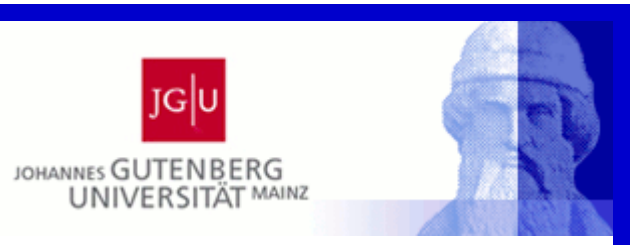

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It’s Not the Money: Why German Smokers May Turn to Illicit Markets

Maike Roth, Friedrich Schneider

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Johannes Gutenberg University Mainz
Gutenberg School of Management and Economics
Jakob-Welder-Weg 9
55128 Mainz
Germany
https://wiwi.uni-mainz.de/

Contact details

Maike Roth
Department of Law and Economics
Johannes Gutenberg University
Jakob-Welder-Weg 4
55128 Mainz
Germany
maroth@uni-mainz.de

Friedrich Schneider
Research Institute of Banking and Finance
Johannes Kepler University
4040 Linz
Austria
Friedrich.schneider@jku.at

It's Not the Money: Why German Smokers May Turn to Illicit Markets

Maike Roth* Friedrich Schneider†

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Using a survey for Germany, we evaluate access to illicit tobacco products and the propensity to engage in illicit purchasing. By separating realized opportunities from stated openness toward future illicit purchases, the analysis provides insight into the behavioral foundations of illicit tobacco markets. This is relevant for current policy. If illicit demand responds not only to prices but also to attitudes toward taxation and regulation, tax increases may have heterogeneous effects across groups. Overall, the findings suggest that effective tobacco tax policy should not rely solely on price incentives, as perceived restrictions of freedom may increase openness to illicit markets.

Keywords: Tobacco tax noncompliance, conducted survey, illicit tobacco products and markets, price incentive, regulation.

JEL-Codes: K42, M38, H26, O17

1 Introduction

Illicit trade in tobacco products represents a persistent and economically significant phenomenon across Europe (Paraje et al., 2022; Khoruk and Fares, 2026). Estimates suggest that billions of cigarettes consumed annually within the European Union originate from illicit sources, generating substantial fiscal losses for member states and undermining the intended public health effects of excise taxation (Prieger and Kulick, 2018). Large (tax-induced) price differentials between neighboring countries create incentives

*maroth@uni-mainz.de, Research Assistant, Department of Law and Economics (FB 03), Johannes-Gutenberg-University Mainz, D-55128 Mainz, Germany

†friedrich.schneider@jku.at, Retired Professor, Research Institute of Banking and Finance, Johannes Kepler University, A-4040 Linz, Austria

for cross-border shopping, smuggling, and the distribution of counterfeit products, making illicit trade a transnational rather than purely domestic issue (Lakhdar et al., 2016; Prieger and Kulick, 2018).

Beyond its fiscal implications, tobacco taxation has become a politically and socially important policy instrument. Governments increasingly rely on excise taxes not only to generate revenue but also to influence health behavior and reduce smoking prevalence. At the same time, higher taxes often raise concerns about distributive fairness, personal autonomy, and unintended consequences such as illicit trade (Schmidt, 2022; Topart et al., 2024). As a result, tobacco taxation sits at the intersection of public health policy, fiscal policy, and broader debates about the legitimacy of state intervention in individual consumption decisions.

Therefore, understanding the drivers of participation in the illicit tobacco market is of immediate policy relevance. Although states invest substantial resources in combating illicit trade, effective intervention requires an understanding of which groups are most likely to access illicit products and which are most open to purchasing them. This distinction is important because policies aimed at restricting supply may differ from those intended to reduce demand and social acceptance. Our paper tries ti fill this gap.

Most economic explanations of illicit tobacco markets focus on price incentives. From a standard economic perspective, higher tobacco taxes increase the potential gains from tax avoidance and evasion, thereby raising the attractiveness of illicit products. Individuals facing stronger price pressures, such as lower-income smokers or those exposed to cross-border price differentials, are therefore expected to participate more frequently in illicit markets (Vladisavljevic et al., 2022). In this framework, tax noncompliance appears primarily as a response to financial incentives.

However, this interpretation may be incomplete. Compliance decisions are embedded in broader normative and political contexts. Individuals differ not only in their economic constraints but also in their perceptions of tax fairness, their beliefs about the legitimacy of government intervention, and their general attitudes toward regulation (Torgler, 2007). This argument is supported by evidence specifically for Germany, showing that attitudes toward taxation cannot be explained by narrow financial self-interest alone, but also reflect fairness considerations and beliefs about economic success (Hennighausen and Heinemann, 2015).

Using survey data from California, Prieger (2023) shows that tax morale and related attitudes are strong predictors of tobacco tax noncompliance. In several model specifications, these attitudinal variables explain substantial variation in noncompliant intentions

and, in the case of counterfeit products, can even outweigh traditional socio-demographic predictors. These findings suggest that illicit tobacco demand is not only driven by price incentives and individual economic status but also - and we show: mainly - by ideological believes.

