HS 232

Lecture 9 24th January 2025

Cap and Trade Vs Carbon Tax

Recap

- Climate mitigation is a positive externality
- Climate change is a negative externality
- Public good Vs Public bad
- Market failure – under production / over production
- Policy options to correct the marker failure

Cap and Trade

- **KEY TAKEAWAYS**
- Cap-and-trade energy programs are intended to gradually reduce pollution by giving companies an incentive to invest in clean alternatives.
- The government issues a set amount of permits to companies that comprise a cap on allowed emissions, typically carbon dioxide.
- Companies that surpass the cap are taxed, while companies that cut their emissions may sell or trade unused credits.
- The total limit or cap on pollution credits declines over time, giving corporations an incentive to find cheaper alternatives.
- Critics say that caps could be set too high and give companies an excuse to avoid investing in cleaner alternatives for too long.

Advantages and Disadvantages

Pros

- Income source for companies
- Promotes cleaner technologies
- Leads to faster cuts in pollution
- Source of revenue for the government
- Suplements taxpayers resources
- Gives consumers the power to decide

Cons

- Allowed emissions levels are set too high
- Credits and penalties and are cheaper than converting to cleaner technologies
- Some credits are given away
- Companies can cheat the system
- It increases the prices for goods and services
- There is no global consistency in the system

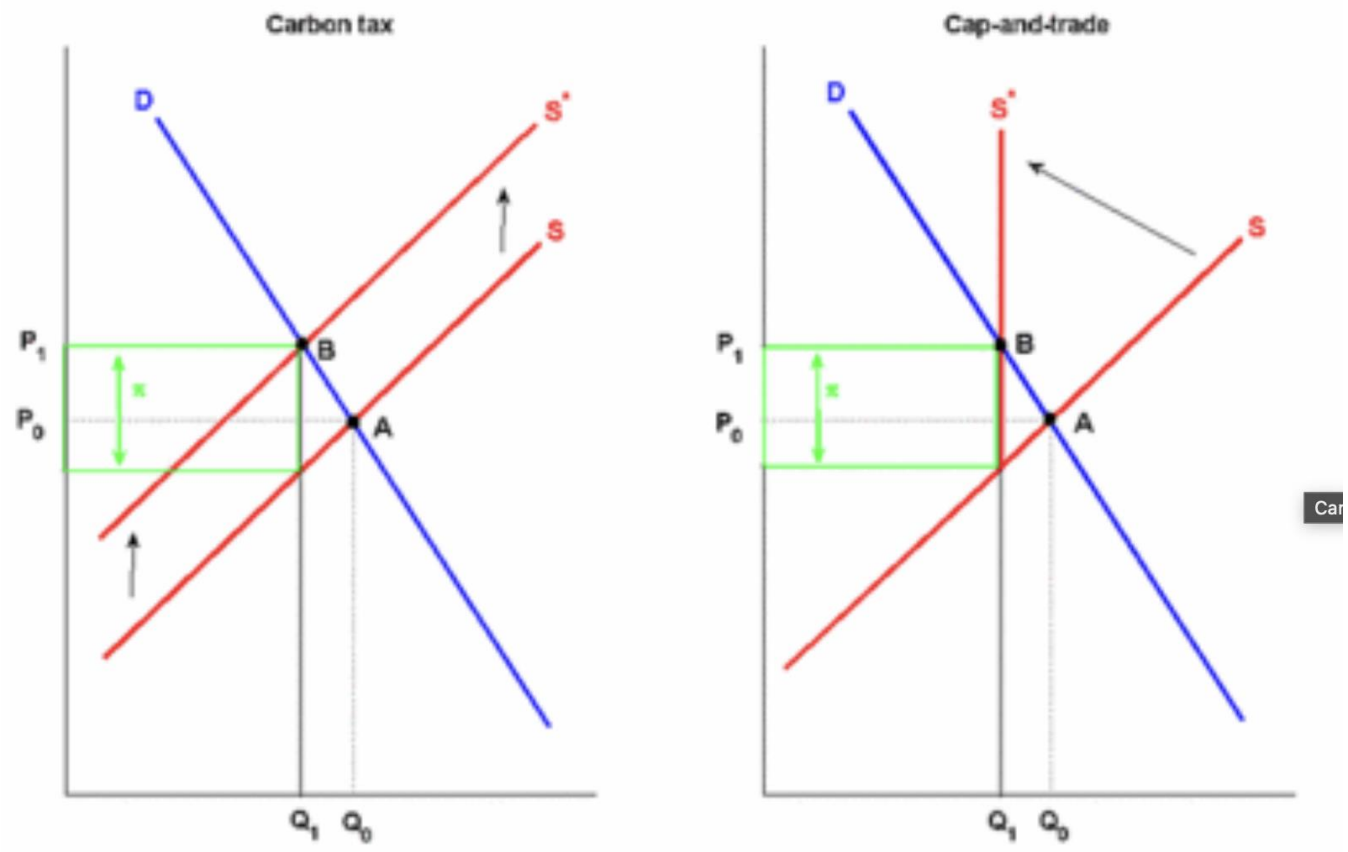
Need for monitoring system
The difficulty to achieve an international consensus on emissions and caps since each country has different priorities, or the high transaction and administrative costs involved, among others.

