

Professional Career Program

Introduction to Environmental Economic Theory

25 September 2018

Basic problems

Basic Questions

- Does the present economic system contribute to keeping the quality of natural environment?
- Is economic development or economic growth compatible with environmental conservation?
- If not, should we give up economic development or growth to keep environmental quality?
- Is the so called sustainable development really possible?
- If possible, how will it be realized?
- How can we contribute to sustainable development?

What we should know

- First, we have to know much more about what is happening to natural environment (Fact-finding).
- Next, we have to explore how it has been damaged by human economic activities. (Analysis of causal relationships)
- Thirdly, we have to know how we can change the present economic and social systems so that sustainable development be realized. (Policy contribution)

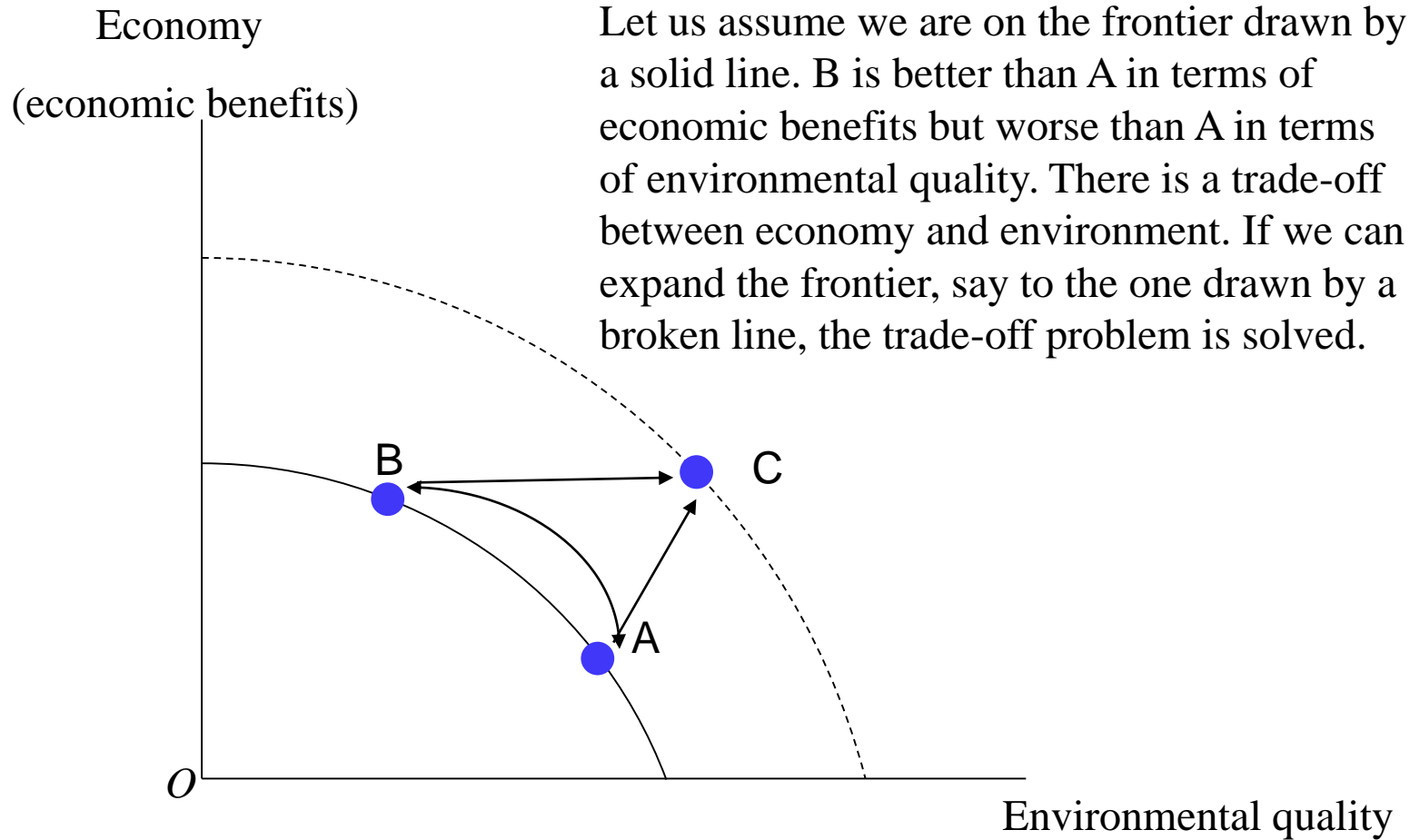
Various ways of approaches

- There are various ways of approaches for solving environmental problems.
- It must be remembered that quite a few environmental problems are caused by human economic activities.
- Thus, it is worth studying environmental economics to solve environmental problems.
