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Reference: Recher, Vedran (2019). Tobacco smuggling in the Western Balkan region : exploring habits, attitudes, and predictors of illegal tobacco demand = Krijumčarenje duhana na zapadnom Balkanu: navike, stavovi i determinante potražnje za ilegalnim duhanom. Zagreb, Croatia : The Institute of Economics, Zagreb.

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Vedran Recher

Tobacco smuggling in the Western Balkan region: Exploring habits, attitudes, and predictors of illegal tobacco demand

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Tobacco smuggling in the Western Balkan region:
Exploring habits, attitudes, and predictors of illegal tobacco demand

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Zagreb, February 2019

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e-ISSN 1847-7844

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Tobacco smuggling in the Western Balkan region: Exploring habits, attitudes, and predictors of illegal tobacco demand

Abstract

This paper investigates tobacco smuggling in the Western Balkans, a region notorious as the main smuggling route for Western European countries. Data from a large-scale nationally representative survey from seven Western Balkan countries are used to explore smoking habits, attitudes about the illicit market, and predictors of illicit market demand. Our results show that, while there are substantial differences between countries in the prevalence of illicit market purchases, the attitudes of people across countries are not dissimilar. The logit model is estimated in order to analyze the predictors of illicit market buying. The results show that purchasing on the illicit market can best be predicted by variables approximating people's social status. People with lower income and higher levels of addiction are more likely to buy illegal tobacco.

Keywords: smuggling, tobacco, logit, Western Balkans

JEL classification: K42, I18, F19

Krijumčarenje duhana na zapadnom Balkanu: navike, stavovi i determinante potražnje za ilegalnim duhanom

Sažetak

Rad istražuje krijumčarenje duhana na zapadnom Balkanu, glavnoj krijumčarskoj ruti prema zapadnoj Europi. Podaci iz velike nacionalno reprezentativne ankete u sedam zemalja iz regije korišteni su u analizi pušačkih navika, stavova o ilegalnom tržištu te determinanti potražnje za ilegalnim duhanom. Rezultati pokazuju da postoje značajne razlike između zemalja u učestalosti kupnje duhanskih proizvoda na ilegalnom tržištu, ali da se stavovi ljudi ne razlikuju značajno među zemljama. Procijenjeni logit model pokazuje da se potražnja za ilegalnim duhanom može najbolje objasniti varijablama koje aproksimiraju društveni status. Ljudi s manjim dohotkom i višim razinama ovisnosti o duhanu vjerojatnije će kupovati duhan ilegalno.

Ključne riječi: krijumčarenje, duhan, logit, zapadni Balkan

JEL klasifikacija: K42, I18, F19

1 Introduction¹

Tobacco smuggling and illegal tobacco trade result in huge losses of revenues to governments around the world (Joossens and Raw, 2008; West et al., 2008). Apart from the lost revenues, the illegal tobacco market has various negative social consequences; it diverts billions of dollars from legitimate businesses and governments to criminals, and it increases crime associated with the illegal cigarette market and with organized crime engaging in murder, kidnappings, and armed robberies to earn and protect the illegal profits (Joossens et al., 2000; Fleenor, 2003; Griffiths, 2004). Moreover, it is associated with terrorist financing (Coker, 2003; Shelley and Melzer, 2008).

Historically, the Western Balkan region was the clash zone of two different civilizations, Western European and Ottoman. Fotić (2011) writes that tobacco first arrived in the Balkans in the late 16th century, and was grown after 1622 in spite of several issued bans. The Balkan route has long been infamous as a passage used for smuggling illegal goods and immigrants into Western Europe. It has been known mainly for drug trafficking, most notably trafficking of heroin produced in Afghanistan to Western Europe. The original route passes from Afghanistan through Pakistan or Iran, Turkey, Bulgaria, FYR Macedonia or Serbia, Bosnia and Herzegovina, Croatia, Slovenia, and into Italy and Western Europe.

Smuggling of tobacco along the Balkan route also has a long history, and has intensified after 1960. As Pinotti (2015) notes, after the free port of Tangier was closed in 1960, smuggling was largely removed from the “Tyrrhenian route” and moved to the “Adriatic route” from Albania and Yugoslavia to Turkey and Cyprus. Somewhat later, during the 1970s, tobacco smuggling became the most profitable criminal business (Pinotti, 2015). The disintegration of Yugoslavia in the 1990s, which was followed by fierce armed conflict in the region, facilitated the smuggling routes and contributed to the legitimization of smuggling activities (Hajdinjak, 2002), as some of these routes were used during the war for smuggling weapons to armies fighting for independence, most prominently in Croatia.

As Hozic (2004) writes, modern-day smuggling re-constitutes the Balkans as a dual periphery, one which serves as a giant semi-regulated territory from which illicit goods

¹ “This paper is part of the research project “Illegal Trade of Tobacco Products: Smuggling as Experienced along the Balkan Route – BalkanSmugg”, funded by PMI IMPACT – a global grant initiative by Philip Morris International (“PMI”) to support projects dedicated to fighting illegal trade and related crimes. In the performance of its research, the authors maintained full independence from PMI. The views and opinions expressed in this document are those of the authors and do not necessarily reflect the views of PMI.”

are brought into Western Europe. Existing research on tobacco smuggling is generally based on a macro approach, affirming the historical conditions, and the role of interest groups and organized crime groups in explaining the illegal tobacco trade. This paper contributes to the literature in a different way, by using the bottom-up approach.

