A Discrete Choice Experiment in Türkiye to Assess Tradeoffs in Choosing Nicotine Products:

Data Analysis Plan

Preregistration of an Analysis Plan with the Center for Open Science

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1. Introduction and Background

The purpose of this working paper is to present an analysis plan for data collection through an online survey to investigate the choices of adult consumers in Türkiye about using combustible and non-combustible nicotine products and the tradeoffs that they face when making a choice between these products. We will investigate the role that nicotine product attributes (in particular, prices, legal status, and flavor availability) play in consumers' choices. We aim to estimate the effects of these attributes on consumer choices and test whether the effects are different across consumers.

Türkiye is a country with a high prevalence rate of cigarette smoking. At present, about 30-35% of adults are estimated to be smokers. According to nationwide surveys in 2022[2], about 44% of men and 27% of women were current regular/daily users, about 6% were occasional users. Smoking before the legal age of 18 was also common. Among smokers, about 65% of men and 50% of women started smoking before 18. About 27% of men and 33% of women started at ages 18-24.

Regulatory authorities in the country have been keen on adopting tobacco control policies. In fact, Türkiye was one of the first to sign and ratify the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) and the first country to adopt all MPOWER measures at the highest level. Smokers who want to quit may receive cessation services free of charge; however, demand for such services has been low. Smoking in public places has been banned since 1996, the coverage gradually expanding to include entertainment services such as restaurants, cafes, and pubs. There have also been bans on advertising and promotions. Mandatory messages against tobacco use are broadcast regularly via television and radio. With the regulation in 2019, plain packaging and harsher combined (graphic and text) health warnings were required on cigarette and tobacco packages, to be effective by January 2020[3].

The planned study aims to investigate the tradeoffs that adult consumers in Türkiye face when making the choice between combustible and non-combustible nicotine products, using a discrete choice experiment (DCE) embedded in an online survey. Our research will assess the role that nicotine product attributes (in particular, prices, the legal status, and flavor availability) play in consumers' choices. About flavor availability, it is important to note that Turkish regulation on characteristic flavor (the scent or flavor noticed before or during the use of tobacco products that can be distinguished from the tobacco's own flavor originating from an additive such as but not limited to fruit, spices, herbs, alcohol, sugar, menthol or vanilla) required that cigarettes which have used menthol and/or derivatives in their production cannot be present in the market after 2020[4].

[2] https://www.tepav-he.org/en/publications/newsletters/.

[3] REGULATION ON THE PROCEDURES AND PRINCIPLES RELATED TO THE PRODUCTION METHODS, LABELING AND SURVEILLANCE OF TOBACCO PRODUCTS, FRIDAY March 1, 2019, Official Gazette, Edition: 30701, https://assets.tobaccocontrollaws.org/uploads/legislation/Turkey/Turkey-2019-Regs.pdf

[4] Ibid.

About the legal status of products, we should note that a presidential decree on 25 February 2020 (Presidential Decree number 2149) banned the import of tobacco products that are specifically "consumed by being heated or being lit, other than cigarettes, shredded tobacco products for hand-rolled cigarettes, tobacco products for use in pipes, tobacco products for use in hookahs, cigars, and cigarillos, and all products that are used to imitate tobacco products regardless of their nicotine content including electronic cigarettes and electronic hookahs as well as electronic devices, apparatus, spare parts, and solutions used in the consumption of these products."[5] Therefore, the import of cigarette-like products such as electronic cigarettes (e-cigarettes) and heated tobacco products (HTPs), as well as electronic devices, apparatus, spare parts and solutions to be used with e-cigarettes and HTPs was banned. An exception was provided (via Circular No. 2020/7) for imports for personal use, including one device per person and cartridges or solutions up to 30 ml, or 10 disposable electronic cigarettes in total.

The import ban is reinforced by a production ban in the country. The domestic production of cigarette-like products is subject to the approval of the Ministry of Agriculture and Forestry; however, no approvals have been granted. Therefore, the combination of import and production bans effectively prohibits the sale of cigarette-like products. Existing smoking restrictions (such as on indoor smoking) apply to cigarette-like products. Moreover, restrictions apply to virtually all forms of advertising and promotion of these products. E-cigarettes or HTPs were never offered as a part of official cessation services or suggestions in Türkiye.

Beginning in April 2024, we have been working on designing an online survey about smoking and vaping behavior among adults (ages-18-65) in Türkiye. The survey includes questions about the opinions of participants on the health risks and social acceptability of the products, in addition to their interest in or willingness to consume the products. The collected data will be used for three main purposes: First, to depict the types of products used in the country and the pattern of consumption. In particular, data will be collected on the usage of packed cigarettes, loose tobacco for rolling cigarettes (roll-your-own, RYO), electronic cigarettes (e-cigarettes, vapes), and heated tobacco products. The intensity of consumption and the age of initiation will be asked. The second purpose will be to conduct empirical analysis and estimate econometric models to study consumer behavior and the tradeoffs involved in product choice, asking the participants to choose among several products (or none) when faced with a real-life situation where they purchase a nicotine product. The third purpose will be to measure the level of general knowledge of adult consumers about the contents, health risks, and legal status of cigarettes and cigarette-like products, as well as their perceptions about the product's addictiveness, health risk, social acceptability, and their interest in the product.

Our research plan includes the submission of one or more papers reporting the results for publication in peer-reviewed journals. The overarching goal of our research is to contribute to evidence-based tobacco regulatory policymaking.

[5] DECISION CONCERNING ELECTRONIC CIGARETTES AND SIMILAR DEVICES AND CERTAIN TOBACCO PRODUCTS AND PRODUCTS THAT ARE USED TO IMITATE TOBACCO PRODUCTS, Feb 25, 2020, Official Gazette, 31050, https://assets.tobaccocontrollaws.org/uploads/legislation/Turkey/Turkey-Decision-No.-2149.pdf

This study is being conducted with the help of a grant to the Economic Research Agenda Association (ERAA) 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 research results, nor did Global Action edit or approve any presentations or publications from the research. 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.

Open Science Principles and Practices[6]

The Center for Open Science (2020) stated that they "envision a future scholarly community in which the process, content, and outcomes of research are openly accessible by default…. All stakeholders are included and respected in the research lifecycle and share pursuit of truth as the primary incentive and motivation for scholarship."

Our research team supports this mission, vision, and goals. We agree to comply with open science best practices by sharing online documentation of our research methods, by preregistering the research plans for any randomized controlled trials, by circulating working papers or preprints prior to publication, and by reporting negative as well as positive findings.

Our aim in online documentation of our research will include methods, data, and codes in sufficient detail to ensure replicability. We agree to post documentation when a working paper is available, or when a paper is accepted for publication in a peer-reviewed academic journal. We may be restricted from depositing some of the data files in an openly accessible data repository (such as when using restricted-use or proprietary data). In those cases, the shared documentation will include information on how, where, and under what conditions an independent researcher can access the data.

Our research team pursues to incorporate the best practices for reproducible science and applied econometrics. Pre-registration has been recommended in order to address publication bias and bad practices such as data dredging or p-hacking (Munafò, Nosek, Bishop, et al., 2017). In this research we plan to conduct hypothesis-driven subgroup analyses to test for systematic differences across subgroups in the estimated effects. The studied subgroups will be defined by characteristics such as gender, age, and product use patterns. To avoid the appearance of p-hacking or other improper research practices, we will always report the results for the full sample, regardless of whether the full sample results are statistically significant at conventional levels.

In clinical trials pre-registration of studies is standard practice, unlike in economics research. In research on applied economics and economic policy analysis, the standard practice is to present

[6] With the authors' permission, this content is extracted from the Data Analysis Plan submitted by Kenkel and Mathios (2023), which can be accessed at https://doi.org/10.17605/OSF.IO/EK5F7.

robustness checks and sensitivity analyses. In their review of the state of applied econometrics, Athey and Imbens (2017) explain that "Standard practice in modern empirical work is to present … estimates of the preferred specification of the model in combination with assessments of the robustness of the findings from this preferred specification. These alternative specifications are intended to convey that the substantive results of the preferred specification are not sensitive to some of the choices in that specification, like using different functional forms of the regression function or alternative ways of controlling for differences in subpopulations." As stated in our earlier work, "although our econometric estimates will provide tests of theory-driven hypotheses, the focus of our research will be on the implications for tobacco regulatory policy. For economic policy analysis, the best practice is to conduct extensive analysis that explores the sensitivity of the econometric results to different assumptions made at various steps in the analysis. We see this pre-registered data analysis plan and sensitivity analysis during the research as complementary practices for reproducible science." (Kenkel and Mathios, 2023).

