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Section 10
Public Sector & the Tax System

Reference:

N. Gregory Mankiw and Mark P. Taylor (2023), “*Microeconomics*", Cengage Learning, Chapter 8

www.efv.admin.ch

The slides of this section are mainly based on the 6th edition of the book by Mankiw and Taylor (2023). In some slides we reproduce figures, sentences and definitions given in the book.

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Introductory video: Denmark introduced the "Fat tax" (2011)

https://www.bbc.com/news/av/world-europe-15140821/fatty-food-tax-introduced-in-denmark

Market Failures

Externalities, public goods,..

↓

State Intervention

Public programs, regulation,

↓

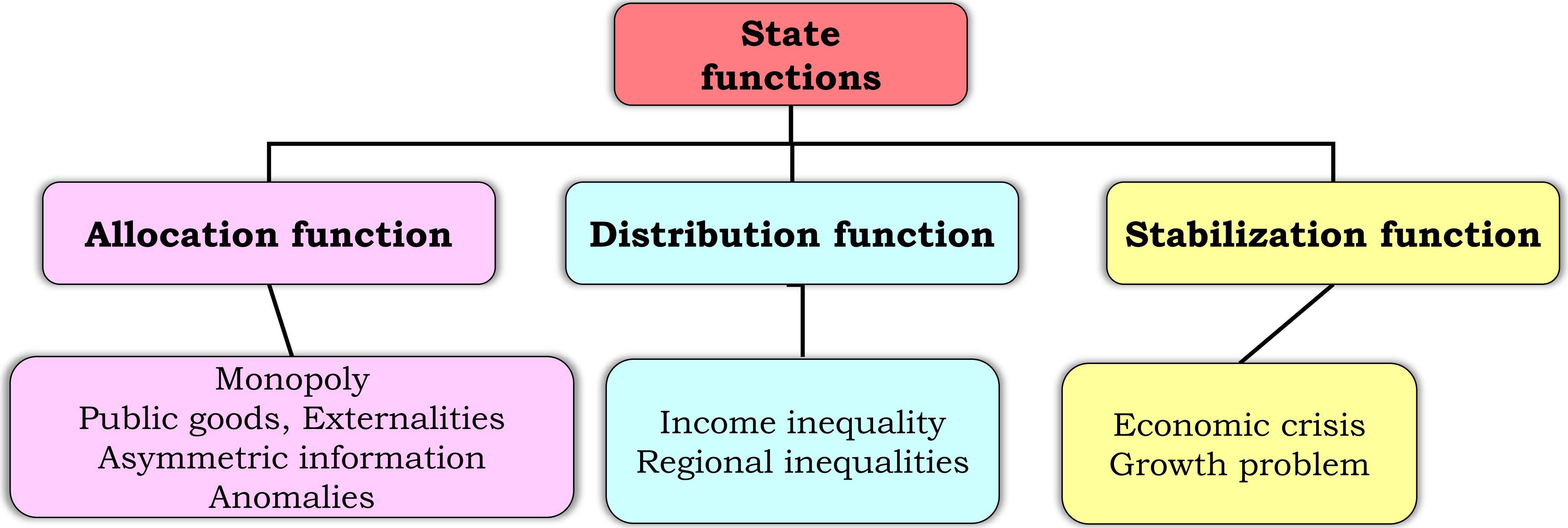
Revenues

Taxes, fees, prices,..

Contents

A. Government Spending

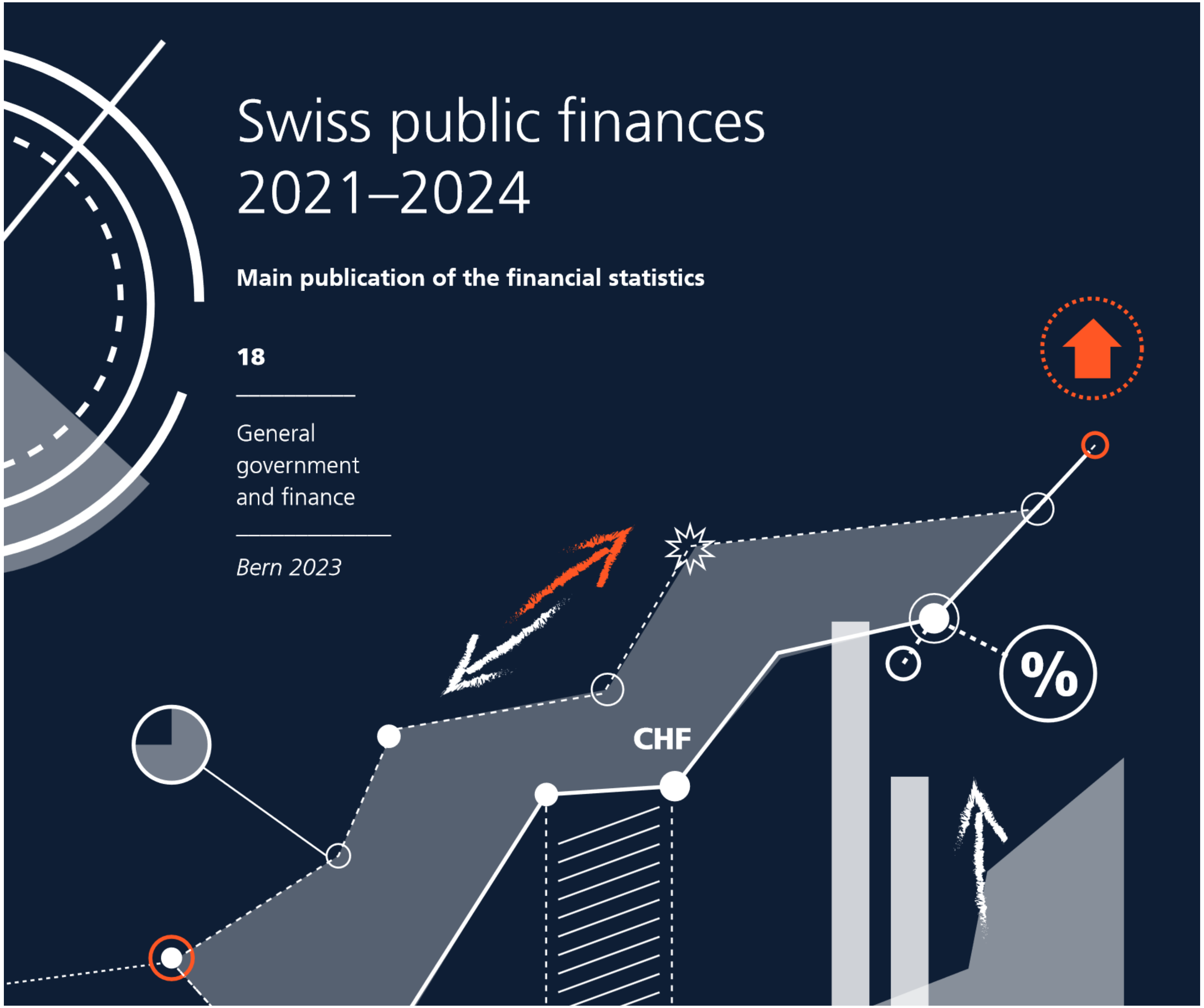
Government Spending



Government Spending

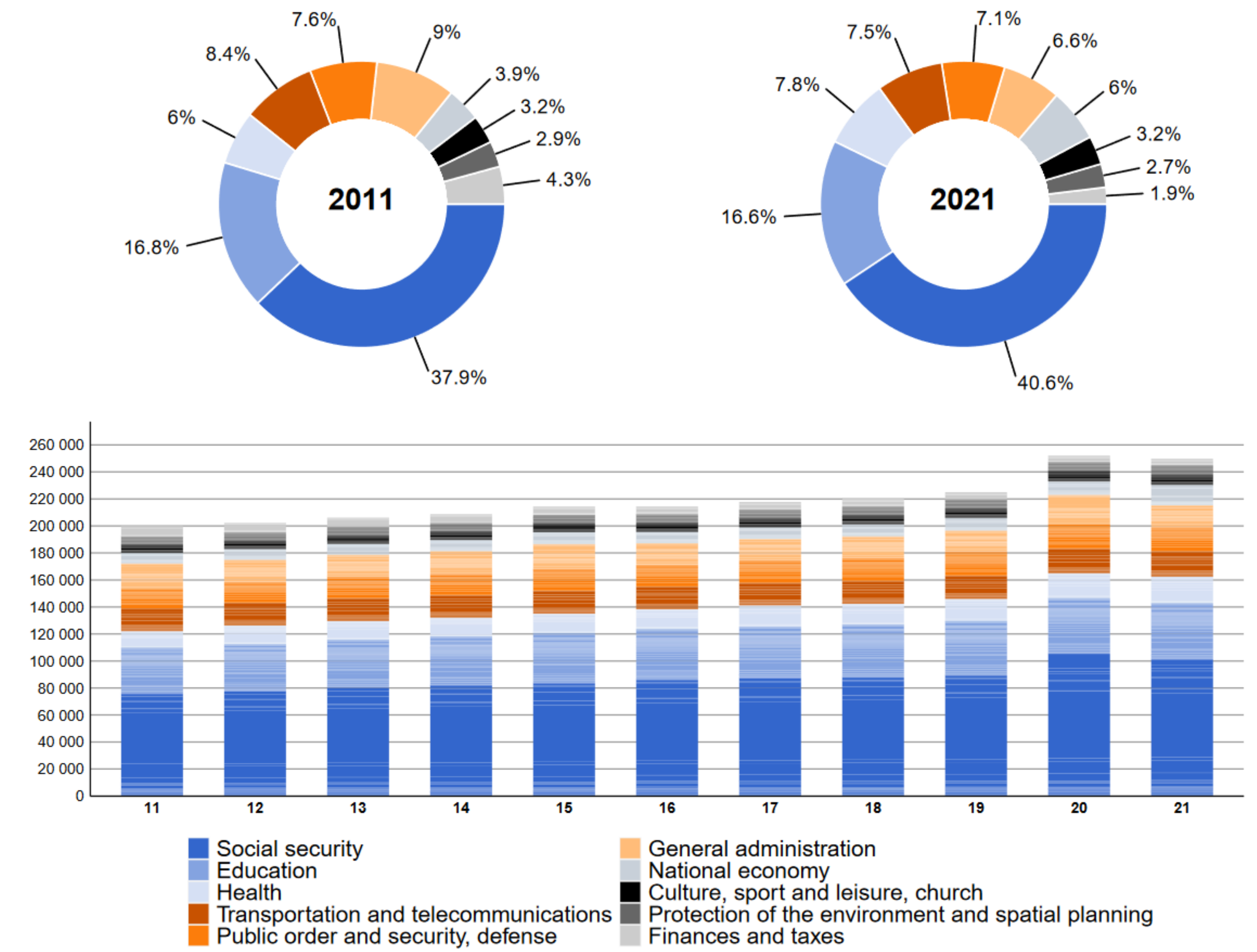
- **Government spending** includes transfer payments, the purchase of public goods and services and general public policy programs
  - In a federal state: Different institutions, different public expenditures

