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Abstract

This report investigates tobacco prevalence and consumption patterns in Lebanon. This study combines data from a nationally representative survey and sales records obtained from a major national retailer. The findings reveal persistently high smoking prevalence, with 66 percent of survey respondents reporting being regular smokers. Cigarettes remain the dominant tobacco product for most users (54 percent) followed by waterpipe (39 percent), with notable gender- and age-specific consumption preferences. The financial crisis significantly influenced consumption trends, with a noticeable shift towards cheaper local brands like Cedars. The report discusses the implications of these findings and compares them to recent findings from Lebanon and the region.

Acknowledgments

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1. Introduction

This report provides a landscape of tobacco consumption in Lebanon in the aftermath of the multifaceted crisis (2019–2022). It provides a descriptive analysis of tobacco consumption in Lebanon by presenting: 1) stylized facts using recent primary data on tobacco consumption and 2) a comparison of pre- and post-crisis tobacco consumption.

The crisis was marked by a drastic currency devaluation² and a structural shift in income distribution.³ This led to three major changes in tobacco prices: 1) a massive increase in the average nominal pre-tax tobacco prices, 2) an increased variance in tobacco nominal prices between various brands, and 3) a reduction in the real value of the lira-denominated taxes on tobacco products. Put together, these changes led to significant variations in the real cost of tobacco consumption. While this report does not provide a formal demand estimation, the comparative analysis presents insights into the impact of price variations on tobacco consumption. In particular, this study reveals trends in the direction and patterns of tobacco consumption in response to large variations in real prices, with a focus on the response by demographic subgroups. These insights are particularly useful, from a policy perspective, in assessing the impacts of significant tax increases.

2. Data Sources and Research Methodology

The analysis relies on two data sources. The first is primary data collected from a nationally representative survey that was specifically designed and administered for the purpose of this study, and the second is sales data from the largest supermarket retailer in the country.

Survey data were collected between February and April 2024. The data set consists of a sample of 2,500 adults (aged 18 years and older⁴). The sample covers all 28 administrative districts in the country and is split equally between men and women. A multistage cluster sampling approach was employed to ensure comprehensive coverage of the population of interest across the territory.⁵

² <https://blog.blominvestbank.com/42028/lebanons-inflation-rate-reached-144-12-by-september-2021/>

³ <http://www.cas.gov.lb/index.php/latest-news-en/201-labour-force>

⁴ In Lebanon, 18 is the age of majority and the legal age of buying tobacco.

⁵ Details about sampling and the questionnaire can be found on the online data repository <https://github.com/aliabb87/Tobacco-Use-Survey-Lebanon-2024>

In comparison to the last national labor force and household survey conducted in 2022, our survey oversamples Lebanese nationals and more educated individuals. The geographic distribution across the governorates is comparable to the latest population estimates. The survey includes a wide range of questions on current and retrospective tobacco consumption, spending on tobacco products, and other behavioral issues related to tobacco use. It also includes detailed demographic, employment, and income information on the survey participants. The average age in the sample is 43, most of the participants (90 percent) are Lebanese nationals, and 56.7 percent are employed, with an average individual monthly income of USD 296.

Survey data are analyzed to explore tobacco prevalence clustered by demographic and income categories. To study the evolution of tobacco consumption, we compare the reported current and retrospective consumption. Additionally, we compare the results from the survey to earlier figures on prevalence of tobacco consumption documented in the literature.

The supermarket data cover monthly aggregated sales of all tobacco products⁶ and tobacco-related accessories⁷ at all branches of the supermarket chain for the period between January 2018 and December 2023. The chain has more than 17 branches concentrated in the greater Beirut area and the other major coastal cities. There are two measures of sales in the data: 1) volume and value of sales per brand of tobacco product and 2) the average monthly retail price per product, which is constructed as the ratio of value and volume of sales. These aggregated data are used to explore general trends in consumption of tobacco products before and after the crisis. The monthly frequency of the data allows for the analysis to zoom in on the changes in tobacco consumption around the onset of the financial crisis in October 2019. Moreover, disaggregation of the data at the brand level permits exploration of potential substitution behavior by consumers.

3. Results and Main Findings

Results in this section are presented thematically, starting with an observational cross-sectional analysis of tobacco prevalence by demographic characteristics, educational attainment, employment status, and income groups.

⁶ The list includes cigarettes, cigars, waterpipe tobacco and other raw tobacco, and e-cigarettes.

⁷ This includes lighters, rolling papers and rolling machines, filters, and cigar accessories.

a. Smoking behavior: stylized facts

The rates of smoking in Lebanon are generally high. In the sample, 66 percent of survey respondents reported to be regular smokers,⁸ and cigarettes are the primary tobacco product consumed (by 54 percent of smokers), followed by waterpipe (39 percent), and 10 percent for all other types of tobacco products. Dual smoking is limited, with only two percent of smokers reporting regularly using two or more types of tobacco products.

Smoking prevalence among men is notably high, with 76 percent reporting as smokers. This is 20 percentage points (95%CI: 16.7; 23.9) higher than the smoking prevalence reported by women. In addition to prevalence rates, smoking behaviors of men and women differ significantly by type of tobacco consumption. Among smoking men, cigarettes are the main type of tobacco consumed (by 66 percent of smokers) followed by waterpipe (26 percent), and 11 percent use other types of tobacco. Among women, waterpipe is the preferred type of consumption for 57 percent (Difference=-30.8pp 95%CI: -35.3; -26.2) of smoking women, followed by cigarettes for 37 percent (Difference=28.7pp 95%CI: 24.0; 33.4), while eight percent (Difference=3.3pp 95%CI: 0.4; 6.2) of smoking women use other tobacco products.