- However, it is obvious that other scientific disciplines contribute to solving the problems as well.

Trade-off between economy and environment

- Yet, it is sometimes very costly to protect natural environment in a certain situation.
- Any action made by any person should affect natural environment in an adversary manner.
- How much are we prepared to give up to protect natural environment?
- How much should we sacrifice natural environment to obtain economic benefits?

Explanation by means of a figure



Costs and Benefits

- Then, how can we overcome the difficulties caused by trade-off between economy and environment?
- Economists consider that comparing costs and benefits concerning environmental protection often help solving the problem.
- We study this rigorously in this lecture.

Interaction among actors

Part I Conceptual Matter

Actors in an Environmental Regime

- *A lead actor*: A strong commitment to effective (international) action
- *A supporting actor*: Support of a lead actor in the negotiations
- *A swing actor*: Demander for significant concessions to its interests
- *A veto or blocking actor*: Opposition to a proposed environmental regime

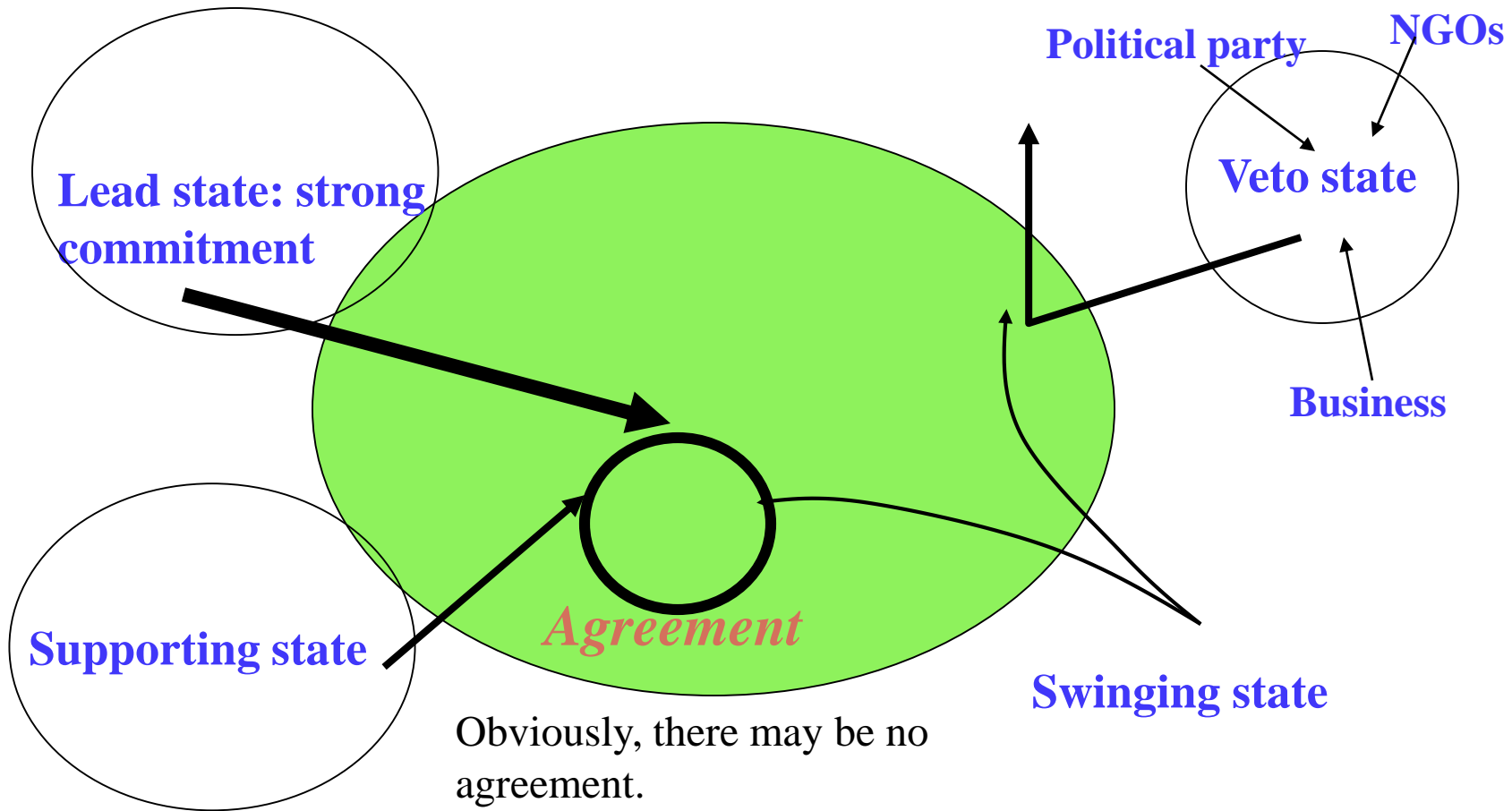
Costs and Benefits of Environmental Regime