- **Transfer payments** are government payments not made in exchange for a good or a service, e.g. pensions, education programs, transport, environment or unemployment benefits.
  - In a federal state: Also intergovernmental transfers



https://www.bfs.admin.ch/asset/en/28765646

Figure 4: Expenditure by function with the FS Model (in CHF mn and % of total)



Source: Swiss financial statistics – FS Model (31.08.2023)

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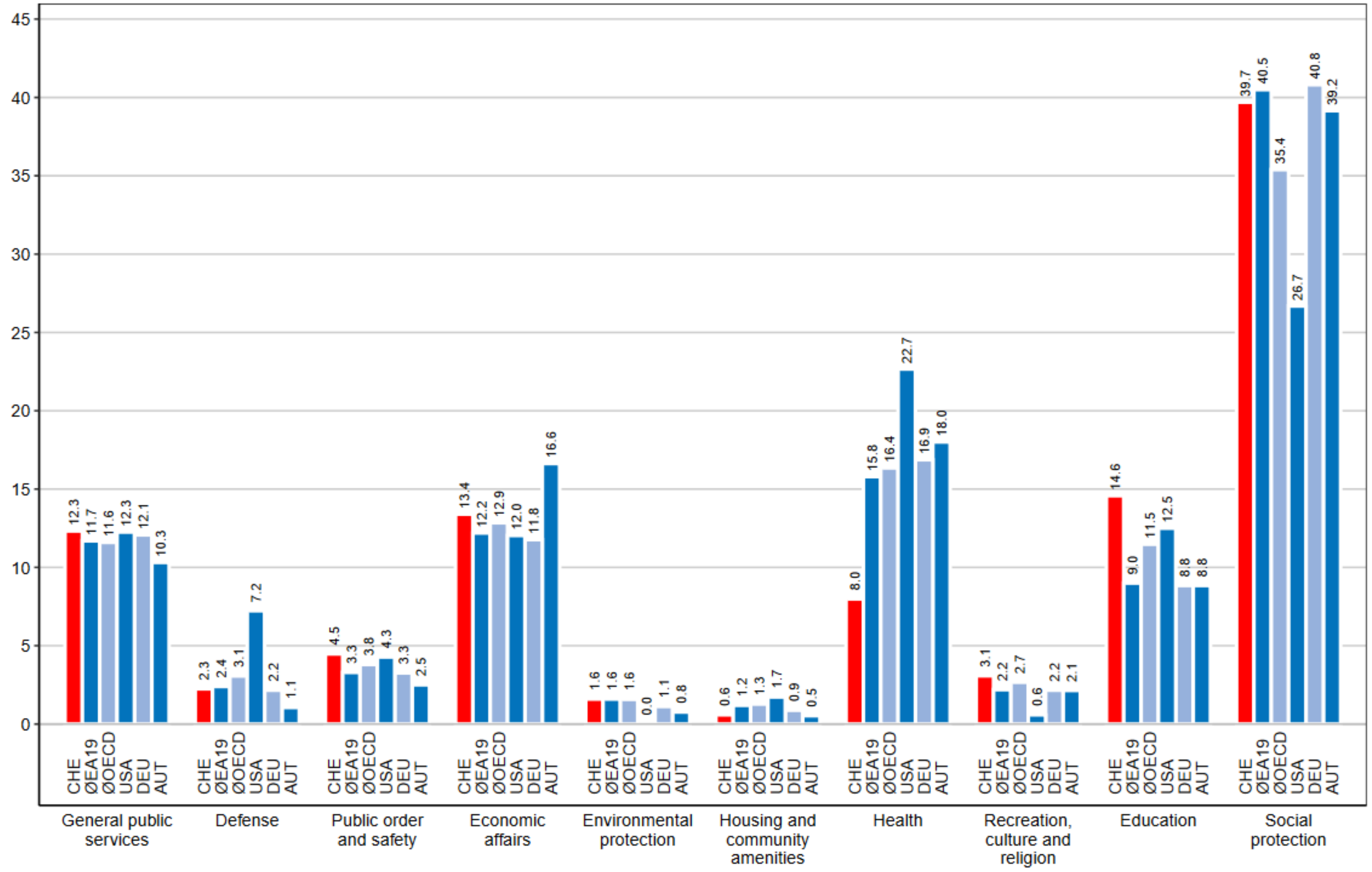
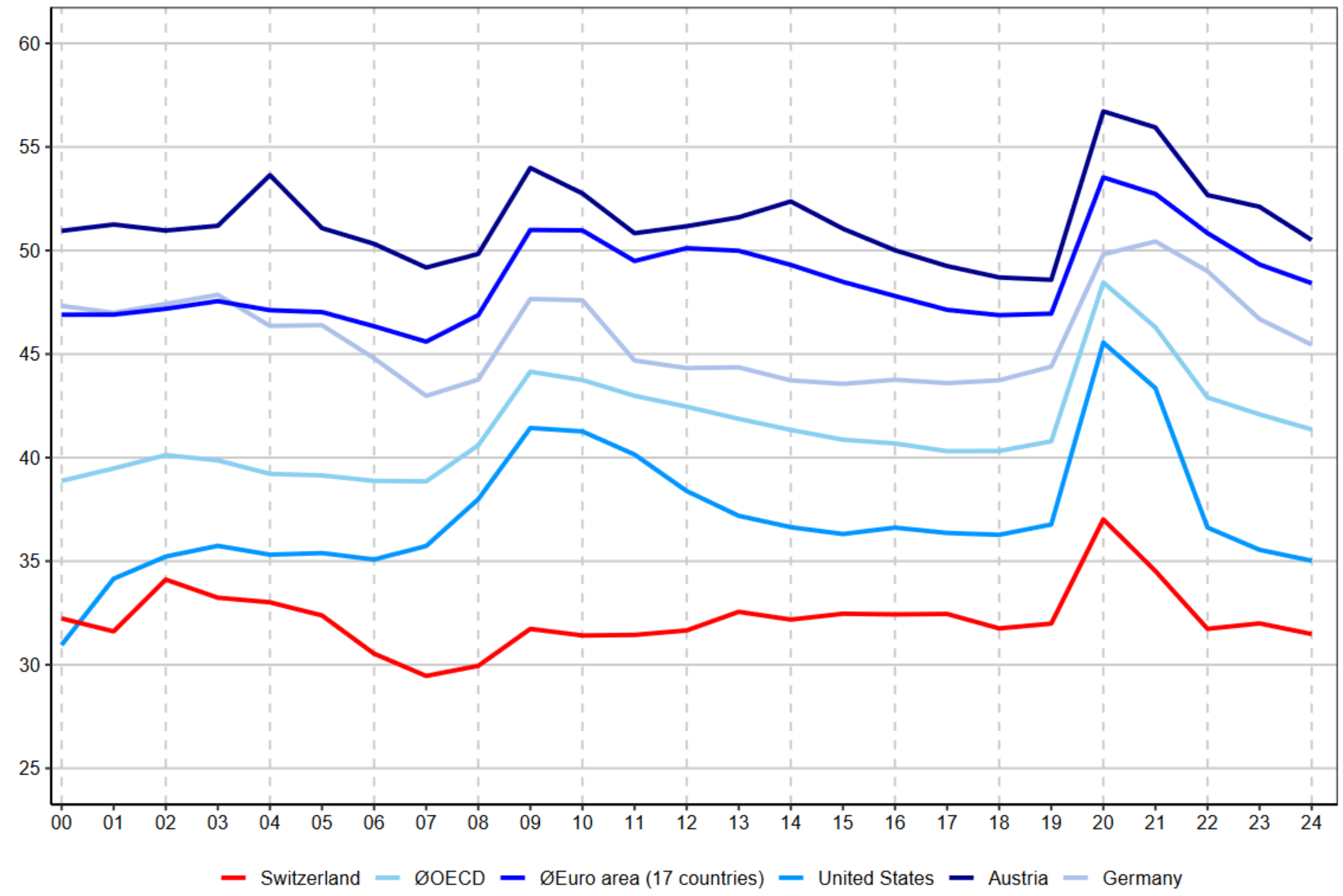
Figure 11: General government expenditure by function (COFOG) in 2021 (in % of total expenditure)



Source: IMF GFS and OECD databases (countries) as well as Eurostat COFOG databases (EU and EA19)

Figure 10: Development of general government expenditure ratios (in % of nominal GDP)



Source: IMF GFS database, updated and supplemented with OECD Economic Outlook 113 (June 2023)

B. Sources of Government Revenues, Fiscal balance and Debt

Sources of Government Revenues

- **Public revenues** are defined as the sum of financial resources accruing to the public sector in order to finance **national expenditure** and the **subsidies for the economy**.

- The Revenues of the public sector come from:

  - **Sale and leasing** of goods and services

  - **Contributions:**

    - **Taxes** (obligatory withdrawal, not for specific services)

    - **Fees** (obligatory contributions, for specific services)

  - **Loans**: the state may raise money from capital markets. These are not revenues in the original sense.

Taxes

Reasons for paying taxes:

- **to produce and offer public and merit goods**
- **to contribute to the income distribution process, solidarity found**
- **to reduce negative externalities (eco-tax, fat-tax)**
- **to implement fiscal policy instruments**

Types of Taxes

Source: finance-office.ch

Total-EFT CHF: 16.25

MWST-NUMMER: CHE-105.970.604 MWST

GR	MWST%	TOTAL	MWST
1	2.50	16.25	0.40

BESTEN DANK FÜR IHREN EINKAUF!

