Department of Economics

Delhi School of Economics

M.A. Economics

COURSE 609: CLIMATE CHANGE ECONOMICS

Course Description

This course focuses on climate change from an economic perspective. The problem is characterised as one of regulating a global stock externality in an intertemporal setting and in the presence of uncertainty and irreversibility. Topics covered include economic impacts of climate change, climate policy with regard to mitigation and adaptation and international cooperation. Tools of analysis include dynamic optimisation, econometrics and game theory.

Topics

1. Climate modeling: various modelling approaches to analyse climate-economy interactions including Integrated Assessment Models (IAMs).

2. The choice of discount rate for climate change policy: role of (and justification for) a pure rate of time preference; role of discounting in climate change policy.

3. Social cost of carbon (SCC): determinants of the shadow price of carbon in integrated climate-economy models.

4. Technical change and fossil energy consumption: responses to climate change in an endogenous growth model with clean and dirty technologies; implications of a transition to clean technologies in an IAM; green paradox; carbon leakage.

5. 'Tipping points' or non-linearities in the climate system and their role in formulating climate policy: fat tail probability distributions and the Weitzman Dismal Theorem

6. Mitigation (tradable permits, carbon taxes, geoengineering)

7. Impacts and Adaptation: economic impacts of climate change (focus on developing countries); adaptation.

8. Environmental treaties: applying non-cooperative and co-operative games.

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Texts/Readings

Nordhaus, William D. (2008). *A Question of Balance*. Yale University Press.

Nordhaus, William D. (2013). "Integrated Economic and Climate Modeling," in *Handbook of Computable General Equilibrium Modeling*, Vol. 1, Amsterdam: Elsevier, pp. 1069-1131.

Nordhaus, William D. and Paul Sztorc (2013). DICE 2013R: Introduction and User's Manual. 2nd (October 2013) http://aida.wss.yale.edu/~nordhaus/homepage/documents/DICE_Manual_100413r1.pdf

Gollier, Christian (2008). "Discounting with fat tailed economic growth," *Journal of Risk and Uncertainty*, 37: 171-186.

Acemoglu, Daron, Ufuk Akcigit, Douglas Hanley and William Kerr (2016). "Transition to Clean Technology," *Journal of Political Economy*, 124(1):52-104.

Eichner, Thomas and Rudiger Pethig (2011). "Carbon leakage, the green paradox, and perfect future markets," *International Economic Review*, 52(3): 767-805.

Weitzman, Martin L. (2009). "On modeling and interpreting the economics of catastrophic climate change," *Review of Economics and Statistics*, 91(1): 1-19.

Newell, Richard G. and William A. Pizer (2003). "Regulating stock externalities under uncertainty." *Journal of Environmental Economics and Management* 45:416–432.

Weitzman, Martin L. (2014). "Can negotiating a uniform carbon price help to internalize the global warming externality?" *Journal of the Association of Environmental and Resource Economists*, 1(1): 29-49.

Melissa Dell, Melissa, Benjamin F. Jones and Benjamin A. Olken (2012). "Temperature Shocks and Economic Growth: Evidence from the Last Half Century," *American Economic Journal: Macroeconomics*, 4(3): 66–95.

Barrett, Scott (2005). "The Theory of International Environmental Agreements," in K-G.

Mäler and J. Vincent (eds.), *Handbook of Environmental Economics*, Vol. 3, Amsterdam: Elsevier, pp. 1457-1516.

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