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Price and Income Sensitivity and Stability of Cigarette Demand Amidst Economic Crisis: Evidence from Lebanon

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Abstract

This study estimates own-price, cross-price, and income elasticities of demand for local and foreign cigarette brands in Lebanon several years into its ongoing economic and financial crisis. Using a nationally representative volumetric choice experiment (VCE) conducted in early 2024 with 2,500 adults across the country's eight governorates, we elicited stated purchases of local and foreign cigarettes under varying hypothetical scenarios. Censored Poisson regression models were applied to estimate demand functions and derive Marshallian price and income elasticities overall and by sociodemographic subgroups. Results reveal remarkable stability in cigarette demand behavior despite profound economic hardship: smoking prevalence in 2024 (35.5%) closely mirrors that of 2019, while own-price elasticities for local (-0.735) and foreign cigarettes (-1.019) remain statistically indistinguishable from pre-crisis estimates. Cross-price elasticities are positive and significant, with stronger substitution toward foreign brands than toward local ones. Income elasticity is negligible for local brands but significantly positive for foreign ones, highlighting brand differentiation in responsiveness to income changes. Subgroup analyses show higher price sensitivity among older smokers and those with intermediate smoking histories, but no systematic gender differences. These findings underscore the resilience of tobacco demand in Lebanon and suggest that economic hardship alone is insufficient to reduce consumption where cigarettes remain cheap and under-taxed. Stronger and harmonized excise taxation—applied across both local and foreign brands—emerges as the most effective lever to curb smoking and mitigate its health and fiscal burdens.

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1 Introduction

Tobacco use remains one of the leading preventable causes of morbidity and mortality worldwide, and is responsible for over eight million deaths each year, including 1.3 million due to secondhand smoke exposure (WHO, 2023). While global tobacco control efforts have led to declining smoking rates in many high-income countries, trends in low- and middle-income countries (LMICs) are more concerning. In particular, the Eastern Mediterranean Region (EMR) continues to experience some of the highest smoking prevalence rates globally, alongside persistently low tobacco prices and relatively weak regulatory enforcement (Bteddini et al., 2023; Jawad et al., 2024; Saad et al., 2023).

Lebanon stands out as a notable example within the EMR. Recent estimates place the prevalence of current cigarette smoking at 48.6% among men and 21.5% among women, and waterpipe smoking at 32.7% and 46.2% respectively—among the highest rates in the region and the world (Nakkash et al., 2022). Despite its ratification of the WHO Framework Convention on Tobacco Control (FCTC) in 2005 and the enactment of Law No. 174 in 2011, Lebanon's implementation of tobacco control measures remains partial and inconsistent, particularly in areas such as taxation, health warnings, and smoke-free public spaces (UNDP & Secretariat of the WHO FCTC, 2024). Cigarette prices remain low by international standards, with domestic brands often retailing below $1.00 per pack (Salti et al., 2015), and the overall tax burden on tobacco products estimated at just 45.6%—well below the WHO's recommended 75% threshold (Jawad et al., 2024).

Lebanon's tobacco excise tax structure is primarily ad valorem, consisting of a 108% domestic consumption excise tax and a 5% customs duty on the cost, insurance, and freight (CIF) value of imported manufactured cigarettes, a 5% import duty and an 11% value-added tax (VAT) at the retail level. In addition, imported raw tobacco used in domestic cigarette production is subject to a 48% domestic consumption tax on its CIF value. Because most cigarette brands—both local and international—are now produced domestically under license by the national monopoly (Regie), the 48% excise on raw tobacco effectively applies across brands, rendering the 108% and 5% rates on imported finished products largely nominal. There is no specific excise tax currently applied, and tax rates are uniform. This structure results in a lower effective tax burden on both local and foreign cigarettes that is coupled with substantial retail price gaps between the two, undermining

the health and fiscal effectiveness of tobacco taxation as a public health tool (Chalak et al., 2023a). Although a specific excise tax of LL12,500 per pack (about $0.14) was proposed in 2024 as part of a sin tax reform, the bill was later withdrawn for revision amid industry opposition. To date, the only notable post-crisis change has been the adjustment of the USD/LBP exchange rate used for tax collection, representing a nominal devaluation that increased revenues in local currency terms without altering the statutory tax rates.

Since the summer of 2019, Lebanon has experienced a profound economic and financial crisis that has drastically altered household income levels, employment prospects, and the purchasing power of consumers. This context provides a unique setting for assessing how economic instability may alter consumer behavior, particularly for addictive goods such as tobacco. On the one hand, economic hardship may suppress consumption through reduced affordability (Goel, 2014). On the other, it may increase reliance on cigarettes as a coping mechanism (Gallus et al., 2016; Kaiser et al., 2018), particularly where tobacco products remain under-taxed and relatively cheap. Understanding these countervailing forces is essential for designing effective fiscal and health policy interventions.

While a small body of research has estimated the price elasticity of cigarette and waterpipe demand in Lebanon and the wider EMR (Awawda et al., 2022; Chalak et al., 2023b; Salti et al., 2015), most of these studies are based on data from periods preceding the current economic crisis. This limits the applicability of past findings to current policy debates, particularly those concerning the structure of excise taxes or the substitution effects between product categories. To address this limitation, the present study applies a Volumetric Choice Experiment (VCE) (Carson et al., 2022) to estimate own- and cross-price elasticities of demand for local and foreign cigarette brands among Lebanese consumers. Unlike conventional discrete choice experiments (DCEs), VCEs allow respondents to indicate the quantity of each product they would purchase under varying hypothetical price scenarios, thereby more closely approximating real-world purchasing behavior. This method also permits the unrestricted estimation of substitution patterns and facilitates detailed post-estimation analysis of consumer subgroups' elasticities.

This study builds upon prior VCE applications conducted in 2019 at the onset of the crisis (Chalak et al., 2023b), while offering a more targeted analysis of cigarette consumption behavior in the post-crisis context. Specifically, it investigates: (1) the price sensitivity of demand for local versus

foreign cigarette brands; (2) the extent of substitution between the two; and (3) how these responses vary by income, age, gender, and smoking intensity. By doing so, it generates updated elasticity estimates that can inform tobacco taxation policies aimed at reducing consumption, mitigating health harms, and increasing government revenues—a particularly pressing concern given that tobacco-attributable economic losses in Lebanon are estimated to be thirteen times higher than government revenue from tobacco taxes (UNDP & Secretariat of the WHO FCTC, 2024).