2. Conceptual Framework

The empirical analyses originate from the conceptual framework of the economics of consumer behavior. On the demand-side of the market for tobacco products, consumers are assumed to choose the product that maximizes their utility, which is a function of consumer characteristics and product attributes. Consumers have heterogeneous preferences; some consumers may prefer combustible products (packaged cigarettes or roll-your-own (RYO) cigarettes), whereas others may prefer non-combustible products (electronic cigarettes or heated tobacco products).

In Türkiye, packaged cigarettes dominate as the most used tobacco product among adults, yet a significant portion of consumers opt for loose tobacco to roll their own cigarettes. According to a nationwide survey by the Economic Policy Research Foundation of Türkiye (TEPAV) in 2022, when asked about the tobacco products used daily, 76.5% of adult smokers reported using packaged cigarettes and 28.6% reported using RYO cigarettes. Other products such as waterpipes, cigars, and cigarillos have notably lower daily usage rates.

The market for tobacco-related products in Türkiye has been evolving rapidly with the introduction of non-combustible cigarette-like products such as electronic cigarettes (e-cigarettes). Although conventional combustible cigarettes remain the primary choice of adult consumers, e-cigarettes are quickly gaining popularity.

The emergence of e-cigarettes has sparked a debate about their advantages and disadvantages. Some argue that their trial and use among non-smokers could lead to nicotine addiction and potentially result in smoking dependency. The availability of various flavors is often mentioned to entice consumers. Conversely, others argue that e-cigarettes pose significantly less health risk than traditional smoking, serving as a potential smoking substitute and aid in smoking reduction or cessation.

Turkish regulation requires that flavored cigarettes cannot be present in the market after 2020. Moreover, the import of e-cigarettes was banned in 2020, although an exception was provided

for imports for personal use. The import ban is reinforced by a production ban, effectively prohibiting sales in the country. Existing smoking restrictions (such as on indoor smoking) also apply to e-cigarettes. Moreover, restrictions apply to virtually all forms of advertising and promotion. The legal sale of RYO cigarettes and e-cigarettes is prohibited, although they are accessible under-the-counter, and their use is not insignificant.

In this proposed study, we aim to explore the decision-making process of consumers and the tradeoffs they face when choosing a tobacco product by using a discrete choice experiment (DCE) embedded in an online survey. DCEs are known to have strong internal validity to determine causal effects.

The proposed research will assess the role that attributes of the products (in particular, prices, legal status, and flavor availability) play in consumers' choices. As explained in more detail below, in order not to overcomplicate the analysis, we imagined a scenario mirroring real-life circumstances, in which there are only three product alternatives in the market: packaged cigarettes, RYO cigarettes, and cigarette-like products (referring to non-combustible products such as electronic cigarettes or heated tobacco products), ignoring the other products such as waterpipes or cigars. If the consumer is not interested in any of these three products, then there is the fourth option of choosing none and quitting using tobacco products.

Given the policy environment in Türkiye, it is important to understand how consumers evaluate different products and their attributes to decide on using them or not. Prices, legal status, and flavor availability were chosen as attributes particularly to study policy implications. For instance, the effect of e-cigarette bans on consumer behavior is, a priori, ambiguous. Banning e-cigarettes might reduce their consumption; however, if e-cigarettes and cigarettes are substitutes, the ban could lead to an unintended consequence of inducing consumers to use more cigarettes. Price is another important attribute that influences consumer decisions. In Türkiye, packaged cigarettes are regulated and heavily taxed, whereas roll-your-own cigarettes and e-cigarettes are not, making them potentially less costly choices for consumers.

The proposed study will build on the emerging literature on consumer perceptions of legally versus illegally sold products (Fataar et al.,2021), on the effects of bans and restrictions on consumer behavior (Cotti et al., 2024; Saffer et al., 2024), and on the benefit-cost analysis of regulatory policies that might create illegal markets (Kenkel et al., 2024).

The emerging literature on this topic has raised numerous critical and policy-relevant questions, which we aim to address in this research. Our study will aim to explore how consumers respond to changes in the prices of packaged cigarettes, RYO cigarettes, and e-cigarettes, as well as their reactions to bans. Additionally, we will investigate factors influencing the decision to quit and the product attributes associated with that choice. We will also consider how consumers might behave under different regulatory environments and the disutility of bans. The overarching goal of our research is to contribute to evidence-based tobacco regulatory policymaking.

3. Overview of the Survey

General Information

This research will be based on an experimental inquiry of the role that the attributes (in particular, prices, legal status, and flavor availability) of nicotine products play in consumers' choices. Data will be collected using an online opt-in survey. Our team has developed a questionnaire that involves a module with a discrete choice experiment (DCE) as well as other modules that collect data on the perceptions and experiences of adult smokers and nonsmokers in general. The questionnaire includes questions on conventional cigarettes (factory-made and hand-rolled --or roll-your-own (RYO)-- cigarettes) and non-combustible cigarette-like products (e-cigarettes such as Vuse, Smok, Puff, ElfBar, Vozol, and heated tobacco products such as IQOS and GLO).

Online opt-in surveys are commonly used by social scientists as a valuable source of data on a range of topics (Hulland and Miller 2018; Mercer, Lau, and Kennedy 2018; Sostek 2019). Our research design and our questionnaire have been reviewed and approved by the Human Research Review Board of TOBB University of Economics and Technology. The official ethical approval has the protocol number E-27393295-100-56588, dated 12 March 2024.

The Sample

We have contracted with SSRS to conduct the survey and assist in designing the DCE. SSRS conducts a wide range of survey research, including sample design, experimental design, data collection, and data analysis. The firm has experience in conducting research on public opinion and social science for academic and non-profit institutions. Important for our research, SSRS has considerable experience in conducting tobacco control research and in designing and implementing DCEs.

SSRS will use an opt-in non-probability online panel in Türkiye. The panel partner of SSRS will be Dynata. Although the panelists in this panel are recruited in ways that are not probability-based (such as by soliciting panel membership via a website partner, referrals, direct enrollments, etc.), the panel offers a vast variety of eligible respondents from a host of demographic categories that can "simulate" the study population. Thus, they can be targeted to help obtain a sample distribution suggestive of the population of interest.

Participants of the online survey will be randomly selected, but loose quotas will be effective to have a sufficient number of respondents in different age groups, geographical regions, and different genders to ensure the sample is similar to the projected universe. The sample is also intended to reflect the smoking prevalence in the country. The research company will aim to obtain about 2,000 completed questionnaires in total.

People will be allowed to participate in the questionnaire regardless of their knowledge about the products or the legal status of the products in Türkiye. The survey will be optimized for smartphone/mobile device administration and will be adapted to all operating systems and browsers.

First, a “soft launch” will be conducted, inviting a limited number of panelists to participate. After checking soft launch data to ensure that all questionnaire content and skip patterns are correct, additional sample will be released to ensure the final sample meets the study goals. The soft launch survey data will be carefully checked for accuracy, completeness, and non-response to specific questions so any issues will be identified and resolved prior to the full launch.

Sampled panelists will be emailed an invitation to complete the survey online. The email for each respondent will include a unique passcode-embedded link. Reminder emails will be sent out as appropriate. In appreciation for their participation, respondents will receive panel rewards (“prize points”) for their participation.

Survey Questions

In general, survey questions are patterned on established surveys such as the Global Adult Tobacco Survey, Health Research Survey of Türkiye, and other custom surveys we have designed in previous studies about tobacco consumption. The questions are intended to reflect the general predisposition of smokers and nonsmokers as regards to health risk perceptions and the legal status of nicotine products, as well as daily consumption patterns. The survey questions are shared in the Appendix. Each section is explained in further detail below:

PART I: Product Consumption

This part of the survey collects basic data on the region of residence, gender, and age of the respondent. Smoking status is determined by responses to four questions as follows: A non-smoker is a person who has not smoked 100 cigarettes so far, OR has not smoked in last 30 days, OR has not purchased cigarettes in last 30 days, OR currently does not smoke cigarettes at all.

