

INTERNATIONAL TRADE, THE ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Cees van Beers

Department of Economics, Faculty TPM, Delft University of Technology, The Netherlands

Keywords: trade, environment, trade policies, environmental policies, trade theories, welfare economics

Contents

1. Introduction
 2. The impact of international trade on economic welfare
 3. The interaction between international trade, the environment and sustainable development: traditional theoretical approaches
 - 3.1. The impact of environmental quality on international trade
 - 3.2. The impact of international trade and international trade policy on the environment and environmental policies
 - 3.3. Impact of environmental policy on trade
 4. The interaction between international trade, the environment and sustainable development: alternative theoretical approaches
 5. The interaction between international trade, the environment and sustainable development: empirical studies
 - 5.1. The impact of environmental policies on international trade flows
 - 5.2. The impact of international trade and international trade policies on the environment
 6. The interaction between international trade, the environment and sustainable development: policy and institutional issues
- Glossary
Bibliography
Biographical Sketch

Summary

The central focus of this article is the relationships between trade, environment and sustainable development. In the first part of the present article attention is paid to the impact of trade on economic welfare without taking into account environmental issues. The workhorse of international trade, the Heckscher-Ohlin model or factor endowment approach, is explained. Then a graphical exposition of a welfare analysis in a partial equilibrium model is shown. The conclusion is that international trade increases welfare. Introduction of environmental externalities can change this conclusion, particularly if environmental externalities are large and not incorporated in prices by environmental policies. In such cases, a country may export pollution-intensive commodities, when it would maximize economic welfare by importing those commodities. The impact of environmental quality on international trade is dealt with theoretically. Environmental services can be a production factor and therefore a source of comparative advantage and thus international trade. If a country is relatively well endowed with environmental

resources e.g. forests, its exports will consist for the most part, of environmentally intensive goods like timber.

The impact of environmental policy on international trade is a ‘hot’ issue of debate and dispute. More stringent environmental policies increase production costs for pollution-intensive firms. This is what environmental policies are aimed at. The fear among policymakers and businessmen is that these firms can go bankrupt. Losses of employment opportunities will be the result. From the point of view of welfare economics the value of employment loss should be weighted against the value of a less polluted environment. More interestingly is that it is often suggested that increasingly stringent environmental policies affect the international competitiveness of pollution-intensive firms negatively, especially when other countries have relatively lax or even non-existent environmental policies. Empirical studies do not provide evidence in favor of this argument. The Porter hypothesis (1991) argues instead that relatively stringent environmental policies would remove slack (**low-hanging fruit**) out of firms and stimulate innovation, which in the end will result in improved competitiveness for the firm. At the moment there are insufficient empirical studies to give a definite judgement on this hypothesis.

Alternative economic approaches to the trade and environment issue come from ecological economists. They argue that GDP is not a good measure for economic welfare because environmental depreciation is not taken into account. Moreover, they argue that even if all countries in the world would have internalized environmental externalities, international trade provides an incentive for a **race-to-the-bottom**. This means that countries would lower their environmental regulations in order to remain competitive. In order to avoid such a **race-to-the-bottom** it is necessary, in this alternative view, to reduce trade flows by means of impediments to imports from countries that have less stringent or non-existent environmental policies.

Although environmental policies aim at correcting for market failures, many government policies introduce market failures like environmentally damaging subsidies. These are aimed at achieving an (often non-environmental) goal and end up in barely realizing this goal and contributing strongly to environmental damage. This issue is relatively new and needs a thorough investigation to answer the main question of how to reduce or eliminate these subsidies.

1. Introduction

The contribution of international trade flows to economic growth has increased enormously since 1945. Together with the increasing public awareness of environmental problems in the developed countries during the 1980s more attention has been paid to the relationship between international trade patterns and the environment.

Environmental problems have long been considered as occurring on a restricted spatial scale. Therefore economic research has long been concentrated on local dimensions of pollution and resource use. During the 1960s this resulted in a focus on local air and water pollution. In the second half of the 1980s a widespread concern for global issues and long-term environmental phenomena emerged, leading to the concept of sustainable development.