Table 1. Smoking prevalence by gender

	Men	Women	All
Smoker	0.76 (0.43)	0.56 (0.50)	0.66 (0.47)
Cigarette smoker	0.66 (0.47)	0.37 (0.48)	0.54 (0.50)
Waterpipe smoker	0.26 (0.44)	0.57 (0.50)	0.39 (0.49)
Other tobacco products	0.11	0.08	0.10

⁸ Classification as a smoker was based on the participant's response to the question: "Do you currently use any tobacco or nicotine products (cigarettes, pipe, cigar, vape or Argileh)?" The general understanding of the question does not require regular or frequent smoking.

	(0.31)	(0.27)	(0.30)
Dual smoker	0.03 (0.17)	0.02 (0.12)	0.02 (0.15)
Daily consumer of cigarettes	0.98 (0.13)	0.93 (0.25)	0.97 (0.17)
Packs per week	9.93 (5.09)	7.12 (4.17)	9.10 (5.01)
Daily consumer of waterpipe	0.74 (0.44)	0.71 (0.45)	0.72 (0.45)
Bowls per week	10.93 (6.96)	9.35 (6.42)	9.95 (6.68)

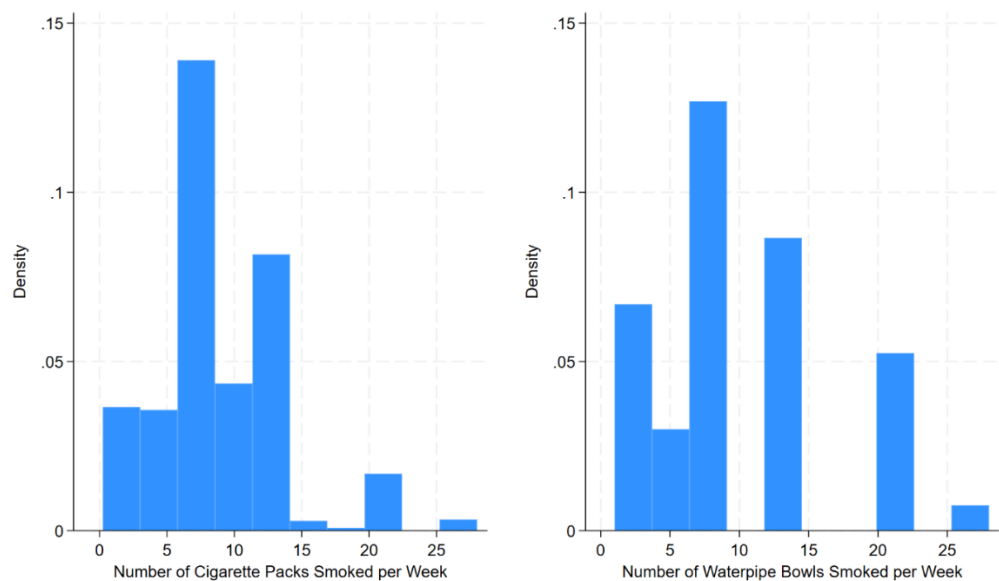
Note: Standard deviation in parentheses.

The reported rates show that tobacco products are in regular use, with 97 percent of all cigarette smokers reporting daily consumption. Daily consumption rates are at 98 percent and 93 percent (Difference=5.3pp 95%CI: 2.8; 7.8) among men and women, respectively. Cigarette-smoking men consume around 10 packs of cigarettes a week. As for women, the average is slightly higher than seven packs per week (Difference=2.8 95%CI: 2.1; 3.6). Overall, an average of 9.10 packs per week are consumed by all cigarette consumers in the sample. More than 70 percent of waterpipe smokers use it on a daily basis, resulting in an average of around 10 bowls consumed per week—10.93 for men and 9.35 for women (Difference=1.6 95%CI: 0.5; 2.6).

There is a significant high variance in the rate of consumption of tobacco products, as can be noted in the histograms below. The median number of weekly cigarette packs smoked is seven, while the top quartile of cigarette smokers smoke 14 cigarette packs or more per week. Similarly, the median of waterpipe bowls smoked per week is seven. The distribution of waterpipe smoking frequency has thicker tails, indicating a higher prevalence of occasional smokers (two or less bowls per week)

and extremely high-frequency smokers (21 bowls or more per week).

Figure 1. Cigarettes and waterpipe weekly smoking frequency



Smoking behavior by age group shows some interesting patterns. The prevalence of smoking is high and shows very little variance across all age groups. Between the ages of 18 and 64, the proportion of smokers varies between 64 and 70 percent (all one-by-one mean differences are statistically insignificant at the five-percent level of significance). The prevalence of smoking in the group aged 65 years or older is lower at 54 percent (statistically difference from all age groups at the five-percent level of significance). This pattern is indicative of persistent smoking behavior throughout life.