Whether these mechanisms generalize beyond the United States remains an open question. Institutional frameworks, political discourse, and market structures differ substantially across countries. Germany provides a particularly relevant case to examine these dynamics. As one of the largest tobacco markets in the European Union and a centrally located country bordering several lower-tax jurisdiction, Germany occupies an intermediate position within the European tobacco tax landscape (von Lampe, 2006; Meneghini et al., 2020). Cigarette prices remain lower than in high-tax markets such as France or the United Kingdom but higher than in neighboring lower-tax countries such as Poland or the Czech Republic (European Commission, 2026).

Further increases in tobacco tax could alter Germany's role within European illicit trade networks. Currently functioning primarily as a transit location, Germany could increasingly develop characteristics of a destination market if domestic demand for cheaper illicit alternatives grows (Meneghini et al., 2020).

Germany is a particularly valuable case because it allows us to study illicit market attitudes in a setting where ideological orientations are plausibly shaped by distinct historical experiences, yet observed today under one common legal framework. Alesina and Fuchs-Schündeln (2007) show that Germany's post-war division generated persistent differences in beliefs about the role of the state, suggesting that political-economic socialization can leave long-lasting attitudinal legacies.

Against this background, our new contribution is to measure these ideological orientations directly and examine whether they are associated with attitudes toward tobacco taxation and openness to illicit tobacco products. The analysis builds on the conceptual approach proposed by Prieger (2023) and tests whether similar behavioral mechanisms can be observed in a European institutional context. Hence we try to measure for the first time whether ideological components are equally important as price increases for the change of the demand tobacco products. Additionally how strong is the substitution effect to illegal products.

Previous studies on illicit tobacco markets largely focus on realized noncompliance or past purchasing behavior (Stehr, 2005; Barker et al., 2016).

The conducted survey enables us to examine respondents' access to illicit tobacco products as well as their propensity toward illicit tobacco consumption. By separating

realized opportunities from stated openness toward future illicit purchases, the analysis provides new insights into the behavioral foundations of illicit tobacco markets for the first time.

Understanding these mechanisms is particularly relevant in the current policy context. If illicit demand responds not only to prices but also to attitudes toward taxation and regulation, further tax increases may have heterogeneous effects across population groups. Misidentifying the underlying drivers of illicit demand could therefore lead to unintended policy outcomes.

To examine these mechanisms empirically, section 2 outlines the institutional background of tobacco taxation in Germany and develops the theoretical framework. Section 3 describes the data and the empirical strategy. Section 3.2 presents the results, followed by a discussion of their implications. The final section 5 concludes.

2 Theory and Hypotheses

According to Meneghini et al. (2020), Germany functions in part as a transit location within European illicit tobacco networks for cigarettes. At the same time, it represents a major consumer market within the European Union. Compared to several neighboring countries in central and eastern Europe, tobacco excise levels in Germany are substantially higher, creating price differentials that incentivize cross-border purchases and smuggling activities. Conversely, compared to high-tax countries such as France or the United Kingdom, Germany's price level is more moderate, positioning it between lower-tax source countries and higher-tax destination markets (European Commission, 2026).

Germany's intermediate position increases its exposure to cross-border arbitrage and shifting trafficking routes. According to recent research, Russia's invasion of Ukraine has disrupted established smuggling corridors, including land routes via Belarus and maritime routes through Ukrainian seaports. This has led to a reconfiguration of illicit supply chains within the European Union (Krylova, 2024). Meanwhile, evidence on the evolving dynamics of Europe's illicit tobacco trade shows how quickly criminal networks adapt their routes and operational structures in response to geopolitical and regulatory shocks (Khoruk and Fares, 2026). This volatility in trafficking patterns further exposes centrally located markets, such as Germany, to risk.

To analyze the various factors influencing access to and propensity toward the illegal market, we organize them into four groups: socio-demographic, smoking-related, spatial,

and ideological factors, from which the abbreviations SD, SM, SP, and IF are derived.

2.1 Socio-demographic factors

Previous criminological research from Epper et al. (2022) shows that different demographic characteristics are associated with varying propensities to engage in rule-breaking behavior. In particular, men tend to have a higher risk tolerance and are more willing to participate in illegal activities than women. Age is also a relevant factor, as younger people are generally more prone to risk-taking behavior and informal economic activities. Moreover, Mahdaviazad et al. (2022) found that lower education levels are significantly associated with higher tobacco use, highlighting the broader role of socioeconomic conditions in shaping smoking behavior.

In light of these research results, we formulate our first hypothesis as follows:

Hypothesis 1 *Male smokers (SD1), younger individuals (SD2) and those with a lower level of education (SD3) are more likely to have access to the illicit tobacco market and more likely to have a higher propensity toward illicit tobacco products.*

After taking into account socio-demographic characteristics such as gender, age and education, another important factor is individuals' economic resources.

Previous empirical research has shown that economic factors play a key role in determining tobacco tax noncompliance. Wang et al. (2019) found that the financial incentives created by the tax differentials were the most important factor in explaining the noncompliance with the cigarette tax. Individuals with tighter budgets may therefore be more likely to seek cheaper alternatives outside the legal market (Vladisavljevic et al., 2022; Curti et al., 2019).

In order to consider these findings from previous research, we formulate the following hypothesis.

