

Lecture 01

Introduction to Environmental Economics

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AEM 4510

Roadmap

- What is environmental economics?
- What are the goals for this class?
- Microeconomics recap

What is environmental economics?

What's enviro econ?

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These ideas can be applied to the environment

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The value of mitigating pollution

How agents will response to climate change policies

Whether investment tax credits for wind power are cost-effective

Air pollution is bad



How do people respond to info?



ADVISORY: [#ozone](#) is expected to be Unhealthy for All today in and around the foothills area of [@SequoiaKingsNPS](#) (Ash Mountain entrance)

Ozone Air Quality Guide

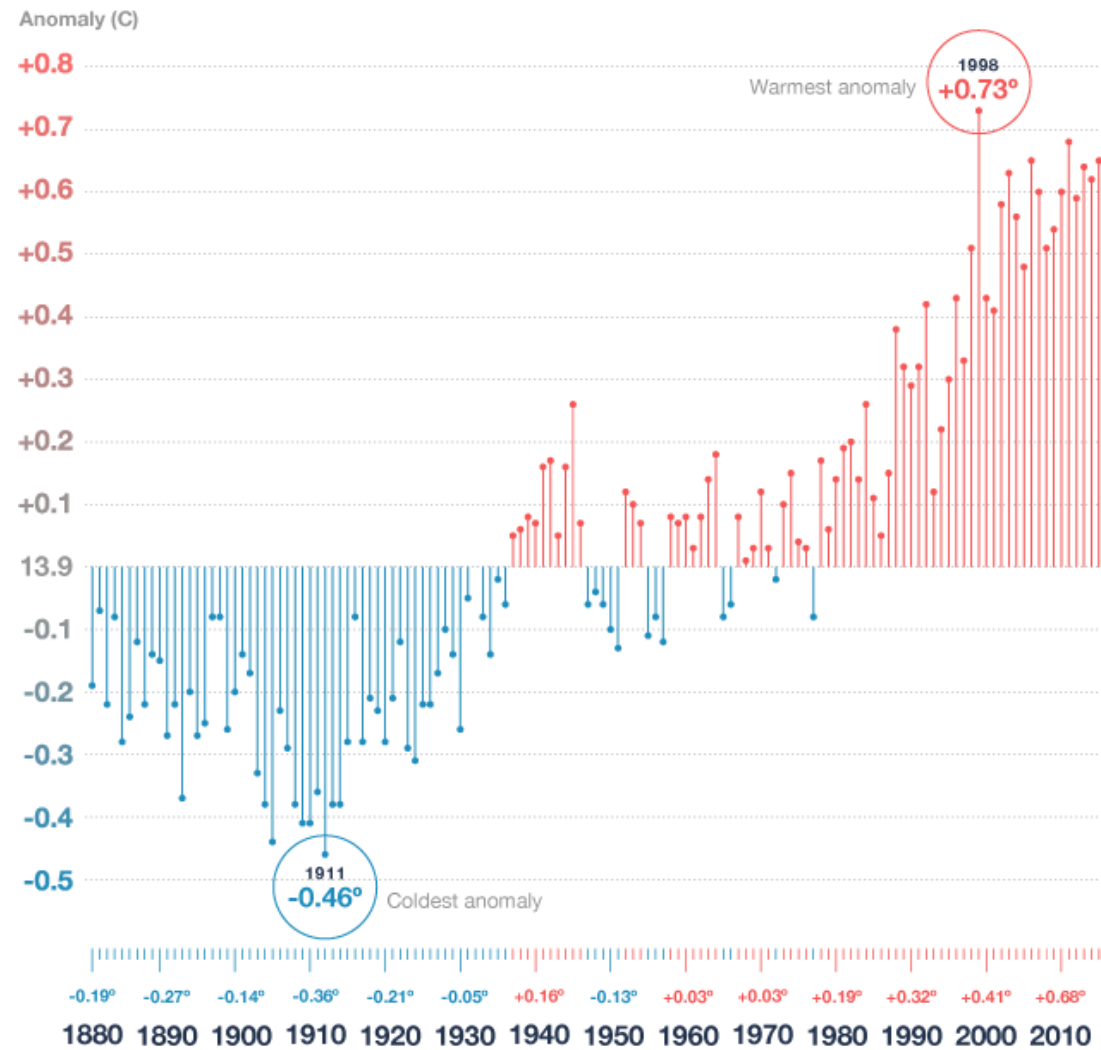
Advisory Level	Health Concern
Unhealthy (86 ppb – 105 ppb)	The following groups should avoid prolonged outdoor exertion: <ul style="list-style-type: none">• People with lung disease.

Places provide info to help people avoid air pollution

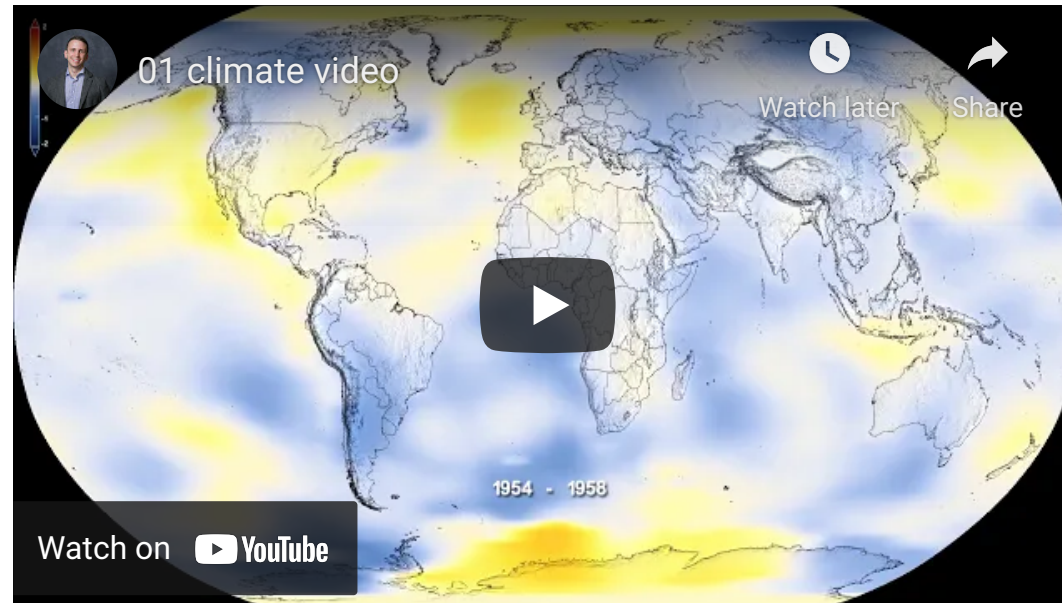
Does it work?