We use data from a large nationally representative survey conducted in seven Western Balkan countries on 21,000 respondents to examine people's attitudes and opinions on smoking and on the illicit tobacco market. Furthermore, we explore the determinants of buying tobacco products on the gray market, adopting the bottom-up approach unlike previous research that focused mainly on the supply side and took a top-down approach. This alternative approach could enable policy makers to construct a wider policy framework, taking into account the demand for smuggled cigarettes.

The paper is structured as follows. The next section provides a brief overview and background of tobacco smuggling. The third section describes the data and empirical strategy used in the paper. The fourth section presents the results. The first part offers descriptives on the smoking prevalence and the scope of the illegal tobacco market in the analyzed region, followed by insight into people's attitudes and perspectives. Next, the results from the logit and probit estimations are presented. In the last section, before the conclusion, the results are discussed in the context of previous research and policy applications.

2 Tobacco smuggling - background

Smuggling is defined as the evasion of excise taxes on goods by circumvention of border controls, and can be divided into bootlegging and wholesale smuggling (Merriman, 2013). Generally, bootlegging refers to buying cigarettes in one country and using or reselling them in another (where usually the taxes are higher), while wholesale smuggling refers to the situation where taxes are avoided even in the country of origin. Price differentials among countries create incentives for bootlegging, while high tobacco taxes create an incentive for wholesale smuggling, even when tax systems are harmonized (Merriman, 2013).

Seminal work in the theory of smuggling was done by Bhagwati and Hansen (1973) and Bhagwati and Srinivasan (1973). However, research focusing on tobacco smuggling was limited until the late 20th century. Namely, the problem with the generalization of analysis done by Bhagwati and Hansen (1973) was that one of their main analytical simplifications was that markets clear at the same final price, i.e., consumers do not

discriminate between legal and smuggled goods. As shown by Wiltshire et al. (2001) and Taylor et al. (2005), among others, it is the material hardship more often than not, that pushes smokers into buying illegal, which also means cheaper, tobacco products. Klaus von Lampe and Johnson (2015) explore the relationship between poverty and crime in the South Bronx with special attention on the illegal cigarette market. They use the personal experiences of consumers of illegal cigarettes in their research. From their literature overview, it is clear that the consumption of illegally traded cigarettes is regarded as normal and legitimate in disadvantaged communities and neighborhoods. When comparing the South Bronx with the New York City, they find the expected positive link between poverty and illegal cigarettes.

Combating tobacco smuggling is relevant from at least three different standpoints, which are all represented in the literature. First, smuggling can be relevant for increasing tax revenues (World Bank, 1999). The issue of whether increased taxation of tobacco products increases the scope of illegal trade and smuggling is still hotly debated in the literature. For example, Schwartz and Zhang (2016) argue that the assumption that the increase in taxes charged on tobacco products always leads to increasing use of illegal tobacco is misleading. In their view, lowering taxes on tobacco would not solve the problems with illegal tobacco. Somewhat contrary to this argumentation is the study by Prieger and Kulick (2018) in the European Union, which finds that for a one euro tax increase per pack, the increase in illegal cigarette sales of 25 to 120 percent of the average consumption is expected. Second, smuggled tobacco could have a substantial impact on health policies (West, 2008). Third, as already mentioned, tobacco smuggling is often related to other illegal and criminal activities (Beare, 2002), such as drug trafficking and terrorism financing.

Joossens and Raw (2012) describe the dramatic change of landscape of tobacco smuggling. While decades ago illegal trade implied large-scale smuggling of well-known brands, the landscape has changed. Other types of illegal trade emerged, such as illegal manufacturing; as a result major tobacco companies revising their export practices due to tax regulations and investigations by the authorities (Joossens and Raw, 2012).

The Western Balkan region makes a perfect case-study for analysis of tobacco smuggling. Its specific geopolitical position was a fertile ground for the development of the so-called Western Balkan smuggling route. It is not surprising then that the literature almost unanimously mentions cigarette and tobacco smuggling when discussing the issues of development, relationship with Western Europe, or connections to organized crime (some prominent examples include Hozic, 2004; Hajdinjak, 2002; Sorensen, 2003;

Becker, 2008; Blades, 2011 among others). This paper contributes to the literature on the illicit tobacco market in two important aspects. First, it looks at tobacco smuggling from the customer/consumer point of view. Second, it maps the landscape of people’s attitudes and opinions on this debated topic in the Western Balkan region and offers comparison across the countries of the region.

3 Data and empirical strategy

The data were collected by computer assisted telephone interviewing (CATI) in February, March, and April of 2018 in seven countries on a nationally representative sample. There were 3,000 respondents in each country or 21,000 respondents in total for Croatia, Slovenia, Serbia, Montenegro, Bosnia and Herzegovina, FYR Macedonia, and Kosovo. Data collection quality control was done by re-contacting the respondents and cross-checking answers to selected questions with answers from the initial interview. A minimum of 25 percent per interviewer was controlled.

The first part of the analysis is focused on descriptive statistics of people’s attitudes towards tobacco smuggling and differences among participants based on their smoking status and age. This part’s main goal is to map the landscape of predominant values concerning tobacco smuggling in the notorious region of the Western Balkans. As a foundation for further analysis, the aim is to explore whether people in the region are generally in favour of the illegal tobacco market because this could at least partially explain the wide-spread appearance of illegal tobacco resellers.