The remainder of this paper is structured as follows. Section 2 describes the survey methodology, questionnaire and experimental design, fieldwork strategy, and empirical modeling strategy. Section 3 presents empirical results, including subgroup elasticities. Section 5 discusses the results, and Section 6 concludes.

2 Materials and methods

2.1 Volumetric Choice experiment

This study employs a stated preference (SP) survey to estimate the demand elasticities for two categories of cigarettes—local and foreign brands—among Lebanese consumers. SP methods provide significant advantages over revealed preference (RP) data, particularly in cases where actual behavioral data is non-existent or difficult to obtain (Louviere et al., 2000). Unlike RP methods, which rely on observed market behavior, SP approaches such as discrete choice experiments (DCEs) allow researchers to capture preferences in hypothetical yet controlled scenarios. This flexibility is especially useful in areas like food choice (Chalak & Abiad, 2012; van den Akker et al., 2022) and healthcare decision-making (Föhn et al., 2023; Viney et al., 2002), where direct market observations are often unavailable. Additionally, SP methods can integrate multiple attributes of choices, allowing for robust welfare estimations that RP data alone cannot offer.

Among SP methods, volumetric choice experiments (VCEs) (Carson et al., 2022; Chalak et al., 2020; Chalak et al., 2023b) represent a valuable extension of traditional discrete choice experiments (DCEs) by enabling respondents to select multiple units from various options, more closely simulating real purchasing behaviors. VCEs allow for the unrestricted estimation of both

own- and cross-price elasticities, providing a more detailed view of consumer demand patterns and price sensitivity. The survey and experimental design of this study builds upon the VCE design used by Chalak et al. (2023b) to investigate the demand for tobacco products, including both cigarette and waterpipe products, right at the onset of the economic and financial meltdown that hit the country in the summer of 2019. The present VCE, however, is streamlined to focus solely on cigarette choices. This adjustment reflects the study's narrower focus on cigarette products, and allows for a more in-depth examination of the Lebanese consumers' demand dynamics between local and foreign cigarette brands as they are affected by the economic crisis.

The experimental design utilizes two cigarette types: (1) Local brands (e.g., Cedars, Byblos) which are usually cheaper, and (2) Foreign brands (e.g., Marlboro, Davidoff, Gitanes) which are usually more expensive. In each scenario, respondents were simultaneously presented with both a local and a foreign pack, each shown at a specific price level. The design varied these price levels across scenarios to capture potential substitution or complementarity between the two products. Prices for local and foreign cigarettes were drawn from realistic ranges observed in the market at the time of the study, with 9 levels each, ranging between \$0.30 and \$4.50 for local brands, and \$1.00 and \$6.00 for foreign brands. The typical market prices of \$0.60 and \$2.00 for local and foreign brands, respectively, were included at the third level of each range. Because the design was full-factorial, every possible price combination was represented, which also allowed for scenarios where local and foreign packs could be offered at the same price. The wide range of variations around the typical market prices further enabled the simulation of the effects of substantial tax-induced price increases as well as discounts on the demand for cigarettes. Needless to say, respondents wishing to opt out from certain scenarios could do so by simply stating zero purchases for both brands.

Given the simple choice task format composed of two products with nine possible levels each, we opted for a full factorial design, resulting in 81 unique choice sets derived from all possible two-way price combinations. To reduce respondents' response burden, these 81 choice sets were blocked into nine groups, each containing nine scenarios. Each respondent was randomly assigned to one of the nine blocks, ensuring orthogonal representation of price combinations while limiting fatigue during decision-making. Respondents could choose one or more of each product, or none at all, depending on their preferences relative to the products' prices.

An example choice task can be found in Figure 1. Only respondents reporting they were cigarette smokers participated in the VCE. In each choice task, respondents could indicate the number of packs they would purchase of local and/or foreign cigarettes, or choose not to purchase either. This design permitted respondents to 'split' their budget that they would normally allocate to their next cigarette purchase across the two types of cigarettes, thus enabling the estimation of both own- and cross-price effects. Indeed respondents were instructed to answer each scenario as if they were making real-world purchase decisions, taking into account their own financial situation. This allowed responses to reflect individual affordability considerations without imposing an artificial expenditure ceiling.

2.2 Questionnaire design

The VCE survey questionnaire is structured into several key sections. It opens up with general questions collecting respondent and household identifiers, followed by background characteristics covering demographics, education, employment, and income. It then explores financial aspects, including household expenditure and borrowing habits. The following sections focus on tobacco use, with detailed questions on cigarette and waterpipe smoking behaviors, brand preferences, purchasing patterns, and spending habits. Then follows a section gauging information on smoking cessation intentions, health awareness, and taxation views. The core VCE exercise then follows, where respondents state their hypothetical purchases based on the nine different choice scenarios presented to them. The questionnaire closes with a section addressing young adults aged 18-22 to check the possibility of future communication.

2.3 Household interviews

The questionnaire and data collections procedures obtained ethical approval from the Institutional Review Board (IRB) at the American University of Beirut (AUB). The fieldwork for this national survey on tobacco consumption was conducted from February 19 to April 8, 2024, utilizing 24 fieldworkers to collect data across Lebanon's eight governorates. A multistage cluster sampling technique was employed, ensuring random and representative selection of households and participants. Fieldworkers approached 1,571 households, from which 1,310 accepted to participate, resulting in 2,500 completed questionnaires. They obtained the respondents' consent to participate before administering the Arabic version of the VCE survey. One eligible male and

one female resident were selected from each selected household, resulting in a 50% representation of each gender in the sample. Interviews involved respondents who could potentially be either cigarette smokers or non-smokers, but, again, only those who reported being smokers participated in the VCE. Face-to-face interviews were conducted using tablets, following informed oral consent. Non-responses were recorded, including 213 households that refused participation and 48 where no one was home after three attempts. To maintain a balanced sample, additional households were selected when necessary.