Since the beginning of the 1970s there have been efforts to investigate the link between international trade and the natural environment, and recently, attention on trade and environment has increased significantly. The links between foreign trade and environmental quality can be analyzed by means of formal methods based on specific theories. Environmental economists were mainly concerned with environmental policy issues in closed economies while trade economists have focused on imperfections other than environmental externalities, such as imperfect market structures and economies-of-scale. Ultimately some mix of externality and trade theories is unavoidable for answering relevant fundamental and policy questions. Specific models may therefore originate from foreign trade theory and externality theory.

One can distinguish between theories of foreign trade according to whether they are based on the notion of a general or partial equilibrium. General equilibrium models focus on the interaction of markets with each other in determining foreign trade patterns while partial equilibrium theories consider the factors that determine foreign trade from the perspective of isolated markets. The latter is more restricted in scope but they have a clear advantage in that they provide a clear view on how certain environmental policy interventions or environmental phenomena influence foreign trade directly. Both general and partial equilibrium theories of foreign trade theories are discussed in the next section. In section 3 the theoretical approaches discussed in section 2 will be extended to incorporate environmental elements. Four relationships are considered as important in this respect:

- The impact of international trade on environmental quality;
- The impact of environmental quality on international trade;
- The impact of international trade on environmental policies;
- The impact of international environmental policies on trade.

Section 4 pays attention to alternative theoretical approaches of both trade and environment issues that are critical of the neoclassical approach presented in sections 2 and 3. The neoclassical approach is a dominant school of thinking in present economic science, which emphasizes an efficient allocation of scarce resources through the price system and the forces of demand and supply. Empirical work is discussed in section 5. In section 6 some relevant policy and institutional issues with regard to the trade-environment debate are presented and discussed.

-
-
-

TO ACCESS ALL THE 20 PAGES OF THIS CHAPTER,
Visit: <http://www.eolss.net/Eolss-sampleAllChapter.aspx>

Bibliography

Anderson, K., and R. Blackhurst, eds., (1992). *The Greening of World Trade Issues*. Harvester Wheatsheaf, New York. [This is one of the first studies that extensively studied the relationship between trade and environment]

Antweiler, W.B., B.R. Copeland and M.S. Taylor (2001). Is Free Trade Good for the Environment?, *American Economic Review*, vol. 91, no. 4, pp. 877-908. [A paper that was the first attempt to analyze the impact of trade on environment by decomposing the effects into scale, composition and technique effects]

Ayres, R.U. (1996), Limits to growth paradigm, *Ecological Economics*, 19, p. 117-134. [An alternative approach to the trade and environment debate]

Baumol W.J. and W.E. Oates (1988). *The Theory of Environmental Policy*, 2nd edition. Cambridge University Press, Cambridge. [An important book that deals with many aspects of environmental policy]

Bhagwati and Hudec, eds. (1996), *Fair Trade and Harmonization. Prerequisites for Free Trade*, vol 1: Economic Analysis, MIT Press, Cambridge, Massachusetts. [An informative book consisting of analytical contributions]

Burniaux, J.-M., G. Nicoletti and J. Oliveira Martins (1992). Green: A Global Model for Quantifying the Costs of Policies to Curb CO₂-Emissions, *OECD Economic Studies*, No. 19, Winter, p. 49 –92. [Description of the General Equilibrium Model GREEN]

Daly, H. (1993) The perils of Free Trade. *Scientific American*, 269, p. 24-29. [Alternative approach to trade and environment debate]

Daniel Esty, (2001), Bridging the Trade-Environment Divide, *Journal of Economic Perspectives*, vol, 15, No. 3, p. 113-130. [Provides a good overview on the policy issues in the trade-environment debate]

Fredriksson, P.G. ed. (1999), *Trade, Global Policy and the Environment*, World Bank Discussion paper no. 402, The World Bank, Washington D.C. [An informative report of the World Bank on the international aspects of trade and the environment. Can be considered as a follow-up on the work of Low (1992): see below]