In the next part of the analysis, in order to see which characteristics of the respondents could best predict whether they buy tobacco/cigarettes on the illicit market, we run the logistic (binomial) regression. Our binary logistic model has a dependent variable with two possible values, and is constructed from the question *Do you usually buy tobacco products at authorized stores or on the gray market? Please consider all purchases of all tobacco products that you use.* We code the response as 1 if the respondent selected that he/she buys these products on the gray market, and 0 if he/she buys them at authorized stores. Therefore, we want to predict the probability of buying on the gray market. Formally, the model can be written as:

$$P(Y_i = 1|X) = \psi(X'\beta), \quad (1)$$

where Y_i is an outcome equal to 1 if the person i buys tobacco products on the illicit market and 0 if he/she buys them in authorized stores. A set of individual charac-

teristics is represented by X , and ψ is a cumulative distribution function of the logistic distribution (for the logit specification) and cumulative distribution function of the standard normal distribution (for probit specification). Our main parameter of interest in the estimation is β .

Vector of covariates X includes gender, age, unemployment status, smoking intensity, education, country, settlement size, household income, and whether the person received their salary, or part of it, *under the table*. Gender is a dummy variable taking value 1 for women, and 0 for men. Age is specified as a continuous variable, taking any value from 18 onwards, because the survey participants could not be underage. Unemployment status is a dummy variable, taking value 1 for unemployed persons, and 0 for everybody else. Smoking intensity is an aggregation of five possible tobacco products used by smokers: industrially manufactured cigarettes, fine-cut tobacco for rolling or stuffing cigarettes, cigars, cigarillos, and pipe tobacco. Most people use just one type of product, so we aggregated all the categories instead of using a different variable for each category. Education is specified with three dummy variables: elementary school or less, high school, and college, university or higher, with elementary school or less being the reference category. Country is also specified with seven dummy variables for each country in the sample, with Slovenia being the reference. Slovenia is chosen as the reference because, as depicted in Figure 1, it has the lowest share of smokers buying illicit tobacco products. Settlement size is divided into four categories in the survey: up to 2,000 inhabitants, 2,001 to 10,000 inhabitants, 10,001 to 100,000 inhabitants, and over 100,000 inhabitants. They are also coded as dummy variables, with the smallest settlement being the reference. Household income is specified as a dummy variable, with four possible responses: refuse to answer, below average, average, and above average. Along with the statements, the participants were presented with respective values in their local currency. Here, refusal to answer is taken as the reference category. Receiving (part of) one's salary cash-in-hand is specified as a dummy variable, taking value 1 for answering yes to the question *Sometimes employers prefer to pay all or part of the regular salary or the remuneration for extra work or overtime hours cash-in-hand and without declaring it to tax or social security authorities. Did your employer pay you all or part of your income in the last 12 months in this way?*, and 0 for answering no, or refusing to answer.

Gender and age should be included when discussing the demand for illicit market cigarettes, as smoking prevalence also differs by these demographic characteristics. For example, of the total smokers in the sample, over 55 percent are men. Similarly, almost 60 percent of smokers are older than 40. According to Taylor et al. (2005), employ-

ment status and degree of addiction both play a role in deciding to buy illegal tobacco. Education is included because it should be correlated with the information set on the negative social and economic effects of tobacco smuggling. Country is included for obvious reasons shown in Figure 1. Settlement size could also play a role in whether a person buys on the illicit market, because smaller settlements have fewer inhabitants and consequently fewer opportunities to obtain tobacco illegally. It could also play a reverse role, because it is easier to supply the illegal tobacco to smaller settlements considering that there is less control and sanctions, and many people, if not all, know each other. Household income is also expected to predict the demand for illicit market tobacco, as smokers with lower income will have greater incentive to buy illegally. Relatedly, if a person receives (part of) their salary as undisclosed income, it is more likely that they will buy illegal tobacco. There are two possible channels. The first one is related to the person's inherent values and beliefs. If a person does not disclose part of their income, that person is probably more likely to engage in other shady behavior. The second one is related to the income itself—if a person has a larger income than the one disclosed, that person will have more purchasing power, and therefore less incentive to engage in the illicit tobacco market. Table 1 shows the distribution of smokers per each variable used in the model.

Table 1: Descriptive statistics for smokers

Variable	N	Relative frequency
Gender	7,534	1
Men	4,224	0.56
Women	3,310	0.44
Education	7,534	1
Elementary school or less	495	0.06
High school	4,786	0.64
College, university or higher	2,253	0.30
Country	7,534	1
Croatia	979	0.13
Slovenia	762	0.10
Bosnia and Herzegovina	1,279	0.17
Serbia	1,104	0.15
Montenegro	1,132	0.15
FYR Macedonia	1,165	0.15
Kosovo	1,113	0.15
Settlement size	7,534	1
Up to 2,000	2,875	0.38
2,001–10,000	1,089	0.15
10,001–100,000	1,967	0.26
More than 100,000	1,603	0.21
Household income	7,534	1
Below average	2,431	0.32
Average	2,535	0.34
Above average	1,344	0.18
Refuse to answer	1,224	0.16
Part of income undisclosed	7,534	1
No	6,944	0.92
Yes	590	0.08