- Costs and benefits are different among actors.
- Costs and benefits are different within an actor.
- Interaction among actors changes the current situation of costs and benefits. \Rightarrow *Game-theoretic situation* of an environmental regime

Domestic Politics and International Politics

- Domestic politics affect formation of an international environmental regime.
- Power politics: Political leaders, business leaders, and NGOs, their interests are different.
- There are often strong tensions among different actors.
- Interaction among those domestic actors affects an attitude of a state for construction of an environmental regime.

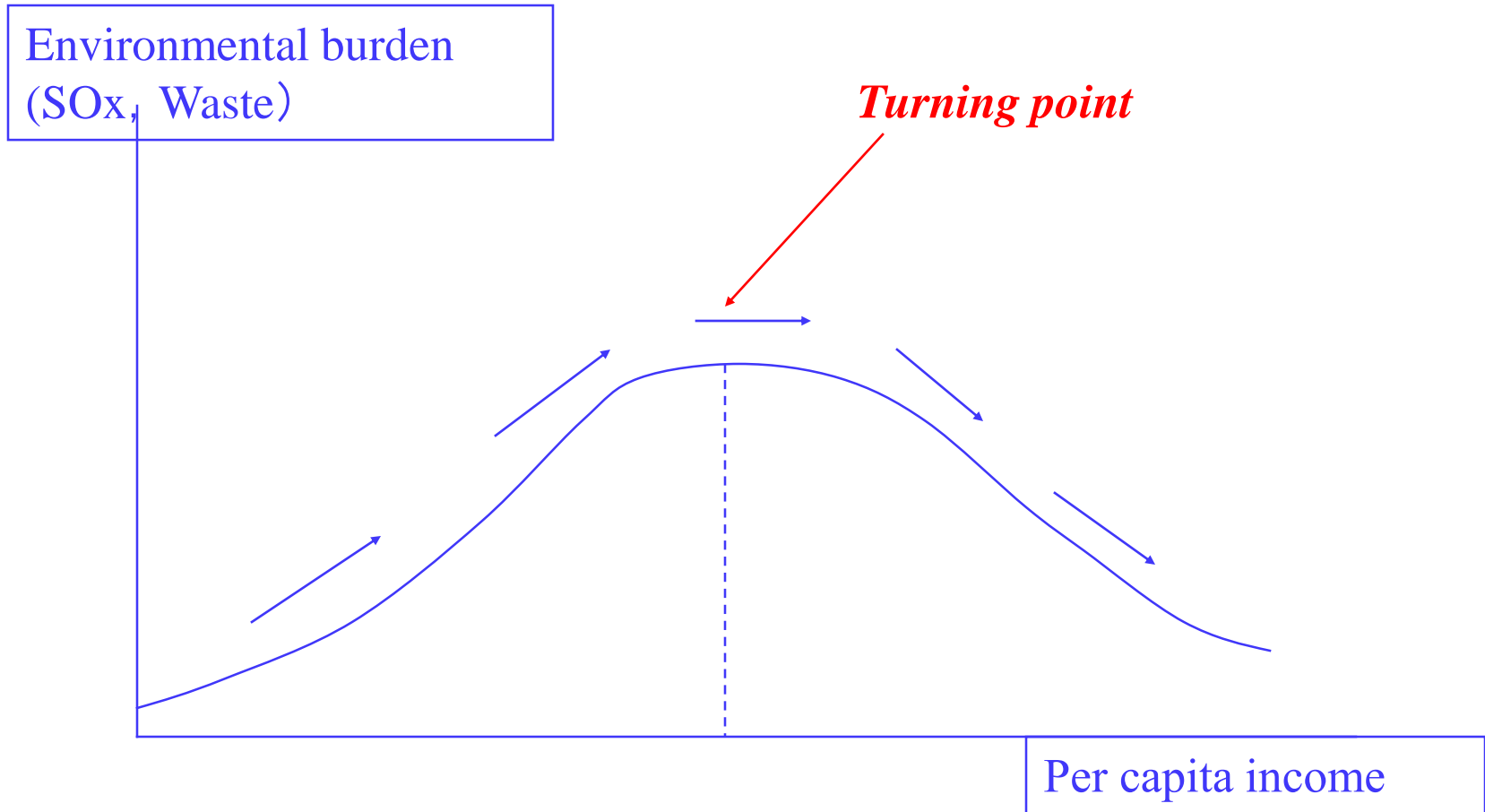
Image of interaction of actors in environmental regime



