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Section 9
Market Failures & Behavioral Anomalies II

References:

N. Gregory Mankiw and Mark P. Taylor (2023), "*Microeconomics*", Cengage Learning, Chapter 9, 10

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.

Market Failure and behavioral anomalies: A Justification for Government Intervention

There are at least seven reasons for the **imperfect functioning of the market**:

Efficiency
- Public goods and common resources;
- Externalities;
- Imperfect competition;
- Incomplete information;

Equity
- Income and wealth inequalities;

Efficiency Equity Macro-economics
- Unemployment, inflation and disequilibrium
- Behavioral anomalies

Contents

B. Externalities

Externalities

- An **externality**: the cost or benefit of one person's decision on the well-being of a bystander (a third party) which the decision maker does not take into account when making the decision

- Externalities (negative or positive) cause markets to be inefficient, and thus fail to maximize total surplus

➢ Water pollution determined by firms and air pollution determined by cars are examples of negative externalities

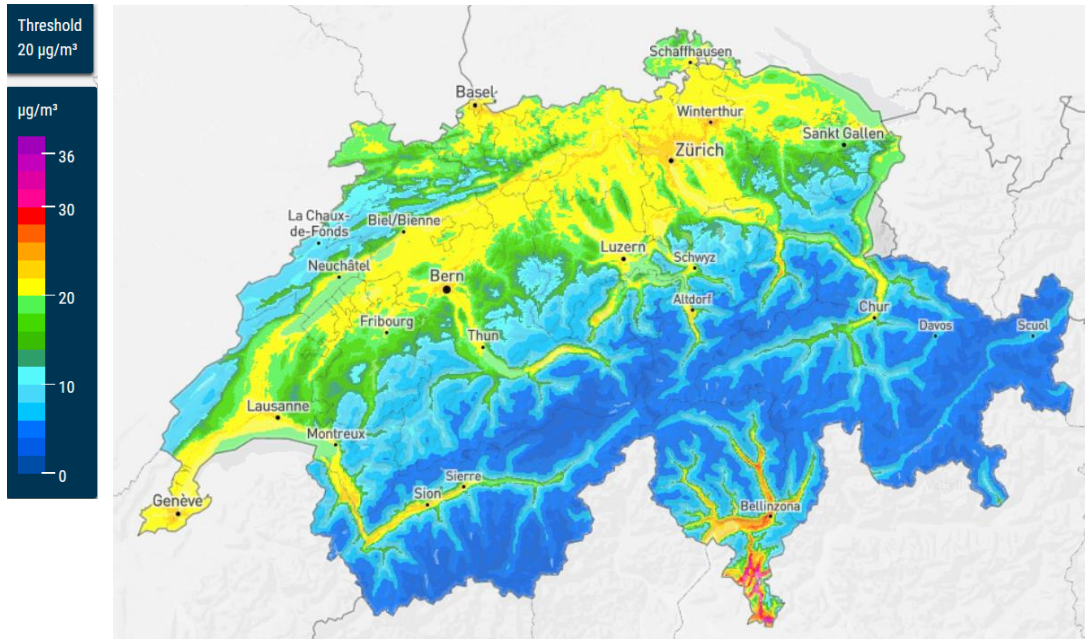
Source: http://i.telegraph.co.uk

Source: www.tz-online.de

Air Pollution

Environmental Problems: Air pollution

Annual Mean of Particulate Matter (PM10)



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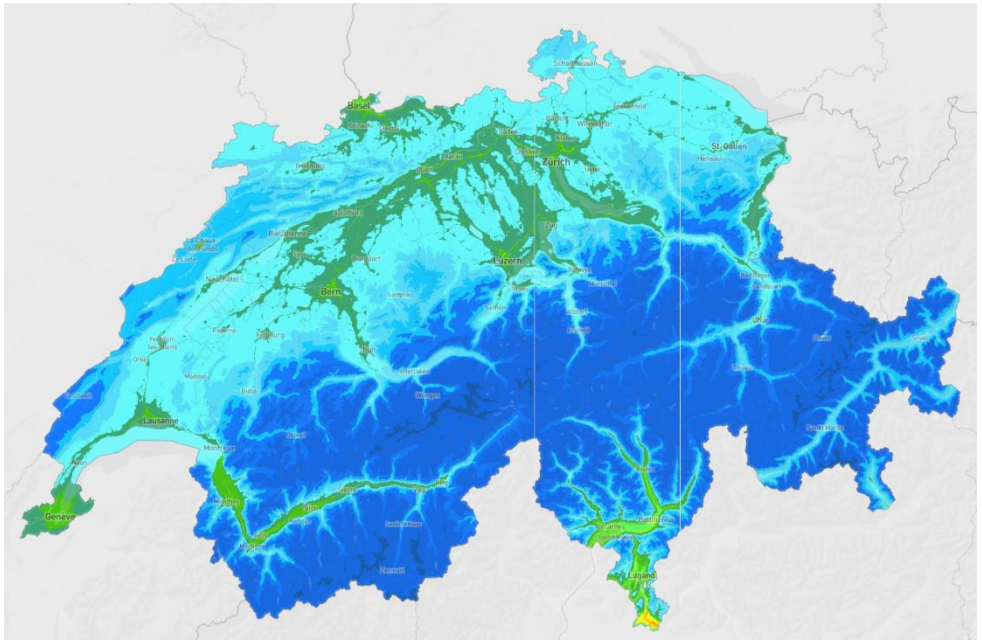

2022

Source: Federal Office of the Environment FOEN
URL: https://www.bafu.admin.ch/bafu/en/home/topics/air/state/data/historical-data/maps-of-annual-values.html

The European Journal of Health Economics (2019) 20:919–931
https://doi.org/10.1007/s10198-019-01049-y

ORIGINAL PAPER

The impact of ambient air pollution on hospital admissions

Massimo Filippini[1,2] · Giuliano Masiero[2,3] · Sandro Steinbach[1,4]

