

UN3902: Economics of Public Policy Seminar
Week 3: Externalities and Public Goods I

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Outline

Externalities: Problems and Solutions

Externalities in Action: Environmental and Health Externalities

Congestion Pricing in NYC

Outline

Externalities: Problems and Solutions

Externality Theory

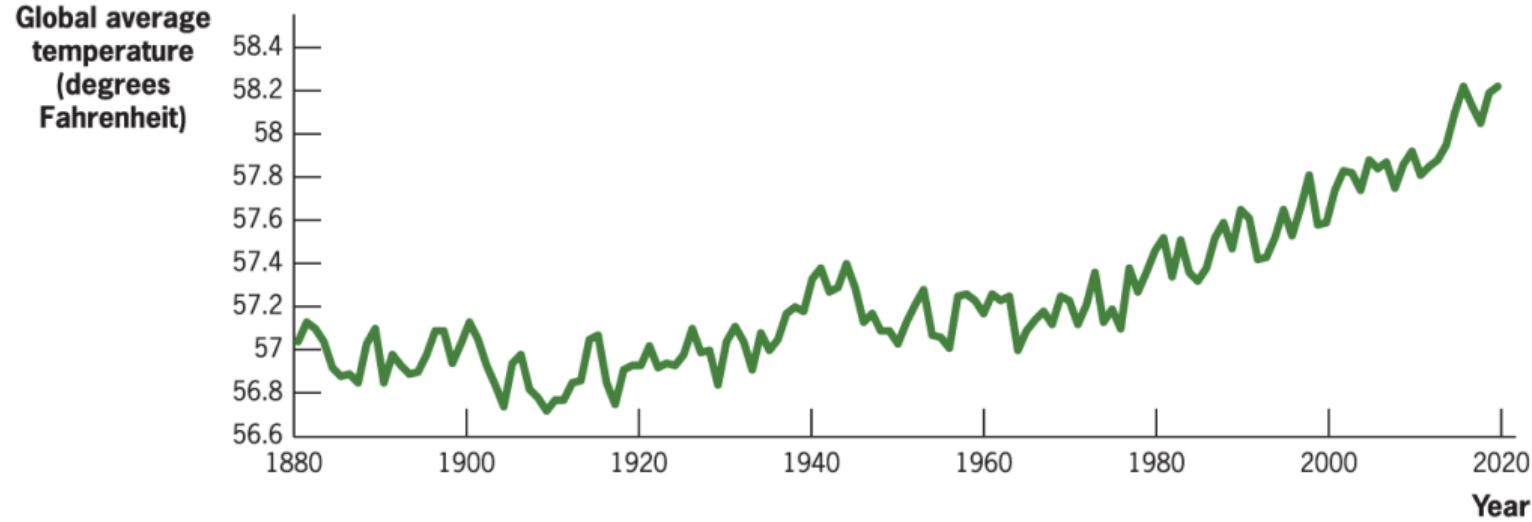
Private-Sector Solutions

Public-Sector Remedies

Introduction to Externalities: Global Warming

- ▶ In 2015, representatives from 195 nations met in Paris, France, to negotiate an international pact to limit temperature rise around the world.
- ▶ Carbon dioxide emissions contribute to global warming, which could cause enormous damage.
- ▶ The cost of reducing the use of fossil fuels, particularly in the major industrialized nations, is immense. Some predict that we will have to reduce our use of fossil fuels to nineteenth-century (preindustrial) levels.

Average Global Temperature, 1880–2020



Externalities: Key Definitions

- ▶ Global warming is a classic example of an **externality**, which is a kind of market failure.
- ▶ **Externality:** Externalities arise whenever the actions of one party make another party worse or better off, yet the first party neither bears the costs nor receives the benefits of doing so.
- ▶ **Market failure:** A problem that causes the market economy to deliver an outcome that does not maximize efficiency.

Negative Externalities

- ▶ **Negative production externality:** When a firm's production reduces the well-being of others who are not compensated by the firm.
 - ▶ Example: Pollution from steel production, dumped in a river, hurts fishers.
- ▶ **Negative consumption externality:** When an individual's consumption reduces the well-being of others who are not compensated by the individual.
 - ▶ Example: Smoking at a restaurant affects the health and enjoyment of others.

Private and Social Marginal Cost

- ▶ Negative production externalities drive a wedge between private and social marginal cost.
- ▶ **Private marginal cost (PMC)**: The direct cost to producers of producing an additional unit of a good.
- ▶ **Social marginal cost (SMC)**: The private marginal cost to producers plus any costs associated with the production of the good that are imposed on others.
- ▶ The loss from pollution is a cost of production imposed on others.

Private and Social Marginal Benefit

- ▶ Negative consumption externalities drive a wedge between private and social marginal benefit.
- ▶ **Private marginal benefit (PMB):** The direct benefit to consumers of consuming an additional unit of a good by the consumer.
- ▶ **Social marginal benefit (SMB):** The private marginal benefit to consumers minus any costs associated with the consumption of the good that are imposed on others.
- ▶ Your consumption of cigarettes at a restaurant may have a negative effect on my enjoyment of a meal.

Externalities and Efficiency

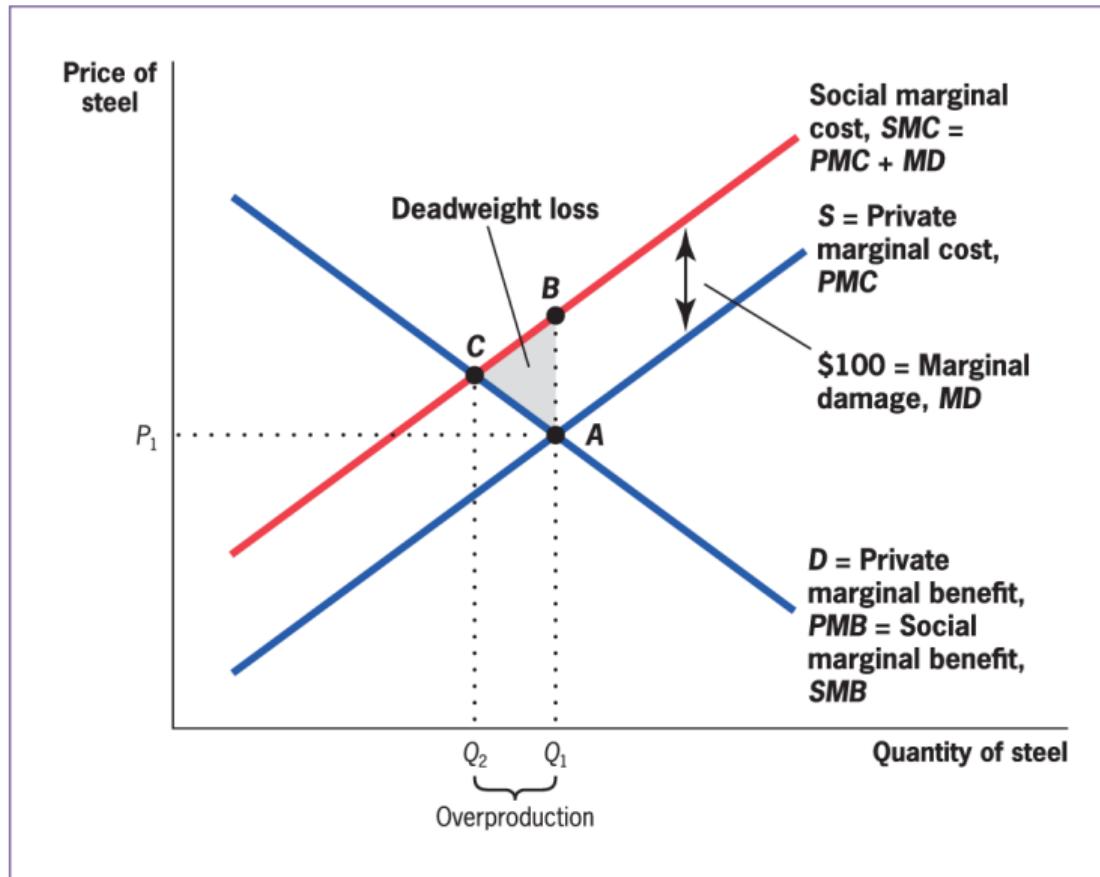
- ▶ How do externalities affect efficiency?
- ▶ Efficiency requires that $SMC = SMB$.
- ▶ The market sets $PMC = PMB$.
- ▶ When $PMC = SMC$ and $PMB = SMB$, the market is efficient.
- ▶ Production or consumption externalities lead to inefficiency because $PMC \neq SMC$ and/or $PMB \neq SMB$

Marginal Damage

- ▶ With a negative production externality
 - ▶ $SMC = PMC + MD$
 - ▶ MD is the marginal damage done to others from each unit of production.
- ▶ With a negative consumption externality
 - ▶ $SMB = PMB - MD$
 - ▶ MD is the marginal damage done to others by your consumption of that unit.

