



## Analysis

Waste prevention and social preferences: the role of intrinsic and extrinsic motivations<sup>☆</sup>Grazia Cecere<sup>a,b</sup>, Susanna Mancinelli<sup>c,d</sup>, Massimiliano Mazzanti<sup>c,d,e,\*</sup><sup>a</sup> Telecom Ecole de Management, Institut Mines Telecom, 9 rue Charles Fourier, 91011 Evry, France<sup>b</sup> University Paris Sud, RITM, 54, Bd Desgranges, 92330 Sceaux, France<sup>c</sup> Department of Economics and Management, University of Ferrara, Via Voltapaletto 11, 44100 Ferrara, Italy<sup>d</sup> SEEDS (Sustainability, Environmental Economics and Dynamics Studies) Research Centre, Italy<sup>e</sup> CERIS CNR Milan, Italy

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## ABSTRACT

It is only recently that EU policies have started defining targets for waste reduction despite waste prevention being at the top of the 'waste hierarchy'. Against this backdrop, we examine whether individual behaviour towards waste reduction is more strongly driven by extrinsic motivations such as social norms, or intrinsic motivations, such as altruistic preferences. We exploit a new survey covering 22,759 individuals from EU27 countries. Our results suggest that individual preferences matter to move beyond an orientation based on recycling, to achieve a reduction of the sources of waste. Behaviour patterns which lead to waste reduction are seldom socially oriented, seldom exposed to peer pressure, and very reliant on purely 'altruistic' attitudes.

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## 1. Introduction

Although reducing waste is at the top of the waste hierarchy (Palmer et al., 1997; Pearce, 2004), no real decoupling between waste generation<sup>1</sup> and consumption has been demonstrated. The European Commission has published several waste Directives (see Nicolli and Mazzanti, 2011), but they have only brought about minor changes within the key objective of reducing waste generation

(EEA, 2009), one of the main targets in the EU's long term transition towards a green economy (EEA, 2013b, 2014a,b).<sup>2</sup> Most efforts have been targeted towards greater amounts of recycling and better management of waste disposal. Whilst these are desirable and socially beneficial goals, they are not sufficient for the achievement of long-term sustainability targets. Too much policy and media attention related to recycling as a final societal aim can somewhat distort perceptions: society 'feels good' because more waste is being recycled, whilst the

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<sup>1</sup> Waste generation is meant as waste collected, i.e. here waste collection and waste generation/production are terms used interchangeably.

<sup>2</sup> See Figure A1 in the Appendix A, which depicts waste generation, recycling and composting trends in the EU related to Municipal Waste Generation. Apart from Germany, the leading European countries have not achieved any reduction in waste generation. The EEA (2013a) states that "[i]f the figures are compared for the years 2001 and 2008, 26 countries recorded an increase and six countries a decrease. This suggests that the economic downturn that started in 2008 may have caused a reduction in municipal waste generation per capita. Overall, however, the picture is mixed and there is no clear evidence of improved waste prevention across countries between 2001 and 2010". This confirms other EEA figures (see also Figure A2 and EEA, 2009).

real objective should be to reduce the amount of waste being produced, in both relative and absolute terms. EU targets on waste prevention are very recent.<sup>3</sup> The means achieving them is difficult given the current economic stagnation, which does not emphasise environmental targets. The costs of waste prevention are high and actions aimed at reducing waste imply radical changes in behaviour and life styles.

Although economic tools have had some positive effects on waste management, it is generally agreed that individual decisions about what to buy and how to dispose of goods play a fundamental role in waste prevention and recycling programmes. Thus, a good understanding of the factors influencing individuals' preferences and behaviours is essential to tackling the problem of waste effectively.

In the present article, we investigate individual behaviour towards waste reduction by exploiting a recent large EU surveys about individuals. The empirical analysis presented is backed by theoretical discourse that revolves around intrinsic and extrinsic motivations that might characterise an individual's waste management behaviour. We specifically test whether individual behaviour towards waste reduction is mostly driven by intrinsic or extrinsic motivation.

Since individual behaviour is at the heart of this analysis, micro economic studies are crucial. The shortcoming of these studies on empirical sides is that their survey-based nature often limits the available dataset to a regional setting, or prevents a study from producing completely generalisable results.

As far as the EU is concerned, studies that rely upon individual data mainly refer to Scandinavian and UK experiences, due in part to the relatively richer availability of regional and municipal datasets (see amongst others D'Amato et al., 2013; Mazzanti and Nicolli, 2013; Mazzanti et al., 2008, 2011, 2012 for analyses and surveys on regional-like data). For instance, Hage et al. (2009) investigate the main determinants of the collection rates of household plastic packaging waste in some Swedish municipalities, using spatial econometrics for a cross-section of 282 units. This work is linked to other analyses on recycling and separated collection performances focusing on household behaviour, using survey data at a local level (Hage and Söderholm, 2008). Barr (2007) analyses households' waste management (waste reduction, reuse and recycling), considering behavioural values, behavioural intentions and the actions of 673 residents in Exeter, UK. Graham-Rowe et al. (2014) analyse household food waste through a qualitative study on 15 UK household food purchasers.