2.4 Empirical model

In a first step, we analyze the determinants of cigarette smoking. Understanding these determinants is essential for identifying "structural zeros"; that is, individuals who did not engage in the volumetric choice experiment (VCE) used to assess cigarettes demand and estimate price elasticities. By analyzing the sociodemographic characteristics associated with smoking, the model helps interpret the participation dynamics in the VCE and provides insights into smoking-related behaviors. To this end, we estimate a binary logit model in which the dependent variable is an indicator of whether an individual reports smoking. The model includes a range of independent variables capturing demographic, socioeconomic, and regional characteristics (see Table 1 for a full list of these covariates). Given the hierarchical nature of the data, where typically a male and female individuals are nested within a household, we clustered the standard errors at the household level to account for potential intra-household correlation. Following the logit estimation, we derived the adjusted probabilities of smoking associated with each of the covariates' subgroups, holding other covariates at their mean values. Additionally, we performed pairwise comparisons between demographic subgroups to evaluate significant differences in smoking behavior across them.

In a second step, we analyzed the demand of self-reported cigarette consumption among smokers (n=888) for local and foreign cigarette brands using two censored Poisson models. Count data models have often been used in food consumer research (Buason & Agnarsson, 2020; Xia, 2023), and we applied them to the stated purchase data elicited from the VCE, following the example of Carson et al. (2022). The dependent variable in each censored Poisson model was the number of cigarette packs respondents stated they would purchase in any one choice task. A censored Poisson

approach with a censoring point at zero was deemed necessary (Saffari et al., 2013), since there was a high proportion of zero stated purchases (33.9 and 68.0 percent for local and foreign cigarettes, respectively).

The models incorporated price, household income, and sociodemographic variables to estimate demand sensitivity. Similarly to Carson et al. (2022), the independent variables included log-transformed prices for local and foreign cigarette brands and household income, along with interaction terms between each of them and key demographic and smoking-related characteristics: age, gender, years of smoking, and the number of cigarettes smoked per day (see Table 4 for the complete list of covariates included in the models). This interaction structure allowed the model to capture heterogeneous demand responses across different consumer segments.

Before estimating the models, we examined the data for potential outliers which we defined as stated purchases above 10 packs in a single choice task. Respondents stated that they would purchase more than 10 packs of local and foreign brands in only 1.05% and 0.60% of the cases (and never in excess of 20 packs in both cases), respectively. On the one hand, the number of such potential outliers is negligible. On the other hand, they may in themselves reflect a genuine tendency among some consumers to engage in stockpiling behavior. We therefore decided not to exclude any observations from our analysis.

We also examined the data to look for respondents who consistently stated zero purchases of both local and foreign brands across all their 9 choice tasks. Of the 888 respondents who stated they were cigarette smokers and hence participated in the VCE, only 8 (0.90% of the estimation sample) turned out to be such ‘serial non-purchasers’. Furthermore, we looked at how many respondents stated zero purchases in at least 7 out of their 9 choice tasks, and these turned out to be only 47 (5.29% of the estimation sample). Indeed 766 respondents (85.59% pf the estimation sample) stated non-zero purchases for the majority of their choice tasks. This gave us reassurance that cigarette-smoking respondents in their vast majority engaged in genuine price evaluation and stated purchasing behavior.

Model estimation was performed in Stata 18.0 using the ‘cpoisson' command and a lower limit set at zero, ensuring that negative purchase quantities were not predicted. To account for potential within-individual correlation, standard errors were clustered at the respondent level. Additionally,

an offset variable was included to adjust for variations in the reported frequency of cigarette purchasing across respondents.

Because the censored Poisson model is estimated with a log-link function, the coefficients of log-transformed prices and income can, in principle, be directly interpreted as elasticities. In the absence of interaction terms, each coefficient on a log-price or log-income variable would represent the corresponding elasticity. However, in our specification, these log variables were interacted with multiple sociodemographic and smoking-related covariates. This means that elasticities are not constant but vary across individuals depending on their characteristics. To obtain interpretable summary elasticities, we carried out a post-estimation procedure using the Stata 'margins' command. This approach allowed us to derive Marshallian (uncompensated) own-price, cross-price, and income elasticities, evaluated at mean levels of the covariates for the overall population as well as for the subgroups of interest. These estimates provide policy-relevant insights into price and income sensitivity among different consumer segments, with standard errors computed via the Delta method.

3 Results

3.1 Sample characteristics and drivers of smoking behavior

Table 1 presents the sample characteristics of the 2,500 interviewed respondents, distributed across the various sociodemographic variables. These include monthly household income, governorate, gender, age, marital status, type of residential area, employment, education, nationality, and role in daily household purchases. In addition, the estimates of the binary logit model of cigarette smoking are presented in the same table, alongside the overall and subgroup adjusted probabilities estimates of cigarette smoking.

The results indicate that smokers are significantly more likely to belong to households with monthly incomes below $1,000 and to reside in Beirut and Mount Lebanon. They are also significantly more likely to be male, aged over 50, and not married. Other characteristics significantly associated with smoking include living in suburban areas, being unemployed, having only middle school education, and being non-Lebanese. Conversely, higher household income,

residing in regions outside Beirut and Mount Lebanon, higher educational attainment, and having no role in daily household purchase decisions are associated with lower probabilities of smoking.

Table 2 presents some smoking behavior characteristics that were included as covariates in the econometric models below. In terms of reported years of smoking, the threshold years were chosen such that the 3 generated categories would have approximately equal frequencies (excluding those who refused to answer). The frequencies show that the sample respondents tend to be long-term smokers, with two thirds of the sample having been smokers for more than 19 years, and one third for more than 35 years. As for the reported number of cigarettes smoked per day, the categories were chosen to correspond to a previous study that members of this study team have contributed to (Nakkash et al., 2022), namely <10 cigarettes (less than half a pack); 10-20 cigarettes (half to one pack), and >20 cigarettes (more than one pack) per day. Here the results show that almost 90 percent of smokers smoke half a pack of cigarettes or more per day, among whom 42 percent smoke more than two packs a day.

3.2 Overall own- and cross-price elasticity estimates

Table 3 presents the Lebanese population's own- and cross-price elasticities for cigarette products. Both own-price elasticities were negative and highly significant, as expected. The own-price elasticity of -0.735 for local cigarettes suggested a relatively inelastic demand, with a 10% price increase leading to a less than proportional decrease in demand of around 7.4%. For foreign cigarettes, the elasticity of -1.019 suggested a stronger and more (unit) elastic demand response, with around 10.2% decrease in demand for the same 10% price increase.

