

The Choice between Cigarettes, RYO, E-Cigarettes, and Quitting: Evidence from Discreate Choice Experiment

Asena Caner, Berna Tarı Kasnakoğlu, Belgi Turan, Yenal Can Yiğit,
(TOBB University of Economics and Technology, Türkiye)

Donald S. Kenkel, Alan D. Mathios
(Department of Economics, Brooks School of Public Policy,
Cornell University, USA)

Disclosure Note:

This (report/research/study) was funded with a grant from Global Action to End Smoking (formerly known as Foundation for Smoke-Free World), an independent, U.S. nonprofit 501(c)(3) grantmaking organization, accelerating science-based efforts worldwide to end the smoking epidemic. Global Action played no role in designing, implementing, data analysis, or interpretation of the (report/research/study) results, nor did Global Action edit or approve any presentations or publications from the (report/research/study). The contents, selection, and presentation of facts, as well as any opinions expressed, are the sole responsibility of the authors and should not be regarded as reflecting the positions of Global Action to End Smoking.

Smoking in Türkiye

1. In Türkiye, about 30-35% of adults are estimated to be smokers.
2. 44% of men and 27% of women were current regular/daily users, about 6% were occasional users (THS,2022).
3. Among smokers, about 65% of men and 50% of women started smoking before 18.
4. About 27% of men and 33% of women started at ages 18-24 (TEPAV).

Tobacco Control Policy Environment in Türkiye

1. Türkiye is the 1st country to fully adopt all WHO MPOWER tobacco control measures.
2. Smoking in public places has been banned since 1996 (expanding to include restaurants, cafes and pubs).
3. Implementation of Plain Packaging (PP) and intensified graphic and text health warnings since January 2020,
4. On 25 February 2020 banned the import of tobacco products that are specifically. (Individuals are allowed personal imports as one device per person along with cartridges or solutions up to 30 ml. Alternatively, individuals can import up to 10 disposable e-cigarettes in total.)

Objective of Research

1. The purpose of our research is to investigate the choices of adult consumers in Türkiye about using combustible (cigarette or RYO), and non-combustible nicotine products and the tradeoffs that they face when making a choice between these products.
2. We investigate the role that nicotine product attributes (in particular, prices, legal status, and flavor availability) play in consumers' choices.

Data

1. Online Survey among adults (18 – 65) in Turkiye.
2. 4 parts in Online Survey
 1. **PART I: Product Consumption**
 - **Demographic Questions:** region of residence, gender, and age.
 - **Smoking status:** A daily smoker, A non-daily smoker, A non-smoker
 - **Smoking intensity:** age at initiation, preferred flavor (if any) are asked to daily and non-daily smokers.
 - **Price:** from smokers to determine the price paid per pack (20) of cigarettes

Data

2. PART II: Discrete Choice Experiment (DCE) (For smokers)

- Choose among four alternatives (packed cigarettes, roll-your-own (RYO) cigarettes, cigarette-like products (e-cigarettes or HTPs), or use nothing).
- The products will have three attributes (price, legal status, and flavor availability).
- Respondents will be asked to state what they would choose today and 6 months later.
- There will be 12 different choice sets, each presented twice (one for today and the other for 6 months later), totaling 24 choices per respondent.
- The attributes will vary across choice sets.

Data

3. PART III: Post-DCE Questions

- Knowledge level of the participants regarding cigarette-like products and the current legal environment in Türkiye, as well their opinions about using the products.
- Perceptions regarding various nicotine products, (health risks, costs, practicality, and overall favorability for usage)
- Knowledge about nicotine (addictive and carcinogen).
- Motivations for usage (perceptions of health benefits, cost-effectiveness, practicality, pleasant aroma, indoor usability, customization options, and potential for aiding in smoking reduction or cessation efforts)

Data

PART IV: Demographics

- Level of Education,
- Level of parents education,
- Discretionary income,

Descriptives: Ever Users (Smokers, RYO, Vapers)