Economics of Negative Production Externalities: Steel Production

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Application: The Externality of SUVs

The consumption of large cars such as SUVs produces three types of negative externalities:

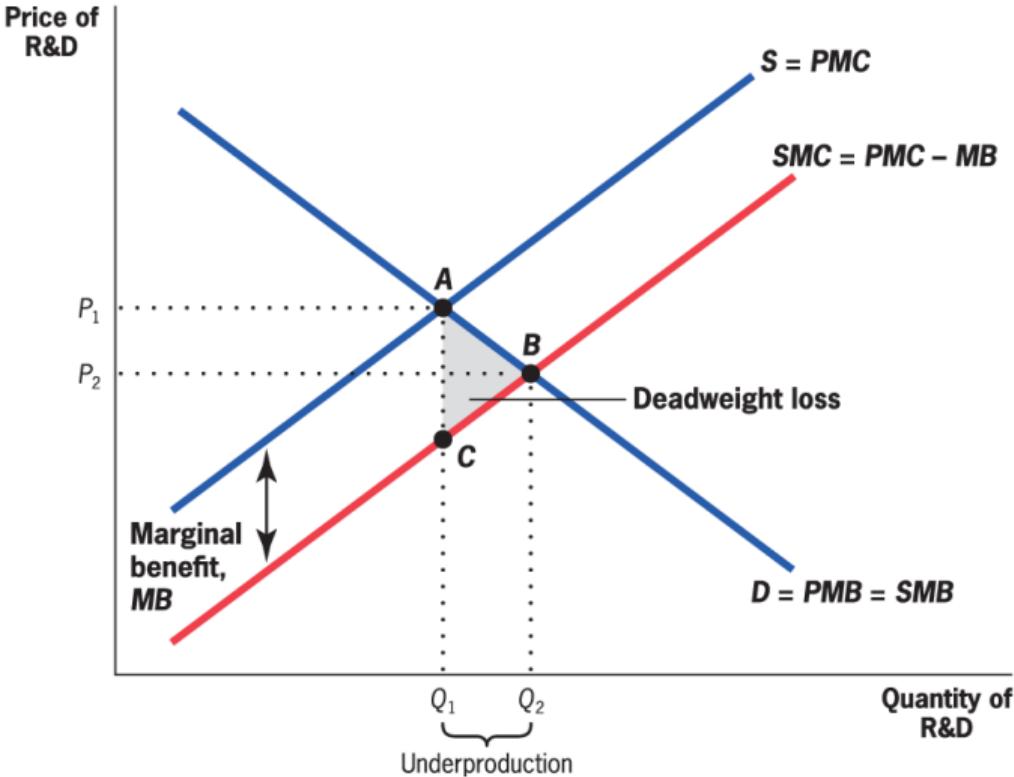
1. **Environmental externalities:** In 2020, compact cars get 32.0 miles/gallon, but SUVs get only 23.9.
2. **Wear and tear on roads:** Larger cars wear down the roads more.
3. **Safety externalities:** For a car of average weight, the odds of having a fatal accident quadruple if the accident is with a typical SUV and not with a car of the same size.

Positive Externalities

- ▶ Externalities can be positive as well as negative.
- ▶ **Positive production externality:** When a firm's production increases the well-being of others but the firm is not compensated by those others.
- ▶ **Positive consumption externality:** When an individual's consumption increases the well-being of others but the individual is not compensated by those others.

Economics of Positive Production Externalities

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Quick Hint

One confusing aspect of the graphical analysis of externalities is knowing which curve to shift and in which direction. There are four possibilities:

- ▶ Negative production externality: SMC curve lies above PMC curve.
- ▶ Positive production externality: SMC curve lies below PMC curve.
- ▶ Negative consumption externality: SMB curve lies below PMB curve.
- ▶ Positive consumption externality: SMB curve lies above PMB curve.

Armed with these facts, the key is to assess which category a particular example fits into.

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Externality Theory

Private-Sector Solutions

Public-Sector Remedies

Private-Sector Solutions to Negative Externalities

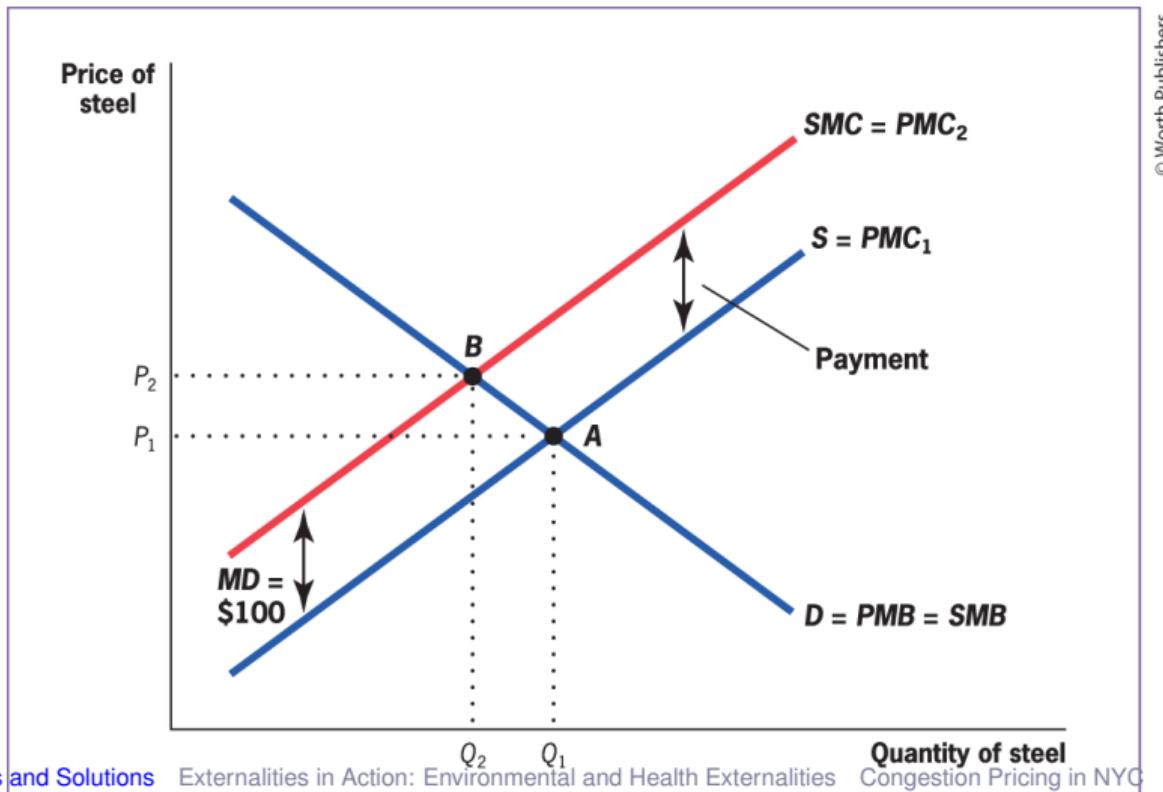
- ▶ Externalities undermine efficiency because one party does not pay the costs or get all the (net) benefits of its actions.
- ▶ The solution to this, therefore, is to **internalize the externality**.
- ▶ **Internalizing the externality:** When either private negotiations or government action led the party to fully reflect the external costs or benefits of that party's actions.
- ▶ Steel producer could pay the fishers for each unit of steel produced so that they are compensated for the damage to their fishing grounds.