Also known as emission trading !

Cap and Trade Examples

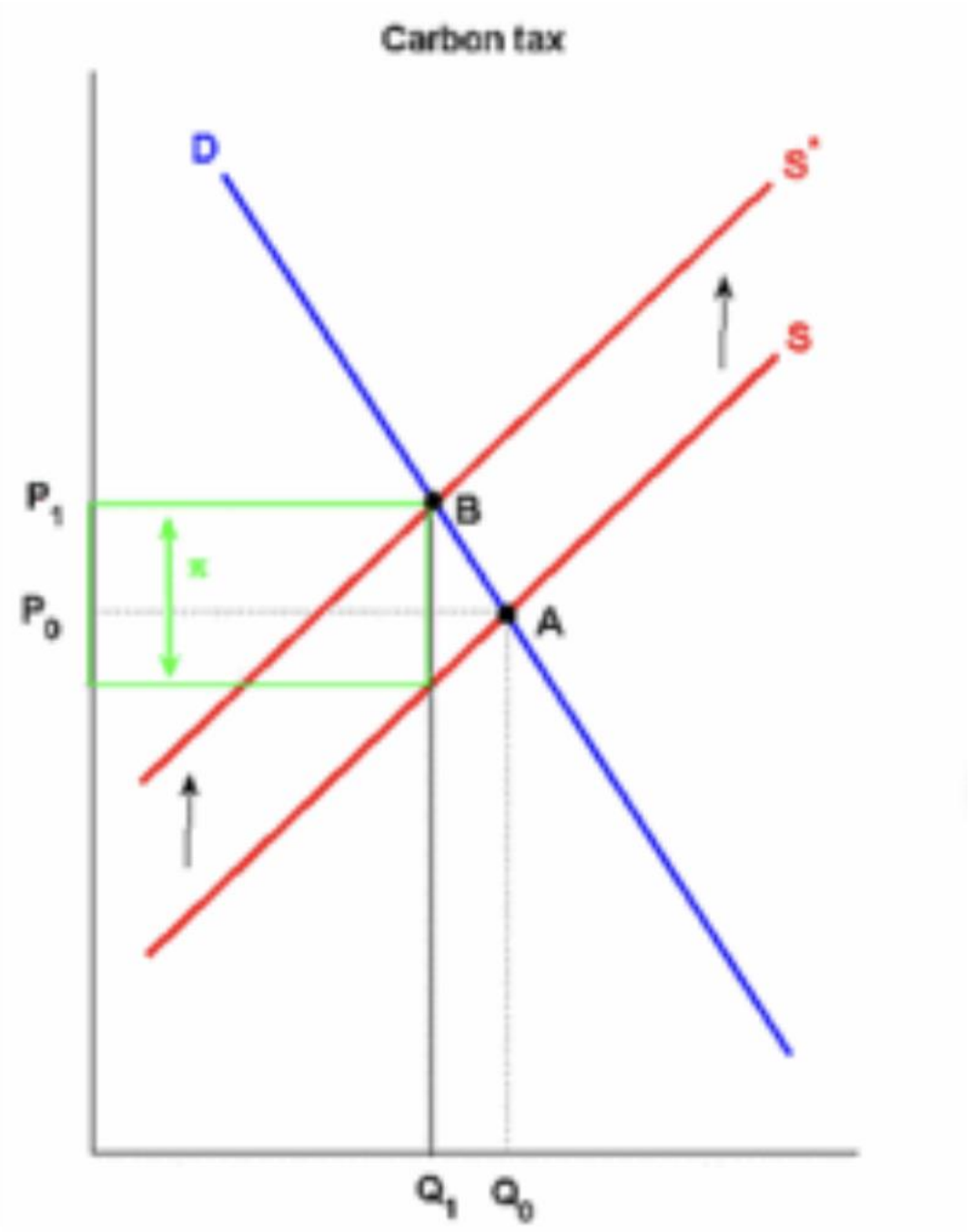
- In 2005, the European Union (EU) created the world's first international cap and trade program with the goal of reducing carbon emissions. In 2019, the EU estimated that there would be a 21% reduction in emissions from sectors covered by the system by 2020.
- During the administration of U.S. President Barack Obama, a clean energy bill that included a cap and trade program was introduced in Congress. It was eventually approved by the House of Representatives but never even got to a vote in the Senate.
- The state of California introduced its own cap-and-trade program in 2013. The program was initially limited to fewer than 400 businesses, including power plants, large industrial plants, and fuel distributors. Its goal of reducing greenhouse gas emissions to 1990 levels by 2020 was successfully met in 2016.
- Mexico is running a pilot cap-and-trade program that the country began in January 2020. This is the first emissions trading pilot program in Latin America, and it aims to move to full operations in 2018. The country committed to a 22% reduction in greenhouse gasses by 2030
- The Chinese government is working toward a national cap program and currently, several Chinese cities and provinces have had carbon caps since 2013.

