



Section 1

Introduction to Economics

Reference:

N. Gregory Mankiw and Mark P. Taylor (2023), “*Microeconomics*”, Cengage Learning, Chapters 1, 2

Goodwin et al. (2019), “*Microeconomics in Context*”, Routledge, Chapter 1

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.

Contents

- A. Introduction
- B. Basic Concepts and Principles of Economics
- C. Disciplines in Economics and the Economist as Policy Advisor
- D. Methods and Models in Economics

A. Introduction

Introduction

- Every day firms, households and individuals take decisions related to economics: buying goods and services, producing goods, performing investments,...
- Decision to do a master at ETH or to take this course, or...
- Decisions that should maximize the **well-being of individuals and society**
- Decisions that are taken under some **constraints due to limited resources**

Introduction

Economics Economics is the study of how societies use scarce resources to produce and consume goods and services and distribute them among people to maximize the well-being of current and future societies.

- The study of the use of society's resources is important because resources are scarce.
- **Scarcity** means that society has limited resources and therefore cannot produce all the goods and services people wish to have.
- **Economics is a social science:** emphasis on the role of society and on the study of human behavior

Introduction

- **Resources**

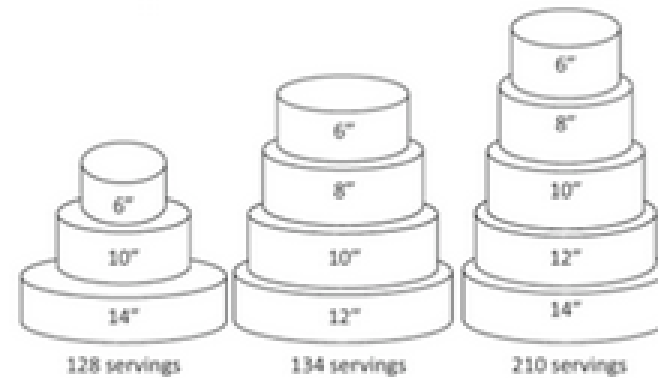
- **Land** (natural resources, e.g. iron ore or oil)
- **Labor** (human efforts, e.g. hours of worker in factory)
- **Capital** (production equipment and structures, e.g. machinery; money)



Introduction

↳ **Scarcity** of the resources implies that we need to be efficient in the use of the resources

↳ **Efficiency**: society gets the most that it can from its scarce resources. (“the size of the cake”)



↳ **Equity**: the property of distributing economic prosperity (economic well-being) fairly among the members of society. (“how the cake is divided”)

Basic Economic Issues

Every society has to resolve basic economic problems:

1. **Which goods to produce and in what quantities?**
2. **How to produce the goods, which resources and what kind of production technology should be used?**
3. **For whom are the produced goods? Who will benefit from the economic efforts: the workers, the shareholders or the landlords?**
4. **How to produce and consume goods in a sustainable way?**

Keeping in mind that:

Society's objective is to maximize the well-being of current and future generations considering that natural resources on planet Earth are limited.

The Planetary Boundaries and what they mean for the Future of Humanity, Swiss Federal Office for the Environment

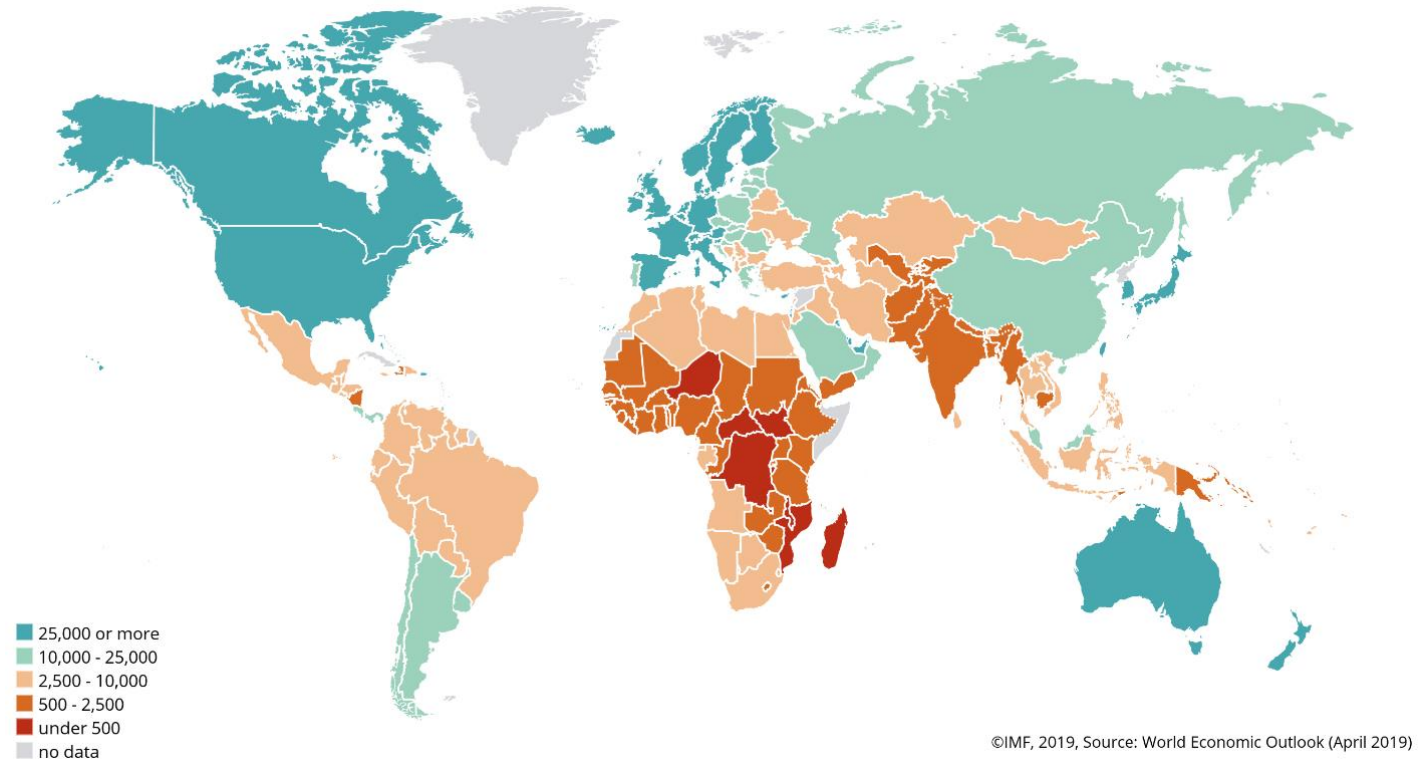


<https://www.youtube.com/watch?v=SieN0IrZ5wg>

GDP as an indicator of well-being...

