

Waste generation, recycling and prevention – reflection

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OECD conference on
'Household Behaviour and Environmental Policy'
Paris, 3rd of June 2009



Introduction

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1. Current research – water and economics (WFD)
2. Former research – waste
 1. Weight-based pricing in *Resource and Energy Economics* (2001)
 2. Land fill taxation in the NL (report 2005)
 3. Economic instruments in waste policy in the NL (report 2008)

My task

Reflection on two papers

- Waste Generation by Kwang-yim KIM
- Waste Recycling and Waste Prevention by Ida FERRARA

Outline

General remarks

Research questions

Questions and remarks

- Both papers
- Waste generation - KIM
- Recycling - Ferrara
- Prevention - Ferrara

General remarks

Combined research on household behaviour on five environmental areas: energy, waste, transportation, organic food and water.

Country comparison of 10 OECD countries.

What drives generation, recycling and prevention of waste?

General remarks

Very interesting:

Focus on waste recycling and prevention: not a lot of economic analysis on these issues

Both papers make a clear comparison of results of the analysis with earlier findings in the literature

Taking into account many differences in waste collection, recycling, and pricing

A lot of results as expected, but not all of them.

Research questions (Recycling)

Waste generation

- What are the determinants (environmental awareness/attitudes) of waste generation? **Poisson (and ordered probit) regression on number of bags of mixed waste**

Waste recycling

- Do user fees for waste disposal affect waste recycling rates (by material and/or by type of unit pricing)?
- Does the presence of a recycling program significantly affect waste recycling rates (by materials)?

Research questions (Generation)

Waste recycling

- Does the household waste recycling decisions depend on the type of recycling programs?
- Do general attitudes towards the environment influence and intrinsic motivation affect waste recycling levels?
 - Probit regression on recycling participation per material
 - Ordered probit regression on recycling intensity per material
 - Multivariate probit regression on recycling participation for all materials

Waste prevention

- Do user fees have significant effects on waste prevention (frequency of refillable containers)?
 - Probit regression on recycling participation per material
 - Ordered probit regression on recycling intensity per material

Questions and remarks (both)

The OECD Survey is web-based:

Two concerns

- 1) How representative is the survey per country?
- 2) The information on waste generation (number of bags), recycling participation and recycling intensity is derived from the survey. These are not actual figures. Were these figures verified with actual country data on waste generation, recycling participation and recycling intensity?

Questions and remarks (both)

Use of environmental awareness variables:

- Rank of environmental concerns (5 levels)
- Dummy for waste generation concern
- Environmental concern index (5 levels)
- Environmental attitude index (5 levels)

Three concerns:

- 1) Not a continuous variable=> use dummy variables, so that the data tell you what the impact of the levels are? These impacts are not necessarily linear.
- 2) What is the correlation between these variables (per country)? Danger of multicollinearity in regressions
- 3) Are the variables correlated with age or education for instance?

Similar concerns for recycling motivations

Questions and remarks (Generation - KIM)

Waste generation data: table 1 on p. 16 presents survey averages, or not?

Are containers excluded?

How comparable are the averages per country?

How is the pay per bag system included in the unit based systems?

In the NL, bags collection is primarily done in strongly urbanized areas.

Table 5: a frequency table on environmental attitude is more informative than summary statistics.

Table 6: collection frequency: what is the reference category?

Why is the Poisson regression preferred over the ordered probit regression although the results hardly differ?

Questions and remarks (Recycling – FERRARA)

In the introduction of the paper, land filling is regarded as an environmental less favourable option. However, a social cost benefit analysis for the Netherlands showed that social costs including environmental costs of modern landfills are lower than the social costs of waste incineration plants (Bartelings et al., 2005).

The link between waste recycling and environmental quality on page 20 is not necessarily present. Non-recyclers do not necessarily harm the environment. In particular, non-recyclers provide waste for incineration plants that produce power and heat.

Questions and remarks (Recycling – FERRARA)

Probit model: might the total amount of waste be an explanatory variable that influences the recycling decision?

Ordered probit model: do the recycling rate relate to total recycled materials or total waste?

The results between the regular and ordered probit regression hardly differ for many coefficients. Is there an explanation for this observation?

Unit based pricing for **mixed waste collection** does not affect the recycling decision. Not even in the presence of a collection service for recyclables.

Unexpected result: One explanation for this finding might be that the survey does only include the type of pricing system, but not the actual marginal costs of mixed waste collection.

Questions and remarks (Prevention – FERRARA)

One of the dependent prevention variables is whether consumers take into account a recycling logo when buying consumer goods. What does it tell us about actual behaviour on consumption pattern and recycling?

For instance, the consumer might not buy the product or the consumer buys the product, but does not recycle it.

Is there any verification possible?

Will there be a multivariate analyses for all five areas?

-Food waste generation (and recycling) and organic food consumption might be related.

■ Thank you!