Carbon Tax Vs Cap and Trade



Carbon tax

- **Carbon tax**: Suppose that a carbon tax π is added into the price. For a given quantity, the supplier's price will be the old price plus the amount of the tax, and the supply curve will shift up to S*. The new equilibrium is at point B, the quantity is the target Q_1, and the price will increase to P_1.
- Note that the price increase will be less than the tax, although if the demand curve is fairly steep (i.e., inelastic, or relatively insensitive to changes in price), the increase in the price will be pretty close to π.

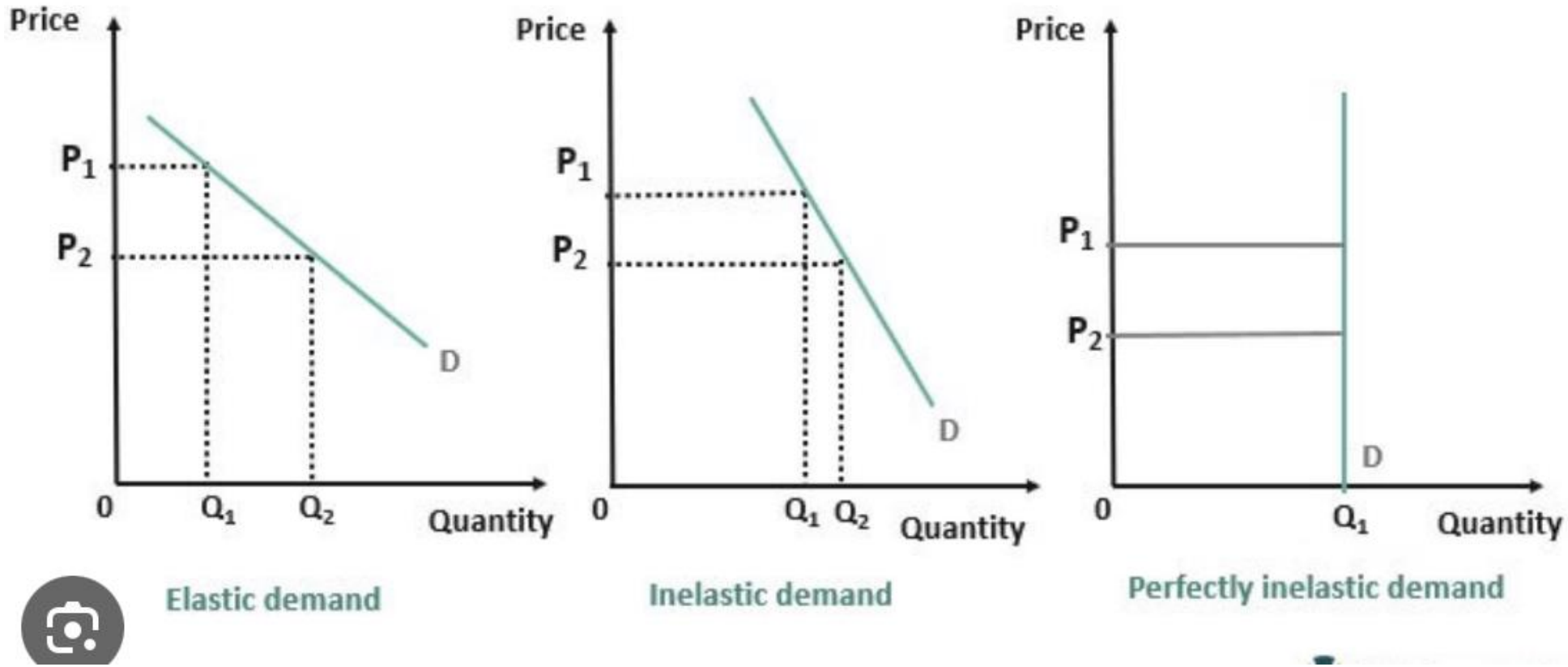


Elasticity

