

Embodied pollution in trade: estimating the ‘environmental load displacement’ of industrialised countries

Roldan Muradian ^{a,*}, Martin O’Connor ^b, Joan Martinez-Alier ^a

^a *Departament d’Economia i d’Història Econòmica, Universitat Autònoma de Barcelona, 08193 Bellaterra, Barcelona, Spain*

^b *C3ED, Université de Versailles-St Quentin en Yvelines, 47 Boulevard Vauban, 78047 Guyancourt Cedex, France*

Received 22 June 2001; received in revised form 6 November 2001; accepted 27 November 2001

Abstract

The present paper sets out to aid in the development of ‘environmental load displacement’ indicators. Developing the notion of the ‘environmental memory’ of physical flows, we estimated embodied pollution in trade of 18 industrialized countries with (a) the rest of the world and (b) developing countries, from 1976 to 1994. We found that in the last years of analysis, total imports of Japan, USA and Western Europe have entailed, in general, larger air pollutant emissions than local exports. The balance of embodied emissions in trade (BEET) seems to follow an inverted-U shape across time in Japan and Western Europe, and an N-shape in the US. In the period of analysis, Japanese and European environmental terms of trade with developing countries ‘improved’ (from the Japanese and European point of view), whereas American environmental terms of trade with developing countries ‘deteriorated’ over time. Although there is no statistical trend between income and embodied emissions in imports in a cross-section analysis, there does seem to be a positive relationship between both variables at a national level. The results suggest that, despite many shortcomings, this type of assessment may shed useful insights on the international aspects of sustainable development. © 2001 Published by Elsevier Science B.V.

Keywords: Environmental terms of trade; Embodied pollution; Ecologically unequal exchange; Environmental Kuznets curve; International trade

1. Introduction

The assessment of the environmental performance of any selected economic system requires us to specify the relevant spatial scales of analysis (Grainger, 1999). This choice will depend on the assumptions adopted about: (a) the interrelationship between the different ecological systems

transformed by the economic activity; (b) the agents and institutions where environmental liability has to be assigned; (c) the economic driving forces of environmental transformation; and (d) the envisaged mechanisms of environmental policy. Traditionally, environmental accounting is mostly referred to political (not ecological) territories, particularly to the country-level. Nevertheless, due to the existence of international environmental interrelationships, sustainability evaluations at a national level may face significant

* Corresponding author.

E-mail address: rolmur@yahoo.com (R. Muradian).