Table 2. Smoking prevalence by age group

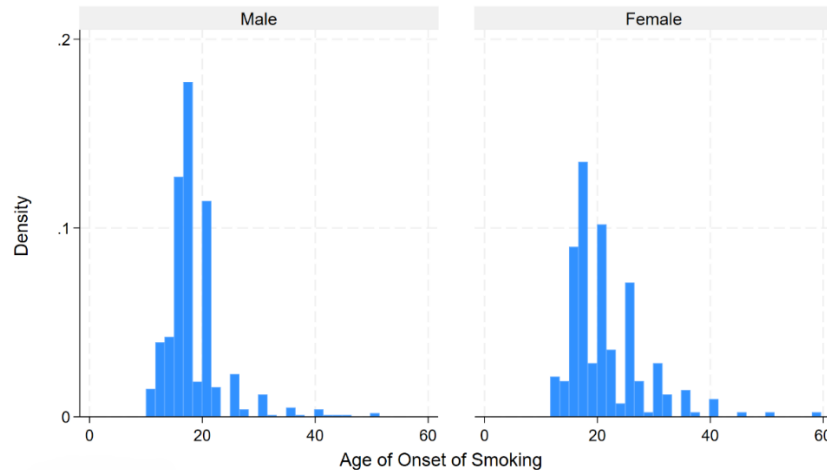
	18–25	26–35	36–45	46–55	56–64	65+
Smoker	0.67	0.66	0.69	0.64	0.70	0.54
	(0.47)	(0.47)	(0.46)	(0.48)	(0.46)	(0.50)
Cigarette smoker	0.44	0.42	0.44	0.55	0.79	0.89

	(0.50)	(0.49)	(0.50)	(0.50)	(0.41)	(0.31)
Waterpipe smoker	0.51 (0.50)	0.48 (0.50)	0.45 (0.50)	0.38 (0.49)	0.18 (0.38)	0.11 (0.31)
Other tobacco products	0.09 (0.28)	0.13 (0.34)	0.12 (0.33)	0.08 (0.28)	0.05 (0.23)	0.02 (0.13)
Dual smoker	0.04 (0.19)	0.03 (0.17)	0.02 (0.14)	0.02 (0.12)	0.02 (0.14)	0.02 (0.13)
Daily consumer of cigarettes	0.95 (0.21)	0.94 (0.23)	0.98 (0.13)	0.98 (0.13)	0.97 (0.18)	0.97 (0.17)
Packs per week	8.32 (4.36)	8.95 (5.29)	8.98 (4.85)	9.89 (5.15)	9.54 (4.95)	7.99 (4.97)
Daily consumer of waterpipe	0.77 (0.42)	0.73 (0.44)	0.74 (0.44)	0.71 (0.46)	0.62 (0.49)	0.50 (0.52)
Bowls per week	10.68 (6.10)	10.02 (6.71)	9.95 (6.77)	10.06 (6.98)	8.37 (6.19)	7.42 (7.37)

Note: Standard deviation in parentheses.

The average age of onset of smoking in the sample is 19, with males starting earlier on average at the age of 18 compared to 21 for females (Difference=-2.9 95%CI: -3.8; -2.1). The distribution is heavily skewed to the left for both men and women (Figure 2), with a median age of onset of 18 and 20 for men and women, respectively.

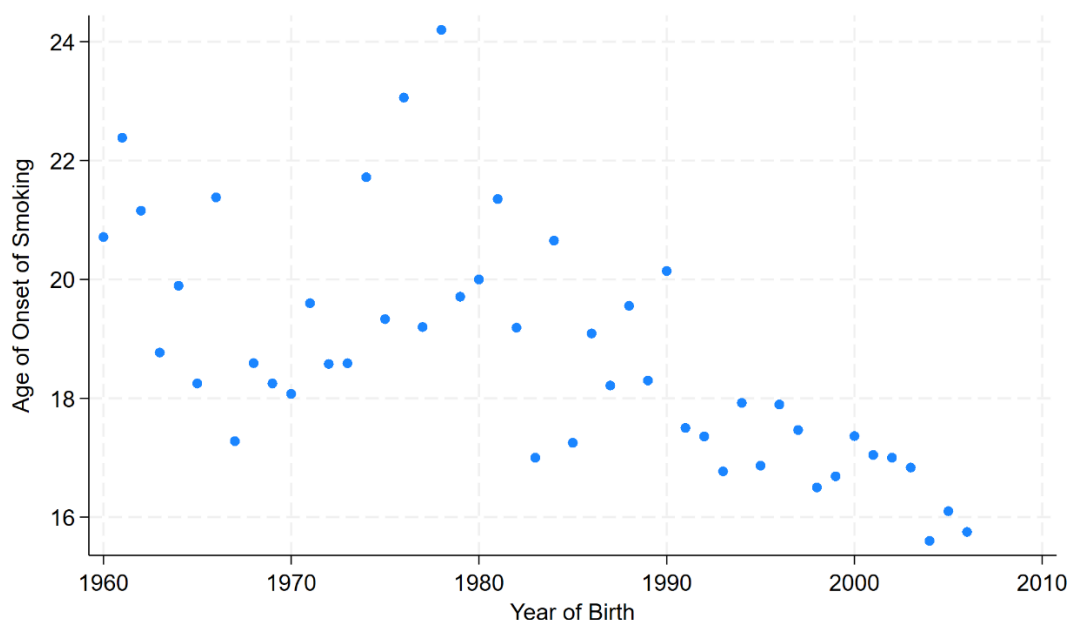
Figure 2. Distribution of age of onset by gender



Moreover, the age of onset is on a downward trend, with younger birth cohorts initiating smoking at an earlier age. Starting with birth cohorts born after 1990, age of onset has been consistently lower than 18, which is the legal age of smoking in Lebanon.

Cigarettes are the main tobacco product consumed by the older age groups, with more than half of smokers aged 46 years or older smoking cigarettes. This rate goes up to 89 percent among smokers aged 65 years or older. Waterpipe is consumed by around half the smokers aged 45 years or younger, while the proportion of waterpipe smokers is significantly lower among the older age group—less than 20 percent among those who are older than 56 and 11 percent among those who are 65 years or older. The differences in mean cigarette and waterpipe consumption between the youngest three age groups are statistically insignificant at the five-percent level of significance; however, the difference between the three youngest and three oldest groups are statistically significant at the five-percent level. Consumption of alternative tobacco products such as vapes or e-cigarettes is still rare, but it is gaining some consumption share among the younger age groups. Around 10 percent of smokers who are between the ages of 18 and 55 consume alternative tobacco products, while very few older smokers report using these products.