How well?

Climate change



Climate change



Climate change

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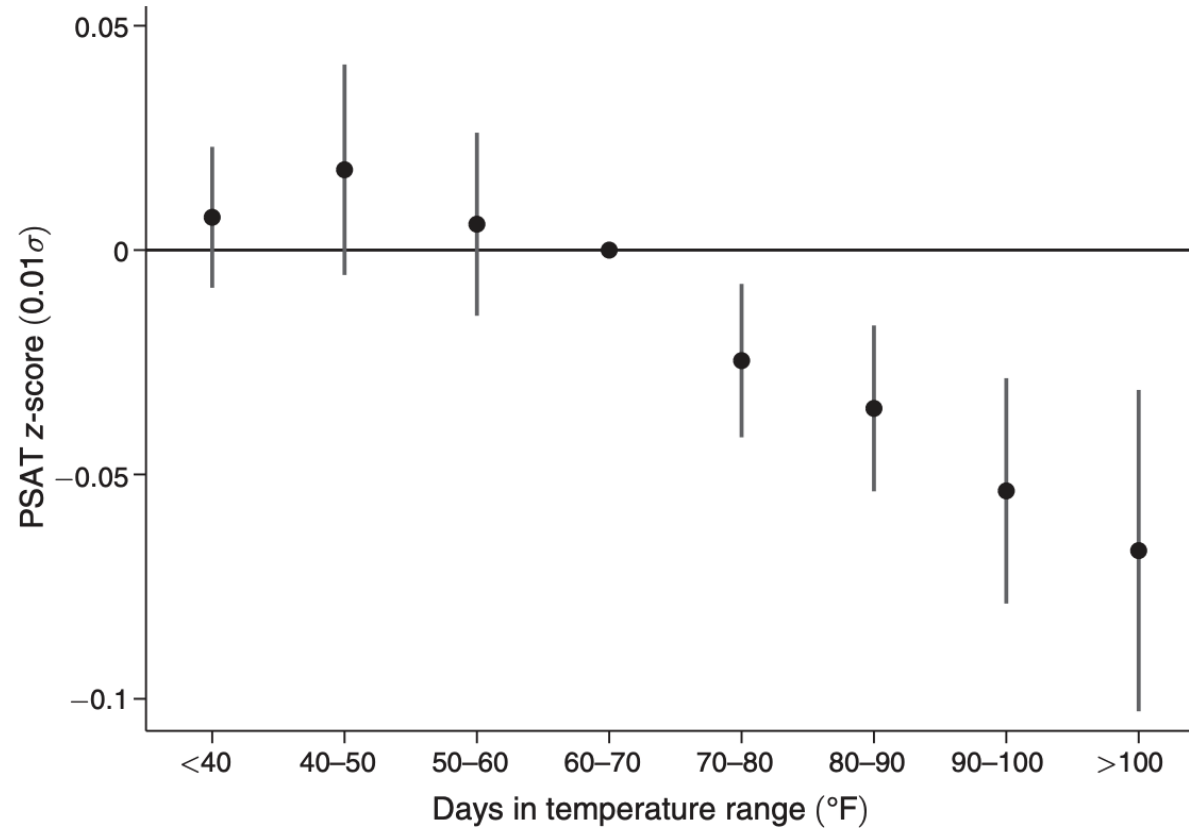
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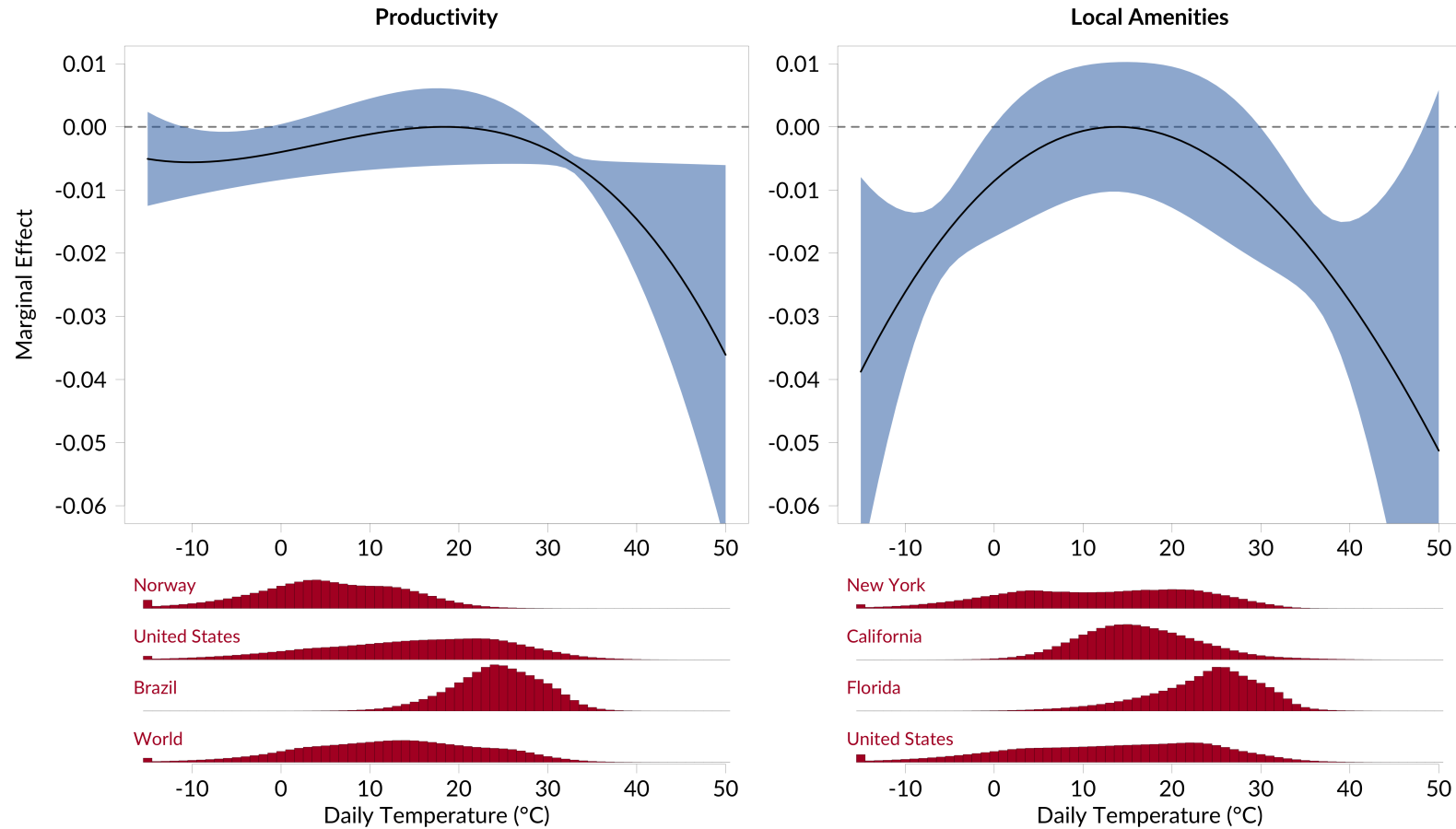
- Production
- Learning
- Leisure
- Fishing
- etc, etc