A daily smoker is defined as a person who has smoked at least 100 cigarettes, AND smoked in past 30 days, AND purchased cigarettes in last 30 days, AND currently smokes cigarettes every day. A non-daily smoker is a person who has smoked at least 100 cigarettes, AND smoked in past 30 days, AND purchased cigarettes in last 30 days, AND smokes cigarettes occasionally. Questions on smoking intensity, age at initiation, preferred flavor (if any) are asked to daily and non-daily smokers.

Important for our research, and as preparation for the DCE part, price data will be collected from smokers of cigarettes based on their most recent purchase. Depending on whether they bought by the pack, the carton, they rolled their own cigarettes (RYO), or bought individual cigarettes, price data will be collected from smokers to determine the price paid per pack (20) of cigarettes.

Other questions will gather data on consumption on cigarette-like non-combustible products (e-cigarettes such as Vuse, Smok, Puff, ElfBar, and Vozol, or heated tobacco products such as IQOS, and GLO). An explanatory note will be added to ensure that the participants understand what products the questions are about. The note will be similar to “E-cigarettes, e-cigs, e-hookahs, vapes, or mods are battery powered devices that usually contain a nicotine-based liquid that is vaporized and inhaled and may contain flavors. There are also cigarette-like non-combustible products known as heated tobacco products (such as IQOS, and GLO).” Questions will be asked

on consumption pattern, age at initiation, whether they purchased abroad or in Türkiye, whether the product contains nicotine, and preferred flavor (if any).

PART II: Discrete Choice Experiment (DCE)

In this part of the survey, participants who stated in the first part of the survey that they smoke or vape will be presented with a real-life situation (i.e., a scenario) where they will need to 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). To ensure that the respondents understand which products are offered to them, the photos of the products (a cigarette pack with no brand logo, several rolled cigarettes in a plastic bag (as commonly sold in Türkiye), and some e-cigarette devices with no brand) will be shown on screen along with the information about their 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.

The legal status of the packed cigarettes will have one level: an original, legally sold product with a banderole. The legal status of RYO cigarettes will have one level: an illegally sold product with no banderole (unrecorded sale, under-the-counter). The legal status of the cigarette-like products will have three levels: An original, legally sold product with a banderole; an illegally sold product with no banderole (unrecorded sale, under-the-counter); a product that is strictly banned and not available in shops, on the internet etc., only available on the street or can be bought abroad.)

The flavor availability for packed cigarettes will have two levels: Tobacco flavor; or menthol flavor. The flavor availability for roll-your-own cigarettes will have one level: Tobacco flavor only. The flavor availability for cigarette-like products will have two levels: A variety of flavors available (such as tobacco, fruit, sweet, mint, menthol); or only tobacco flavor available.

The prices of the products will be determined as follows: For packed cigarettes, price will be manipulated by using the price actually paid per pack of cigarettes as a level of the price attribute, in addition to half that price and double that price as the second and third levels. The price of RYO cigarettes will be the average market price determined by the researchers at the time of the experiment (single level). The price of cigarette-like products will have three levels: the average market price determined by the researchers; half that price; and double that price.

PART III: Post-DCE Questions

Following the DCE part, the survey will ask questions that aim to determine the knowledge level of the participants regarding cigarette-like products and the current legal environment in Türkiye, as well their opinions about using the products.

One set of questions will ask all respondents whether they are familiar with e-cigarettes, whether they are aware of the typical nicotine content found in both traditional cigarettes and e-cigarettes, and whether they are aware of the current legal status of cigarettes and cigarette-like products in Türkiye. Additionally, participants will be questioned about their perceptions regarding various nicotine products, including considerations such as health risks, costs, practicality, and overall favorability for usage. They will also be asked if nicotine is addictive and carcinogen.

Another set of questions will aim to gather insights from users of cigarette-like products about their motivations for usage. This includes factors such as perceptions of health benefits, cost-effectiveness, practicality, pleasant aroma, indoor usability, customization options, and potential for aiding in smoking reduction or cessation efforts.

PART IV: Demographics

In this last section of the survey, all participants will be queried about their highest level of education attained and the educational backgrounds of their parents. Additionally, participants will be asked about their discretionary income, defined as the portion of their earnings available for leisure activities, entertainment, and discretionary purchases after meeting essential expenses such as rent, educational fees, food, and transportation.

4. Weighting, Margin of Sampling Error, and Sample Size[7]

The sample for this study will be derived solely from a non-probability panel. The target sample size will be about 2000 observations, based on the assumed 30% incidence of smoking, that would yield 600 exposures to the DCE. The 600 completed surveys (and 12 choice sets per respondent in the DCE) will be assumed to provide adequate power to estimate the models and should be sufficient for many types of analysis.

The sample will be divided into two distinct groups: Smokers (daily or non-daily) and Non-Smokers. A weight will be computed to balance the smokers data to population benchmark distributions for smokers in Türkiye for ages 18-65. A similar weight will be computed for non-smokers of the same age group. In survey research, weights are usually normalized to sum to the unweighted completed interviews sample size for smokers and non-smokers, respectively. Also, weights are often trimmed at the 2nd and 98th percentiles to ensure that individual respondents do not have too much influence on survey-derived estimates.

After the Smoker and Non-Smoker weights are computed, the intention will be to combine and reproportion them to reflect the smoking incidence rate in Turkey. Benchmarks to match the sample to the population will be derived from the Sağlık Araştırması Anketi (Turkey Health Survey (THS)) 2022 and from the most recent statistics published by the Turkish Statistical Institute.

[7] The material in this section is adapted from the Method Report prepared by the SSRS.

As the data collection method will be non-random sampling, statistical adjustments will be needed after data collection, to ensure that analyses reflect departures from simple random sampling. SSRS will calculate the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called "design effect" represents the loss in statistical efficiency that results from a disproportionate sample design and systematic non-response. The weighting will be done so that design effect for the final reproportioned weight overall will be around 2.00 for the entire sample, 1.68 for the smoker sample, and 1.76 for the non-smoker sample.

The margin of error of the survey will be defined as the largest 95% confidence interval (around 50%) for any estimated proportion based on the total sample. It will be aimed to restrict the margin of error for the final combined reproportioned weight overall to ± 3.1 percentage points, which will require a total sample size of 2008. This will mean that with this sample size, in 95 out of every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 3.1 percentage points away from the currently reported estimate. The margins of error for subgroups will be larger; in particular, ± 3.8 percentage points for smokers and ± 4.4 percentage points for non-smokers.

The approach of the SSRS to handle any missing demographic data will be to employ a technique called “hot decking”. Hot deck imputation replaces the missing values of a respondent randomly with another similar respondent without missing data. These are further determined by variables predictive of non-response that are present in the entire file. The SSRS plans to use the SPSS macro detailed in ‘Goodbye, Listwise Deletion: Presenting Hot Deck Imputation as an Easy and Effective Tool for Handling Missing Data’ (Myers, 2011) for imputation.

5. Empirical Analyses

a) Descriptive Statistics

Upon receiving the survey data, descriptive statistics will be generated on the variables related to smoking and vaping behavior. It will also be important for the purposes of this study to generate descriptive statistics on the knowledge level of the participants regarding packed cigarettes, roll-your-own cigarettes, and cigarette-like products, the current legal environment in Türkiye (the regulations regarding these nicotine products), as well their health risk perceptions and opinions about using these products.

b) Econometric Models

We plan to use discrete choice models to study the factors that determine the choice of nicotine products, i.e., packed cigarettes, roll-your-own cigarettes, cigarette-like products (e-cigarettes or HTPs). The discrete choice experiment (DCE) described above will generate choice data under various scenarios. In each scenario, the participants will have the option to choose one of the three products, or to use nothing and quit, generating four possible outcomes

Our discrete choice models will rely on the random utility model (Train, 2009): A decision maker, n, faces a choice among J alternatives. The utility that this person receives from alternative j is:

$$U_{nj} = V_{nj} + \varepsilon_{nj}$$

U_{nj} is decomposed into the representative utility V_{nj} that can be explained by observed attributes (of the alternatives and/or the decision maker), and an unobserved random utility term ε_{nj}. It is assumed that V_{nj} depends on parameters that are unknown to the researcher and therefore estimated statistically.