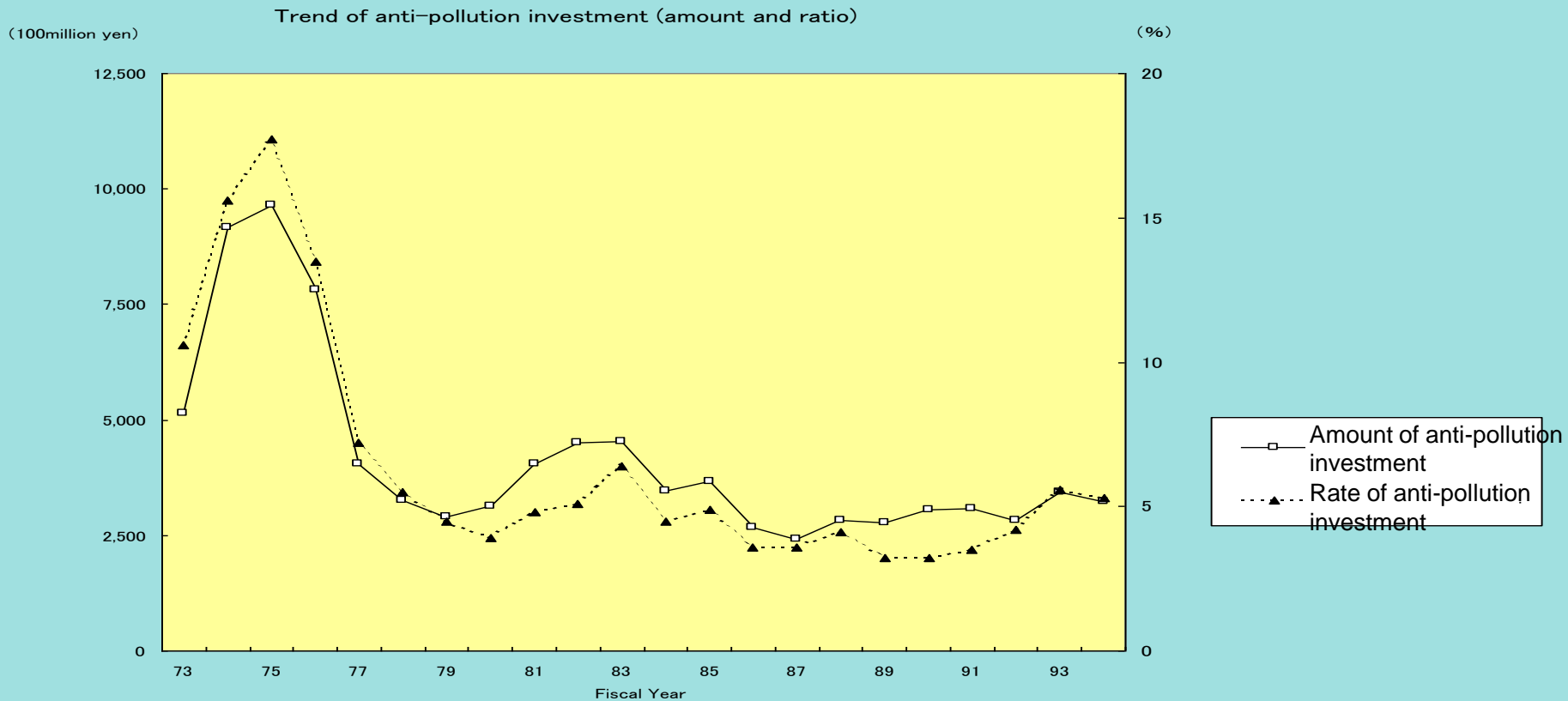
Growth, Development and Environment

- Is there any trade-off between environment and development?
- How is “Sustainable Development” (SD) possible?
- An important fact on SD: Environmental Kuznetz Curve