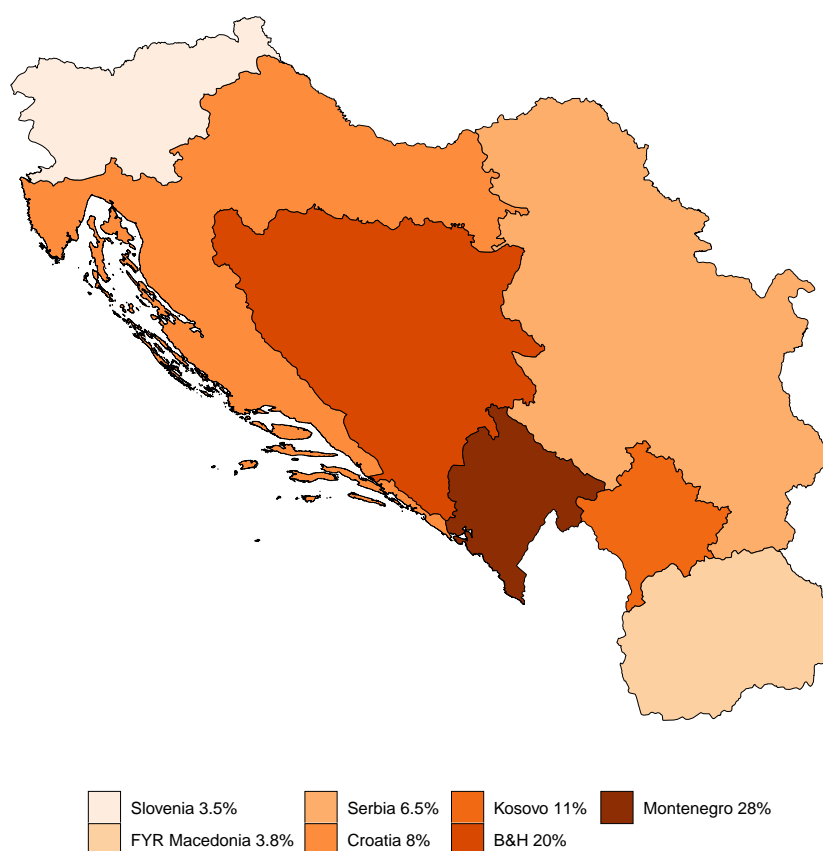
Note: All data are from a large cross-national survey conducted in seven Western Balkan countries.

4 Results

4.1 Attitudes and perspectives

Figure 1 shows the share of smokers buying tobacco products on the illicit market by country in the analyzed region. Bosnia and Herzegovina and Montenegro have by far the largest share of buyers on the gray market, with around a quarter of smokers preferring to buy illegally.

Figure 1: Share of smokers buying on the illicit tobacco market, by country



Source: Author's work based on survey data.

The results show that the differences between countries in buying tobacco on the illicit market are far greater than the differences in smoking prevalence.

It is well known that the Western Balkan region is economically struggling (Bartlett, 2007, 2009). Bartlett (2009) even labels it the „European super-periphery”. In this

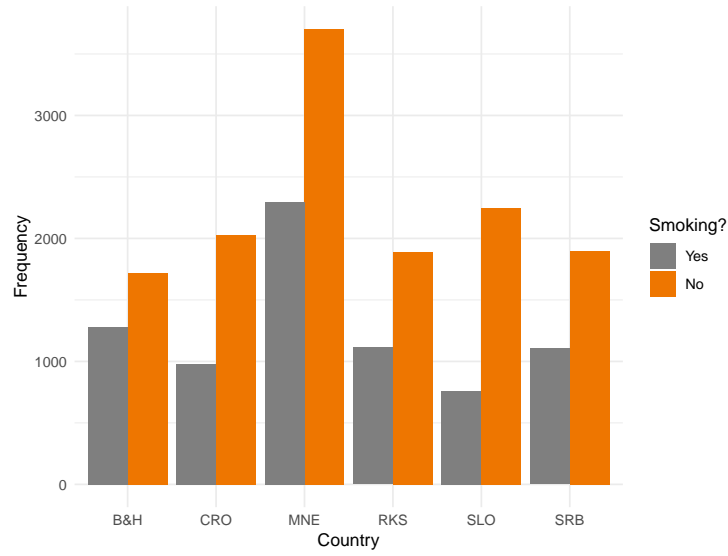
economic context and based on findings by Klaus von Lampe and Johnson (2015), one would expect lenient attitudes towards the illegal tobacco market in the Western Balkan region. Indeed, average GDP per capita for the seven countries in the sample amounted to just above 9,900 constant 2010 US dollars, with the European Union average about 3.5 times that amount. The average unemployment rate (percent of labor force, ILO estimate) in 2017 was 16 percent, while the EU average was 7.6 percent.

Taylor et al. (2005) demonstrate that the consumers of illegal tobacco in England are socially deprived people with high levels of addiction, albeit often not unemployed. Their usage of illicit tobacco is explained through their need to save money as well as sustain their heavy smoking habit. The question is whether these conclusions could be generalized to larger geographic areas.

Judging by Figure 1, it would seem that this is indeed the case. The share of smokers buying on the illicit market roughly corresponds to the level of economic development of a country, with the exception of FYR Macedonia, which has an unusually low share of smokers buying on the illicit market². Looking at the prevalence of smoking by country, there are also non-negligible differences (Figure 2). Bosnia and Herzegovina has the largest smoking prevalence, with 43 percent of respondents being smokers. Slovenia is on the other side of the spectrum with just 25 percent of smokers. Montenegro, which has the largest share of gray market buyers, is second with 38 percent of smokers. Pearson's coefficient of correlation between smoking prevalence and illicit market prevalence is 0.58. Considering the structure of smokers, the vast majority of smokers in all countries use industrially manufactured cigarettes, with fine-cut tobacco in second place, and almost negligible numbers for other tobacco products and e-cigarettes, which are most popular in Slovenia and Croatia (Figure 3).