The cross-price elasticity estimates were positive and significant in both directions, indicating that the two products are substitutes. However, the Local×Foreign cross-price elasticity (0.144) was lower than the Foreign×Local elasticity (0.299). This suggests that the substitution of foreign cigarettes for local ones in response to price increase in the latter was stronger than the substitution of local cigarettes for foreign ones when those become more expensive, i.e. consumers are likelier to upgrade from local to foreign brands when cigarette prices increase. Specifically, our estimates predicted a 1.4% increase in demand for local brands among foreign cigarette smokers and 3.0% for foreign brands for local cigarette smokers following a 10% increase in the prices of both types.

Finally, income elasticity is statistically not significant for local cigarettes, whereas it is highly significantly positive in the case of foreign cigarettes. The estimates predict that a 10% increase in income yields virtually no change in the consumption of local cigarettes, while leading to a 4.0% increase in the consumption of foreign cigarettes, respectively. Indeed, this signals a high demand responsiveness of demand for foreign cigarettes to income changes.

3.3 Elasticity estimates by population subgroups

Table 4 presents own-price, cross-price, and income elasticity estimates for various population subgroups of interest (age, gender, years of smoking, and number of cigarettes smoked per day) evaluated at mean levels of covariates. In terms of own-price elasticities, virtually all estimates across all subgroups and local and foreign cigarette products are highly significant and negative, as expected, lending credibility and validity to the results. Foreign cigarette elasticities are consistently larger across all subgroups. Demand for cigarettes was consistently inelastic for local cigarettes, and mostly elastic for foreign cigarettes, with notable exceptions that will be described and discussed below. In terms of cross-price elasticities, Foreign×Local elasticities across virtually all subgroups turned out to be highly significantly positive, and generally higher in magnitude than their Local×Foreign counterparts, many of which were insignificant. This indicates that as in the case of the overall population, most Lebanese cigarette consumer segments are likelier to upgrade to foreign brands than downgrade to local cigarettes in response to an increase in cigarette prices.

Finally, virtually all subgroup income elasticities of foreign cigarettes were highly significantly positive, while those of local cigarettes were mostly insignificant, and the few that were significant were negative. This means that among most sociodemographic groups, the demand for foreign cigarettes increases significantly with income, while that of local cigarettes is either insensitive to income or, for a few groups, decreases with it, signaling an inferior good status.

Moving to subgroups, results across age groups suggest that own-price elasticities for local cigarettes are similar and insignificantly different across them. For foreign cigarettes, on the other hand, the contrast between smokers aged 50 or less and those older is noteworthy: whereas demand for the former is substantially inelastic, that of the latter is elastic, and the difference between the two is highly significant. In terms of Local×Foreign cross-price elasticities, only the 36-50 age group shows a significant readiness to substitute local to foreign cigarettes should the price of the

latter rise. For Foreign×Local cross-price elasticities, all elasticities are significant. This suggests that the propensity to substitute foreign to local cigarettes should the price of the latter increase is strong across all age groups (and probably strongest among older groups aged >50).

Income elasticities across age groups display an interesting pattern. Whereas younger groups aged <35 have a negative income elasticity for local brands, their income elasticity towards foreign brands is insignificant. This trend is reversed for older groups, whose income elasticities of local brands are insignificant, while those of foreign brands are significantly positive. Therefore, while younger smokers seem to react to income increase only by decreasing their consumption of local cigarettes, older smokers only do so by increasing their consumption of foreign cigarettes.

In terms of gender, none of the own- or cross-price elasticities were significantly different between males and females. Similarly, income elasticities across the two genders were in line with the overall population trend. This suggests that cigarette demand behavior and substitution patterns are not influenced by gender.

In terms of years of smoking, own-price elasticity estimates for local cigarettes are insignificantly different across the various groups. In contrast, for foreign cigarettes, an interesting pattern emerges: smokers with 19–35 years of smoking history show highly elastic demand, while those with shorter or longer smoking histories display inelastic demand. The difference is especially pronounced compared to smokers with less than 19 years of smoking. As for cross-price elasticities, Local×Foreign results indicate that only smokers for more than 35 years would significantly substitute local to foreign cigarettes should the price of the latter rise; smokers for less than 35 years would not engage in such substitutions. Foreign×Local cross-price elasticities, on the other hand, indicate that smokers for any number of years would significantly substitute foreign to more expensive local cigarettes, and would do so in more or less similar proportions that are insignificantly different.

Income elasticities across years of smoking are only significant and negative for the 19-35 group, who seem to be willing to reduce their consumption of local cigarettes when their income increases. As for foreign cigarettes, only smokers for 35 years or less have significantly positive income elasticities. Though still positive, the insignificant income elasticity for smokers for >35

years indicates that they are less ready to increase their consumption of foreign cigarettes should their income increase.

Finally, results for smoking intensity (the number of cigarettes smoked per day) exhibited patterns that resonate with those of years of smoking. Own-price elasticity estimates for local cigarettes are again insignificantly different across the smoking intensity groups, while the foreign cigarettes' elasticity for respondents who smoke half to one pack a day is significantly larger than those who smoke lower or larger amounts, and therefore signals an elastic demand. Smokers of less than half a pack and more than a pack a day both exhibit inelastic demand behaviors. Local×Foreign cross-price elasticity is only significant for those smoking half a pack or more; those smoking less do not seem to be willing to switch to smoking local brands should the price of foreign ones increase. For Foreign×Local cross-price elasticities, they are significant across all groups. In addition, the cross-price elasticity of the half to one pack frequency group is highest in magnitude, indicating that consumers in this smoking intensity group are the readiest to switch from local to foreign brands when the former become more expensive.

As for income elasticities across smoking these intensity groups, while these are insignificant across all intensity groups in the case of local cigarettes, they significant and positive for all these groups when it comes to foreign cigarettes. Of note is the very high income elasticity for respondents that have been smoking <10 years, which is significantly higher than for smokers for 10 years or more. This suggests that more 'casual' smokers are likelier to increase their cigarette consumption compared to the more 'established' smokers.

4 Discussion

The findings of this study contribute significantly to the evidence base on cigarette demand behavior in low- and middle-income countries (LMICs) under severe economic duress. Despite Lebanon experiencing one of the worst economic crises globally since 2019—with massive currency devaluation, skyrocketing inflation, and a sharp increase in poverty rates—our results indicate a remarkable stability in the overall cigarette smoking prevalence and own-price elasticity estimates for both local and foreign cigarette brands.