Figure 3. Progression of the average age of onset by birth cohort



Frequencies of consumption by age group show a persistent daily consumption by almost all cigarette consumers, resulting in average consumption ranging between eight and 10 packs per week. The differences are mostly statistically insignificant at the five-percent level of significance, except for the mean difference between the 65+ age group and the two age groups between 46 and 64. Waterpipe consumption frequency is also elevated, but it decreases with age: around 70 percent of all waterpipe smokers younger than 55 report daily consumption, compared to about 60 percent daily smokers among those older than 55 (the difference is only statistically significant at the 10-percent level of significance).

Table 3. Smoking prevalence by education level

	No formal education	Primary education	Secondary education	Tertiary education
Smoker	0.56	0.68	0.67	0.64
	(0.50)	(0.47)	(0.47)	(0.48)

Cigarette smoker	0.86 (0.35)	0.64 (0.48)	0.49 (0.50)	0.35 (0.48)
Waterpipe smoker	0.14 (0.35)	0.34 (0.47)	0.43 (0.50)	0.48 (0.50)
Other tobacco products	0.00 (0.00)	0.04 (0.19)	0.12 (0.32)	0.19 (0.39)
Dual smoker	0.00 (0.00)	0.02 (0.13)	0.03 (0.18)	0.03 (0.17)
Daily consumer of cigarettes	0.95 (0.23)	0.97 (0.17)	0.97 (0.17)	0.97 (0.18)
Packs per week	10.10 (5.07)	9.69 (5.03)	8.45 (4.43)	7.68 (5.26)
Daily consumer of waterpipe	0.89 (0.33)	0.75 (0.43)	0.74 (0.44)	0.67 (0.47)
Bowls per week	10.56 (5.46)	10.35 (7.06)	10.25 (6.54)	9.15 (6.28)

Note: Standard deviation in parentheses.

The prevalence of smoking does not vary immensely with educational attainment, as the lowest rate of smokers is among adults with no formal education at 56 percent, while prevalence ranges between 64 and 68 percent for those who completed any level of formal education. The mean difference in prevalence between those with no formal education and all other groups is statistically significant at the five-percent level. Nonetheless, there are clear divergent trends when it comes to the preferred smoking product and frequency of smoking.

Cigarettes are the most commonly consumed tobacco product among adults with no formal education, with 86 percent of smokers in that group smoking cigarettes and 14 percent consuming waterpipe. The proportion of cigarette consumption is inversely proportional to educational attainment, dropping to as low as 35 percent of smokers among those with the highest level of education. The proportion of smokers who smoke waterpipe increases with education, reaching 48 percent among those with the highest levels of education (all differences in cigarettes and waterpipe consumption among those with no formal education are statistically significant). Consumption of alternative types of tobacco is only found among those with higher levels of education, in particular those with university level degrees, among whom the proportion of consumption of other types of tobacco products is 19 percent of smokers.

Lower-education groups tend to have the highest quantity of tobacco consumption for both cigarettes and waterpipe. The two lowest-education groups have the highest quantity of cigarette smoking with an average of 10 packs per week. Lower-education groups also report the highest levels of waterpipe consumption, with the highest proportions of daily smokers and an average consumption higher than 10 bowls per week.

Table 4. Smoking prevalence by labor force status⁹

	Employed	Unemployed	Inactive	Out of the labor force
Smoker	0.73 (0.44)	0.66 (0.47)	0.53 (0.50)	0.59 (0.49)
Cigarette smoker	0.55 (0.50)	0.54 (0.50)	0.44 (0.50)	0.76 (0.43)
Waterpipe smoker	0.36 (0.48)	0.44 (0.50)	0.51 (0.50)	0.22 (0.41)
Other tobacco products	0.12	0.06	0.06	0.04

⁹ The sample is stratified into four employment categories: “Employed” includes everyone who works for salary, is self-employed, or works for a family business; “Unemployed” includes those who are currently not working but are searching for a job; and “Inactive” are those who are eligible to work but are not working or searching for a job. The last group “Out of the labor force”, includes all those who are retired or are still in school.

	(0.32)	(0.24)	(0.23)	(0.21)
Dual smoker	0.03 (0.16)	0.04 (0.20)	0.01 (0.10)	0.02 (0.15)
Daily consumer of cigarettes	0.99 (0.12)	0.95 (0.22)	0.93 (0.26)	0.96 (0.20)
Packs per week	9.68 (5.06)	9.05 (4.95)	8.05 (4.72)	6.72 (3.62)
Daily consumer of waterpipe	0.71 (0.46)	0.76 (0.43)	0.77 (0.42)	0.50 (0.51)
Bowls per week	10.01 (6.68)	11.15 (6.89)	9.77 (6.50)	7.55 (7.26)

Note: Standard deviation in parentheses.

Tobacco consumption trends by labor force status reinforce the trends documented above. The highest prevalence of smoking is among the employed group, with cigarettes being the main product used by 55 percent, followed by waterpipe by 36 percent. The employed also have a significant portion of consumers of other products at 12 percent. The frequency of smoking in this group is high as well, with an average of 9.68 packs of cigarettes and 10 bowls of waterpipe smoked weekly. The unemployed have roughly similar patterns to those who are employed, with slightly higher frequency of waterpipe consumption (only significant at the 10-percent level). The prevalence of smoking is 20 percentage points (95%CI: -24.2; -15.8) lower among inactive adults compared to the employed, with lower frequency of smoking both in terms of daily consumption and average weekly consumption of both cigarettes and waterpipe.