GDP – Gross Domestic Product

- It is the measure of the market value of all final goods and services produced in a country during a given year. It measures the overall performance of an economy.
- It is part of the national income and product accounts.



Nominal GDP per capita [USD], 2018

Source: International Monetary Fund, World Economic Outlook Database April 2019

The world's wealth is measured the wrong way

Opportunities, solidarity, material gain or a sustainable environment: How can we better measure the condition of societies in different countries?

[Auf Deutsch lesen](#)

Until now, gross domestic product (GDP) has been the main measure for comparing the well-being of countries. Many consider this to be inadequate. The volume of goods a country produces does not reflect how its citizens really feel, critics say. "What we measure determines what we do," says Joseph Stiglitz, winner of the Nobel Prize for Economics in 2018, who belongs to a group of experts at the Organisation for Economic Cooperation and Development (OECD) developing alternative methods for measuring the well-being of countries. GDP, many researchers now believe, holds far too much political sway.

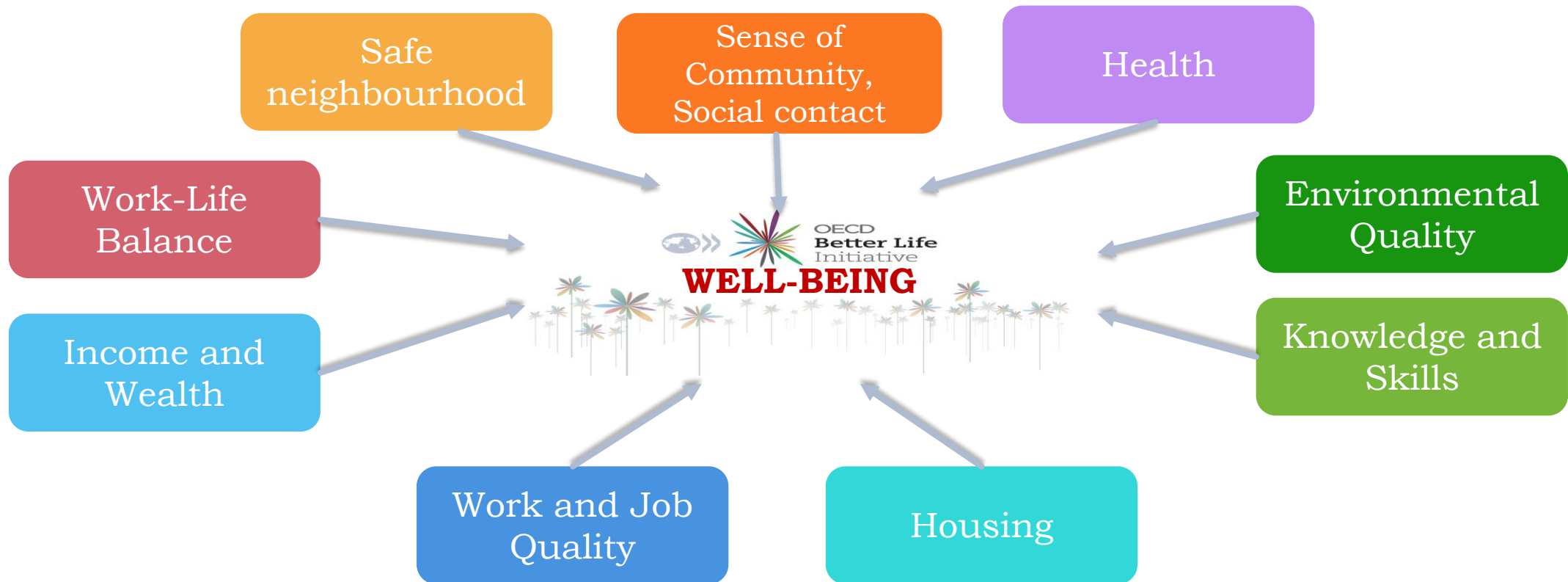
GDP measures the level of production of a country. This level might be correlated with quality of life, however, there are many aspects of well-being that are not captured by GDP:

1. Quality of Nature and environment
2. Education
3. Health
4. Crime and safety
5. Income and wealth distribution

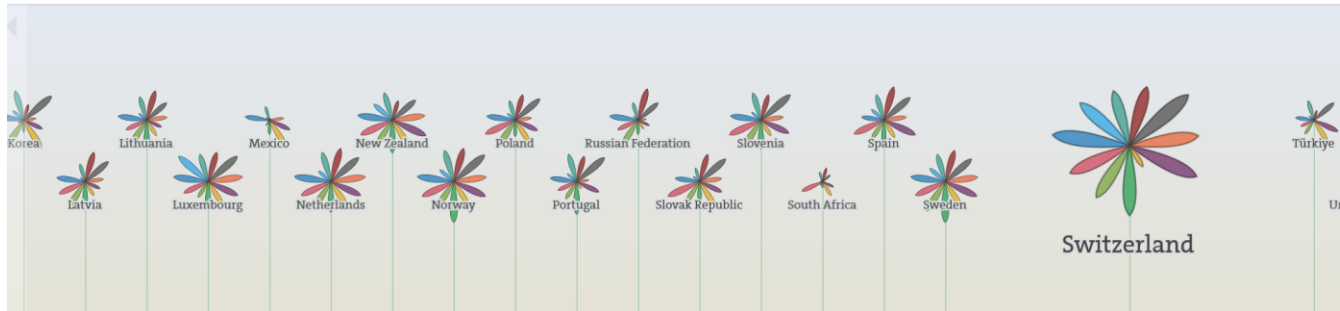
<https://interaktiv.tagesspiegel.de/lab/the-worlds-wealth-is-measured-the-wrong-way/>

Factors that Influence Well-Being

being in good health, feel happy and satisfied with the life, have good material living conditions, live in a sustainable socio-economic as well as natural system



Organization for Economic Co-operation and Development (OECD) <http://www.oecd.org/newsroom/oecdlaunchesnewreportonmeasuringwell-being.htm>



Switzerland

→ Learn even more about Switzerland at [oecd.org](https://www.oecdbetterlifeindex.org/countries/switzerland/)

How's Life?