In terms of smoking prevalence, comparisons of cigarette smoking prevalence rates in Table 1 with prevalence rates in 2019 (Nakkash et al., 2022) derived from nationally representative data collected in Lebanon during that year on tobacco smoking behavior, indicate similar overall crude smoking prevalences (35.5% in 2024 vs. 35.1% in 2019) as well as similar breakdowns by gender (48.6% vs. 48.6% for males and 19.2% vs. 21.5% for females in 2024 and 2019, respectively).

Further, in terms of demand behavior, the estimated own-price elasticity for local (discount) cigarette brands in 2024 was -0.733, suggesting inelastic demand, while that of foreign (premium) brands was -1.061, indicating elastic demand behavior. These figures are consistent with, and statistically indistinguishable from, elasticity estimates derived in 2019 by Chalak et al. (2023b) based on the same data and using a similar survey-based VCE, which reported elasticities of -0.639 for local and -1.157 for foreign cigarettes. Pairwise comparisons of these estimates confirm that the differences are not statistically significant, reinforcing the conclusion that consumer responsiveness to cigarette prices has not changed substantially during the economic crisis. This said, cross-price elasticates which are larger in both directions in the 2024 compared to 2019, indicate an increased readiness to substitute between cigarette brands in response to prices changes. To our knowledge, our paper presents the first estimates of income elasticity of smoking in Lebanon, as both Salti et al. (2015) and Chalak et al. (2023b) did not look at cigarette demand responsiveness to income changes. The findings for foreign cigarettes are in line findings from the developing world, where research in the latest decade in Ecuador (Mena & Paraje, 2024), Uruguay (Ferre et al., 2025), and Colombia (Maldonado et al., 2016) ranging from 0.34 and 0.61. Yürekli and Sayginsoy (2010) found a global income elasticity of cigarette demand of 0.37—similarly to our estimate for foreign brands.

These findings underscore the policy relevance of harmonized taxation across local and foreign brands. Without coordinated tax policy, price differentials—particularly if driven by uneven tax burdens—could incentivize brand switching rather than reducing overall consumption. Such substitution behavior could undermine both public health goals and revenue expectations, especially if smokers shift toward cheaper alternatives rather than quit altogether

In terms of elasticity estimates by age groups, the significantly larger own-price elasticity magnitude and income elasticity for foreign cigarettes for the >50 age group contrasts with findings from the literature in either high-, middle-, or low-income countries. Franz (2008), Kjeld

et al. (2023), and Kostova et al. (2011) find that it is younger age groups who exhibit higher price elasticities, while Franz (2008) also finds that in the USA, older individuals are less sensitive to price changes. Similarly, Kostova et al. (2011) notes that domestic cigarettes are considered luxury goods for adolescents but normal goods for elderly consumers in Thailand, indicating lower elasticity magnitudes for the latter age group.

This contrasting result for Lebanon can be explained by the fact that elderly consumers, who are likelier to be pensioners, were hardest hit by the economic crisis that massively devalued their savings without a countervailing recourse to a current income. Hence their higher price and income sensitivity. In comparison, younger consumers of working age are still able to earn current income, and therefore were relatively better able to mitigate the effects of this devaluation on their livelihoods.

In terms of elasticity by smoking frequency subgroups, results tend to resonate with findings from the limited literature dealing with the topic. Boachie and Ross (2020) report that in South Africa, that frequent smokers do respond to price changes, albeit to a lesser extent than occasional smokers. Similarly, in our case, smokers of more than 20 cigarettes per day have an elasticity that is less than half the magnitude of those who smoke between 10 and 20 cigarettes.

Finally, regarding the effects of economic recession and crisis on cigarette demand behavior, the literature suggests that cigarette consumption is significantly impacted by them. The evidence from Spain (Martín Álvarez et al., 2020), the USA (Goel, 2014), and Cuba (Varona-Perez et al., 2019) concurs that under conditions of economic recession and crisis, cigarette consumption declines substantially. Yet Martín Álvarez et al. (2020) also find that in counterpart, price elasticities remain consistent across economic conditions, and the decrease in consumption is therefore driven mainly by the decline in real incomes brought about by the recession. While our results certainly exhibit the same stability in price elasticities, they also show strong evidence for stability in smoking prevalence that goes against what the literature documents. This is no doubt in large part the result of cigarettes in Lebanon remaining cheap and subject to low taxation rates (UNDP & Secretariat of the WHO FCTC, 2024), owing to a market structure that is dominated by a powerful state-owned tobacco monopoly (the Regie Libanaise de Tabacs et Tombacs) that is highly resistant to increasing taxation.

This study presents one of the first quantitative examination of cigarette demand elasticities in Lebanon following the onset of its economic and financial crisis. A key strength of the VCE approach employed in this study is its ability to simulate real-world purchasing decisions by allowing respondents to state the number of units they would buy across a wide range of price combinations. This enables the estimation of both own- and cross-price elasticities without the restrictive assumptions required by traditional demand models or revealed preference data. Moreover, the full factorial design employed here ensured robust identification of substitution patterns between local and foreign cigarette brands, while minimizing respondent fatigue. The integration of socio-demographic and smoking-behavior covariates further allowed us to estimate heterogeneous price sensitivities across income, age, and gender groups, producing policy-relevant elasticity estimates.

These findings point to the dual potential of tobacco taxation in Lebanon. Given the moderately elastic demand, especially among low-income and older smokers, cigarette taxation could serve as a powerful policy lever to simultaneously generate much-needed fiscal revenue and reduce smoking rates, thereby contributing to public health improvements.

That said, a key limitation of the present analysis is the absence of cessation elasticity estimates. While own- and cross-price elasticity estimates provide important insights into brand substitution and reductions in quantity smoked, they do not directly capture the extent to which smokers may quit altogether in response to price increases. Without these estimates, the full public health impact of tax policy interventions cannot be assessed.

Moreover, the interpretation of elasticity estimates must be approached cautiously in the context of Lebanon's volatile macroeconomic environment. The country's ongoing crisis has led to wide fluctuations in real incomes and price instability, which may cause distortions in both perceived and actual price responsiveness. This uncertainty complicates the translation of elasticity estimates into concrete policy outcomes, particularly when attempting to forecast the effects of price changes over time.