Hypothesis 2 *Smokers with lower household income (SD4) are more likely to have access to the illicit tobacco market and more likely to have a higher propensity toward illicit tobacco products.*

2.2 Smoking-related factors

Vladisavljevic et al. (2022) and Curti et al. (2019) suggest that a higher intensity of smoking increases total tobacco expenditures and thus strengthens the financial incentive

to turn to illicit products. Consequently, lower income individuals and those who smoke more heavily may be particularly motivated to access the illicit tobacco market.

Hypothesis 3 *Heavy smokers (SM1) are more likely to have access to the illicit tobacco market and to have a higher propensity toward illicit tobacco products.*

In recent years, novel nicotine products such as e-cigarettes and heated tobacco products have grown in popularity, particularly among younger consumers (Feliu et al., 2020). At the same time, emerging evidence suggests that many vaping products on the European market bypass regulatory requirements, including tax obligations and product registration rules (Schlautmann, 2026). The presence of such products on the market could lead to consumers becoming more accustomed to purchasing cheaper products outside official distribution channels, potentially normalizing the practice of buying non-compliant or untaxed products.

Hypothesis 4 *Consumers of novel nicotine products (SM2) are more likely to have access to the illicit tobacco market and more likely to have a higher propensity toward illicit tobacco products.*

2.3 Spatial factors

Curti et al. (2019) shows that increases in cigarette taxes raise the likelihood that smokers living in cities near national borders switch to illicit cigarettes, highlighting the importance of geographic access to cheaper alternatives. Germany provides a particularly relevant case in this context, as border regions differ substantially in their proximity to countries with lower tobacco taxes. While eastern regions border lower-tax countries such as Poland and the Czech Republic, western regions are mainly adjacent to higher-tax countries such as Belgium and France (European Commission, 2026). These differences may systematically affect the accessibility of cheaper illicit tobacco products.

Hypothesis 5 *People living close to the eastern borders (SP1) are more likely to have access to the illicit tobacco market and more likely to have a higher propensity toward illicit tobacco products.*

While geographic proximity to lower-tax countries may increase access to illicit tobacco products, this relationship may also be influenced by historically shaped attitudes toward informal markets. In the immediate post-war period, illicit trade was widespread in

Germany as a response to severe shortages and economic disruption. Participation in black market exchanges became a common strategy for obtaining scarce goods and was often perceived as a necessary element of everyday survival rather than purely criminal behavior (Hilton, 2010; Roesler, 1989). This broader argument is consistent with Alesina and Fuchs-Schündeln (2007), who show that post-war Germany constitutes a particularly informative case for studying how political and economic systems shape individual preferences. Because East and West Germany were separated for exogenous reasons, exposed to different regimes for decades, and later observed under a common institutional framework, Germany allows researchers to identify long-lasting effects of political-economic socialization.

Black market activity was also widespread in West Germany in the immediate post-war period, but declined rapidly following the 1948 currency reform and the introduction of the social market economy, which restored the availability of consumer goods and strengthened formal market institutions (Buchheim, 1988). These diverging historical experiences may therefore have shaped long-term norms regarding the acceptance of informal or illicit trade.

Hypothesis 6 *Individuals living in eastern Germany (SP2) are more likely to have access to the illicit tobacco market and more likely to have a higher propensity toward illicit tobacco products.*

2.4 Ideological factors

However, economic and structural explanations alone may not fully account for participation in the illicit tobacco market. Although previous research has emphasized factors such as price differentials, income constraints and geographical access, empirical evidence does not consistently demonstrate that these incentives alone explain illicit purchasing behavior (Filippidis et al., 2020).

Taken together, this newer perspective suggests that earlier research may have overlooked an important part of the explanation, namely the normative and ideological foundations of tax noncompliance. Building on this perspective, Prieger (2023) shows that individual tax morale, perceptions of tax legitimacy, and broader attitudes toward government regulation can be stronger predictors of illicit purchasing behavior than economic incentives or perceived detection risk. Individuals who view tobacco taxation as illegitimate or overly restrictive may therefore be more willing to circumvent regulation by purchasing illicit products.

This study tests the theoretical drivers of illicit tobacco consumption using a new survey dataset of German smokers, in order to assess whether the mechanisms identified in previous research also apply in a different institutional context. Examining these mechanisms in a European setting allows the analysis to evaluate whether the economic and ideological factors associated with illicit tobacco markets can be replicated outside of the studied U.S. context.

Building on Prieger's broader argument that normative and ideological orientations may shape illicit market behavior, the present study examines this perspective through specific observable indicators, beginning with anti-regulatory opinions.

Hypothesis 7 *People who feel that the tobacco tax restricts their freedom (IF1) are more likely to access illicit tobacco products and have a higher propensity to engaging with illicit tobacco markets.*

In addition to general attitudes towards regulation, political orientation may also influence attitudes towards tobacco policy. Evidence from across Europe shows that how people see themselves politically is associated with both smoking behaviour and support for tobacco control measures (Filippidis et al., 2017). Left-leaning respondents tend to express stronger support for such policies, while centre-right respondents tend to express weaker support.

Further evidence from Austria indicates that right-leaning parties tend to have a higher proportion of smokers among their voters (Huber, 2020). Against this background, this analysis examines whether support for the Alternative for Germany (AfD) party is also associated with access to illicit tobacco products and a higher propensity toward illicit tobacco markets.