	N	%
Triple Use	66	6,08%
Exclusive Cigarette Smokers	618	56,96%
Exclusive RYO Users	140	12,90%
Exclusive E-cigarette Users	14	1,29%
Cig-RYO Users	183	16,87%
Cig-E-cig Users	59	5,44%
E-cig-RYO Users	5	0,46%
Total	1.085	

Descriptives:

	All		Female		Male	
Smoker Status	N	%	N	%	N	%
Daily Smoker	953	85,01%	449	82,23%	504	87,65%
Non-Daily-Smoker	168	14,99%	97	17,77%	71	12,35%
Total	1.121	100,00%	546	100,00%	575	100,00%
Elementary	83	7,40%	26	4,76%	57	9,91%
High School and Above	593	52,90%	269	49,27%	324	56,35%
University and Above	445	39,70%	251	45,97%	194	33,74%
Total	1.121	100,00%	546	100,00%	575	100,00%
West	552	49,24%	268	49,08%	284	49,39%
Central	257	22,93%	141	25,82%	116	20,17%
South	138	12,31%	66	12,09%	72	12,52%
North	62	5,53%	20	3,66%	42	7,30%
East	112	9,99%	51	9,34%	61	10,61%
Total	1.121	100,00%	546	100,00%	575	100,00%







DCE Module Screen

Attributes	Packed Cigarette	Roll Your Own (RYO)	E-Cig or HTP	Quit
Price	0,5 P	25 TL	20 TL	
	P		40 TL	
	2P		80 TL	
Sale Type	Legal with Bandrole	Illegaly Sold	Legal with Bandrole	
			Illegaly Sold	
			Strictly Banned	
Flavor	Tobacco	Tobacco	Tobacco	
	Menthol		Variety of Flavor	

The picture can't be displayed.

DCE Module Screen

	Option 1	Option 2	Option 3	Option 4
	 (Packed Cigarettes)	 (Roll Your Own)	 (E-cigarette or a heated tobacco product)	None
PRICE	3 Levels	1 Level	3 Levels	I will quit smoking cigarettes and not use e-cigarettes.
SALE TYPE	1 Level	1 Level	3 Levels	
FLAVOR	2 Levels	1 Level	2 Levels	
Please select one option.	0	0	0	0

Empirical Framework

Panel mixed logit choice model

$$U_{ij} = ASC_j + \beta_{price} \times price_{ij} + \beta_{flavor} \times flavor_{ij} + \beta_{legal} \times legal_{ij} + \alpha_{age,j} \times age_i + \alpha_{region,j} \times region_i + \alpha_{female,j} \times female_i + \alpha_{education,j} \times education_i + \epsilon_{ij}$$

