OVERVIEW

This episode addresses the issue of plastic pollution, exploring creative policies for managing the negative externalities associated with plastic use. Plastic is integral to the modern economy. However, its environmental costs are significant, manifesting in pollution across roadways, oceans, and even in human bodies. The episode focuses on strategies to mitigate these impacts, highlighting various policy approaches such as bag bans (command-and-control policies), pricing bags (taxes), and nudges (incentives). Experiments in South Africa, Botswana and Maryland demonstrate that pricing plastic bags can reduce usage. Bag bans on the other hand, may reduce use but have unintended consequences compared to bag prices. The concept of nudges is another policy option that focuses on impacting consumer choices without pricing or bans. Bag pricing remains the most effective tool, but there is value in having policy options, for this and other negative externalities.

Key Microeconomics Links

- **Externalities**: The environmental and social costs of plastic use represent negative externalities that require policy intervention.

- **Consumer Behavior**: Pricing, bans and nudges affect consumer choices, influencing demand for plastic bags.

- **Policy Tools to Correct for Externalities**: Different policy mechanisms, such as command-and-control policies, taxes, and nudges provide different policy tools to managing plastic pollution.

- **Supply and Demand**: The impact of policy changes on the supply and demand for plastic products, including shifts towards alternatives.

Preview Question

What's the best way to reduce plastic bag usage?

Discussion Questions

1. How do plastic products create negative externalities?

2. Discuss the effectiveness of pricing as a tool to reduce plastic bag usage.

3. What are the potential unintended consequences of implementing plastic bag bans?

4. How do nudges differ from traditional policy tools in influencing consumer behavior?

5. Analyze the role of economic incentives in driving environmental policy outcomes.

6. How can policymakers balance the need for plastic reduction with consumer convenience?

7. Discuss the impact of plastic pollution on ecosystems and human health.

8. What are some challenges that producers may face when they attempt to reduce plastic in consumer products?

9. What are the advantages and disadvantages of combining multiple policy tools to address plastic pollution?

10. What strategies can be employed to increase public awareness and engagement in reducing plastic use?

Multiple Choice Questions

1. Which of the following are policies that can be implemented to correct for negative externalities like plastic pollution?
   A) Command-and-control regulations
   B) Taxes
   C) Nudges
   D) All of these

   Answer: D) All of these

2. What material has served as the fabric of the modern economy for over 100 years?
   A) Metal
   B) Plastic
   C) Wood
   D) Glass

   Answer: B) Plastic

3. When consumer plastic bag taxes (prices) are implemented, how does this impact the market for plastic bags?
   A) There is no impact on supply or demand for plastic bags
   B) Demand decreases, leading to higher bag prices and lower quantities
   C) Demand increases, leading to lower bag prices and lower quantities
   D) Supply decreases, leading to higher bag prices and higher quantities

   Answer: B) Demand decreases, leading to higher bag prices and lower quantities

4. When plastic bag nudges are implemented, how does this impact the market for plastic bags?
   A) There is no impact on supply or demand for plastic bags
   B) Demand increases, leading to higher bag prices and lower quantities
   C) Demand decreases, leading to lower bag prices and lower quantities
   D) Supply decreases, leading to higher bag prices and lower quantities

   Answer: C) Demand decreases, leading to lower bag prices and lower quantities

5. What is an unintended consequence of bag bans mentioned in the episode?
   A) Increased plastic production
   B) Shift to thicker bags with their own costs
   C) Decreased consumer demand
   D) Higher prices for alternatives

   Answer: B) Shift to thicker bags with their own costs

6. What is a nudge in the context of environmental policy?
   A) A strict regulation
   B) Influencing choices without restricting them
   C) A financial penalty
   D) A government subsidy

   Answer: B) Influencing choices without restricting them

7. If only one policy can be implemented, what is the single best way to reduce plastic bags, according to the video?
   A) Ban them
   B) Educate consumers
   C) Price them
   D) Ignore the issue

   Answer: C) Price them

8. What is a key benefit of having multiple policy tools to address plastic pollution?
   A) Increases complexity
   B) Allows for tailored solutions
   C) Reduces effectiveness
   D) Limits consumer choice

   Answer: B) Allows for tailored solutions

9. What is a negative externality associated with plastic bag use?
   A) Increased consumer demand
   B) Environmental pollution
   C) Lower production costs
   D) Enhanced product durability

   Answer: B) Environmental pollution

10. In the plastic bag pricing examples in South Africa, Botswana, and Maryland, what were the results of the policy?
    A) There was no change in plastic bag use
    B) Plastic bag use decreased
    C) Economic inequality increased
    D) Inflation increased in the region