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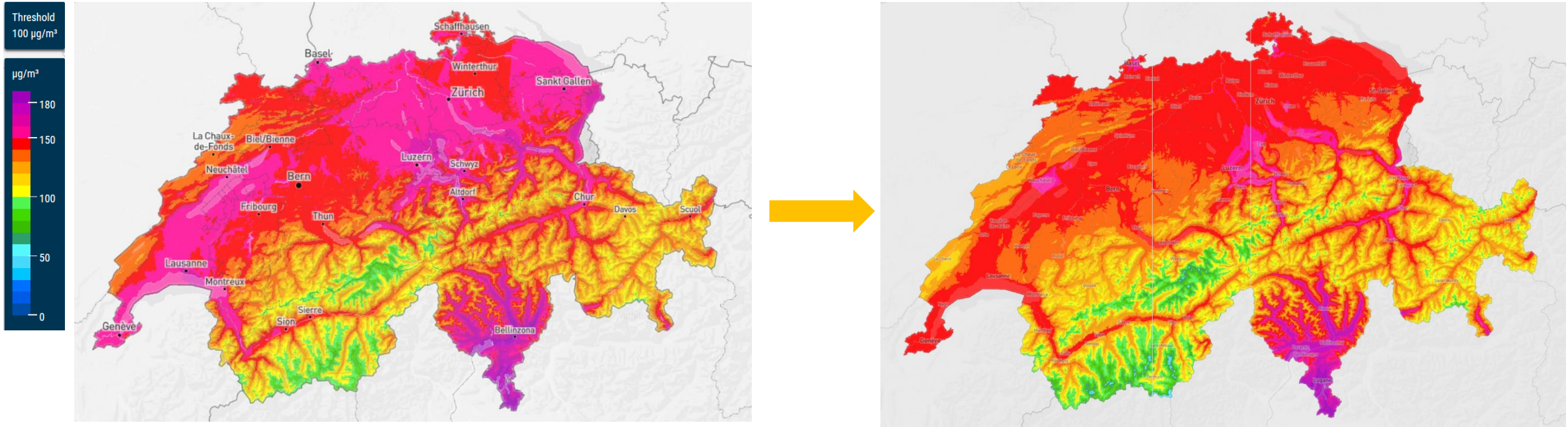
Abstract

Ambient air pollution is the environmental factor with the most significant impact on human health. Several epidemiological studies provide evidence for an association between ambient air pollution and human health. However, the recent economic literature has challenged the identification strategy used in these studies. This paper contributes to the ongoing discussion by investigating the association between ambient air pollution and morbidity using hospital admission data from Switzerland. Our identification strategy rests on the construction of geographically explicit pollution measures derived from a dispersion model that replicates atmospheric conditions and accounts for several emission sources. The reduced form estimates account for location and time fixed effects and show that ambient air pollution has a substantial impact on hospital admissions. In particular, we show that SO_2 and NO_2 are positively associated with admission rates for coronary artery and cerebrovascular diseases while we find no similar correlation for PM10 and O_3. Our robustness checks support these findings and suggest that dispersion models can help in reducing the measurement error inherent to pollution exposure measures based on station-level pollution data. Therefore, our results may contribute to a more accurate evaluation of future environmental policies aiming at a reduction of ambient air pollution exposure.

Keywords Ambient air pollution · Dispersion model · Hospital admissions · Count panel data

Environmental Problems

Annual values of Ozone (Maximal monthly 89th percentile)



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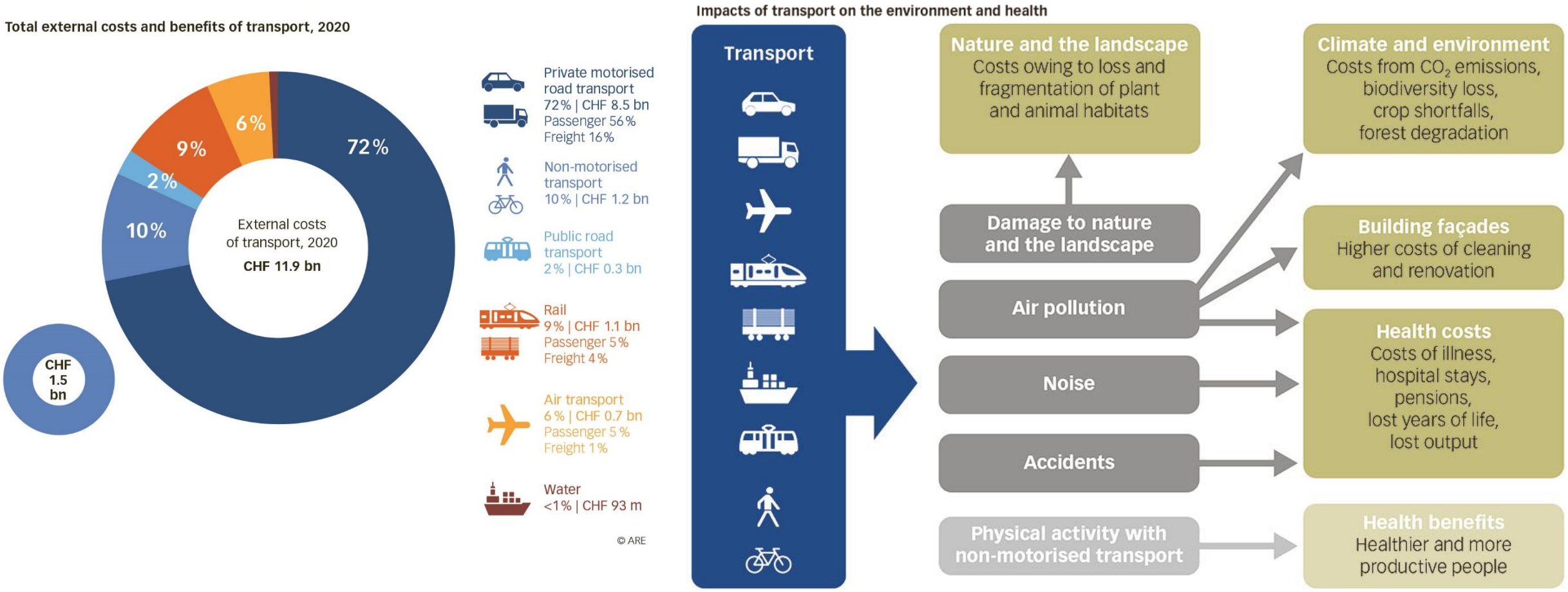
2022