Climate change: heat hurts learning



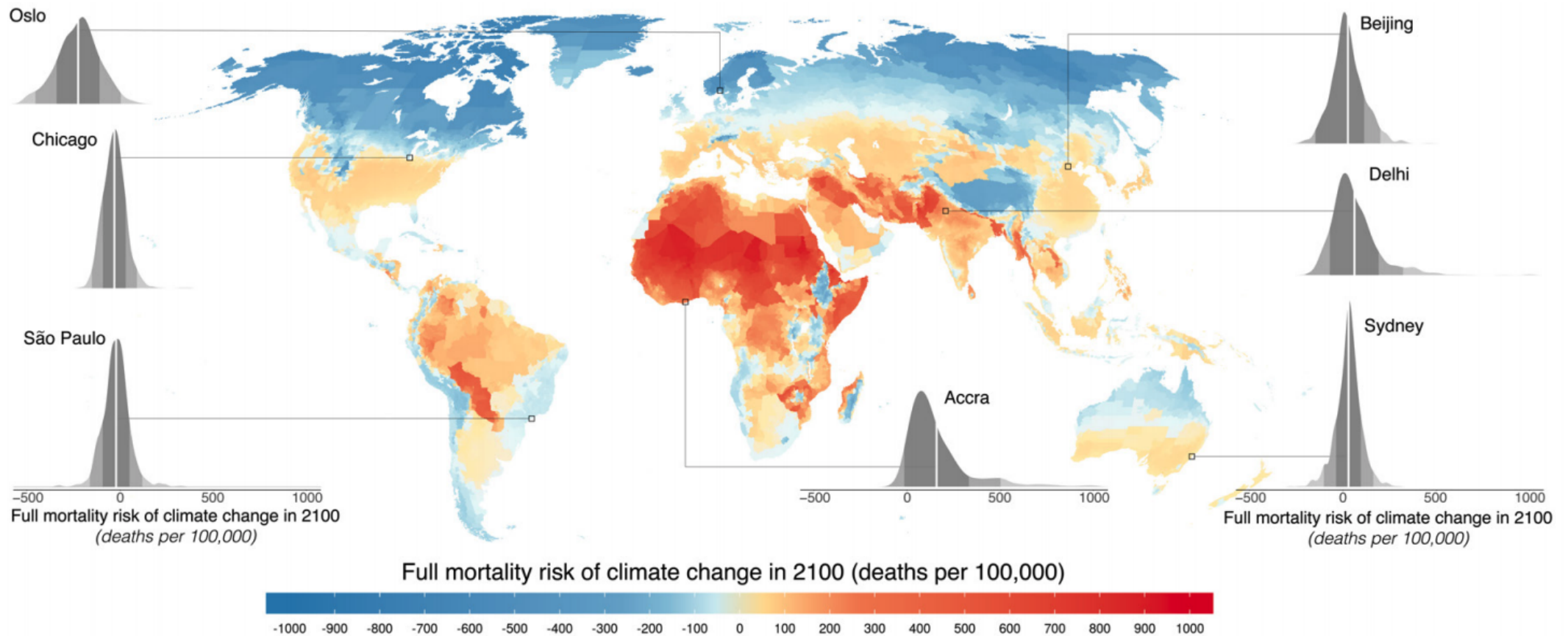
Park et al. (2020)

Climate change: heat hurts the economy



Rudik et al. (2021)

