

“The Market for Legal and Illegal Cigarettes in Poland: A Closer Look at Demand and Supply-Side Characteristics”

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September 4, 2007

RECOMMENDED CITATION:

Ciecierski, Christina (2007) The Market for Legal and Illegal Cigarettes in Poland: A Closer Look at Demand and Supply-Side Characteristics,
IDRC Working Paper Series/ITEN Working Paper Series No.1
accessible, respectively, via the following:
http://www.idrc.ca/tobacco/ev-84071-201-1-DO_TOPIC.html
<http://www.tobaccoevidence.net/itenproducts.html>

ACKNOWLEDGMENTS:

This research was supported by IDRC-RITC Grant and by the International Research Exchanges Board (IREX) Individual Advanced Research Fellowship. I am grateful to both David Merriman and Frank Chaloupka for their helpful comments and suggestions. Tomasz Barczyk provided excellent research assistance.

1.0 Introduction

The World Health Organization (WHO) estimates that by the year 2030, more than 7 out of every 10 deaths caused by tobacco will predominantly occur in low and middle-income nations, including Poland and surrounding countries in Central and Eastern Europe (CEE). In Poland, the introduction of an open-market economy has been associated with increased awareness of- and active improvements in- health-related behaviors of the national population however, cigarette smoking continues to be a widely popular and socially acceptable habit within this population. [1]

In 2000, about 40 percent of adult Polish men and over 20 percent of adult Polish women smoked. [1] Statistical evidence suggests that Poland's women and youth have begun to bear larger burdens of tobacco as prevalence statistics among these subgroups remain high. For example, between 1975 and 1999, the prevalence of cigarette smoking increased dramatically among select female age groups. Smoking prevalence statistics reveal a rise from 22 percent to 30 percent smoking prevalence among Polish women ages 30-39; an increase of 23 percent to 38 percent for Polish women ages 40-49; and finally, a rise from 16 percent to 23 percent smoking prevalence among Polish women ages 50-59. [1] Relatively high smoking rates also persist among Polish youth. Statistics from a 1993/94 study of 15 year olds indicate that 65 percent of boys and 50 percent of girls have had a smoking experience. Furthermore, findings show that 23% of boys and 13% of girls surveyed reported smoking at least once per week. [2]

Since the fall of communism, Poland's governing bodies have introduced legislative¹ and fiscal² efforts to help control the country's tobacco market. In doing so, the country has moved from being a state with no tobacco regulations to one of Central and Eastern Europe's most stringent tobacco control environments. Since 1993, Poland has instituted excise taxes and value added taxes (VAT) on all domestically available tobacco products. [3] In 1995, the Law on the Protection of Public Health against the Effects of Tobacco Use was ratified by Poland's Parliament. It imposed restrictions on cigarette sales, smoking in public places and tobacco advertising. The law has since been amended to cover a wide range of tobacco regulations including: large health warning labels on cigarette packs, reductions in allowable levels of tar and nicotine and a comprehensive ban on tobacco promotions as well as street level and traditional media advertising. [4] Finally, as a result of European Union (EU) accession in May 2004, Poland's tobacco control environment must continue to become more rigorous as

¹ See Appendix A

² See Appendix B and C

the government works to meet deadlines for adhering to EU directives concerning tobacco control regulations (i.e. 2001/37/EC and 95/59/EEC). [7] Hence, Poland must strengthen a number of its anti-tobacco policies including: meeting the minimum tobacco excise tax rate of 64 Euro per 1000 cigarettes by 2009; the introduction of color photographs to accompany health warning labels on cigarette packs; tightening enforcement of current legislation and finally, cracking-down on the sale of illegal cigarettes.

Reports from several developed countries indicate that tobacco taxation is a very effective tobacco control instrument. [6-13] In Poland, rising tobacco taxes have also been associated with higher cigarette prices and falling rates of smoking³. [14] The tobacco industry, fearful of the financial repercussions surrounding rising market prices for cigarettes, argues that smuggling is caused by price differences between countries, which create an incentive to smuggle cigarettes from cheaper to more expensive countries.

The tobacco industry has urged the Polish government to solve its smuggling problem and strengthen its revenues by reducing taxes. [15] Yet, it has been proven that in countries such as Canada, where taxes have been reduced to circumvent smuggling, revenue has fallen and smoking risen - creating disastrous consequences for public health. [16] It has also been argued that although market forces have some effect, smuggling is not due to price differences alone and that smuggling occurs all over the world, particularly in countries where taxes are low. [16]

An internal document from British American Tobacco (BAT) estimates that relative to total market sales, volumes of duty-not-paid (DNP) cigarettes, an industry term for contraband cigarettes, are largest (13%) in Eastern Europe. [17] Here, experts maintain that cigarette smuggling is supply driven and caused by fraud through the illegal evasion of taxes. [16-18] Such smuggling is large scale and is run by sophisticated networks of participants, including organized crime. [19] It has also been argued that the beneficiaries of large smuggling operations are tobacco companies [17] that use smuggling to sell their products at lower prices to specific market sub-groups, which under legal market conditions, could not be penetrated.

Currently, Poland's border guard is responsible for monitoring the flow of legal/illegal cigarettes, alcohol and other products across country borders. Poland, as a member state that forms part of the European Union's (EU) external border, implements the strict Schengen⁴ border rules to restrict illegal immigration and trade along its eastern borders with Belarus,

³ See Appendix D

⁴ The 1985 Schengen Agreement is an agreement among some European states which allows for the abolition of systematic border controls between the participating countries. It also includes provisions on common policy on the temporary entry of persons, the harmonization of external border controls, and cross-border police co-operation.

Russia and the Ukraine. Despite relatively strict control over illegal cigarettes along its borders, Poland's enforcement of illegal cigarette sales within the country appears less vigorous. Street vendors sell smuggled cigarettes in open-markets across Poland with seemingly little negative consequence from local authorities.

Indeed, cigarettes traded through a variety of legal and illegal venues bring huge profits for the domestic and global tobacco industry while their production and consumption carry large impacts on the social and economic resources available in Poland. For these reasons, the economic aspects of tobacco use and tobacco control are critical to the debate over efforts to reduce Poland's public health toll from tobacco.