Source: Federal Office of the Environment FOEN
URL: https://www.bafu.admin.ch/bafu/en/home/topics/air/state/data/historical-data/maps-of-annual-values.html

Externalities from Traffic and Transportation

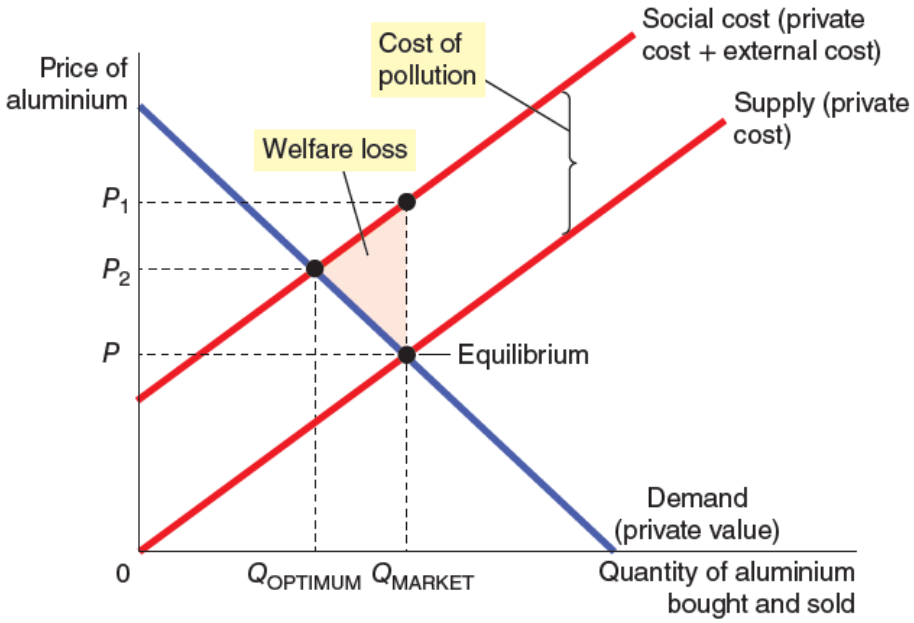


Source: https://www.are.admin.ch/are/en/home/transport-and-infrastructure/data/costs-and-benefits-of-transport.html

Negative Externality

- **Negative Externality:** the cost of a decision imposed on a third party
- Examples: exhaust gases from industry, noise of night club, air pollution

- The socially optimal output level *is less* than the market equilibrium quantity.

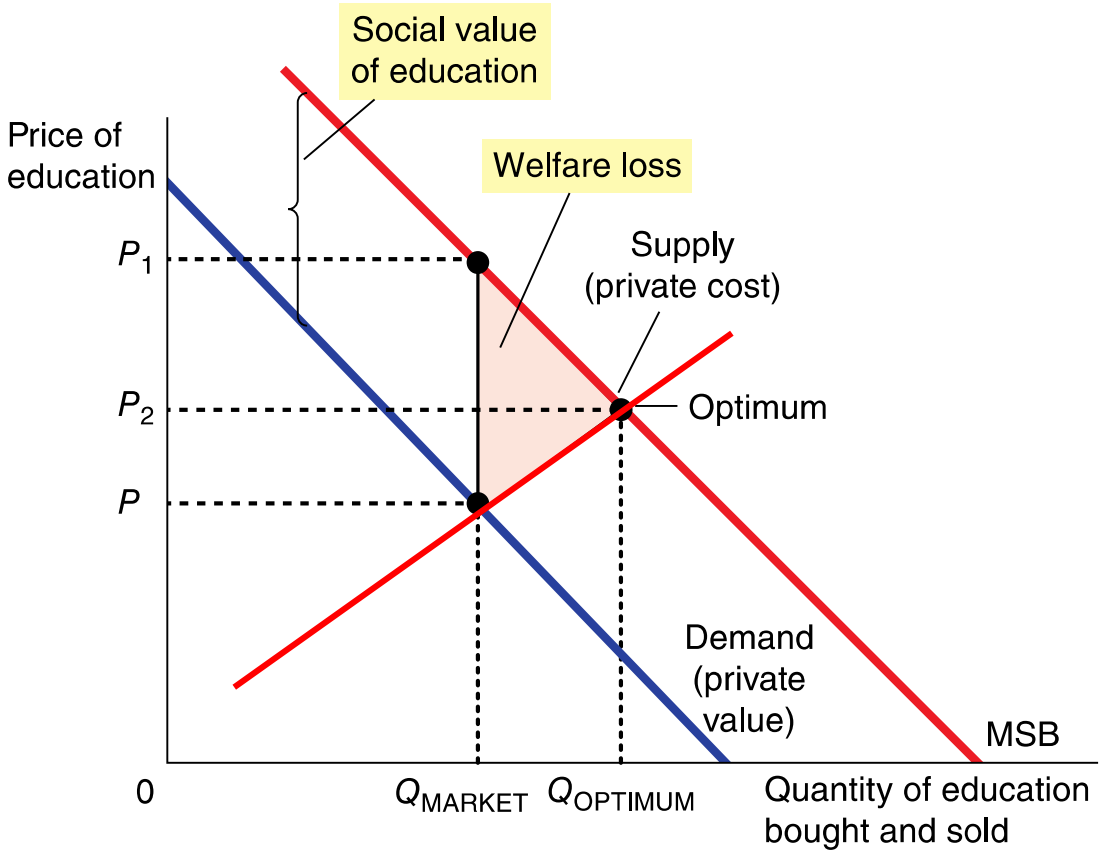


Source: Mankiw and Taylor (2023), "*Microeconomics*"

Positive Externalities

Positive Externality: a benefit is created for a third person and the person does not pay for that benefit

- Examples: restored historic buildings, research into new technologies, education
- The market produces a smaller quantity than is socially desirable.
- The social value of the good exceeds the private value of the good.