Climate change: extreme heat/cold increases mortality

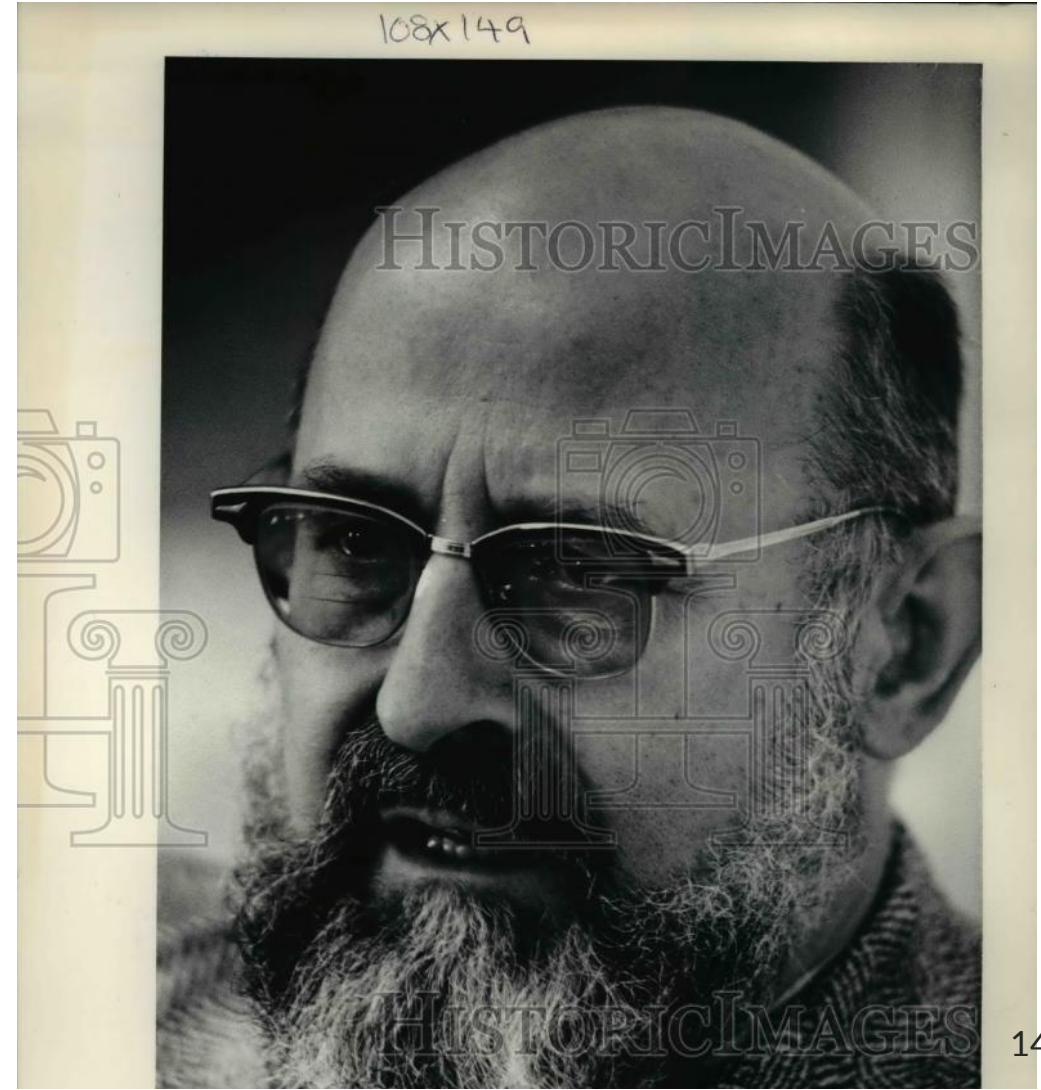


What is enviro econ?

Environmental economics is actually pretty new

Spurred by **John Krutilla** in the 1950s

His paper **Conservation Reconsidered** is the landmark paper in the field (sort of like Wealth of Nations and economics as a whole)



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Learn both the theory and **applications** of environmental economics

Microeconomics recap

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Is Intro to Micro applicable everywhere?

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Creating markets to solve problems

How do we solve some problems in practice?

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Micro recap: terminology

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Supply curve:

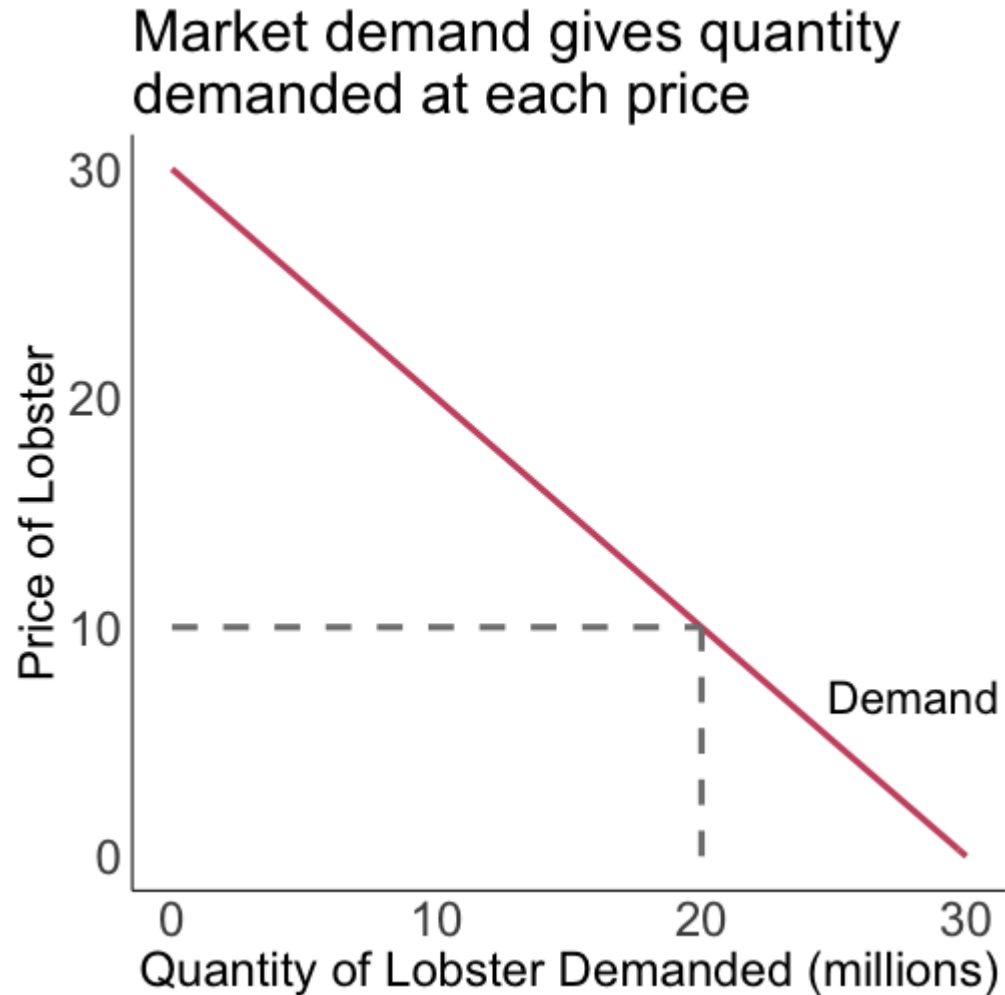
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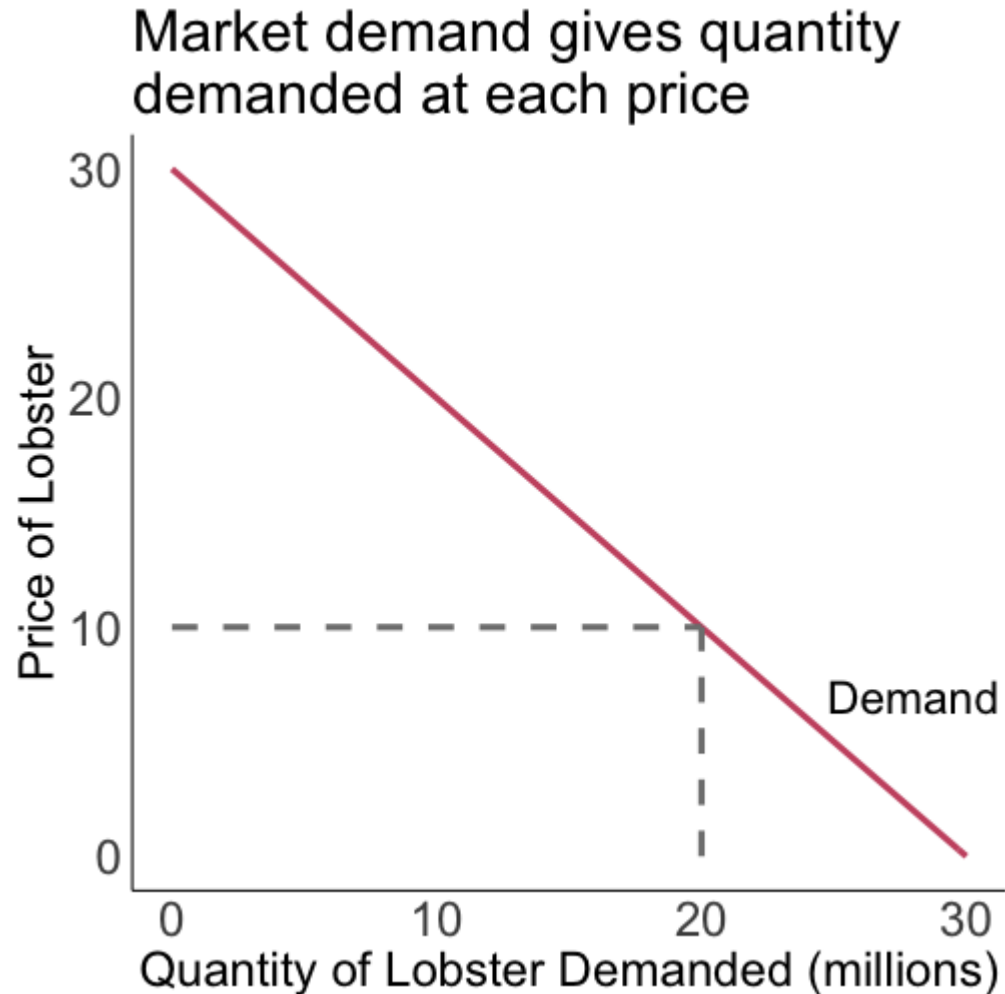
Supply curve: A schedule or graph showing the quantity of a good that sellers wish to sell at each price; it gives us the marginal willingness to accept or the marginal cost