Adults outside the labor force diverge in their smoking behavior from the other three groups. The prevalence of smoking in this group is 59 percent, with the overwhelming majority (76 percent) being cigarette smokers. As this group is mostly composed of retired individuals, this correlates

with the earlier documented high prevalence of cigarette use among the oldest age groups. The smokers in the inactive group have the lowest frequency of smoking among all groups, with a weekly average consumption of 6.72 cigarette packs and 7.55 waterpipe bowls (differences with all other age groups are statistically significant at the 5-percent level.).

Table 5. Smoking prevalence by income group¹⁰

	Less than \$500	\$500–\$1,000	\$1,001–\$2,000	More than \$2,000
Smoker	0.65 (0.48)	0.76 (0.43)	0.77 (0.43)	0.54 (0.52)
Cigarette smoker	0.55 (0.50)	0.51 (0.50)	0.47 (0.50)	0.14 (0.38)
Waterpipe smoker	0.41 (0.49)	0.31 (0.47)	0.30 (0.46)	0.14 (0.38)
Other tobacco products	0.06 (0.24)	0.20 (0.40)	0.23 (0.43)	0.71 (0.49)
Dual smoker	0.02 (0.15)	0.04 (0.19)	0.00 (0.00)	0.00 (0.00)
Daily consumer of cigarettes	0.96 (0.19)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)
Packs per week	9.00 (4.89)	9.21 (5.07)	9.37 (5.87)	10.00 (0.00)
Daily consumer of waterpipe	0.73	0.70	0.69	0.00

¹⁰ In the analysis of tobacco prevalence by income group we focus on the three groups with monthly income lower than or equal to USD 2,000. The number of observations in the highest-income group (more than USD 2,000) is too small to make any meaningful inferences. The averages for the top income group are displayed in the table for completeness.

	(0.44)	(0.46)	(0.48)	(0.00)
Bowls per week	10.04	10.23	6.62	2.00
	(6.63)	(7.39)	(2.72)	(0.00)

Notes: Standard deviation in parentheses. Income categories are defined by monthly income.

The prevalence of smoking increases with income, ranging from 65 percent in the lowest-income group to 77 percent for those earning between USD 500 and USD 2,000 (difference is statistically significant at the 5 percent level of significance). In terms of preference for tobacco products, cigarettes tend to be the most consumed product across the three lowest-income groups, but the proportion of cigarette smokers decreases with income. The prevalence of alternative tobacco products is significantly larger in the higher-income group, with more than 20 percent of smokers compared to only six percent of smokers in the lowest-income group. The quantity of smoking is relatively constant across income groups, with the only exception being the average weekly bowls consumed by the USD 1,000 – USD 2,000 income group that is significantly lower than the two lower-income groups.

b. Evolution of tobacco consumption and the impact of the crisis

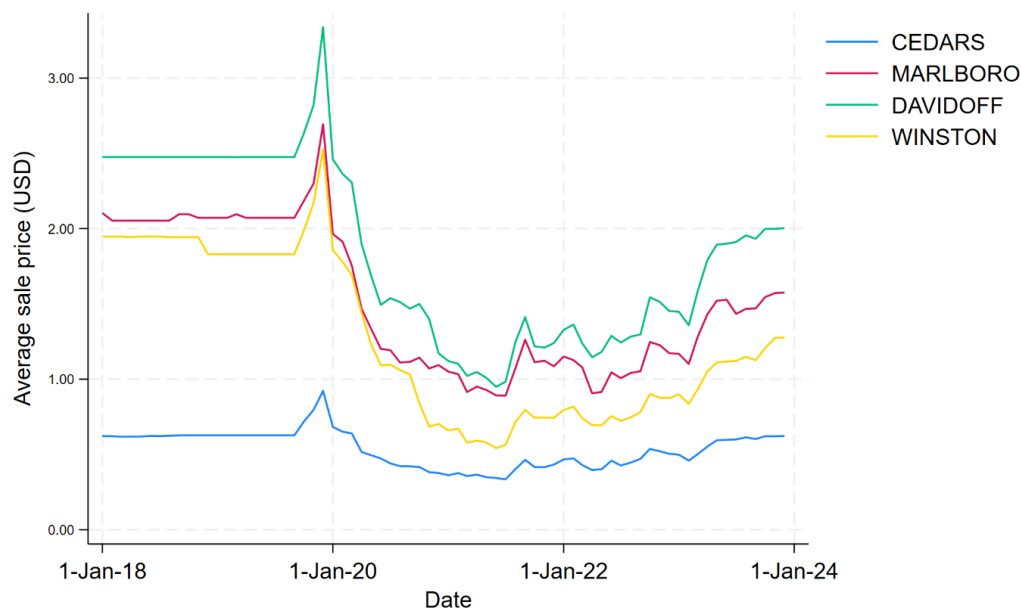
The financial crisis that started in October 2019 was marked by a rapid devaluation of the currency, a massive loss of savings, and a reduction in real income. This severely altered consumers' budget constraints, with a shift in real income and significant variations in real prices. Moreover, the slow fiscal response by the government and the much-delayed changes in tax rates significantly lowered the real value of taxes on all products.