The unobserved random utility ε_n is assumed to come from a distribution $f(\varepsilon_n)$. If, people faced the same observed utility, V_{nj} for all j, then their choices would differ according to the values that ε_{nj} take for the alternatives j, drawn from the same distribution $f(\varepsilon_n)$. It is assumed that the alternative that provides the highest utility will be chosen. In other words, alternative j is chosen if and only if $U_{nj} \geq U_{nk}\ \forall k \neq j$. Hence, we derive the probability that individual n chooses alternative j as:

$$P_{nj} = Prob\big(\varepsilon_{nk} - \varepsilon_{nj} \leq V_{nj} - V_{nk}, \forall k \neq j\big)$$

$$P_{nj} = \int_{\varepsilon} I\big(\varepsilon_{nk} - \varepsilon_{nj} \leq V_{nj} - V_{nk}, \forall k \neq j\big)\, f(\varepsilon_n)\, d\varepsilon_n\,.$$

The above is a multidimensional integral over the density of the unobserved portion of utility, ε_n. Depending on the specification of density $f(\varepsilon_n)$, different discrete choice models and choice probabilities can be obtained.

A widely used assumption is that ε_n is independent and identically distributed (iid) according to extreme value distribution across all j, leading to a closed form logit specification of the *probability that individual n chooses alternative j:*

$$P_{nj} = \frac{e^{V_{nj}}}{\sum_{k=1}^{J} e^{V_{nk}}}.$$

For any two alternatives *i* and *k*, the ratio of the logit probabilities P_{ni}/P_{nk} does not depend on any alternatives other than *i* and *k*. In other words, the relative odds of choosing *i* over *k* are the same regardless of what other alternatives are available or what the attributes of the other alternatives are, and substitution is proportional across alternatives. This is known as the independence from irrelevant alternatives (IIA) property. The assumption of iid error term may not be appropriate in some cases. For example, packaged cigarettes and RYO cigarettes are similar in that they are both combustible products. A person who likes one of these products probably likes the other one, too. If so, then the unobserved factors affecting the two are correlated and not independent.

A more general model that can avoid the independence assumption within a logit is the class of generalized extreme-value (GEV) models. As the name implies, in this class of models the

unobserved portions of utility for all alternatives are jointly distributed as a generalized extreme value. Correlation in unobserved factors is allowed over alternatives and when this correlation is zero, the model collapses to the logit model. A relatively simple GEV model places the alternatives into several groups called nests. Within a nest, unobserved factors have the same correlation for all alternatives and no correlation for alternatives in different nests.

Another, more general, model is the mixed logit model that allows the unobserved factors to follow any distribution. The defining characteristic of a mixed logit is that the unobserved factors can be decomposed into a part that contains all the correlation and heteroskedasticity, and another part that is iid extreme value. The first part can follow any distribution, including non-normal distributions. The mixed logit model is fully general and can approximate any discrete choice model.

In this proposed research, using all or a combination of the models described above, we plan to estimate the following equation:

$$U_{ijt} = A_{ijt} + \alpha_i \, p_{ijt} + \beta_i' \, L_{ijt} + \gamma_i' \, F_{ijt} + \, \varepsilon_{ijt}$$

This equation is based on a random utility model, where individual i's indirect utility from product j in choice task t is linear and additively separable in an alternative specific constant (A), the product's price (p), the legal availability (or sales status) of the product (L), and flavor availability for the product (F).

We plan to estimate models separately for the choices made for today and for 6 months later. Upon estimating the coefficients of the model, we plan to examine policy-relevant counterfactual scenarios.

Moreover, we plan to conduct hypothesis-driven subgroup analyses to test for systematic differences across subgroups in the estimated effects of product attributes on consumer choices. The studied subgroups will be defined by characteristics such as gender, age, and product use patterns. To follow the best research practices and to avoid the appearance of p-hacking or other improper research practices, we will always report the results for the full sample, regardless of whether the full sample results are statistically significant at conventional levels.

References:

Athey, Susan, and Guido W. Imbens (2017). "The State of Applied Econometrics: Causality and Policy Evaluation." *Journal of Economic Perspectives* 31 (2): 3–32.

Cotti, C. D., Courtemanche, C. J., Liang, Y., Maclean, J. C., Nesson, E. T., & Sabia, J. J. (2024). *The Effect of E-Cigarette Flavor Bans on Tobacco Use* (No. w32535). National Bureau of Economic Research.

Fataar, F., Goodman, S., Wadsworth, E., & Hammond, D. (2021). Consumer perceptions of 'legal'and 'illegal'cannabis in US states with legal cannabis sales. *Addictive behaviors*, *112*, 106563.

Hulland, J., & Miller, J. (2018). "Keep on turkin'"?. Journal of the Academy of Marketing Science, 46, 789-794.

Kenkel, D. S. & Mathios, A.D. (2023, July 12). An Online Survey about Smoking Behavior Before and After California's Ban on Menthol Cigarettes: Data Analysis Plan. https://doi.org/10.17605/OSF.IO/EK5F7

Kenkel, D. S., Mathios, A. D., Phillips, G. N., Suryanarayana, R., Wang, H., & Zeng, S. (2024). *Just What the Doctor Ordered? The Benefits and Costs of E-Cigarette Regulation in Australia* (No. w32654). National Bureau of Economic Research.

Mercer, A., Lau, A. & Kennedy, C. (2018). *For Weighting Online Opt-In Samples, What Matters Most?*, Pew Research Center Methods. United States of America. Retrieved

Munafò, M. R., Nosek, B. A., Bishop, D. V., Button, K. S., Chambers, C. D., Percie du Sert, N., ... & Ioannidis, J. (2017). A manifesto for reproducible science. *Nature human behaviour*, *1*(1), 1-9.

Saffer, H., Ozdogan, S., Grossman, M., Dench, D. L., & Dave, D. M. (2024). *Comprehensive E-cigarette Flavor Bans and Tobacco Use among Youth and Adults* (No. w32534). National Bureau of Economic Research.

Sostek, K. (2019). Evaluating the accuracy of Google surveys.

Train, K. E. (2009). *Discrete choice methods with simulation*. Cambridge University Press.

APPENDIX A: QUESTIONNAIRE

Title of the Survey: Türkiye Tobacco Discrete Choice Experiment (DCE) Survey

CONSENT

Dear Participant,

This research is being conducted by the researchers at the Economic Research Agenda Association. The questions below aim to measure your thoughts, opinions, and behaviors regarding the use of nicotine products. Responses will be evaluated collectively and will not be used for purposes other than academic research. Data will not be shared with third parties and will be securely stored in an electronic environment. This research has been approved by the TOBB ETU Human Research Review Board (Ethics Committee).

There are no right or wrong answers to the questions. Therefore, to guide policy-makers correctly, it is important that you reflect your situation sincerely. The questions may take you about 15 minutes to answer. We sincerely thank you for taking the time and supporting our work. If you would like to obtain more information about the study, you can contact us at the email addresses below.

(Email addresses shown here)

This questionnaire includes questions about the consumption of combustible cigarettes (factory made packed cigarettes, hand rolled tobacco) and non-combustible cigarette-like products (electronic cigarettes, heated tobacco products). You do not have to be familiar with all of these products to participate in this study. Please answer the questions based on what you know.

The survey you are about to take is best experienced on a PC, Laptop or Tablet. You will still be able to take the survey on a smaller screen or mobile device; however, you may need to scroll to the left, right, up, or down. If taking this survey on a mobile device, you will need to rotate your mobile device to landscape mode and be sure that your display settings are in standard mode rather than zoom mode.

PART I: Product Consumption

PN: START TIMER

ASK ALL

PN: SINGLE RESPONSE

PN: ALLOW FOR ***AUTOCOMPLETE TEXT*** ENTRY QUESTION TYPE THAT CAN GUESS THE ANSWER A RESPONDENT'S GOING TO GIVE BY DRAWING ON THE ***LIST*** OF PREEXISTING CITY PROVINCE CODES.

S1. Which province do you currently live in?

Search for your province by typing in the search box below or select from the list below.

