Lecture 03

Coasean Bargaining

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AEM 4510

Roadmap

1. Can we achieve the efficient outcome without government intervention?
2. What does the Coase theorem say?
3. What are the limits to Coasean bargaining?

Coase Theorem

Pigou vs Coase

We have argued that efficient allocations are not achieved in the presence of externalities

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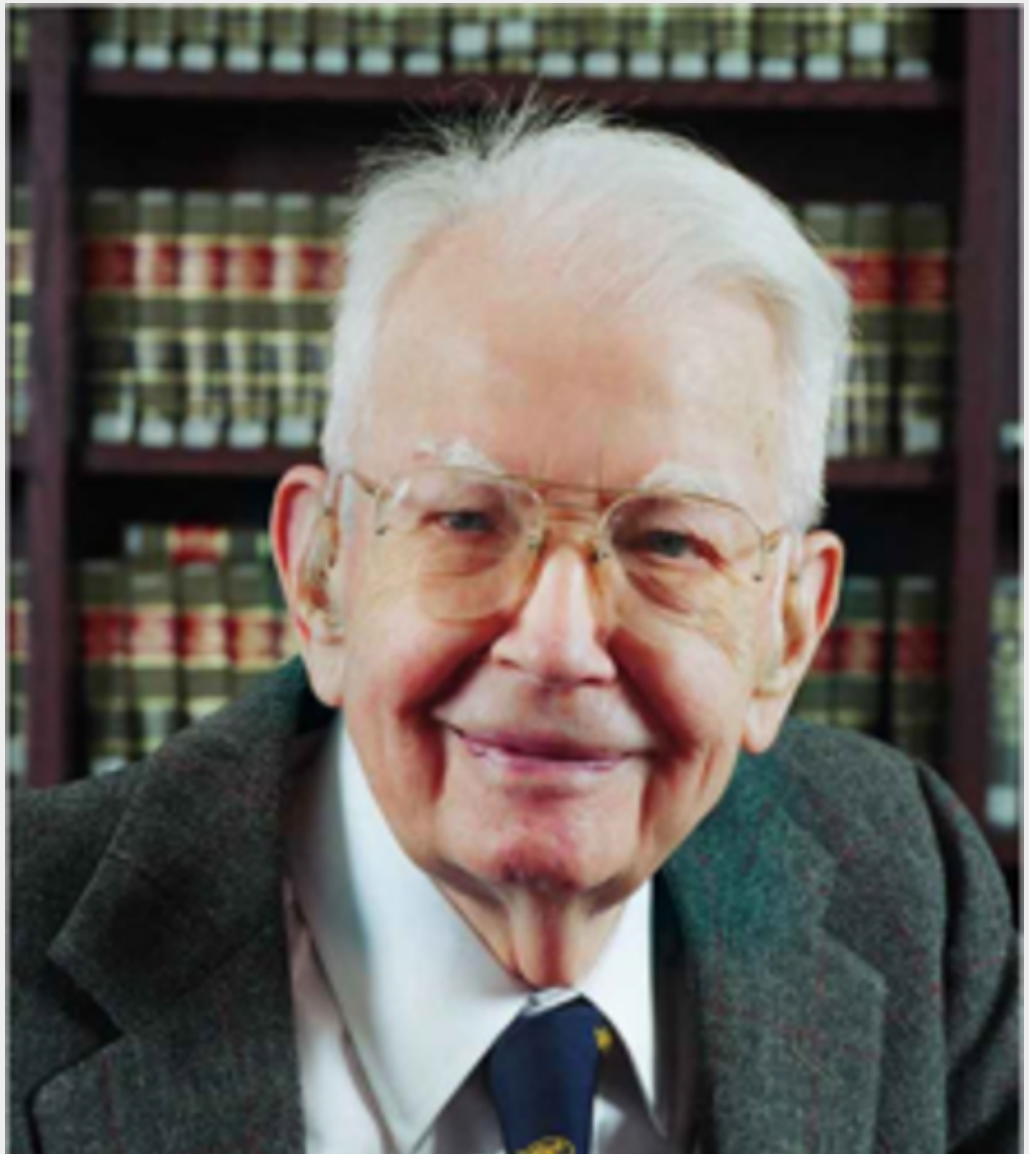
Why?

There are no markets through which the source of the externality must pay/be compensated for its effect on society

i.e. they're not priced

This means there's a role for government to create this market or price the externality

Ronald Coase (1910-2013)



In a famous paper ("The Problem of Social Cost"), 1991 Nobel prize winner Ronald Coase made people rethink this

Do we actually NEED government intervention?

Ronald Coase (1910-2013)

The Coase Theorem

If there are:

1. No wealth effects on demand
2. No transactions costs
3. Well-defined property rights

then:

The Coase Theorem

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then:

the most efficient or optimal economic activity will occur regardless of who holds the property rights

The right to pollute (a resource) will end up in the hands who value it most through negotiation

Coasean arguments

Coase versus Pigou: externalities are reciprocal in nature

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Coasean arguments

Coase versus Pigou: externalities are reciprocal in nature

A power plant produces emissions that nearby residents breathe and those people incur the external costs

By breathing the air, the nearby residents help create the externality (i.e. if they weren't there, there would be no external cost from emitting pollution)

Coasean arguments

What is more valuable to society?

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The externality generated by the power plant or letting people live nearby?

Coasean arguments

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The externality generated by the power plant or letting people live nearby?

Argument resonates better in the context of the legal cases being considered by Coase (e.g. the doctor and the confectioner). In the context of the power plant the victims aren't "producing" anything

The Doctor and the Confectioner

More noise = more candy and less medical services

The Doctor and the Confectioner

More noise = more candy and less medical services

Less noise = less candy and more medical services

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Which is better from a social point of view depends upon the relative values of candy and medical services

The Doctor and the Confectioner

More noise = more candy and less medical services

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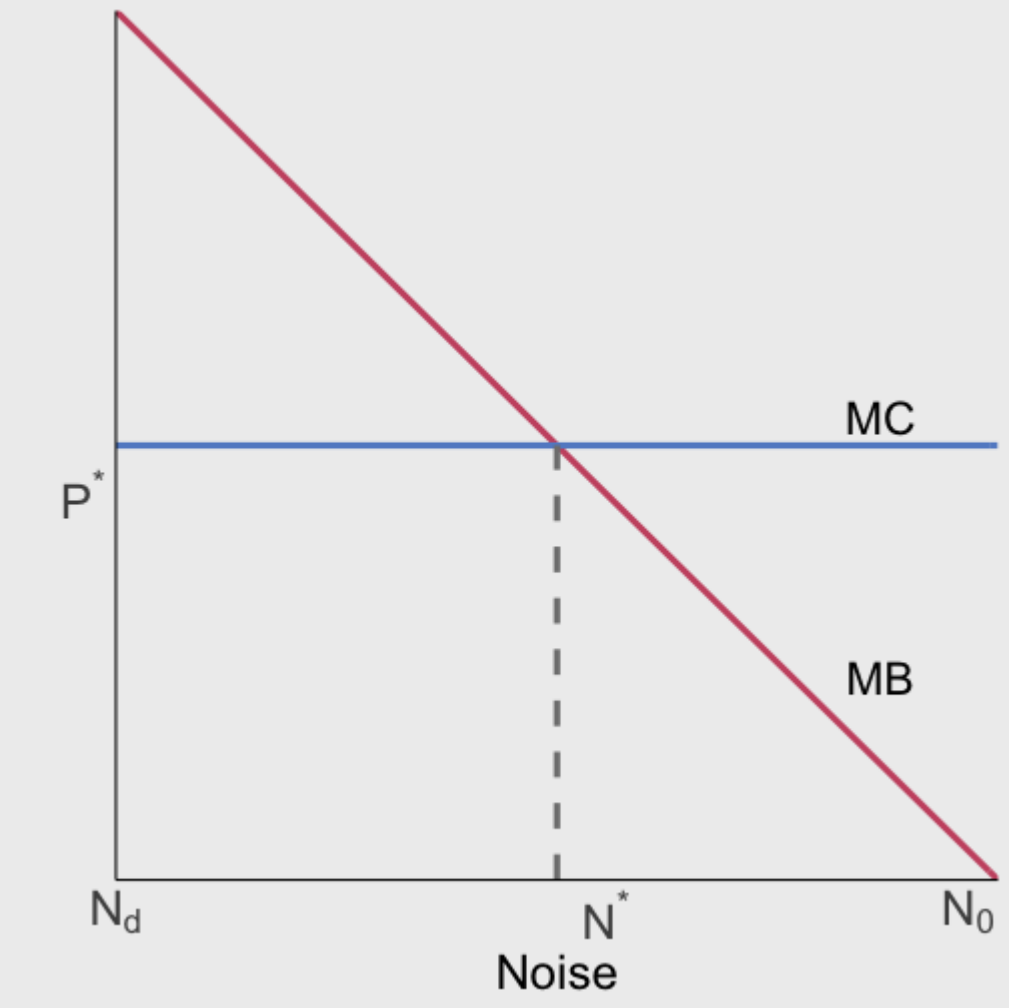
Which is better from a social point of view depends upon the relative values of candy and medical services