Figure 4 shows the evolution of the price¹¹ of the top four cigarette brands sold between January 2018 and December 2023. There are three main observations. First, prior to the crisis, cigarette prices were relatively constant, and the price of the local cigarette brand (Cedars) was significantly lower than the top three foreign brands. Second, there was significant variation in the dollar value of a cigarette pack price during the crisis period, with an initial increase in price followed by a massive decline in the first half of 2020, which coincides with the beginning of the rapid devaluation of the

¹¹ The prices were obtained from the retailer data. Given that tobacco pricing is highly regulated by the Regie (national monopoly), this price is a good representation of the average price of cigarettes at the national level.

lira. Prices started trending upward in the third quarter of 2021, with the beginning of the fiscal adjustments of the government and the reevaluation of the exchange rate applied for taxes and customs. Third, the price fluctuations reduced the difference in real dollar price between the local cigarette brand and the foreign brands.

Figure 4. Average monthly price of the top four cigarette brands sold



Although the variations in dollar prices of cigarettes are clear, inferring the impact of these changes on consumers' budgets and choices is not straightforward. While the nominal dollar prices went down, the impact on affordability is not clear and is likely divergent among consumers. Adjustment of income in response to currency devaluation was slow and uneven between various sectors of employment.^{12,13,14} This meant that the real price (price relative to income) variation of cigarettes depended heavily on income adjustments of consumers, with some of them facing lower relative

¹² <http://www.cas.gov.lb/index.php/latest-news-en/201-labour-force>

¹³ For a detailed discussion of the impact of the crisis on income, wages, and living conditions, see the Lebanon Economic Monitor 2023 <https://www.worldbank.org/en/country/lebanon/publication/lebanon-economic-monitor-spring-2023-the-normalization-of-crisis-is-no-road-for-stabilization>

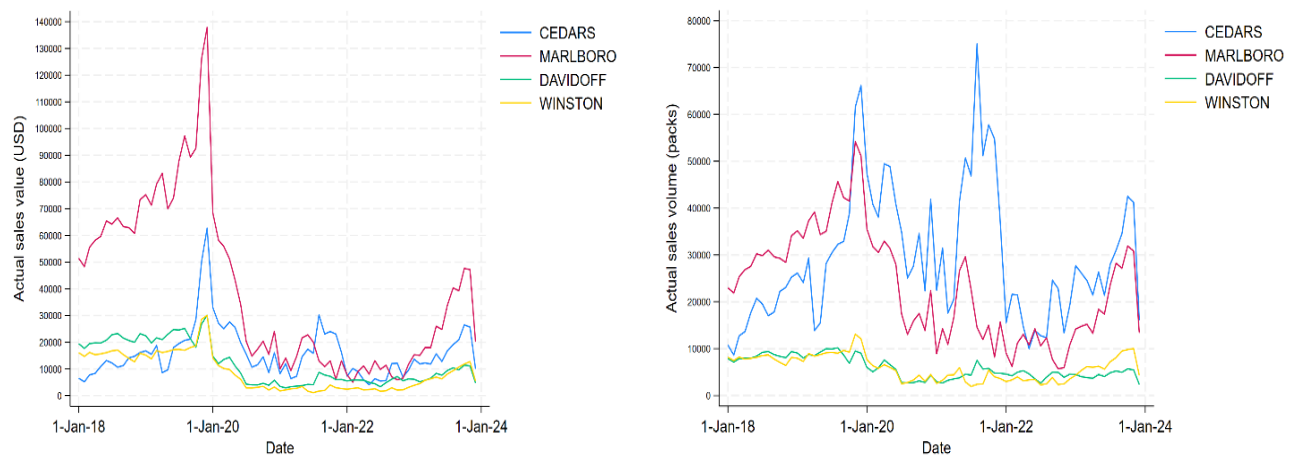
¹⁴ <https://www.thepolicyinitiative.org/article/details/448/paying-the-price-lebanon%E2%80%99s-public-sector-wage-crisis-and-institutional-collapse>

cigarette prices while for others, the real price of cigarettes increased significantly. This could have significant implications for consumer choices, which could potentially impact overall consumption and brand choice.

Conceptually, there are two potential mechanisms through which currency devaluation could have impacted cigarette demand and brand substitution. On one hand, the reduction in the relative difference in price reduced the appeal of Cedars as a cheaper local brand (substitution effect); on the other hand, a decrease (increase) in real income increases (decreases) the appeal of cheaper brands (income effect). The overall impact on tobacco affordability (income effect) is less clear and is highly dependent on individual income adjustment.

Sales of cigarettes (Figure 5) show a remarkable substitution between local and foreign brands. There is a clear switching to Cedars, which became the primary cigarette brand sold, replacing Marlboro starting in 2020. The sales figures show that Marlboro and Cedars are the top two brands consumed since before the crisis and that the variation in relative prices led to a shift towards Cedars as the cheaper, more affordable brand. Sales of other brands declined by around 50 percent at the beginning of 2020, after which the volume of sales stabilized. The overall variations in prices and volume of sales led to a significant drop in the value of the sales of all the foreign brands. This substitution towards the nominally cheaper brands, despite the real price of Cedars becoming closer to the premium brands (see Figure 4), is likely due to the overall drop in disposable income (tighter budget constraints) and consumers compensating by reducing nominal spending on cigarettes.

Figure 5. Monthly sales value and volume of the top four cigarette brands



The retail sales data provide some suggestive evidence on consumer response to price fluctuations. Nevertheless, these data have one major limitation: despite the retailer being the largest in the country, its main customer base is middle- and high-income consumers. Moreover, the shifts in income distribution that happened as a result of the crisis could have had a major impact on the customer base frequenting the stores of this large retailer, impacting overall demand. The cigarette sales figure does show an aggregate drop in certain months followed by aggregate increases, indicating major fluctuations in overall demand. These limitations of the sales data impact the generalizability of the findings. Despite these limitations, sales data provide important insights that could be further corroborated using detailed behavioral questions in the survey. To have a more comprehensive understanding of tobacco consumers' response to the crisis, the analysis below explores responses to questions on retrospective tobacco consumption questions collected in the primary survey.