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

Positive Externalities

Flowers, nice facades,…

Basic research

Management of the landscape
And environment: farmers in the Swiss Alps

© Thimas Lohnes/AFP/Getty Images

Preventive health:

- Vaccination…

Externalities and Government Intervention

- The market fails to allocate resources efficiently when
  - ↳ consumers/producers determine negative or positive externalities

- The state intervention can potentially solve the problem.
- For instance, in the presence of negative externalities determined by the use of fossil fuels, the government can design and implement **environmental and energy policy instruments**

State intervention: environmental and energy policy instruments

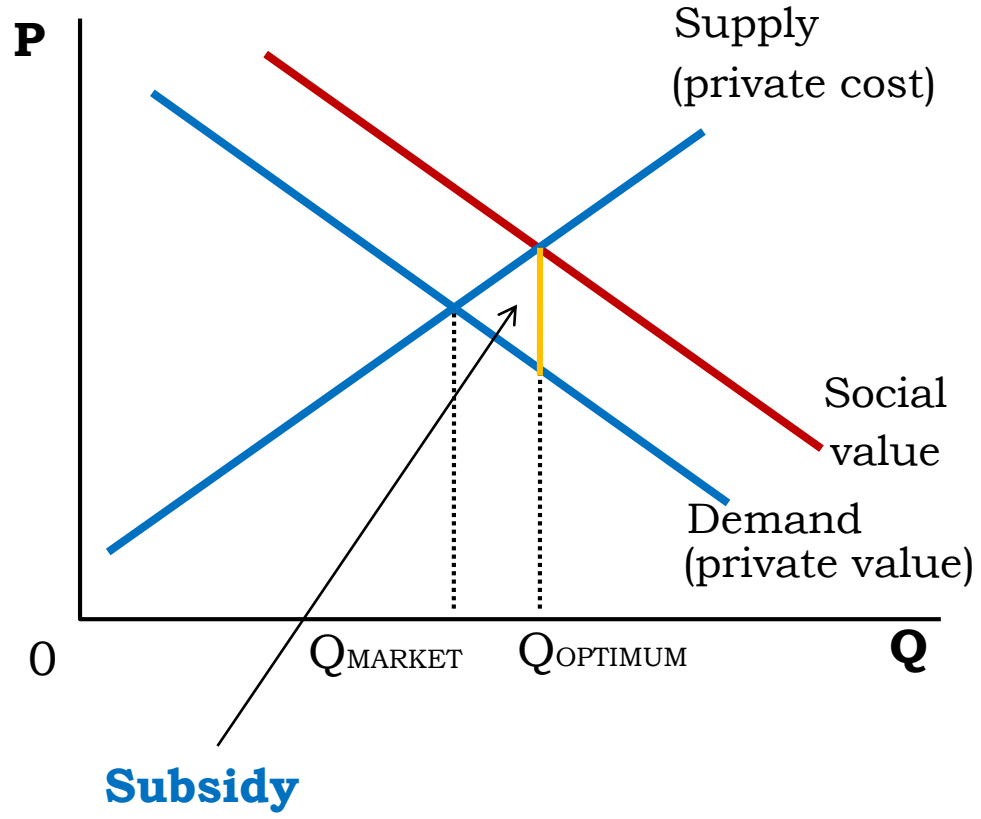
- **Traditional regulation instruments ('command & control')**
  ↳ Emission limits, technology standards

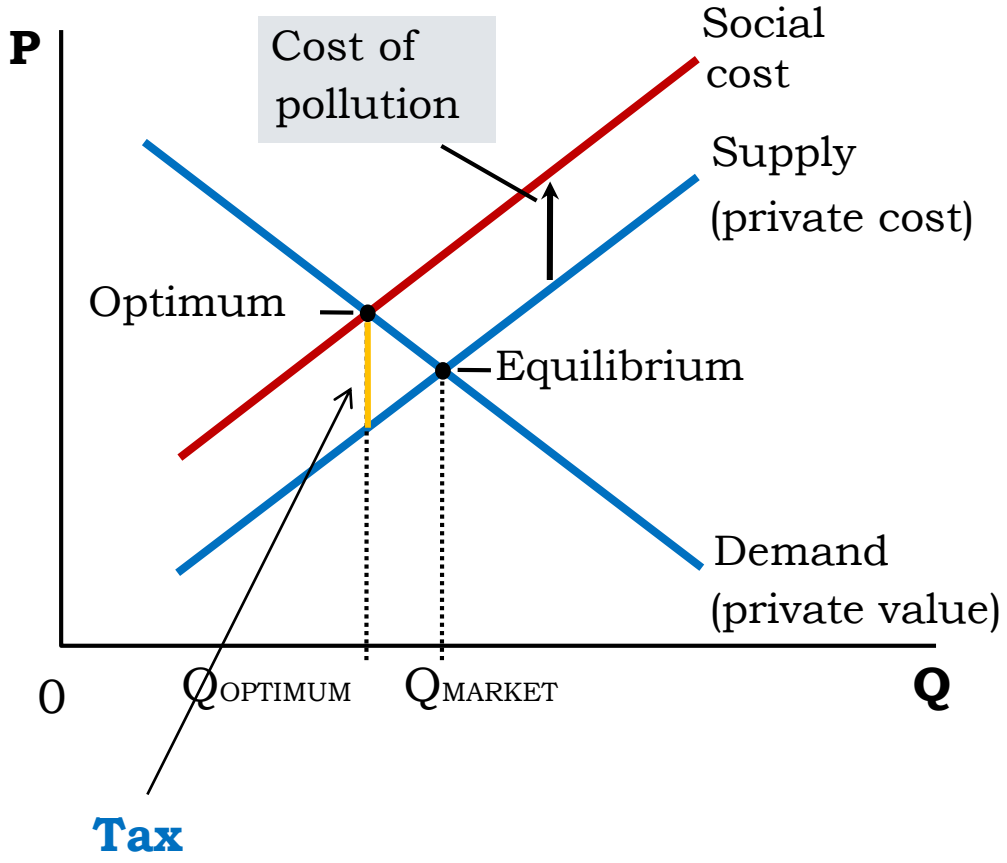
- **Economic instruments (market-based-policies)**
  ↳ Environmental taxes (e.g. pollution charges), Targeted subsidies,