Switzerland performs well in many dimensions of well-being relative to other countries in the Better Life Index. Switzerland outperforms the average in income, jobs, education, health, environmental quality, social connections, safety and life satisfaction. These assessments are based on available selected data.

Money, while it cannot buy happiness, is an important means to achieving higher living standards. In Switzerland, **the average household net-adjusted disposable income per capita is USD 39 697 a year**, more than the OECD average of USD 30 490 a year.

In terms of employment, **about 80% of people aged 15 to 64 in Switzerland have a paid job**, above the OECD employment average of 66%. Some 84% of men are in paid work, compared with 76% of women. **In Switzerland, nearly 0% of employees work very long hours in paid work**, below the OECD average of 10%.

Topics

Housing

6.9



Income

8.2



Jobs

9.4



Community

8.2



The Human Development Index (UN)

Index with three dimensions:

- Life expectancy index
- Education index
- Income index.

subjective and objective indicators that captures 11 dimensions of well-being: housing, income, jobs, community, education, environment, civic engagement, health, life satisfaction, safety and work-life balance

Answers to the Basic Economic Questions in: Market Economy, Planned Economy and Mixed Economy

- In a **market economy** the main decisions about production and consumption are made by firms and households: price system, markets and incentives determine what, how and for whom to produce.
- In a **planned economy**, however, the state makes the decisions about the production and the distribution of goods. Moreover, the state owns the majority of the means of production and determines the allocation of existing resources for the production of goods and services.
- Today no society can be completely assigned to one of both categories. Rather there are **mixed economies** → answers given by firms, households and the state.
- **Role of the state in Switzerland** : <https://data.oecd.org/gga/general-government-spending.htm>

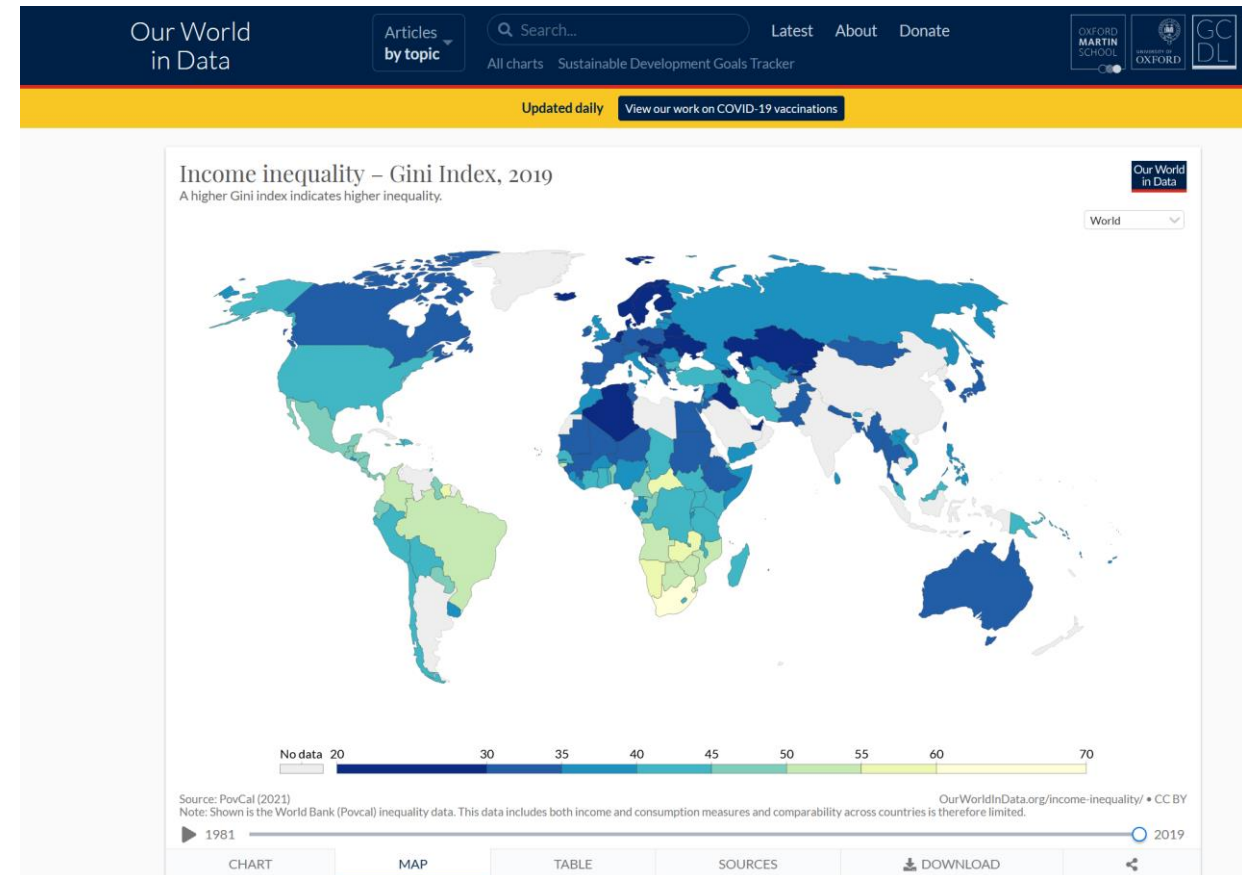
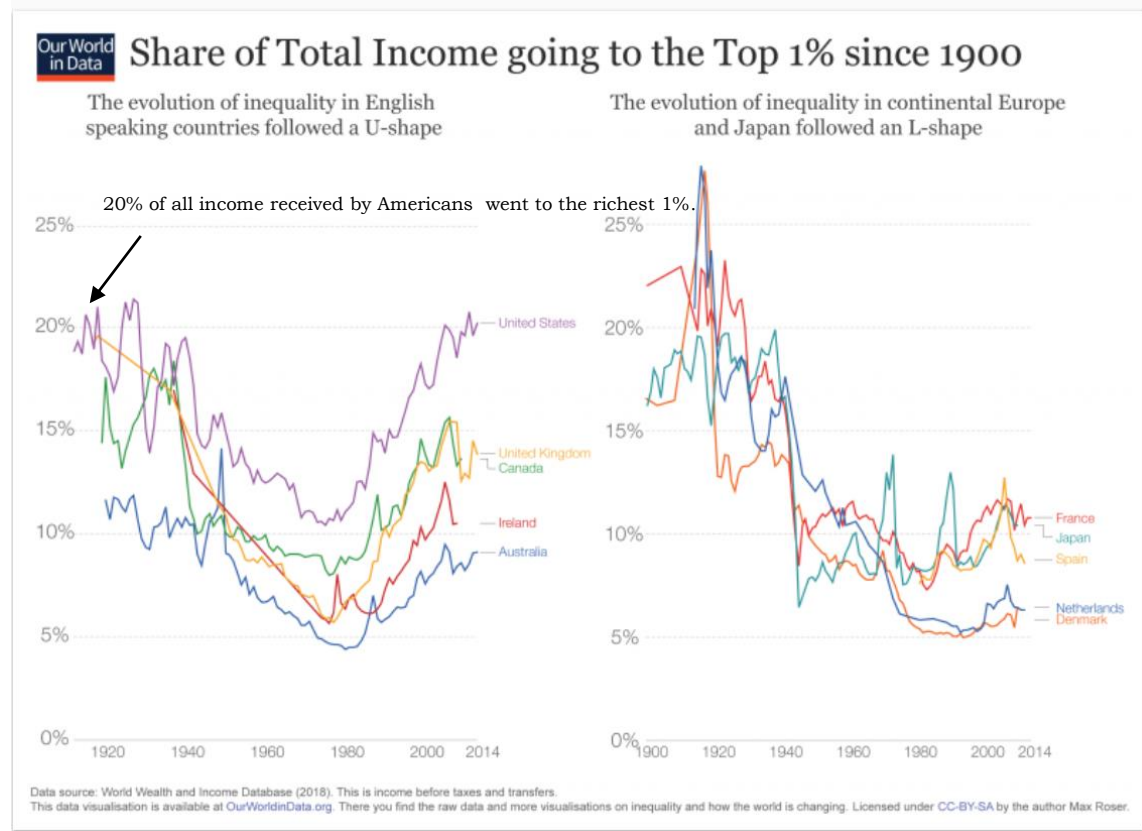
“which product, which quantity?”