01	Adana
02	Adıyaman
03	Afyonkarahisar
04	Ağrı
05	Amasya
06	Ankara
07	Antalya
08	Artvin
09	Aydın
10	Balıkesir
11	Bilecik
12	Bingöl
13	Bitlis
14	Bolu
15	Burdur
16	Bursa
17	Çanakkale
18	Çankırı
19	Çorum
20	Denizli
21	Diyarbakır
22	Edirne
23	Elazığ
24	Erzincan
25	Erzurum
26	Eskişehir
27	Gaziantep
28	Giresun
29	Gümüşhane
30	Hakkâri
31	Hatay
32	Isparta
33	Mersin
34	Istanbul
35	İzmir
36	Kars
37	Kastamonu
38	Kayseri
39	Kırklareli
40	Kırşehir
41	Kocaeli
42	Konya
43	Kütahya
44	Malatya
45	Manisa
46	Kahramanmaraş
47	Mardin
48	Muğla
49	Muş
50	Nevşehir
51	Niğde
52	Ordu
53	Rize
54	Sakarya
55	Samsun
56	Siirt
57	Sinop
58	Sivas
59	Tekirdağ
60	Tokat
61	Trabzon
62	Tunceli
63	Şanlıurfa
64	Uşak
65	Van
66	Yozgat
67	Zonguldak
68	Aksaray
69	Bayburt
70	Karaman
71	Kırıkkale
72	Batman
73	Şırnak
74	Bartın
75	Ardahan
76	Iğdır
77	Yalova
78	Karabük
79	Kilis
80	Osmaniye
81	Düzce

PN: Code respondent into one of five regions below based on Province.

Provinces in the NUTS-1 regions:	**5 Regions**
İstanbul, Tekirdağ, Edirne, Kırklareli, Balıkesir, Çanakkale, İzmir, Aydın, Denizli, Muğla, Manisa, Afyonkarahisar, Kütahya, Uşak, Bursa, Eskişehir, Bilecik, Kocaeli, Sakarya, Düzce, Bolu, Yalova	West
Ankara, Konya, Karaman, Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir, Kayseri, Sivas, Yozgat	Central
Antalya, Isparta, Burdur, Adana, Mersin, Hatay, Kahramanmaraş, Osmaniye	South
Zonguldak, Karabük, Bartın, Kastamonu, Çankırı, Sinop, Samsun, Tokat, Çorum, Amasya, Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane	North
Erzurum, Erzincan, Bayburt, Ağrı, Kars, Iğdır, Ardahan, Malatya, Elazığ, Bingöl, Tunceli, Van, Muş, Bitlis, Hakkari, Gaziantep, Adıyaman, Kilis, Şanlıurfa, Diyarbakır, Mardin, Batman, Şırnak, Siirt	East

S2. Are you…?

1 Male
2 Female

PN: Check soft quotas for gender. Place into overquota if quota target is achieved.

ASK ALL
PN: NUMERIC TEXT BOX

S3. How old are you? *(Please type-in your answer.)*

_____ years old ***[PN: Allow 2-digit answers only. Range 1-98]***

999 Prefer not to say

PN: If less than 18 or over 65, TERMINATE. If prefer not to say (999), ask S3a.

PN: Check soft quotas for age. Place into overquota if quota target is achieved.

ASK THOSE WHO DO NOT PROVIDE AGE
PN: SINGLE RESPONSE

S3a. Please indicate if your age falls into one of these ranges.

1 Less than 18 ***[TERMINATE]***
2 18-24
3 25-44
4 45-65
5 66 and over ***[TERMINATE]***

PN: If less than 18 (1) or 66 and over (5), TERMINATE.

ASK ALL SCREENED
PN: SINGLE RESPONSE

S4. To ensure the program is working properly, please select the number “3” below.

1	1
2	2
3	3
4	4
5	5

PN: END TIMER

Cigarette Consumption Section

PN: START TIMER

AN: Cigarette consumption questions.

ASK ALL SCREENED
PN: SINGLE RESPONSE

0a. Have you smoked at least 100 cigarettes (equivalent to 5 packs of cigarettes, factory-made or hand-rolled loose tobacco) in your entire life?

1 Yes
2 No

PN: If No (2), respondent qualifies as Non-Smoker, skip to Q10.

ASK ALL SCREENED
PN: SINGLE RESPONSE

0b. Have you smoked at least one cigarette or one rolled tobacco in the last 30 days?

1 Yes
2 No

PN: If No (2), respondent qualifies as Non-Smoker, skip to Q10.

ASK ALL SCREENED
PN: SINGLE RESPONSE

0c. Did you purchase any cigarettes (packed or roll-your-own) in the last 30 days?

1 Yes
2 No

PN: If No (2), respondent qualifies as Non-Smoker, skip to Q10.

PN: END TIMER

PN: START TIMER

ASK WHO HAVE PURCHASED CIGARETTES IN LAST 30 DAYS (Q0C=1)
PN: SINGLE RESPONSE

1. How often do you smoke cigarettes?

1 Every day
2 Not every day, but occasionally
3 Not at all

PN: Qualification Definitions: Create variable SMOKER and define as follows:

Non-Smoker (SMOKER=0): Must meet <u>one</u> of the following definitions:

- ***Hasn't smoked 100 cigarettes (Q0a=2)***
- ***Hasn't smoked in last 30 days (Q0b=2)***
- ***Hasn't purchased cigarettes in last 30 days (Q0c=2)***
- ***Doesn't smoke cigarettes (Q1=3)***

Daily Smoker (SMOKER=1): Must meet <u>all</u> of the following definitions:

- **Smoked at least 100 cigarettes (Q0a=1)**
- **Smoked in past 30 days (Q0b=1)**
- **Purchased cigarettes in last 30 days (Q0c=1)**
- **Smokes cigarettes every day (Q1=1)**

Non-Daily Smoker (SMOKER=2): Must meet <u>all</u> of the following definitions:

- **Smoked at least 100 cigarettes (Q0a=1)**
- **Smoked in past 30 days (Q0b=1)**
- **Purchased cigarettes in last 30 days (Q0c=1)**
- **Smokes cigarettes occasionally (Q1=2)**

PN: If Non-Smoker (SMOKER=0), skip to Q10.

PN: If everyday smoker (SMOKER=1), then ask Q2 and Q3; otherwise, skip to note before Q4.

ASK DAILY CIGARETTE SMOKERS (SMOKER=1)
PN: SINGLE RESPONSE

2. How many cigarettes do you normally smoke per day? (Consider the average in the last month.)

1 0-5
2 6-10
3 11-15
4 16-20
5 21-25
6 26-30
7 31-35
8 36-40
9 More than 40

ASK DAILY CIGARETTE SMOKERS (SMOKER=1)
PN: SINGLE RESPONSE

3. How long after waking up do you usually smoke the first cigarette of the day?

1 Within 5 minutes
2 6-30 minutes
3 31-60 minutes
4 After 60 minutes

PN: If non-daily smoker (SMOKER=2) then ask Q4 – Q6. Otherwise, skip to Q7a

ASK NON-DAILY CIGARETTE SMOKERS (SMOKER=2)

4. On how many of the past 30 days did you smoke cigarettes? Please enter your best guess below. (Open ended question)

_____ (Number of days smoked in the past 30 days) ***[PN: Range 1-30]***

ASK NON-DAILY CIGARETTE SMOKERS (SMOKER=2)
PN: SINGLE RESPONSE

5. On the days that you smoked in the last 30 days, how many cigarettes on average did you smoke per day?

1 1-5
2 6-10
3 11-15
4 16-20
5 21-25
6 26-30
7 31-35
8 36-40
9 More than 40

ASK NON-DAILY CIGARETTE SMOKERS (SMOKER=2)
PN: SINGLE RESPONSE

6. On the days that you smoked in the past 30 days, how long after waking up did you usually smoke the first cigarette of the day?

1 Within 5 minutes
2 6-30 minutes
3 31-60 minutes
4 After 60 minutes

ASK ALL CIGARETTE SMOKERS (SMOKER=1,2)
PN: NUMERIC TEXT BOX

7a. How old were you when you first smoked?

Enter age: _____ ***[PN: Allow 2-digit answers only. Range 1-98 (max answer is respondent age in S3 or max of range selected in S3a.)]***

ASK ALL CIGARETTE SMOKERS (SMOKER=1,2)
PN: NUMERIC TEXT BOX

7b. Since what age have you been fairly regularly (daily or occasionally) smoking?