Market demand



Market demand is aggregated from all individual demand curves

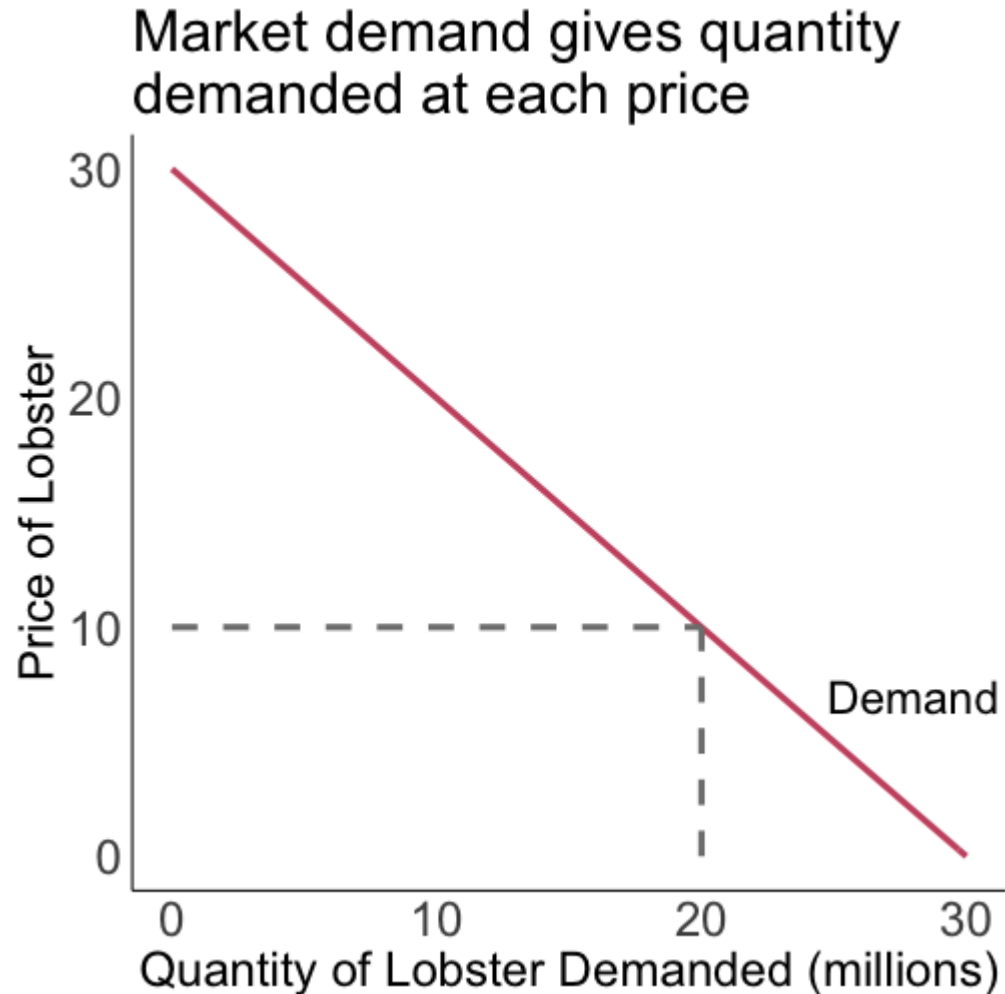
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Vertical interpretation: if buyers are buying 20 million lobsters, the marginal buyer is willing to pay at most \$10