- In economics, elastic means a product is sensitive to price changes, while inelastic means a product is less sensitive to price changes.

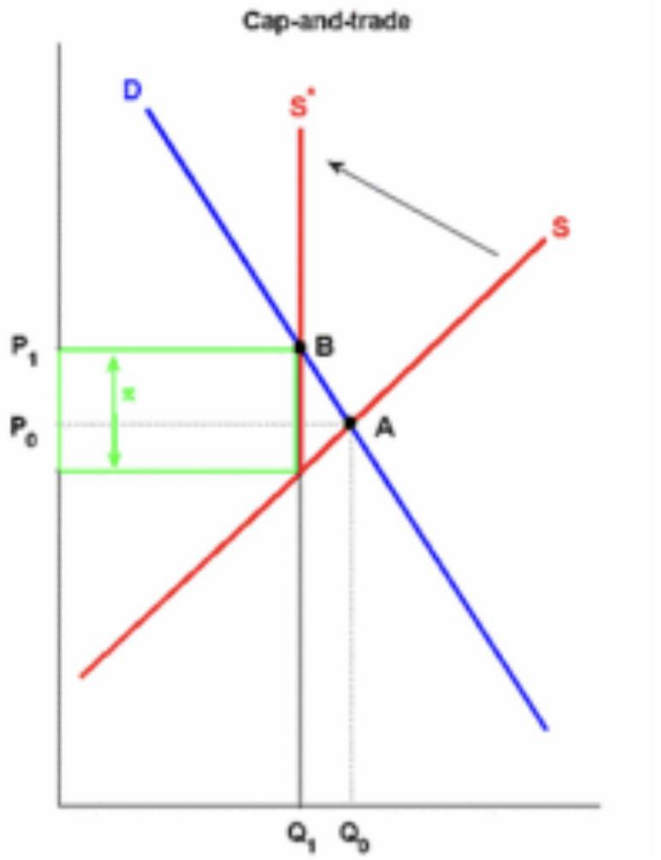
$$PE_d = \frac{\%\ Change\ in\ Qty}{\%\ Change\ in\ Price}$$

Luxury goods Vs Necessary goods



Cap-and-trade:

- Suppose that the government restricts emissions to a level consistent with Q_1. The new supply curve - denoted by S* - is now vertical at the target: no matter how high the price goes, supply will remain fixed at Q_1. The new equilibrium is again B: the quantity is determined by the cap at Q_1, and the price will rise to P_1.