An Example: Environmental Kuznetz Curve



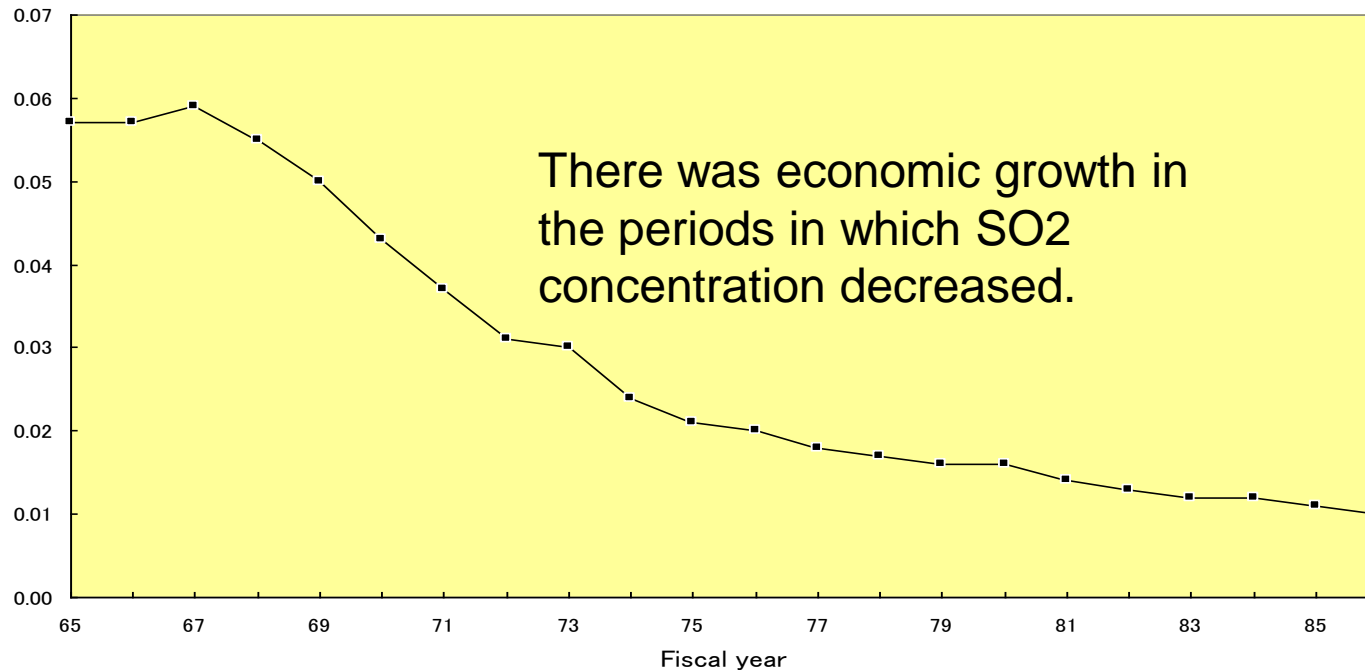
Evidence: Anti-pollution investment



Evidence:SO2 Concentration

Annual average (ppm)