The Solution: The Coase Theorem

- ▶ The Coase theorem says that private parties will be able to solve the problem of externalities. This is accomplished by internalizing the externality.
- ▶ **Coase theorem (Part I):** When there are well-defined property rights and costless bargaining, then negotiations between the party creating the externality and the party affected by the externality can bring about the socially optimal market quantity.
- ▶ **Coase theorem (Part II):** The efficient solution to an externality does not depend on which party is assigned the property rights as long as someone is assigned those rights.

The Solution: Coasian Payments

- The charge internalizes the externality and removes the inefficiency of the negative externality.



The Problems with Coasian Solutions (1)

There are difficulties with Coasian solutions, making them less likely to arise as more people become involved.

- ▶ **The assignment problem:** The first problem is assigning blame. Does the fisher pay the steel plant for not polluting? Or does the steel plant pay for polluting?
- ▶ **The holdout problem:** Shared ownership of property rights gives each owner power over all the others. Each person has veto power and so may demand enormous payments.

The Problems with Coasian Solutions (2)

- ▶ **The free rider problem:** When an investment has a personal cost but a common benefit, individuals will underinvest. Individuals may not want to pay enough to reduce pollution.
- ▶ **Transaction costs and negotiating problems:** It is hard to negotiate when there are large numbers of individuals on one or both sides of the negotiation.
- ▶ This problem is amplified for an externality such as global warming, where the potentially divergent interests of billions of parties on one side must be somehow aggregated for a negotiation.

Bottom Line

- ▶ Ronald Coase's insight that externalities can sometimes be internalized was a brilliant one.
- ▶ It provides the competitive market model with a defense against the onslaught of market failures.
- ▶ It is also an excellent reason to suspect that the market may be able to internalize some small-scale, localized externalities.
- ▶ It won't help with large-scale, global externalities.

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Public-Sector Remedies for Externalities

Public policy makers employ three types of remedies to resolve the problems associated with negative externalities:

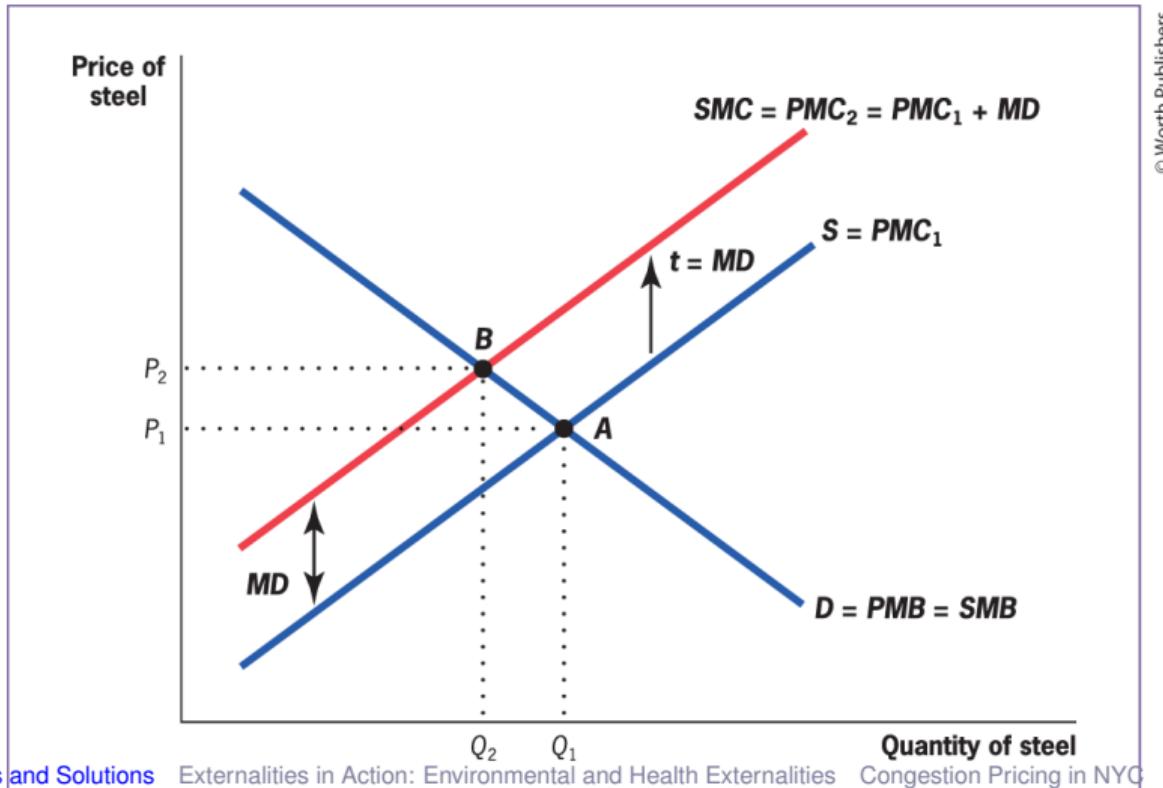
1. Corrective taxation to discourage use
2. Subsidies to encourage use
3. Regulation to directly change use

Corrective Taxation and Subsidies

- ▶ Taxes and subsidies change the private marginal cost or marginal benefit without affecting the social marginal cost or benefit.
- ▶ They can therefore be used to internalize the externality.
- ▶ Taxes that correct externalities are called “Pigouvian taxation,” after A. C. Pigou.

Corrective Taxation

- This tax internalizes the externality and removes the inefficiency of the negative externality.