Enter age: _____ ***[PN: Range 2-98 (min answer is Q7a response, max answer is respondent age in S3 or max of range selected in S3a.)]***

ASK ALL CIGARETTE SMOKERS (SMOKER=1,2)
PN: SINGLE RESPONSE

8. Which cigarette flavor or sweetener do you usually use?

01 Flavorless
02 Fruit flavor
03 Sweet flavor
04 Tobacco ***[PN: Do not show:]***
05 Menthol or mint
06 Spicy
97 Other (please specify)_____

ASK ALL CIGARETTE SMOKERS (SMOKER=1,2)
PN: SINGLE RESPONSE

9. The last time you purchased cigarettes, did you buy your cigarettes by the pack, the carton, did you roll your own, or as individual cigarettes?

1 Pack
2 Carton
3 Roll your own
4 Individual Cigarettes, “Loosies”

PN: If Q9 = 1 (pack), ask Q9a and Q9b.

ASK PACK PURCHASERS (Q9=1)
PN: NUMERIC TEXT BOX

9a. What price did you pay for the LAST PACK of cigarettes? Please report the cost after using discounts or coupons.

_____ TL ***[PN: Whole number answers only. Range 50-75 TL]***

ASK PACK PURCHASERS (Q9=1)
PN: NUMERIC TEXT BOX

9b. How many cigarettes were there in your last pack?

_____ ***[PN: Range 1-20]***

PN: If Q9 = 2 (carton), ask Q9c, Q9d and Q9e.

ASK CARTON PURCHASERS (Q9=2)
PN: NUMERIC TEXT BOX

9c. What price did you pay for the LAST CARTON (that has 10 packs) of cigarettes? Please report the cost after using discounts or coupons.

_____ TL ***[PN: Whole number answers only. Range 400-1500 TL]***

Skip 9d.
ASK CARTON PURCHASERS (Q9=2)
PN: NUMERIC TEXT BOX

9e. How many cigarettes were there in each pack of cigarettes in the last carton you purchased?

_____ ***[PN: Range 1-20]***

PN: If Q9 = 3 (roll own), ask Q9f.

ASK THOSE WHO ROLL THEIR OWN (Q9=3)
PN: NUMERIC TEXT BOX

9f. What is the price/cost to you for rolling 20 cigarettes?

_____ TL ***[PN: Whole number answers only. Range 15-50 TL]***

PN: If Q9 = 4 (individual/loosies), ask Q9g and Q9h.

ASK THOSE WHO PURCHASE INDIVIDUAL CIGARETTES (Q9=4)
PN: NUMERIC TEXT BOX

9g. How many cigarettes do you usually buy at a time?

_____ (Enter number) ***[PN: Range 1-40]***

ASK THOSE WHO PURCHASE INDIVIDUAL CIGARETTES (Q9=4)
PN: NUMERIC TEXT BOX

9h. How much do you pay for that number of cigarettes?

_____ TL ***[PN: Whole number answers only. Range 2-300 TL]***

PN: DP – Please compute the price per 20 cigarettes (a pack) for all sample respondents – DP should calculate this as a variable that will ultimately be used in the DCE and stored in the dataset.

PN: Based on responses, calculate price per 20 cigarettes ("P") as follows:

If respondent answered…	*0.5P: Cost 1 is half of Cost 2 (50%):*	*P: Cost 2 is:*	*2P: Cost 3 is 2x higher than Cost 2 (200%):*
Q9=1 (pack)	*Multiply Cost 2 * 0.5*	*Response in (Q9a/Q9b)*20*	*Multiply Cost 2 * 2*
Q9=2 (carton)	*Multiply Cost 2 * 0.5*	*(Q9c/10)*(20/Q9e)*	*Multiply Cost 2 * 2*
Q9=3 (individual)	*Multiply Cost 2 * 0.5*	*Response in Q9f*	*Multiply Cost 2 * 2*
Q9=4 (ind/loosies)	*Multiply Cost 2 * 0.5*	*(Response in Q9h/Q9g)*20*	*Multiply Cost 2 * 2*

These calculations will be presented as Options 1, 2, or 3 in the Price section of the DCE.

PN: END TIMER

Non-Combustible Products

PN: START TIMER

ASK ALL
PN: SINGLE RESPONSE

10. Cigarette-like non-combustible products such as Vuse, Smok, Puff, ElfBar, and Vozol are battery powered devices that usually contain a nicotine-based liquid that is vaporized and inhaled and may contain flavors. You may also know them as e-cigarettes, e-cigs, e-hookahs, vapes, or mods. There are also cigarette-like non-combustible products known as heated tobacco products (such as IQOS, and GLO). Do you currently use any of these cigarette-like non-combustible products?

1 Yes
2 No

PN: If Q10 = 2, skip to Q17

PN: If Q10 = 1, then ask Q11-Q16

ASK E-CIGARETTE USERS (Q10=1)
PN: NUMERIC TEXT BOX

11. How old were you when you FIRST used cigarette like non-combustible products (e-cigarettes or other electronic nicotine vaping products)?

Enter age: _____ ***[PN: Allow 2-digit answers only. Range 1-98 (max answer is respondent age in S3 or max age based on range selected in S3a.)]***

ASK E-CIGARETTE USERS (Q10=1)
PN: NUMERIC TEXT BOX

12. Since what age have you been regularly using cigarette like non-combustible products (e-cigarettes or other electronic nicotine vaping products)? If you are not a regular user, please indicate that.

Enter age: _____ ***[PN: Allow 2-digit answers only. Range 1-98 (Max answer is respondent age in S3 or max age based on range selected in S3a. Minimum age is response in Q11.)]***

00 Not a regular user

ASK E-CIGARETTE USERS (Q10=1)
PN: SINGLE RESPONSE

13a. How often do you use cigarette like non-combustible products (e-cigarettes or other electronic nicotine vaping products) now?

1 Every day
2 Not every day, but occasionally
3 Rarely or not at all

ASK E-CIGARETTE USERS (Q10=1)
PN: SINGLE RESPONSE

13b. The last time you purchased a cigarette-like non-combustible product (e-cigarette, another electronic nicotine vaping product, or a heated tobacco product), where did you make the purchase?

1 Within Türkiye
2 Abroad (or at a Duty Free)
3 I do not want to answer.

ASK E-CIGARETTE USERS (Q10=1)
PN: SINGLE RESPONSE

14. To the best of your knowledge, do the cigarette like non-combustible products (e-cigarettes or other electronic nicotine vaping products) that you use contain nicotine?

1 Yes
2 No
3 Don't know

PN: If Q14 = 1, ask Q15

ASK IF PRODUCT CONTAINS NICOTINE (Q14=1)
PN: SINGLE RESPONSE

15. How much nicotine do the cigarette like non-combustible products (e-cigarettes or other electronic nicotine vaping products) that you use contain?

1 Does not contain nicotine
2 3 mg/ml (~ 0.3%) or less
3 4 mg/ml (~ 0.4%) to 6 mg/ml (~ 0.6%)
4 7 mg/ml (~ 0.7%) to 11 mg/ml (~ 1.1%)
5 12 mg/ml (~ 1.2%) to 19 mg/ml (~ 1.9%)
6 20 mg/ml (~ 2.0%) or more
7 Don't know

ASK E-CIGARETTE USERS (Q10=1)
PN: SINGLE RESPONSE

16. When using non-combustible products (e-cigarettes or other electronic nicotine products) which flavor do you typically use?

01 Flavorless
02 Fruit flavor
03 Sweet flavor
04 Tobacco
05 Menthol or mint
06 Spicy
97 Other (please specify)_____

PN: If e-cigarette user (Q10=1) skip to Q18.

ASK E-CIGARETTE NON-USERS (Q10=2)
PN: SINGLE RESPONSE

17. Are you interested in using or trying a non-combustible product within the near future, and if so, which one(s)?

1 An e-cigarette/ vape (such as Vuse, Smok, Puff, ElfBar, Vozol)
2 A heated tobacco product (such as IQOS or GLO).
3 Both of them
4 Neither of them

ASK ALL
PN: PROGRAM IN GRID FORMAT

18. Please mark the table to indicate your consumption frequency of packed cigarettes, roll-your-own (RYO) cigarettes, e-cigarettes (such as Vuse, Smok, Puff, ElfBar, Vozol) and heated tobacco products (such as IQOS or GLO). Please select one answer in each row.