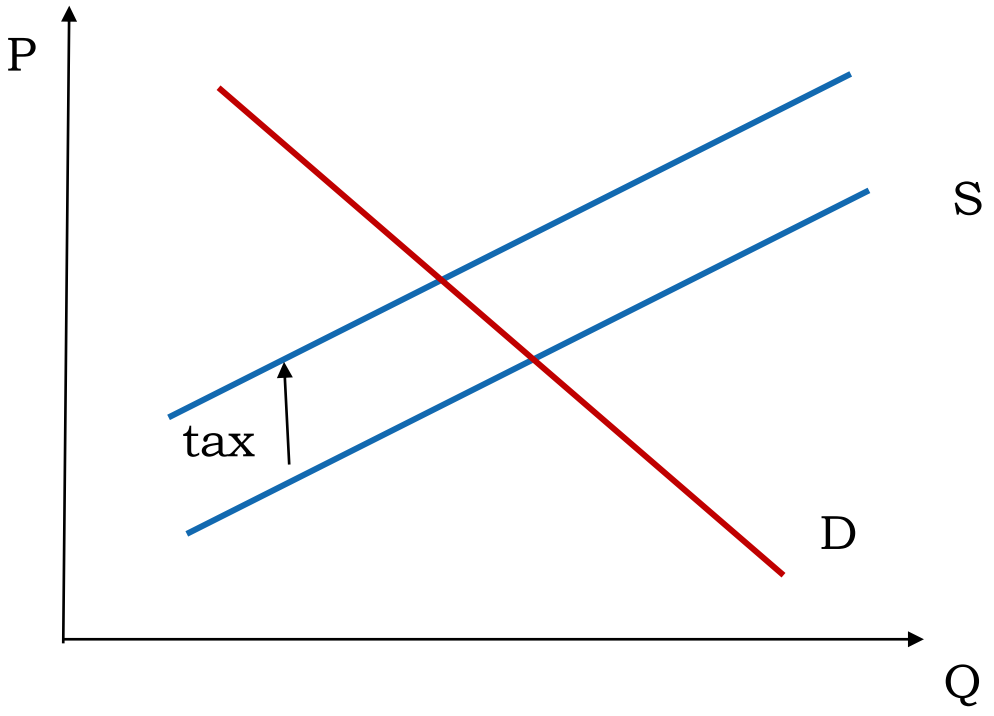
Type of Tax

- **Direct Tax**: levied on income and wealth →
- **Indirect Tax**: levied on the sale of goods and services (e.g. VAT) →

Amount of Tax

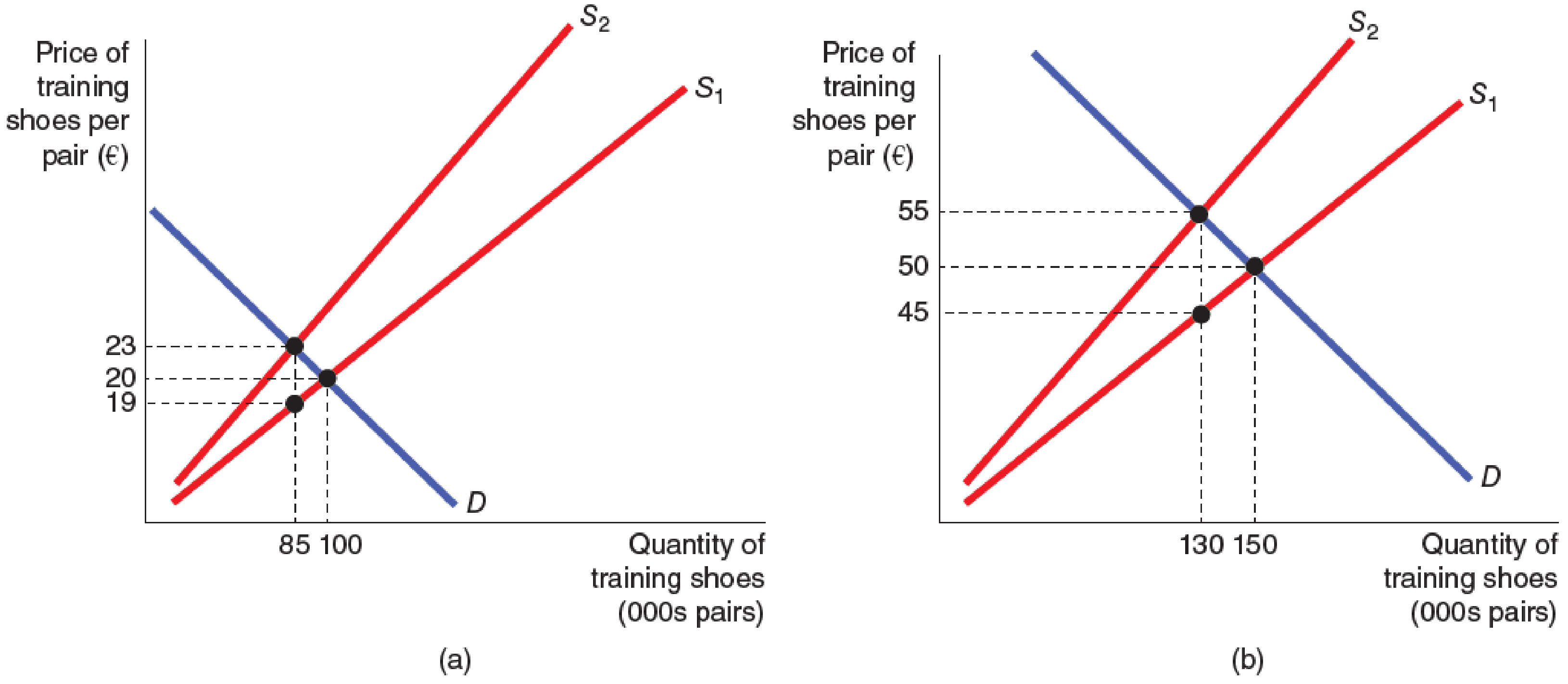
- **Specific tax** (tax per unit of a good) →
- **Ad valorem tax** (tax levied as a percentage of the price of a good)

A specific tax on Sellers



Tax is added on price: Supply curve is shifted parallel, to the left and upwards

An Ad Valorem Tax on Sellers

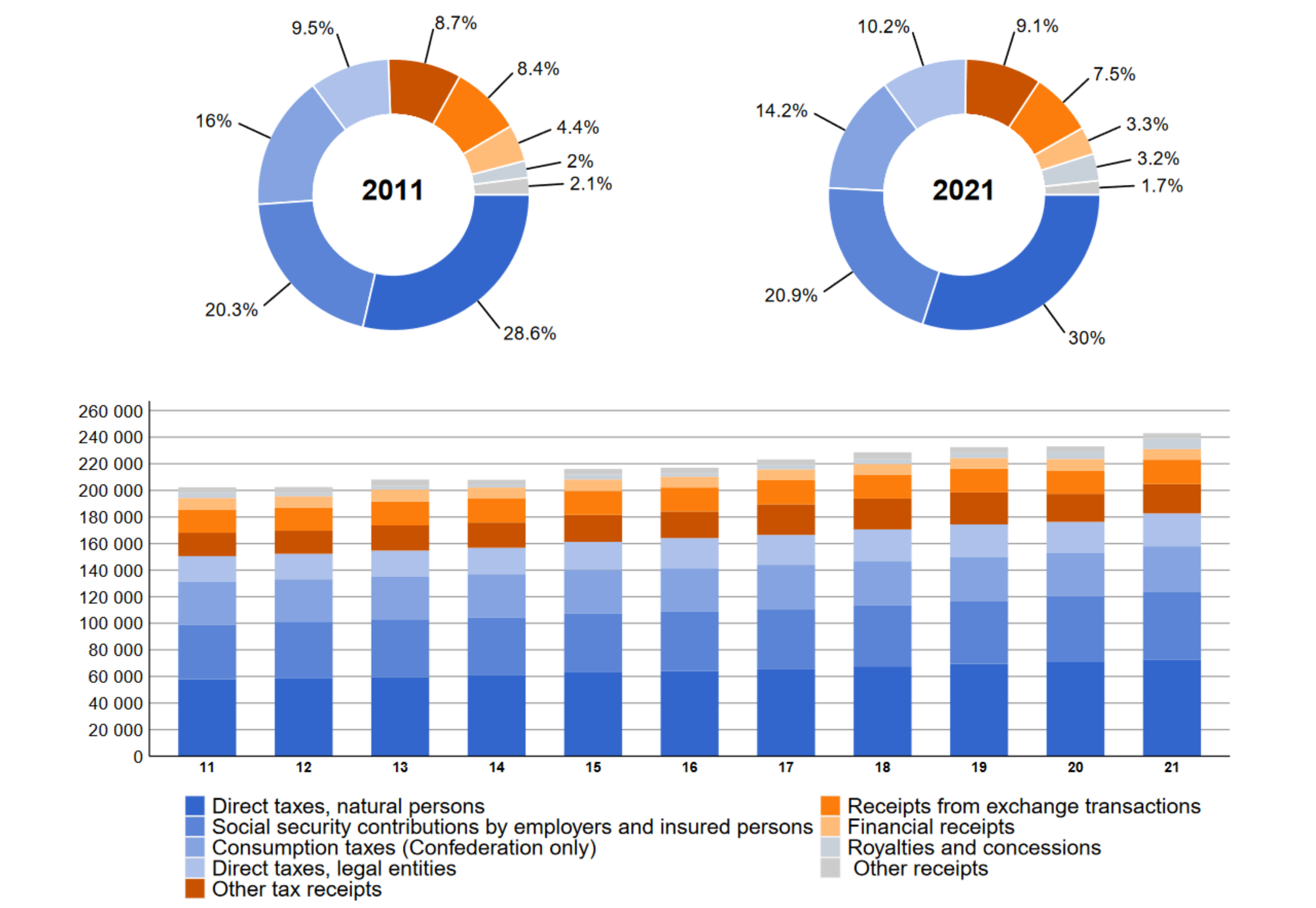


Source: Mankiw & Taylor (2023), "Microeconomics"

Tax is added on price and calculated as a percentage of the price:

- Supply curve is not shifted parallel
- At lower prices the amount of the tax paid is relatively low
- At higher prices the seller has to give more to the government

Figure 2: Receipts by economic classification (in CHF mn and % of total)



Source: Swiss financial statistics – FS Model (31.08.2023)