Poland signed the Framework Convention on Tobacco Control (FCTC) on June 14th, 2004 and later ratified the treaty on September 15th, 2006. This, coupled with the country's accession to the European Union (EU) and the necessity to meet EU directives, have finally led the economic aspects of tobacco to receive the government's serious attention.⁵ Policymakers are seeking answers to important economic questions - particularly, about optimal tax levels and the detrimental effects of tobacco smuggling to the national budget.⁶

2.0 Background

Estimating illicit tobacco smuggling activity is difficult because of its hidden and illegal nature. Furthermore, estimates of tobacco smuggling are often expedited in response to political arguments or concerns. In other instances, analysts, funded by the tobacco industry, may aim to show that increased tobacco taxes are counter-productive as they encourage tobacco product smuggling while others, such as advocates of public health, seek to show the exact opposite. Hence, accurate estimates of cigarette smuggling are necessary to help evaluate and establish the importance of tobacco tax revenues for the fiscal budget as well as for governmental anti-smuggling efforts.

To date, there have been very few research efforts made to understand or explain the trends in cigarette smuggling in Poland specifically. Academic efforts concerning tobacco tend to focus on measuring the prevalence of cigarette use across Poland's subpopulations. Poland's government, despite facing considerable budgetary implications from variations in the prices

⁵ See web link to the Confederation of Poland's Employers (Konfederacja Polskich Pracodawcow): <http://www.kpp.org.pl/index.html?action=sai&ida=6019>

⁶ It has been estimated that in 2007, approximately 1 billion Polish zloty had been lost to Poland's budget due to cigarette tax evasion. See: http://www.huby.seo.pl/D3/index.php?option=com_content&task=view&id=39&Itemid=60

and sales of legal versus smuggled cigarettes, has not made adequate efforts to report official statistics regarding cigarette smuggling in Poland. Meanwhile, the information that has reached the public has derived from the media. Most of this information, however, inevitably originates from the tobacco industry. [20-24]

An early benchmark report commissioned by Krajowe Stowarzyszenie Przemysłu Tytoniowego (Poland's National Association for the Tobacco Industry) was promoted by a press release in late 2000. The report states that as much as 23 percent of Poles declared smoking smuggled cigarettes within the past 3 months. The study further suggests that as many as 49.8 percent of cigarettes consumed in eastern Poland are smuggled with another 7.2 percent and 6.8 percent in Central and Western Poland, respectively, being derived from the black market. [20] Another document, the annual market report on Poland's tobacco market prepared by the monthly publication "Poradnik Handlowca" (or Retailer's Handbook) published in July 2004 estimates that 15-20 percent of cigarettes smoked in Poland derive from illicit trade. [21] A report published in 2006 by BAT Polska (ISSN: 1897-3353) and commissioned by BAT from ALMARES Consulting and Market Research Institute estimates that in 2004-2005, 13.6% of cigarettes smoked in Poland are illicit in nature, with the majority originating in Russia, the Ukraine and Byelorussia. [22]

Statistics regarding the share of smuggled cigarettes within Poland's cigarette market have also been presented by the Customs Policy Department of the Ministry of Finance of the Republic of Poland (see: www.mf.gov.pl). These statistics, however are based on the above mentioned study, conducted the ALMARES Marketing group and commissioned by Poland's National Association for the Tobacco Industry.⁷ Finally, an in-depth report published within *AgroTrendy*, a bi-weekly publication of Top Consulting, Ltd., focuses on the implications of increasing tobacco excise taxes on Poland's tobacco market. [24] In doing so, the report utilizes econometric techniques to provide an empirical approach to measuring the impacts of continued tobacco taxation on both tobacco sales and government revenues. Despite its reliance on the application of sophisticated empirical techniques, the study, like Poland's government, relies upon ALMARES-generated estimates, which again, is a body of information commissioned by Poland's National Association for the Tobacco Industry. [24]

At present, there is no widely accepted method available for measuring shares of smuggled cigarettes within legal tobacco markets. Although researchers have developed

⁷ Identical shares of illicit cigarettes within the legal market are report by both the tobacco industry and Poland's government, please see: <http://www.mf.gov.pl/dokument.php?const=2&dzial=534&id=25301&PortalMF=9f52f930240cb2dfe0b13af314df0e1f> [23]

sophisticated econometric techniques and other analytical methods for assessing tax evasion, [25] none of the widely applied methods, is fully satisfactory. This is due to the fact that these methods have required that levels of tax evasion be estimated based on observable discrepancies in observed data (e.g. the difference between tax revenues collected and smoking observed in surveys of the smoking public).

Rather than drawing upon aggregate data to estimate the share of smuggled cigarettes within Poland's cigarette market, this study applies a consumer survey methodology to a nationally representative sample of adults in Poland so as to measure the prevalence of smuggled cigarette packs and illicit cigarette use among smoker households in Poland. This work interviewed respondents (both smokers and non-smokers living in smoker households), about their cigarette purchases and carefully inspected cigarettes pack(s) for various indicators of illegal origins including: price; domestic versus foreign versus missing excise tax stamps, health warning labels and/or tar and nicotine labels. This methodological approach has allowed this study to avoid some of the technical problems that arise with the use of national aggregate data (e.g. simultaneity biases, correlation between price and policy measures) and allows for detailed analysis of the smuggling problem (e.g. differentiating types of smokers; types of tobacco products consumed; tobacco prices; and categories of tobacco outlets from across various administrative levels of Poland) to produce meaningful and stable estimates of the share of smuggled cigarette use within Poland's tobacco market.

3.0 Methodology and Analytical Approach

There exist a number of useful and reliable methods designed to measure the share of cigarette smuggling within legal tobacco markets, however, each method has limitations. Merriman (2000) describes and critiques each of the five major methods which researchers have already utilized when measuring levels of tobacco smuggling. The combined application of one or more of these methodologies is best so as to cross-validate findings and minimize any methodological objections. [25]

A. Methodologies for Data Collection

(i) Survey of Legal versus Illegal Cigarette Availability and Use among Households⁸.

The first part of this study builds on an already existing approach used to measure cigarette smuggling. This technique is characterized by its careful inspection of cigarette packs to determine their legal nature. Here, smuggled cigarette packs were identified by the presence/absence of tax stamps, health warnings, tar, nicotine and CO labels as well as other distinctive features such as brand name and price.

⁸ See Appendix E

To date, studies that have inspected cigarette packs have obtained samples by either interviewing cigarette smokers on the street or by soliciting smokers to mail-in their empty cigarette packs. [26] Although this approach is sound, its past application had been subject to bias stemming from one or more of the following: (1) individuals who purchase smuggled cigarettes may be less willing to provide access to their cigarette packs than those who purchase cigarettes legally (this may be particularly true for a survey methodology that relies on voluntary responses taken along street-sides); (2) it is difficult to obtain a truly representative sample of the population by stopping individuals along street sides as many subgroups are either unlikely to walk along city streets (e.g. the elderly, the sick or those with higher incomes who tend to travel by car) or may not agree to an interview for other reasons (e.g. underage smokers or immigrants who do not adequately speak the local language); (3) a random street-side approach does not necessarily gather information that could help explain the individual characteristics of the respondent. As a result, different propensities to consume smuggled cigarettes across various subgroups of the general population are not sufficiently accounted for.