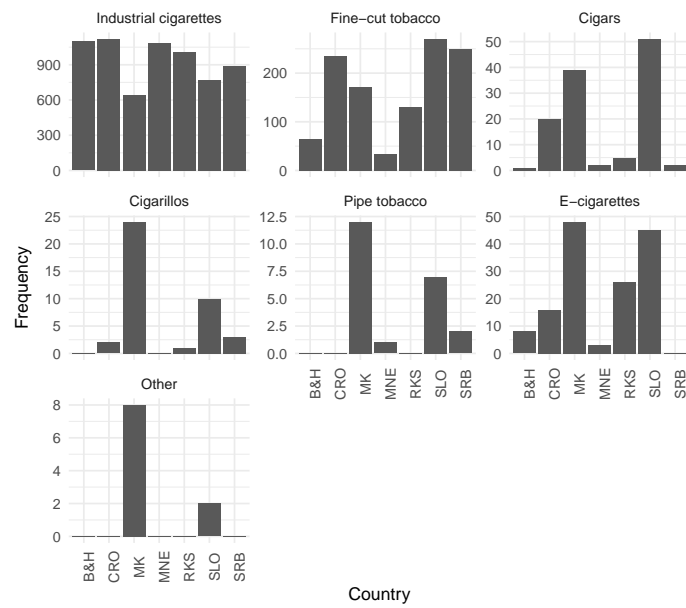
²The Pearson correlation between the number of people buying on the illicit market and GDP per capita is -0.41 .

Figure 2: Prevalence of smoking, by country



Source: Survey data.

Figure 3: Type of smokers, by country



Source: Survey data.

After looking at these “hard” figures, it is interesting to analyze whether they correspond to people’s attitudes and values. One would expect that where a lot of

people smoke illegal tobacco, the attitudes towards it would be fairly lenient, and vice versa. However, as we show below, it seems that in all countries people are more or less firmly opposed to tobacco smuggling and consumption of illegal tobacco.

Table 2 shows some basic descriptive statistics on the attitudes of the survey participants towards the illegal tobacco market. The answers range either from *1 - completely disagree* to *5 - completely agree*, or from *1 - completely unacceptable* to *5 - completely acceptable*, depending on the formulation. The table shows that negative attitudes on the illegal tobacco market are not exactly ubiquitous.

Table 2: Attitudes of survey participants towards the illegal tobacco market

Statistic	N	Code	Mean	St. Dev.	Min	Max
Age	21,013	-	47.259	16.640	18	96
Smokers profit from buying gray market tobacco products	21,013	att_1	3.308	1.146	1	5
There is nothing wrong with purchasing gray market tobacco products	21,013	att_2	2.512	1.159	1	5
Gray market of tobacco products causes considerable damage to society	21,013	att_3	3.656	1.011	1	5
Gray market of tobacco products causes an increase in other forms of crime	21,013	att_4	3.471	1.050	1	5
All smokers can't afford legal tobacco products	21,013	att_5	3.536	1.102	1	5
Smokers sometimes buy gray market tobacco products	21,013	att_6	3.536	1.102	1	5
Gray market of tobacco products causes substantial damage to the state budget	21,013	att_7	3.753	0.991	1	5
Purchase of gray market tobacco products causes the loss of jobs	21,013	att_8	3.149	1.124	1	5
Suppressing the gray market of cigarettes would reduce the number of smokers	21,013	att_9	2.974	1.223	1	5
Selling cigarettes on the gray market is not being sanctioned enough	21,013	att_10	3.637	0.986	1	5
Cigarette and tobacco smuggling is part of organized crime	21,013	att_11	3.811	0.969	1	5
The gray market of tobacco products is one of the major problems in my country	21,013	att_12	3.134	1.138	1	5
Purchase of tobacco directly from farmers	21,013	acc_1	2.675	1.277	1	5
Purchase of gray market tobacco	21,013	acc_2	2.145	1.072	1	5
Purchase of cigarettes without tax stamps	21,013	acc_3	1.973	0.996	1	5
Purchase of counterfeit brands of cigarettes	21,013	acc_4	1.795	0.873	1	5
Purchase of stolen cigarettes	21,013	acc_5	1.725	0.858	1	5
Purchase of cigarettes of unknown brands without tax stamps	21,013	acc_6	1.869	0.935	1	5
Tax evasion and evasion of excise duties on tobacco products	21,013	acc_7	1.877	0.975	1	5

Note: All data are from a large cross-national survey conducted in seven Western Balkan countries.

Around 25 percent of respondents do not think that smokers profit from buying on the illegal market³ while at the same time, around 50 percent think the opposite (average 3.3). Over 20 percent of respondents think that there is nothing wrong with purchasing gray market tobacco products (average 2.5)⁴. Still, over half the respondents think that the gray market of tobacco products causes considerable damage to society (average 3.7). A slightly fewer number of participants think that the gray market causes an increase in other forms of crime (average 3.5). The majority of respondents (around 58 percent)

³Those answering *1 - completely disagree* and *2 - disagree*.

⁴Those answering *4 - agree* and *5 - completely agree*.

agree that not all smokers can afford to buy legal tobacco products, and largely agree that smokers sometimes buy gray market tobacco products (average 3.5 for both). A smaller portion of respondents think that the gray market of tobacco products causes the loss of jobs (average 3.2) in comparison with the portion who think that it causes substantial damage to the state budget (average 3.8). The majority of respondents think that selling cigarettes on the gray market is not being sanctioned enough (average 3.6) and that tobacco smuggling is part of organized crime (average 3.8). Interestingly, in spite of this, only 41 percent of respondents think that the gray market of tobacco products represents one of the major problems in their country.