Hypothesis 8 *Supporters of right-wing party AfD (IF2), are more likely to access illicit tobacco products and have a higher propensity toward illicit tobacco markets.*

The formulated hypotheses are summarized in the diagram below in figure 1. The independent variables are listed on the left and the two dependent variables on the right. The precise operationalization and interpretation of these variables is discussed in the next chapter.

[Figure 1 about here.]

3 Data and methodology

The survey was conducted in December 2025. Participation was restricted to individuals who reported smoking within the past month. Active smokers were recruited through an established online access panel and completed a structured online questionnaire. The average completion time was approximately ten minutes. Participation was voluntary and anonymous, and all responses were self-reported.

The questionnaire collected detailed information on tobacco consumption patterns, including product types and usage intensity, as well as attitudes toward tobacco taxation, perceptions of illicit products, quit attempts, and political party preferences [1].

After quality checks, including the exclusion of speeders and inconsistent responses, the final analytical sample consists of 1,487 respondents.

[Table 1 about here.]

Table 5 presents descriptive statistics of the sample, including gender, age, income, and regional distribution. The discrepancies from the stated sample size of 1,487 are due to missing responses. The population benchmarks used for quota sampling were provided by the survey institute from (Gesellschaft für integrierte Kommunikationsforschung, 2023) and are based on population statistics [2].

Overall, our sample closely reflects the target population in terms of gender and the main age groups. However, a few deviations remain. Respondents aged 18–29 are overrepresented, while those aged 30–39 and 50–59 are slightly underrepresented. With respect to income, the sample contains a larger share of respondents in the lowest income category (no income–1,999€) and a smaller share in the 2,000–3,999€ category than indicated by the population benchmarks. Since the survey distinguished four income groups, while the available population benchmarks provided only three, the two highest survey categories (4,000–5,999€ and $\geq$ 6,000€) were merged into one category ($\geq$ 4,000€) for weighting purposes.

[1] The complete questionnaire is part of the supplementary material.

[2] The Society for Integrated Communication Research (GIK), which is supported by Axel Springer Verlag among others, publishes nationally representative market and media studies annually under the title "best for planning." These were compared with official data from the Microcensus from 2017 and 2021 and data from the Robert Koch Institute (RKI) as of 2019 and show a very high degree of consistency (Robert Koch Institute, 2022). In some cases, direct comparability with the figures reported by Gesellschaft für integrierte Kommunikationsforschung (2023) was limited because the Microcensus used overlapping age groups (20–25 and 25–30 years), while the Robert Koch Institute reported income distribution in quartiles, whereas our analysis relied on different income groupings.

At the regional level, the eastern federal states Saxony and Brandenburg are overrepresented, while some western states, including Baden-Württemberg, Hesse, Lower Saxony and North Rhine-Westphalia, are underrepresented.

To address these remaining deviations from the population benchmarks, post-stratification weights were constructed using official population benchmarks from Gesellschaft für integrierte Kommunikationsforschung (2023) and calibrated by age, gender, income, and regional distribution. Cases with missing information on any weighting variable were excluded, resulting in a final weighted base sample of 1,337 respondents.

The subsequent empirical analysis relies on logistic regression models because both dependent variables are binary. Coefficients are reported as odds ratios. Values above one indicate a higher likelihood of the respective outcome, whereas values below one indicate a lower likelihood, holding all other variables constant. For categorical predictors, coefficients are interpreted relative to an omitted reference category.

Missing values on variables included in a given model are handled by complete-case analysis, which leads to variation in the number of observations across specifications. The constant is included in the estimation but omitted from the regression tables. All analyses were conducted in R using the survey package. Reported results include HC3 robust standard errors, 95 % confidence intervals, and conventional significance levels. Model fit is assessed using AIC and BIC, with lower values indicating better relative fit; these statistics are only compared across models based on the same dependent variable and estimation sample.

3.1 Data description

The first dependent variable measures illegal access. It includes respondents who reported knowing where to obtain illegal tobacco products, regardless of whether they have used them personally. Our second dependent variable, the propensity toward the black market, refers to respondents who stated that illegal goods are not frowned upon in their own environment or social circle. Although about one-third of respondents are aware of how to obtain these products, openness toward illegal products appears to be significantly more widespread, at just under 70 %.

The independent variables capture sociodemographic characteristics, economic conditions, attitudes toward regulation and political orientation.

Sociodemographic variables include age, gender, education, and household income. *Age* is measured as a continuous variable based on the respondent's reported age. Gender was operationalized as a binary variable, coded 1 for male respondents *(male)*, while

female respondents constitute the reference category. Respondents who selected 'diverse' were excluded from this analysis, as there were only six of them and they therefore offered limited analytical value. Education is categorized into three groups reflecting different levels of educational attainment. Prior to weighting, educational attainment was collapsed into three categories: lower education *(lower secondary degree)*, medium education *(upper secondary degree, including Abitur and Fachabitur)*, and higher education including Bachelor's, Master's, or doctoral degrees). Respondents who reported training were assigned to the relevant educational category according to the official classification used in German educational statistics (Bundesinstitut für Berufsbildung, 2025). This distinction was necessary because respondents with training may differ in their level of formal educational attainment.

Income is measured in brackets representing monthly net household income. For the weighting procedure, the categories "no income to < 1,000€" and "below 2,000€" were merged due to the very small number of respondents in the lowest income categories. Household size was also collected in the survey. However, since income was reported only in income groups, calculating a standardized household income would not have provided any additional information and was therefore not pursued.