This study has attempted to solve the problems outlined above by administering a face-to-face survey methodology to a nationally representative sample of Polish inhabitants ages 18 and older. The administration of six consumer surveys was outsourced to GfK Polonia, Inc., an international market research company operating in Poland. Like many other local and international market research agencies worldwide, GfK administers national omnibuses bi-monthly across nationally representative samples of households. The omnibus nature of these surveys makes it possible to include a tobacco use questionnaire into the larger, national consumer study. Due to the fact that no more than 1000 respondents can be surveyed by a single wave of the omnibus, five surveys were commissioned within a twelve month period. The sixth and final survey incorporated a number of methodological improvements⁹ and was commissioned a year after the completion of the first five waves.

Upon interviewing a survey respondent, trained survey administrators asked each respondent to present a pack of cigarettes typically found in the respondent's home. If provided with a cigarette pack, surveyors completed an inspection checklist (see questions 6-11 in Appendix E). Given legal packaging and tax requirements, smuggled cigarette packs in Poland

⁹ In wave six, the survey instrument's ability to extract details of a cigarette pack's characteristics was greatly improved with the addition of the following question: "Is the cigarette pack that has been presented by the respondent open or is it not open and still wrapped in cellophane?". Possible responses included: new and not open; open with cellophane partially removed; open with cellophane entirely removed. The inclusion of this question, when combined with the remaining indicators of legal versus illegal origin (see section 4.3 for description of other available indicators of illegal origin) made it possible to discern, that percentage of packs without a tax stamp that were missing a tax stamp because of missing cellophane or because of a pack being opened rather than tax evasion.

are particularly easy to identify (see training photos which accompany questions 8, 10 and 11 in Appendix E). Their distinctive features significantly lessen the probability of error in the interviewer's discernment of smuggled from legal cigarette packs. Specific characteristics include: a tax stamp (issued by Poland's Ministry of Finance), health warning labels (written in Polish, issued by Poland's Ministry of Health and cover at least thirty percent of both the front and the back panels of a cigarette pack) and finally, tar, nicotine and CO labels (written in Polish). This component yielded a number of important variables that made descriptive analyses possible across various socio-demographic, smoker and market characteristics (see Data section for a complete listing of variables).

As demonstrated through the survey questionnaire presented in Appendix E, each survey respondent was asked to orally define his/her: 1) smoking participation; 2) the number of cigarettes smoked on average per day; 3) the location of their purchase (with a street-vendor/open-market seller being a possible response) and 4) the per pack price paid. After completing questions about consumer tobacco use, with the respondent, the trained surveyor completed questions regarding characteristics of cigarette packs. In doing so, the trained GfK surveyor assumed responsibility for identifying and defining the legal/illegal nature of a respondent's cigarette pack.

GfK's sampling design is multi-stage and has been tested and perfected by the company over time to assure a quality, random sample.¹⁰ First, in terms of recruitment, GfK Polonia mails an announcement postcard to each randomly, computer-selected household. Here, the respondent is chosen from among the persons residing in the selected household. Upon arrival at the interview site, the GfK surveyor identifies one individual from each randomly selected household through a logarithm generated by his/her laptop. Once this individual is identified, the surveyor makes three attempts to meet that person at home in order to conduct the interview/survey.

As is the case with survey methodology, this study is subject to the underreporting of both smoking behaviors and smuggled cigarette possession/use. This risk may be particularly pronounced among the youngest respondents living at home with their parents. Furthermore, the post-communist context of our Polish sample also creates greater than usual concerns

¹⁰ Details of the selection of households and individual respondents include the following: an address sample is used for the GfK Omnibus study. It is a multi-stage process drawn in three steps. In the first step, the planned sample size is randomly distributed among the *gminas* or communes (Poland's smallest administrative unit) proportionally to the number of inhabitants of Poland (this, in terms of regions, town size and voivodships). In the second step, a locality (village, town, city) and its inhabitants are drawn from the randomly chosen *gminas*. The third step is carried out by GfK interviewers on-site via a computer generated algorithm.

about the underreporting of smoking including, black-market cigarette purchases. As a result, the format of the consumer survey questionnaire was carefully designed to minimize the tendency to underreport. First, the survey was conducted in a confidential manner and within a private setting, assuring each respondent that their responses and identity are to remain completely anonymous. Second, GfK identified and confirmed the participation of individuals to be surveyed well-in advance of the actual survey day. Hence, respondents to our survey participated knowingly with informed consent. Third, respondents to this study, when compared to other methodologies which generally survey volunteers (e.g. along street sides) about cigarette use and purchases, the at-home environment could arguably allow respondents to more precisely and/or more candidly, answer questions about their cigarette purchases and cigarette use. Fourth, the tobacco-related questions constituted just one section of a larger consumer survey addressing the consumption of numerous commodities. As a result, detailed questions about the nature of cigarette purchases may have appeared relatively less threatening or less "thematic" than if they had been asked in a stand-alone, tobacco survey. Finally, because the oral section of our consumer survey required surveyors to ask respondents about their smoking behaviors in advance of any direct mention/distinction between smuggled and legal cigarette use, smokers, particularly those who purchase illicit packs, were probably less likely to underreport consumption.

(ii) Survey of Tobacco Points of Sale (POS)¹¹

In an effort to capture the penetration and characteristics of illegal cigarette packs available for sale across Poland's Point-of Sales, part two of this work utilized an existing obtrusive survey methodology called I-TIME to gather local environmental data from various points-of-sale across Poland. The survey collected information regarding the interior/exterior advertising, pricing and promotional activities for cigarette products at POS from across Poland. Funded by the National Cancer Institute of Canada, the I-TIME survey methodology was created by an international collaboration of researchers from four countries that currently lead the world in developing POP methodologies (namely, Canada, Australia, the USA and Scotland). The I-TIME survey is the product of a comprehensive review of existing methodologies and includes innovative methods¹¹ for measuring ever-changing tobacco industry marketing strategies at both legal and illegal retailer points of sale. The I-TIME survey has been piloted in four countries including Canada, Scotland, the USA and Poland¹². Designed to

¹¹ See Appendix F

¹² Results from the Warsaw, Poland pilot were presented during the World Conference on Tobacco or Health in Helsinki, Finland. [27]

investigate how the tobacco industry uses POS marketing strategies in different regulatory environments to increase or maintain tobacco sales, the I-TIME survey collects a wide range of variables that describe a given locality's tobacco outlets (i.e. the type of outlet – including street or open-market vendors, the outlet's location relative to schools and other institutions), the tobacco products available for sale (i.e. cigarette price, types of tobacco products, the assortment of brands and their forms of packaging) and accounts for POS compliance with national tobacco control laws (i.e. signage, restrictions on advertising). **Results from this data collection are presented in Tables**