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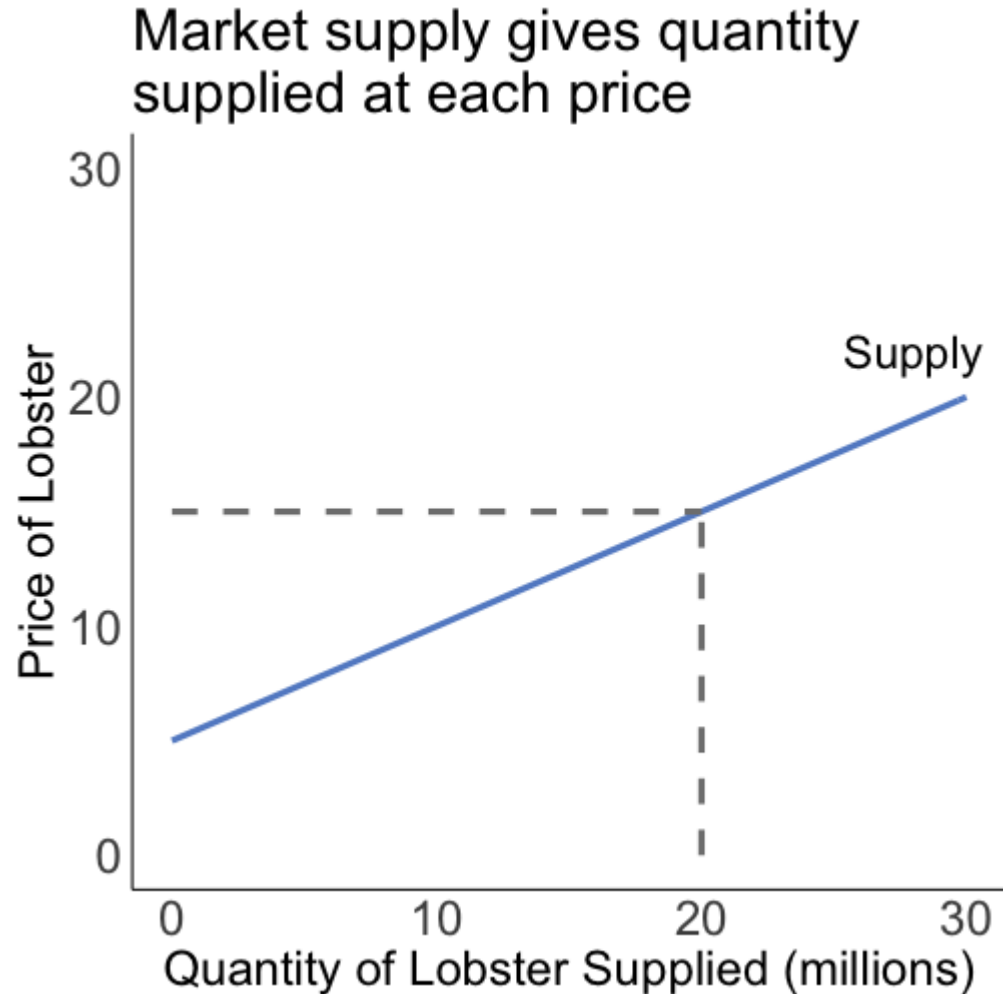
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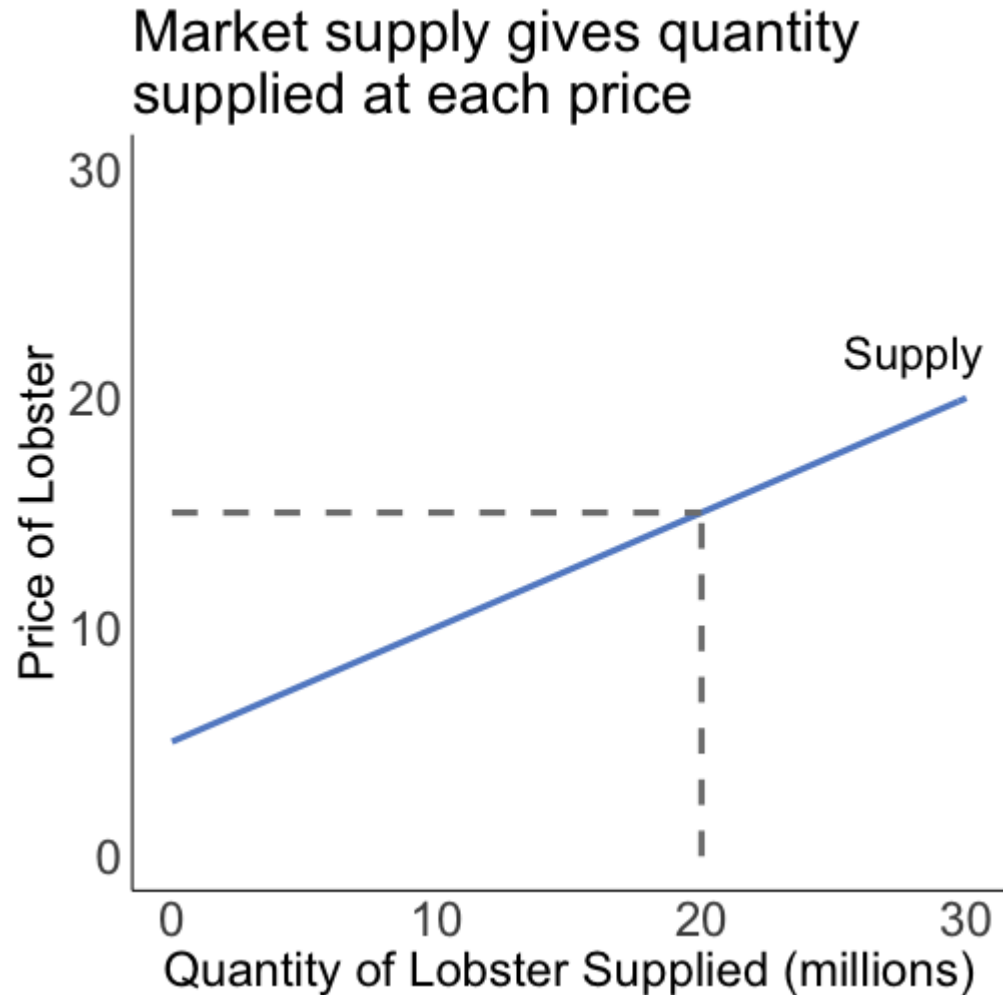
This is the **income effect**: if the price of pizza goes up, we have a lower real budget