Is the net benefit to society better at no noise, 0, or the level of noise that maximizes confectioner profit, N_0

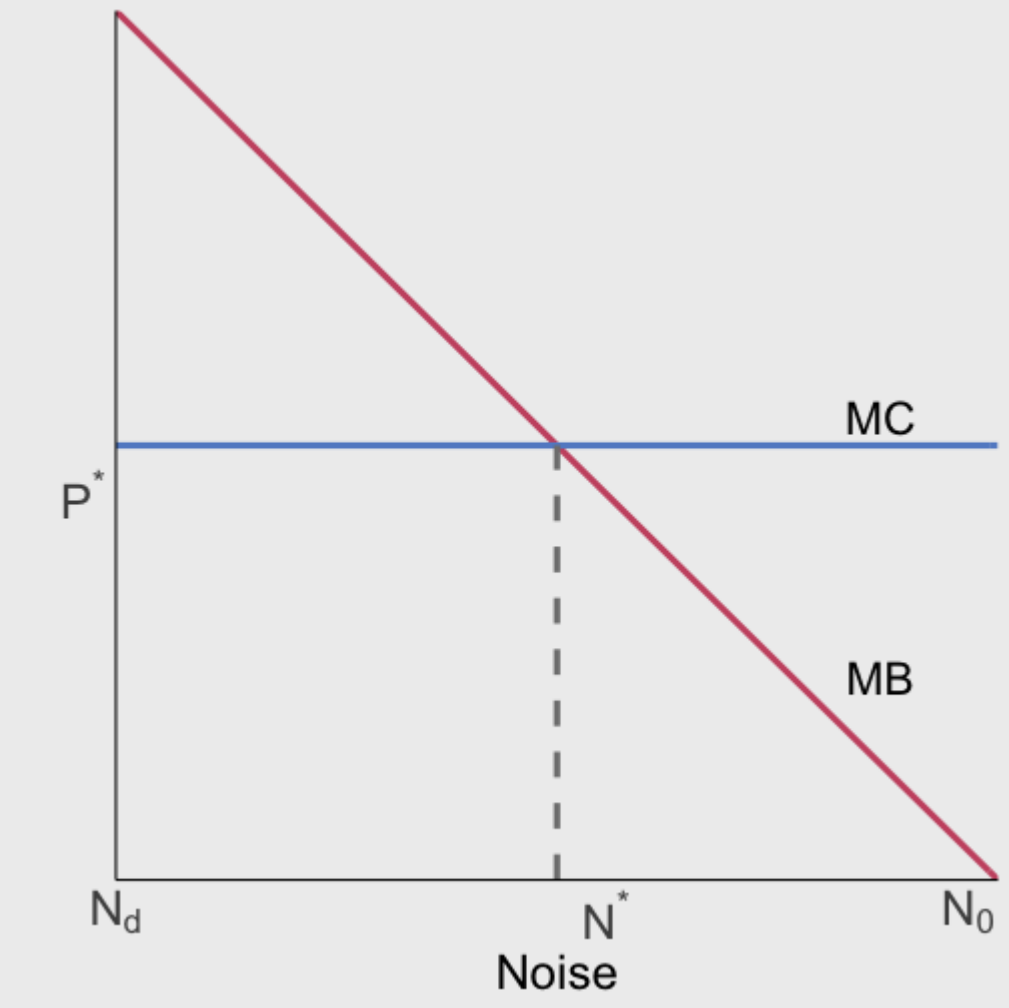
The Doctor and the Confectioner



MC is the marginal cost imposed on the doctor by noise

MB is the marginal benefit to the confectioner (marginal profits) from the production process that creates noise

Coase: Point 1



It is important to establish that someone has the property rights

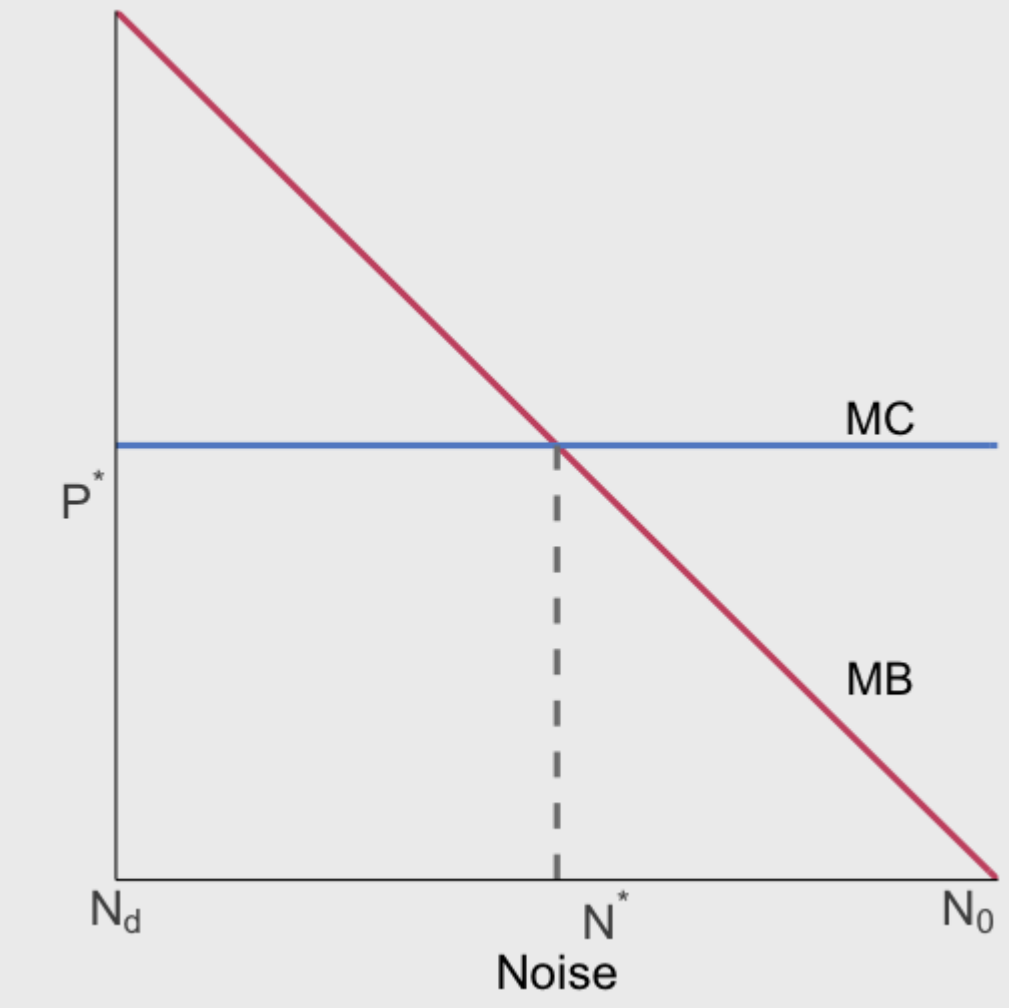
Otherwise, trade will not happen

Give property rights to the confectioner

Initial outcome will be $N=N_0$

What happens next?