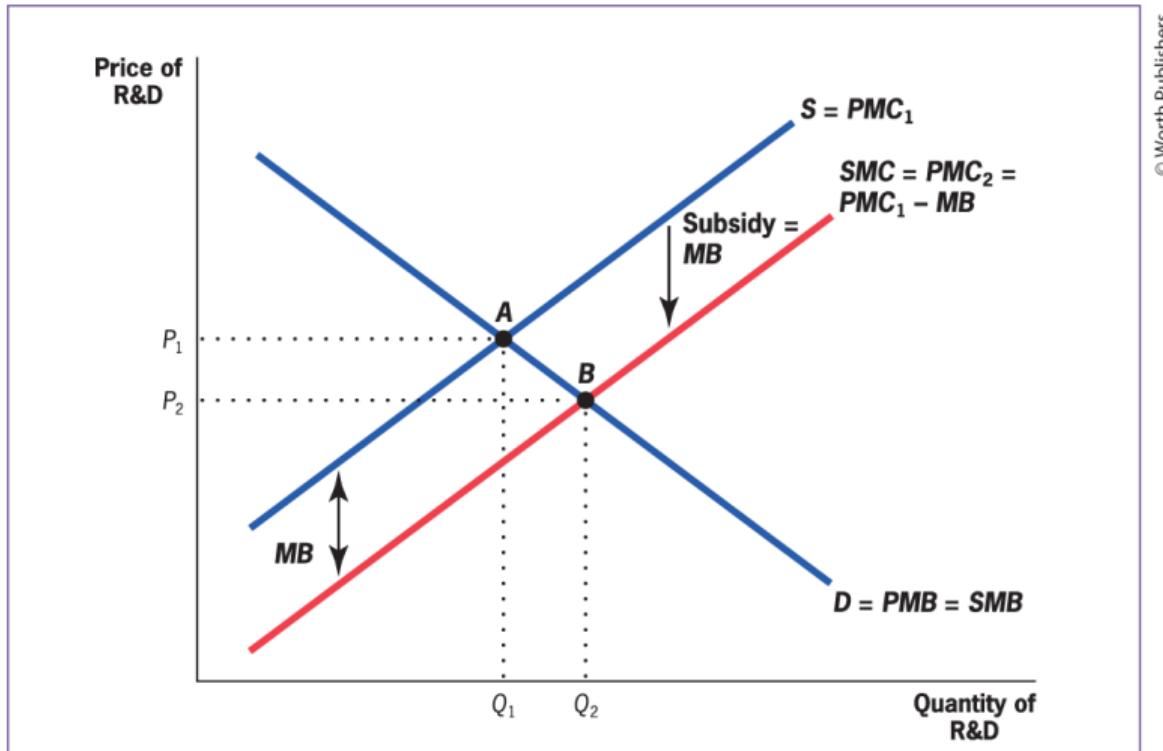


Application: Congestion Pricing

- ▶ Traffic jams lead to huge time and environmental costs to the US economy. They are also a classic externality: each driver does not account for the fact that adding their car to the road increases costs on others.
- ▶ Economists recommend corrective taxation to solve such externalities, in this context, **congestion pricing**.
- ▶ London first created congestion tax in 2003. This was a flat tax of \$21.00 for entrance into city center on weekdays. Decreased cars on streets by 39%
- ▶ In Stockholm, variable congestion fee used. Price depends on length of time driving in city. Decreased health impacts of pollution.
- ▶ Plans for congestion tax in New York City postponed after Covid-19 lockdown. Implemented Jan 2025.
- ▶ See Cody Cook, Aboudy Kreidieh, Shoshana Vasserman, Hunt Allcott, Neha Arora, Freek van Sambeek, Andrew Tomkins & Eray Turkel, *The Short-Run Effects of Congestion Pricing in New York City* NBER Working Paper #33584, 2025 on Courseworks.

Corrective Subsidies

- The quantity produced rises from Q_1 to Q_2 , the socially optimal level of production.



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Application: Operation Warp Speed

- ▶ Vaccination classic positive externality: private benefits of vaccination are less than social benefits. Private benefits do not take into account the health improvements of others by ones' own vaccination.
- ▶ The U.S. Government's "Operation Warp Speed" provided both "push" and "pull" incentives to speed rapid development of Covid-19 vaccines.
- ▶ Push incentives were large grants to firms, and pull incentives were large purchase guarantees.
- ▶ This ensured that vaccines would be developed quickly, and would be distributed quickly once made.
- ▶ Was huge success: instead of typical timeline of 10 to 15 years for vaccine development, Covid-19 vaccine created in just seven months with efficacy of over 90%.

Regulation

- ▶ The government could mandate that production take place at the socially optimal level of production.
- ▶ In an ideal world, Pigouvian taxation and regulation would be identical.
- ▶ Regulation has been the traditional choice for addressing environmental externalities in the United States and around the world.
- ▶ In practice, there are complications that may make taxes a more effective means of addressing externalities.

Extensions

1. Contrasting Price vs. Quantity Regulation
2. Multiple Plants with Different Reduction Costs
3. Uncertainty About Costs of Reduction

Conclusion

- ▶ Externalities arise when one party's actions affect another party and the first party doesn't fully compensate (or get compensated by) the other for this effect.
- ▶ Externalities are the classic answer to the "when" question of public finance: if externalities are present, then the market has failed, and intervention is potentially justified.
- ▶ This naturally leads to the "how" question of public finance. Two solutions:
 - ▶ Price-based measures (taxes and subsidies)
 - ▶ Quantity-based measures (regulation)
- ▶ Which of these methods will lead to the most efficient regulatory outcome depends on factors such as the heterogeneity of the firms being regulated, the flexibility embedded in quantity regulation, and the uncertainty over the costs of externality reduction.

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Externalities in Action: Environmental and Health Externalities

Environmental Regulation: Particulates

The Economics of Cigarette Smoking

Other Externality-Creating Behaviors

The Case of Particulates

- ▶ Particulates are a classic negative production externality.
- ▶ Burning coal releases mercury, SO_2 , and NO_x , which combine with hydrogen in the atmosphere to create “acid rain” and particulate matter (soot), which is associated with everything from low visibility to heart attacks.
- ▶ The majority of SO_2 emissions come from coal-fired power plants, mostly located in the Ohio River Valley.

The Damage of Particulates

The negative effects of particulates include:

- ▶ Environmental damage to both water and land ecosystems.
- ▶ Property damage to painted surfaces (autos) and metal or stone exteriors (statuary).
- ▶ Reduced visibility caused by suspended acidic chemicals (smog).
- ▶ Adverse health outcomes (lung or heart diseases).

History of Particulate Regulation

- ▶ To combat damaging particulates, Congress passed the 1970 Clean Air Act.
- ▶ **1970 Clean Air Act (CAA):** Landmark federal legislation that first regulated damaging emissions by setting maximum standards for atmospheric concentrations of various substances, including SO₂.
- ▶ Regulations affected only new plants, however, encouraging use of older, dirtier plants.

History of Acid Rain Regulation

- ▶ Clean air acts reduced SO₂ emissions but encouraged use of older plants.
- ▶ The 1990 amendments and emissions trading attempted to rectify this.
- ▶ **SO₂ allowance system:** The feature of the 1990 amendments to the Clean Air Act that granted plants permits to emit SO₂ in limited quantities and allowed them to trade those permits.

Estimating the Adverse Health Effects of Particulates (1)

How do particulates affect health?

- ▶ The typical approach taken in this literature is to relate adult mortality in a geographical area to the level of particulates (such as SO₂) in the air.
- ▶ The results are suspect: Areas with more particulates may differ from areas with fewer particulates in many other ways, not just in the amount of particulates in the air.

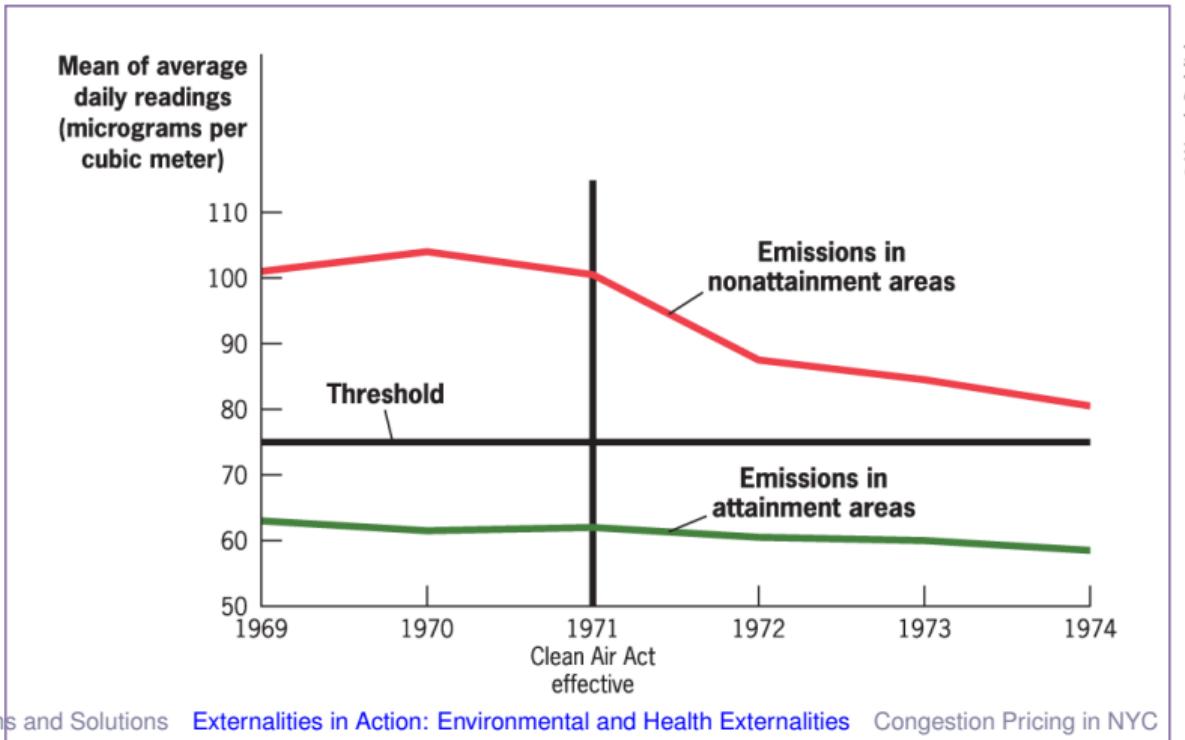
Estimating the Adverse Health Effects of Particulates (2)

Chay and Greenstone (2003) studied this question.