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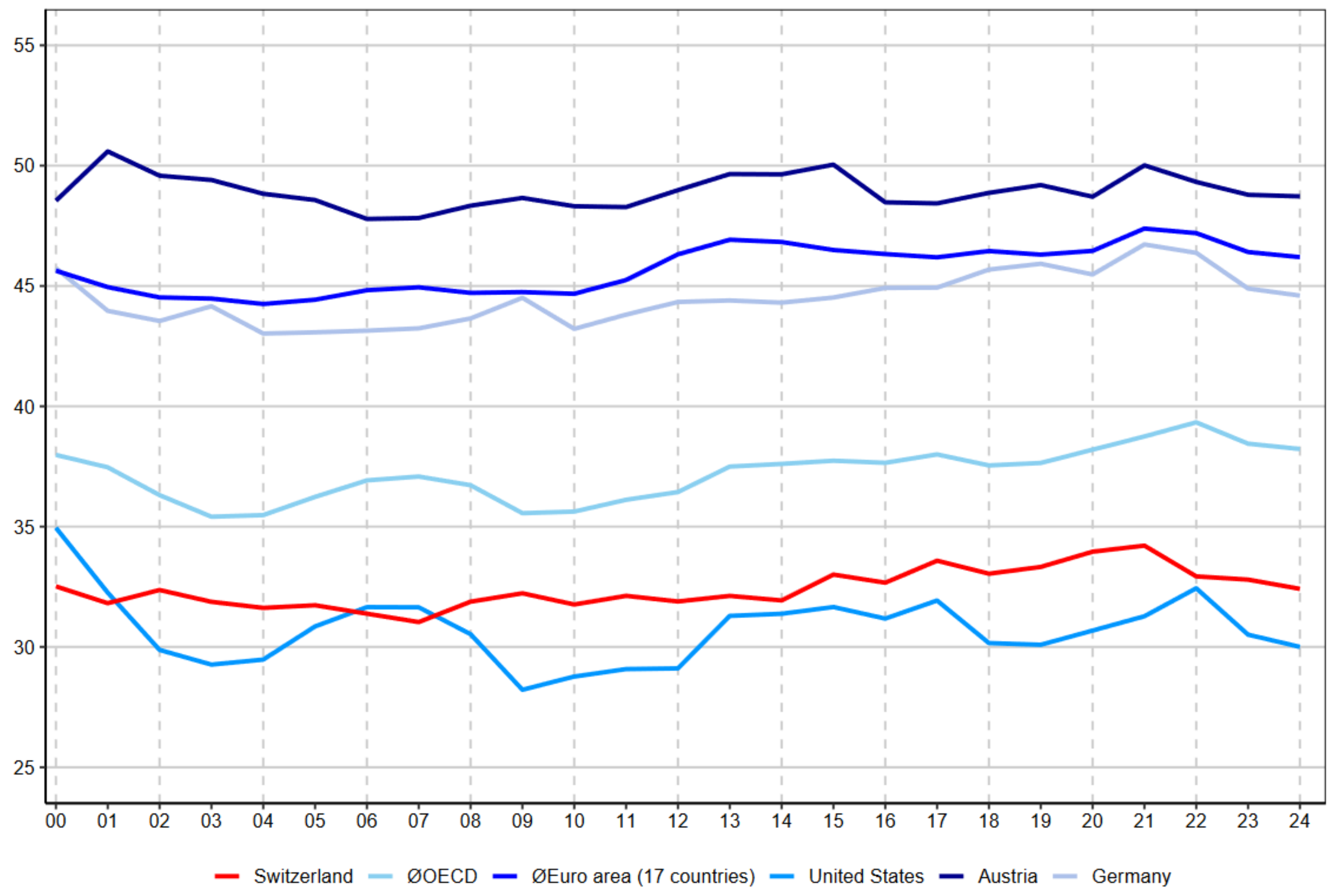
Figure 9: Development of receipt ratios (in % of nominal GDP)

Very important: compare always the level of tax with the level of public goods and services offered



Source: IMF GFS database, updated and supplemented with OECD Economic Outlook 113 (June 2023)

For CH: The numbers consider only mandatory contributions to public institutions; exclusions of mandatory contributions to private institutions (private pension funds, health insurance,…); approximately 10-13%.

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Income tax rates and Lump-sum income tax

- The **average tax rate** is total tax paid divided by total income.

$$ATR = \frac{Tax\ liability}{Taxable\ income}$$

- The **marginal tax rate** is the extra tax paid on an additional $ of income (proportional, progressive and regressive).

$$MTR = \frac{Change\ in\ tax\ liability}{Change\ in\ taxable\ income}$$

- A **lump-sum tax** is a tax that is the same amount for every person, regardless of earnings or any actions that the person might take.

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Eidgenössische Steuerverwaltung ESTV

**Tarife
Barèmes
Tariffe
2023**

Tabelle für die Berechnung der direkten Bundessteuer der natürlichen Personen

Diese Tarife gelten auch für Kapitalleistungen aus Vorsorge

Tableau servant à calculer l'impôt fédéral direct des personnes physiques

Ces barèmes sont valables aussi pour des prestations en capital provenant de la prévoyance

Tabella per il calcolo dell'imposta federale diretta delle persone fisiche

Questi tariffe sono validi anche per il prestazioni in capitale provenienti dalla previdenza

	Alleinstehende / Contribuables vivant seuls / Contribuenti che vivono soli		Verheiratete und Einelternfamilien[3] / Mariès et familles monoparentales[3] / Coniugati e famiglie monoparentali[3]			Alleinstehende / Contribuables vivant seuls / Contribuenti che vivono soli		Verheiratete und Einelternfamilien[3] / Mariès et familles monoparentales[3] / Coniugati e famiglie monoparentali[3]	
Steuerbares Einkommen[1] / Revenue imposable[1] / Reddito imponibile[1]	Steuer für 1 Jahr[2] / Impôt pour 1 année[2] / Imposta per 1 anno[2]	Für je weitere CHF 100 Einkommen / Par CHF 100 de revenu en plus / Per CHF 100 di reddito in più	Steuer für 1 Jahr[2] / Impôt pour 1 année[2] / Imposta per 1 anno[2]	Für je weitere CHF 100 Einkommen / Par CHF 100 de revenu en plus / Per CHF 100 di reddito in più	Steuerbares Einkommen[1] / Revenue imposable[1] / Reddito imponibile[1]	Steuer für 1 Jahr[2] / Impôt pour 1 année[2] / Imposta per 1 anno[2]	Für je weitere CHF 100 Einkommen / Par CHF 100 de revenu en plus / Per CHF 100 di reddito in più	Steuer für 1 Jahr[2] / Impôt pour 1 année[2] / Imposta per 1 anno[2]	Für je weitere CHF 100 Einkommen / Par CHF 100 de revenu en plus / Per CHF 100 di reddito in più
Fr.	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.
18 100	25.41				**79 700**	1 462.35		1 021.00	
18 500	28.49				**85 000**	1 812.15		1 233.00	4.00
19 000	32.34				**90 000**	2 142.15		1 433.00	
20 000	40.04				**92 000**	2 274.15		1 513.00	
21 000	47.74				**92 100**	2 280.75	6.60	1 518.00	
22 000	55.44				**95 000**	2 472.15		1 663.00	5.00
23 000	63.14				**100 000**	2 802.15		1 913.00	
24 000	70.84				**105 400**	3 158.55		2 183.00	
25 000	78.54	0.77			**105 500**	3 165.15		2 189.00	
26 000	86.24				**105 500**	3 165.15		2 189.00	
27 000	93.94				**105 600**	3 173.95		2 195.00	6.00
28 000	101.64				**110 000**	3 561.15		2 459.00	
28 700	107.03				**115 000**	4 001.15		2 759.00	
29 000	109.34				**116 900**	4 168.35		2 873.00	
30 600	121.66		18.00		**117 000**	4 177.15		2 880.00	
31 000	124.74		22.00		**120 000**	4 441.15		3 090.00	7.00
32 200	133.95		34.00		**125 000**	4 881.15	8.80	3 440.00	
32 300	134.83		35.00		**126 500**	5 013.15		3 545.00	
33 000	140.99		42.00		**126 600**	5 021.95		3 553.00	
34 000	149.79		52.00		**130 000**	5 321.15		3 825.00	8.00
35 000	158.59		62.00		**134 200**	5 690.75		4 161.00	
36 000	167.39		72.00		**134 300**	5 699.55		4 170.00	
37 000	176.19	0.88	82.00		**137 200**	5 954.75		4 431.00	9.00
38 000	184.99		92.00		**137 300**	5 965.75		4 440.00	
39 000	193.79		102.00		**139 900**	6 251.75		4 674.00	
40 000	202.59		112.00	1.00	**140 000**	6 262.75		4 684.00	10.00
41 000	211.39		122.00		**143 800**	6 680.75		5 064.00	
42 200	221.95		134.00		**143 900**	6 691.75		5 075.00	11.00
42 300	224.59		135.00		**145 800**	6 900.75		5 284.00	

Source:https://www.estv.admin.ch/estv/de/home/direkte-bundessteuer/direkte-bundessteuer/fachinformationen/tarife.html

Marginal Tax Rate

- A **proportional tax** (**Flat-rate tax**) is one for which high-income and low-income taxpayers pay the same fraction of income.

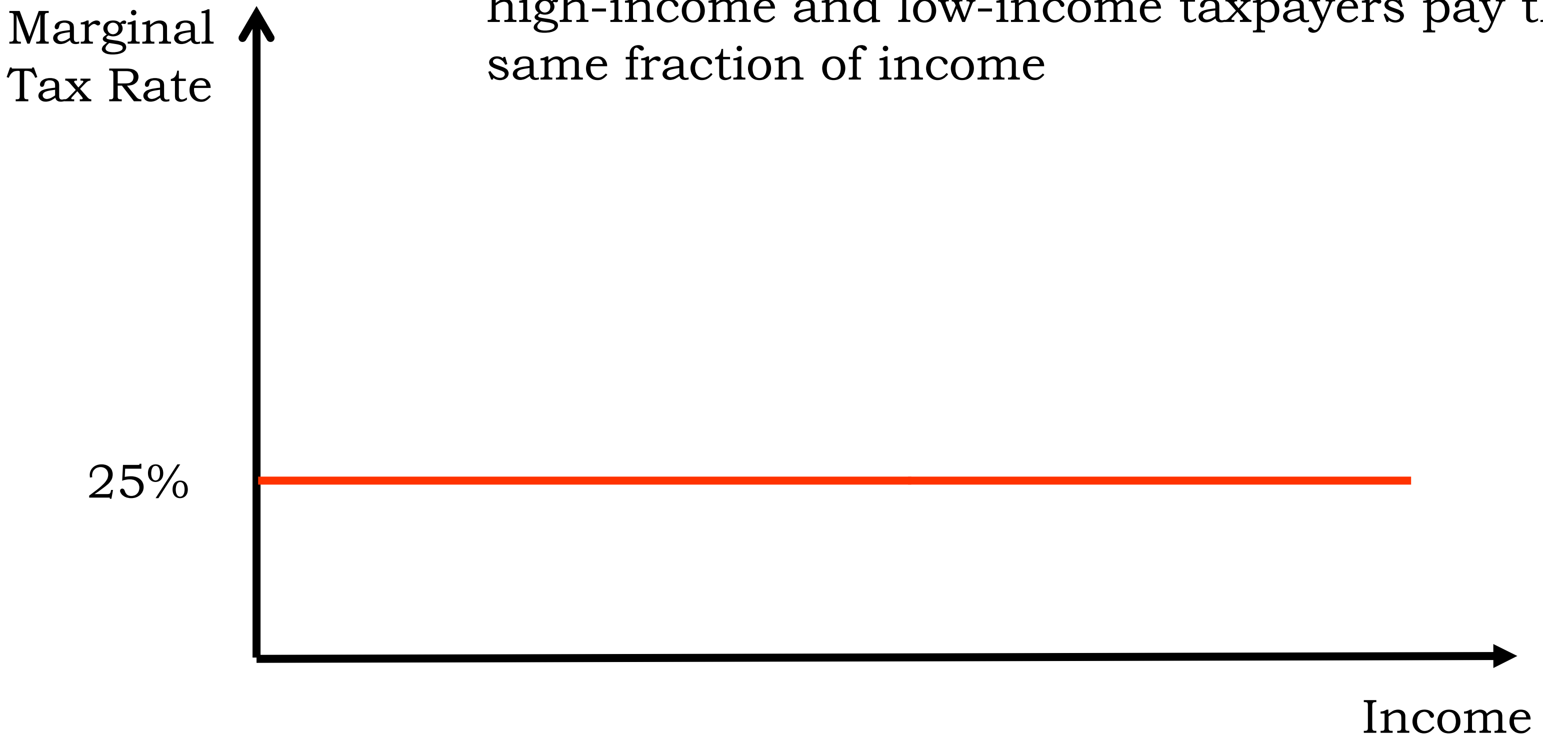
- A **regressive tax** is one for which high-income taxpayers pay a smaller fraction of their income than do low-income taxpayers.