Coase: Point 1

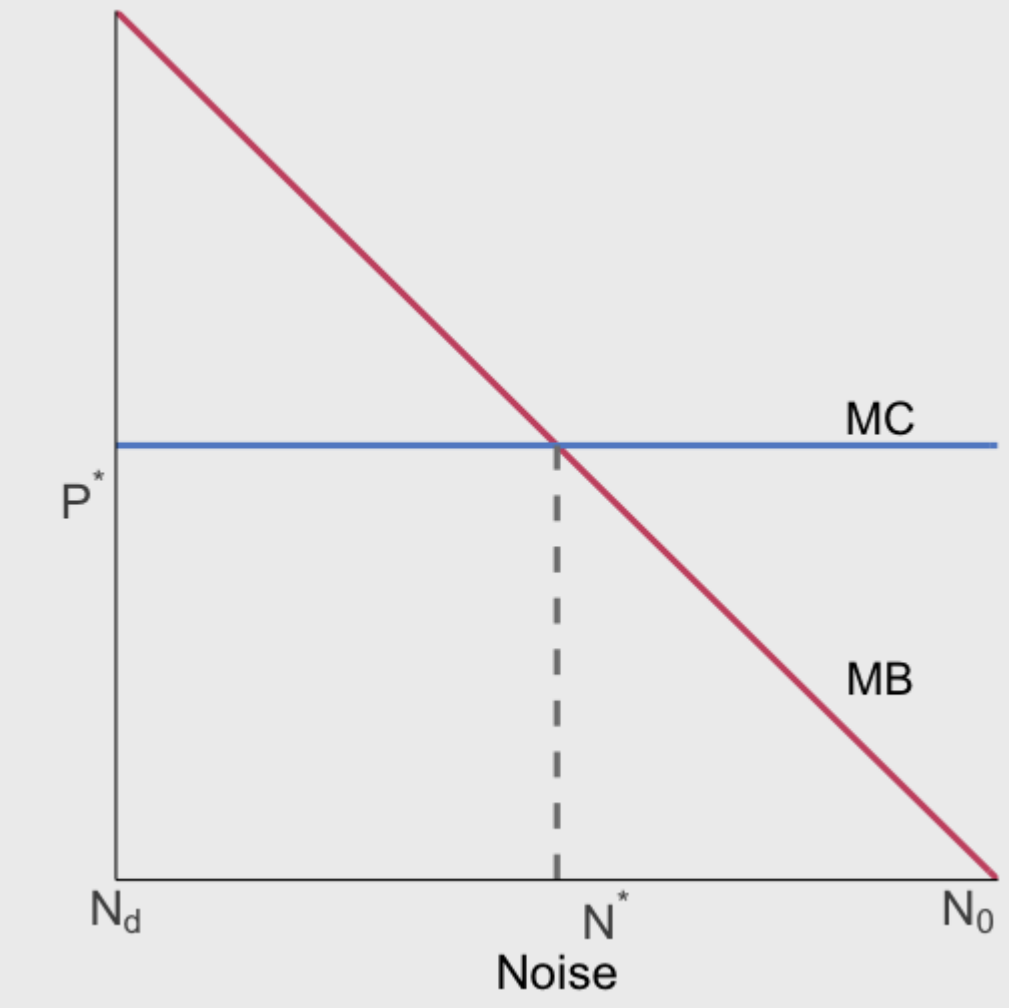


the doctor can pay the confectioner to stay quiet (stop producing) for part of the day

Why?

Because MC to the doctor is higher than the MB to the confectioner for the units of noise after N^*

Coase: Point 1



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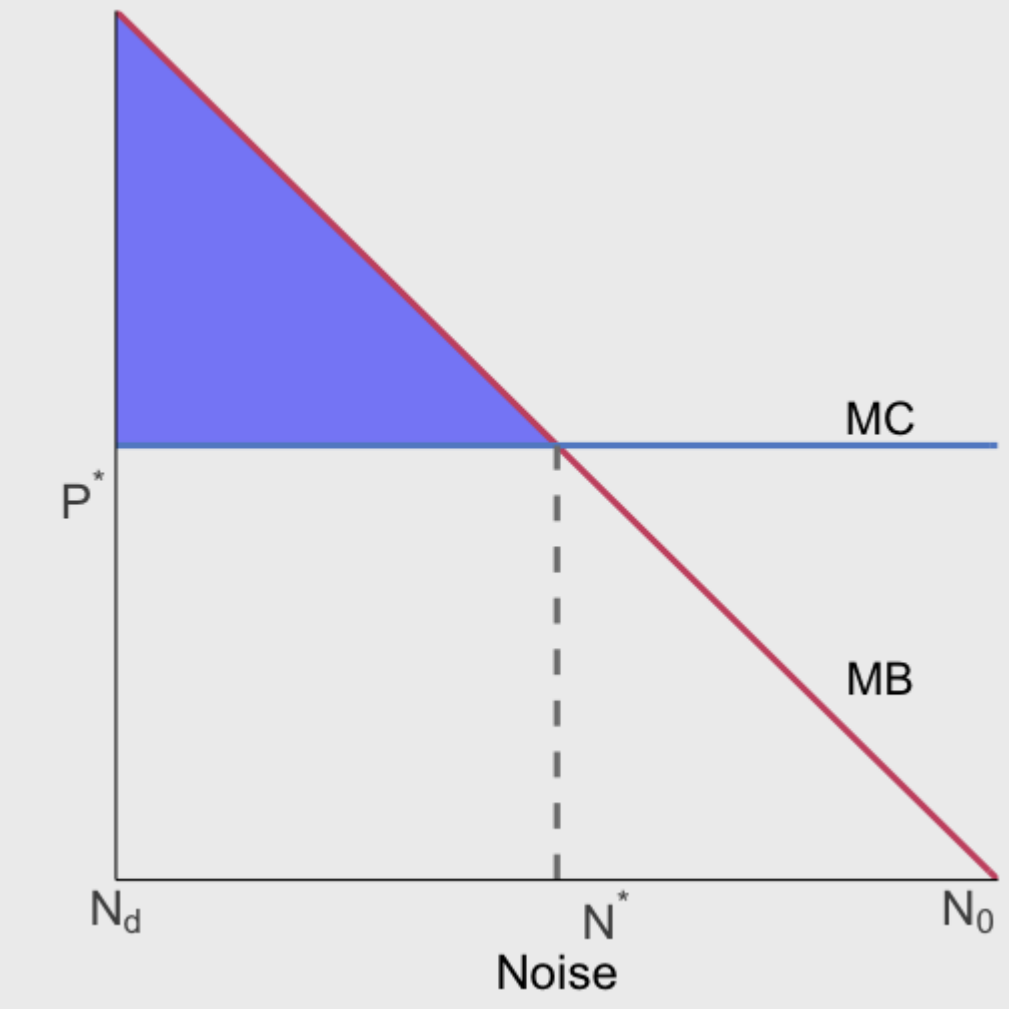
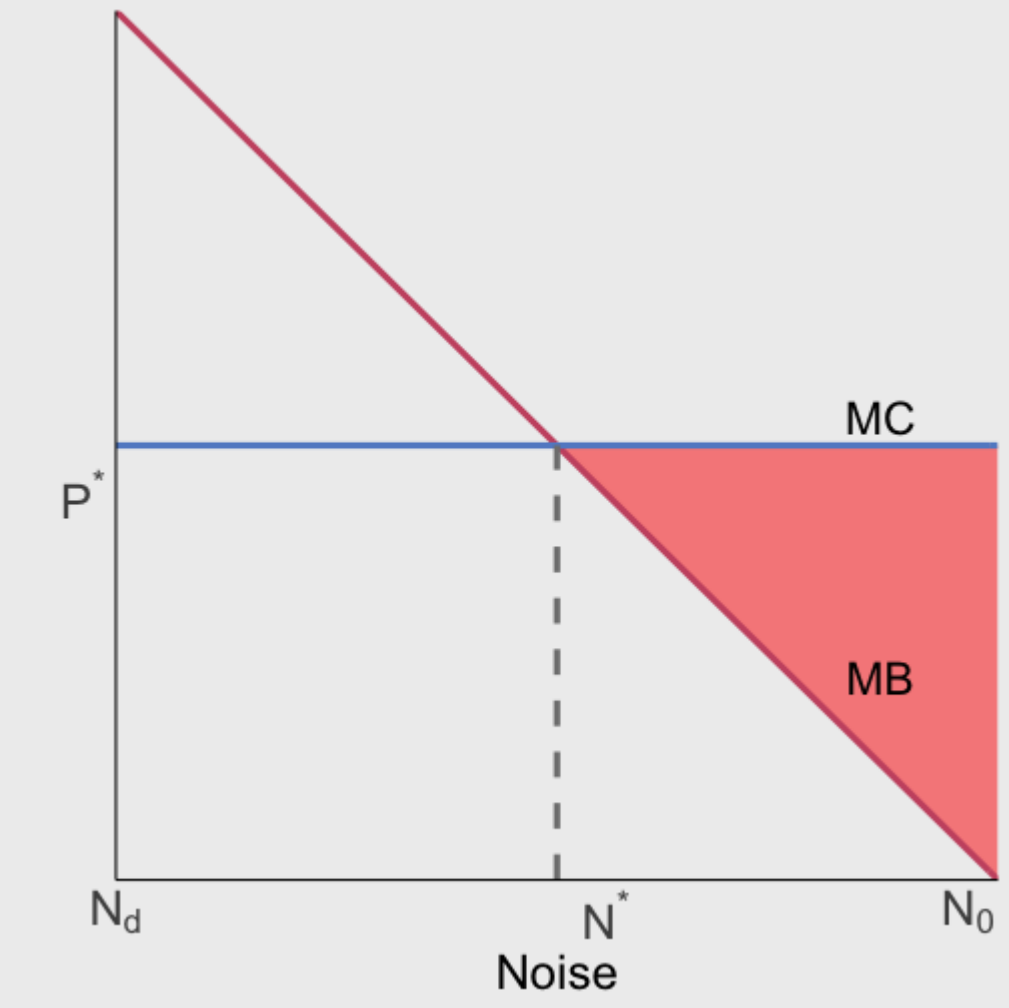


The doctor is willing to pay more (MC) than the confectioner is willing to accept (MB) until noise is reduced to N^*

This is where total benefit is maximized (blue area)

