands amount Q_1 and would be willing to pay a lower price for amount Q_s . It will lead to costs exceeding those for the services provided at amount ABC. For the second community, a centrally-set amount of supplied public goods will cause the supplied amount to be insufficient. It will lead to a loss of utility due to the level of non-realized consumption at amount CDE.

Centralization thus **leads to loss**. Its size depends on demand homogeneity from the point of view of their **extent** and their **elasticity**. The more homogeneous both demands are, the closer they approach the hypothetical average demand, meaning less loss from centralization. Elasticity – the less elastic the demand, the greater the loss centralization brings. Oates assumes the following – the majority of demands for local public goods are not elastic and the loss from centralization is high. The Brennan and Buchanan Leviathan models also use losses from the centralization as arguments (see below).



On the other hand, Oates admits that even decentralisation can lead to losses. They result from the termination of returning to scale efficiency if the goods are not centrally provided. The figure below (Fig. 5) demonstrates a return to scale efficiency for centrally-provided public goods.

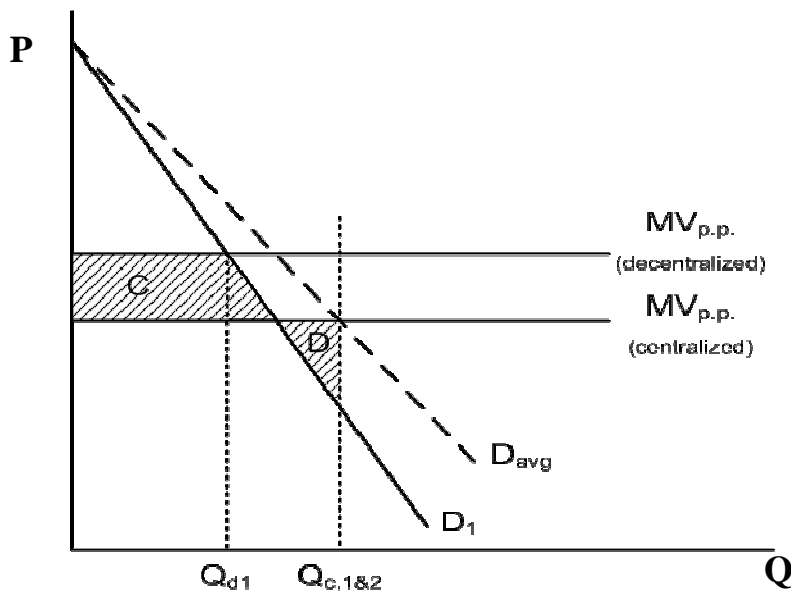


Fig. 5: Returns to scale with centralized and decentralized provision of public services
Source: own based on Hamerníková (2010, p. 198)

The figure contains two parts, D and C, and two levels of marginal costs with a centralized ($MV_{p.p. \text{ centralized}}$) and decentralized ($MV_{p.p. \text{ decentralized}}$) provision of public services. Part D shows the loss of prosperity of local consumers at demand D_1 with centrally-supplied public goods. The centrally-supplied amount of public goods ($Q_{c, 1\&2}$) obtained at the intersection of price and demand D_{avg} , is higher than demand at this price. The additional consumer surplus is lower than additional costs. Part D is the difference. Opposite the previous situation, consumers, thanks to return to scale, can pay a lower cost ($MV_{p.p. \text{ centralized}}$) for centrally-supplied public services. Thus, consumer surplus rises – part C. The total efficiency resulting from (de)centralization depends on which part (D or C) is greater. If $D > C$, then decentralized provision is more appropriate. On the contrary, if $D < C$, centralized provision is more appropriate for the given goods.

In conclusion, the lower table demonstrates the prerequisites of the decentralization theorem and their criticism.