Market supply



Market supply is aggregated from all individual supply/MC curves

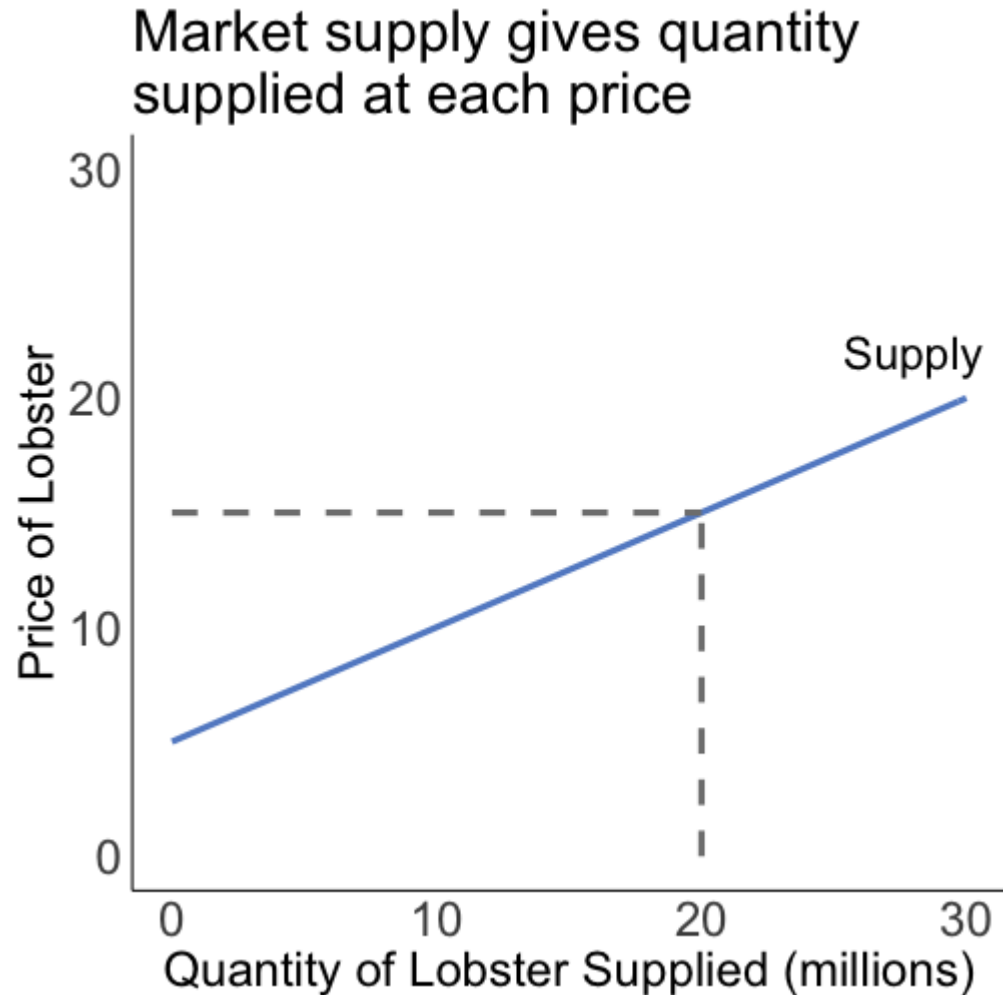
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Vertical interpretation: if sellers are selling 20 million lobsters, the marginal cost of the last lobster is \$15

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If we produce more of a good, we choose the lowest (opportunity) cost production processes first, higher cost production processes later

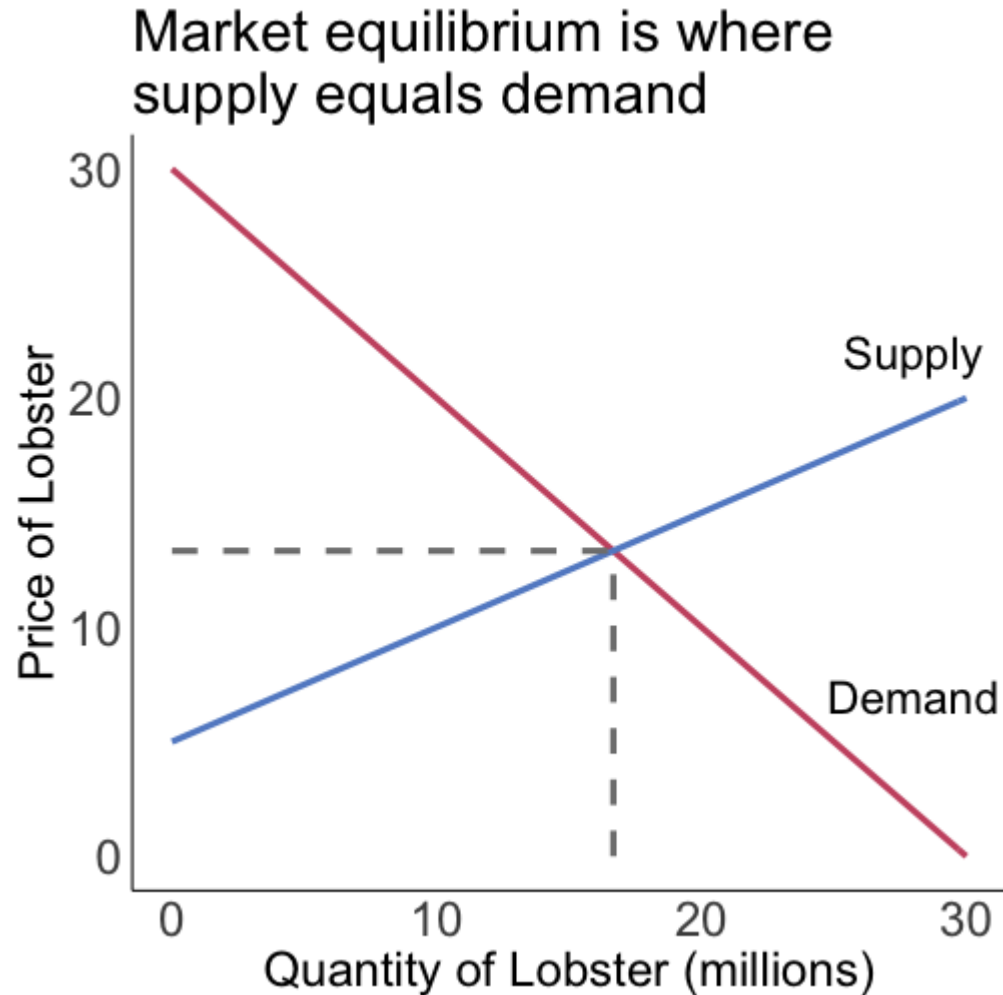
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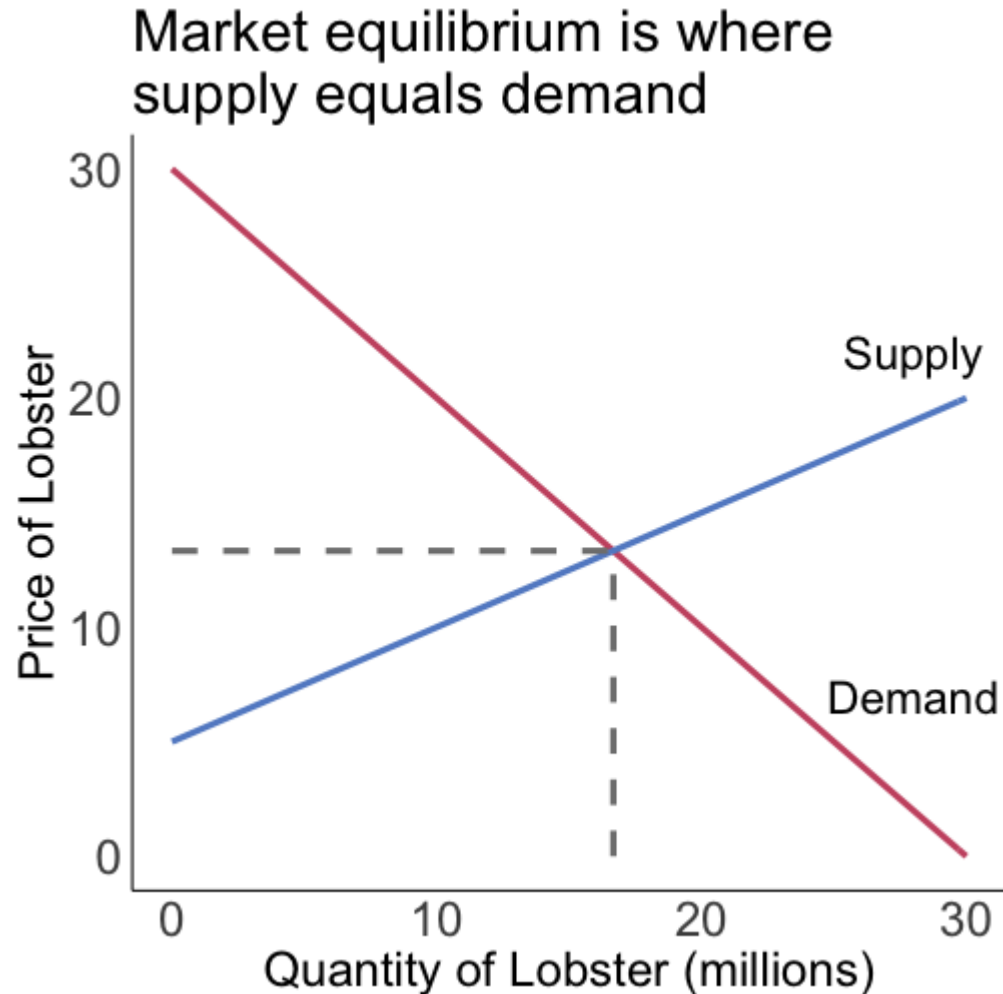
Marginal costs go up as production goes up → producers need higher prices in order to produce more goods