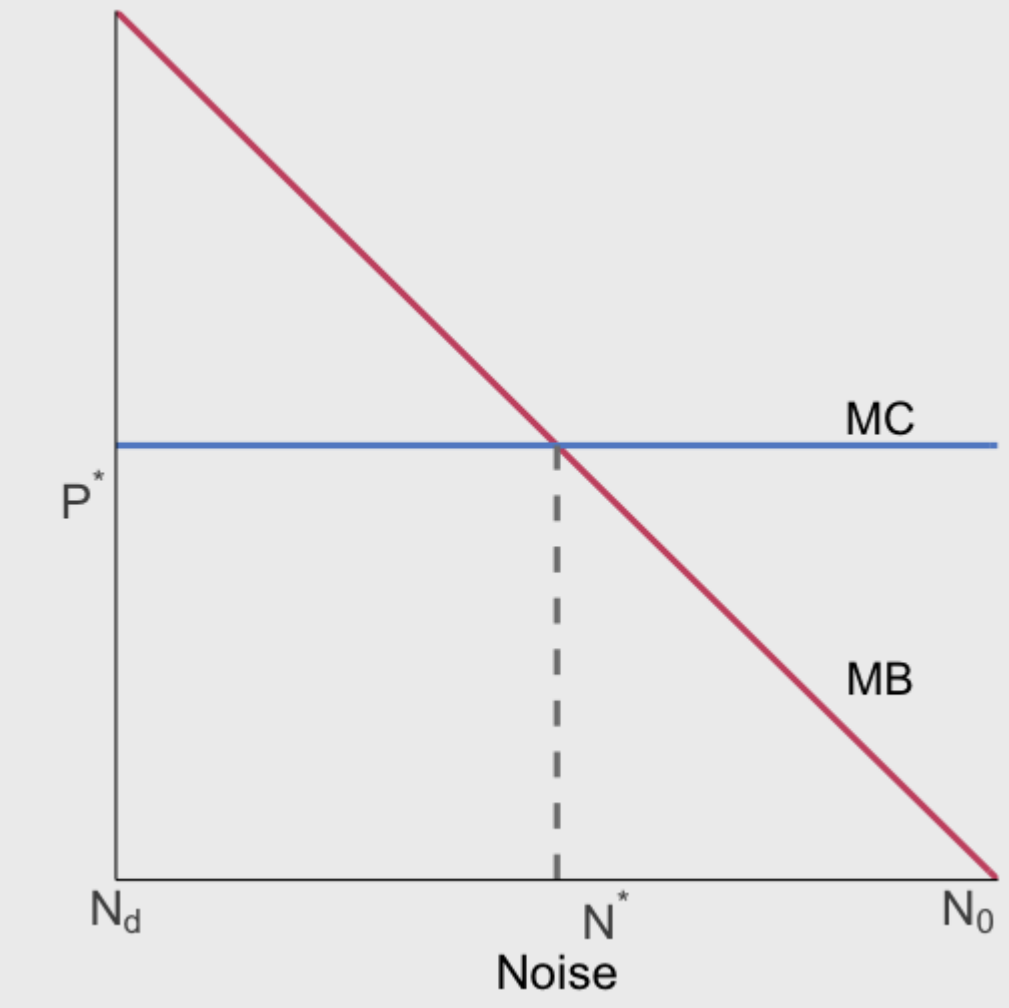
Coase: Point 1



The doctor and confectioner can split the **bargaining surplus**, the red area

This is just the avoided deadweight loss from the noise externality

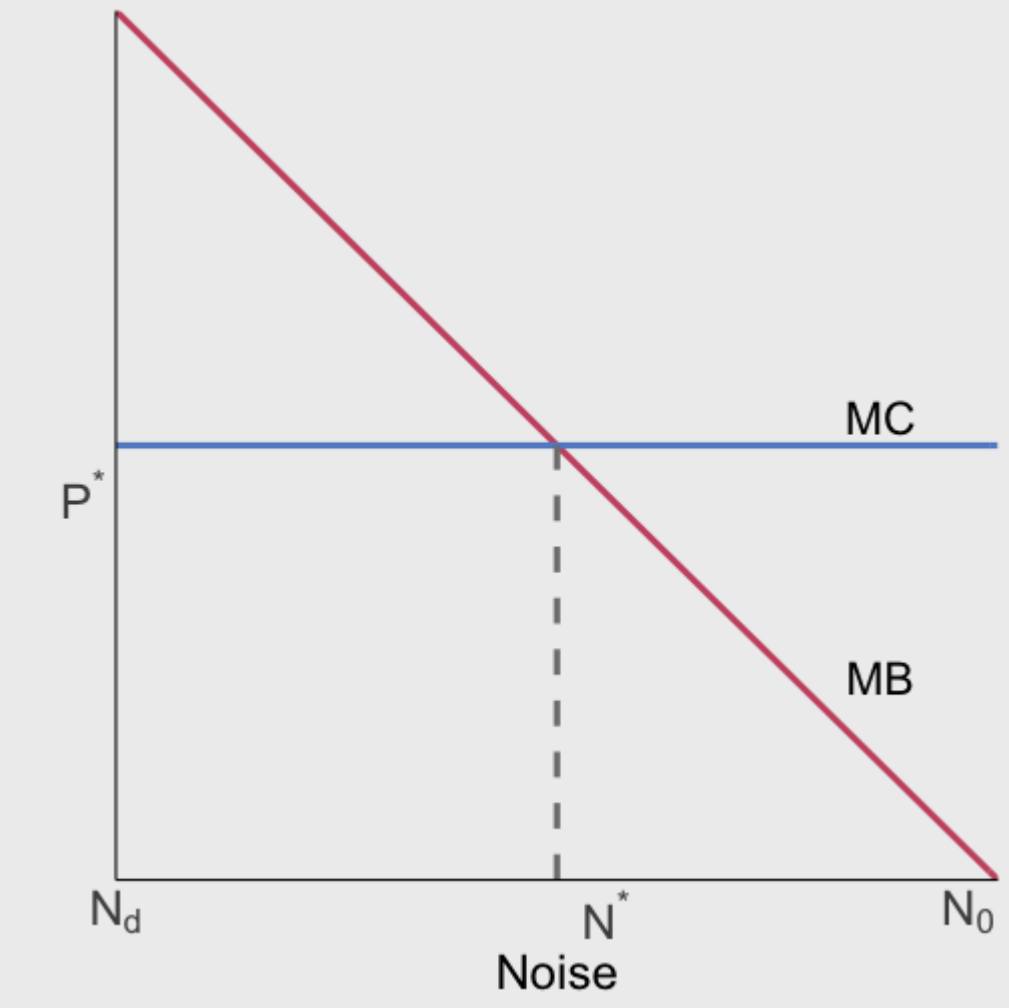
Coase: Point 1



Instead of assigning property rights to the confectioner we could have assigned them to the doctor

In this case what happens?

Coase: Point 1

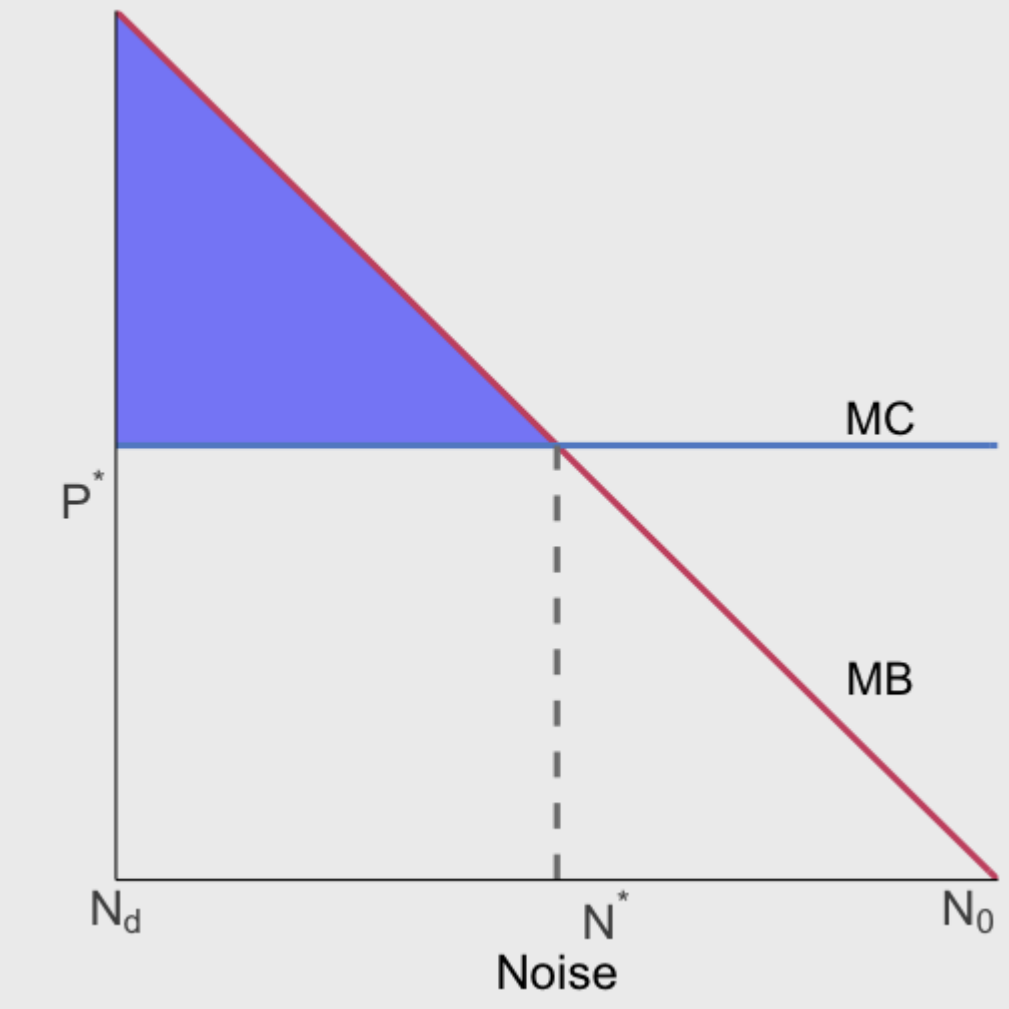


First, we start at N_d now since the doctor does not like noise

Confectioner pays the doctor to be allowed to make noise

The confectioner is willing to pay (MB) more than the doctor is willing to accept (MC) until we reach N^*