In the survey, 48.8 percent of cigarette smokers and 56.6 percent of waterpipe smokers report that they currently smoke the same quantity compared to the pre-crisis period. The proportion of those who report smoking less is 25.1 percent and 29.8 percent among cigarette and waterpipe smokers, respectively. These figures show that there is a persistence of smoking across tobacco type, indicating strong habit formation, yet some level of responsiveness to price changes. There are some minor gender differences in the change in frequency of smoking. The difference is most

notable for cigarette consumption, where women were five percentage points more likely than men to report smoking more cigarettes after the crisis.

Table 6. Self-reported change in tobacco consumption frequency after the 2019 crisis

	Cigarette smokers			Waterpipe smokers		
	Overall	Men	Women	Overall	Men	Women
More	24.8	23.3	28.5	12.1	12.5	11.8
Less	25.1	25.8	23.5	29.8	31.5	28.7
The same	48.8	50.2	45.4	56.6	54.8	57.7
Not sure	1.3	0.7	2.6	1.5	1.2	1.8

Income plays an important role in determining changes in tobacco consumption frequency. Smokers earning USD 1,000 or more were the least likely to report lower consumption of cigarettes or waterpipe. It can also be noted that waterpipe smokers were more likely to report maintaining their levels of smoking across all income groups.

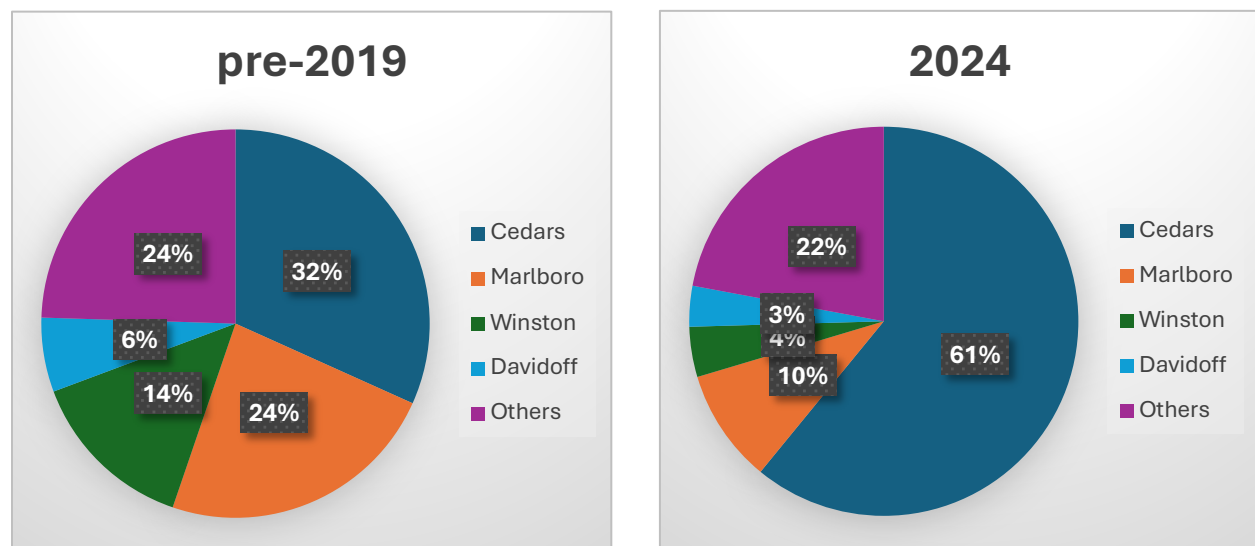
Table 7. Self-reported change in tobacco consumption frequency after the 2019 crisis, by income group

	Cigarette smokers			Waterpipe smokers		
	Less than \$500	\$500 – \$1,000	\$1,001 – \$2,000	Less than \$500	\$500 – \$1,000	\$1,001 – \$2,000
More	25.6	16.5	20.0	12.3	10.8	7.7
Less	23.7	37.2	20.0	29.5	32.4	23.1

The same	49.2	45.5	60.0	56.4	56.8	69.2
Not sure	1.5	0.8	0.0	1.8	0.0	0.0

The main consumer response to price fluctuations seems to happen through adjustments in brand choice. Survey participants reported that in the pre-crisis period, 32 percent smoked Cedars and 24 percent smoked Marlboro, followed by Winston at 14 percent, Davidoff at six percent, and 24 percent for all other brands. In 2024, the share of smokers who report smoking Cedars almost doubled, reaching 61 percent of all cigarette smokers. This increase in Cedars' share of smokers came at the expense of the other three major brands.

Figure 6. Changes in cigarette brand consumption



This brand substitution is likely driven by the increased affordability of the Cedars brand. As discussed above, while the relative price of Cedars increased compared to the other brands of cigarettes, the real price of all cigarette brands became much more expensive, pushing consumers towards the nominally cheapest brand in the market. The survey also asks participants to report the price per pack they used to pay pre-crisis and the price they currently pay. The pre-crisis average

pack price was LL 2,081, equivalent to USD 1.38 in 2019, while the current average pack price is LL 83,720, equivalent to USD 0.94 at current exchange rate.