Market equilibrium



A market equilibrium is a price/quantity pair where the demand curve crosses the supply curve

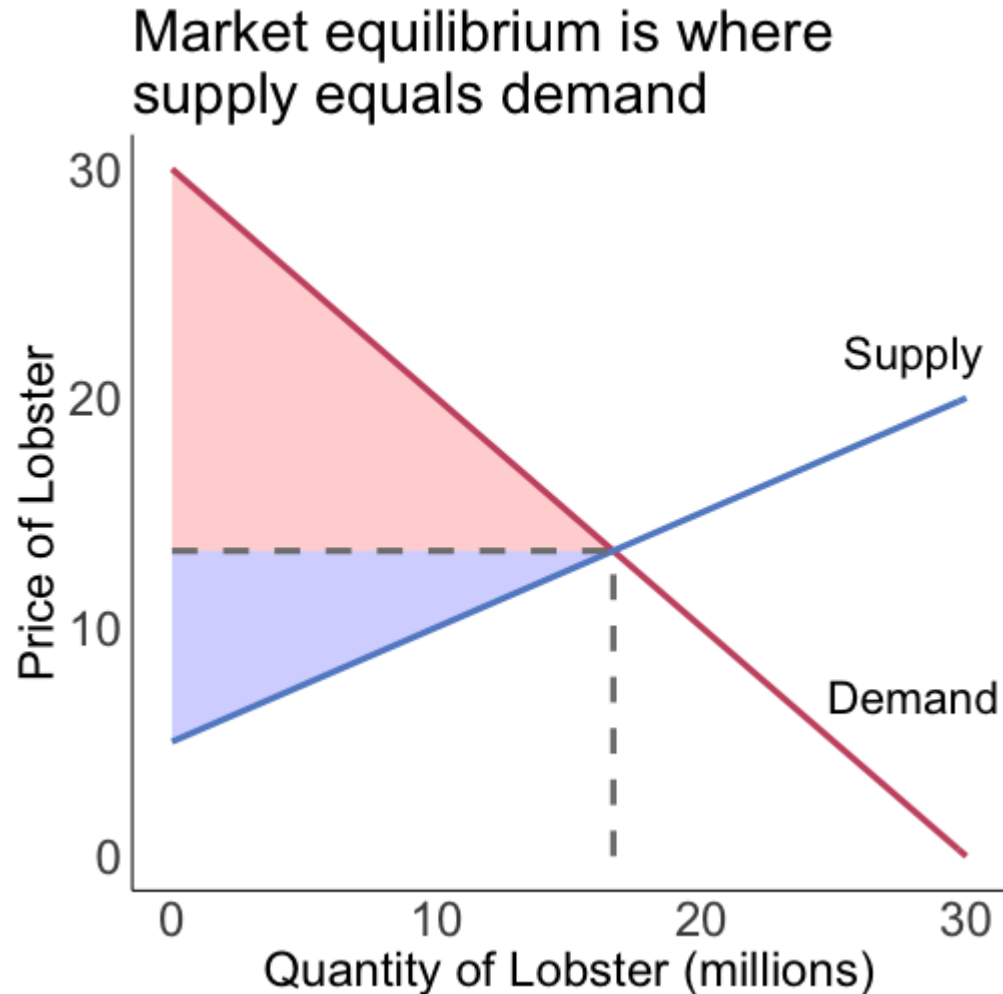
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This gives us the price where the quantity demanded exactly equals the quantity supplied: no shortages, no surpluses

Market equilibrium



Consumer surplus is the difference between willingness to pay (demand) and price

Producer surplus is the difference between price and marginal cost (supply)

Total surplus is the sum of CS and PS

Efficiency

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If you can make one person better off without making anyone else worse off it's called a **Pareto improvement**

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Main takeaway: markets are often a nice way to allocate scarce resources

Under what assumptions are markets efficient?

What are the underlying assumptions for market efficiency?

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2. Perfect information
3. Complete markets (minimal transactions costs)
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They drive a wedge between private and social marginal cost, or private and social marginal benefit

The key departures in environmental economics

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	Excludable	Non-Excludable
Rival	Private goods (food)	Common-pool resources (fish, timber)
Non-rival	Club goods (parks, netflix)	Public goods (air, national defense)

Imperfect information

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Without the adequate information, buyers or sellers cannot make the choices in their best interest

Efficiency and equity

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- If Elon Musk held **all** the wealth in the world, that would be a Pareto efficient outcome even though it goes against basically all people's notions of equity
- Perfect price discrimination is also Pareto efficient: producers capture all the surplus but it is maximized

Ecological wealth