	Every day (1)	Less than daily but at least once a week (2)	Less than weekly, but at least once a month (3)	Less than monthly, but occasionally (4)	I have quit (5)	Never (6)
a. Factory-made (packed) cigarettes						
b. Roll-your-own (RYO) cigarettes (loose tobacco)						
c. Electronic cigarettes, vapes						
d. Heated tobacco products						

PN: If daily/weekly user of electronic cigarettes (Q18c=1-2), ask Q19-Q21.

ASK DAILY/WEEKLY USERS OF ELECTRONIC CIGARETTES (Q18C=1-2)
PN: NUMERIC TEXT BOX

19. Thinking about your use of e-cigarettes, on average, how many days does it take you to consume 30 milliliters (small size) of e-cigarette liquid? (Consider the average in the last month.)

_____ (Enter number) ***[PN: Range 1-50]***

ASK DAILY/WEEKLY USERS OF ELECTRONIC CIGARETTES (Q18C=1-2)
PN: NUMERIC TEXT BOX

20. How many times per day do you usually use your e-cigarette? (assume 'one time' consists of around 15 puffs, or lasts around 10 min)

_____ (Enter number) ***[PN: Range 1-25]***

ASK DAILY/WEEKLY USERS OF ELECTRONIC CIGARETTES (Q18C=1-2)
PN: SINGLE RESPONSE

21. What type(s) of e-cigarette do you typically use? Select all that apply.

1 Tank type
2 Mod type
3 Pod type
4 Disposable (not refillable)
5 JUUL

PN: If daily/weekly user of heated tobacco products (Q18d=1-2), ask Q22.

ASK DAILY/WEEKLY USERS OF HEATED TOBACCO PRODUCTS (Q18D=1-2)
PN: NUMERIC TEXT BOX

22. Thinking about your use of heated tobacco products, on average, how many sticks do you use per day? (Consider the average in the last month.)

_____ (Enter number) ***[PN: Range 1-50]***

PN: END TIMER

PART II: Discrete Choice Experiment (DCE)

PN: START TIMER

PN: Assign respondent into one of 12 conjoint Versions, keeping quota distribution as similar as possible. Assign based on "greatest need".

PN: Note that for the DCE (DCE1-DCE12), all responses must be completed. (No web blanks.)
HIDVERSION

1 "Version 1"
2 "Version 2"
3 "Version 3"
4 "Version 4"
5 "Version 5"
6 "Version 6"
7 "Version 7"
8 "Version 8"
9 "Version 9"
10 "Version 10"
11 "Version 11"
12 "Version 12"

SCREEN I

PRESENT TO ALL CIGARETTE SMOKERS (SMOKERS=1,2) AND TO ALL E-CIGARETTE USERS (Q10=1)

In this section, we want you to imagine that you face a real-life situation in which you would like to purchase a nicotine product (packaged cigarettes, roll your own cigarettes, or e-cigarettes).

You will be presented with these three products and asked to choose one of them or neither. Each product can be described by several characteristics. You will see different scenarios each with different combinations of the price, flavor availability, and whether the sale is a recorded sale or not. If you choose one of the products, please assume that you have enough cash to pay for that product at the moment of purchase.

The products presented to you may be:

- *An original, legally sold product with a banderole, or*

- *An illegally sold product with no banderole (unrecorded sale, under-the-counter), or*

- *A product that is strictly banned and not available in shops, on the internet etc. Such a product is only available only on the street or can be bought abroad.*

Although e-cigarettes are sold in various quantities with different types of devices, we will be asking you about e-cigarette packages that are equivalent to one pack of your brand of cigarettes. For the purposes of your choices, please do not consider the price of buying the startup kit for reusable e-cigarettes.

Please answer all the questions that you are able to. All of your responses will be kept confidential and anonymous. Although the scenarios appearing on your screen may look similar to each other, each scenario shows a different combination of product attributes, so please read each carefully and take time to decide.

Let’s begin!

PN: Respondent will see 12 screens with 4 choice options per screen (Packed Cigarettes, Roll Your Own, E-Cigarettes, None). An example of a scenario programmed by SSRS is below:

PN: Present "first" on the first screen and "another" on all subsequent screens.

PN: Once Version is selected, randomize order of Tasks (i.e., 1-12 can be randomized). Present Options 1-2 based on which Version respondent has been assigned into. Tasks/Options should be presented one at a time, until all Tasks are completed.

PN: As a reminder – we vary the cigarette price at the individual level – that is – based on several previous questions we determine the price the respondent currently pays for 20 cigarettes. Whatever that price is we then would vary it by showing a price that was 50% of that number, that number, and 200% of that number.

PN: Always ask 2 DCE questions together of one grid before moving to next set. E.g., DCE1 and DCE1a, then go to next Task, DCE2 and DCE2a, etc. through all 12 tasks.

PN: Include timer for <u>each screen</u> in the DCE section, DCE1-DCE12, DCE1a-DCE12a. The client would like to see how much time respondents spend on each screen as a way to gauge attention.

ASK ALL CIGARETTE SMOKERS (SMOKERS=1,2) AND TO ALL E-CIGARETTE USERS (Q10=1)

DCE1-DCE12. Here is the (first/another) set of products that could be available to you.

Think about your immediate choice **today**.

Here are the set of tobacco products available when you are shopping. Please select one option **for your immediate choice today** from the choices below.

(If you want to see a larger version of the images, please click the magnifying glass below.)

EXAMPLE OF 1 GRID SHOWN TO RESPONDENTS:

	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.	O	O	O	O

PN: Show DCE grid again.

ASK ALL CIGARETTE SMOKERS (SMOKERS=1,2) AND TO ALL E-CIGARETTE USERS (Q10=1)

DCE1a-DCE12a. Now, think about what you would choose **6 months from now**.

If the same set of cigarettes and e-cigarettes you just saw were available when you are shopping **6 months from now**, please select one option from the choices below.

EXAMPLE OF 1 GRID SHOWN TO RESPONDENTS:

	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.	O	O	O	O

PN: Options Available

- Packed Cigarettes
  -  1 product type (Cigarettes) & Photo

  - 3 price levels (price levels are based on what respondent indicated they pay per cigarette unit

    If respondent purchased pack or carton (Q9=1-2) use P calculation in the DCE (0.5P; P, 2P)

    If respondent purchased RYO or individuals (Q9=3-4) use low, medium, and high market prices provided by the client. 30 TL, 60 TL, and 120 TL

    If respondent is non-cigarette smoker but uses e-cigarettes (SMOKER=0 and Q10=1) use low, medium, and high market prices provided by the client. 30 TL, 60 TL, and 120 TL

  - One sale type:

    Original product with a banderole

  - 2 Flavor descriptions

    1. Tobacco Flavor
    2. Menthol Flavor

- Roll Your Own
  -  1 product type (Roll Your Own) & Photo

- 1 price level (price levels are based on what respondent indicated they pay per cigarette unit

  Price of RYO: 25 TL

- One Sale Type:

  An illegally sold product (unrecorded sale) with no banderole

- 1 Flavor description

  Tobacco Flavor

- E-cigarette or a heated tobacco product

  -  1 product type (e-cigarettes) & Photo

  - 3 Price Levels

    Prices of e-cigs: 20 TL, 40 TL, and 80 TL

  - 3 Sale Types

    1. Original product with a banderole
    2. An illegally sold product with no banderole
    3. A product that is strictly banned and not available in shops, on the internet etc.

  - 2 Flavor Descriptions

    1. A variety of flavors available (such as tobacco, fruit, sweet, mint, menthol)
    2. Only tobacco flavor available

PN: END TIMER

PART – III POST DCE Questions

PN: START TIMER

PN: If cigarette smoker (SMOKER=1,2) or e-cigarette smoker (Q10=1) ask Q24.

ASK ALL CIGARETTE SMOKERS (SMOKERS=1,2) AND TO ALL E-CIGARETTE USERS (Q10=1)
PN: MULTIPLE RESPONSE

24. Thinking back to the choices you made before, how did the following features of tobacco products change from question to question? *(Select all that apply.)*

01 The flavors were always the same
02 The flavors varied
03 The price of packed cigarettes varied
04 The price of packed cigarettes was always the same
05 The price of Roll Your Own varied
06 The price of Roll Your Own was always the same
07 The price of electronic cigarettes varied
08 The price of electronic cigarettes was always the same
09 The sale type of e-cigarettes was always the same
10 The sale type of e-cigarettes varied
11 The sale type of packed cigarettes was always the same
12 The sale type of packed cigarettes varied
13 The sale type of Roll Your Own was always the same
14 The sale type of Roll Your Own varied

ASK ALL
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-C.