Respondents were asked to report their postal code, which allowed assignment to the respective German federal state. Based on this information, a dummy variable was constructed for respondents living in Brandenburg, Mecklenburg-Western Pomerania, Saxony, Saxony-Anhalt, Thuringia or Berlin *(east Germany)*. Since regional weighting information was available only at the federal-state level, Berlin could not be separated into East and West Berlin.

In addition, a variable capturing proximity to the eastern border was derived. For this purpose, people whose postal codes began with 01, 02, 03, 08, 09, 15, 16, 17, 18, 92, 93, 94, or 95 were grouped together to capture potential geographic proximity to lower-tax neighboring markets *(nearby border)*.

The survey also collected information on the tobacco products respondents consume and the quantities consumed per week, with weekly consumption amount measured as a continuous variable. Because the distribution of consumption intensity among e-cigarette and heated tobacco users showed substantially less variation than for conventional cigarettes, only the variable *(amount cigarettes)* was included in the regression model. Based on these responses, the dummy variable *(new products)* was constructed, which indicates whether respondents report the use of alternative tobacco products such as e-cigarettes or heated tobacco products.

In addition, respondents were asked whether they perceive tobacco taxation as an infringement on personal liberty *restriction of freedom)*. Responses were recorded on a Likert scale ranging from "strongly agree" to "strongly disagree". For the regression analysis, the item was coded so that higher values indicate a stronger perception of tobacco taxation as an infringement on personal freedom. This measure allows for a more direct assessment of perceived regulatory overreach and can thus be understood as a further development of Prieger's tax morale approach.

Political orientation was measured using a standard voting intention question (Sonntagsfrage), asking respondents which party they would vote for if a federal election were held the following Sunday (Forschungsgruppe Wahlen, Mannheim, 2025). To ensure comparability with the general population, we adopted the response categories from that source, namely the Union (CDU/CSU), the Left Party, Bündnis 90/The Greens, the Free Democratic Party (FDP), the Alternative for Germany (AfD), and Bündnis Sahra Wagenknecht (BSW). Based on these responses, indicator variables were constructed for the relevant political groups used in the empirical analysis. Since expressed support for the AfD may still be subject to social desirability concerns, some reporting bias cannot be excluded (Zajak et al., 2024). However, the relatively high level of support for this party observed in our sample suggests that any such bias is more likely to reduce than exaggerate the estimated effect.

The variables indicated no problematic degree of multicollinearity.

3.2 Empirical results

[Table 2 about here.]

Model 2 reports the full logistic regression specification, including all explanatory variables. Column (1) presents the results for the depended variable *illegal access*, and column (2) for *propensity illegality*. Due to the large number of regressor, potential overfitting and multicollinearity were assessed. These checks did not reveal any notable problems.

The results show that men have higher odds than women of exhibiting a greater propensity toward the illegal market, while no significant gender difference is found for illegal access. Respondents age is not significantly related to illegal access, but increasing age significantly reduces the propensity to engage in illegal activities. Education shows no significant effect on either dependent variable.

Thus, hypothesis 1 cannot be fully rejected. The expectation that men and younger

individuals are more open to illegal products is only partially supported with regard to dependend variable (2), which measures propensity toward illegal market behavior.

In contrast, there is no empirical support for hypothesis SD2 (2). Neither model shows any statistically significant effects for the various income groups. We thus provide evidence that income effects, often assumed central in the literature, do not robustly predict illicit-market orientation in this sample. This null finding may seem somewhat counterintuitive, given the expectation that lower-income smokers should have stronger incentives to seek cheaper illicit products. We therefore performed additional robustness checks among heavy smokers, for whom the financial gains from switching to illicit products should be especially pronounced. Under this logic, income differences ought to emerge most clearly in this subgroup. Yet the Kruskal–Wallis test showed no statistically significant differences in income distribution across the relevant groups ($p = 0.068$). Even when we compare these figures with external reference data from Robert Koch Institute (2022), the results point in the same direction. Overall, these findings suggest that the hypothesized role of income cannot be confirmed in the present sample and may therefore be less decisive for illegal access to or openness toward illicit tobacco products than initially assumed.

Moreover, to hypothesis SM1 (3), the weekly quantity of cigarettes consumed is not significantly associated with the outcome, which implies that, within the present sample, heavy smokers do not show higher odds than occasional smokers.

The use of *new products* is significantly associated only with the dependent variable *illegal access*, compared to established products such as cigarettes or fine-cut tobacco. For *propensity illegality*, however, no significant effect is found. In line with Schlautmann (2026), a plausible explanation is that the rapid growth of the e-cigarette market makes the boundary between legal and illegal products less transparent to consumers. The observed effect may therefore be driven less by the attitudes of new-product users than by the structure and opacity of this evolving market.

Turning to the spatial factors, table 2 shows that proximity to countries with lower tobacco taxes has no significant effect on either dependent variable. Accordingly, hypothesis 5 is not supported.

A different pattern emerges for the variable indicating whether respondents live in East Germany. This variable is positively and significantly associated with both illegal access and the propensity for illegality. These findings support hypothesis 6, suggesting that East Germans differ from West Germans in their attitudes toward the illicit market.