How to produce? Choice of the technology... bakery oven...old...new



For whom....? Depends on Income and wealth distribution



<https://ourworldindata.org/grapher/economic-inequality-gini-index>

B. Principles of Economics

A. How People Make Decisions

1. People Face Trade-Offs

- Making decisions requires trading off one goal against another.
- Trade-offs:
 - Go out for dinner vs. go to the cinema
 - Leisure time vs. work
 - Leisure time vs. microeconomics class
 - Efficiency vs. equity

A. How People Make Decisions

2. Opportunity Cost

- Decisions require comparing costs and benefits of alternatives.
- The opportunity cost of an item is what you give up to obtain that item; the value of the benefits foregone.
- Example: Opportunity cost of doing a Masters degree: The money a student would earn during that time in an employment status plus the cost of the Masters degree.

Question 1

Suppose you find €20. If you choose to use the 20€ to go to a football match, your opportunity cost of going to the game is

- A. nothing, because you found the money
- A. €20 (because you could have used the €20 to buy other things)
- A. €20 (because you could have used the €20 to buy other things) plus the value of your time spent at the game

Solution

Suppose you find €20. If you choose to use the 20€ to go to a football match, your opportunity cost of going to the game is

- A. nothing, because you found the money
- A. €20 (because you could have used the €20 to buy other things)
- A. €20 (because you could have used the €20 to buy other things) plus the value of your time spent at the game**

A. How People Make Decisions

3. Rational People Think at the Margin

- **Marginal changes** are small, incremental adjustments to an existing plan of action.
- People make decisions by comparing costs and benefits at the margin.
- The decision to choose one alternative over another → *marginal benefits exceed its marginal costs!*
- **Neoclassical microeconomics (mainstream economics)** assumes that humans are rational and maximize their individual self-interest
- Humans are always rational? Behavioral economics questions this assumption

A. How People Make Decisions

Behavioral Economics

- ↳ In comparison to **neoclassical microeconomics**, **behavioral economics** considers psychological aspects in trying to explain people's behavior on the marketplace.
- ↳ **Behavioral economics** doesn't assume that humans are always rational and maximize only their individual self-interest.

A. How People Make Decisions

Behavioral Economics

- **Concept of bounded rationality**

- Individuals do not always have **all the information** to make a rational decision (Simon 1978) or do not always have **all the tools and abilities** to do an economic calculation.

↳ Satisficing behavior: after defining a satisfactory result level, choose an option that meets this level (not all options are evaluated).

↳ Improving behavior: every time a decision is made, individuals try to improve the result compared to the choice made previously.

A. How People Make Decisions

4. Individuals Respond to Incentives

- Extrinsic motivation → for reasons external to the person → reward, monetary benefit, status or power or to avoid punishment, sanctions.
- As individuals make decisions based on cost and benefit, their behavior changes if those criteria change
 - ↳ monetary incentives are important
 - ↳ example *rubbish bag tax to promote recycling*



A. How People Make Decisions

Behavioral Economics

- Psychologists Kahneman (Nobel Prize for Economics 2002) and Simon (Nobel Prize for Economics in 1978) have proposed a more complex view on the motivations and processes that lead individuals to take certain decisions → not only costs and benefits.
- ↳ **Intrinsic motivation** → for reasons internal to the person, because she enjoys an activity, because it corresponds to her ethical values, strengthens the identity.
- ↳ **Altruism**: the aim is to promote the welfare of other individuals, the common good because it pleases the agent and corresponds to his ethical values. But also because it is recognized that personal well-being is strongly linked to the general well-being of the society.

B. How People Interact

5. Trade Can Make Everyone Better Off

- People gain from their ability to trade with one another.
- Competition results in gains from trading.
- Trade allows people to specialize in what they do best.

B. How People Interact

The General Characteristics of Trade:

- If people own **different resources/goods** and/or have **different desires**, trade will be possible and beneficial to every participant.
- If one participant was worse off by agreeing to the trade, that participant would prefer not to make the deal.
- Interdependence and voluntary trade are desirable because they allow everyone to enjoy a greater quantity and variety of goods and services.
- Trade activities:
 - ↳ increase generally the well-being
 - ↳ can create equity and environmental problems

Example specialisation

Your flatmate is a better cook than you are, but you can clean more quickly than your flatmate can. If your flatmate did all of the cooking and you did all of the cleaning, would your household tasks take you more or less time than if you divided each task evenly?