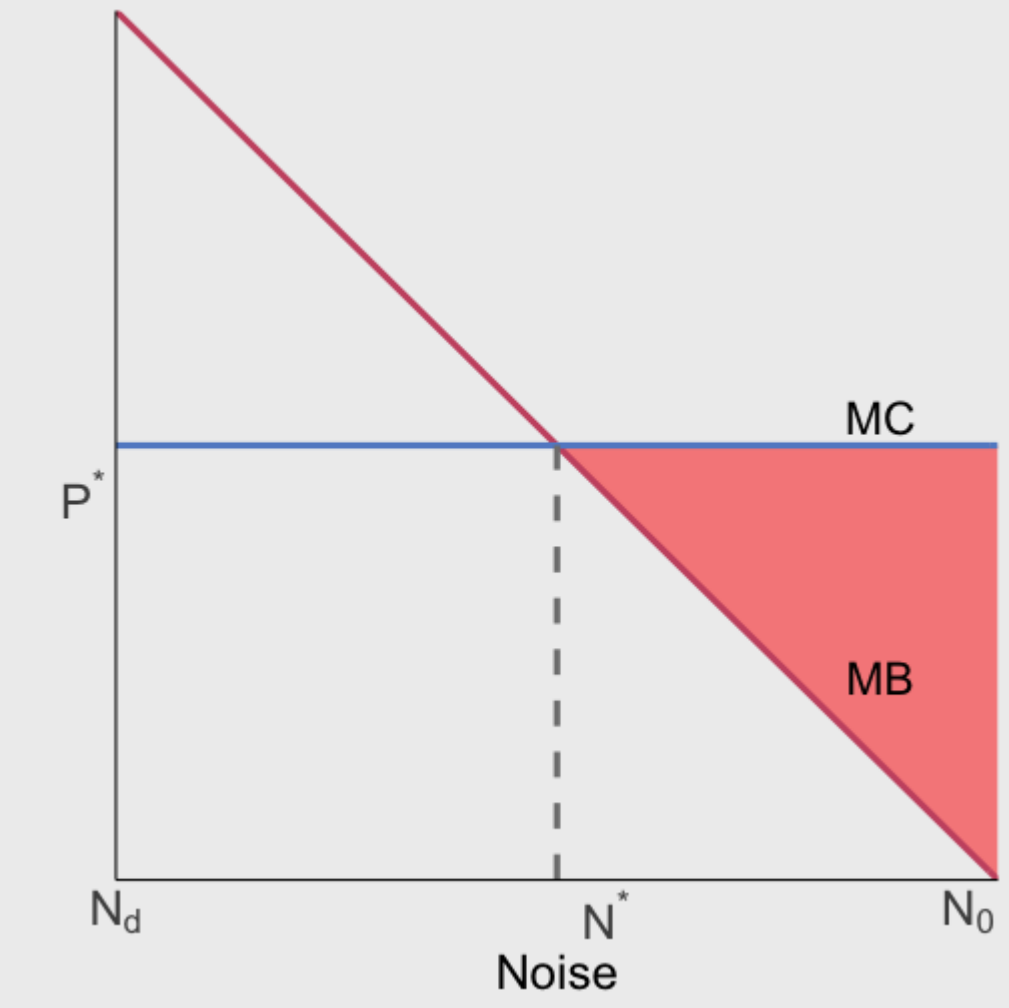
Coase: Point 1



We now maximize surplus (**blue**) and gain bargaining surplus (**blue**) that is split between the doctor and confectioner

It didn't matter who had the property rights, we managed to get to N^*

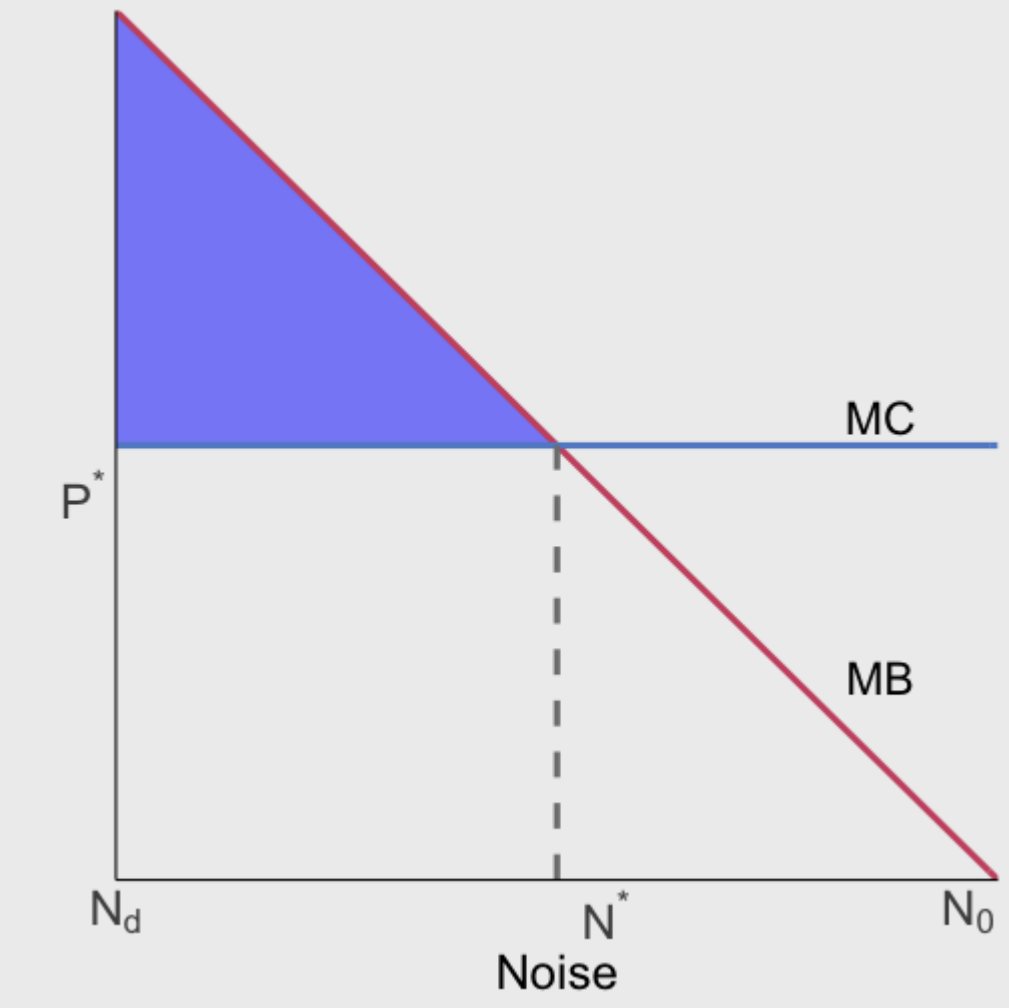
Coase: Point 2



The initial assignment of property rights does matter for the distribution of surplus

If we give the confectioner property rights, they get paid by the doctor some quantity up to the total size of the red area (bargaining surplus)

