Quiz #4

EE460 (Semester 1/ 2018)

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The New York Times

2018 Nobel in Economics Is Awarded to William Nordhaus and Paul Romer

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https://www.nytimes.com/2018/10/08/business/economic-science-nobel-prize.html

WASHINGTON — The Yale economist William D. Nordhaus has spent the better part of four decades trying to persuade governments to address climate change, preferably by imposing a tax on carbon emissions.

His careful work has long since convinced most members of his own profession, and on Monday he was awarded the 2018 Nobel Memorial Prize in Economic Sciences in recognition of that achievement.

The award was announced just hours after a United Nations panel said large changes in public policy were urgently needed to limit the catastrophic consequences of rising temperatures. The prize committee said its choice of laureates was meant to emphasize the need for international cooperation.

The Nobel committee cited Professor Nordhaus for showing "the most efficient remedy for problems caused by greenhouse gases is a global scheme of universally imposed carbon taxes."

Question 1: Why the conventional theory in economics initiated by Adam Smith cannot be directly applied to the issues of environmental economics? What is the main policy instrument that Prof. Nordhaus has proposed to policy makers in order to mitigate the climate change problem?

Answer: The conventional theory in economics excludes the externalities, and it only determines the values of private costs and benefits. Hence, the pollution is not considered as a private cost in conventional computation. Following the paradigm of Pigovian tax, Prof. Nordhaus has developed the economic model incorporating the negative externalities of CO_2. This modification enables the computation of carbon-tax values and the long-term effects of CO_2 mitigation. Based on his findings, Prof. Nordhaus has been recommending the implementation of carbon tax as a key policy instrument for resolving the global warming.

Question 2: Table 1 exhibits the targets of Greenhouse Gases (GHGs) reduction that Thai government has internationally committed. Are these targets related to three national energy plans? [Specifically, those three plans are (1) Power Development Plan (PDP), (2) Alternative Energy Development Plan (AEDP) and (3) Energy Efficiency Development Plan (or Energy Conservation Plan).]

Table 1: Thailand's Nationally Determined Contribution Roadmap on Mitigation 2021–2030

	2015	2020	2025	2030
Total GHG reduction (mil.ton)	**13.99**	**39.63**	**75.84**	**113**
1.Electricity generation	**9.13**	**14.62**	**20.71**	**24.00**
1.1 Energy efficiency enhancement programs	0.51	2.87	5.84	6.00
1.2 New renewable sources	8.62	11.75	14.87	18.00
2. Uses of energy in households	**0.69**	**1.63**	**2.82**	**4.00**
2.1. Energy efficiency enhancement programs	0.49	1.19	2.06	2.74
2.2 Uses of new renewable energy in households	0.2	0.44	0.76	1.21
3. Uses of energy in buildings (including government's ones)	**0.09**	**0.19**	**0.56**	**1.00**
4. Uses of energy in industrial process	**1.78**	**13.82**	**27.92**	**43.00**
4.1 Energy efficiency enhancement programs	0.04	2.38	8.27	11.00
4.2 Uses of new renewable energy in industrial processes	1.73	11.45	19.65	32.00
5. Uses of energy in transportation	**2.3**	**9.37**	**23.83**	**41.00**
5.1 Energy efficiency enhancement programs	1.74	7.08	18.02	31.00
5.2 Uses of new renewable energy in transportation	0.56	2.28	5.81	10.00

Answer:

The PDP is related to the reduction target of 1.2, aiming at the implementation of renewable energy in power generation, especially the promotion of wind and solar energy.

The AEDP is corresponding to the reduction targets of 2.2, 4.2 and 5.2. Particularly, the target of 5.2 is based on the increasing uses of biofuels (i.e. gasohol and biodiesel).

The Energy Efficiency Development Plan is responsible for the reduction targets of 1.1, 2.1, 4.1 and 5.1. The plan includes the efficiency improvement of existing electric appliances and the investment in new machineries.

In addition to the targets based on three energy plans, Thai government has been exploring the alternative policy schemes in order to additionally lower the CO_2 emissions. However, the results from model simulation show that the carbon tax can propagate the economy-wide negative impacts initiated by tax burden. This is because both refinery and petrochemical industry are the key upstream sectors in the structure of Thai economy. The simulation results suggest that the emission trading would be an optimal tool for resolving CO_2 emissions in the case of Thailand.

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