By specializing in each task, you and your flatmate can finish the activities more quickly. If you divided each task equally, it would take more time to cook and to clean. By specializing, you reduce the total time spent on household tasks.

B. How People Interact

6. Markets (social organization which aims to facilitate exchange activities) are usually an effective tool for organizing economic activity

- **Market Economy:** an economic system in which resources are allocated through the decentralized decisions of a variety of firms and individuals who interact in the markets for goods and services.
- Adam Smith (1723 bis 1790) demonstrated that in a **market economy** characterized by **competitive markets**, the interaction of individuals and businesses leads to maximizing the well-being of society (the **invisible hand**).
 - ↳ **Competitive markets should satisfy some basic assumptions to maximize the well-being of society**
 - ↳ **State intervention (visible hand) is not necessary.**

B. How People Interact

7. Governments Can Improve Market Outcomes

- **Market failure** occurs when the market fails to allocate resources efficiently.
 - ↳ When the market fails (breaks down), the government can intervene to promote efficiency and equity.
- Market failure may be caused by:
 - ↳ The **absence of a true price**, i.e., a market price that also includes the social and environmental costs of product
 - ↳ **market power**, is the ability of a single person or firm to unduly influence market prices.
(Further market failures will be discussed in Lecture 9).
- Different views among economists on the role of the State in the economy

C. How the Economy as a Whole Works

8. An Economy's Standard of Living Depends on its Ability to Produce Goods and Services.

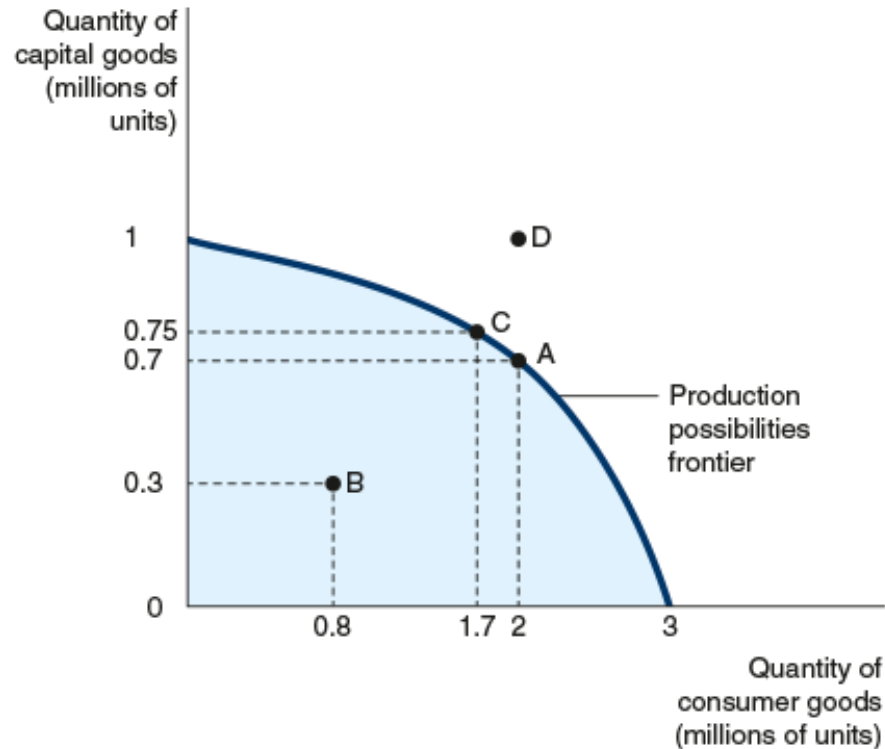
- Standard of living (material well-being) may be measured in different ways by comparing personal incomes or by comparing the total market value of a nation's production.
- Almost all variations in living standards are explained by differences in countries' productivity (ratio between output and input) and resources. → Productivity depends on **technological change**

The Technological change and the Production Possibility Frontier

Every society has to make decisions about both the usage of the means of production (inputs) and about the goods (output) produced by the economic system.

- ↳ **Inputs** (which can be divided into the four main categories: labor, capital, energy and materials) include everything that the firm uses in the production process (disposable technologies).
- ↳ **Outputs** are the various goods and services which result from the production process.

The Production Possibility Frontier (PPF)



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

The **production possibilities frontier (PPF)** is a graph that shows the combinations of output that the economy can possibly produce given the available factors of production (resources) and the available production technology.

In a two-goods economy: The amount of good **X** you have to forego in order to get a certain amount of good **Y** represents the **opportunity cost** of good **Y**.

Production Possibilities Frontier (PPF) and the Roles of R&D Activities, Universities, ETH etc.

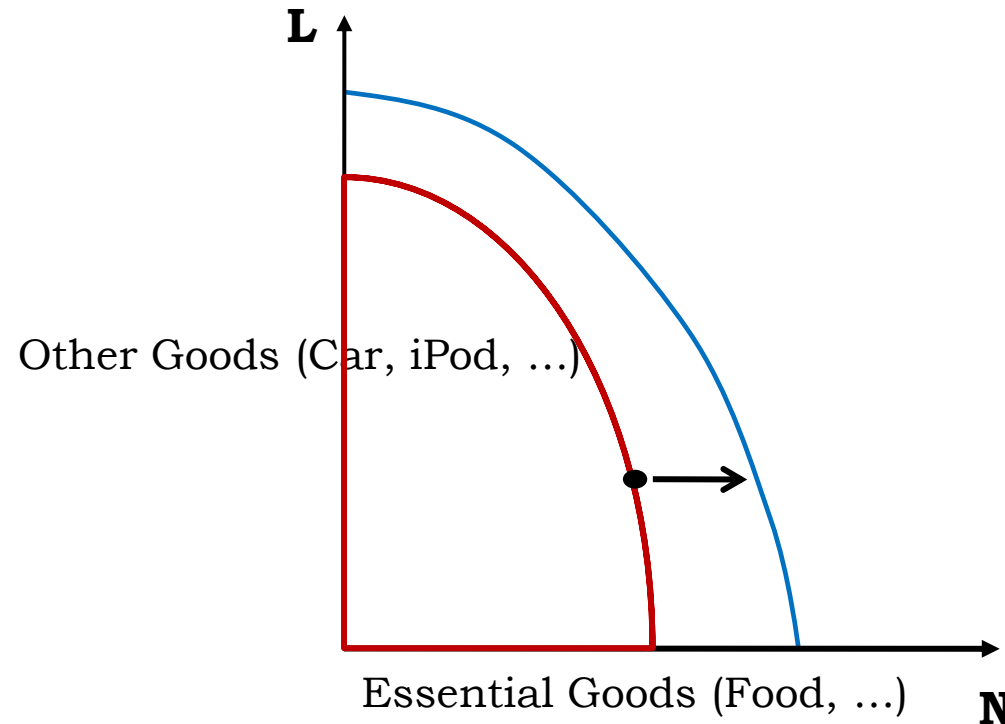


Figure: Displacement of the PPF because of technological progress

D. Sustainable Development

9. An economic system should promote a sustainable development



«development that meets the needs of the present without compromising the ability of future generations to meet their own needs»

(Brundtland report (1987), UN commission on Environment and Development)

- General definition
- Nature is important for economic development
- Growth in demographic, social and economic terms at a speed compatible with the ecosystem.