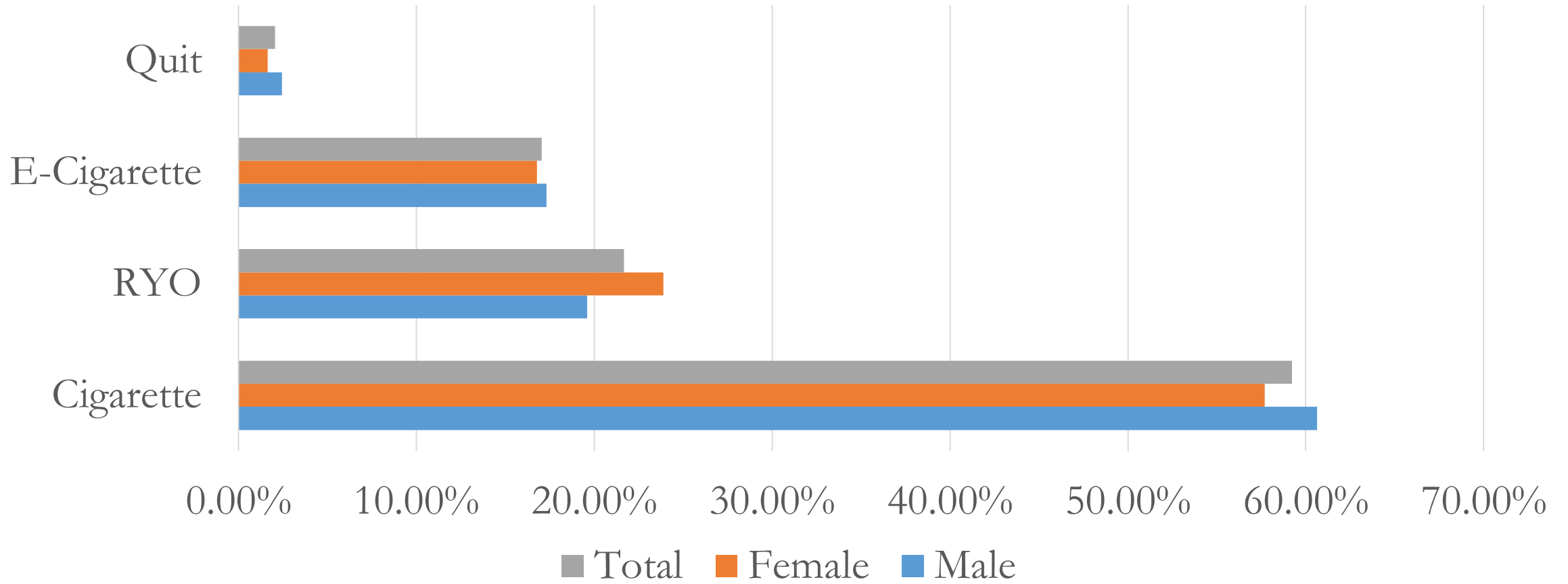
ASC_j : *Alternative Specific Constant for product j (cigarette, RYO, E – cigarette, quit)*

$\beta.$: *Coefficients for non – alterantives (price, flavour, legality)*

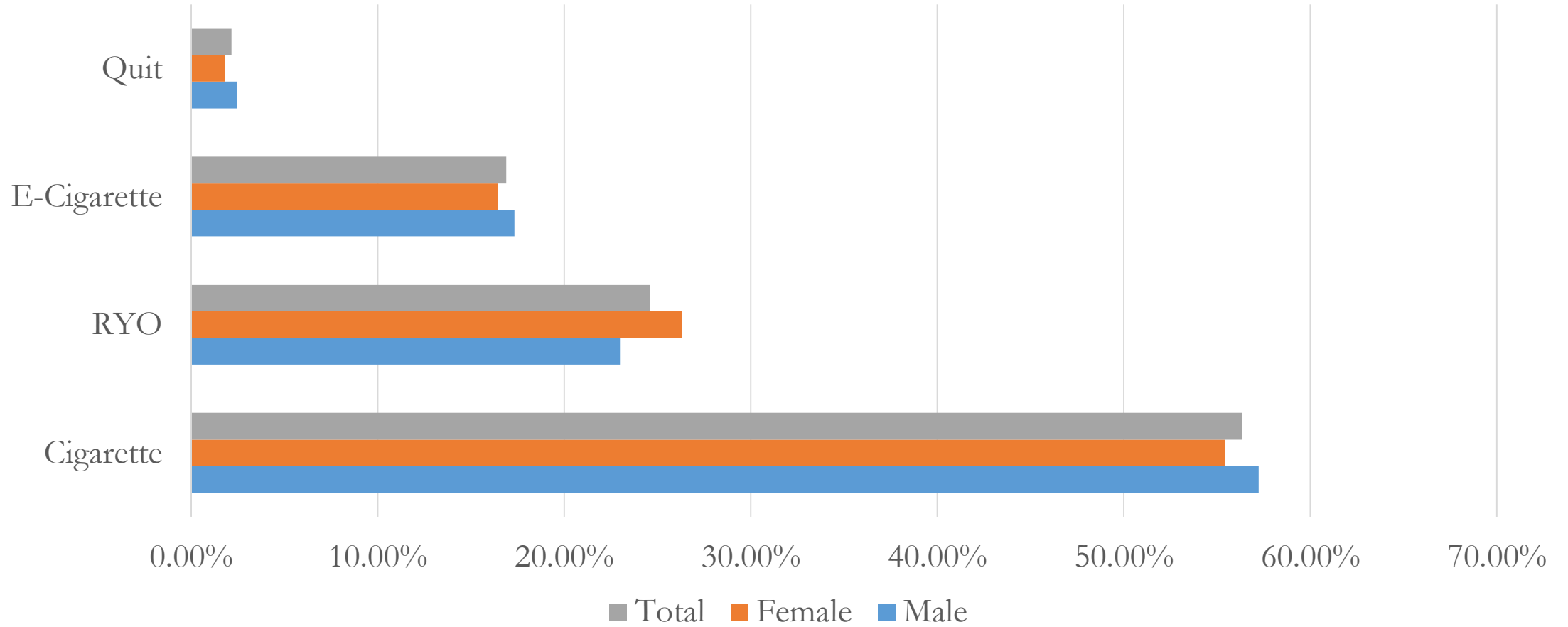
$\alpha_j.$: *Individual attribute coefficient for product j*