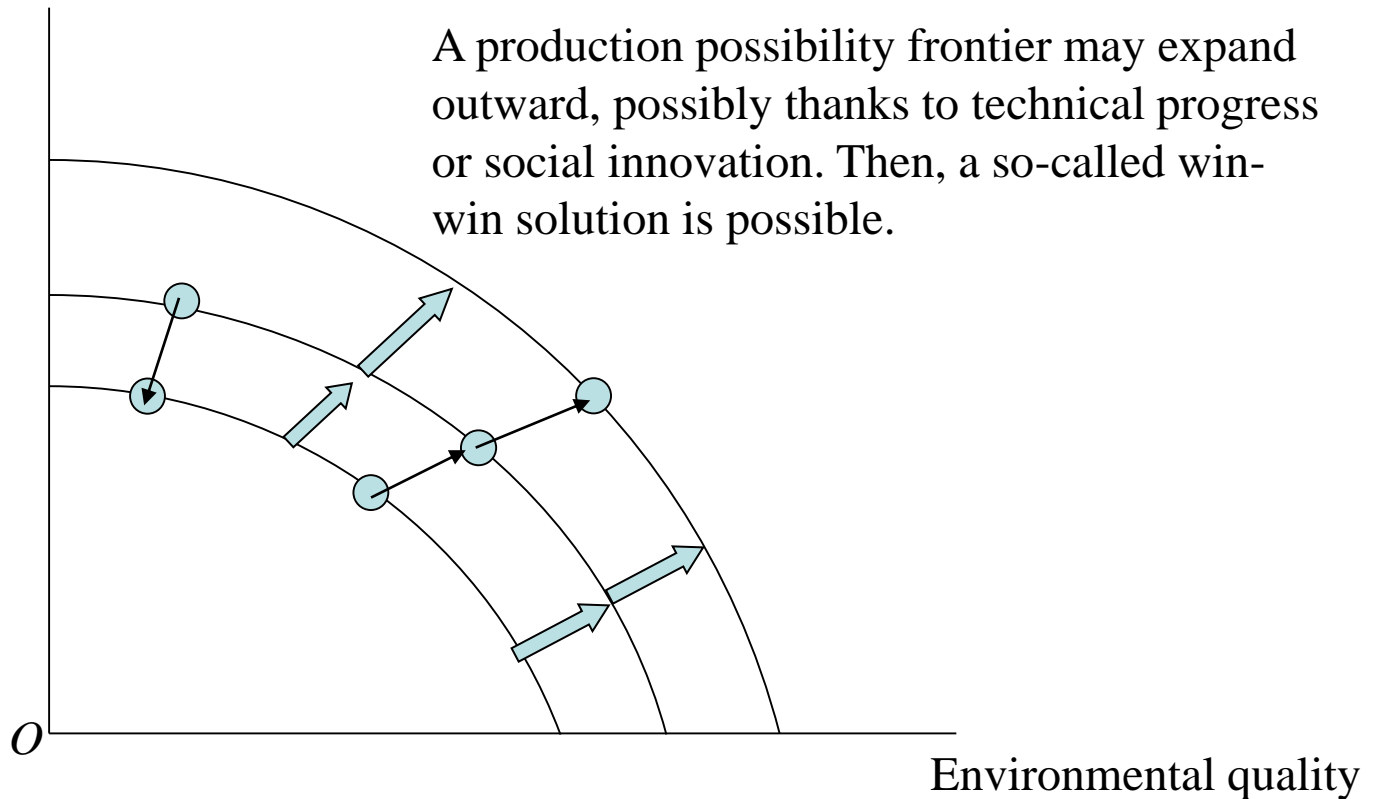
Trend of SO2 concentration



—■— 一般環境大気測定局15局平均

How is such a win-win solution possible?

Market goods



Regulation of exhaust gas in US and Japan

- Abandonment of the Musky act in U.S.A; car manufacturers were *veto actors*, who won. The act was not adopted in USA.
- The act equivalent to the Musky act was successfully introduced to Japan in 1978.
- Results: The quality of Japanese cars was improved. The sales-share of Japanese cars in US increased. ⇒ *Environmental regulation and economic development went together.*
- *The Cafe regulation promoted such trend further.*

Part II The Problem of Global Warming (Climate Change)

- There is disagreement among actors on how to curb global warming gases.
- Why?
- Who benefits from disagreement?
- Who benefits from agreement?
- What methods are adopted to curb global warming gases?

The Paris Agreement Last Year

- There was an agreement in the COP 21 in Paris to suppress the temperature within 2°C.
- If the temperature increases more than that, then it is anticipated that the sea level will rise more than 7m, devastating many areas near the seas over the world.
- However, it is uncertain how long it will take the sea level to rise that high.

Review: Why did developed countries agree the Montreal Protocol?

- Phase out of CFCs were agreed among developed countries.
- Lead state: U.S.A. \Rightarrow Domestic politics: Big business did not block the basic idea of the protocol.
- Supporting states: EU
- Swinging state: Japan \Rightarrow U.S.'s follower

Different circumstances in GWG reduction

- Veto state: U.S.A. (Particularly under Trump legislation)
- Lead states: EU countries
- Swinging state: Canada etc.
- Potential veto states: Developing countries
- Japan used to be a swinging state (actor). It became a lead state, although its attitude is not so clear at present.