One of the empirical bullets of our study is that it focuses on the EU as a whole, rather than on regions and municipalities. In fact, our research hypotheses are tested on an original dataset containing 22,759 individual data, which were collected in 2011 by the Gallup Organization on behalf of Eurobarometer (EU Commission). The data includes detailed information on waste related behavioural preferences. Our analysis econometrically investigates whether, amongst the many socio-economic drivers, individuals' intrinsic and/or extrinsic motivations are significant. We verify these effects with reference to 'food waste' (e.g. bio-waste), a major proportion waste whose production is effectively linked to individuals' day-to-day behaviour.<sup>4</sup>

The paper is organised as follows: Section 2 reviews the literature on intrinsic and extrinsic motivations behind individuals' pro-social

behaviour, focusing particularly on the waste management context. It also describes the conceptual framework and formulates the main research hypothesis. Section 3 presents the dataset and some socio-economic information on respondents. Section 4 discusses the estimations and the results of the econometric analysis. Section 5 concludes.

## 2. Crowding Out, Crowding In: The Role of Intrinsic and Extrinsic Motivations

The idea that the motives which induce people to engage in pro-social behaviour may go beyond purely economic reward has been widely recognized and accepted by economists, who have turned to psychological studies for an explanation that transcends the classic view of the wholly selfish, monetary motives of the human being. The present section provides a short review of the general relevant literature in these terms (Section 2.1), with a particular focus on waste management (Section 2.2) which informs the conceptual framework of our analysis and formulation of our main research hypothesis.

### 2.1. Relevant Literature

In the economic literature on pro-social behaviour, it is possible to distinguish at least four groups of theories.<sup>5</sup> The first includes theories that explain people's pro-social behaviour in view to achieving a private or material reward, such as tax breaks in the case of donations or the creation of social networks in the case of voluntary work (Olson, 1965). The second group includes theories based on the idea that people care about the well-being of others for three reasons: first, people's own utility function is directly and positively influenced by the well-being of others, as in the case of Becker's (1974) pure altruists and their donation to a public good; second, people perceive a 'warm glow' from their pro-social behaviour, as in the case of Andreoni's (1989, 1990) impure altruists who, by contributing to the public good, 'get some private good benefit from their gift per se, like a warm glow' (Andreoni, 1989, pp. 1448–1449); third, people dislike inequality and hence behave altruistically towards those worse off than themselves, as in Fehr and Schmidt (1999). The third group of theories includes those on people moved by a sense of reciprocity so that their pro-social behaviour depends on the behaviour of others within a given group (Fehr and Gächter, 2000; Rabin, 1993). Finally, the fourth group refers to social norms and reputational concerns as triggers for people's pro-social behaviour (Bénabou and Tirole, 2006).

Thus, people's pro-social behaviours are driven by intrinsic and extrinsic motivations.<sup>6</sup> A generally accepted definition of intrinsic motivations comes from psychology (Deci, 1975) and identifies the peculiarity of an intrinsic motive in the absence of an external reward, and as a motivation that comes from 'within the person's attitude'. On the other hand, extrinsic motivation comes from outside the person. On this basis, motives such as pure altruism or the 'warm glow' can be considered intrinsic, since their rewards are purely internal, derived from the donor's own knowledge of his/her pro-social behaviour, whilst motives that involve material rewards, such as tax breaks, may be considered extrinsic, since here behaviour is instrumental in obtaining an external reward. Reciprocity, social norms and reputational concerns do not appear to only come from within the person, and in the case of social norms in particular further examination is necessary. People keen to conform to a socially shared perception of an ideal form of pro-social behaviour are moved both by the desire to achieve a good self-image (essentially intrinsic) and to gain the respect and approval of others (essentially extrinsic). People behave pro-socially in order to signal

<sup>3</sup> At <http://scp.eionet.europa.eu/facts/WPP> one can read: "The revised EU Waste Framework Directive (2008/98/EC) requires that by 12 December 2013 Member States establish national waste prevention programmes. In Article 3 (12) (2008/98/EC) 'prevention' is defined as 'measures taken before a substance, material or product has become waste, that reduce: the quantity of waste, including through the re-use of products or the extension of the life span of products; the adverse impacts of the generated waste on the environment and human health; or the content of harmful substances in materials and products'". The EEA recently started monitoring national waste prevention plans in addition to waste management. 2014 marks the first annual survey of waste prevention programmes aimed at assisting member states in accordance with the EEA mandate as described by the 2008 Waste Framework Directive (see EEA, 2014a, p. 37).

<sup>4</sup> Bio waste is the specific target addressed by the EU Landfill Directive. Further details are provided below.

<sup>5</sup> See Meier (2007) for a more detailed survey.

<sup>6</sup> Definitions of these two sets of motivations are not so precise or unambiguous, to the point that Reiss (2005) considers this distinction misleading and not yet scientifically convincing.

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