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Trade liberalisation and effects on pollutive emissions to air and deposits of solid waste. A general equilibrium assessment for Norway

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Abstract

This paper assesses the effects of the last decade's multinational liberalisation of foreign trade, in terms of economic gains and in terms of emissions to air and deposits of solid waste. By means of a disaggregated intertemporal CGE model for Norway two scenarios with and without the trade reforms are compared. Despite a slight decrease in GDP, emissions of several pollutants rise significantly. This is partly attributable to a modest increase in aggregate welfare, as polluting consumption rises along with reduced labour effort. Further, the trade reforms, in combination with existing policy concessions, result in a long-run structural change in favour of heavy-polluting export industries. As these are large consumers of electricity, prices of clean hydropower rise and cause an economy-wide substitution towards more pollutive energy sources.

JEL classifications: D58; D60; F13; Q25

Keywords: Trade reforms; Welfare; Environment; Intertemporal CGE model

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1. Introduction

The last decade has witnessed a strong increase in the degree of regional and global economic integration. This has been motivated by the mutual national gains from stronger specialisation of the production structure according to comparative advantage and scale economies, stronger competition, and access to a richer menu of goods. Simultaneously, there has been a growing awareness of the potential environmental consequences of trade liberalisation. The scientific literature also reflects a revitalisation of these issues, starting in the early 1990s, see e.g. Whalley (1991), Grossman and Krueger (1993), Perroni and Wigle (1994) and Copeland and Taylor (1994).

From a national point of view, the relationship between environmental pressure and growth from trade is ambiguous. First, direct effects on environmental pressure will come through scale and composition effects in domestic production and consumption. The numerous contributions to the Environmental Kuznets Curve (EKC) literature,[1] connecting the development of environmental quality to growth, throw light on these effects. The EKC literature also emphasises that economic growth may stimulate environmental policies and technology innovations because the demand for environmental goods and regulatory policy is income elastic. In a world of freer trade, however, incentives may well pull in the other direction, e.g. through initialising a race to the bottom of environmental standards or by limiting the scope of national policy instruments. Clear and robust policy implications are even less likely in cases where environmental damage spills across borders. Multilateral arrangements are then required to ensure abatement policies.

This study addresses both economic and environmental implications for Norway of three multinational trade agreements of the last decade: the European Economic Area Agreement (EEA); the EFTA Resolution on Fisheries, both in force from 1994; and the WTO Agreement from 1995. The resulting reforms of tariffs, non-tariff barriers and governmental aid imply new domestic and world market conditions for Norwegian agents. Environmental effects considered in this study include changes in air emissions and deposits of solid waste, which are either locally harmful or affect the government's ability to fulfil international commitments on transboundary pollution.

We apply a dynamic and disaggregated CGE model for Norway to compare a simulated trade reform path with a business-as-usual reference scenario. We isolate the effects of implementing the trade reforms; no simultaneous growth effects from technological or demographic changes are considered. The model allows us to quantify changes in an aggregate welfare index and other macroeconomic aggregates, as well as detailed composition adjustments within production, factor input and consumption. As in most other comparable trade policy studies,[2] the simulated macroeconomic effects are small; while GDP is

[1] See Stagl (1999) for a survey on the Environmental Kuznets Curve literature.