With regard to the ideological variables, hypothesis 7 is supported. A strong per-

ceived restriction of personal freedom is positively and significantly associated with both dependent variables, indicating that respondents who perceive tobacco taxation as an infringement on personal freedom are more likely to report illegal access and to display a greater propensity toward illicit market behavior. This finding suggests that perceived regulatory intrusion is closely linked to openness toward the illicit tobacco market.

Concerning the second ideological hypothesis IF2, the results provide partial support for hypothesis 8. Respondents intending to vote for the AfD appear more likely to report illegal access and a greater propensity toward illicit market behavior than those intending to vote for other parties, although both effects are only marginally significant.

Overall, the most consistent and statistically significant associations are found for three key variables: residency in East Germany, the perception of tobacco-related regulation as a restriction of personal freedom, and intended AfD vote. Notably, all three can be considered ideological or identity-related variables, rather than purely socioeconomic ones. This pattern confirms Prieger's finding that ideological factors play a substantial explanatory role in determining which individuals are oriented toward illicit markets. By contrast, age and gender only have statistical significance in relation to the propensity measure, not illegal access.

To directly address the potential concern that AfD voter and Restriction of freedom may capture the same underlying construct rather than distinct effects, we conducted additional robustness checks. Indeed, the variables *AfD voter* and *restriction of freedom* are positively correlated (Spearman's $\rho = 0.25$, $p < 0.01$) This suggests that they may partly reflect a shared underlying disposition - namely, skepticism toward state authority and mainstream institutions. This is particularly important if support for the AfD party is understood not merely as a partisan preference, but as an indicator of broader political disaffection and an anti-establishment attitude. Against this background, an alternative specification replaces the AfD indicator with a broader measure of anti-establishment party support, while excluding perceived restrictions on freedom, as these may otherwise function as an overly proximate attitudinal control.

Following Höhne et al. (2025), Bündnis Sahra Wagenknecht (BSW) and the AfD are treated as anti-establishment parties. As a robustness check, supporters of both parties are combined into a single category indicating an anti-establishment political orientation. This specification allows us to assess whether the association between political preferences and illicit-market openness is specific for AfD voters or instead captures a broader anti-establishment orientation.

[Table 3 about here.]

The results reported in table 3 indicate that the observed political association is not limited to AfD support alone, but extends to a broader anti-establishment orientation that also includes BSW voters. This suggests that the driving factor is not party loyalty as such, but rather a more fundamental rejection of top-down regulatory measures perceived as punitive or restrictive impositions by the state.

Importantly, the remaining covariates remain largely stable. Male respondents and individuals living in East Germany continue to show a significantly higher likelihood of illicit market interaction, while the consumption of new products remains positively associated with illegal access.

4 Discussion

Roughly one-third of respondents already report knowing how to obtain illicit tobacco products. If the regulatory environment were to tighten further - for example, through additional tax increases or stronger restrictions - the illicit market would not be facing an uninformed population. Rather, it would be facing a substantial group of smokers, with nearly 70 % reporting at least some openness toward such products. This latent demand is particularly relevant in light of two broader developments. First, potential tax harmonization or further tax increases at the European level could make Germany a more attractive destination for illicit tobacco and nicotine products. Second, if border controls were to become more effective, for example toward France or Great Britain, established smuggling routes may shift, putting further pressure on the German market. The present study not only identifies who already has access, but also shows which groups may become particularly relevant if illicit demand expands under changing regulatory conditions.

The present findings build on Prieger (2023) central insight that tobacco tax noncompliance cannot be understood through financial incentives. While the empirical design here focuses on two broader outcome dimensions, illicit access and propensity for illicit-market openness, the substantive conclusion is closely aligned with his results: Ideological and attitudinal factors appear more informative than standard socioeconomic characteristics alone. In the German case, perceived restriction of freedom, anti-establishment political orientation, and East German residence emerge as the most consistent predictors across the main specifications, whereas income and education do not show robust independent effects. In this sense, the study provides supporting evidence for Prieger's broader argument in a different institutional and political context.

At the same time, the present findings do not provide robust evidence that economic incentives are decisive predictors of illicit-market orientation in this sample. Several expectations derived from the economic literature are not borne out in the data, which to our knowledge is a new result, at least for Germany. Neither income differences nor proximity to neighboring countries with lower taxes emerge as robust predictors. Even among heavier smokers, no clear income-based pattern emerges. Notably, financial incentives and geographic opportunities alone are insufficient to explain illicit access or market openness. This shifts the focus away from purely economic explanations and lends further support to the idea of 'tax morale', in which attitudes, identity and the perceived legitimacy of regulation matter more than potential savings.

The German case points to the importance of such historically and politically embedded factors. The effect of East German residence is especially suggestive in this regard: It is consistent with the notion of a legitimacy gap as theorized by Torgler (2007), whereby taxes are only perceived as compliance-worthy when the regulatory authority imposing them is regarded as legitimate. Where that legitimacy is historically contested, as in the post-DDR context, the threshold for considering illicit alternatives is correspondingly lower.

This is unlikely to be a reflection of geography alone. It may instead capture long-term patterns of political socialization, state-society relations and norms regarding informal or semi-legal exchange. This interpretation is consistent with broader research on Germany indicating that political-economic regimes can leave lasting attitudinal legacies even after formal institutional convergence. In the context of illicit tobacco, this suggests that attitudes toward the black market may be shaped not only by immediate economic incentives, but also by perceptions of state authority and regulatory legitimacy rooted in history. This pattern extends to the broader political dimension, where center-right individuals in the European Union were less likely to support illicit market behavior than those at the political center, even after controlling for smoking status (Filippidis et al., 2017).