Turning to responses on how acceptable certain actions are to respondents, purchase of tobacco directly from farmers is by far the most acceptable way of procurement (average 2.7) in comparison with all other options: purchasing gray market tobacco (average 2.2), purchasing cigarettes without tax stamps (average 2.0), purchasing counterfeit brands (average 1.8), purchasing stolen cigarettes (average 1.7), or purchasing cigarettes of unknown brands without tax stamps (average 1.9). Tax evasion and evasion of excise duties on tobacco products is unacceptable for around 81 percent of respondents (average 1.9).

While the data in Table 2 offer a useful insight into the attitudes of the general population on the issues of the illegal tobacco market, they do not reveal differences between countries, smokers and non-smokers, or age groups. In order to observe these differences, we construct a heatmap of responses by country and age group. Figure 4 depicts more detailed information on twelve questions from Table 2. Each cube represents a mean of response, the question is on the y-axis, while the country is on the x-axis. All answers are then divided by panels, showing means by age group and by smoking status. The darker the cube, the closer the mean is to the statement of 5 - *completely agree*. Several stylized facts could be drawn from the figure. First, as expected, smokers appear to be more lenient towards the gray market of tobacco products. The pattern clearly shows that smokers tend to agree more with statements in favor of the gray market of tobacco products (for example, att_2) and vice versa. Second, older people tend to have stronger opinions in each direction. Compare, for example, the differences in the first panel (non-smokers, 18-24) with the differences in the sixth panel (non-smokers, 65+). The first panel is almost uniformly pale, while there are some stark contrasts in the panel of older people. Third, the differences between countries in attitudes are smaller than expected after looking at Figure 1.

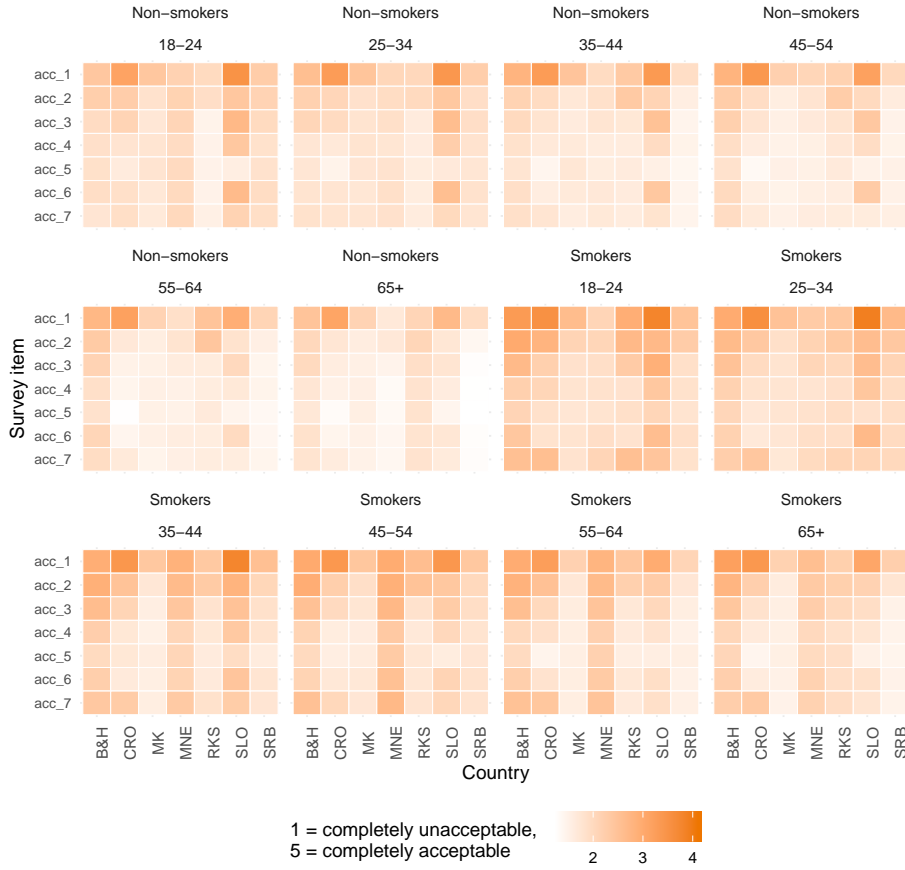
Figure 4: Heatmap of attitudes towards the illegal tobacco market, by country and age group



Source: Author's work based on survey data.

Next, we look at the same heatmap for seven other questions from Table 2, concerning the acceptability of various actions (Figure 5). It is immediately obvious that again smokers find actions related to the gray market of tobacco products more acceptable on average than non-smokers. However, here, young smokers have stronger attitudes than older ones. Comparing the smokers aged 18-24 and those in the older age groups (especially those older than 45), we can see that younger smokers exhibit darker cubes for all items and in all countries. The reason behind this could be a lack of awareness as well as immaturity of younger people in comparison with older people. Furthermore, in Croatia and Slovenia, which have a relatively low share of people buying on the gray market, people find that buying tobacco directly from farmers is more acceptable than in other countries. This is true across all age groups and for smokers and non-smokers alike.

Figure 5: Heatmap of acceptability of various actions related to gray market tobacco products, by country and age group



Source: Author's work based on survey data.

Figures 4 and 5 give a bird's eye view of opinions and attitudes regarding the illicit tobacco market in Western Balkan countries. The differences in mean between smokers and non-smokers are all statistically significant at a 5 percent level, although they are not always substantial by size. When analyzing the demand side of the gray market for tobacco products, non-smokers are plausibly irrelevant. Of course, one could argue that all non-smokers are *potential* smokers who could, given their life circumstances, purchasing power, etc., become smokers and thus should be taken into account when looking at the demand side of the illicit tobacco market. This is true to some extent, but if we are interested in the current dynamics and behavior of people actually buying tobacco, then it makes sense to exclude the non-smokers from the analysis.