25. Please indicate to what extent you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. I know what e-cigarettes are; I am knowledgeable about them.					
b. I know the nicotine content of an average pack of cigarettes.					
c. I know the average nicotine content of e-cigarettes.					

ASK ALL
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-F.

26. Please indicate to what extent you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. E-cigarettes are more harmful to health than combustible cigarettes.					
b. E-cigarettes are less costly than combustible cigarettes.					
c. E-cigarettes are more practical and convenient to use than combustible cigarettes.					
d. I am concerned about the materials, chemicals, and additives in combustible cigarettes.					
e. I am concerned about the materials, chemicals, and additives in electronic cigarettes.					
f. I generally have a positive opinion towards the use of e-cigarettes.					

PN: If cigarette smoker (SMOKER=1,2) ask Q27.

ASK ALL SMOKERS (SMOKER=1,2)
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-E.

27. Please indicate to what extent you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. I think smoking cigarettes suits me.					
b. Because of smoking I think my health has / is deteriorated.					
c. Because of smoking I think my budget is negatively affected.					
d. Because of smoking I get negative reactions from my family.					
e. Because of smoking I get negative reactions from my social network.					

PN: If user of non-combustibles (Q18c=1,2 OR Q18D=1,2) ask Q28.

ASK USERS OF NON-COMBUSTIBLES (Q18C=1,2 or 18D=1,2)
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-J.

28. Thinking about your reasons for using non-combustible cigarette like products (e-cigarettes and heated tobacco products), please indicate to what extent do you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. Non-combustible cigarette like products are more cost-effective compared to combustible cigarettes.					
b. Non-combustible cigarette like products are less harmful compared to combustible cigarettes.					
c. Non-combustible cigarette like products smell nice.					
d. Non-combustible cigarette like products can be used indoors.					
e. Non-combustible cigarette like products are trendy.					
f. Non-combustible cigarette like products offer greater opportunities for personalization, including the choice of liquids, devices, and more.					
g. Non-combustible cigarette like products are good transition products for quitting smoking.					
h. Non-combustible cigarette like products are good products to reduce smoking.					
i. I am able to adjust the amount of nicotine in this product as I want.					
j. I am able to adjust the flavor selections and blends in this product as I want.					

PN: If user of non-combustibles (Q18c=1,2 OR Q18D=1,2) ask Q29.

ASK USERS OF NON-COMBUSTIBLES (Q18C=1,2 or 18D=1,2)
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-E.

29. Please indicate to what extent you agree with the following statements about your use of non-combustible cigarette like products (e-cigarettes and heated tobacco products).

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. I think using cigarette-like products suits me.					
b. Because of my consumption of cigarette-like products I think my health has/ is deteriorating.					
c. Because of my consumption of cigarette-like products I think my budget is negatively affected.					
d. Because of my consumption of cigarette-like products I get negative reactions from my family.					
e. Because of my consumption of cigarette-like products I get negative reactions from my social network.					

PN: If smoker or non-combustible user (SMOKER=1,2 OR (Q18C=1,2 OR Q18D=1,2)), ask Q30.

ASK ALL SMOKERS OR NON-COMBUSTIBLE USERS (SMOKER=1,2 OR (Q18C=1,2 OR Q18D=1,2))
PN: SINGLE RESPONSE

30. Thinking about your smoking habits **6 months from today**, which one is correct about you? What are your plans?

1 I will be smoking, but not using cigarette-like products (vapes, heated tobacco products).
2 I will be using both cigarettes and cigarettes-like products (I will be both smoking and vaping/using heated tobacco products).
3 I will be using cigarette-like products, but not cigarettes.
4 I will not be using any cigarettes or cigarette-like products (I will have quit all).

OMIT Q31

ASK ALL

PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-F.

32. We would now like to understand what you know about the legality of various cigarette and non-combustible cigarette like products in Türkiye. Please answer "True" or "False" to each of the following statements. If you do not know, please indicate that.

	True (1)	False (2)	I do not know (3)
a. The sale of packaged cigarettes is legal in Türkiye.			
b. The sale of cigarette-like products (such as e-cigarettes) is legal in Türkiye.			
c. The sale of hand-rolled cigarettes is legal in Türkiye.			
d. The sale of packaged flavored cigarettes is legal in Türkiye.			
e. In Türkiye, the possession and use of e-cigarettes is permitted /not illegal.			
f. In Türkiye, the use of e-cigarettes in closed public spaces is permitted.			

ASK ALL

PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-D.

33. Please indicate to what extent you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. I think nicotine is the substance in cigarettes and cigarette-like products that causes cancer.					
b. I think nicotine is addictive.					
c. I think the contents in combustible cigarettes other than nicotine cause cancer.					
d. I think the contents in non-combustible cigarette-like products other than nicotine cause cancer.					

ASK ALL
PN: NUMERIC TEXT BOX

33a. Among 100 users of packed cigarettes, how many do you think will die from lung cancer, heart disease, throat cancer and all other illnesses because of using this product?

_____ **(PN: ENTER NUMBER 0-100)**

ASK ALL
PN: NUMERIC TEXT BOX

33b. Among 100 users of loose tobacco/ roll-your own cigarettes, how many do you think will die from lung cancer, heart disease, throat cancer and all other illnesses because of using this product?

_____ **(PN: ENTER NUMBER 0-100)**

ASK ALL
PN: NUMERIC TEXT BOX

33c. Among 100 users of electronic cigarettes/ vapes, how many do you think will die from lung cancer, heart disease, throat cancer and all other illnesses because of using this product?

_____ **(PN: ENTER NUMBER 0-100)**

ASK ALL
PN: NUMERIC TEXT BOX

33d. Among 100 users of heated tobacco products, how many do you think will die from lung cancer, heart disease, throat cancer and all other illnesses because of using this product?

_____ **(PN: ENTER NUMBER 0-100)**

ASK ALL
PN: PROGRAM IN GRID FORMAT; RANDOMIZE A-D.

34. Please indicate to what extent you agree with the following statements.

	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)
a. I am good at resisting temptations					
b. I have a hard time breaking bad habits					
c. I wish I had more self-discipline					

PN: END TIMER

PART IV: DEMOGRAPHICS

PN: START TIMER

[Transition Screen]: The following questions are for classification purposes only.

ASK ALL
PN: SINGLE RESPONSE

35. What is the highest level of school you have completed or the highest degree you have received?

1 Elementary school (5 years) or less
2 Primary school (8 years) or middle school graduate
3 High school graduate
4 2-year college education (Vocational higher education)
5 4-year University education
6 Master's degree (including Medicine and Dentistry graduates)
7 Doctoral degree/ Ph.D.

ASK ALL
PN: SINGLE RESPONSE

36. What is the highest educational degree that your mother has received

1 Elementary school (5 years) or less
2 Primary school (8 years) or middle school graduate
3 High school graduate
4 2-year college education (Vocational higher education)
5 4-year University education
6 Master's degree (including Medicine and Dentistry graduates)
7 Doctoral degree/ Ph.D.

ASK ALL

PN: SINGLE RESPONSE

37. What is the highest educational degree that <u>your father</u> has received

1 Elementary school (5 years) or less
2 Primary school (8 years) or middle school graduate
3 High school graduate
4 2-year college education (Vocational higher education)
5 4-year University education
6 Master's degree (including Medicine and Dentistry graduates)
7 Doctoral degree/ Ph.D.

ASK ALL

PN: SINGLE RESPONSE

38. In a typical month, how much <u>discretionary income do you have available for socializing, entertainment, and additional purchases</u>, after covering essential expenses like rent, school fees, food, and transportation

1 1000 TL or less
2 1001 - 3000 TL
3 3001 - 5000 TL
4 5001 - 8000 TL
5 8001 - 12.000 TL
6 12.001 -17.000 TL
7 More than 17.000 TL
8 Don’t know
0 Prefer not to say

SHOW ALL

END. Thank you very much for your time. This concludes the survey. Have a good day!

PN: END TIMER