Tobacco taxation remains a key public health tool, but its effectiveness hinges on whether higher prices lead to reduced consumption rather than merely shifting demand into the illicit market. If smokers substitute legal products for illicit ones, governments may lose tax revenue without achieving a proportional reduction in smoking-related harm, since consumption is merely displaced rather than eliminated.

From this perspective, the policy challenge lies not only in determining how far taxation can be raised, but also in designing, justifying and enforcing regulation in ways

that maintain legitimacy and reduce incentives to exit the legal market. This is particularly relevant where a legitimacy gap already exists. This highlights the importance of combining taxation with credible enforcement, transparent communication of public health goals and stronger cessation support, particularly for groups that appear less responsive to conventional price-based deterrents. The potential of differentiated taxation structures, as discussed by Barbaro et al. (2024), is another avenue worth considering in this regard.

There are several important caveats. Firstly, the dependent variables capture self-reported knowledge of access and stated openness rather than verified illicit purchases. This means that the study speaks to consumer dispositions and potential future behavior rather than past conduct alone. Secondly, ideological indicators such as an intention to vote for the AfD or a perception of a restriction of freedom may partly reflect a more general distrust of state institutions rather than tobacco-specific views. Thirdly, the cross-sectional design does not permit robust causal inferences regarding the direction of these relationships. Nevertheless, the overall pattern is difficult to reconcile with an account centered only on price incentives. A more plausible interpretation is that, while economic motives create opportunities, it is attitudinal and normative dispositions that determine whether smokers are willing to consider the illicit market at all.

5 Conclusion

This paper examined illicit-market access and openness among German smokers, showing that ideological variables are central to understanding both outcomes. While the empirical design is more concise than that of Prieger's and does not model the entire spectrum of illicit behaviors, the key conclusion is remarkably similar: Attitudes toward regulation and broader political orientations are more consistently influential than standard socio-economic characteristics such as income or education. In doing so, the study applies Torgler's concept of general tax morale to the more specific context of product non-compliance in a European setting.

Our study adds three elements that go beyond the existing literature for the first time. Firstly, it tests Prieger (2023) core argument in a European context. Secondly, it uses the German case to demonstrate the importance of historically and politically shaped attitudes, particularly East-West differences and anti-establishment views. Thirdly, it distinguishes between actual access to illicit products and general openness toward them. This shows that illicit market behavior also has an important attitudinal dimension.

Overall, and for the first time the findings suggest that effective tobacco tax policy should not be based solely on price incentives. Where regulation is perceived as a restriction of freedom and is embedded in broader anti-establishment worldviews, the risk of openness to the illicit market may increase, even in the absence of strong income effects. Attitudinal heterogeneity plays a central role here; understanding how people respond to taxation requires consideration of the political and ideological foundations of compliance. This includes recognizing that openness to illicit markets is shaped not only by smoking behavior, but also by political identity and party preference. Therefore, future research should pay closer attention to these foundations, particularly in settings where historical legacies and contemporary political polarization influence attitudes toward the state.

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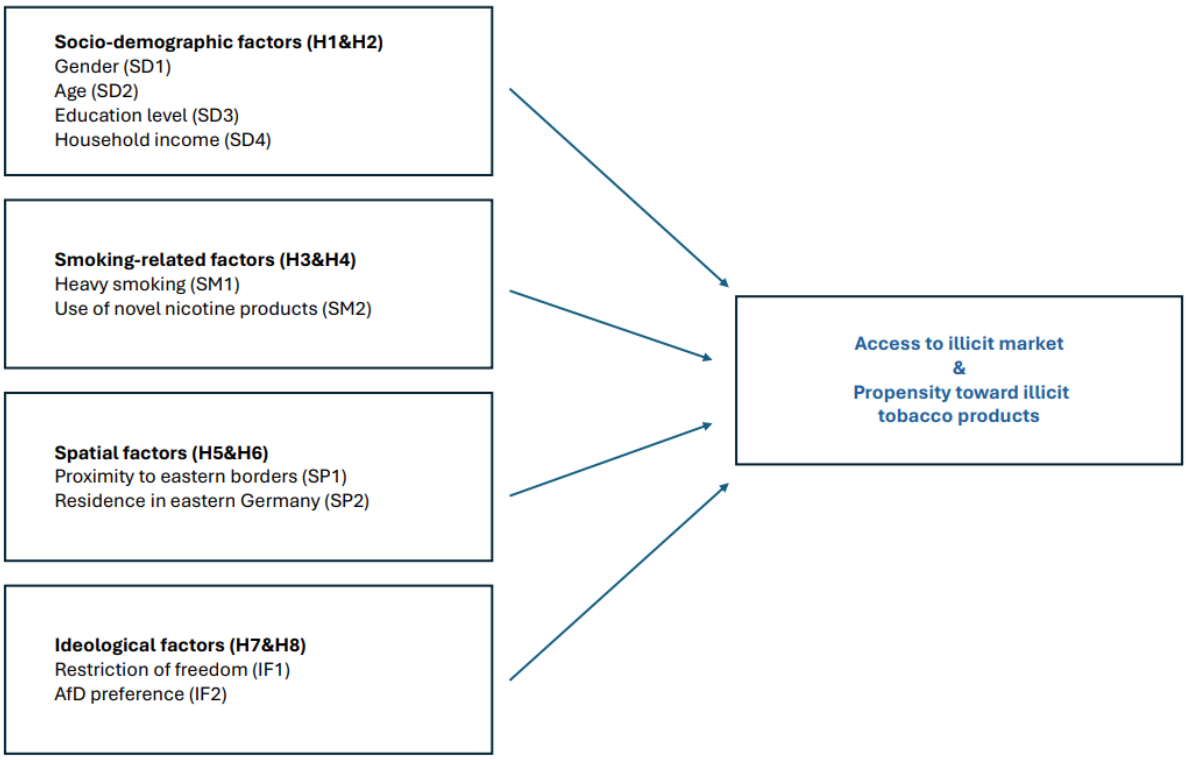