Coase: Point 2



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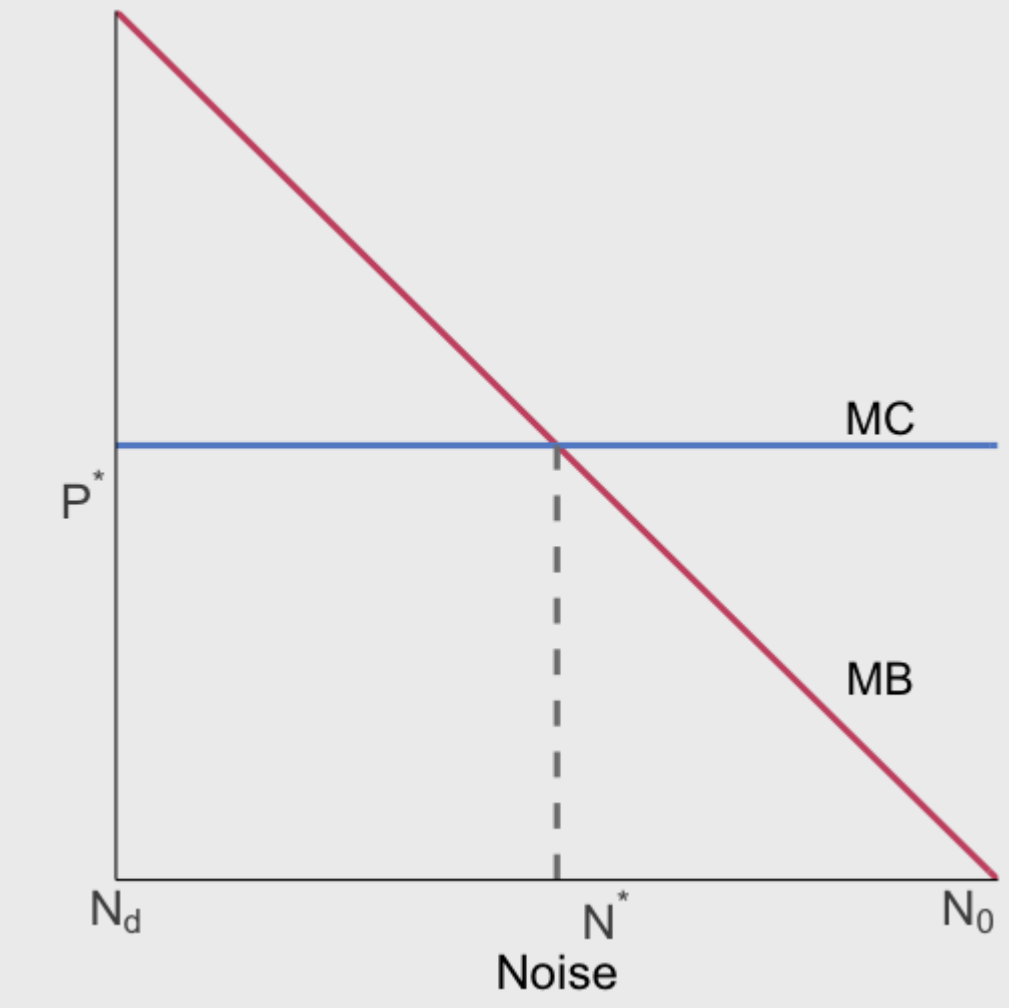

This means that property rights are valuable!

If you have property rights, others have to incentivize you in order to deviate from your privately optimal choice

You will only change the level of noise if your welfare/surplus improves

Coase: Point 3

What if the choice is discrete: noise or silence?

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Suppose the surplus to the two people under noise and silence is given by:

	Confectioner	Doctor
Noise	500	0
Silence	0	250

What happens?

Coase: Point 3

What if the choice is discrete: noise or silence?

Suppose the surplus to the two people under noise and silence is given by:

	Confectioner	Doctor
Noise	500	0
Silence	0	250

What happens?

Total surplus is maximized with noise (500 > 250)...

Coase: Point 3

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If the confectioner has the property rights, we are already at the efficient outcome

If the doctor has property rights, the confectioner can pay the doctor > 250 but < 500 and both are better off, a Pareto improvement!

Coase Caveats

Coasean bargaining does not always work

There are two key pieces we need to have satisfied:

1. No Transactions costs
2. No income effects

Coase Caveats: Transactions costs

Suppose the doctor owns the property right of zero noise

Noise N imposes cost $C(N)$ on the doctor, benefits $B(N)$ to the confectioner

Coase Caveats: Transactions costs

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The confectioner could propose a contract where the doctor accepts some noise N, in exchange for a payment θ

Coase Caveats: Transactions costs

The confectioner could propose a contract (N, θ) consisting of noise level N and transfer payment θ

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Negotiating is costly and has its own transactions cost tr

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The doctor is weakly better off accepting the contract if the transfer payment θ (the benefit) is at least the cost of noise $C(N)$

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i.e. what contract proposal maximizes the confectioner's profit?

Coase Caveats: Transactions costs

The confectioner will choose to offer $\theta = MC \times N$

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Why?

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Why?

It's the least amount required for the doctor to accept

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This means we can write the confectioner's total profit as:

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$$\pi(N) = B(N) - MC \times N - tr$$

Where $B(N)$ is the benefits to the confectioner of noise (area under the MB curve)

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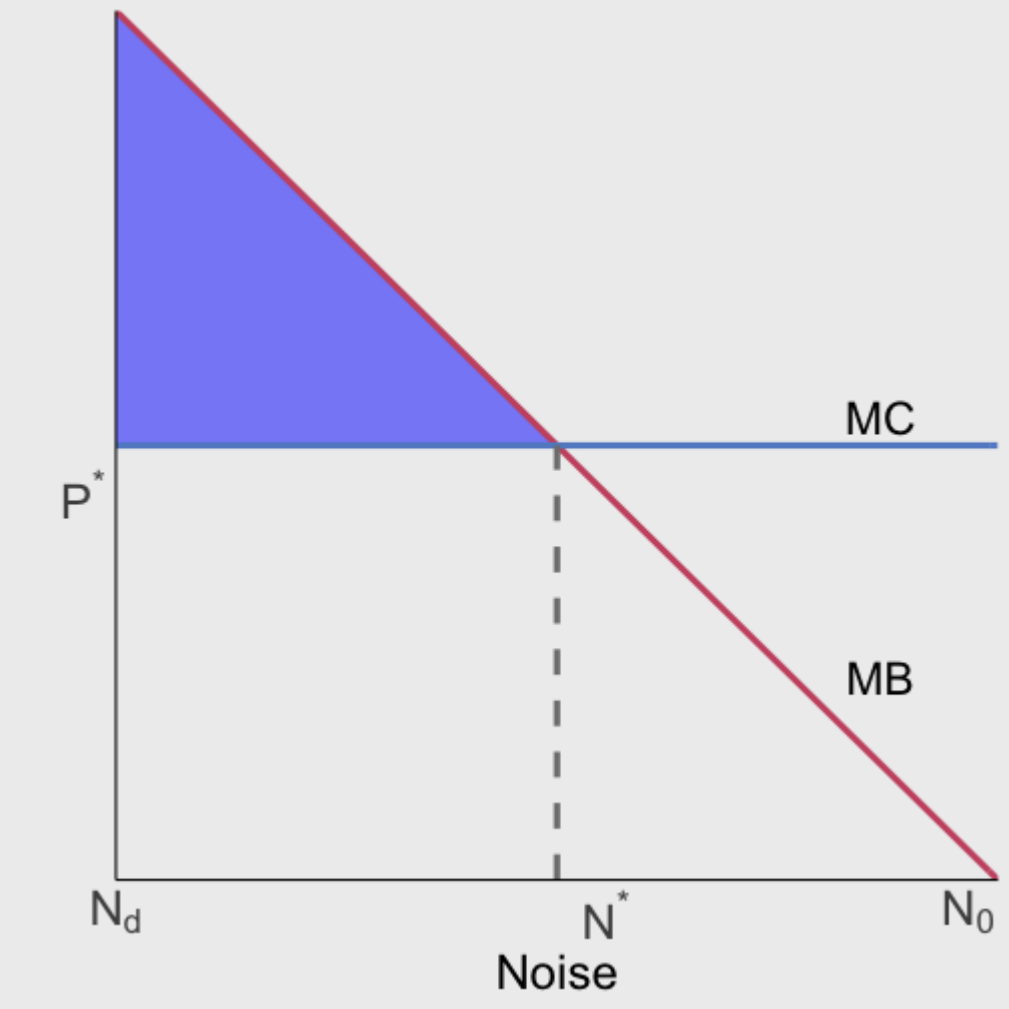
Did transactions costs actually cause any problems?

Coase Caveats: Transactions costs



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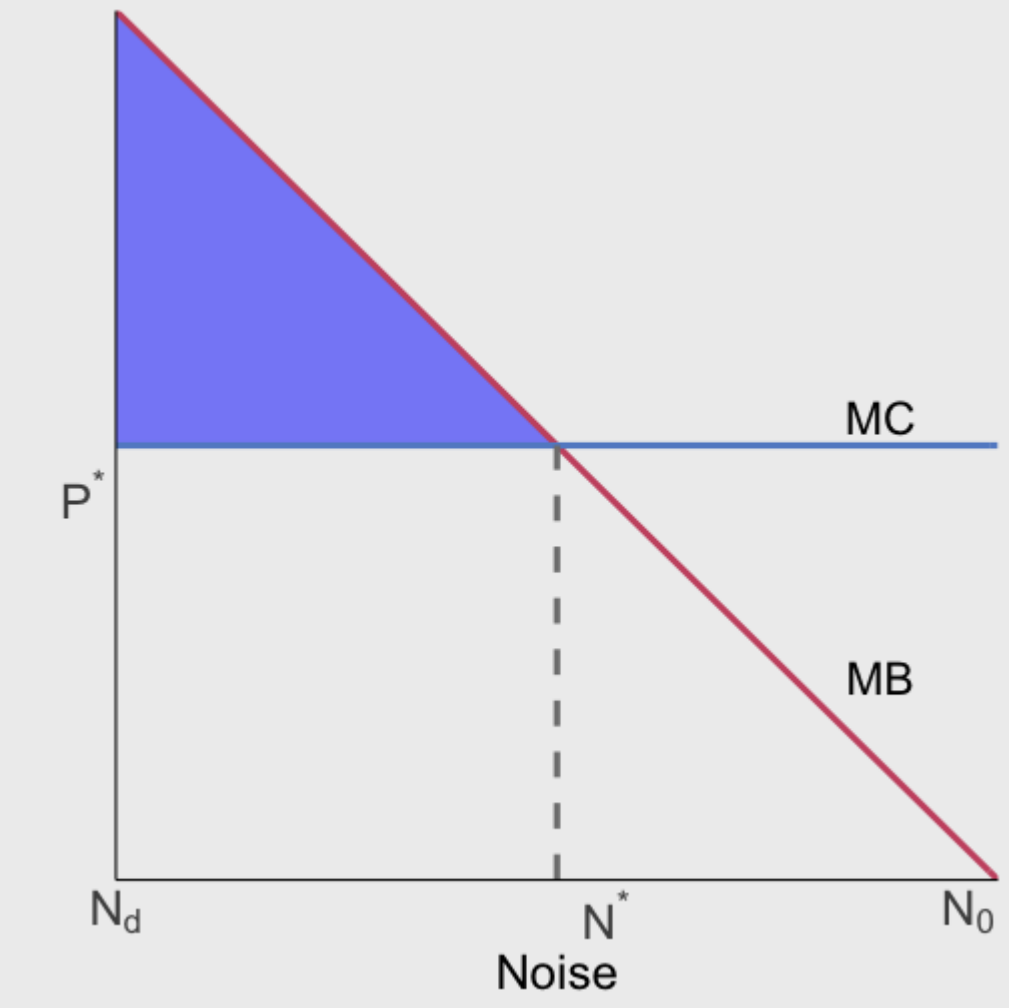
Coase Caveats: Transactions costs