Grossman, G, and A. Krueger (1995). Economic Growth and the Environment, *Quarterly Journal of Economics*, CX (2), p. 353-377. [Paper that introduces the Environmental Kuznets Curve]

Hueting, R. (1980). *New Scarcity and Economic Growth: More Welfare through Less Production?* North-Holland, Amsterdam. [Deals with measurement problems with regard to GDP]

Krueger, A.O., (1977), *Growth, Distortions, and Patterns of Trade among Many Countries*, Princeton, International Finance Section. [An important paper analyzing the upgrading of countries' factor endowments in the course of time]

Landis Gabel, H. and B. Sinclair-Desgagné (1999), The firm, its routines and the environment, in: T. Tietenberg and H. Folmer (eds.) *The International Yearbook of Environmental and Resource Economics*, Edward Elgar, Cheltenham, p. 89-118. [A paper that shows how firms can be myopic to efficiency. It is of importance for the Porter Hypothesis]

Linder, S.B. (1961). *An Essay on Trade and Transformation*, Almquist & Wiksell, Upsala. [This book formulates the trade theory of Linder]

Low, P. (1992), *International Trade and Environment*, World Bank Discussion Papers, No. 159. World Bank, Washington D.C. [The first extensive contribution of the World Bank to the trade and environment debate]

Muradian, R. and J. Martinez-Alier (2001), Trade and the environment: from a 'Southern' perspective, *Ecological Economics*, 36, p. 281-297. [Interesting paper that argues that the Kuznets curve will not exist for many developing countries as these countries would be trapped in a low-developed factor endowment base of raw materials]

Palmer, K.L., W.E. Oates and P.R. Portney (1995), Tightening environmental standards: the benefit-cost or no-cost paradigm, *Journal of Economic Perspective*, 9, p. 119-132. [A critique on the Porter hypothesis]

Porter, M.E. (1991), America's Green Strategy, *Scientific American*, p. 168. [Introduction of the Porter hypothesis]

Siebert, H. (1987). *Economics of the Environment: Theory and Policy*. Springer-Verlag, Berlin. [An important though not easily accessible theoretical work on the trade and environment issue]

Steininger, K. (1999). General models of environmental policy and foreign trade, in: J.C.J.M. van den Bergh (ed.) *Handbook of Environmental and Resource Economics*, Edward Elgar Publishers, Cheltenham UK. [A concise description and discussion of several empirical and theoretical models]

Tobey, J.A. (1990). The Effects of Domestic Environmental Policies on Patterns of World Trade: An Empirical Test. *Kyklos*, Vol. 43: 191-209. [The first extensive empirical study on the impact of stringent environmental policies on international trade]

Van Beers, C. and J.C.J.M. van den Bergh (1996). An Overview of Methodological Approaches in the Analysis of Trade and Environment, *Journal of World Trade*, vol. 30, no. 1, 143-167. [Extensive discussion and comparison of several models in the analysis of trade and environment]

Van Beers, C. and J.C.J.M. van den Bergh (1997). An Empirical Multi-Country Study of the Impact of Environmental Regulations on Foreign Trade Flows, *Kyklos*, vol. 50, 1, p. 29-46. [After Tobey (see above) the second extensive empirical study of the impact of environmental policies effects on international trade flows].

Van Beers, C. and A. de Moor (2001), *Public Subsidies and Policy Failures. How subsidies distort the natural environment, equity and trade and how to reform them*, Edward Elgar, Cheltenham, United Kingdom. [A first analytical but also policy-relevant approach to the issue of environmentally damaging subsidies]

WCED (1987). *Our Common Future*. World Commission on Environment and Development, Oxford University Press, Oxford and New York. [Important report of the United Nations on the relationship between environment and economic development]

Biographical Sketch

Cees van Beers is Associate Professor of Economics at Delft University of Technology. He previously held research and teaching positions at Leiden University and the Free University of Amsterdam. His publications are in the fields of international economics, environmental economics and innovation economics.