- ▶ In a quasi-experiment, they examined the infant mortality rate, using the regulatory changes induced by the Clean Air Act of 1970.
- ▶ Some areas (“attainment”) did not have to reduce SO₂ levels.
- ▶ Others (“nonattainment”) were required to do so.
- ▶ Infant mortality declined substantially in nonattainment areas, relative to attainment areas.

SO₂ Levels in Attainment and Nonattainment Areas

- For areas with TSPs below the mandated threshold, there was only a slight reduction in TSPs over time. For areas above the mandated threshold, there was a very large reduction in emissions after the legislation became effective in 1971.



Has the CAA Been a Success?

- ▶ Led to dramatic improvements in infant health and lifetime earnings, among other things.
- ▶ But may have cost 600,000 jobs and \$75 billion in polluting industries.
- ▶ Recent studies suggest that our efforts to curb emissions have not gone far enough.
- ▶ Marginal costs to firms to reduce emissions were below estimated marginal benefits.
- ▶ Lack of enforcement combined with increases in economic activity and wildfires has led to an increase in particulate matter in US counties by 5.5%.

Outline

Externalities in Action: Environmental and Health Externalities

Environmental Regulation: Particulates

The Economics of Cigarette Smoking

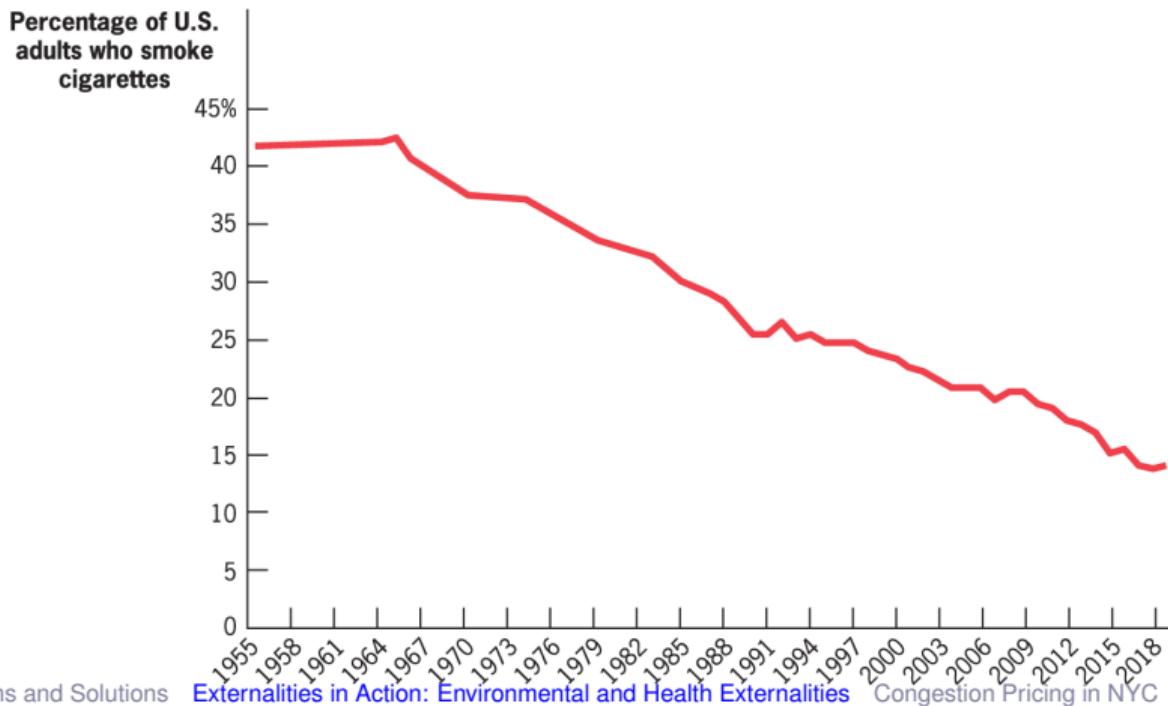
Other Externality-Creating Behaviors

The Economics of Cigarette Smoking

- ▶ Not all externalities are large-scale environmental problems.
- ▶ Some of the most important externalities are local and individualized.
- ▶ Many of these arise in the arena of personal health, and one of the most interesting is cigarette smoking.

Annual Percentage of U.S. Adults Who Smoke Cigarettes, 1955–2016

- The percentage of Americans who smoke has declined substantially over the past few decades, yet 14.2% of Americans still smoke.



The Externalities of Cigarette Smoking

- ▶ Negative health consequences do not, by themselves, mean cigarette smoking generates externalities.
- ▶ Externalities require that the smoker not bear all these costs.
- ▶ Rational cigarette smokers—who know the health risks—may internalize these costs.
- ▶ But there are several reasons that the costs might not be internalized.

Increased Health Care Costs

Cigarette smoking increases health care costs. Is this an externality?

- ▶ Not if people pay for their health care themselves
- ▶ Or if their insurance premiums are actuarially adjusted
- ▶ **Actuarial adjustments:** Changes to insurance premiums that insurance companies make in order to compensate for expected expense differences.
- ▶ Yes, if their insurance premiums are not adjusted, since nonsmokers would pay some of the cost

Workplace Productivity

Smokers have lower workplace productivity because they are more likely to get sick and to take (smoking) breaks. Externality?

- ▶ Yes, if cigarette smokers and nonsmokers are paid the same amount, then cigarette smokers end up taking profits from their employers or wages from nonsmokers
- ▶ No, if cigarette smokers are paid according to their productivity

Fires

Cigarette smokers are much more likely to start fires than nonsmokers, mostly due to falling asleep with burning cigarettes. Externality?

- ▶ Yes, if cigarette smokers burn other people's property
- ▶ Yes, if cigarette smokers burn their own property, and fire insurance/fire department costs aren't actuarially adjusted
- ▶ No, if cigarette smokers burn only their own property, and the costs are actuarially adjusted

The “Death Benefit”

- ▶ Cigarette smokers' early deaths might create a positive externality for taxpayers.
- ▶ Social Security and Medicare pay out until death.
- ▶ Early deaths of cigarette smokers mean smokers receive less in benefits, leaving greater benefits for nonsmokers.
- ▶ If smokers die early, they don't incur nursing home or other medical costs at very advanced ages, offsetting medical costs for treatment of cancers and heart disease at younger ages.

Externality Estimates

- ▶ The effects of these four components, along with some other minor negative externalities, make the estimate of the external costs of cigarette smoking roughly \$0.56 per pack in 2020 dollars.
- ▶ This figure is sensitive to many factors, but, by most estimates, the external cost of cigarette smoking is well below the average cigarette tax in the United States, which is more than \$1 per pack.

What About Secondhand Smoke?

- ▶ Secondhand smoke appears to be a classic externality.
- ▶ **Secondhand smoke:** Tobacco smoke inhaled by individuals in the vicinity of smokers.
- ▶ The costs of secondhand smoke are not easily added to the list of external costs:
 - ▶ There is considerable medical uncertainty about the damage done by secondhand smoke.
 - ▶ Most of the damage from secondhand smoke is delivered to the spouse and children of smokers. The rational cigarette smoker has thus already internalized the damage to their family in accounting for their overall net benefits from smoking.

Do “Internalities” Matter?

Economists usually assume that smokers follow the rational addiction model:

- ▶ They know the costs (which occur far in the future).
- ▶ They understand the possibility of addiction.

This model may not be a good description of smoking.

- ▶ **Youth smoking:** More than 75% of adult smokers begin smoking before their nineteenth birthday.

Adults Are Unable to Quit Smoking (1)

- ▶ Many adults who smoke would like to quit but are unable to do so.
- ▶ Eight in ten smokers in America express a desire to quit the habit, but many fewer than that actually do quit.
- ▶ According to one study, over 80% of smokers try to quit in a typical year, and the average smoker tries to quit every eight and a half months.
- ▶ 54% of serious quit attempts fail within one week.