Generate a long-lasting growth of income and work

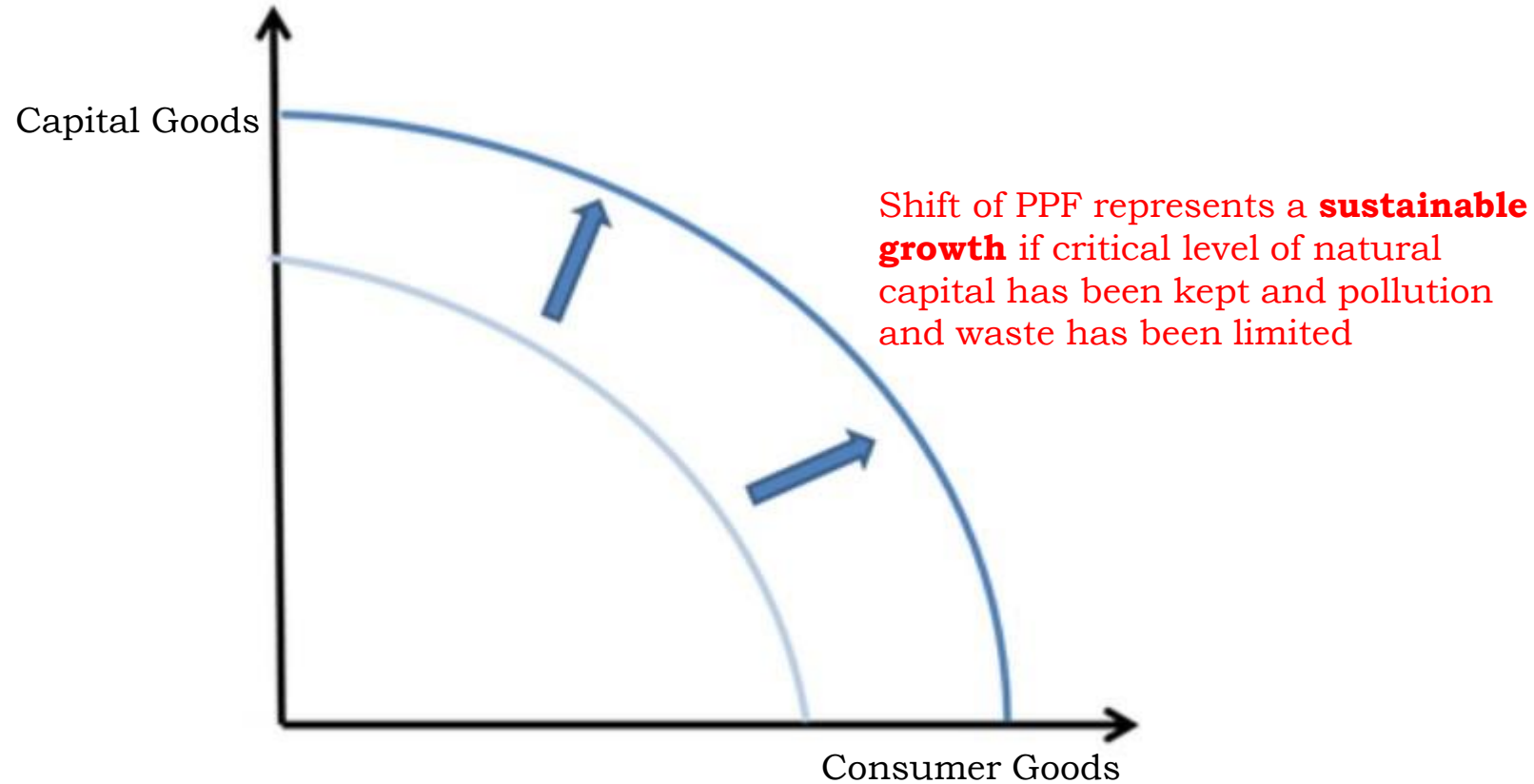


Preserve the functions of ecosystems over time

Guarantee wealth conditions equally distributed.

(UN World Summit on Sustainable Development in Johannesburg (2002))

The Production Possibility Frontier (PPF) and sustainable development



From throwaway society to circular economy

What is a circular economy?

The circular economy differs from the linear production processes that are still widespread today. In a linear economic system, raw materials are extracted, and products are manufactured and sold, consumed and disposed of (see following diagram). This leads to shortages of raw materials, emissions, large volumes of waste and the associated environmental problems.



Figure 1: Diagram of a linear economic system

© FOEN

In a circular economy, products and materials are kept in circulation (green arrows in the following diagram). As a result, fewer primary raw materials are used than in the linear system. Moreover, products retain their value for longer and less waste is generated.

The circular economy is an integrated approach which considers the cycle as a whole, from raw material extraction through design, production, distribution and a maximised use phase, to recycling. A change of mindset is needed among all stakeholders if products and materials are to remain in the loop.



Figure 2: Diagram of the circular economy

**Recycling
Reuse
Repair
Share
Use longer**

<https://www.bafu.admin.ch/bafu/en/home/topics/economy-consumption/info-specialists/circular-economy.html>

Transition from linear business model to circular business models



“Moving to a more circular approach also represents a huge opportunity for businesses, opening doors to new markets and the opportunity of increasing market share; reducing costs and risks for business; driving innovation, attracting talent and aligning business performance with public expectations. To do this, businesses can use a value-chain approach to prioritize where they should take action to have the biggest impact on greenhouse gas emissions, biodiversity loss and pollution while making ‘transformational sprints’ towards circularity.”

