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Personal transport choices – OECD Project on household behaviour and environmental policy

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Outline

1. Introduction and key questions
2. Methodology
3. Results & policy recommendations
Introduction

Personal transport choice:

- Choice of alternative modes
- Willingness to pay a premium price to purchase an electric car
- Importance of environmental impacts relative to other attributes in car choice
Key questions

Mode choice:
• Main determinants behind the use of alternatives modes?
• Influence of household car ownership?

WTP:
• How does WTP vary across different groups?
• Who is most reluctant?

Importance environmental factors car choice:
• Most important characteristics when choosing a car?
• Effect of attitudes towards the environment?
Methodology I

- Binary logit (mode choice, car ownership)

\[ V_i = ASC_i + \beta_{SoEc} i \cdot X_{SoEc} + \beta_{GeoEnvInf} i \cdot X_{GeoEnvInf} + \beta_{At} i \cdot X_{At} + \beta_{Country} i \cdot X_{Country} + \beta_{TT} \cdot X_{TT} (1+\epsilon_{MC} \cdot G_{MC}+\epsilon_{HC} \cdot G_{HC}) \]

- OLS (environmental factors)

\[ y_i = \alpha + \beta_{(CarChoice \ i)} \cdot X_{CharChoice} + \beta_{(SoEc \ i)} \cdot X_{SoEc} + \beta_{(At \ i)} \cdot X_{At} + \beta_{(Country \ i)} \cdot X_{Country} + \epsilon_i \]
Methodology II

• Censored regression model (WTP)

\[ y_i^* = \alpha + \beta_{(SoE c\ i)} \cdot X_{SoE c\ i} + \beta_{(At\ i)} \cdot X_{At\ i} + \beta_{(Country\ i)} \cdot X_{Countr\ i} + \varepsilon_i \]

\[ y_i = \begin{cases} 
0 & \text{if } y_i^* \leq 0 \\
y^* & \text{if } 0 < y_i^* < 100 \\
100 & \text{if } y_i^* \geq 100 
\end{cases} \]

\[ \frac{\partial E[y^*]}{\partial x_i} = \beta_i \quad \frac{\partial E[y]}{\partial x_i} = \Phi \left( \frac{x_i \beta}{\sigma} \right) \beta_i \]
Mode choice - commute

Walking:
• Long distances discourage respondents strongly from walking compared to car use

Cycling:
• Travel time has strong negative influence but decreases with high environmental concerns

Public transport:
• Travel time and accessibility are most important, no interaction between travel time and environmental concerns
Mode choice - shopping

Walk:
- Less likely alternative for shopping caused by on distance, environmental awareness has light positive impact

Cycling:
- Least preferred mode for shopping, differs among countries

Public transport:
- Respondents with higher income tend to shop by car
Mode choice – policy recommendations

- Long term policies should aim to improve urban planning and increase the mix of residential and business zones

- Short term: adjustment to transportation infrastructure with relatively low costs to serve non-motorized modes
Car ownership

- Strong impact on mode choice → car ownership model to support findings of mode choice models
- Strongest influence: income and travel time savings
- Important: Household size and public transport accessibility
- Countries with high public transport use (e.g. Switzerland or Japan) have strongest negative impact
- Being environmentally friendly has only minor effect
Car ownership - policy recommendations

- Income and household size can’t be targeted by policy actions
- Car ownership can be decreased by offering valuable and time efficient alternatives
- Possible rediscovery of non-motorized modes when households deliberately abstain from car ownership
WTP price premium for EV

- Supporters and political active respondents are willing to contribute themselves to the environment and pay a price premium for an EV
- Experience with fuel efficient and sustainable vehicles increases WTP
- WTP differs among countries
WTP price premium for EV - policy recommendations

• Encourage the environmental awareness of the public

• Provision of reliable high quality information about environmental impacts of products

• Subsidy price for an electric vehicle has to be taken into consideration
Imp. envtl. factors car choice

- Most important for car choice: price, reliability & safety

- Envtl. Factors have strong relationship with importance of fuel consumption and safety

- Price as the most important factor has negative influence

- Awareness of environmental issues and concerns
Imp. envtl. factors car choice - policy recommendations

- Necessity to improve awareness of the seriousness of environmental issues

- A more informed consumer choice may lead to a positive effect on the importance of environmental factors when buying a car

- Link considerations for personal safety and stability with direct negative consequences brought about by ecological change

- Subsidy for environmentally friendly cars may have a stronger effect than a penalty for ecologically inefficient cars
Thank you very much!

Questions?