- A **progressive tax** is one for which high-income taxpayers pay a larger fraction of their income than do low-income taxpayers.

Proportional Marginal Rate (Flat-rate tax)

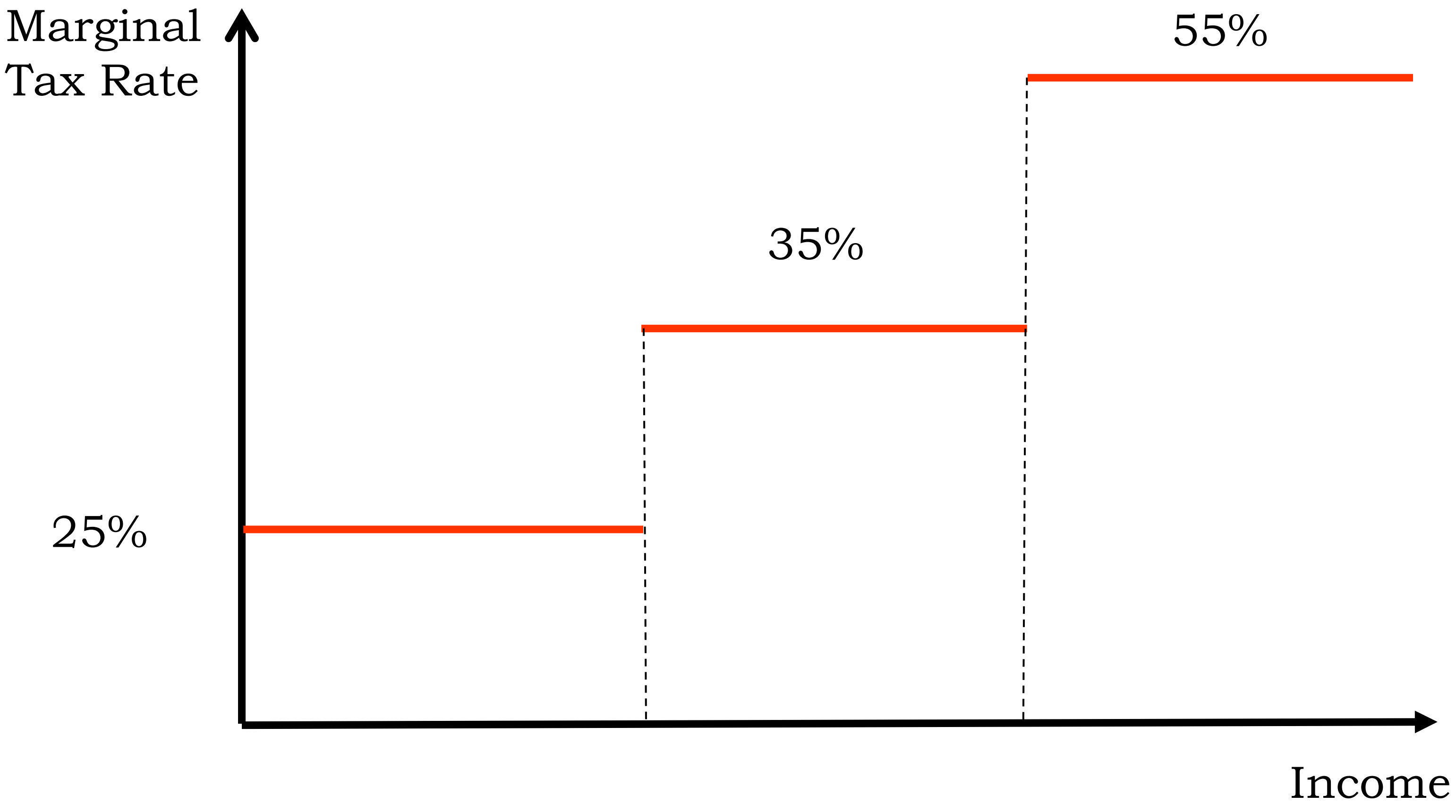
Example: 25%.

A **proportional tax** (**Flat-rate tax**) is one for which high-income and low-income taxpayers pay the same fraction of income



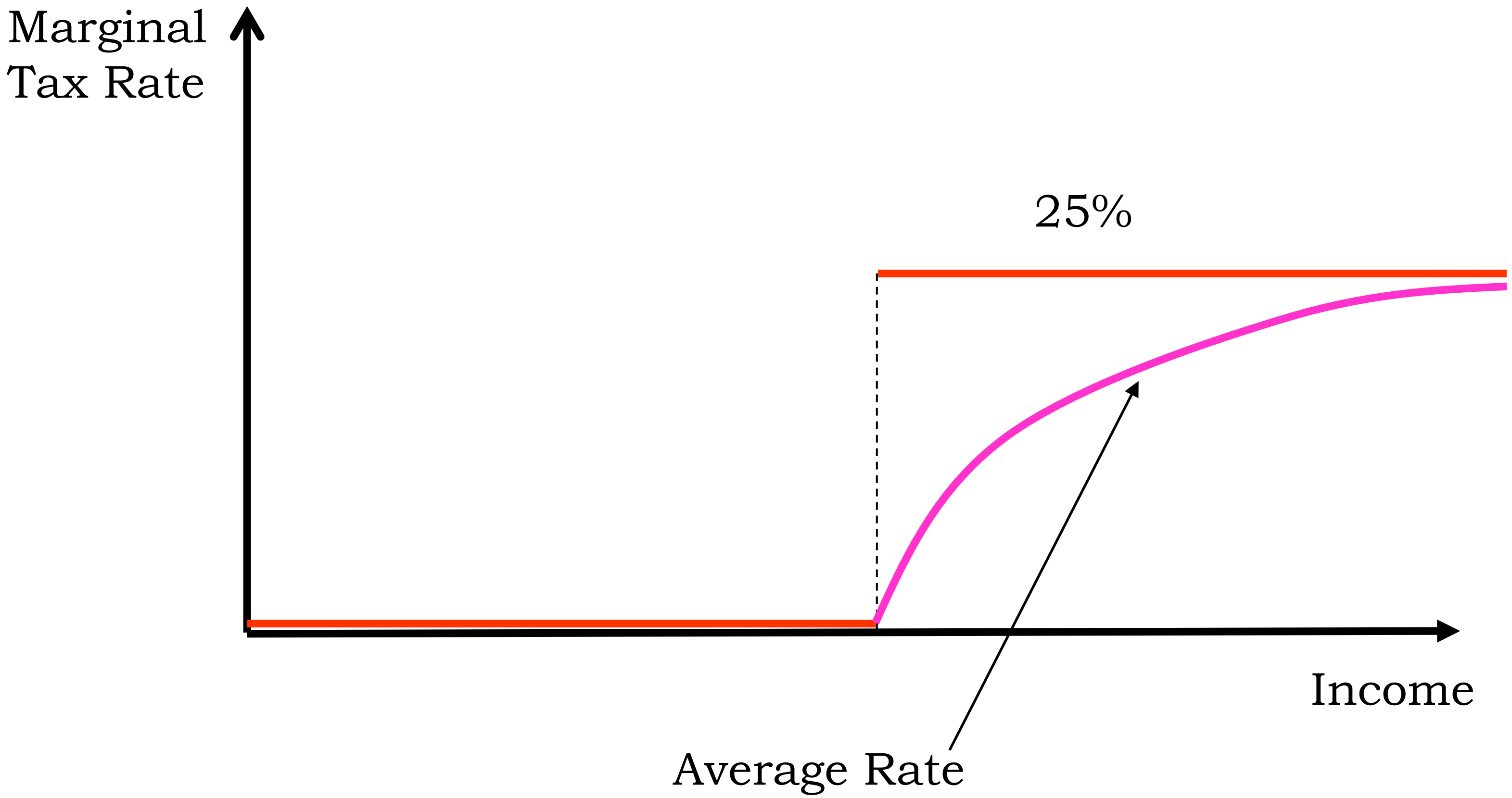
Increasing Marginal Rates

- A **progressive tax** is one for which high-income taxpayers pay a larger fraction of their income than do low-income taxpayers.

