The effect of single and multilabeling on extra virgin olive oil consumer choices: the case of organic and PDO labels.

Georgia Papoutsi

AGRICULTURAL ECONOMICS RESEARCH INSTITUTE
HELLENIC AGRICULTURAL ORGANIZATION "DEMETER"

21st Conference on Research on Economic Theory and Econometrics

Naxos, July 10-14, 2023

Introduction

while there is an extensive literature on the impact of organic and PDO certifications on olive oil consumer preferences and demand under the assumption that they are independent or they address different consumer needs (*on average positive WTP & conflicting findings regarding their relative preference*), there is scant literature focusing on their complementarity or substitution relationship

Research objective

- The objective is twofold:
  - to assess and compare consumer preferences and WTP for labels pertaining to organic production and designation of origin, certified by the EU, when they are presented separately or simultaneously on extra virgin olive oil bottle
  - to investigate the potential heterogeneity of consumer choices and identify different consumer segments

Methodology: data

Data

- online-based survey due to limited budget (SurveyMonkey)
- 272 randomly selected consumers (18+ years old)
- criteria: should have purchased and consumed extra virgin olive oil in the six months leading up to the survey

Methodology: product of interest

Why extra virgin olive oil?

- in terms of supply, it is estimated that 80 per cent of olive oil production in Greece is extra virgin and it is quite essential to the sustainability of the rural economy of Greece (National Bank of Greece, 2015)
- in terms of demand, 70% of Greeks that consume olive oil, use extra virgin olive oil (Siskos et al., 1995)
- it represents a value-added product for which additional labeling information regarding the production method and/or the designation of origin is an important marketing tool.

Methodology: questionnaire

(A)

Choice experiment

(B)

Consumer preferences & Attitudinal characteristics

(C)

Demographics

Methodology: experimental design

- CE was **hypothetical** (i.e., it did not include exchange of actual money or olive oils)
- 12 **choice sets** (in random order to avoid order effects)
- each choice set – **3 alternative scenarios:** two unlabeled alternative extra virgin olive oil bottles (1 liter each) that carried different attributes and a no-purchase option
- to minimize any hypothetical bias in the WTP estimates we used a **cheap talk script** where we discussed the propensity of respondents to exaggerate stated willingness to pay
- before presenting the choice questions, participants were provided with **information regarding the product attributes**

Methodology: attributes

Attributes	Levels	Visual Logo
Organic (ORG) label	Present/Absent	
Protected Designation of Origin (PDO) label	Present/Absent	
Price (€ per 1 liter)	€5.5 €7.7 €9.5 €12.5	

[It was also considered the interaction between both labels (OPDO) by the inclusion of Organic and PDO labels simultaneously on the bottle]

Methodology: choice card

	Alternative A	Alternative B	Alternative C
	  **7.5 €/l**	  **9.5 €/l**	If these were the only options available, I would not buy any
I prefer	○	○	○

Model specification

- since preference and scale heterogeneity across consumers are expected in this study and realistic WTP values is the goal of this paper, a **mixed logit model in WTP space** is specified.

- the utility associated with each alternative i, as evaluated by each individual n in choice task s can be represented as follows:

Model specification

$$U_{nis} = \theta_n \left(-Price_{nis} + \beta_1 ORG_{nis} + \beta_2 PDO_{nis} + \beta_3\, OPDO_{nis} + Nobuy\right) + \varepsilon_{nis}$$

- θ_n is the random positive scalar representing the price/scale parameter;
- β_s are the marginal WTP estimates for the various attributes;
- $Price_{nis}$ is a continuous variable derived from the four price levels determined for the experiment;
- ORG, PDO and $OPDO$ are dummy variables taking the value "1" if the corresponding label is present on the bottle of the olive oil, and "0" if it is absent;
- $Nobuy$ is the alternative-specific constant representing the no-buy choice alternative;
- ε_{nis} is the error term that follows a type-one extreme value distribution.

Results: model estimates

	Coefficients	Std. Error
Means		
Nobuy	-7.99***	0.22
ORG	2.16***	0.20
PDO	1.79***	0.21
OPDO	-1.33***	0.36
Standard deviations of parameter distributions		
ORG	2.86***	0.18
PDO	2.51***	0.17
OPDO	2.85***	0.28
Scale heterogeneity		
Tau	0.52***	0.03
Goodness of fit measures		
McFadden Pseudo-R^2	0.39	
Log Likelihood	-2184.11	
Akaike information criterion	4386.2	
Participants/Observations	272/3,264	

Results: consumer heterogeneity

		(%)
Single label effect: ORG lovers (ORG > 0)	203	75
Single label effect: PDO lovers (PDO > 0)	218	80
Multiple label effect: Negative (OPDO < 0)	216	79.41
Substitutes (ORG > 0 & PDO > 0 & OPDO < 0)	*122*	*44.85*
Rejectors (ORG < 0 & PDO < 0 & OPDO < 0)	*19*	*6.99*
PDO lovers neg. affected by the 2nd label (ORG < 0 & PDO > 0 & OPDO < 0)	*45*	*16.54*
ORG lovers neg. affected by the 2nd label (ORG > 0 & PDO < 0 & OPDO < 0)	*30*	*11.03*
Multiple label effect: Positive (OPDO < 0)	56	20.59
Complements (ORG > 0 & PDO > 0 & OPDO > 0)	*46*	*16.91*
PDO lovers pos. affected by the 2nd label (ORG < 0 & PDO > 0 & OPDO > 0)	*5*	*1.84*
ORG lovers pos. affected by the 2nd label (ORG > 0 & PDO < 0 & OPDO > 0)	*5*	*1.84*

Concluding remarks

- consumers are **willing to pay on average a higher premium price** for information related to environmental impact (e.g., EU organic label) than information related to rural development (e.g., EU PDO certification)
- EU ORG & PDO are **partial substitutes** because the benefits associated with the organic label are already implied by the PDO label and vice versa, or **information overload generates mistrust and confusion** in processing the label information
- there is also a limited group of consumers who perceive these labels in a **complementary manner**

Thank you for your attention!

(gpapoutsi@elgo.gr)