Methodologically, as with all stated preference methods, responses to hypothetical choice scenarios may not fully reflect actual behavior, particularly under conditions of economic instability or where social desirability bias is present. While efforts were made to design realistic

price levels and frame scenarios in familiar contexts, the absence of revealed preference validation data is a limitation.

Additionally, while the VCE permitted respondents to state zero purchases, it could not fully account for "structural zeros"—individuals who categorically do not smoke cigarettes—though these were modeled separately in a preliminary smoking participation model. Finally, although the price ranges presented in the experiment spanned realistic and policy-relevant values, future studies could expand the design to include dynamic or longitudinal components to assess evolving preferences as the crisis unfolds.

5 Conclusions

This study provides updated and policy-relevant estimates of own- and cross-price elasticities for local and foreign cigarette brands in Lebanon, using a nationally representative volumetric choice experiment conducted several years into the country's prolonged economic and financial collapse. A central and key finding is the stability of cigarette demand behavior despite the unprecedented crisis. Both the estimated price elasticities and smoking prevalence rates in 2024 closely mirror those from 2019, suggesting that the economic downturn—marked by widespread poverty, inflation, and currency devaluation—has not substantially altered aggregate smoking behavior or consumer responsiveness to cigarette prices.

This resilience may be attributed to the continued low prices of cigarettes in Lebanon, especially for local brands, and the lack of significant increases in tobacco taxation. The inelastic demand for local cigarettes and the elastic but stable demand for foreign ones, combined with the consistent willingness of consumers to substitute across brands in response to price changes, reinforce the importance of fiscal tools—particularly excise taxation—as a lever for reducing tobacco consumption and improving public health outcomes.

These findings carry important implications for policymakers. They highlight that without meaningful increases in tobacco taxes, economic hardship alone is insufficient to deter smoking in a context where cigarettes remain widely affordable. As such, the economic crisis should not be viewed as a substitute for tobacco control measures, but rather as a call to action for adopting robust fiscal policies that align with international best practices. Future research may examine how

behavioral stability in tobacco use under crisis conditions interacts with psychological, cultural, and institutional factors, and how long-term structural reforms in taxation and governance can shift demand in more health-promoting directions.

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7 References

Awawda, S., Chalak, A., Khader, Y., Mostafa, A., Abla, R., Nakkash, R., . . . Abu-Rmeileh, N. M. E. (2022). Gender differences in the price elasticity of demand for waterpipe and cigarette smoking in Lebanon, Jordan and Palestine: A volumetric choice experiment. *BMJ Open, 12*(7), e058495. doi: https://doi.org/10.1136/bmjopen-2021-058495.

Boachie, M. K., & Ross, H. (2020). Determinants of smoking intensity in South Africa: Evidence from township communities. *Preventive Medicine Reports, 19*, 101099. doi: https://doi.org/10.1016/j.pmedr.2020.101099.

Bteddini, D., Nakkash, R. T., Chalak, A., Jawad, M., Khader, Y., Abu-Rmeileh, N. M. E., . . . Salloum, R. G. (2023). Economic research in waterpipe tobacco smoking: reflections on data, demand, taxes, equity and health modelling. *Tobacco Control, 33*(1), 116-121. doi: https://doi.org/10.1136/tc-2022-057383.

Buason, A., & Agnarsson, S. (2020). Fond of fish? Count data analysis of seafood consumption in France. *Marine Resource Economics, 35*(2), 159-176. doi: https://doi.org/10.1086/708522.

Carson, R. T., Eagle, T. C., Islam, T., & Louviere, J. J. (2022). Volumetric choice experiments (VCEs). *Journal of Choice Modelling, 42*, 100343. doi: https://doi.org/https://doi.org/10.1016/j.jocm.2022.100343.

Chalak, A., Abboud, A., & Abou Zaki, S. (2023a). *Landscape report on tobacco consumption and taxation in Lebanon*. Research report, Issam Fares Institute for Public Policy and International Affairs, American University of Beirut, Beirut, Lebanon. https://www.aub.edu.lb/ifi/Documents/Landscape-Report-on-Tobacco-Consumption-and-Taxation-in-Lebanon.pdf.

Chalak, A., & Abiad, M. (2012). How effective is information provision in shaping food safety related purchasing decisions? Evidence from a choice experiment in Lebanon. *Food Quality and Preference, 26*(1), 81-92. doi: https://doi.org/10.1016/j.foodqual.2012.04.001.

Chalak, A., Ghandour, L., Anouti, S., Nakkash, R., Yassin, N., & Afifi, R. (2020). The impact of broad-based vs targeted taxation on youth alcohol consumption in Lebanon. *Health Policy and Planning, 35*(6), 625-634. doi: https://doi.org/10.1093/heapol/czaa018.

Chalak, A., Nakkash, R., Abu-Rmeileh, N. M. E., Khader, Y., Jawad, M., Mostafa, A., . . . Salloum, R. G. (2023b). Own-price and cross-price elasticities of demand for cigarettes and waterpipe tobacco in three Eastern Mediterranean countries: A volumetric choice experiment. *Tobacco Control, 32*(1), 86-92. doi: https://doi.org/10.1136/tobaccocontrol-2021-056616.

Ferre, Z., Gerstenblüth, M., & Triunfo, P. (2025). Demand for cigarettes in Uruguay: a national analysis with monthly data. *Discover public health, 22*(1). doi: https://doi.org/10.1186/s12982-025-00495-9.

Föhn, Z., Nicolet, A., Marti, J., Kaufmann, C., & Balthasar, A. (2023). Stakeholder engagement in designing attributes for a discrete choice experiment with policy implications: An example of 2 Swiss studies on healthcare delivery. *Value in Health, 26*(6), 925-933. doi: https://doi.org/10.1016/j.jval.2023.01.002.

Franz, G. A. (2008). Price effects on the smoking behaviour of adult age groups. *Public Health, 122*(12), 1343-1348. doi: https://doi.org/10.1016/j.puhe.2008.05.019.

Gallus, S., Asciutto, R., Muttarak, R., Pacifici, R., La Vecchia, C., & Lugo, A. (2016). Which group of smokers is more vulnerable to the economic crisis? *Public Health, 134*, 34-38. doi: https://doi.org/10.1016/j.puhe.2015.11.023.

Goel, R. K. (2014). Economic stress and cigarette smoking: Evidence from the United States. *Economic Modelling, 40*, 284-289. doi: https://doi.org/10.1016/j.econmod.2014.04.009.