Tab. 3: Prerequisites and criticism of the Oates theorem

Oates decentralisation theorem – losses caused by centralization of allocation function of public finance	
Prerequisites of the model	Criticism of model's prerequisites
<ul style="list-style-type: none"> • heterogeneity of user preferences 	<ul style="list-style-type: none"> • low grade of heterogeneity of user preferences
<ul style="list-style-type: none"> • inelastic demand for public goods 	<ul style="list-style-type: none"> • elastic demand for public goods (existence of substitution)
	<ul style="list-style-type: none"> • when are public goods provided centrally, returns to scale emerge

Source: own based on Hamerníková (2010, p. 199)

Brennan-Buchanan decentralization hypothesis

Why the **Leviathan** hypothesis? The public sector or its representatives are referred to as Leviathan¹. They try, to the detriment of citizens, to maximize their utility through additional power and income. They use the concept of monopoly, especially the area of the power to tax. Fiscal decentralisation should moderate Leviathan, break this monopoly and optimize the public sector. “Moderation” should be achieved by fiscal limitation (the limitation of sovereign behaviour). This means that more public sector entities with their own taxation powers should exist. They would compete with each other, thus optimizing / increasing the size of the public sector. Residents will move between locations and will choose the ones which, from the point of view of supplied public goods, will satisfy them the most.



Moderation of the public sector (Leviathan) is more difficult when:

- **mobility costs** are higher – e.g. public sectors will be far from each other.
- there is a higher probability of **secret agreements** among single public sectors (the monopoly will be replaced by a cartel).
- public goods of the same **character (type) and size** are supplied – returns to scale will be more appropriate for a lower number of public sectors.



¹ This expression comes from the T. Hobbes (philosopher of the 17th century) book of the same name. Leviathan is a sovereign representative of the state or also absolute authority that disposes of legislative executive and judicial powers. In order to eliminate chaos and keep an order (peace and defense) Hobbes was willing to accept certain abuse of these powers. However, Hobbes is not an author of the expression “Leviathan”. He took this term from the holy bible where Leviathan was a sea monster.

- **administrative** costs are lower – administrative costs can increase by scattering the supply of public goods into decentralized units, which is against decentralisation.

9.2.2 The division of public finance functions connected with fiscal decentralization

Decentralisation means shifting responsibility for the provision of public goods and for raising funds to be used for the provision to lower government levels. Hence, it means the division of public finance functions that should be executed at certain levels of the government.



It is possible to empirically divide good fiscal decentralisation into several steps.

- 1) **Integrate** decentralisation into a **legislative framework** (from the constitution to regulation through standards).
- 2) **Assign functions** to individual levels in connection with expenses.
- 3) **Define income that should guarantee the implementation of the functions** in relation to individual levels.
- 4) Set control standards of the output of individual levels.
- 5) **Provide residents the opportunity to express their preferences.**



Now we will look at articles 2 and 3 in greater detail.

From among public finance **functions**, the stabilization function and redistribution functions are typically performed by the central government. Therefore, the allocation is the only one that can be spread among different government levels. The allocation function is also most closely connected to space. That is why this function is at the focus of attention of decentralisation. A clear definition of functions and determination of expenses increases the credibility and transparency of the public sector.

The table (Tab. 4) illustrates the function division at single government levels.

Tab. 4: A Representative Assignment of Expenditure Responsibilities

Function	Policy and standards oversight	Provision/ administration	Provision/ distribution	Comments
Interregional and international conflict resolution	U	U	N, P	Benefits and costs international in scope
External trade	U	U, N, S	P	Benefits and costs international in scope
Telecommunications	U, N	P	P	National regulation not feasible
Financial transactions	U, N	P	P	National regulation not feasible
Environment	U, N, S, L	U, N, S, L	N, S, L, P	Externalities of global, national, state and local scope
Foreign direct investment	N, L	L	P	Local infrastructure is critical
Defense	N	N	N, P	Benefits and costs national in scope
Foreign affairs	N	N	N	Benefits and costs national in scope

Monetary policy, currency, banking	U, ICB	ICB	ICB, P	Independence from all levels essential, some international role for common discipline
Interstate commerce	Constitution, N	N	P	Constitutional safeguards important for factors and goods mobility
Immigration	U, N	N	N	U due to forced exit
Transfer payments	N	N	N	Redistribution
Criminal and civil law	N	N	N	Rule of law, a national concern
Industrial policy	N	N	P	To avoid beggar-thy-neighbor policies
Regulation	N	N, S, L	N, S, L, P	Internal common market
Fiscal policy	N	N, S, L	N, S, L, P	Coordination is possible
Natural resources	N	N, S, L	N, S, L, P	Promotes regional equity and internal common market
Education, health, and social welfare	N, S, L	S, L	S, L, P	Transfers in kind
Highways	N, S, L	N, S, L	S, L, P	Benefits and costs of various roads vary in scope
Parks and recreation	N, S, L	N, S, L	N, S, L, P	Benefits and costs of various roads vary in scope
Police	S, L	S, L	S, L	Primarily local benefits
Water, sewer, refuse, fire protection	L	L	L, P	Primarily local benefits

Note: U Supranational responsibility.
 ICB Independent central bank.
 N National government.
 S State/provincial government.
 L Local government
 P Nongovernmental sectors/civil society.