B. Analysis Methodology

The results presented here derive from descriptive analyses. Confidence interval analysis has been used to identify statistically significant patterns in smoking behaviors; cigarette purchasing (legal versus illegal) behaviors and cigarette sales/marketing characteristics over time and across population subgroups in Poland. Confidence intervals have been generated for all estimates that are based on individual-level survey data. The generated confidence intervals follow the classical, normal theory method, where the underlying assumption is multivariate normality in the sample distribution (assumes the variable is normally distributed in the population).¹³ [28]

(i) Confidence Interval Analysis

Confidence intervals were generated by SAS Statistical Software version 9.1 through use of the SURVEYFREQ procedure. In general, the confidence interval characterizes the precision of a statistical estimate. That is, the confidence interval around the percentage statistic represents the range of values within which the “true population” is expected to be located. This report presents 95% confidence intervals, indicating 95% certainty or at a .05 level of precision, that the true value lies between the lower and upper bounds of the interval.¹⁴ For

¹³ Please see Bentler, P.M. and Dudgeon, P. (1996) Covariance Structure Analysis: Statistical Practice, Theory and Directions, Annual Review of Psychology 47, 541-570 - for further methodological details.

¹⁴ The width of the confidence interval depends on a number of factors including sample size and variation of data values. Overall, one may conclude that the narrower the confidence interval, the greater the certainty that the percentage statistic represent the true population. Hence, if a given percentage for a smoking outcome is 25% and the confidence interval for that percentage statistic is ± 5.0 , it is 95% certain that the true population percentage will fall between 20% and 30%. Estimates of percentage statistics may be considered comparable if the difference between the two (or three, or four, etc) statistics is not statistically significant. Statistical significance is a term that refers to the assertion that the differences between two (or more) estimates can be understood to represent the “true population”. The term also provides a definable level of certainty (generally 95% confidence or a .05 level of precision). This means that the differences are not the result of chance. Throughout the discussion of the results from the confidence interval analyses, percentages are stated to be statistically significant (or statistically different) when there is no overlap in the confidence intervals of the percentage estimates being compared.

example, in Appendix Tables 5, ¹⁵ looking at the 2004-2006 pooled sample, this study finds that the *prevalence of current daily smoking* is highest among Poland's middle-aged adults ages 45-59. More specifically, adults ages 45-59 are statistically more likely to smoke cigarettes daily than are their 18-29 or 60 and older counterparts. Note however, that although adults ages 45-59 smoke more than their 30-44 counterparts, this finding is not statistically significant. Hence, adults ages 45-59 are not significantly more likely to smoke than their 30-44 year old counterparts.

(ii) Notes regarding Missing data

The number of unknowns among survey responses is a factor that affects the accuracy in the collected data because during the administration of the survey, information may be overlooked or refused by the respondent. Missing responses among survey data create uncertainty during analysis as analysts become unsure about how non-respondents compare to respondents. For example, "are smokers less likely to respond to a question on smoking?" or "are purchasers of illicit cigarettes less likely to present a illicit cigarette pack for inspection?". During the preparation of the data for this study, records that did not contain the items of interest were omitted. For example, the reported statistics on smoking prevalence by age group include only those records that included full information about the respondent's smoking status as well as his/her age. The completeness of reporting was 98% or higher for most data items analyzed in this study, thus the omission of missing data had little impact on the findings presented. Nevertheless, one should be aware that the exclusion of missing data suggests that the smoking statistics presented within may differ slightly from similar statistics published elsewhere.

4.0 Data

4.1 Tobacco use outcome measures

All respondents were asked a series of questions about their smoking participation and the frequency of their cigarette use - making it possible to construct three different types of measures of smoking behavior. First, in order to identify respondents by category of smoking, each were asked: "Currently, how often do you smoke cigarettes?". Possible answers included: every day, some days, never and "I am an ex-smoker" (this response not available in waves 1 and 2). Second, some day smokers were asked about the frequency of their use (number of days smoked in the past 30 days) making it possible to create a 30-day smoking consumption measure for all current smokers (daily and some day) in the sample. Finally, all smokers, daily,

¹⁵ This research has constructed an exhaustive number of tables reporting descriptive statistics by wave and for the pooled cross-sections, column percentage estimates and confidence intervals for a wide range of population and market characteristics. Please refer to the Appendix Tables for a complete set of results.

someday and ex-smokers were asked about when engaging in cigarette smoking, how many cigarettes they smoke/smoked on average per day.

4.2 Characteristics of Cigarette Sales

The trained surveyor inquired with each respondent about the possibility of seeing a cigarette pack that was present within the household at the time of the survey. Respondents could have produced any one of the following: a) their own cigarette pack; b) a cigarette pack belonging to another person from within that household or c) refuse to present a pack.

Next, the presented packs were inspected using a checklist of cigarette pack characteristics. This checklist included the following two oral questions. First, respondents were asked about where the particular cigarette pack was purchased. Possible replies included: a Gas Station; Hypermarket; Grocery store/ Deli; Tobacco Shop; Newsstand/Kiosk; Marketplace (with stationary stands or fixed sellers); Street seller (mobile seller); wholesaler; over the internet; in the Ukraine; "I roll my own" or "other". Second, respondents were asked to declare the purchase price at which they bought this particular cigarette pack.

A second set of questions from this checklist was completed through the surveyor's own inspection of the cigarette pack. This checklist included the following: cigarette brand (selected from list); cigarette length (short; regular; long or other); type of cigarette (light; super light; menthol or full-flavor); pack type (hard or soft packaging) and pack size (20, 25, 30, 40 or other).