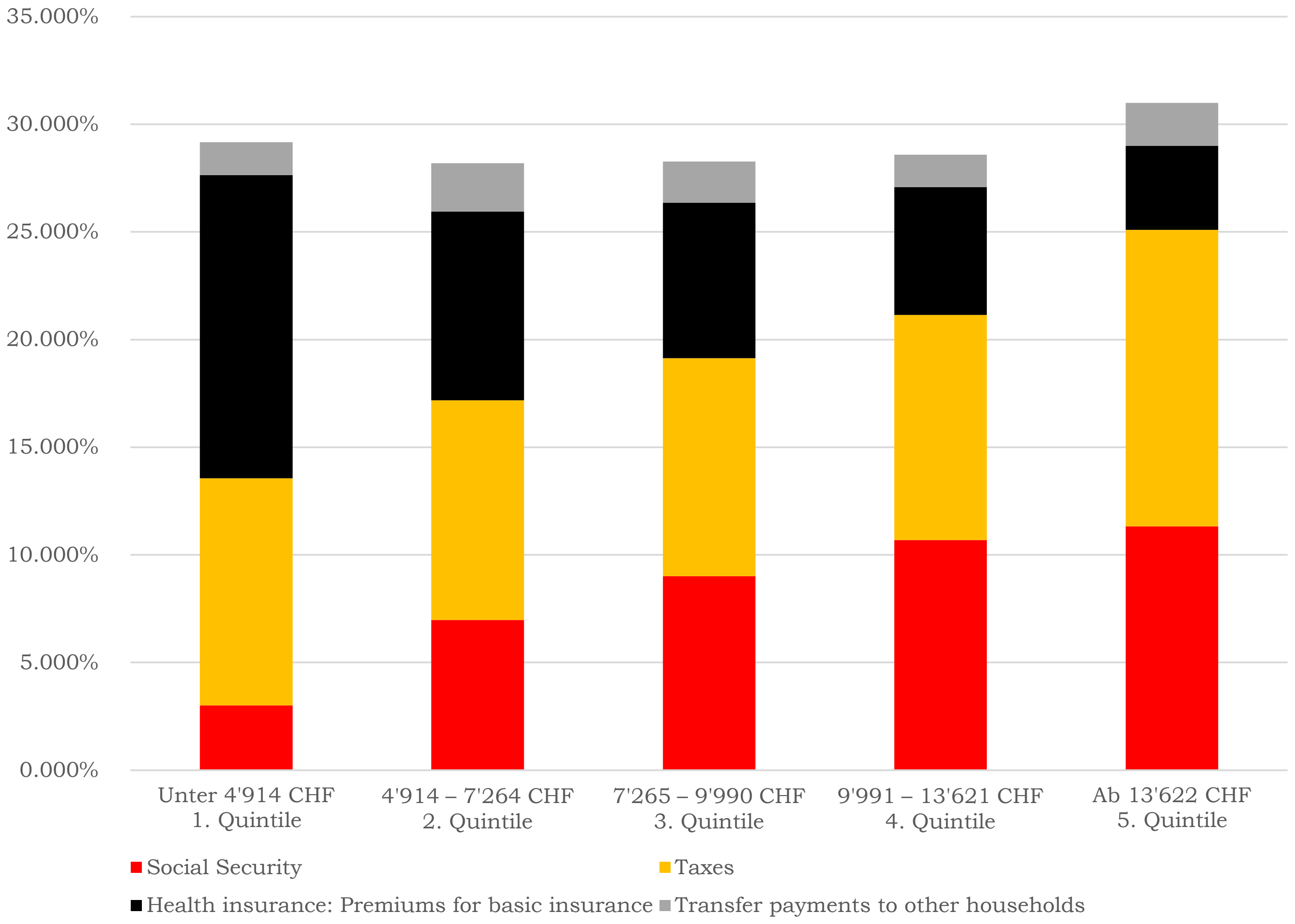


Tax Free Allowance

Example: 0% for first $10k and
25% tax rate thereafter.



«Mandatory Expenses» as % of Income



Source: http://www.bfs.admin.ch, Haushaltsbudgeterhebung, 2015–2017

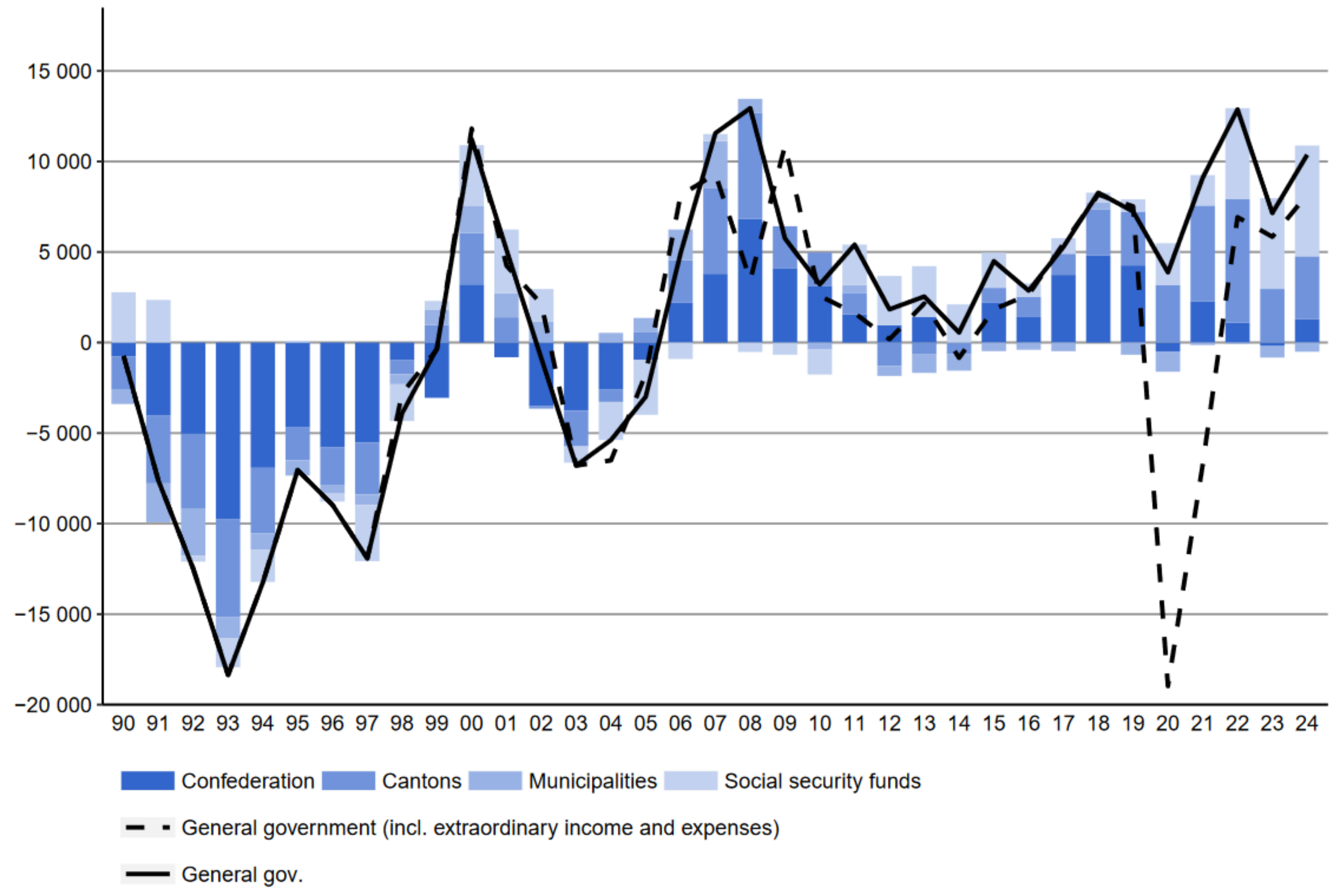
Progressive income tax system, but relatively Flat mandatory expenses!

Budget Deficit and National Debt

- If government spending exceeds government revenues, a **budget deficit** (flow) occurs. The resources to finance the deficit are in this case provided by national debt.

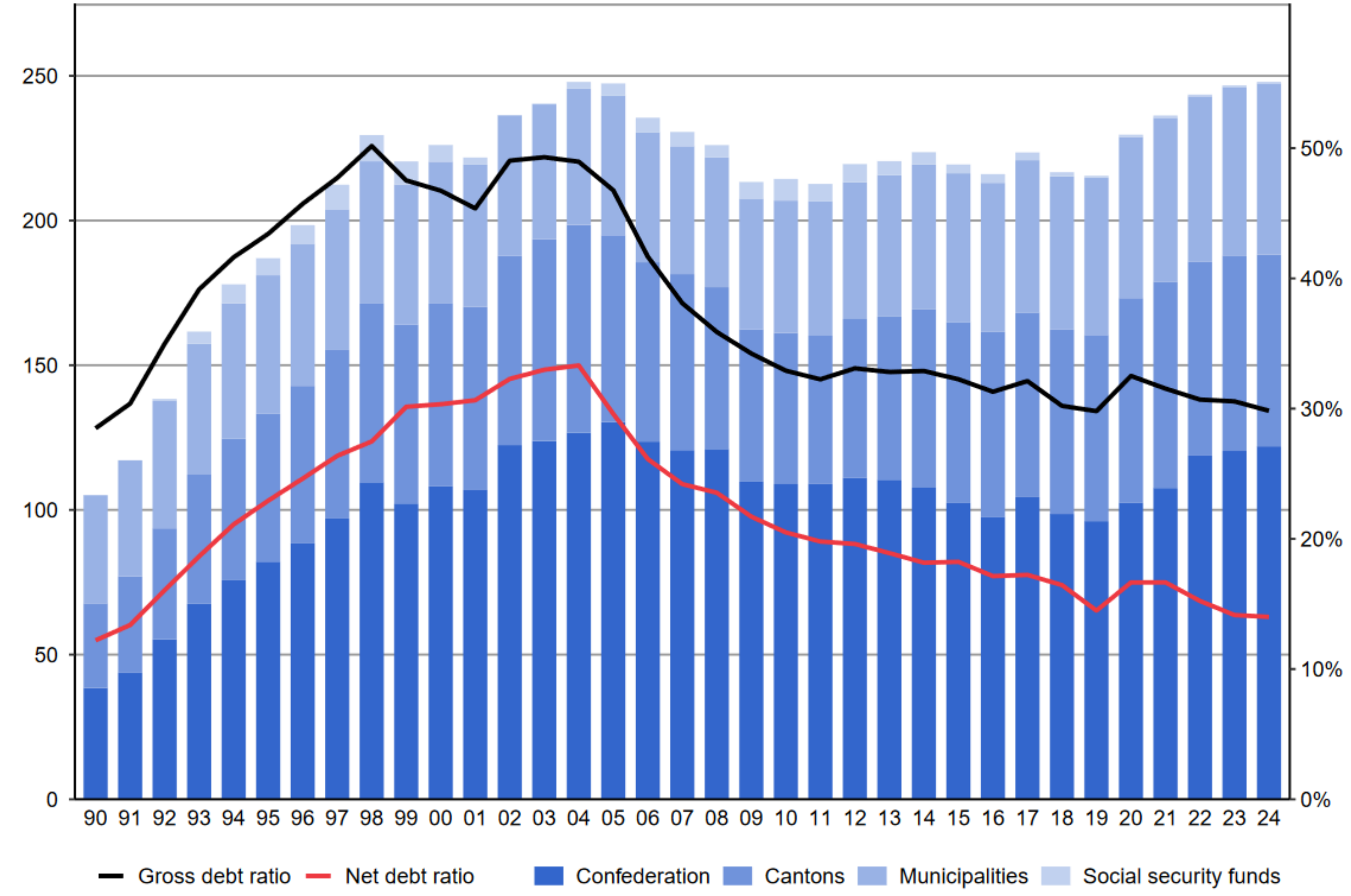
- **National debt** is the value of accumulated net borrowing by the state and other public authorities from the economic system and foreign countries.