Source: Litvack and Seddon (1999, s. 21).

Now the focus is on the **income of particular levels of government**. Income division is a grateful topic when different levels try to negotiate. The responsibility for expenses and income lies with a particular level. Long-term inequality, insufficient income and fixed expenses lead to indebtedness and instability. The standard income tools of individual government levels include **taxes, debt instruments** and **subsidies**.

- **Taxes**

The use of tax instruments should be in accordance with the government's tax policy (see Theme 7 – an introduction to tax theory). Experience with tax instruments and decentralisation shows the necessity to take into account **fiscal need, the efficiency of the common internal market, national equality and administrative costs**.

Fiscal need – tax instruments should be available to those government levels that are supposed to provide public goods.

The efficiency of the common internal market– this is interrupted when tax instruments are used by individual government levels randomly without any connections. Effort that is not harmonized can cause distortion, especially on the market of mobile factors of production. If individual government levels compete with tax rates in order to make their territories more attractive, it can lead to the “beggar your



neighbour” policy. If the response in afflicted territories is to effectuate further tax reductions to attract tax-payers to return, it can lead to a “race to the bottom”. Taxes will be low, but public sector income will be low as well which will negatively affect its proper functioning.

National equality is supposed to mean the same proportion of residents who participate in social welfare in different regions. The shifting of tax power is meant to guarantee redistribution equality at the national level.

Decentralisation in connection with tax instruments can also mean higher costs for tax collection – the growth of **administrative costs**.

And finally, which taxes should be administrated at the central level and which at lower levels?

Whereas highly progressive pension taxes and corporate taxes should be administrated by the central government, fixed basis taxes should be administrated by lower levels of government.

- **Debts instruments**

Debts instruments – these are other instruments that bring financial resources to governments at all levels. These are **refundable** sources (e.g. municipal bonds). Their use needs a careful regulatory framework so that lower levels of government are not overburdened with debt. Regulatory measures should prevent moral hazards (see “too big to fail”).



- **Subsidies**

Subsidies are the last of the three previously-mentioned instruments (taxes, debts and subsidies). The use of subsidies should contribute to 1) **internalizing cross-border effects**, 2) **fiscal settlement among particular jurisdictions** and 3) **improvement of the functioning of the entire tax system**.



Arguments for the use of subsidies are: 1) **fiscal cliff** – expense responsibility is higher than income possibilities (vertical imbalance), 2) **fiscal inequality** – fiscal capacities are not the same and the needs of fiscal capacities are different (horizontal inequality), 3) **fiscal inefficiency** – this results from various fiscal capacities and 4) **cross-border effects (interstate)**.

Subsidies are divided according to common characteristics. The main two groups are **targeted** and **untargeted** subsidies (Fig. 6).