Economic Instruments

- **Internalizing an externality:**
  - involves altering incentives so that people take account of the external effects of their actions.
  - Achieving the Socially Optimal Output
- **Taxes:** In case of *negative externalities* the government can impose a **Pigovian tax** on the producer to reduce the equilibrium quantity to the socially desirable quantity.
- **Subsidies:** Used as the primary method for attempting to internalize *positive externalities.*

Environmental Tax and Subsidy





C. *Imperfect Competition*

Imperfect Competition (will be discussed in more details in other lectures)

- In order to ensure that the mechanism of the invisible hand works perfectly, the economic system must have a **high level of competition**.
- In **monopolistic markets** ➔ no competition
- In **oligopolistic markets** ➔ no competition

- Whenever monopolistic or oligopolistic markets are present, the **resource allocation** provided by the market may be **inefficient**

  ↳Higher prices

  ↳Lower quantities

State intervention

- Oligopoly: establishment of a competition authority
- Monopoly: establishment of a regulatory authorithy

D. Asymmetric Information

Asymmetric Information

- There are many situations characterized by **asymmetric information** ➔ one party in a negotiation has relevant information the other party lacks (for instance on product quality)
  - ➢ seller or producer knows more about the quality of the product than the buyer
  - ➢ a seller of used cars knows more than the buyer about the car's conditions
  - ➢ the insured has more information about the insured risk than the insurance company and more control over behavior that can reduce the likelihood of the adverse event occurring

↳ ***Asymmetric information can lead to an inefficient outcome because sellers (buyers) can take advantage of buyers (sellers) ➔ adverse selection of services or products on the market***

↳ Adverse selection: ➔ risk that only products with low quality will be exchange on the market

Asymmetric Information

An example of used cars: in a market for used cars, the seller has more information regarding the vehicle's actual value, quality, and potential problems than the buyer.

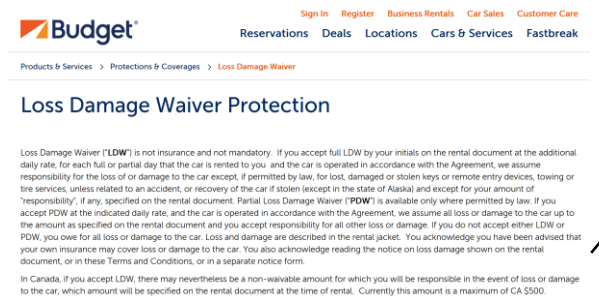
- Possibility to observe an adverse selection process on the market: a tendency on the market to sell just vehicles that have many problems and defects
- This phenomenon can lead the market to disappear.
- Oblige sellers to offer warranties or guarantees on used cars sold could reduce the problem.

Asymmetric Information and moral hazard

Example Insurance: insurance can reduce the incentive to avoid damaging events; the insurance company doesn't have all information on how the insured is behaving

- After the contract we can observe a tendency to act less carefully than it should, thus leaving the insurance company "suffering" the consequences of those actions
- **Moral hazard**: situation where an economic agent takes a risk higher than normal because the cost that could incur will be covered by a third party
- Example: if you insure your car against a theft, there is not always reasons to lock the car. In case the car gets stolen, than the insurance company will pay.

Solution: optimal contracts based on incentives


Budget

Sign In Register Business Rentals Car Sales Customer Care

Reservations Deals Locations Cars & Services Fastbreak

Products & Services > Protections & Coverages > Loss Damage Waiver

Loss Damage Waiver Protection

Loss Damage Waiver ("**LDW**") is not insurance and not mandatory. If you accept full LDW by your initials on the rental document at the additional daily rate, for each full or partial day that the car is rented to you and the car is operated in accordance with the Agreement, we assume responsibility for the loss of or damage to the car except, if permitted by law, for lost, damaged or stolen keys or remote entry devices, towing or tire services, unless related to an accident, or recovery of the car if stolen (except in the state of Alaska) and except for your amount of "responsibility", if any, specified on the rental document. Partial Loss Damage Waiver ("**PDW**") is available only where permitted by law. If you accept PDW at the indicated daily rate, and the car is operated in accordance with the Agreement, we assume all loss or damage to the car up to the amount as specified on the rental document and you accept responsibility for all other loss or damage. If you do not accept either LDW or PDW, you owe for all loss or damage to the car. Loss and damage are described in the rental jacket. You acknowledge you have been advised that your own insurance may cover loss or damage to the car. You also acknowledge reading the notice on loss damage shown on the rental document, or in these Terms and Conditions, or in a separate notice form.

In Canada, if you accept LDW, there may nevertheless be a non-waivable amount for which you will be responsible in the event of loss or damage to the car, which amount will be specified on the rental document at the time of rental. Currently this amount is a maximum of CA $500.

"…if you accept LDW, there may nevertheless be **a non-waivable amount** for which you will be responsible in the event of loss or damage to the car, which amount will be specified on the rental document at the time of rental. Currently this amount is a maximum of CA $500."

Moral hazard and too big to fail

- "Too big to fail" : situation where a firm is so deeply ingrained in the economic system that its failure would be disastrous to the society

➢ State intervention

➢ A state intervention may create a moral hazard problem;

➢ Also in this case we have an asymmetric information problem

➢ Examples: banks, large electricity companies

State intervention

- Possible solutions to correct the market failure determined by asymmetric information:

➢ introduction of regulations that impose sellers to provide information on goods and services sold

➢ Oblige sellers to offer warranties or guarantees on items sold,

➢ Information campaigns to inform consumers of products' and sellers' quality and reputation

➢ .....