Figure 1: Overall fiscal balance 1990–2024 (CHF mn)



Source: Swiss financial statistics – Main aggregates and forecasts with the FS Model (21.09.2023)

Figure 7: Debt trend in accordance with the FS in CHF bn (lhs) and % of nominal GDP (rhs)



Source: Swiss financial statistics – Main aggregates and forecasts with the FS Model (21.09.2023)

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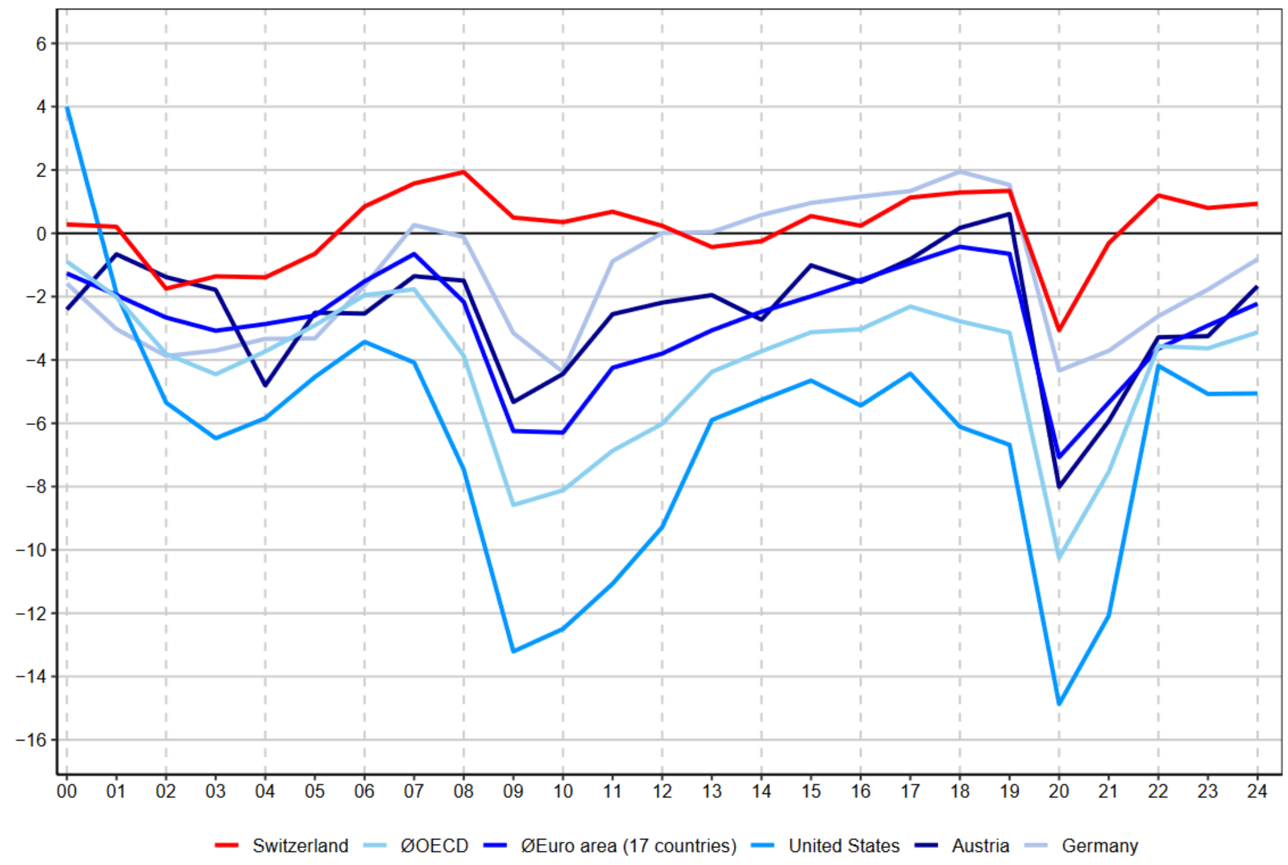
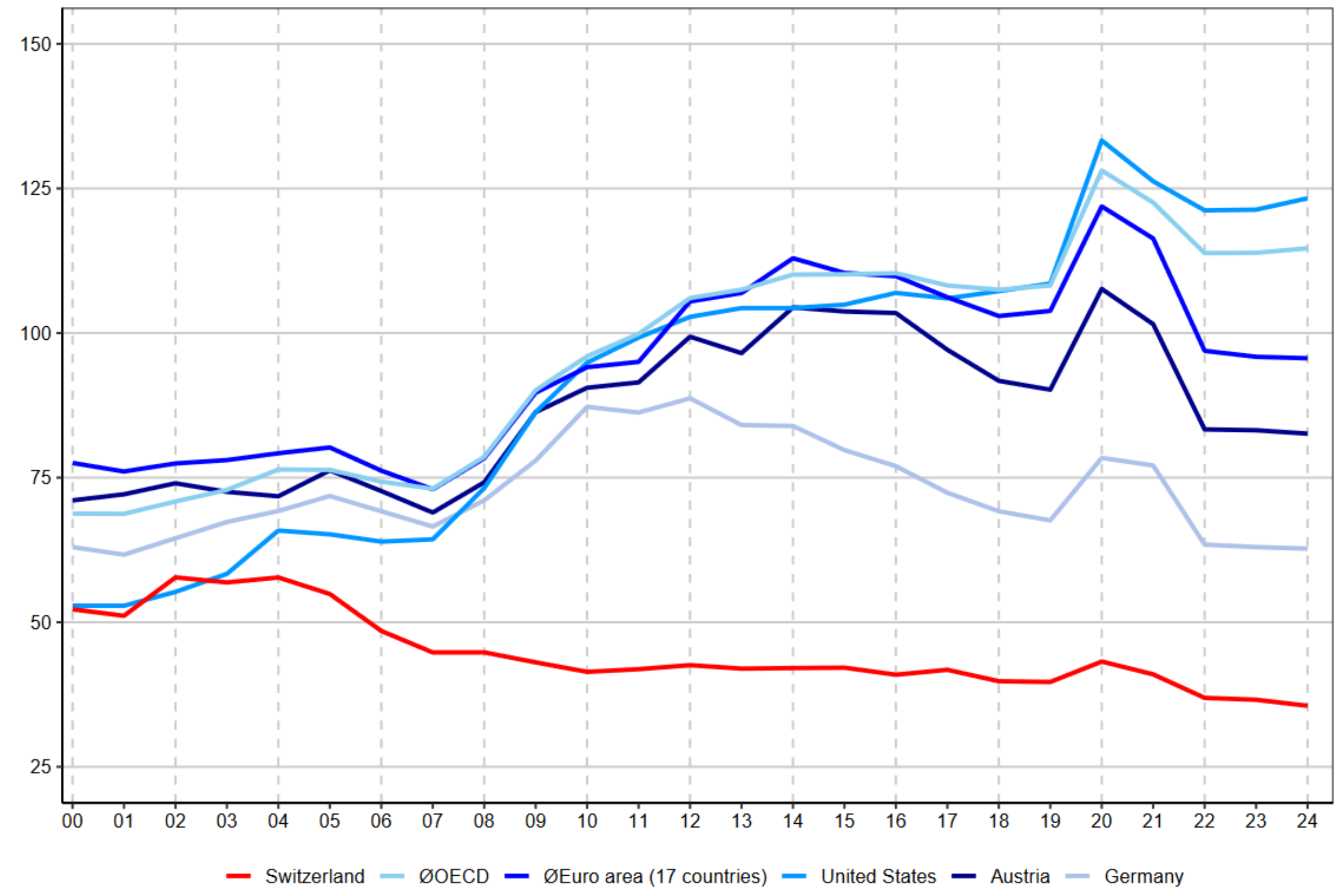
Figure 8: Development of deficit/surplus ratios (in % of nominal GDP)



Source: IMF GFS database, updated and supplemented with OECD Economic Outlook 113 (June 2023)

Figure 12: Development of gross debt ratios (in % of nominal GDP)



Source: IMF GFS database, updated and supplemented with OECD Economic Outlook 113 (June 2023)

C. Taxes and Efficiency in a Competitive Market

Taxes and Efficiency

- An **efficient tax system** tries to minimize the costs to taxpayers and the government.

- Costs are:

  ↳ Administrative burden on both side

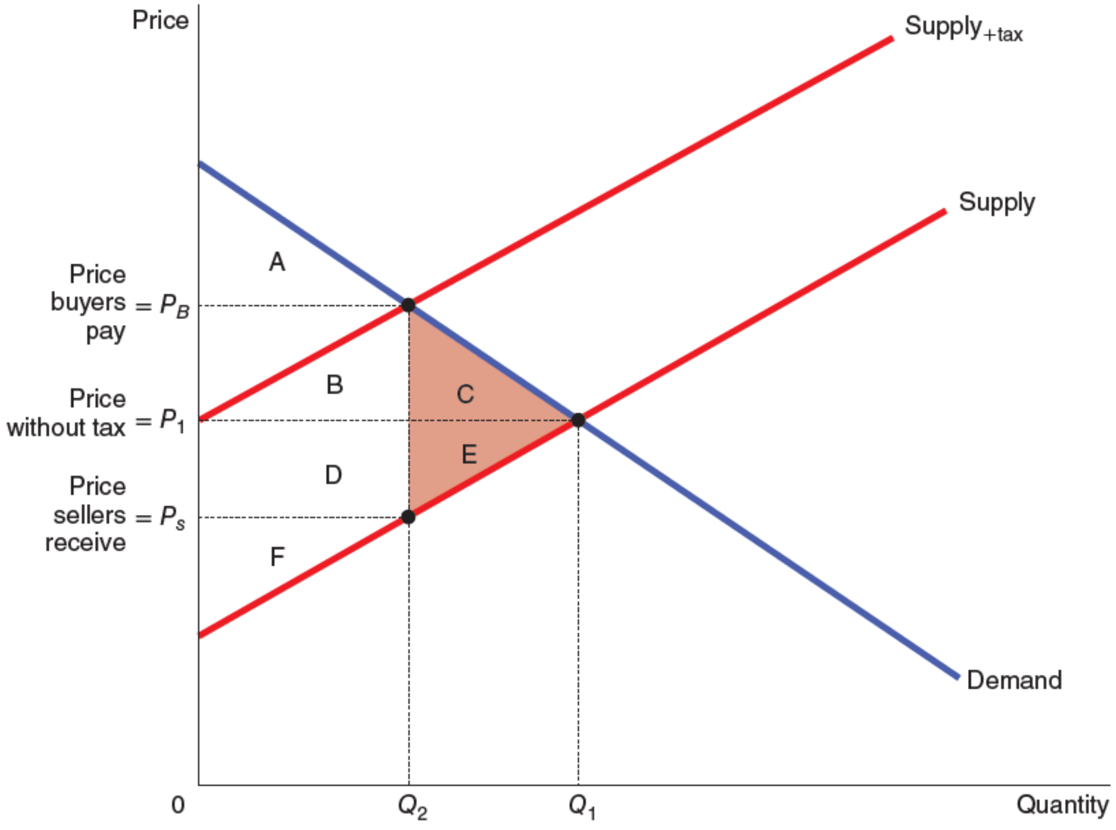
  ↳ Deadweight loss in case of competitive markets

Administrative Burden

- Administrative burden due to
  - Taxpayers spend time and money documenting, computing, and avoiding taxes.
  - These are additional administrative costs that incur over and above the actual taxes they pay.
  - The administrative burden of any tax system is part of the inefficiency it creates.
- Administrative burden can be reduced by simplifying the tax system!