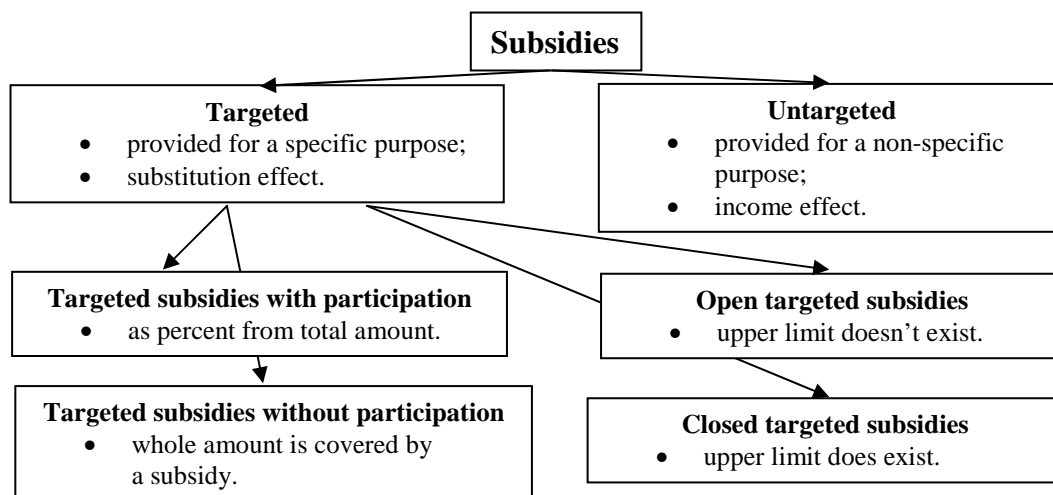


Fig. 6: Division of subsidies

Source: own based on Hamerníková (2010, p. 209)

Targeted subsidies – these are provided for some specific purpose. Their use is defined beforehand. For consumers, it leads to the substitution effect. Because of the subsidy, one good “becomes cheaper” and it influences the consumers’ independence to decide. The situation is illustrated in Fig. 7. This is utilized when it is necessary to increase the consumption of a particular public good (e.g. a targeted subsidy is provided for the restoration of an historical building in order to help to preserve cultural heritage).

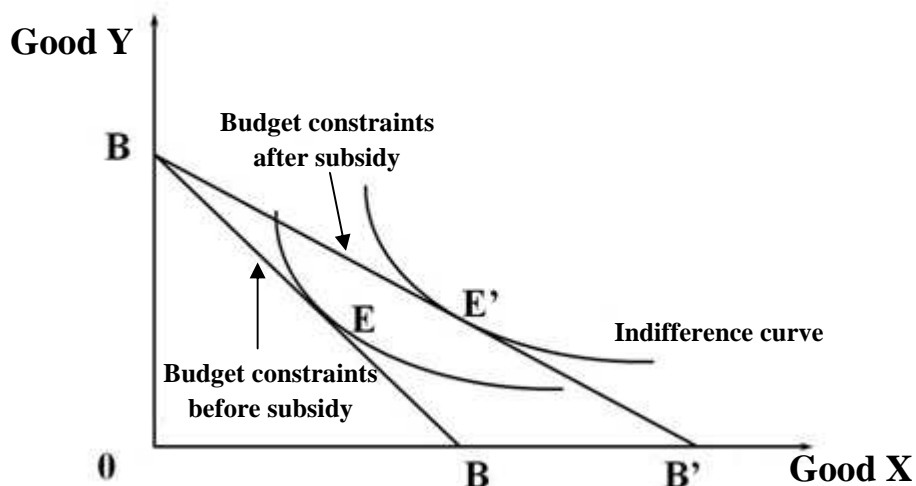


Fig. 7: Substitution effect caused by targeted subsidy

Source: own

Fig. 7 illustrates the situation before and after the subsidy’s distribution. The straight line BB illustrates budget constraints before subsidy distribution; the straight line BB’ illustrates budget constraints after the subsidy’s provision for good X. The consumer, because of the subsidy, can afford more of good X. The straight line of the new budget constraint is flatter and the consumer will shift from the optimal situation E to the new optimal situation E’. The consumer shifted to a higher indifference curve.

Untargeted subsidies – these are used for settling deficiencies caused by fiscal inequality and fiscal capacity. Untargeted subsidies are formed by enforcing the redistribution function. They should be mainly provided to poorer areas. The goal is to achieve horizontal fiscal equality. See Fig. 8 – changes and impacts on consumers’ decisions caused by an untargeted subsidy.