<https://www.unep.org/resources/publication/role-business-moving-linear-circular-economies>

C. *Disciplines in Economics and the Economist as Policy Advisor*

Disciplines in Economics

- General distinction between microeconomics and macroeconomics:
 - **Microeconomics** focuses on the individual parts of the economy.
 - ↳ How households and firms make decisions and how they interact in specific markets
 - **Macroeconomics** looks at the economy as a whole.
 - ↳ Economy-wide phenomena, including inflation, unemployment, and economic growth
- Many disciplines: Labor economics, public economics, health economics, energy economics, behavioral economics etc.

The Economist as Policy Advisor

- Often economists are asked to explain the causes of economic events or to explain what the government should do to improve the economic situation → important role in economic policy
- Economists sometimes disagree:
 - ↳ Economists may disagree about the validity of alternative positive theories about how the world works.
 - ↳ Economists may disagree because of different values, different normative views.

Normative and Positive Economics

In economics you have to distinguish between normative and positive statements:

- **Normative statements** deal with ethical concepts and value judgments.
 - *Should public administration, for example, give money to the poor? Is it correct to support the health sector with subsidies?*
- **Positive statements** describe the facts of an economy and its behavior. How does unemployment develop and which objective reasons can explain the developments?
 - *Which is the impact of the introduction of a subsidy on the adoption of energy efficient cars? (policy evaluation)*

Question 2

Which of the following is a positive rather than a normative statement?

- A. Law X will reduce national income.
- B. Law X is a good piece of legislation.
- C. Congress ought to pass law X.
- D. The president should veto law X.

Question 2

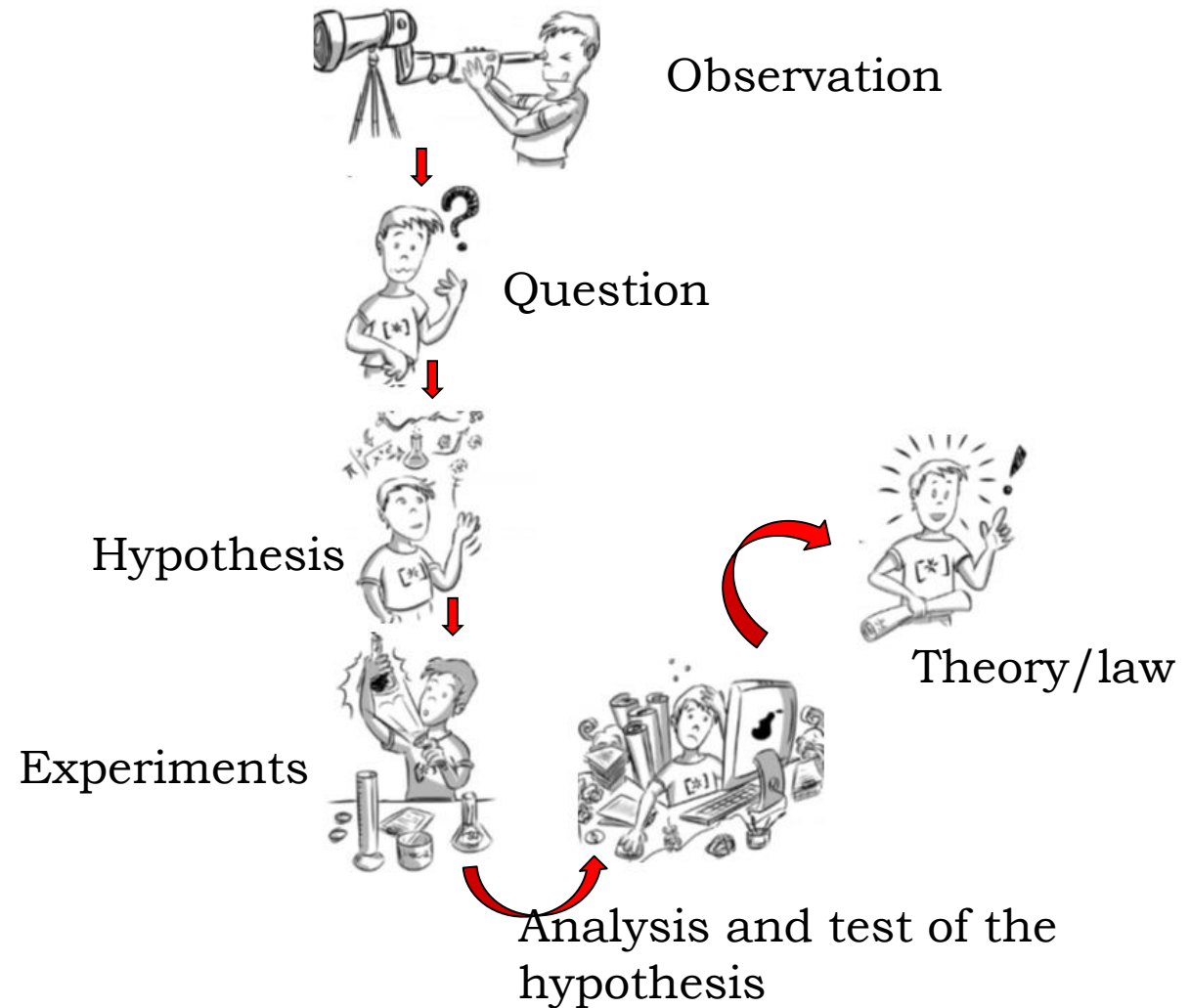
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D. Methods and Models in Economics

The Scientific Method

- Systematic and logical process for creating models and theories that can be verified experimentally
- Economists try to understand and explain the real world by using a scientific method, however...



Experiments in Economics

- **Problem in economics:**

- ↳ difficult to verify hypothesis in a laboratory
- ↳ Economic phenomena influenced by various factors (Economic, natural, social, cultural factors,..)