E. Income and wealth inequalities

Income and wealth inequalities

Competitive markets may result in:

- Individual wealth and income inequality
- Regional wealth and income inequality

High individual and regional wealth and income inequalities may not be accepted by the society ➔ market failure

OECD.org | Data | Publications | More sites | News | Job vacancies

OECD Data | Français | Search for OECD data

OECD Data

Income inequality

Related topics
Society

Gini coefficient:
A measure of the degree of income inequality in a country:
0 = income equality is perfect
1 = all income in the hands of just one household

Indicators

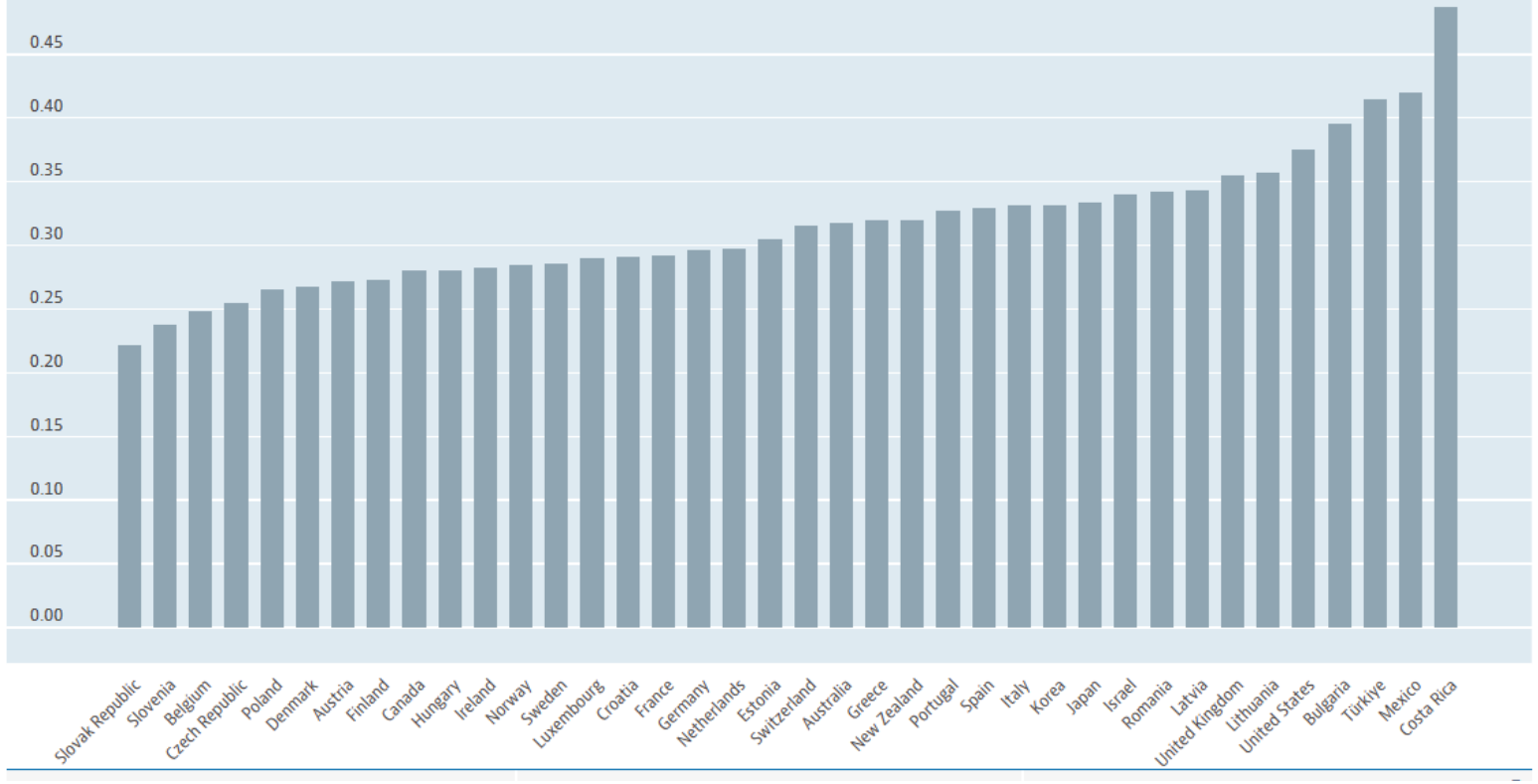
- Income inequality
- Poverty rate
- Poverty gap
- Discrimination in the family
- Violence against women
- Women in politics
- Social Institutions and Gender
- Housing overcrowding

Income inequality

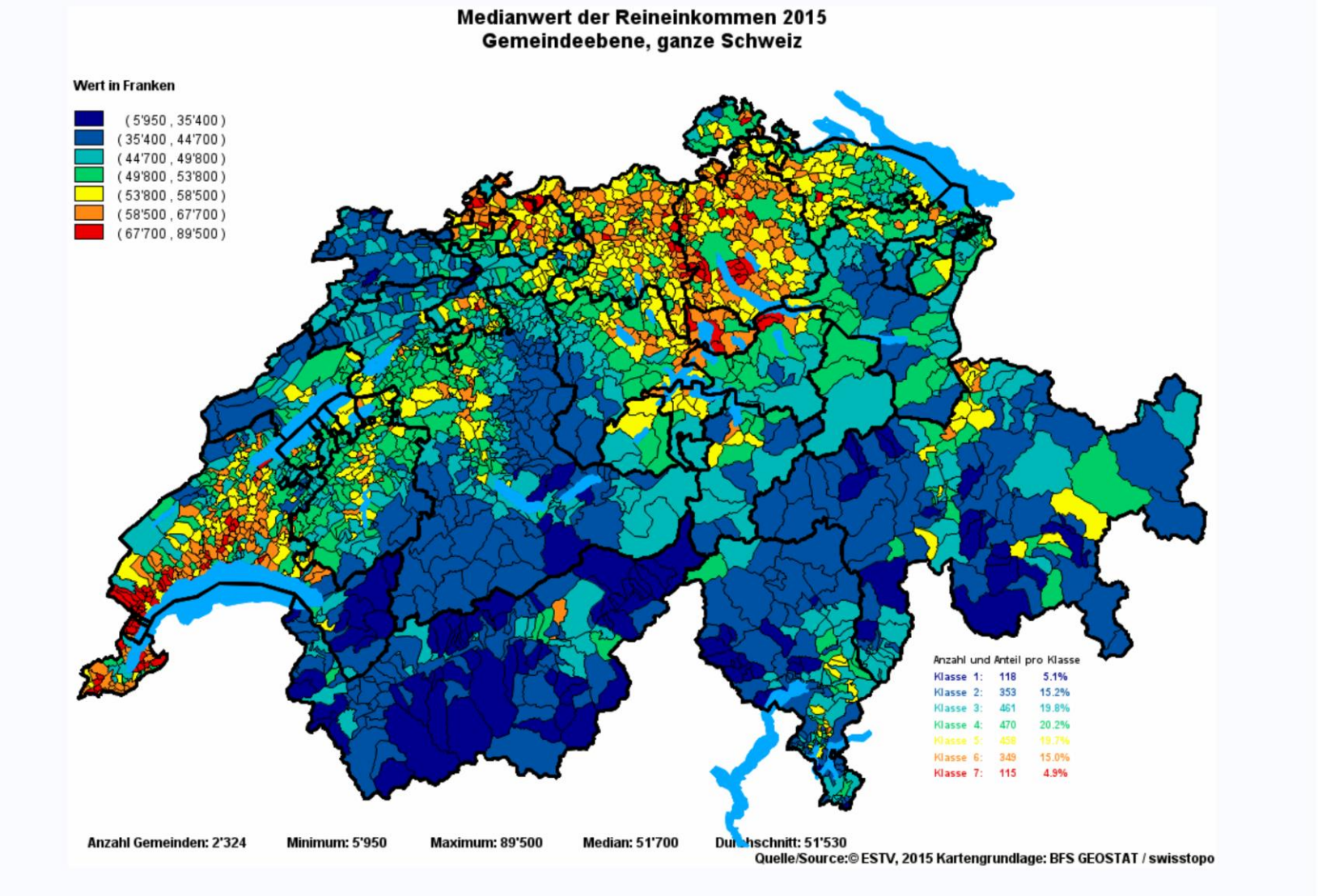
Gini coefficient, 0 = complete equality; 1 = complete inequality, 2021 or latest available

