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Norms and economic motivation in household recycling: Empirical evidence from Sweden☆

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ABSTRACT

This paper analyzes the determinants of recycling efforts in Swedish households, and focuses on the case of packaging waste (i.e., paper, glass, plastic, and metal). The analysis builds on a theoretical framework that integrates norm-motivated behavior into a simple economic model of household choice by assuming that the individuals have preferences for maintaining a self-image as morally responsible, and thus norm-compliant, persons. A postal survey was sent out randomly to 2800 households in four different Swedish municipalities, and in the paper self-reported information on recycling rates at the household level is analyzed in an ordered probit regression framework. The results indicate that both economic and moral motives influence inter-household recycling rates. Specifically, convenience matters in the sense that property-close collection in multi-family dwelling houses leads to higher collection rates. The strength of moral (self-enforced) norms explains a large part of the variation across households, but the importance of such norms in driving recycling efforts partly diminishes if improved collection infrastructure makes it easier for households to recycle. Recycling rates at the household level are also positively influenced by the felt ability to favourably affect environmental outcomes as well as by others' recycling efforts. The paper discusses a number of policy implications that follow from the empirical results.

1. Introduction

Environmental policy often requires people's active involvement, and many obligations are therefore expressed in household-related activities such as sorting of waste and the active purchase of 'green' products and services. In 1994 a producer responsibility ordinance for packaging was introduced in Sweden; this mandates households to sort out packaging waste from other waste, clean the waste, make use of the collection systems that producers provide, and finally sort different packaging materials – paper, plastic, glass, and metal – in assigned recycling bins. Households' participation is mandatory but in practice it is rarely controlled and enforced, and it is easy to defect and free-ride on others' contributions. Nevertheless, official statistics show that households in Sweden recycle substantial amounts of packaging materials (SEPA, 2006).

What explains inter-household participation rates in packaging recycling schemes, and what is the role of public policy in stimulating additional recycling efforts? These are the overall research questions addressed in this paper, and in the analysis we pay particular attention to the role of both economic and norm-based motives as well as to the relationship between these rationales. Our focus is motivated by the fact that waste management policies typically rely on a combination of economic and norm-based policy instruments, thus adhering both to personal moral responsibilities while at the same time providing the incentives that induce people to translate any felt obligation into recycling action.

In Sweden the ordinance requires that the producers of packaging materials provide a collection system, and they have chosen to establish about 6000 drop-off stations where households can leave their packaging waste (Funck, 2006). Still, since Sweden is a sparsely populated country some households may be located far away from their nearest drop-off station. Local authorities have introduced new waste management policies providing economic incentives for households to increase recycling rates. For instance, almost all Swedish municipalities have abandoned the flat fee pricing policy for waste collection and introduced either volume- or weight-based waste fees for single-family dwellings (Hage et al., 2008). Earlier economic studies show, though, that volume-based

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waste pricing schemes can be quite ineffective in increasing recycling levels, at least those where households only pre-subscribe for a certain size of waste collection (e.g., Sterner and Bartelings, 1999; Kinnaman and Fullerton, 2000; Jenkins et al., 2003; Hage and Söderholm, 2008). Also the use of weight-based schemes has been questioned on effectiveness grounds (e.g., Ackerman, 1997), and for inducing improper disposal behavior (Fullerton and Kinnaman, 1996; Dahlén et al., 2007).

Infrastructural measures have also been undertaken to facilitate households' recycling efforts. Some municipalities offer *curbside recycling* of packaging waste to single-family dwellings, and many of the multi-family dwelling houses buy a similar service, *property-close collection*, from recycling entrepreneurs (see also Section 3.2). In spite of these new measures, though, the producer responsibility ordinance imposes burdens on Swedish households, who are not economically compensated for their efforts.

Economically household recycling activities contribute to the production of public goods such as improved environmental quality, i.e., goods characterized by non-rivalry and non-excludability in consumption, and economic theory predicts that such voluntary contributions will be limited in a non-cooperative setting (Bergstrom et al., 1986). This is the typical situation in a so-called social dilemma, i.e., the payoff to each individual of not contributing to the public good is higher than the payoff for voluntary public good provision, but yet overall all individuals receive a lower payoff if all choose to defect than if all contribute. Andreoni (1988) also showed that even in the presence of pure altruism, the contribution to public goods, and hence recycling, would be insignificant in large economies.