Jawad, M., Awawda, S., Abla, R., Chalak, A., Khader, Y. S., Nakkash, R. T., . . . Abu-Rmeileh, N. M. E. (2024). Impact of waterpipe tobacco taxation on consumption, government revenue and premature deaths averted in Jordan, Lebanon and Palestine: a simulation study. *Tobacco Control, 33*(e1), e85-e90. doi: https://doi.org/10.1136/tc-2022-057284.

Kaiser, M., Reutter, M., Sousa-Poza, A., & Strohmaier, K. (2018). Smoking and local unemployment: Evidence from Germany. *Economics and Human Biology, 29*, 138-147. doi: https://doi.org/10.1016/j.ehb.2018.02.004.

Kjeld, S. G., Jørgensen, M. B., Aundal, M., & Bast, L. S. (2023). Price elasticity of demand for cigarettes among youths in high-income countries: a systematic review. *Scandinavian Journal of Public Health, 51*(1), 35-43. doi: https://doi.org/10.1177/14034948211047778.

Kostova, D., Ross, H., Blecher, E., & Markowitz, S. (2011). Is youth smoking responsive to cigarette prices? evidence from low- and middle-income countries. *Tobacco Control, 20*(6), 419-424. doi: https://doi.org/10.1136/tc.2010.038786.

Louviere, J. J., Hensher, D. A., & Swait, J. D. (2000). *Stated Choice Methods: Analysis and Applications*. Cambridge: Cambridge University Press.

Maldonado, N., Llorente, B., & Deaza, J. (2016). Cigarette taxes and demand in Colombia. *Revista Panamericana de Salud Publica/Pan American Journal of Public Health, 40*(4), 229-236.

Martín Álvarez, J. M., Golpe, A. A., Iglesias, J., & Ingelmo, R. (2020). Price and income elasticities of demand for cigarette consumption: what is the association of price and

economic activity with cigarette consumption in Spain from 1957 to 2016? *Public Health, 185*, 275-282. doi: https://doi.org/10.1016/j.puhe.2020.05.059.

Mena, A. C., & Paraje, G. (2024). Tobacco price elasticity by socioeconomic characteristics in Ecuador. *Plos One, 19*(4 April). doi: https://doi.org/10.1371/journal.pone.0302293.

Nakkash, R., Khader, Y., Chalak, A., Abla, R., Abu-Rmeileh, N. M. E., Mostafa, A., . . . Salloum, R. G. (2022). Prevalence of cigarette and waterpipe tobacco smoking among adults in three Eastern Mediterranean countries: A cross-sectional household survey. *BMJ Open, 12*(3), e055201. doi: https://doi.org/10.1136/bmjopen-2021-055201.

Saad, R. K., Maiteh, A., Nakkash, R., Salloum, R. G., Chalak, A., Abu-Rmeileh, N. M. E., . . . Al Nsour, M. (2023). Monitoring and combating waterpipe tobacco smoking through surveillance and taxation. *JMIR Public Health and Surveillance, 9*, e40177. doi: https://doi.org/10.2196/40177.

Saffari, S. E., Adnan, R., Greene, W., & Ahmad, M. H. (2013). A poisson regression model for analysis of censored count data with excess zeroes. *Jurnal Teknologi (Sciences and Engineering), 63*(2), 71-74. doi: https://doi.org/10.11113/jt.v63.1915.

Salti, N., Chaaban, J., Nakkash, R., & Alaouie, H. (2015). The effect of taxation on tobacco consumption and public revenues in Lebanon. *Tobacco Control, 24*(1), 77-81. doi: https://doi.org/10.1136/tobaccocontrol-2012-050703.

UNDP, & Secretariat of the WHO FCTC. (2024). *Investment case for tobacco control in Lebanon*. United Nations Development Programme and World Health Organization, Geneva, Switzerland. file:///C:/Users/ac22/Dropbox/References/Investment%20case%20for%20tobacco%20control%20in%20Lebanon.pdf.

van den Akker, K., Bartelet, D., Brouwer, L., Luijpers, S., Nap, T., & Havermans, R. (2022). The impact of the nutri-score on food choice: A choice experiment in a Dutch supermarket. *Appetite, 168*. doi: https://doi.org/10.1016/j.appet.2021.105664.

Varona-Perez, P., Bridges, S., Lorenzo-Vazquez, E., Suarez-Medina, R., Venero-Fernandez, S. J., Langley, T., . . . Fogarty, A. W. (2019). What is the association between price and economic activity with cigarette consumption in Cuba from 1980 to 2014? *Public Health, 173*, 126-129. doi: https://doi.org/10.1016/j.puhe.2019.05.014.

Viney, R., Lancsar, E., & Louviere, J. (2002). Discrete choice experiments to measure consumer preferences for health and healthcare. *Expert Review of Pharmacoeconomics and Outcomes Research, 2*(4), 319-326. doi: https://doi.org/10.1586/14737167.2.4.319.

WHO. (2023). Tobacco. Retrieved March 25, 2025, from https://www.who.int/news-room/fact-sheets/detail/tobacco#:~:text=Key%20facts,%2D%20and%20middle%2Dincome%20countries.

Xia, F. (2023). Why to use Poisson regression for count data analysis in consumer behavior research. *Journal of Marketing Analytics, 11*(3), 379-384. doi: https://doi.org/10.1057/s41270-022-00166-7.

Yürekli, A., & Sayginsoy, O. (2010). Worldwide organized cigarette smuggling: An empirical analysis. *Applied Economics, 42*(5), 545-561. doi: https://doi.org/10.1080/00036840701720721.