Figure 1: Summary of hypotheses (model 2)

List of Tables

	Population (%)	Sample (%)	Sample (N)
Gender			
Male	54	53	790
Female	46	46	688
Age			
18–29	14	17	248
30–39	18	17	259
40–49	19	18	265
50–59	28	26	380
60–69	20	21	305
Household net income			
No income–1,999€	29	34	482
2,000–3,999€	43	29	402
4,000–5,999€	28	22	316
$\geq$ 6,000 €	/	14	206
Federal states			
Baden-Württemberg	12	8	124
Bavaria	15	15	218
Berlin	5	5	70
Brandenburg	3	7	100
Bremen	1	0	7
Hamburg	3	2	31
Hesse	8	6	91
Lower Saxony	10	6	89
Meck.-Western Pomerania	2	5	75
North Rhine-Westphalia	21	15	219
Rhineland-Palatinate	5	4	62
Saarland	1	1	10
Saxony	5	16	242
Saxony-Anhalt	3	2	37
Schleswig-Holstein	4	3	44
Thuringia	2	2	32

Table 1: Sample characteristics compared to population ratio from Gesellschaft für integrierte Kommunikationsforschung (2023)

Table 2: Logistic regression results for illegal access and propensity toward illicit tobacco market engagement

		Illegal access	Propensity illegality
Socio-demographic factors (SD1–4)	Male	1.410	1.530*
		(0.898, 2.214)	(1.096, 2.136)
	Age	0.987	0.979**
		(0.971, 1.004)	(0.967, 0.992)
	Upper secondary degree	0.804	1.149
		(0.466, 1.385)	(0.759, 1.740)
	Higher education level	0.701	0.730
		(0.409, 1.200)	(0.480, 1.110)
	Income 2,000-3,999€	0.805	0.748
		(0.474, 1.364)	(0.491, 1.140)
	Income $\geq$ 4,000€	0.960	0.958
		(0.588, 1.567)	(0.639, 1.435)
Smoking-related factors (SM1–2)	Amount cigarettes	0.999	1.001
		(0.994, 1.003)	(0.998, 1.004)
	New products	1.588*	1.315
		(1.026, 2.457)	(0.896, 1.930)
Spatial factors (SP1–2)	Nearby border	0.732	1.011
		(0.437, 1.226)	(0.663, 1.543)
	East Germany	2.003**	1.582*
		(1.247, 3.217)	(1.055, 2.372)
Ideological factors (IF1–2)	Restriction of freedom	1.287**	1.200**
		(1.075, 1.541)	(1.058, 1.362)
	AfD voter	1.569*	1.448+
		(1.005, 2.451)	(0.989, 2.120)
	Num.Obs.	868	921
	AIC	772.6	1185.1
	BIC	838.0	1250.2
	Std.Errors	HC3	HC3

Notes: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3: Anti-establishment robustness check on illicit access and openness to the illicit market

		Illegal access	Propensity illegality
Socio-demographic factors (SD1–4)	Male	1.504+	1.559**
		(0.973, 2.324)	(1.140, 2.133)
	Age	0.991	0.982**
		(0.976, 1.006)	(0.970, 0.994)
	Upper secondary degree	0.848	1.012
		(0.502, 1.431)	(0.685, 1.494)
	Higher education level	0.639+	0.740
		(0.381, 1.072)	(0.495, 1.106)
	Income 2,000-3,999€	0.889	0.816
		(0.533, 1.481)	(0.549, 1.212)
	Income ≥ 4,000€	1.026	0.950
		(0.639, 1.647)	(0.649, 1.392)
Smoking-related factors (SM1–2)	Amount cigarettes	0.999	1.003+
		(0.995, 1.003)	(1.000, 1.005)
	New products	1.532*	1.352
		(1.004, 2.335)	(0.941, 1.944)
Spatial factors (SP1–2)	Nearby border	0.757	0.974
		(0.460, 1.246)	(0.655, 1.448)
	East Germany	1.919**	1.437+
		(1.207, 3.050)	(0.979, 2.109)
Ideological factors	Anti-establishment	1.518+	1.754**
		(0.992, 2.321)	(1.250, 2.460)
	Num.Obs.	932	1004
	AIC	837.6	1311.6
	BIC	899.9	1373.6
	Std.Errors	HC3	HC3

Notes: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.