Deadweight Loss in a competitive market
Tax on a good

- The deadweight loss is the inefficiency that a tax creates as people allocate resources according to the tax incentive rather than the true costs and benefits of the goods and services that they buy and sell.



	Without tax	With tax	Change
Consumer surplus	A + B + C	A	− (B + C)
Producer surplus	D + E + F	F	− (D + E)
Tax revenue	None	B + D	+ (B + D)
Total surplus	A + B + C + D + E + F	A + B + D + F	− (C + E)

Source: Mankiw & Taylor (2023), Microeconomics

Tax Redistribution and Deadweight Loss

- To avoid the deadweight loss use of a **lump-sum tax** (tax is the same for every person)

↳ In this case, at the margin the decisions aren't influenced; relative prices remain the same; a person's decisions have no tax consequences

↳ Still possible to finance the public goods and services

- However

↳ not used because considered as unfair (the poor pay as much as the rich relative to income;

↳ More important: presence of market failures makes the efficiency argument weak

Income	Lump-sum tax	Average tax rate	Marginal tax rate
20000	4000	20	0
40000	4000	10	0

Removing deadweight loss from economic discourse on income taxation and public spending

Charles F Manski
Professor in Economics,
Northwestern University

Students of economics learn that the formal usage of the concepts 'inefficiency', 'deadweight loss', and 'distortion' in normative public finance refer to a theoretical setting where a private economy is in competitive equilibrium and a government can use lump-sum taxes to modify the endowments of individuals.

In this setting, classical theorems of welfare economics show that any Pareto efficient social outcome can be achieved by having the government use lump-sum taxes to redistribute endowments and otherwise not intervene in the economy. Income taxes and other commonly used taxes logically cannot yield better social outcomes than optimal lump sum taxes but they may do worse. Deadweight loss measures the degree to which they do worse.

Careful instructors caution students that the theoretical setting envisioned in classical welfare economics is far removed from reality for a host of reasons, from the impracticality of lump-sum taxes to the presence of many forms of market failure.

http://www.voxeu.org/article/removing-deadweight-loss-economic-discourse-income-taxation-and-public-spending

Manski, C (2013), "Choosing Size of Government Under Ambiguity: Infrastructure Spending and Income Taxation", *The Economic Journal*, forthcoming.

D. Tax Incidence

Tax Incidence

Tax incidence is the manner in which the burden of a tax is shared among participants in a market.

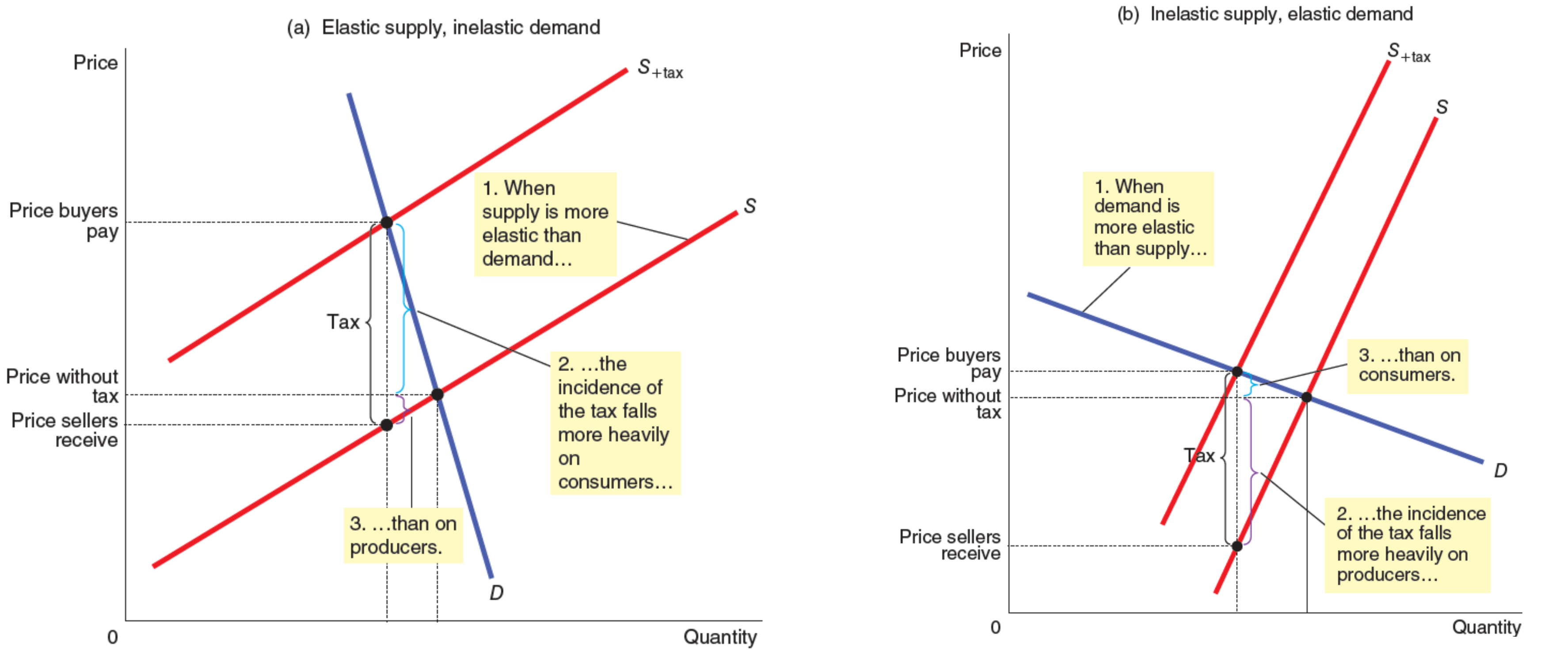
- Tax incidence is the study of who bears the burden of a tax.
- Taxes result in a change in market equilibrium.
- Buyers pay more and sellers receive less, regardless of whom the tax is levied on.
- Even though the tax is levied on sellers, buyers and sellers share the burden of the tax

Elasticity and Tax Incidence

Price Elasticity determines the proportions of the tax burden but also the effects of taxes on sellers compared to those levied on buyers.

The burden of a tax falls more heavily on the side of the market that is less price elastic!

Elasticity and Tax Incidence



Source: Mankiw & Taylor (2023), "Microeconomics"

E. Taxes and Equity

Tax Incidence and Tax Equity

- **Equity** and **efficiency** are the two most important goals of the tax system.
- The difficulty in formulating tax policy is balancing the often conflicting goals of **efficiency** and **equity**.

Taxes and Equity

- Basic question we have to ask if we consider **equity**:
  - How should the burden of taxes be divided among the population?

- There are basically 2 **Principles of Taxation**
  - **Benefits principle**
  - **Ability-to-pay principle**

Benefits Principle

The **benefits principle** is the idea that people should pay taxes based on the benefits they receive from government services.

A possible example is a tax on petrol:

- ➯ Tax revenues from a tax on petrol could be used to finance the construction and maintenance of the road system.
- ➯ People who drive the most would pay the most toward maintaining roads.

- Other examples are fees for house sewerage, water supply connection,…

Ability-to-pay Principle

The **ability-to-pay principle** is the idea that taxes should be levied on a person according to how well that person can shoulder the burden.

The ability-to-pay principle leads to two related notions of equity.

- **Vertical equity**
- **Horizontal equity**

Vertical Equity

Vertical equity is the idea **that taxpayers with a greater ability to pay taxes should pay larger amounts.**

Basically there are 2 different possibilities:

- A **proportional tax** is one for which high-income and low-income taxpayers pay the same fraction of income.
- A **progressive tax** is one for which high-income taxpayers pay a larger fraction of their income than do low-income taxpayers.
- To consider the marginal utility of income…

Canton	Principal Town	Gross income in CHF											
		100'000		150'000		200'000		250'000		300'000		1'000'000	
		MARRIED COUPLE WITH 2 CHILDREN: TAX BURDEN 2010 (federal & cantonal & communal & church tax)											
		%	CHF	%	CHF	%	CHF	%	CHF	%	CHF	%	CHF
ZH	Zürich	6.85%	6'850	11.01%	16'515	15.22%	30'440	18.65%	46'625	21.22%	63'660	33.10%	331'000

Horizontal Equity

Horizontal equity is the idea that taxpayers with similar abilities to pay taxes should pay the same amounts.

For example, two households with the same characterisctics and the same income living in different parts of the country should pay the same amount of taxes.

F. Government Failure

Government failure and Public Choice Theory

Government intervention to promote public interest (benevolent government): making decisions based on a principle where the maximum benefit is gained by the largest number of people at minimum cost

Failure of the state intervention: A situation where political power and incentives distort decision making so that decisions do not promote economic efficiency

Public choice theory

Public choice theory

The state intervention that is defined trough a political process is not always designed and implemented to maximize the welfare of a society.

According to this theory:

- voters;
- politicians;
- bureaucrats;
- interest groups;
- political parties;

➯ participate in political process with the same attitude and motivations with which they make economic choices. Therefore, they try to maximize their own utility or maximize the interests of the groups or institutions that they represent.

These behaviors can hinder an efficient result in the allocation of public resources.