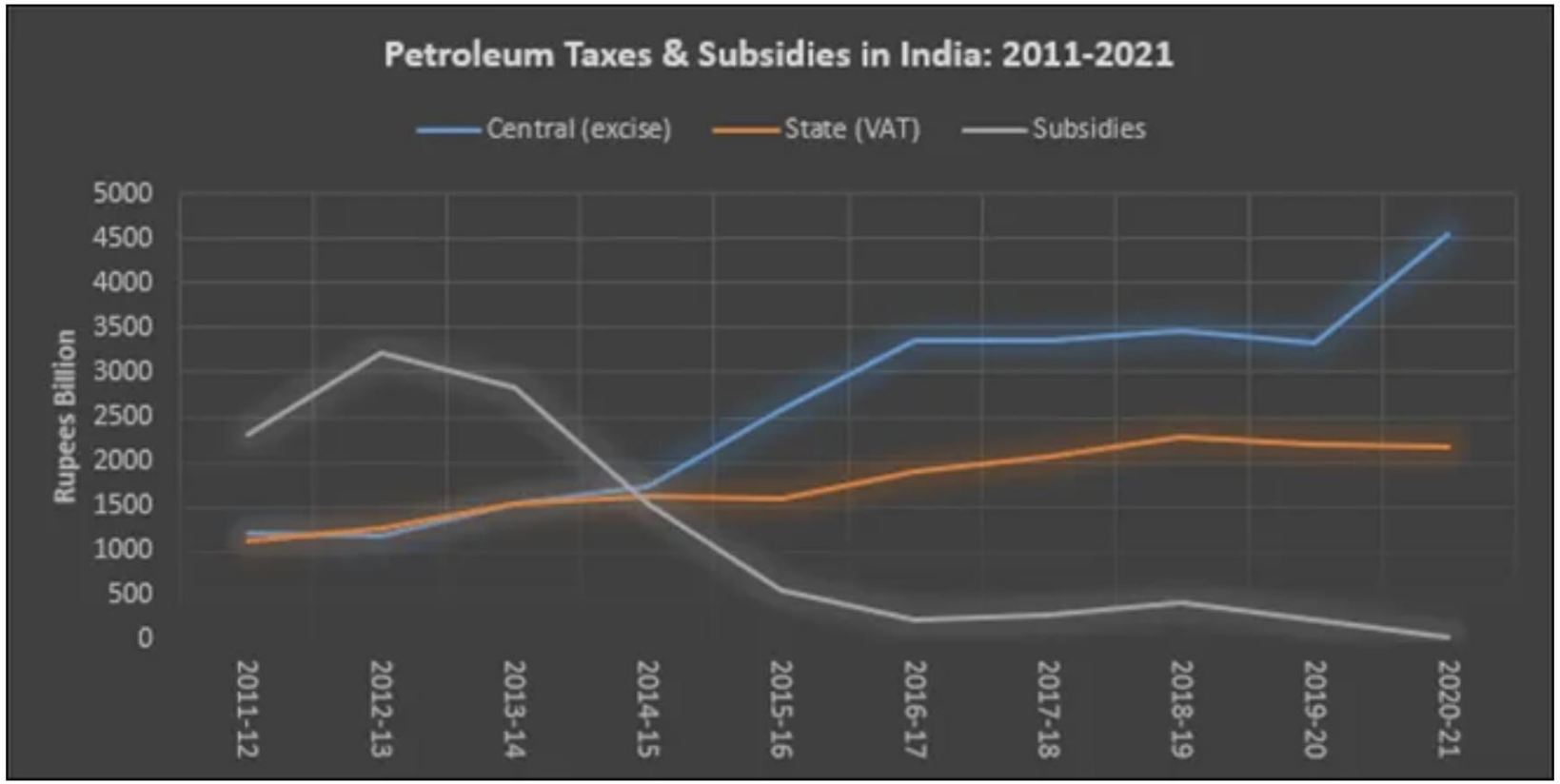
- So as far as prices and quantities go, the two policies are equivalent: as we go from A to B, quantities fall to the target Q_1, and prices rise to P_1. From the consumer's point of view, that's all that matters.
- What distinguishes the two is what happens to π - the difference between the price the consumers pay at B and what it costs suppliers to produce at Q_1.
- In the case of the carbon tax, the money goes to the government. But if output is capped at Q_1, that difference is pure profit: a permit to produce one unit of output allows its owner to collect a rent equal to to the difference between the selling price and the cost of production.
- If permits are traded, their price will be bid up so that their price will be equal to . So where that money goes depends on how the permits are allocated in the first place. If the permits are simply given to existing emitters, then those profits are pocketed by the firms. If the permits are auctioned off, the price will be bid up to π, and the government gets the money.

  So if permits are auctioned off by the government, then cap-and-trade and a carbon tax are equivalent: same quantities, same prices, and the government gets revenues equal to the area in the green rectangle in the graphs.

Case of India

- In India, petrol and diesel were historically subsidized to ensure affordability for the general population, particularly in rural areas, by keeping prices low, thereby providing access to essential energy sources for transportation and basic needs, especially for lower-income groups; however, the government has been actively reducing these subsidies in recent years to promote fiscal responsibility and encourage a shift towards cleaner energy sources like renewables.
- *Price discounts offered to select petroleum products such as LPG (Liquified Petroleum Gas) and kerosene were a more direct form of subsidy expected to benefit poor households.*

The share of excise duty charged on petroleum contributed over 45 percent of India's indirect tax revenue in 2020–21. The share of petroleum revenue as a share of total revenue receipts of the central government increased by over 93 percent from 15 percent in 2010-11 to 29 percent in 2020-21.



Source: Reports of the Petroleum Planning & Analysis Cell

Tradeoff between dangerous climate change and dangerous emission reduction

Subsidy in diesel is directly linked to food security