Yes! Why?

To have a mutually beneficial contract we still need the total gain in surplus (**blue**) to be greater than tr

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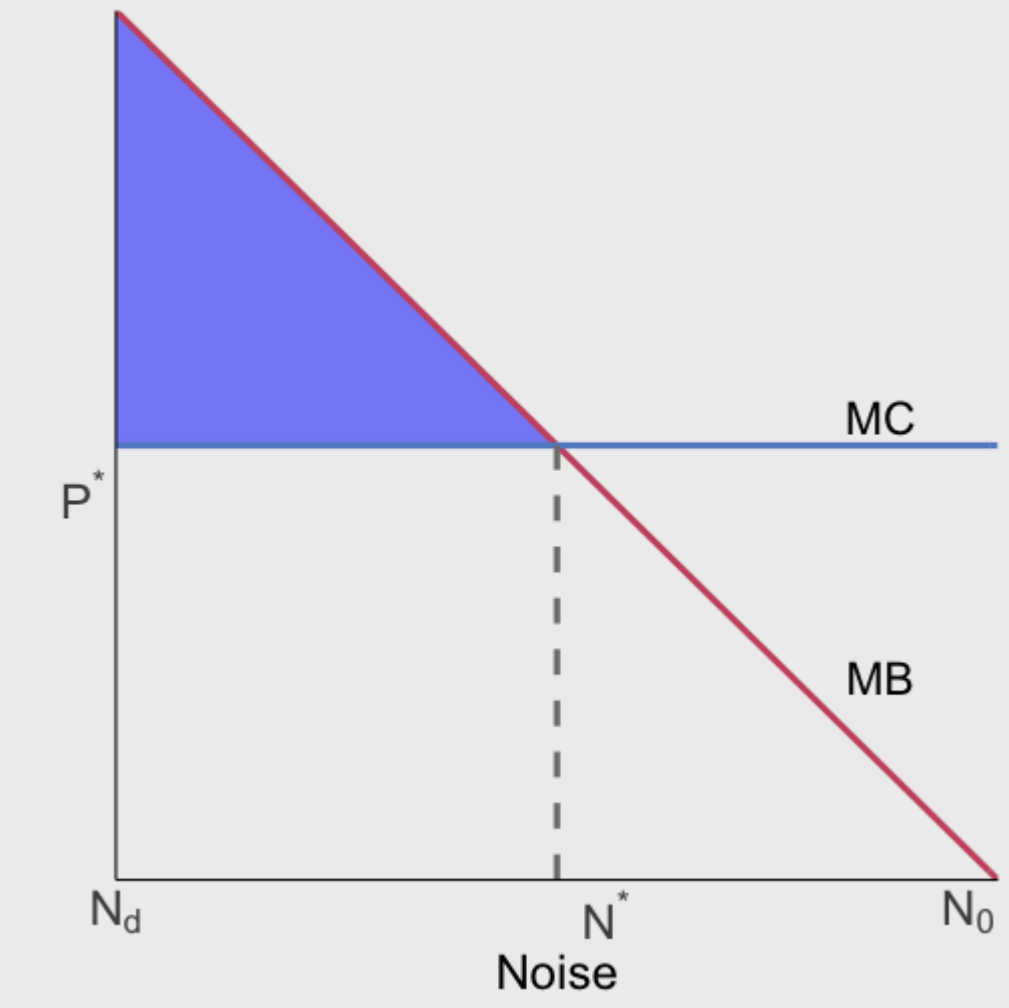

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The doctor will then offer the minimum required: $\theta = B(N_0) - B(N)$

Coase Caveats: Transactions costs

The doctor's problem is then to maximize the benefits of the transaction:

$$\max_N \underbrace{MC \times (N_0 - N)}_{\text{noise cost reduction}} - \theta - tr$$

Which we can write as:

$$\max_N MC \times (N_0 - N) - \underbrace{(B(N_0) - B(N))}_{\theta} - tr$$

Coase Caveats: Transactions costs

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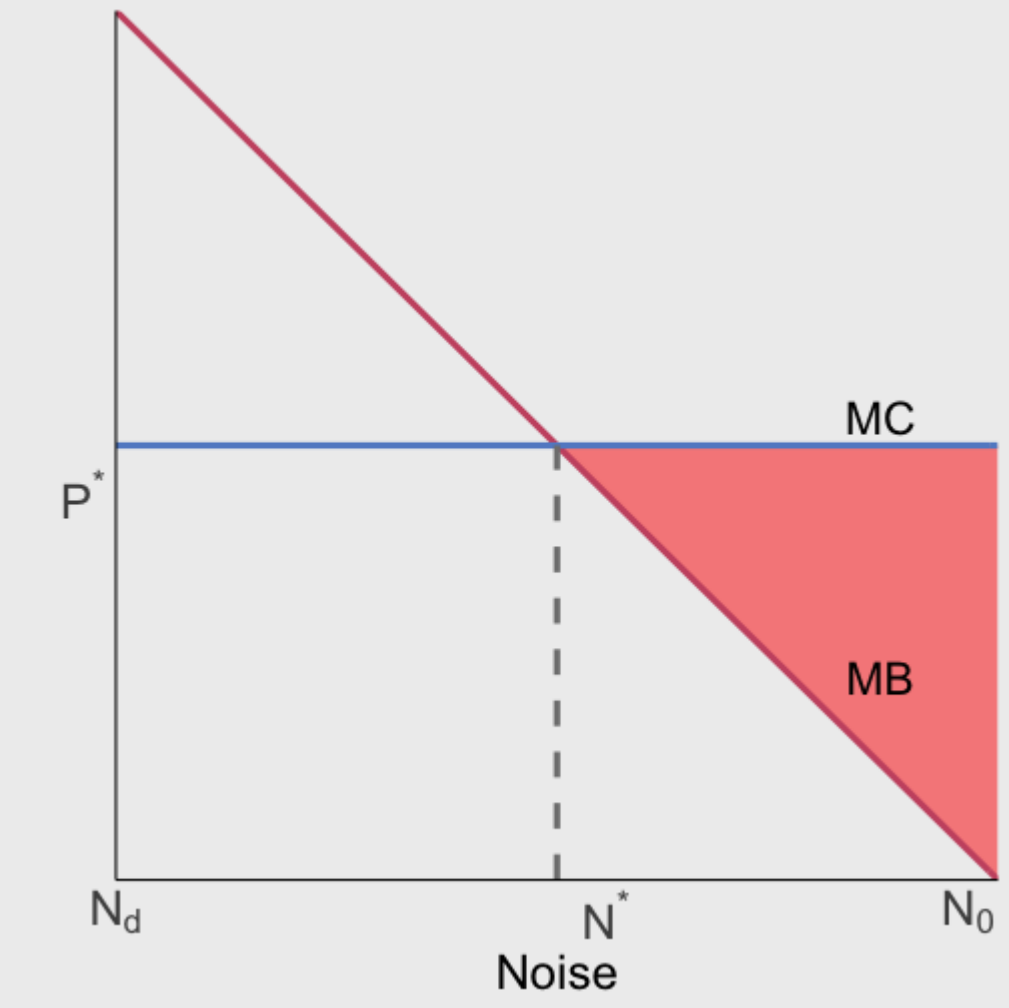
The doctor's problem gives us the first-order condition:

$$MC = B'(E) \equiv MC = MB$$

Coase Caveats: Transactions costs



We again reach the social optimum!