In the next section, we explore the determinants of buying on the gray market, by

using only the smokers from the sample. We use logistic regression to determine which characteristics predict the outcome (buying on the gray market) the best.

4.2 Predictors of illicit tobacco demand

Table 3 shows the results from logit and probit model estimation. Gender, age, country, income, and receiving undisclosed salary are all significant predictors of illicit market demand. Both specifications yield the same significant predictors, and we will focus on the interpretation from logit specification, as it is more intuitive. For women, the log odds of buying on the illicit market are on average by 0.19 lower than for men, holding other predictors constant. In other words, for women the odds of buying tobacco on the illicit market are about 17 percent lower.⁵ Age is positively associated with buying on the illegal market. For every year increase in age, the odds of buying on the gray tobacco market are about 2.2 percent higher.

⁵Odds ratio is calculated by exponentiating β coefficients from Table 3.

Table 3: Results from logit and probit model estimation

	<i>Dependent variable:</i>	
	Buying on the illicit market	
	<i>logit</i>	<i>probit</i>
	(1)	(2)
Gender	−0.187** (0.083)	−0.095** (0.044)
Age	0.023*** (0.003)	0.012*** (0.002)
Salary in cash	0.944*** (0.116)	0.521*** (0.066)
Unemployed	0.459*** (0.106)	0.244*** (0.057)
Smoking intensity	0.036*** (0.004)	0.020*** (0.002)
Croatia	0.751*** (0.239)	0.334*** (0.110)
Serbia	0.647*** (0.240)	0.262** (0.110)
Bosnia and Herzegovina	2.085*** (0.220)	1.022*** (0.102)
Kosovo	1.149*** (0.229)	0.551*** (0.106)
Montenegro	2.116*** (0.218)	1.067*** (0.101)
FYR Macedonia	−0.073 (0.258)	−0.060 (0.117)
Up to 10,000 inhabitants	0.113 (0.126)	0.063 (0.067)
10,001–100,000 inhabitants	−0.083 (0.097)	−0.042 (0.052)
Over 100,000 inhabitants	−0.018 (0.109)	0.003 (0.058)
High school	−0.002 (0.158)	−0.010 (0.085)
College or higher	0.061 (0.177)	0.020 (0.094)
Average income	0.445*** (0.136)	0.260*** (0.071)
Above average income	−0.156 (0.162)	−0.031 (0.083)
Below average income	0.522*** (0.136)	0.280*** (0.071)
Constant	−5.460*** (0.346)	−2.942*** (0.172)
Observations	7,476	7,476
Log likelihood	−2,362.883	−2,367.182
Akaike inf. crit.	4,765.767	4,774.365
McFadden R^2	0.15	0.15

Note: *p<0.1; **p<0.05; ***p<0.01.

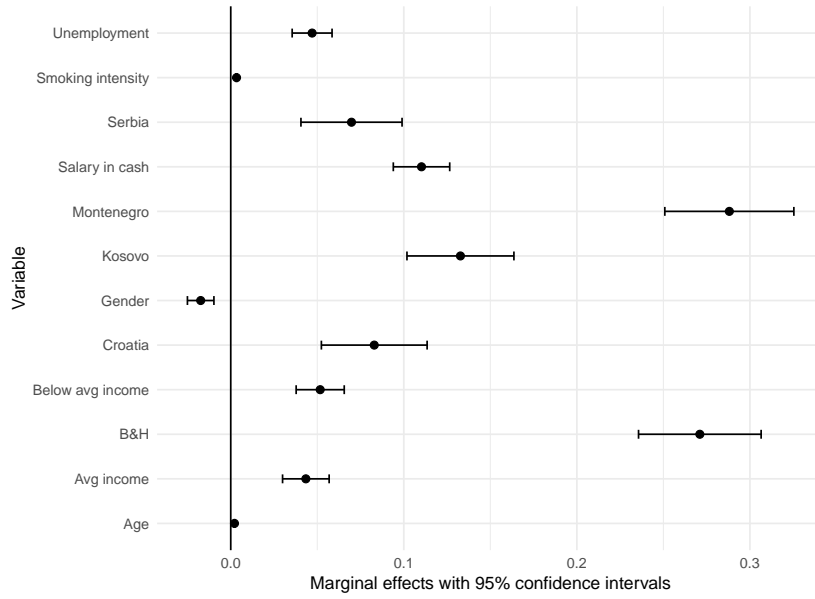
Source: Author's work based on survey data.

For people receiving undisclosed salary, the odds of buying illegal tobacco are about 156 percent higher. Comparing all countries to Slovenia as the reference, living in each of them yields higher odds of buying on the illicit market, but the coefficient for FYR Macedonia is not significantly different from zero. Living in Croatia is associated with 112 percent higher odds of buying illicit tobacco, in Serbia with 91 percent higher odds, and in Bosnia and Herzegovina and Montenegro a striking 704 percent and 729 percent higher odds, respectively, of buying illicit tobacco (all compared to Slovenia).

Settlement size is not statistically significant on any level. Education has the expected negative sign, but is surprisingly also not significant. People with below-average and average income have 69 percent and 56 percent higher odds, respectively, of buying gray market tobacco in comparison with those who refused to answer. Above-average income has a negative coefficient as expected, but is not statistically significant.