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Table 1. Sample characteristics and binary logit model and adjusted probability estimates of cigarette smoking

Variable	N (%)	Coefficient	Adj. probability of smoking (%)	
Constant/Overall	2,500 (100.0%)	0.326*	32.2%	
Monthly household income (USD)				
≤$500	1,313 (52.5%)	-	32.2%	A
$501-$1,000	809 (32.4%)	0.200*	36.7%	A
>$1,000	378 (15.1%)	-0.433***	23.6%	
Governorates				
Beirut & Mount Lebanon	1,122 (44.9%)	-	42.3%	
North & Akkar	538 (21.5%)	-0.714***	26.4%	A
South & Nabatiyeh	482 (19.3%)	-0.876***	23.4%	A
Beqaa & Baalbek-Hermel	358 (14.3%)	-0.791***	25.0%	A
Gender				
Male	1,250 (50.0%)	-	48.6%	
Female	1,250 (50.0%)	-1.382***	19.2%	
Age				
≤35	854 (34.2%)	-	25.8%	A
36-50	850 (34.0%)	0.144	28.6%	A
>50	796 (31.8%)	0.830***	44.3%	
Marital status				
Married	1,918 (76.7%)	-	29.9%	
Not married/No response	582 (23.3%)	0.457***	40.3%	
Type of Residential Area				
Urban	1,840 (73.6%)	-	31.5%	A
Suburban	356 (14.2%)	0.371***	39.9%	
Rural	304 (12.2%)	-0.160	28.1%	A
Employment				
Employed	1,418 (56.7%)	-	32.6%	AB
Unemployed	214 (08.6%)	0.287*	39.2%	B
Not in labor force	868 (34.7%)	-0.127	29.9%	A
Education				
Up to middle school	1,237 (49.5%)	-	39.9%	
High school/Equivalent education	610 (24.4%)	-0.462***	29.5%	
University degree	653 (26.1%)	-0.852***	22.1%	
Nationality				
Lebanese	2,267 (90.7%)	-	31.6%	A
Non-Lebanese	233 (09.3%)	0.293*	38.2%	A
Role in daily household purchases				
Sole/Joint decision-maker	2,000 (80.0%)	-	33.7%	
No role	500 (20.0%)	-0.346**	26.5%	
Model fit				
Log-pseudolikelihood		-138.904		
Wald χ^2 (p-value)		538.62 (0.00)		

(1) Legend: * p<.1; ** p<.05; *** p<.01. (2) Probabilities sharing a letter within the group variable are not significantly different at the 5% significance level. (3) 888 respondents (35.5%) reported that they are cigarette smokers.

Table 2. Smoking behavior characteristics

Variable	N	%
Smokers	888	100.0%
Years of smoking		
<19	286	32.2%
19-35	286	32.2%
>35	296	33.3%
Refuse to answer	20	2.3%
Nr. cigarettes smoked per day		
<10	89	10.0%
10-20	416	46.9%
>20	373	42.0%
Don't know	10	1.1%

Table 3. Overall own- and cross-price and income elasticity estimates

Elasticity	Coef.	Std. Err.	*P*-value	95% Conf. int.
Own-price				
Local	-0.735	0.040	0.000	(-0.814, -0.657)
Foreign	-1.019	0.096	0.000	(-1.207, -0.830)
Cross-price				
Local×Foreign	0.144	0.033	0.000	(0.079, 0.208)
Foreign×Local	0.299	0.033	0.000	(0.235, 0.363)
Income				
Local	-0.051	0.037	0.167	(-0.124, 0.022)
Foreign	0.402	0.085	0.000	(0.236, 0.568)

Table 4. Own-price, cross-price, and income elasticity estimates by subgroups

	Own-price				Cross-price				Income			
Variable	Local		Foreign		Local×Foreign		Foreign×Local		Local		Foreign	
Age												
≤35	-0.701***	A	-0.890***	AB	0.150	AB	0.252***	A	-0.234**	A	0.064	A
36-50	-0.744***	A	-0.574***	B	0.309***	B	0.194***	A	0.005	B	0.503***	B
>50	-0.752***	A	-1.387***	A	0.032	A	0.396***	A	0.025	AB	0.545***	AB
Gender												
Male	-0.717***	A	-1.044***	A	0.150***	A	0.277***	A	-0.063	A	0.340***	A
Female	-0.781***	A	-0.957***	A	0.129**	A	0.352***	A	-0.023	A	0.553***	A
Years of smoking												
<19	-0.689***	A	-0.858***	B	0.083	AB	0.200**	A	0.051	B	0.471***	B
19-35	-0.837***	A	-1.474***	A	0.051	A	0.355***	A	-0.146**	AB	0.528***	AB
>35	-0.717***	A	-0.779***	ABC	0.293***	B	0.346***	A	-0.051	AB	0.233	AB
Refuse to answer	-0.215**		-0.366*	C	0.133	AB	0.214**	A	-0.175*	A	0.105	A
Nr. cigarettes smoked per day												
<10	-0.855***	A	-0.914***	A	0.104	A	0.279***	AB	-0.078	A	0.741***	B
10-20	-0.746***	A	-1.346***		0.150***	A	0.385***	B	-0.039	A	0.432***	AB
>20	-0.693***	A	-0.689***	A	0.169***	A	0.212***	A	-0.042	A	0.252**	A
Don't know	-0.789***	A	-0.656**	A	-0.716**		0.113	AB	-0.652	A	1.730***	

(1) Legend: * p<.1; ** p<.05; *** p<.01. (2) Elasticitie sharing a letter within the group variable are not significantly different at the 5% significance level.

Figure 1. Example of a choice scenario

SECTION C: CHOICE EXPERIMENT

Description:

- In the next section, you will see hypothetical choice scenarios about buying cigarette packs for yourself. The only difference between the scenarios is the price of the cigarette products
- Each scenario will present you with 3 different tobacco products that you may purchase:
    1. Local brand of cigarettes like Cedars or Byblos
    2. Foreign brand of cigarettes like Marlboro, Davidoff or Gitanes
- Each of the 2 cigarette packs will have its own price, and the combination of prices change in each scenario.
- You will be asked to imagine yourself buying your needs of cigarettes as you would typically in real life and tell us how many items you would buy of each of the 2 products on offer.
- You may choose to buy 1 or more items from some types and none (i.e. 0) from others. You may choose to buy nothing at all, in which case the answer will be 0 for each of the 2 products.
- Please seriously consider the prices (in fresh USD) at which each item is being offered when making your decision about the quantities. Make sure that the sum you spend on these products is in line with your budget for buying cigarettes. Also, keep in mind that the money you spend on cigarettes will not be available for you to spend on other things.
- Here is an example of a choice scenario:

Think about the amount of cigarette packs you would purchase, based on the following prices:

	Local brand **Pack of 20**	**Foreign brand** **Pack of 20**
Price	$0.60 (LBP 55,000)	$2.00 (LBP 180,000)
Quantity	|___|	|___|

Now I leave you to complete the choice scenarios. **[INTERVIEWER: LEAVE THE PARTICIPANT TO FILL IN THE CHOICE SETS]**