To have a mutually beneficial contract we still need the total gain in surplus (**red**) to be greater than tr

Otherwise the total cost of the bargaining is greater than the total benefit from bargaining $\rightarrow$ bargaining makes us worse off

Coase Caveats: Transactions costs

Main takeaway: transactions costs can prevent Coasean bargaining from achieving the efficient allocation

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Coase Caveats: Transactions costs

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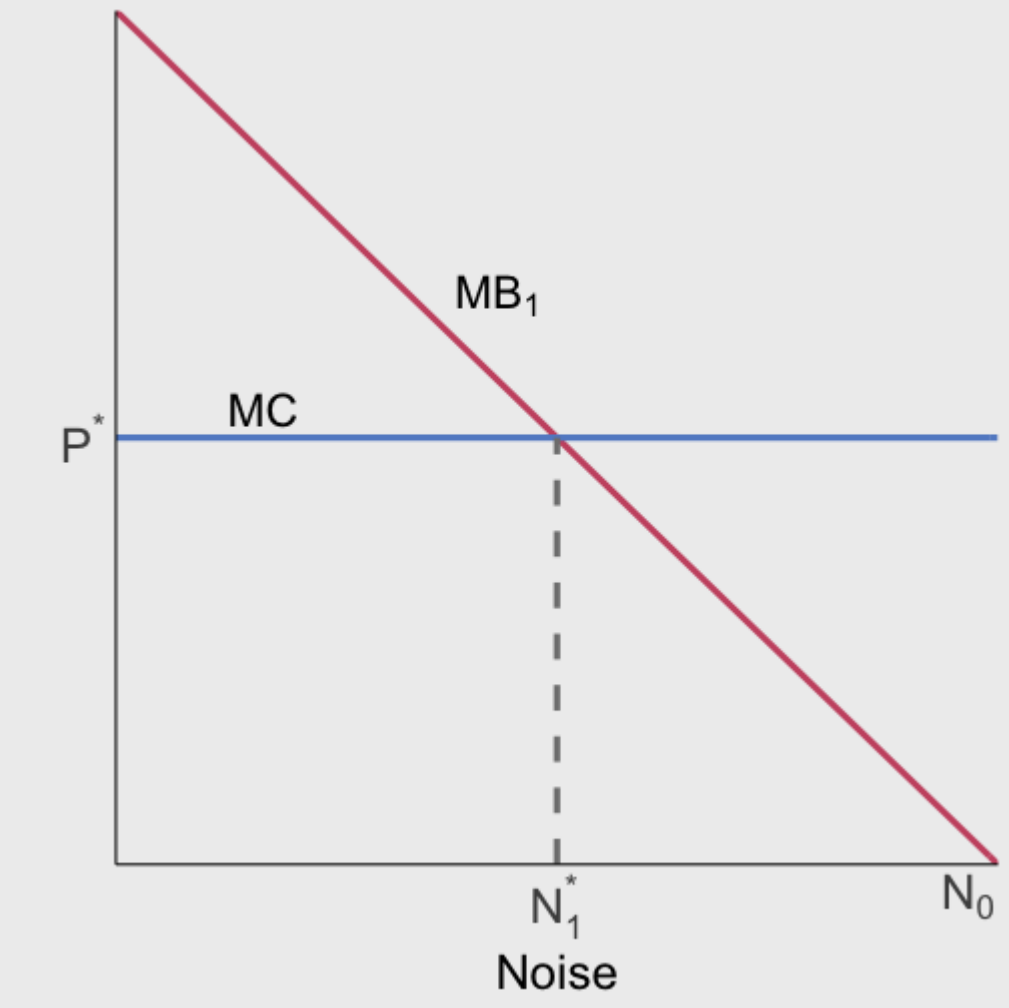
Why?

In cases where the gains from bargaining are small, transactions costs may exceed the benefits and prohibit bargaining from occurring

Coase Caveats: Income effects



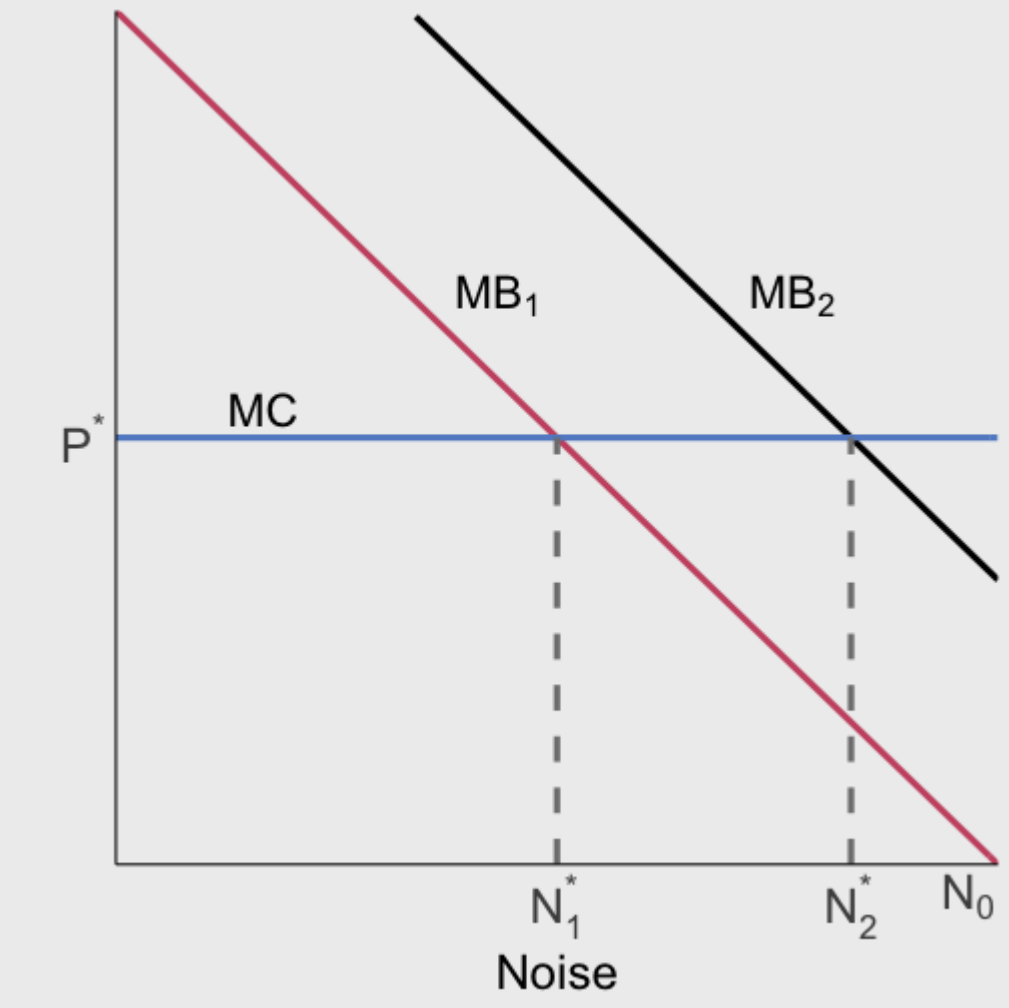
Suppose the confectioner is given the property rights (start at N_0)

Doctor pays confectioner to eliminate noise and move to N_1^*

The confectioner gets some amount of surplus/income

What can the confectioner do with it?

Coase Caveats: Income effects



The confectioner can buy more candy-making machines, increasing its MB from noise

This changes the optimal noise to N_2^*

We have a new equilibrium!

If they contracted to reach N_1^*, it is now inefficient

Ways to alleviate transactions cost

One common issue is incomplete information

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Disseminating information can make it easier to know each other's costs and benefits which makes beneficial trades more likely to occur

Ways to alleviate transactions cost

Emergency Planning and Community Right-to-know Act (1986) set-up the Toxic Release Inventory (TRI): http://www.epa.gov/tri/

Green ("eco") labeling

- Allows companies to learn which firms took positive steps to reduce pollution, and to reward them in the marketplace
- Firms need to be able to increase demand by enough to offset higher costs and raise profits

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Is there a role for the government to be involved in verifying "green" claims? What really constitutes "organic"?

Coase theorem

While transaction costs can be the downfall of Coasian bargaining, there are costs to government policy:

- Bureaucratic costs
- Government might set the policy incorrectly

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- Government might set the policy incorrectly

Coase and Pigou both have trade-offs to their approaches to solving environmental issues

An example: The Cheshire transaction

The Cheshire transaction

Cheshire, Ohio: a small town with a population 221 before 2002

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Gavin Power plant owned by American Electric Power (AEP): 2.6 GW Enough power for 2 million people (completed 1975)

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Why would this be the case?

The Cheshire transaction

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What happened next? Some real world Coasean bargaining

The Cheshire transaction

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September 24, 2002: AEP announces that it has finalized the buyout. About 90 percent of town residents have participated in the buyout offer and have signed the health waivers and the confidentiality agreements

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Property owners in town receive 3.5x assessed value

Outside town: 2x assessed value

Renters receive $5k for each year lived in Cheshire, up to $25k

Must sign a health waiver prohibiting them from suing AEP for future health problems

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Attorneys take about 1/3 of settlement money

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Would it matter whether we granted the "right to clean air" to the town or to AEP?

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The cap-and-trade system will then achieve the efficient outcome