As both logit and probit models are non-linear, the estimated coefficients are sensitive to how one generates the predictions, which is why the *marginal* effects are key for understanding the relationships of interest in the population (Hanmer and Ozan Kalkan, 2013). Following the suggested approach by Hanmer and Ozan Kalkan (2013), the marginal effects are calculated by holding each of the other independent variables at the observed values for each case in the sample, calculating the relevant marginal effect for each case, and then averaging over all of the cases, obtaining the average treatment effect (ATE). These marginal effects are plotted in Figure 6, together with respective 95 percent confidence intervals. Only statistically significant effects from Table 3 are depicted.

Figure 6: Marginal effects from the logit model



Source: Author's work based on survey data.

From Figure 6 it is obvious that the most substantial effects are again country effects. Living in Montenegro increases the probability of being an illicit market buyer by almost 30 percent in comparison with living in Slovenia, and the effect is similar for Bosnia and Herzegovina. For Serbia and Croatia, this increase in probability in comparison with living in Slovenia is between 5 and 10 percent, with Kosovo in-between these pairs of countries at around 13 percent.

Considering the other variables, receiving (part of) one's salary as undisclosed income is the strongest predictor of illicit market demand, as it increases the probability of buying on the gray market by 11 percent. For women, the probability of buying on the gray market is 2 percent lower than for men. For people with below-average income, the probability of buying illegally is around 5 percent higher, with those with average income just a fraction behind. Age has the lowest marginal effect of 0.2 percent, which is expected, because this increase is associated with each year of age. This means that for each 10-year difference in age, there is a 2 percent increase in the probability of buying illegal tobacco. Unemployment is associated with a 5 percent increase in the probability of buying on the illicit market. Smoking intensity is associated with a 0.3 percent increase in the probability of buying illegal tobacco for each product consumed. This means that for each increase of 10 cigarettes, the increase in probability is around 3 percent.

5 Discussion and conclusion

The Western Balkan region has long been known as a route through which goods are smuggled into Western Europe. In this paper, we explore the prevalence of using illegal tobacco products, people's attitudes related to the illegal tobacco market, and predictors of illegal tobacco demand by using a large nationally representative survey of 21,000 participants in seven Western Balkan countries.

We find substantial differences between countries in illicit tobacco demand, with the highest such demand in Montenegro, where 28 percent of smokers buy on the illegal market, and the lowest such demand in Slovenia, where 3.5 percent of smokers buy illegally. Interestingly, when comparing people's attitudes, these differences almost disappear. When looking at heterogeneity of attitudes with respect to smoking status and age, as expected, smokers are on average more lenient towards the illicit tobacco market, and young smokers generally find actions related to this market more acceptable.

One crucial question that arises is why people that seem to have similar attitudes about the illicit tobacco market behave in strikingly different ways. One possible reason can be found in the social psychology literature. Wicker (1969) writes that as early as 1934 there was evidence that people's attitudes do not necessarily correspond to their social behavior. Wicker (1969) cites various personal and social reasons potentially explaining this discrepancy. In the context of illegal tobacco consumption, several of these explanations make sense. First, it might be important to take into account other attitudes, not related to the tobacco market *per se*. People might have a negative general attitude towards the illegal tobacco market, which they state in the survey. However, they also might have some other attitudes that have a stronger influence on their behavior. For example, if they perceive the general environment in which they live as highly immoral and corruptive, which is not far from the truth in the majority of these countries, they might argue that they deserve at least to buy cheaper tobacco. In other words, if their attitudes towards political elites were different, i.e., more positive, then their attitudes and behaviors with regards to illegal tobacco might also be different. Second, somewhat related is the availability of alternative behaviors. This explanation fits well into the issue of illegal tobacco in the Western Balkan region context. People might have a negative attitude towards it, but *because* it is very easily available, they opt to use it anyway. To put it differently, this basically means that the supply determines the demand. Finally, the expected consequences of buying tobacco illegally could also play a role. People might perceive it negatively, but because they think it is not being

sanctioned enough, they might as well use it and save some money. However, all these explanations are currently purely speculative and further research is needed to elaborate the reasons for the high prevalence of illicit smokers in some countries in the region.

Analyzing the predictors of illicit market demand among smokers, we find that age, gender, employment status, smoking intensity, country, income, and receiving (a part of) income in cash are all significant predictors of buying illegal tobacco. Clearly, economic and social status play the most important role in determining whether a person will buy tobacco illegally, which is generally also in line with country illicit buying prevalence shown in Figure 1. Marginal effects show that, apart from country, receiving (part of) one's salary in cash is the most substantial predictor of illicit market demand, which is further proof that the size of the illegal tobacco market is directly related to the general share of the gray market in the economy.

Considering the potential policy implications of our results for combating the illegal tobacco market, several things can be noted. First, when implementing informative campaigns on the negative consequences of illegal tobacco, targeting younger population should be a priority. Although young people generally buy less on the illicit market, young smokers are also more lenient towards it. They generally find actions related to the illicit tobacco market more acceptable. The reason for this is probably lack of information on various negative societal consequences of these actions. Second, the stark differences in prevalence of illicit tobacco smoking between countries point to the need of stronger regional cooperation in control and suppression of supply of these products in the Western Balkan region.

Finally, corroborating the results of Taylor et al. (2005), the demand for illegal tobacco seems to stem largely from socially deprived individuals with high levels of addiction. This means that raising tax on tobacco, which is a fairly popular idea in the public discourse in Croatia lately, would do little to decrease the prevalence of smoking and thus health expenditures. It is more likely that a further increase in tobacco tax would result in more people struggling to sustain their unhealthy habit and therefore turning to a cheaper source of tobacco, i.e., the illicit market.

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