    Answer: B) Plastic bag use decreased

True / False Questions

1. Plastic bags result in positive externalities.
   Answer: False

2. Pricing plastic bags is considered an ineffective method for reducing their usage.
   Answer: False

3. Bag bans can lead to the unintended consequence of consumers switching to thicker plastic bags, which have their own environmental costs.
   Answer: True

4. A nudge is a policy tool that involves placing a financial penalty on consumers.
   Answer: False

5. When nudges are implemented, the supply of plastic bags decreases.
   Answer: False

6. Implementing taxes (prices) on plastic bags results in a decrease in the supply curve, a decrease in equilibrium price, and a decrease in equilibrium quantity of bags
   Answer: False

7. Taxes on plastic bags are designed to increase consumer demand for them.
    Answer: False

8. A command and control policy might involve banning certain types of plastic bags to reduce environmental impact.
   Answer: True

9. Negative externalities refer to the unintended positive effects of economic activities on third parties.
    Answer: False

10. The consensus among economists is that placing a price on plastic bags is the least effective method for reducing their use.
    Answer: False

Application Questions

Table 1: Market for Plastic Bags

Supply		Demand$_1$ (before the tax)		Demand$_2$ (after the tax)	
Price of Plastic Bags (cents)	Quantity Supplied (millions of bags)	Price of Plastic Bags (cents)	Quantity Demanded (millions of bags)	Price of Plastic Bags (cents)	Quantity Demanded (millions of bags)
0	0	0	10		
2	3	2	8		
4	6	4	6		
6	9	6	4		
8	12	8	2		
10	15	10	0		

Questions

1) What is the equilibrium price and quantity in this market?

2) Suppose a bag ban was implemented, what is the new equilibrium?

3) Now suppose a 2 cent bag tax was implemented. What is the new equilibrium?

4) Although a bag ban may seem more effective, what are possible negative outcomes of a bag ban?

Answers

1) 4 cents, 6 million bags. Found where quantity demanded equals quantity supplied.

2) The quantity of bags is zero, none are sold with a ban (see Episode in a Graph S1 Ep5 graph A).

3) A bag tax will shift the demand downward (the vertical distance between the old and new demand curves will be the amount of the tax, 2 cents, see Table 2). The new market equilibrium quantity is 5 (less bags are sold with the tax) and the price is 3 cents per bag, but this is not what the consumer pays. The consumer pays 3 cents for the bag plus the 2 cent tax/fee so the total price to the consumer is 5 cents per bag. See Table 2 and Figure 1 for more details.

4) Although the number of bags will be decreased to zero, this is deceptive because alternative bags are often used that are thicker and also have negative environmental externalities. Enforcement for this policy may also be more costly.

Table 2: Answers to Market for Plastic Bags with Tax

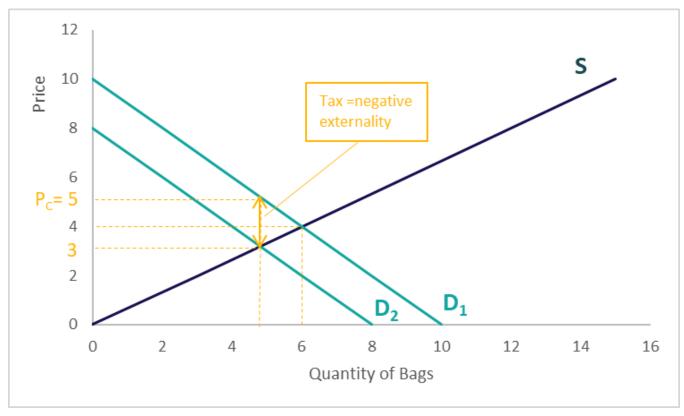| Supply		Demand$_1$ (before the tax)		Demand$_2$ (after the tax)	
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0	0	0	10		10
2	3	2	8	0	8
4	6	4	6	2	6
6	9	6	4	4	4
8	12	8	2	6	2
10	15	10	0	8	0

Figure 1: Answers to Market for Plastic Bags with Tax

Innovative Ways to Extend the Lessons

1. **Listen to our podcast!**

   ○ **Student Assignment:** Listen to the episode podcast and have students reflect: *What is lost or gained when research is translated into casual language? What did I hear that I missed in the video? What concepts does the video clarify that the podcast does not?*

2. **Community Engagement Project**

   ○ Encourage students to design and implement a local campaign to reduce plastic use, involving community members and businesses.

3. **Environmental Impact Assessment**

   ○ Have students conduct an assessment of plastic pollution in their local area, proposing actionable solutions based on their findings.