Adults Are Unable to Quit Smoking (2)

- ▶ Many smokers suffer from self-control problems and use commitment devices.
- ▶ **Self-control problem:** An inability to carry out optimal strategies for consumption.
- ▶ **Commitment devices:** Devices that help individuals who are aware of their self-control problems fight their bad tendencies.
- ▶ Smokers who want to quit make public promises to do so, making it embarrassing to smoke.

Implications for Government Policy

- ▶ If smokers are not rational, then intervention may be justified because of internalities.
- ▶ **Negative internality:** The damage done to oneself through adverse behavior that is not fully accounted for in decision making.
- ▶ Taxation of cigarettes is a plausible, effective mechanism to discourage smoking.

Outline

Externalities in Action: Environmental and Health Externalities

Environmental Regulation: Particulates

The Economics of Cigarette Smoking

Other Externality-Creating Behaviors

The Economics of Drinking

Very large externalities:

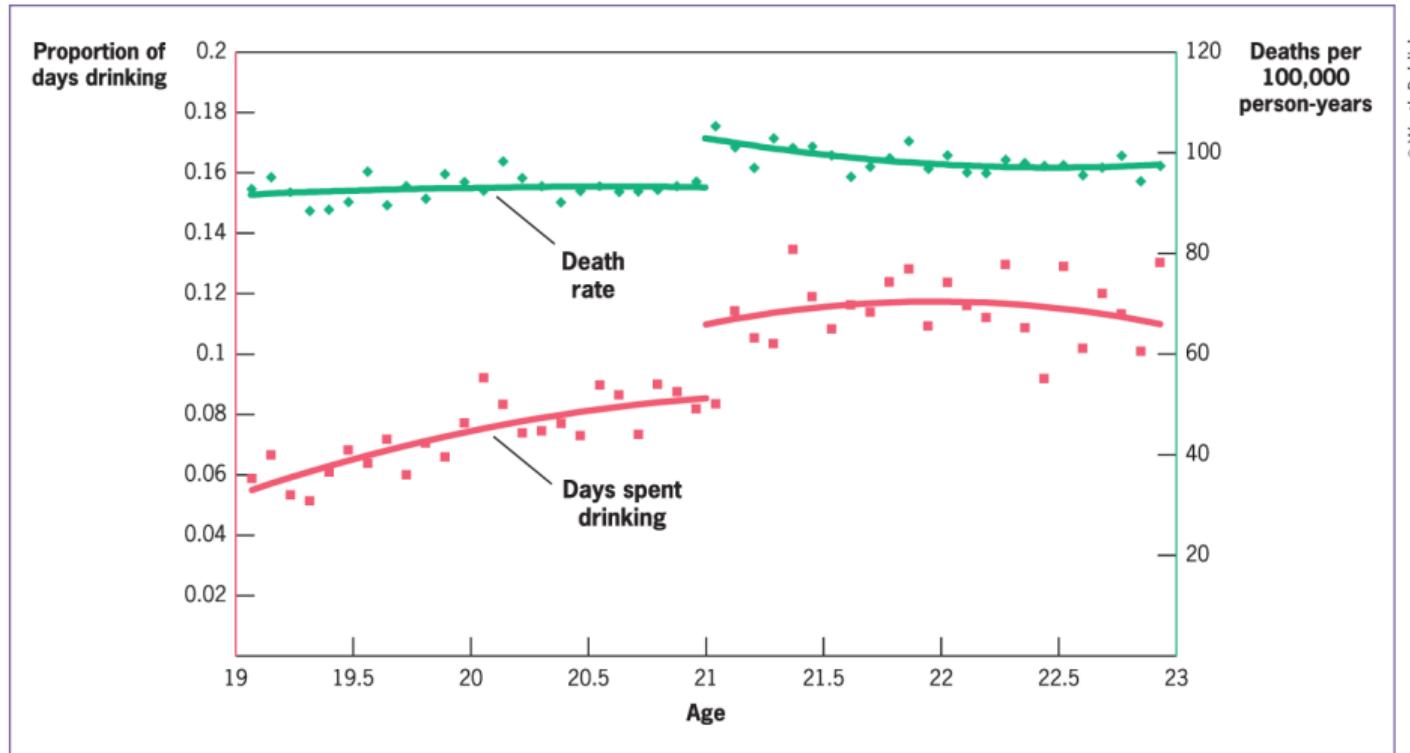
- ▶ In U.S., almost 30 people were killed per day in car crashes involving alcohol-impaired drivers.
- ▶ In 2019, people killed in alcohol-impaired driving crashes accounted for nearly one-third of traffic-related deaths.
- ▶ Driving externalities due to alcohol use are estimated at \$2.05 per drink, much higher than current alcohol taxes, which amount to an average of \$0.21 per ounce of ethanol.
- ▶ Alcohol is estimated to be involved in 55% of violent crimes.
- ▶ Two-thirds of victims attacked by a significant other report that the perpetrator had consumed alcohol.

Evidence: The Effects of Legal Drinking Age at 21 (1)

- ▶ Drinking is regulated as well as taxed: People younger than 21 cannot drink.
- ▶ How does this regulation affect people's health?
- ▶ Carpenter and Dobkin study this question using a regression discontinuity design (RDD), a very clean strategy.
- ▶ The RDD compares health outcomes of people just above and just below their birthday.
- ▶ These people are likely to be quite similar, so the RDD estimates the causal effect of being able to drink.

Evidence: The Effects of Legal Drinking Age at 21 (2)

- There is a discontinuous shift at age 21—a clear jump in the proportion of days drinking at the twenty-first birthday.



Evidence: The Effects of Legal Drinking Age at 21 (3)

Other studies confirm the importance of age 21 for the damage done by drinking.

- ▶ Carrell et al. (2011) found that academic performance falls on reaching drinking age.
- ▶ Yoruk (2015) found that young adults worked less when drinking became legal.
- ▶ Ahammer et al. (2020) found a similar jump in alcohol consumption days by 39 percent upon reaching legal drinking age in countries where the legal age is 16.
- ▶ Hansen and Waddell (2016) found that crime increased right at age 21.

Conclusion

Public finance provides tools to help us think through the regulation of many kinds of externalities:

- ▶ Regional externalities such as particulates
- ▶ Global externalities such as climate change
- ▶ Even the “internalities” of smoking and other health-related decisions

Careful analysis of public policy options requires:

- ▶ Distinguishing external costs from costs that are absorbed through the market mechanism.
- ▶ Understanding the benefits and costs of alternative regulatory mechanisms to address externalities.
- ▶ Considering whether only externalities or also internalities should count in regulatory decisions.

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Congestion Pricing in NYC

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Congestion Pricing in NYC

Cook et al. 2026 - The Short Run Effects

Over to You? Data catalog

Cook et al. 2026 - Motivation

- ▶ In January 2025, New York City implemented a congestion pricing scheme in Manhattan below 60th street.
- ▶ As we saw, congestion pricing is a classic Pigouvian tax designed to reduce negative externalities from traffic congestion and pollution.
- ▶ The policy has generated substantial debate both before and after its implementation.
- ▶ The policy is partial: Only some trips taxed and only some roads.
- ▶ Welfare effects depend on behavioral responses: Do people change driving behavior? In the taxed area? Outside the taxed area?
- ▶ Cook et al. (2026) provide one of the first rigorous evaluations of the short run effects of this policy.

Cook et al. 2026 - Congestion Tax in NYC

- ▶ The congestion tax applies to vehicles entering Manhattan south of 60th street.
- ▶ Tolls vary by time of day and vehicle type, ranging from \$9 for cars, trucks pay \$14.40–\$21.60.
- ▶ Lower prices overnight. Higher prices without EZ-Pass.
- ▶ Taxis pay \$0.75 / trip and ridesharing services \$1.50 / trip.
- ▶ Exemptions include emergency vehicles, public transit.
- ▶ Revenues to be used to fund public transportation improvements.

