

Emissions Trading and its Impacts on World Economies. Contemplation of Baseline Emissions Paths and a Ceiling on Emissions Trading

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Regarding to the Kyoto Protocol of December 1997 the United Nations agreed on several conventions to stabilise the world climate and to reduce greenhouse gases (GHG), respectively. The international conferences on climate change in Buenos Aires and in Bonn in 1998 and 1999 established concrete steps towards efficient international climate change policy options. The explicit accomplishment of the Kyoto mechanisms, *Joint Implementation* (JI), *Emissions Trading* (ET) and the *Clean Development Mechanism* (CDM), were debated controversially, concrete steps and plans of fulfillment are still under discussion. Essentially, the proper definition of baseline emissions paths and the concrete implementation of an emissions trading scheme is discussed controversially. Emissions reductions can be reached by domestic actions or by Kyoto mechanisms including the option to trade emission permits within Annex B countries. Countries will trade emission permits due to their marginal abatement costs, regions facing high marginal abatement costs by, for example, high carbon intensities within main sectors of their economies possess huge incentives to buy emissions permits. Countries with declining emissions because of substantial economic destruction like Russia or Eastern Europe will appear with emissions below their committed reduction target and will consequently prefer selling their emissions permits, entitled as “hot air” effect.

This paper illustrates different scenarios of implementing an emissions trading scheme and investigates the economic implications of different baseline development paths and an additional limitation or ceiling on emissions trading. The analysis focus on the impacts of different emissions reductions options, i.e. to decrease emissions by domestic action or by Annex B emissions trading. World economic impacts are investigated by a world general equilibrium model including 11 international regions and 4 production sectors. Various strategies including flexible instruments, like a ceiling on regional emissions trading and the interregional and intertemporal trade of emissions permits are simulated, compared and evaluated. It turns out that meeting the Kyoto target induce welfare losses to developed and developing countries, an emissions trading option can reduce global and regional welfare losses significantly. Essentially, these welfare losses depend considerably on assumed emissions baseline paths. A ceiling on emissions trading scheme diminish positive economic effects on global and regional welfare, especially within economies in transition.

Keywords: Emissions trading, energy economic modelling, baseline definition

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