



The Swedish producer responsibility for paper packaging: An effective waste management policy?

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Abstract

The main purpose of this study is to analyze the incentive structure and the effectiveness of the Swedish producer responsibility ordinance, i.e., the ability of the system to induce producers to economize with cardboard packaging and to fulfill the related environmental goals cost effectively. A secondary purpose is to discuss if the empirical evidence in any way suggests that an alternative supply chain management regime, i.e., the UCTS-system, could be more effective. According to the results, both the Swedish producer responsibility scheme and the UCTS system fulfill two important cost effectiveness criteria. The packaging fee in the present Swedish system and the packaging tax in the UCTS system provide similar incentives to an *output effect*. Furthermore, both systems also give rise to *input substitution effects*. For instance, both systems encourage the use of secondary materials at the expense of virgin materials by subsidizing collection and recycling activities. However, in the Swedish producer responsibility system, waste collection entrepreneurs in areas with high marginal costs of collection also often obtain high refunds. This implies a violation of the cost effectiveness principle. Neither of the systems tends to encourage enough of *design for recyclability*, but here the Swedish producer responsibility seems to be somewhat more effective than the UCTS system. Our analysis of the *transformation and transaction costs* involved in the two waste management systems suggests that it is hard to a priori determine which system will minimize waste management costs. It will depend on, for instance, households' valuation of sorting efforts, and the presence of economies of scale in the waste collection system. This implies that different systems can be preferred in different parts of the country. © 2006 Elsevier B.V. All rights reserved.

Keywords: Producer responsibility; Supply chain management; Waste management; Cardboard packaging; Recycling; Cost effectiveness

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1. Introduction

1.1. Background and purpose

During the last decades the diffusion of environmental management techniques along the entire supply chain of a product has become a common way of encouraging improved environmental performance of an industry. This strategy is known as environmental supply chain management and involves the inclusion of environmental aspects in integrated management of industrial chains for manufactured goods (e.g., [Lamming and Hampson, 1996](#)). For example, the academic literature has focused a lot of attention on the way in which environmental concerns are integrated into the purchasing functions of companies (e.g., [Min and Galle, 1997](#)), including the use of environmental criteria in supplier assessment as well as collaborations on environmental standards between suppliers and customers.

Most analysts agree that there are basically two reasons why a private company decides to include environmental issues into the entire management of the company's supply chain (e.g., [Berger et al., 2001](#)). Either the company finds such practices profitable due to potential cost savings or risk avoidance or they are forced by government policy and legislation to implement them. This study focuses primarily on the latter case, namely that of the producer responsibility legislation for packaging materials. These policies have become increasingly common in many countries (e.g., Germany and Sweden), and discussions have also been underway at the European Commission for similar schemes on an EU-wide basis.

In general producer responsibility legislation states that producers who disseminate packaging are entrusted with the responsibility for collection and handling of their products at the end of their useful lives ([Palmer and Walls, 1999](#)). For this purpose, the producers are required to establish collection systems for the respective products and in some cases the legislation also mandates that a specific share of the materials consumed are recycled. The aim of the policy is clearly to influence supply chain practices and stimulate the diffusion of environmentally sound practices throughout the complex network of industrial buying and selling.

However, some analysts have questioned the ability of the producer responsibility legislation to stimulate waste minimization throughout the entire supply chain, especially since the responsibility in many cases only relates to the disposal chain (rather than to the supply chain as a whole) (e.g., [Lamming and Hampson, 1996](#)). In addition, some authors argue that there exist alternative policies, e.g., the so-called “upstream combination tax/subsidy” scheme (UCTS system),¹ which provide virtually the same incentives for resource conservation and recycling as a producer responsibility mandate but at lower administrative (transaction) costs (see, in particular, [Walls and Palmer, 2001](#)). Nevertheless, the above arguments have primarily been drawn from theoretical models and analyses, and there exists a lack of empirical evidence on exactly what types of incentives that are created by the producer responsibility legislation and on whether alternative systems would constitute even more effective environmental supply chain management strategies.

¹ The UCTS system combines an output tax on produced intermediate goods with a subsidy granted to collectors of recyclables.

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