Source: Income distribution

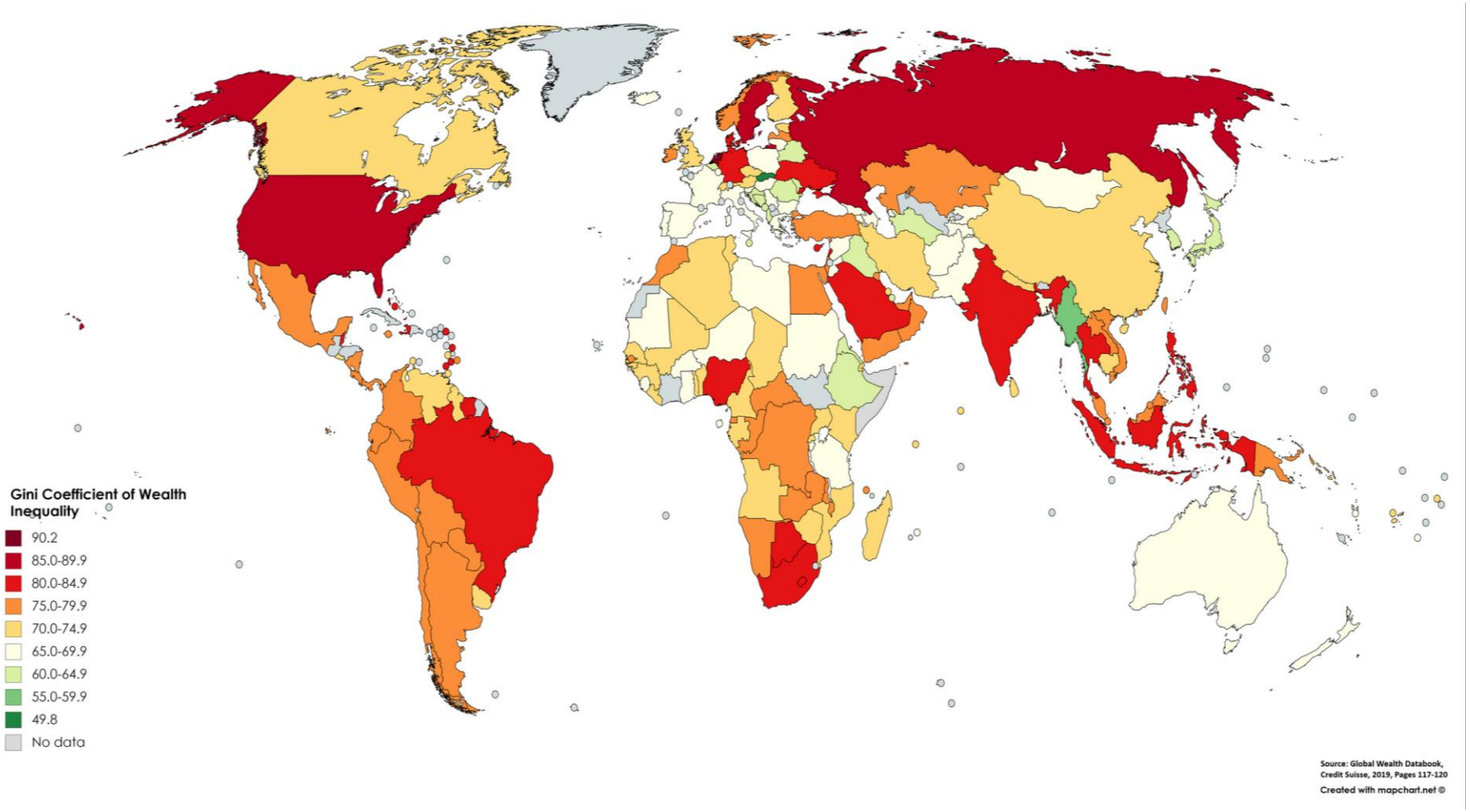
Show: Chart | Table | fullscreen | share | download | My pinboard



https://data.oecd.org/inequality/income-inequality.htm



http://www.estv2.admin.ch/d/dokumentation/zahlen_fakten/karten/dbst/2015/imposable/mediane/suisse/median.html



https://en.wikipedia.org/wiki/List_of_countries_by_wealth_equality#/media/File:Gini_Coefficient_of_Wealth_Inequality_source.png

State intervention: social policy instruments

- **Social policy instruments: taxation system, subsidies, merit goods,..**
- Normally the redistribution of income and wealth is not supported by arguments of economic efficiency but by major **social values, equity values**.
- The decisions related to the redistribution of income are normative and accordingly, they need a political decision.