4.3 Measures of Illicit Cigarette Use

A number of questions regarding various types of cigarette pack labeling were employed as a means for discerning illegal versus legal cigarette packs. First, in regards to excise tax bands, in waves 1-5, the survey asked: "on the cigarette pack shown, there is a tobacco tax stamp issued by the Ministry of Finance of: Possible responses included: Poland, the Ukraine, Byelorussia, Russia, the Czech Republic, Slovakia, Other country or No Tax Stamp is visible on this cigarette pack." In wave 6, this question was improved and resultantly, divided into two separate survey questions. This included the following: "is an official excise tax stamp visible?" The surveyor was asked to indicate any one of the following: "Yes, the packaging displays an excise tax"; "Yes, the packaging displays a fraction of the tax stamp or minutely visible fragments of a tax stamp"; "No, there is no excise tax stamp visible nor are there any signs which would indicate that such a tax stamp had ever been present". The country of origin of the stamp was asked via the following: "The cigarette pack presented displays as excise tax stamp issued by the Ministry of Finance of: (possible replies included: Poland, the Ukraine, Byelorussia, Russia, Other country). Second, in regards to health warning as well as tar, nicotine and CO labels, the following question was employed in waves 1-5: "Is a Polish health-

warning label and/or a tar and nicotine label present on the pack?"". Possible responses included: "No, neither is visible"; "Yes, both are present in a language other than Polish"; "Yes, only a health warning label in a language other than Polish is present"; "Yes, only a tar and nicotine label in a language other than Polish is present"; "Yes, both are present in Polish"; "Yes, only a health warning label in Polish is present"; "Yes, only a tar and nicotine label in Polish is present". In wave 6, this question was altered in order to yield improved results and resultantly, divided into two separate survey questions which included: (i) "Is a health-warning label present on the pack? And (ii) Is a tar and nicotine label present on the pack?. Possible responses to each question included: "No, a health-warning label is not visible"; "Yes, a health-warning label is present in a language other than Polish"; "Yes, a health warning label in Polish is present".

4.4 Population Characteristics

In addition to collecting information about cigarette use and cigarette pack descriptions; the survey instrument also extracted a standardized set of socio-economic and demographic data for each respondent including age¹⁶; gender; household income, education (primary, trade, secondary, higher education); marital status (married, single, divorced, widowed); area of residence (village, city 20-50K, city 100-200K, city 200-500K and city of more than 500,000 inhabitants), region (Central, North-East, North, South-East, South, Middle-East, Middle, West and South-West) and occupation (Specialist/Business Owner/Management; White Collar Worker; Blue Collar - Skilled Worker; Blue Collar - Unskilled Worker; Farmer; Housewife; Student and Retired/Unemployed)

4.5 Descriptive Statistics

Table 1 provides insight into the various socio-demographic and socio-economic characteristics of (1) all respondents interviewed (1-Total Sample); (2) respondents who agreed to present a cigarette pack for surveyor inspection (2a - Sample: Pack Presented) versus those who did not (2b - Sample: Pack not Presented) and finally, (3) respondents who possessed an legal cigarette pack (3a – Sample: Legal Pack) versus those who possessed an illegal pack (3b – Sample: Illegal Pack). Table 1 presents results as derived from the pooled sample of individual responses (encompasses fall 2004 through winter 2006).

¹⁶ Wave 1 of this research attempted to administer the omnibus survey to individual respondents ages 15-17 years of age. A total of 62 young individuals were identified for participation in this survey of which only 50% (31) consented to participation in a tobacco-related survey. Of these 31 individuals, only 3 reported being a smoker. Moreover, only 9 of the 62 individuals ages 17 and younger presented a cigarette pack for inspection. This response rate (14%) is significantly less than among the adult respondents when 259 adults of 903 adults surveyed (a response rate of nearly 29%) revealed a cigarette pack for inspection. For this reason, subsequent waves of this survey excluded youth under the age of 18 from the respondent sample.

Table 1 reveals that 32.5% of the sample reported current smoking participation – with 28.5% smoking daily and 3.96% reporting some day smoking. Former smokers constitute 10.4% of the sample while never smokers¹⁷ constitute 56.4% of the full sample. In terms of the sample of persons who presented either their own cigarette pack or the cigarette pack of another from within the household, the vast majority were daily smokers (84%) or never smokers (8.2%). With regard to legal versus illegal cigarette pack possession, among those who revealed smuggled cigarette packs, the percentage of never smokers (10.9%) was greater than among the sample of respondents that revealed legal cigarette packs (7.9%). Among daily smokers, the trend is exactly opposite. That is, among those who revealed illegal cigarette packs, the percentage of daily smokers (82%) was less than the fraction of daily smokers revealing legal cigarette packs (84%). This lends some speculation that smokers, are conscious about revealing cigarette packs obtained on the black market.

Table 1 also shows that females constitute a slightly larger fraction of the total sample (52.3%) than males (47.7%). The majority of the sample married (62.7%) and has attained some type of secondary schooling (30% completed trade school while 35.6% completed a college preparatory high school). A notable portion of the sample occupy: blue collar jobs (24.6% report being skilled laborers and another 6.18% report being unskilled laborers); white collar jobs (16%) or farm for a living (11%). Also, a large fraction of the sampled population is either retired or unemployed (approximately 25%). More specific information on smoking behaviors across subpopulations of Poland is provided in Table 2 and is discussed in the results section of this report. Also, detailed descriptive statistics of the same sample populations as presented in table 1 have been generated for each survey cross-section of this study and are provide in Appendix Tables 1A-1E and Appendix Tables 2-2E of this report.

Table 2 demonstrates that the majority of the sample presented a pack that was regular flavor (46.5%) or “light” (37.3%); of “regular” length (85mm) (68.3%); with a filter (97.6%); contained in hard-box packaging (82.88%) and provided in a 20 count box (87.24%). These trends are also consistent across both sub-samples presented in Table 2 (sample of packs that have been categorized as legal versus illicit to Poland’s tobacco market). Looking at the overall sample of cigarette packs presented by respondents, just under 3% (2.7%) did not display a tobacco excise tax of any kind (neither foreign nor issued by the Ministry of Finance of the Republic of Poland). However, 8.4% of the packs presented in accompaniment with some form of a foreign tobacco excise tax stamp were determined to be of foreign origin. Similarly, 7.8% of the packs presented displayed some combination of foreign health warning as well as tar,

¹⁷ Information on never-smokers was not directly collected in wave 1 or in wave 2.

nicotine and CO labels. Also in table 3, we can discern popular points of sale for cigarette pack purchases in Poland. The statistics regarding POS for legal cigarette purchases reveal that the most popular venues for legal cigarette purchases include: Supermarkets (44.3%) and Kiosks or Newspaper stands (31.5%). In terms of illicit cigarette pack purchases, the most frequently cited POS include: Open Market Sellers occupying Fixed Selling Stalls (41.9%) and Street Sellers utilizing mobile vending techniques (16.4%). Other popular responses mirrored that of legal sales and report shares as follows: Supermarket (15.9%); Kiosk or Newspaper Stand (14.2%).

Table 3 provides a list of the three most prevalent brands across both the legal and illegal samples of cigarette packs observed within each survey cross-section. Between fall 2006 and winter 2006, the most popular legal cigarette brands included some combination of: L&M, Red & White and Mocne. In each cross-section, this combination of brands accounted for approximately 30% of the brand share. Looking to table 3 and considering brands associated with packs that have been identified as illegal, the continuity in leading cigarette brands is appears more volatile with the brand Jin Ling appearing popular in the early cross-sections but then disappears and is replaced with the Ranson brand.