Cook et al. 2026 - Data

- ▶ Main data comes from Google Maps Traffic Trends, which provides anonymized, aggregated data on vehicle trips in NYC.
- ▶ Covers 9/2024 – 6/2025.
- ▶ Data from NYC and 5 control cities: Chicago, Atlanta, Boston, Philadelphia, and Baltimore.
- ▶ Data at segment level:

$$\bar{y}_{jt} = \frac{\sum_{s \in S_j} \sigma_{s,t} \times d_{s,t}}{\sum_{s \in S_j} \sigma_{s,t} (d_{s,t} / y_{s,t})} \quad (1)$$

where outcome y_{jt} for segment j in period t , S_j is road segments in group j , σ_{jt} is pre-reform share of traversals, and $d_{s,t}$ is distance on segment s .

- ▶ Also origin-destination outcomes, air quality, spending, foot traffic data.

Cook et al. 2026 - Empirical Strategy

- ▶ The authors use Generalized Synthetic Controls (GSC) introduced by Xu (2017). Untreated potential outcomes for unit i at time t are modeled as:

$$Y_{it}(0) = \alpha_i + \gamma_t + \boldsymbol{\lambda}_i^\top \mathbf{f}_t + \varepsilon_{it} \quad (2)$$

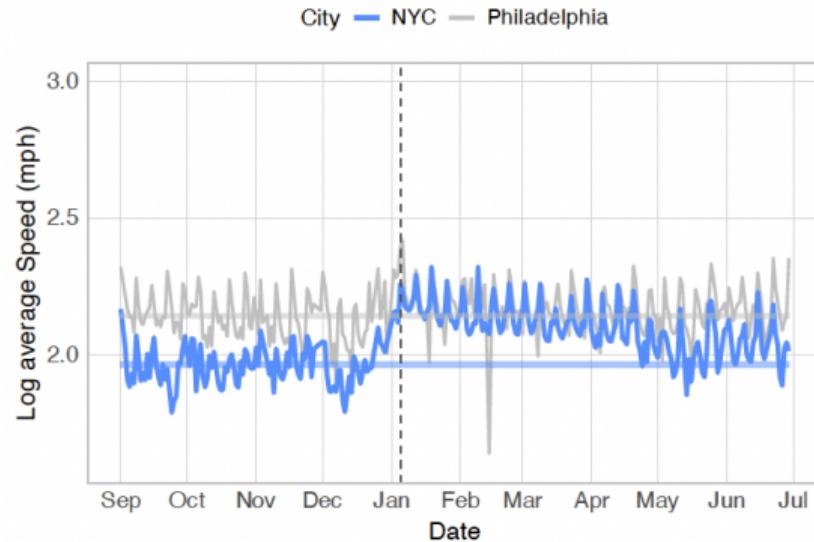
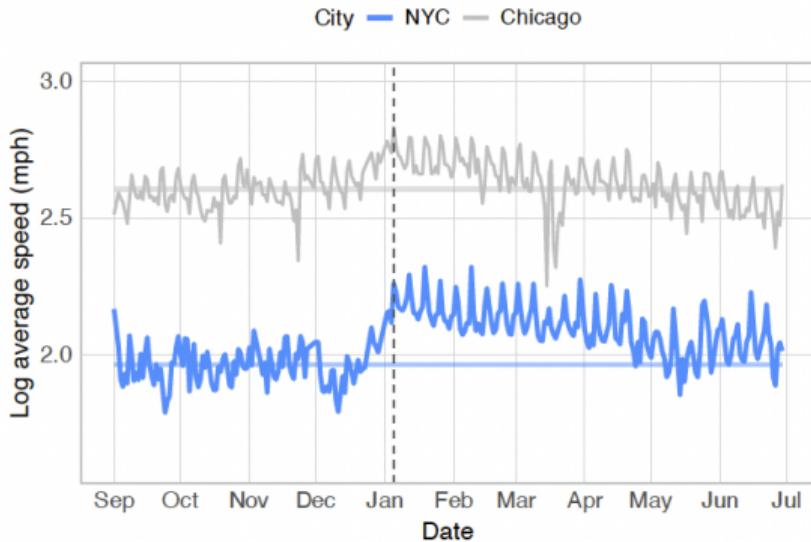
where \mathbf{f}_t is a low-dimensional set of common factors with unit-specific loadings $\boldsymbol{\lambda}_i$.

- ▶ Estimated ATT is then:

$$\widehat{ATT}_t = \frac{1}{|\mathcal{I}|} \sum_{i \in \mathcal{I}} Y_{it} - \hat{Y}_{it}(0) \quad (3)$$

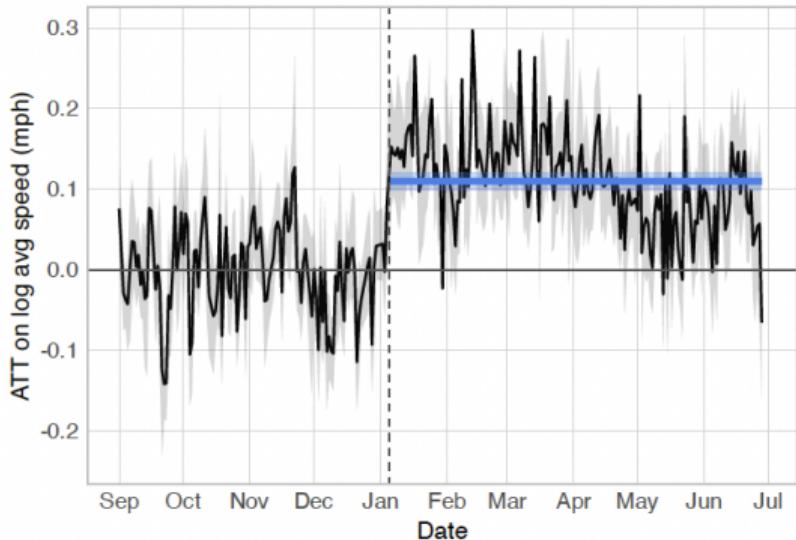
where \mathcal{I} is the set of treated units.