$\epsilon_{ij}.$: *error term*

Ever Smokers



Choice Result



Panel Mixed Logit Choice Model

	Attributed
Price	-0.0110*** (0.000392)
Flavor (Base Tobacco)	
Menthol	-0.159*** (0.0370)
Various Flavors	0.0760 (0.0476)
Legality (Base Legal with Bandrole)	
Illegally Sold	-0.178*** (0.0575)
Strictly Banned	-0.257*** (0.0584)
Observations	53,808

Panel Mixed Logit Choice Model

	Cigarette	RYO	E-Cigarette
Age	0.00297	0.00301	-0.00363
	(0.00281)	(0.00281)	(0.00346)
Central	-0.151	0.180	-0.187
	(0.155)	(0.157)	(0.161)
South	-0.222	-0.111	-0.489**
	(0.182)	(0.186)	(0.192)
North	-0.600***	-1.086***	-1.038***
	(0.208)	(0.223)	(0.226)
East	0.452*	0.430*	-0.0515
	(0.249)	(0.253)	(0.259)
Female	0.263**	0.403***	0.218*
	(0.124)	(0.126)	(0.129)
High School and Above	-0.925***	-0.927***	-0.764**
	(0.316)	(0.320)	(0.326)
University and Above	-0.676**	-0.712**	-0.512
	(0.324)	(0.328)	(0.333)
Constant	4.803***	3.448***	3.584***
	(0.338)	(0.345)	(0.355)
Observations	53,808	53,808	53,808

Willingness to Pay

$$WTP_{Menthol} = -\frac{\beta_{Menthol}}{\beta_{Price}} = -\frac{-0,16}{-0.01} = -16$$

On average, respondents are willing to pay 16 TL less for menthol-flavored products.

$$WTP_{Illegal} = -\frac{\beta_{Illegal}}{\beta_{Price}} = -\frac{-0,18}{-0.01} = -18$$

On average, respondents are willing to pay 18 TL less for illegally sold products.

$$WTP_{Banned} = -\frac{\beta_{Banned}}{\beta_{Price}} = -\frac{-0,26}{-0.01} = -26$$

On average, respondents are willing to pay 26 TL less for strictly banned products.

Conclusion

- **ASC**
 - For 3 product, ASC term positive and statistically significant.
 - Alternative base variable “Quitting”,
 - the cigarette has more benefits than other products.
 - Although the coefficient of electronic cigarettes is seen to be close to the coefficient of RYO, it is seen that it is higher.
- **Attribute**
 - Price is negative and statistically significant.
 - Tobacco flavor is base variable.
 - menthol flavor is negative and significant. Menthol-flavored products are less likely to be preferred than tobacco-flavored products.
 - Legally sold product is base alternative;
 - The coefficient of illegally sold and strictly banned products is negative and significant. If the product is banned or unregistered, it is less likely to be preferred than the legal product.