4. Discussion

The results of this study reveal persistently high smoking prevalence in Lebanon compared to global rates of tobacco prevalence.¹⁵ Cigarettes remain the dominant tobacco product, followed by waterpipe, with notable gender- and age-specific preferences. Moreover, the frequency of smoking is noticeably elevated, especially among cigarette smokers. Prevalence analysis across various demographic groups shows that tobacco use is deeply rooted in the Lebanese population. Moreover, we document an alarming trend of early onset of tobacco consumption. This trend seems to be partially driven by the introduction of modern alternative tobacco products such as e-cigarettes and vapes, which have a higher prevalence among the youngest age groups.

The high smoking prevalence documented in this study aligns with findings from recent research on Lebanon and the Eastern Mediterranean region. Most notably, the high rates of cigarette smoking and the age and gender patterns of waterpipe smoking confirm the earlier results documented by Nakkash et al. (2022). The observed persistence of smoking behaviors across socioeconomic and demographic groups agrees with findings that smoking in Lebanon is deeply entrenched and influenced by a combination of cultural acceptance and weak enforcement of tobacco control policies (Chaaya et al., 2019; Saleh et al., 2020; Farran et al., 2024). It is possible that this weak implementation of tobacco control policies explains the early age of onset, since these tobacco control policies play a significant role in delaying age of onset, as noted by a recent cross-national study (Xing et al., 2022).

This study also provides suggestive evidence on the association between price fluctuations and tobacco demand. While it does not provide formal demand estimation, it explores how tobacco consumers responded to large variations in tobacco prices. These variations resulted from the financial crisis that started in 2019. The crisis led to large variation in real and nominal tobacco prices and to significant changes in relative price across tobacco brands. This massive change in the vector of tobacco prices presents an opportunity to analyze the impact of large-scale changes

¹⁵ See <https://www.who.int/publications/i/item/9789240077164>

in tobacco prices that could result from structural changes to tobacco tax policies. This is often not possible with observational data, since prices usually change marginally over time. The limitation of utilizing this crisis for the analysis comes from the several and concurrent changes that took place during the 2019–2024 period, limiting the possibility to identify the demand relationship.

Both sales and survey data show that the financial crisis influenced tobacco demand. The crisis had a limited effect on prevalence and frequency of tobacco consumption but influenced brand substitution. In particular, cigarette demand shifted towards the cheaper local brand Cedars. Based on these observations, it can be inferred that tobacco consumption responds to economic variables, in particular price and income, which determine the affordability of tobacco and the substitutability of tobacco brands. The evidence suggests: 1) strong substitutability between local and foreign brands; 2) the substitutability varies by income groups; and 3) the decrease in overall income played a significant role in shifting towards the cheaper brand, indicating that the income effect dominated the substitution effect. These findings concur with earlier analyses of tobacco demand in Lebanon (Salti et al., 2015; Awawda et al., 2022; Chalak et al., 2023).

5. Conclusion

This report highlights two overarching issues: 1) tobacco prevalence in Lebanon remains persistently high and on a comparable level to the pre-crisis period and 2) tobacco demand responds to price variations. This reinforces the urgency and necessity of tackling tobacco consumption in Lebanon. Given the well documented impacts of high tobacco prevalence on public health, economic productivity, and health costs, it is estimated that the social cost of tobacco consumption in Lebanon is extremely elevated.¹⁶ The responsiveness of demand to price variations shows that policies targeting prices can play an effective role in impacting tobacco consumption. The substitution towards cheaper brands highlights the importance of using tax policies to reduce relative differences in prices in order to effectively reduce tobacco consumption.

¹⁶ See the recent WHO report <https://iris.who.int/handle/10665/377032>

References

- Awawda, S., Chalak, A., Khader, Y., Mostafa, A., Abla, R., Nakkash, R., Jawad, M., Salloum, R. G., & 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>
- Chaaya, M., Nakkash, R., Saab, D., Kadi, L., & Afifi, R. (2019). Effect of tobacco control policies on intention to quit smoking cigarettes: A study from Beirut, Lebanon. *Tobacco Induced Diseases*, 17. doi: <https://doi.org/10.18332/tid/111128>
- Chalak, A., Nakkash, R., Abu-Rmeileh, N. M. E., Khader, Y., Jawad, M., Mostafa, A., .Abla, R., Louviere, J., & Salloum, R. G. (2023). 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>
- Farran, D., Abla, R. Nakkash, R., Abu-Rmeileh, N., Jawad, M., Khader, Y., Mostafa, A., Salloum, R. G., & Chalak, A. (2024). Factors associated with intentions to quit tobacco use in Lebanon: A cross-sectional survey. *Preventive Medicine Reports*, 37. <https://www.sciencedirect.com/science/article/pii/S2211335523004631>
- Nakkash, R., Khader, Y., Chalak, A., Abla, R., Abu-Rmeileh, N. M. E., Mostafa, A., Jawad, M., Lee, J., & 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>
- Saleh, R., Nakkash, R., Harb, A., & El-Jardali, F. (2020). *K2P COVID-19 Series: Prompting government action for tobacco control in Lebanon during COVID-19 pandemic*. Knowledge to Policy (K2P) Center, Beirut, Lebanon, May 19, 2020. [https://www.aub.edu.lb/k2p/Documents/Tobacco%2019052020%20\(reduced\).pdf](https://www.aub.edu.lb/k2p/Documents/Tobacco%2019052020%20(reduced).pdf)
- 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. <https://tobaccocontrol.bmj.com/content/24/1/77>
- Xing, S., Zhao, M., Magnussen, C. G., & Xi, B. (2022). Proportion and trend in the age of cigarette smoking initiation among adolescent smoking experiencers aged 13-15 years in 148 countries/territories. *Frontiers in Public Health*, 10. <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2022.1054842/full>