Cook et al. 2026 - Results: CBD

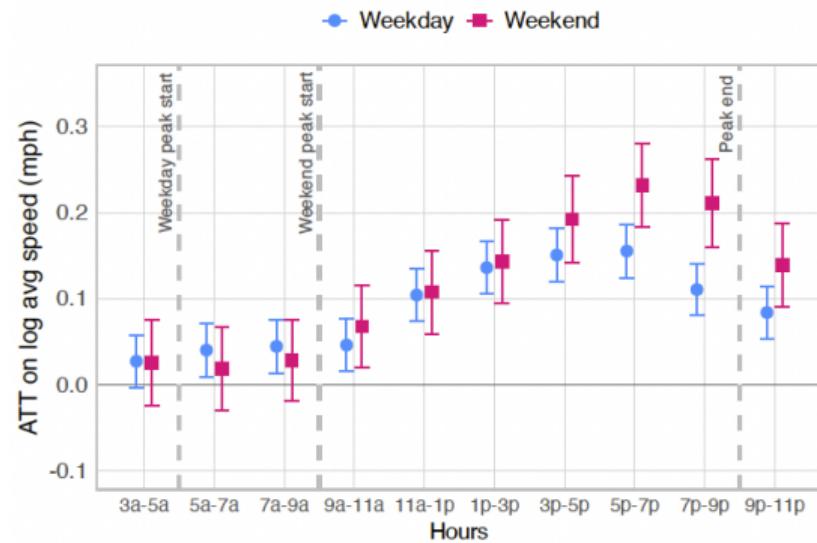


Cook et al. 2026 - Results: CBD

(a) ATT on log speeds: road segments



(d) ATT on log speeds: hour of day



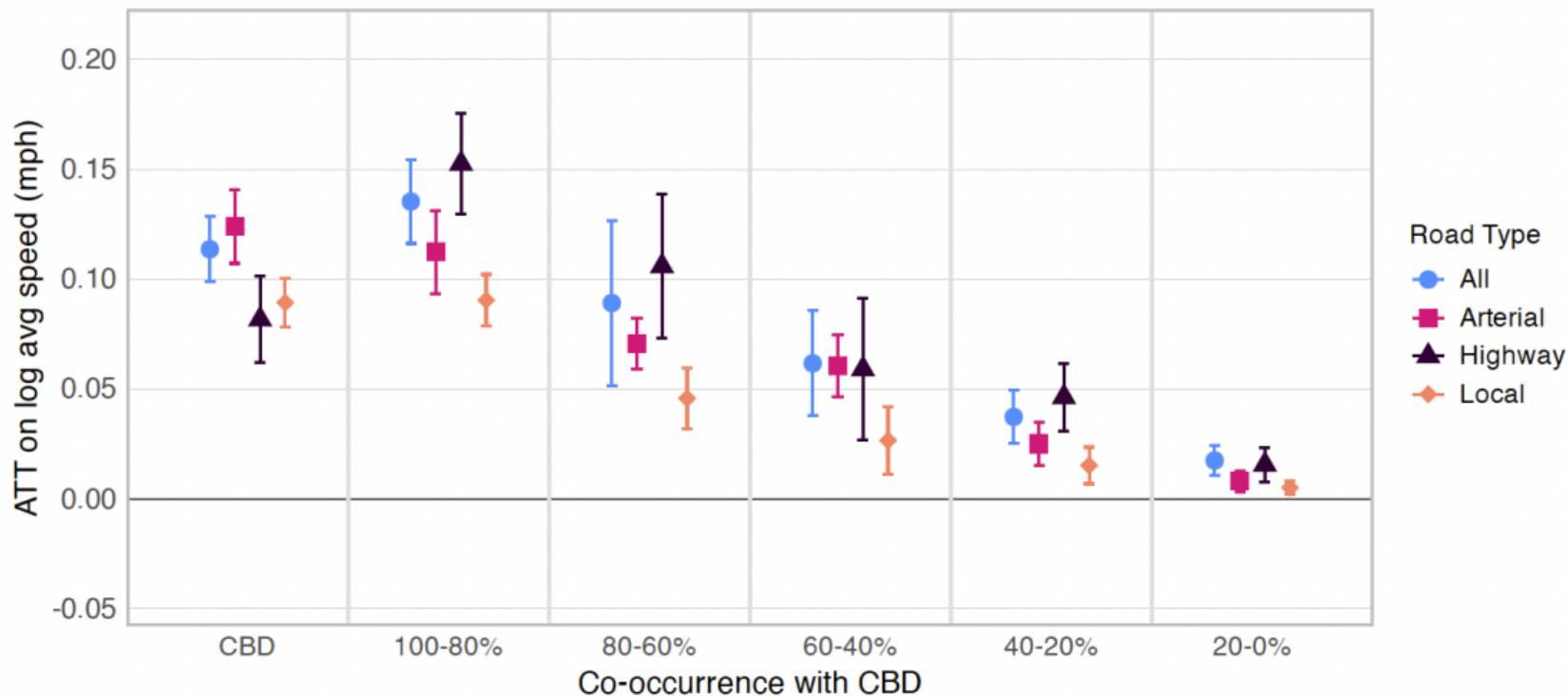
Cook et al. 2026 - Results: Spillovers

- ▶ To measure spillovers, define a measure of the extent of exposure of each road segment: *co-occurrence*.
- ▶ Let: S_{CBD} be the set of segments in the CBD and R the set of trips. Each trip is $R_i = \{s_1, \dots, s_N\}$: a set of segments s_j traversed to get from the origin to the destination.
- ▶ Then co-occurrence of segment s with the CBD C_s is:

$$C_s = \frac{|\{R_i \in R | s \in R_i \wedge S_{CBD} \cap R_i \neq \emptyset\}|}{|\{R_i \in R | s \in R_i\}|} \quad (4)$$

- ▶ Then estimate ATT separately by co-occurrence.

Cook et al. 2026 - Results: CBD



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Congestion Pricing in NYC

Cook et al. 2026 - The Short Run Effects

Over to You? Data catalog

Data Catalog

1. <https://www.congestion-pricing-tracker.com/> Congestion Pricing Tracker.
2. <https://www1.nyc.gov/site/tlc/about/tlc-trip-record-data.page> NYC Taxi and Limousine Commission Trip Record Data.
3. <https://c2smart.engineering.nyu.edu/manhattan-congestion-tracker/> Manhattan Congestion Tracker.
4. https://data.cityofnewyork.us/Transportation/Automated-Traffic-Volume-Counts/7ym2-wayt/about_data NYC Automated Traffic Volume Counts.

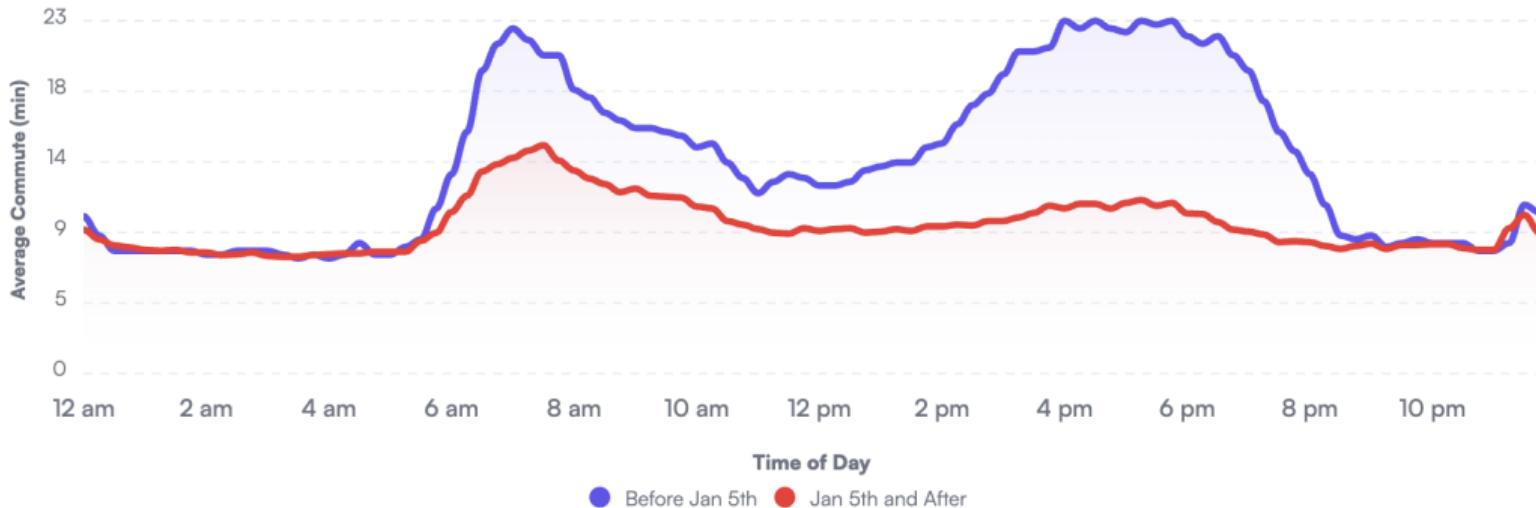
Data Catalog: Congestion Pricing Tracker

Commute Times for

Route 7: Holland Tunnel (Affected)

on

Mondays



Data Catalog: TLC Trip Record Data



Taxi & Limousine Commission

Kreyòl Ayisyen ▶ Translate ▾



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On this page you'll find aggregated data containing information on our regulated industries and raw trip data from our licensees.

- **Aggregated Reports** – On this page you will find aggregated reports, local law reports, and other statistical findings.
- **Raw Data** – In partnership with the New York City Department of Information Technology and Telecommunications (DOITT), TLC has published millions of trip records from both yellow medallion taxis and green SHLs.

Data Catalog: Manhattan Congestion Tracker



Welcome to the C2SMART Manhattan Congestion Tracker!



This interactive data dashboard integrates various public data sources to track congestion in the New York City region's transportation system. It will update regularly and continue to evolve with the addition of new data, impact metrics, and visualizations.

Data Catalog: NYC Automated Traffic Volume Counts



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Automated Traffic Volume Counts Transportation

New York City Department of Transportation (NYC DOT) uses Automated Traffic Recorders (ATR) to collect traffic sample volume counts at bridge crossings and roadways. These counts do not cover the entire year, and the number of days counted per location may vary from year to year.

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