In the social psychology literature it is suggested that the presence of norms – informal rules requiring that one should act in a given way in a given situation – may provide an important reason for a departure from a social dilemma outcome (e.g., Biel and Thogersen, 2007). It is useful to distinguish between *moral* and *social* norms. A moral norm implies that individuals sanction themselves, while a social norm is enforced by explicit approval or disapproval from others. In practice, however, it can be hard to make a clear empirical distinction between these two types of norms, especially since it may be asserted that any influence of social norms is mediated through internalized norms (e.g., Schwartz, 1977). In other words, moral norms are activated through social interaction. Numerous studies find that norms are important for explaining household recycling behavior. Hornik et al. (1995), Schultz et al. (1995) and Thogersen (1996) review this research, and the more recent research efforts by Chan (1998), Barr et al. (2003), and Tonglet et al. (2004) confirm this conclusion.

The bulk of the recycling literature concludes that moral norms and attitudes are more important than social norms. However, Tucker (1999) and Barr et al. (2003) stress that social norms are important in cases where the visibility of recycling behavior is high. Derksen and Gartrell (1993), Guagnano et al. (1995), Ölander and Thogersen (2005) also report that external conditions (e.g., recycling infrastructure) are important for moral recycling decisions thus establishing a link between convenience (economic) and moral motives.

Guagnano et al. (1995) conclude that "science and policy require a socioeconomic theory of behavior that incorporates both external conditions and internal processes" (p. 700). During the last decades a number of economists have tried to achieve just that. For instance, Brekke et al. (2003), Bruvoll and Nyborg (2004) as well as Nyborg et al. (2006) develop neoclassical utility theory by considering moral norms, while, for instance, Holländer (1990), Nyborg and Rege (2003) and Rege (2004) do the same in the case of social norms. However, there exist few empirical economic studies that employ this new strand of research in the waste management field. Survey results from Norway indicate that moral norms and warm-glow effects are important determinants of recycling behavior in Bruvoll et al. (2002) and Halvorsen (2008), and Berglund (2006) finds that households' willingness to pay others for sorting the waste is negatively correlated with the existence of moral norms for recycling.

The present study adds to this limited empirical research by addressing the role of both economic and norm-based motivation as well as the relationship between these rationales. The overall purpose of the paper is to analyze the determinants of inter-household recycling rates for packaging materials in Sweden. We pay particular attention to the presence of social and moral norms as well as to the role of incentive-based policies in the waste management field. The analysis is performed by employing data from a postal survey sent out to 2800 households in four Swedish municipalities, and the self-reported data on recycling rates at the household level are analyzed by using ordered probit regression techniques.

The paper proceeds as follows. Section 2 outlines a simple theoretical framework of household recycling. In the model, which is heavily based on Nyborg et al. (2006), it is assumed that individuals have preferences for maintaining a self-image as morally responsible – and thus norm-compliant – persons. Improved self-image requires, however, that less household time can be allocated to leisure activities. The survey design, variable definitions and the econometric specification of the empirical model are discussed in Section 3. The results are presented and discussed in Section 4, while Section 5 provides some concluding remarks and implications.

2. A simple economic model of a norm-motivated recycler

The recycler utility model that is presented in this section builds on a model for a morally motivated green consumer developed by Nyborg et al. (2006),[1] and it is in turn heavily influenced by Schwartz's psychological theory for altruistic behavior (Schwartz, 1970, 1973, 1977).[2] According to Schwartz, social norms regarding moral behavior could be adopted by each of us on a personal level and hence become personal moral norms. When this norm is internalized and activated, no external sanctions are necessary because moral norms are self-enforced. Schwartz (1973, 1977) also stresses that it is not enough to have a personal moral norm to undertake a specific action. People could internalize norms, but may not necessarily act in accordance with them. Nyborg et al. (2006) provide a good explanation for this:

> "Our model is partial; it considers only one type of green consumer good, while there are a nearly unlimited number of other choices to make in everyday life. However, no-one is capable (cognitively or economically) of contributing to every public good in every possible way; there must be some division of labor in society. Hence, in practice, even individuals with a strong preference for considering themselves to be socially responsible will not feel an obligation to contribute to every good cause." (p. 354)

Schwartz suggests that to influence behavior a specific norm must be *activated*, and to become activated *problem awareness* and *ascription of responsibility* are important. In the case of recycling, individuals must believe that the waste generated by households really harms the environment and that recycling thus will give rise to positive externalities (and affect others' welfare positively). The individual must also feel a personal responsibility to recycle; they

[1] Their model is in turn a simplified version of a model developed by Brekke et al. (2003).

[2] For applications of this theoretical framework in the analysis of pro-environmental behavior, see, for instance, Hopper and Nielsen (1991), Thogersen (1999), Stern et al. (1999), and Ek and Söderholm (2008).