Table 4 provides a list of average prices (as derived from the self-reported prices of survey respondents) of leading legal and illicit cigarette brands. It is clear that the average purchase prices of the illegal cigarette packs are significantly below those of legally sold packs. For example, in the early 2004 cross-section, a daily smoker could have substituted a pack of L&M brand cigarettes priced at a reported average of 5.30PLN per pack for a pack of Jin Ling cigarettes at an average price of 2.40PLN per pack. By winter 2006, a legal pack of L&M cigarettes could have reportedly been purchased at an average price of 5.80 PLN while a pack of Ranson brand cigarettes available for purchase through the black market sold for significantly less, at approximately 3.20 PLN per pack.

One of the most interesting outputs from this study stems from the estimates of region-specific prevalence of illicit cigarette packs. The distribution of illicit cigarette pack prevalence across Poland's regions (see region Table 1) suggests patterns of illicit cigarette migration across Poland – that is, from the eastern border towards central Poland to the western regions. A careful look at the geographical distribution of smuggled cigarette packs across Poland (see figure 1 below) supports this intuitive deduction given the origins of bootlegged cigarettes above. That is, regions along Poland's eastern border (voivodships bordering Russia, Byelorussia and/or the Ukraine) are more highly penetrated with illicit cigarette packs than are regions along the country's western border with the European Union. For example, the

prevalence of illicit cigarette packs among smoker households in the Northeast region is 22.5% as opposed to 1.95% in the North or 2.2% in the Southwest regions of the country.

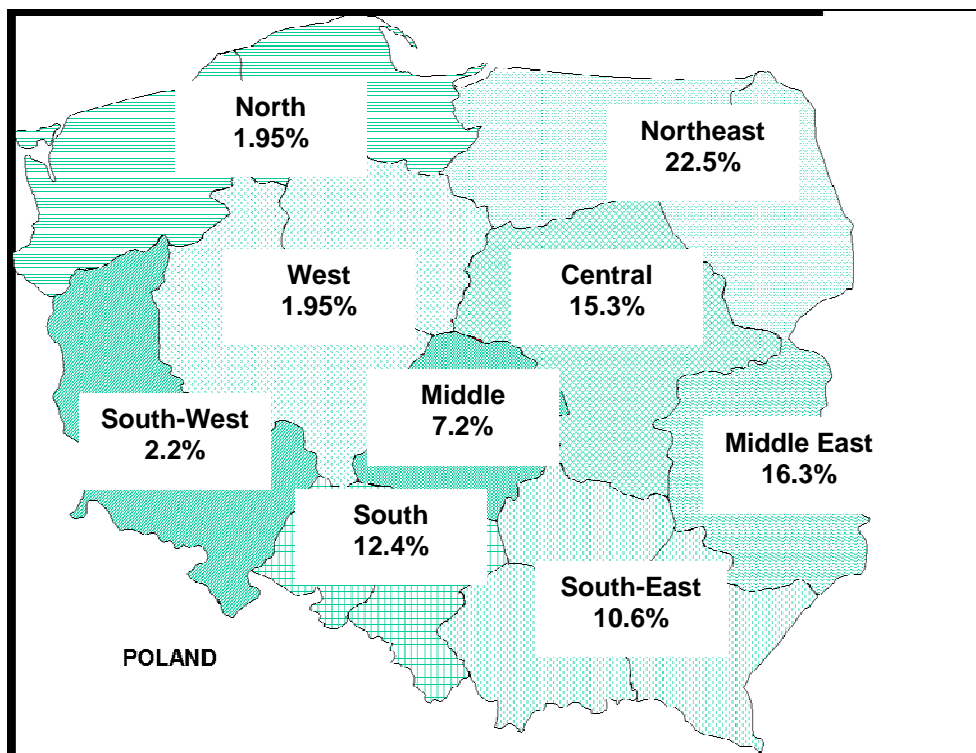


Figure 1. Geographical pictorial of the distribution of smuggled cigarette use, Poland, 2004-2006

In terms of magnitude, these findings differ significantly from those results which stem from industry commissioned studies. That is, in comparison to industry-generated results, our study finds relatively smaller proportions of smuggled cigarette packs among households across most regions of Poland. However, this study and industry studies do agree as to the patterns of distribution of illegal cigarettes across Poland. A 2001 study commissioned by Poland's National Association for the Tobacco industry and carried out by Pentor and Associates of Warsaw, included the following map (see Figure 2 below) in its media releases of the study. These results indicate that among those surveyed in the Northeast region of Poland, 72% declared that their friends smoke cigarettes which lack proper excise tax stamps versus only 5% of those surveyed in the Southwest region of Poland reported the use of illicit cigarettes among friends.

Figure 2 - Geographical pictorial of the distribution of smuggled cigarette use, generated by Pentor and Associates, Study commissioned by Poland's National Association for the Tobacco Industry, 2001

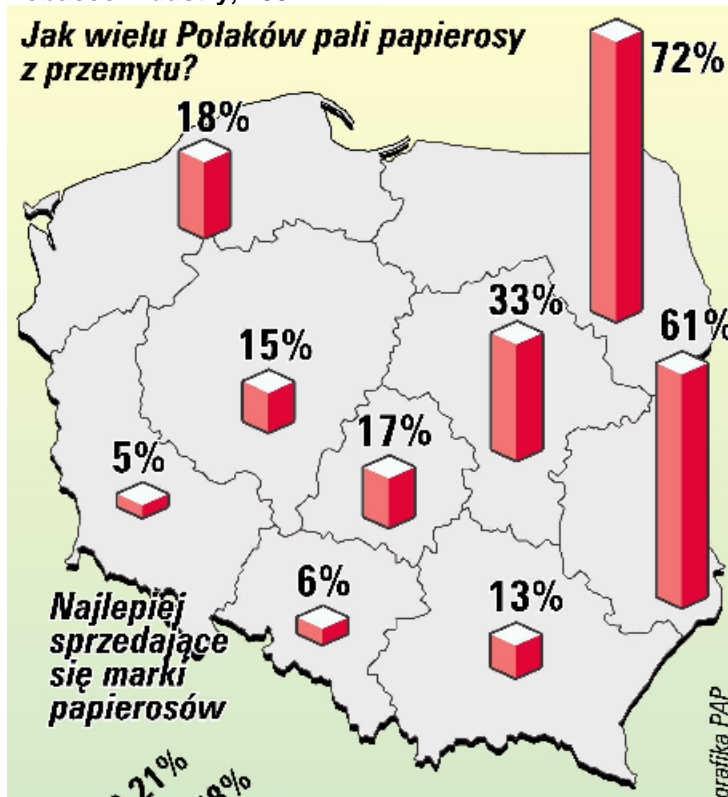


Table 5 provides descriptive statistics conducted on a set of environmental data collected from various points-of-sale from across Poland. The I-TIME POS survey was conducted across 20 localities (villages, small towns and large cities) across 9 of Poland's sixteen voivodships (or states).