- Substitute for a laboratory experiment

- **Use of real data** coming from:

- ↳ Administrative data, surveys,..
- ↳ Randomized field experiments (treated and control group)
- ↳

- **to perform empirical analysis**

Empirical Analysis

- In conducting empirical research on economic issues it is important to distinguish:

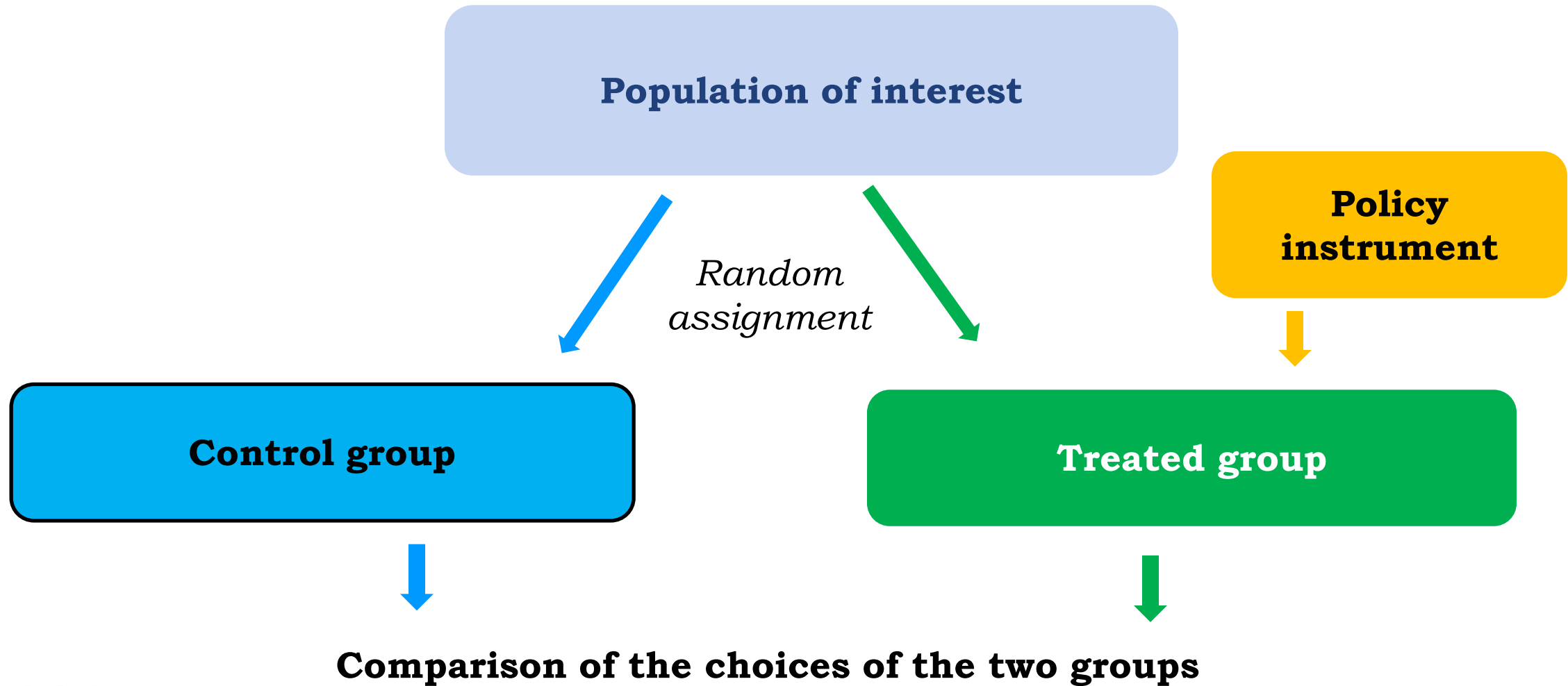
↳ **Causal relationships**

↳ **Correlations**

Causality and Correlation

- **Causality:** To induct that intervention A results in effect B, we must verify three conditions:
 - ⇒ Intervention A must precede effect B
 - ⇒ Cause and Effect must be correlated
 - ⇒ We need to exclude other factors/explanations that could account for effect B
- **Correlation:** Two events are correlated if they vary together, a correlation can be positive (events vary in same direction) or negative (variation in opposite directions).

Methodology to test a policy instrument: Randomized Control Experiments





Contents lists available at ScienceDirect

Journal of Economic Behavior and Organization

journal homepage: www.elsevier.com/locate/jeboCan information about energy costs affect consumers' choices? Evidence from a field experiment^{☆☆}Nina Boogen^a, Claudio Daminato^a, Massimo Filippini^{a,b}, Adrian Obrist^{a,*}^a Center of Economic Research (CER-ETH), ETH Zürich, Switzerland^b Università della Svizzera italiana, Switzerland

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Consumers durable choices

Energy efficiency

Field experiment

ABSTRACT

Whether consumers are fully informed and attentive when investing in energy efficiency is still hotly debated. We experimentally evaluate the role of imperfect information about or limited attention to energy costs in the demand for energy-consuming household durables in Switzerland. Using in-home visits, we collect unique data on the characteristics of participants' current home appliances and light bulbs. Our intervention exploits this data to provide customized information about the potential of monetary savings from adopting new, comparable, and efficient durables. We find a substantial information treatment effect on the energy efficiency of the newly purchased durables. A larger potential of monetary savings induces larger durables choices responses. These findings provide suggestive evidence that the informational content of our intervention played a significant role in determining the observed durables choices responses.

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Resource and Energy Economics

journal homepage: www.elsevier.com/locate/reeBoundedly rational consumers, energy and investment literacy, and the display of information on household appliances[☆]Julia Blasch^{a,b,*}, Massimo Filippini^{b,c}, Nilkanth Kumar^b^a Institute for Environmental Studies (IVM), VU University Amsterdam, Netherlands^b Center of Economic Research (CER-ETH), ETH Zürich, Switzerland^c Università della Svizzera Italiana (USI), Switzerland

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ABSTRACT

It is an ongoing debate how to increase the adoption of energy-efficient light bulbs and household appliances in the presence of the so-called 'energy efficiency gap'. One measure to support consumers' decision-making towards the purchase of more efficient appliances is the display of energy-related information in the form of energy-efficiency labels on electric consumer products. Another measure is to educate consumers in order to increase their level of energy and investment literacy. Thus, two questions arise when it comes to the display of energy-related information on appliances: (1) What kind of information should be displayed to enable consumers to make rational and efficient choices? (2) What abilities and prior knowledge do consumers need to possess to be able to process this information? In this paper, using a series of (recursive) bivariate probit models and three samples of 583, 877 and 1375 households from three major Swiss urban areas, we show how displaying information on the future energy consumption of electrical appliances in monetary terms (CHF), rather than in physical units (kWh), increases the probability that an individual makes a calculation and identifies the appliance with the lowest lifetime cost. In addition, our econometric results suggest that individuals with a higher level of energy and, in particular, investment literacy are more likely to perform an optimization rather than relying on a decision-making heuristic. These individuals are also more likely to identify the most (cost-)efficient appliance.

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