Political Power of U.S.A as a Veto State

- The share of CO2 emission of U.S.A is nearly 25%:
The great role in GWG reduction. (China is the largest discharger of CO2.)
- The emission is *still* increasing.
- We are experiencing disasters caused by huge hurricanes, which *might* be triggered by the climate change.
- Republicans are reluctant to make a positive action for prevention of the global warming.
- They dislike the nonparticipation of developing countries in the regime, either.
- Mr. Trump denies the global warming.

Domestic Circumstances in U.S.A.

- Suspicion on the idea of global warming is still shared among people.
- Business people are worried about a loss of GDP which might be caused when huge reduction of CO2 emission is made.
- Is a change of the American life-style possible?
- Yet, Al Gore appeared to have influenced people a little by little, by *Inconvenient Truth*.
- But not so much.

Utilization of Market Mechanism

- Trade of emission permits is being promoted gradually.
- Carbon tax has been introduced in some countries.
- The idea of carbon-pricing is spreading.
- Yet, how can these instruments be accommodated to the traditional economic system?
- Some Japanese business people are still against carbon tax as well as cap and trade of carbon emission.

Conclusion

- First, we have to define what sort of environmental problems we are facing and talking about.
- Next, we have to collect basic data, *and* analyze them.
- After that, we have to exert ourselves to create a new regime which makes economic development compatible with environmental protection. (Policy)
- To facilitate the procedure, we have to obtain an analytical tool, and environmental economics is a very powerful tool for attaining the purpose.
- It is crucial to know that an economic system is so flexible that it can accommodate our life style to sustainable development.