Table 5 reveals that the majority of POS surveyed were kiosks or news stands (44.4%) as well as small grocery stores or delicatessens (41.2%). Most of these POS contained only one cash register for general store sales (84%). Only two retailers contained a tobacco-only register (1.1%). Nearly half (49%) of the POS required clerk assistance in order to purchase any type of tobacco product. The survey captured the characteristics of only one moveable tobacco vendor (.53%). The survey observed little activity in terms of either significant (7.5%) or moderate (6.4%) external tobacco advertising at the POS. In fact, the majority of venues (86%) can be described as having no external advertising of tobacco products. Among those POS that did advertise tobacco externally, brands that were prominently advertised included L&M (3.7%) and Marlboro (2.7%). In terms of brand penetration across all POS surveyed, Marlboro (35%), L&M (11%) and Sobieski (5%) appeared most frequently on venue displays. The presence of external anti-tobacco advertising is limited to 2.7% of all POS surveyed. As table 5 reports, each

and every of the venues surveyed sold cigarettes (100%); 16% sold cigars; 5.3% sold roll-your-own tobacco; 3.2% sold cigarillos and 2.7% sold pipe tobacco. In relative terms, this finding coincides with other estimates of tobacco product shares within Poland's tobacco market. [21] All of the 187 POS surveyed were found to be in compliance with Ministry-mandated packaging laws (tobacco excise tax stamps; health warning labels as well as tar, nicotine and CO labels). The survey inquired about the presence of five significantly selling brands in Poland. These brands names and their prevalence are as follows: Mocne (available in 78.6% of POS surveyed); Caro (available in 91% of POS surveyed); Klubowe (available in 17% of POS surveyed); Sobieski (available in 90% of POS surveyed); and Marlboro (available in 97% of all POS surveyed). In terms of promotional activities, only store-based specials/price discounts were observed for select brands. See table 5, section "Prevalence of Store-Based Specials/Discounted Prices observed at the POP - By Brand" for the distribution of price promotions across select brands.

4.0 Analysis Results

In looking at Table 6 results from confidence interval analysis of smoking behaviors by socio-demographic characteristics across the 2004-2006 pooled population, we find that Poland's daily smokers are statistically significantly most likely to be: male (36.2%) rather than female (21.5%); between the ages of 30-44 (35.3%) and 45-59 (38%); completed trade-school level schooling (38.9%); divorced or separated (47.4%); fill a blue collar job (either skilled, 42.1% or unskilled, 47.8%) and receive a monthly household income of under 1000 PLN per month (36.2%). Alternatively, Poland's daily smokers are statistically significantly least likely to reside in a village location (25%); be widowed (15%); be age 60 or over (13%). Statistically speaking, college students are significantly less likely to smoke (14.5%) than any other occupation group with the exception of farmers (20.4%). That is, although more farmers than college students smoke daily, this difference in prevalence rate is not statistically significant. At the same time, college students are not significantly less likely to smoke occasionally less than any other occupational group.

In light of these daily smoker characteristics, in Table 6, some day smoking behavior appears less volatile across subsections of this general population. Occasional smokers are statistically less likely to be married (3.44%) or widowed (1.6%) than single (5.96%). On the other hand, occasional or some-day smokers are statistically more likely to be between the ages of 18-29 (6.3%) than between the ages of 45-59 (2.87%) or 60 and older (1.61%).

In terms of presenting a cigarette pack to the surveyor, the results derived from confidence interval analysis and presented in Table 6 demonstrate that neither of the two breakouts of smoker categories (non-smoker versus smoker as well as daily versus someday smokers) are statistically significantly more likely 'to present' rather than 'not present' a cigarette pack upon oral request.¹⁸ In terms of ownership of the presented pack, daily smokers were significantly more likely to present their own pack (95%) than the pack of another member of their household (15%). This finding was not revealed among occasional smokers. Here, the percentage of occasional smokers claiming to present the cigarette pack of another smoker within the same household was greater than the percent of occasional smokers presenting their own cigarette pack – although this finding is not statistically significant. Finally, in terms of the likelihood of possessing an illicit rather than legal cigarette pack, neither of the two breakouts of smoker categories (non-smoker versus current smokers and daily versus someday smokers) were shown to be statistically more likely to present an illegal over a legal pack of cigarettes.

In looking at Table 7 results from confidence interval analysis of smoking behaviors by socio-demographic characteristics across the 2004-2006 pooled population, several statistically significant differences across populations can be identified in terms of illegal versus legal cigarette use. First, individuals residing in households within which monthly household income reaches 3000PLN per month or more are statistically less likely to possess illicit cigarette packs (5.07%) than their counterparts with household incomes under 1000 PLN per month (14.26%). Second, farmers are statistically more likely to possess illicit cigarette packs (14.83%) than their counterparts who are Specialists, Business Owner and/or in positions of Management (3.71%). Third, households in the Northeast region of Poland are significantly more likely to possess cigarette packs of illicit origin (31.5%) than any other region in Poland with the exception of the Middle-East region of Poland. Here, the prevalence of illicit cigarette packs is comparably high (27.8%).

Table 8 uses confidence interval analysis to determine the most significant marketplace characteristics associated with illegal cigarette purchases in Poland. The most pronounced finding here is that illicit cigarette packs are statistically more likely to be purchased from open market (42.4%) or mobile street vendors (83%) while legal cigarette packs are statistically least likely to be purchased from either open market vendors (57.6%) or mobile street sellers (17%). However, no discernable statistical differences were identified in terms of pack type, cigarette type, length, or packaging. For details, please see results from confidence interval analysis generated for each survey cross-section of this study as they are provided in Appendix Tables

¹⁸ Empirical tests of this relationship will be conducted in future work.

3A-3E, Appendix Tables 4A-4E and Appendix Tables 5A-5E of this report.

5.0 Conclusions

This report shows that approximately, 2.7% of cigarettes present within Poland's tobacco market lacked any type of excise tax stamp while another 8.4% displayed excise tax stamps from Russia, the Ukraine or Byelorussia. Similarly, 7.8% of the packs presented displayed some combination of foreign health warning and tar, nicotine and CO labels. The study concludes that on average, approximately 11% of cigarettes brought to sale in Poland between the years of 2004 through 2006 were of some illicit nature (bootlegged; counterfeit, etc). At the same time, it is observed that the rate of illicit pack penetration has remained fairly steady over the 2004-2006. That is, rates of illicit cigarette pack penetration are fairly stable across this study's four cross-sections: fall 2005, 12.5% (2.3% no tax; 9.8% no labels); summer 2005, 11.1% (1.6% no tax; 9.5% no labels); fall 2005, 9.2% (3.4% no tax; 5.9% no labels); winter 2006, 12.5% (3.1% no tax; 9.4% no labels).