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] Mariés et familles monoparentales[3] Coniugati e famiglie monoparentali[3]			Alleinstehende Contribuables vivant seuls Contribuenti che vivono soli		Verheiratete und Einelternfamilien[3] Mariés 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		1 518.00	
22 000	55.44				95 000	2 472.15	6.60	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		140 000	6 262.75		4 684.00	10.00
41 000	211.39		122.00	1.00	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	
43 000	243.07		142.00		145 900	6 911.75	11.00	5 296.00	
44 000	269.47		152.00		146 500	6 977.75		5 368.00	12.00
45 000	295.87		162.00		147 700	7 109.75		5 512.00	
46 000	322.27		172.00		147 800	7 120.75		5 525.00	
47 000	348.67		182.00		150 000	7 362.75		5 811.00	
48 000	375.07		192.00		160 000	8 462.75		7 111.00	
49 000	401.47	2.64	202.00		170 000	9 562.75		8 411.00	
50 000	427.87		212.00		179 400	10 596.75		9 633.00	
51 800	475.39		230.00		179 500	10 609.95		9 646.00	
51 900	478.03		232.00		180 000	10 675.95		9 711.00	
53 000	507.07		254.00		190 000	11 995.95		11 011.00	
54 000	533.47		274.00		200 000	13 315.95		12 311.00	
55 000	559.87		294.00		250 000	19 915.95		18 811.00	
56 000	586.27		314.00	2.00	300 000	26 515.95	13.20	25 311.00	13.00
56 200	591.55		318.00		350 000	33 115.95		31 811.00	

Example income taxation: Progressive Marginal Tax Rate

Example subsidy:

Households receive a subsidy in order to pay health insurance premiums

Merkblatt:
Höhe der jährlichen Prämienverbilligung 2020
(Beträge in CHF)

SVA Zürich

Individuelle Prämienverbilligung

Sozialversicherungsanstalt
des Kantons Zürich
Röntgenstrasse 17, Postfach, 8087 Zürich
Tel 044 448 53 75, Fax 044 448 55 55
www.svazurich.ch/ipv info-ipv@svazurich.ch

1 Verheiratete bzw. eingetragene Partner

- **Erwachsene (Jahrgang 1994 und älter)**

Steuerbares Gesamtvermögen bis CHF 300'000

Steuerbares Gesamteinkommen	Quellensteuer bis	Region 1	2	3
0 – 24'000	598	2'436	2'184	2'040
24'100 – 30'700	1'132	1'752	1'524	1'416
30'800 – 37'600	1'821	1'272	1'092	1'020
37'700 – 41'600	2'295	876	780	732
41'700 – 49'200	3'236	480	432	396
49'300 – 50'700*	3'447	0	0	0
50'800 – 62'900*	5'359	0	0	0

* Prämienverbilligung nur für die minderjährigen Kinder

3 Alleinerziehende

- **Erwachsene (Jahrgang 1994 und älter)**

Steuerbares Gesamtvermögen bis CHF 300'000

Steuerbares Gesamteinkommen	Quellensteuer bis	Region 1	2	3
0 – 24'000	598	1'896	1'704	1'584
24'100 – 30'700	1'132	1'200	1'080	996
30'800 – 37'600	1'821	900	780	720
37'700 – 41'600	2'295	564	504	456
41'700 – 49'200*	3'236	0	0	0
49'300 – 50'700*	3'447	0	0	0
50'800 – 62'900*	5'359	0	0	0

* Prämienverbilligung nur für die minderjährigen Kinder

Merit Goods

- **Merit goods:** goods and services which can be provided by the market but in this case may be under-consumed as a result of imperfect information about the private as well as the social benefits at the time of consumption.
- Examples: education, health care, postal services,..
- **Merit goods** are offered by or with the support of the public sector because their **consumption is assumed to be desirable by society**
- In this case, the choice of public intervention is affected by **equity** and **efficiency reasons**.

Public Services are considered merit goods: a definition that can change over time

- Technological progress
- Change of citizen-consumers' preferences
- Change in the values of a society (e.g. importance given to equity and efficiency, to redistributive policies, to solidarity between urban and rural and peripheral regions)

With the development of mobile phone, telephone boxes are no longer considered a Public service

Source: http://www.lifegate.it/app/uploads/Drone-Australia_001.jpg

Source: https://www.mobilservice.ch/fr/accueil/actualite/dossiers-dactualite/mobilite-4-0-digitalisation-et-automatisation-du-transport-1578.html

E. Behavioral anomalies (recap)

Unrealistic traits	*Behavioral anomalies on the consumer side*
Bounded rationality	➢ ***Limited information-processing skills/abilities* in evaluating complex tasks** *(*Consumers do not always make calculations, base *an* economic decision on the result of an *optimization* problem, perform an investment calculation,…) ➢ **Loss aversion** ➢ Status-quo bias *(*Preference for familiarity. Tendency to resist change and prefer the current state of affairs/situations) ➢ Endowment effect (people give more value to things because they own them); ➢ **Framing** (How a choice is presented strongly affects the choice that is made; (80% fat-free feels better than 20% fat) ➢ **Limited use of information** ➢ Limited attention ➢ Limited salience ➢ Wrong priors/beliefs about which information is relevant ***Anchoring*** (Recently received information appears to be relevant when making a decision – even when it is not) ***Mental accounting*** (People tend to separate their money into different accounts based on subjective criteria) ***Sunk Cost*** *(*continue to do something just because we've already spent resources in it—even if the best action would be to give up on it)
Bounded willpower	***Hyperbolic discounting/present bias*** (rewards in the near future are valued higher than more distant rewards because of varying discount rate), ***Limited self-control / cognitive dissonance*** *(choices that are not in their long-run interest : eat, drink and spend too much, exercise & save too little, having a slice of cake, even though you know you need to lose weight (* temptation goods; attitude-behavior gap)
Bounded selfishness	***Fairness, People seek equity in economic outcomes***

Source: Jolls, Sunstein & Thaler (1998)