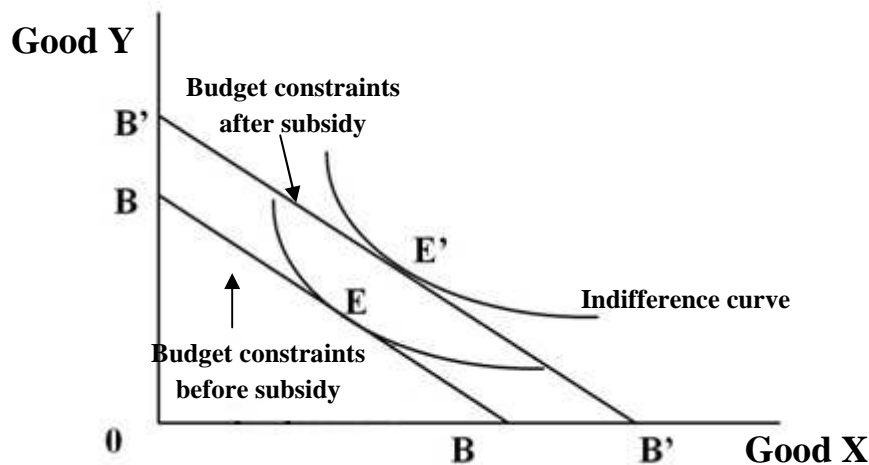


Fig. 8: Income effect caused by untargeted subsidy
Source: own

The straight line BB illustrates the original budget constraints where the consumers achieve their optimum on the tangent with the corresponding indifference curve, i.e. at point E . After an untargeted subsidy is provided, the budget constraint will shift up and to the right and will run parallel to the former budget constraint. Parallelism is given by the fact that the provided subsidy is untargeted and relatively “reduces the prices” of goods X and Y . The consumer can decide which good will increase his consumption. Thanks to the change of budget constraint (the straight line $B'B'$), the consumer will reach a higher indifference curve and he or she will find his or her new optimum at point E' .

9.3 Local Finances

Fiscal decentralisation leads to the formation of **local finances**, which are public income and expenditures divided into several levels of local governments. Among local finances are municipalities, districts, regional budgets, and in the case of supranational (federal) units, state budgets. The main goal of local finances is to provide demanded public goods at the optimal allocation at decentralized levels. If the decentralisation is not set properly, it can lead to systematic failure of all public finances (not just one particular stage). Local finances present other question to be resolved, such as how to set the extent of autonomy, the extent of redistribution within the budget system and questions dealing with the efficiency of fiscal function allocation at the local level (in fact, this is the club theory).



9.3.1 Local budgets



Local budgets are practical instruments of local finance functions. This mainly means the budgets of territorial self-governing units (municipalities, districts, regions, etc.). The character of income, with regard to its extent and structure, suggests the character of the self-governing unit at a particular level. The structure and extent of expenditures then suggests how the expenditure policy of the particular level of state administration will be implemented.

Local budgets should be, under normal circumstances, in balance. This means that income should equal expenditures. If income is higher than expenditures, then it is up to the particular self-governing unit to invest their surplus. Alternatively, if the budget is in deficit, the local self-governing unit is expected to cover the deficit either with a debt instrument or by the sale of assets.

Local budgets have two components; the **current** budget and the **capital** budget. The current budget should provide the common functions of local finance for its residents. This is why income and expenditures that are planned in the current budget concern the current fiscal year. The capital budget is formed by income and expenditures for a time horizon longer than one fiscal year.

The following table (Tab. 5) illustrates local budget items for current and capital budget income and expenditures.

Tab. 5: Structure of local budget

Local budget	
Current budget	
Revenues	Expenditures
Tax <ul style="list-style-type: none"> • shared taxes • exclusive taxes, • local taxes. 	Public order <ul style="list-style-type: none"> • police • fire protection
Non-tax <ul style="list-style-type: none"> • charges for services • local administrative fees • other (presents, rental income,...) 	Public services <ul style="list-style-type: none"> • local government • health care, • education, • social care, • housing and communal services
Subsidies – received	Subsidies – paid
Profit of communal companies	Loss of communal companies
Other	Other
Local budget	
Current budget	
Revenues	Expenditures
From sales of assets <ul style="list-style-type: none"> • movable • immovable • capital 	
Subsidies – received	Subsidies – paid
Received instalments of debts and loans	Instalments of debts and loans
Current budget surplus	Current budget deficit

Source: own based on Hamerníková (2010, p. 214).

In conclusion, here is a brief note concerning the character of local income. It is usually formed by the ratio of **tax** and **non-tax revenues**, **capital** income and **subsidies**. Tax revenues are the result of the sum of **shared taxes**, **exclusive taxes** and **local taxes**. Shared taxes are collected at national level.