These estimates are relatively lower but not drastically different when compared to industry-commissioned estimates. The largest dissonance between estimates occurs in region-specific estimates of illicit cigarette penetration. Media and industry studies provide relatively inflated rates for the eastern regions of Poland when compared to the results of this study.

Recent years, including EU accession, have led to significant increases in Poland's excise tax levels (see Appendix C for details). As a result, the percentage share of tax in retail price has increased accordingly. Figure 3 below report the percent share of tobacco excise taxes in retail cigarette price for the L&M brand of cigarettes. Nevertheless, Poland's revenues from tobacco taxes continue to rise steadily. (See figures 4 and 5 below).

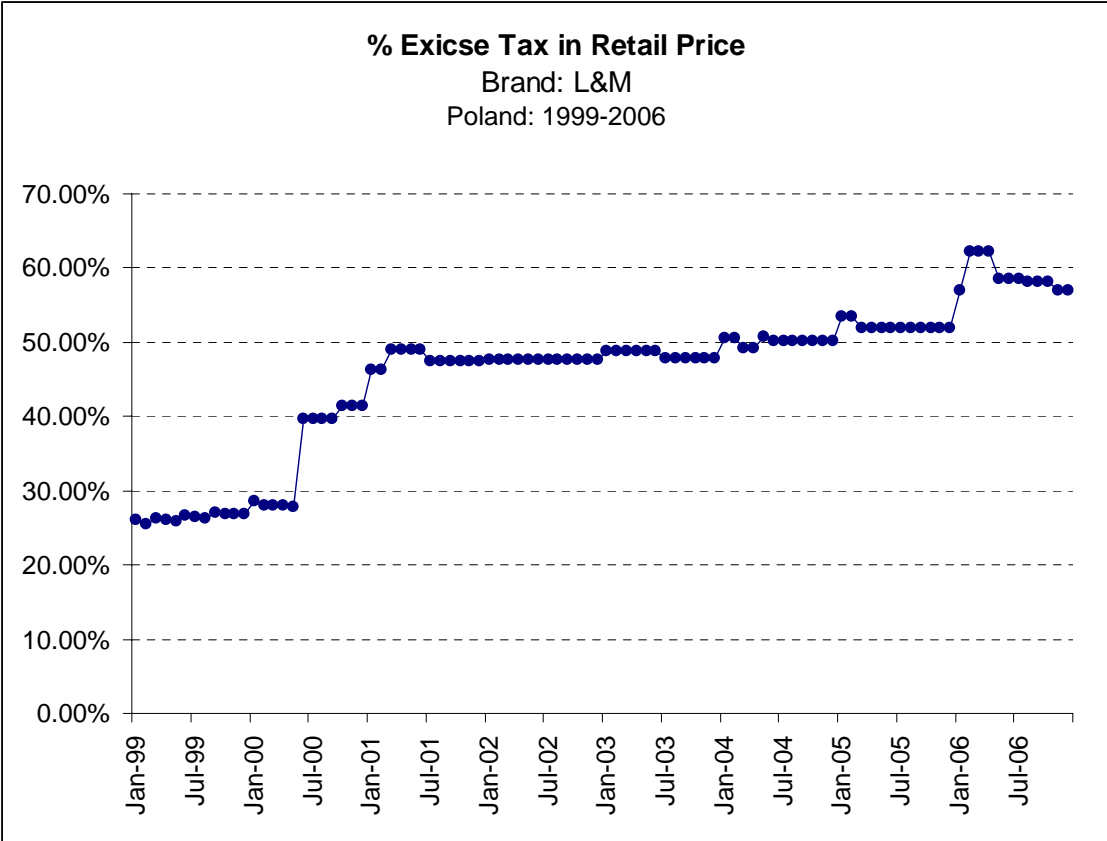


Figure 3 – Excise tax data provided by the Ministry of Finance of the Republic of Poland

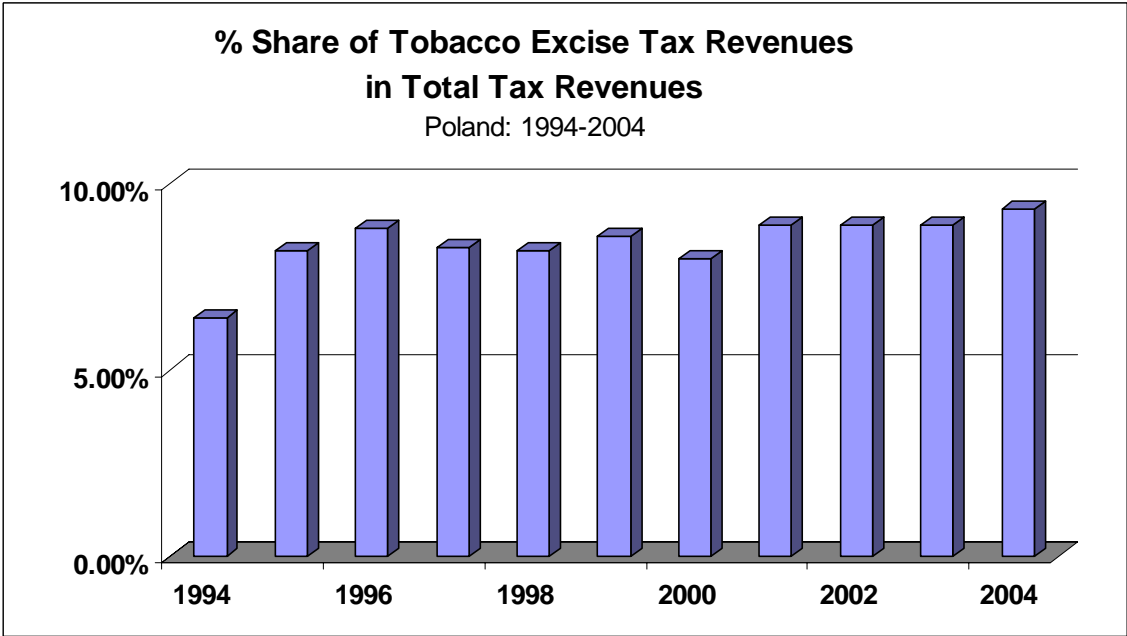


Figure 4 – Data provided by the Ministry of Finance of the Republic of Poland

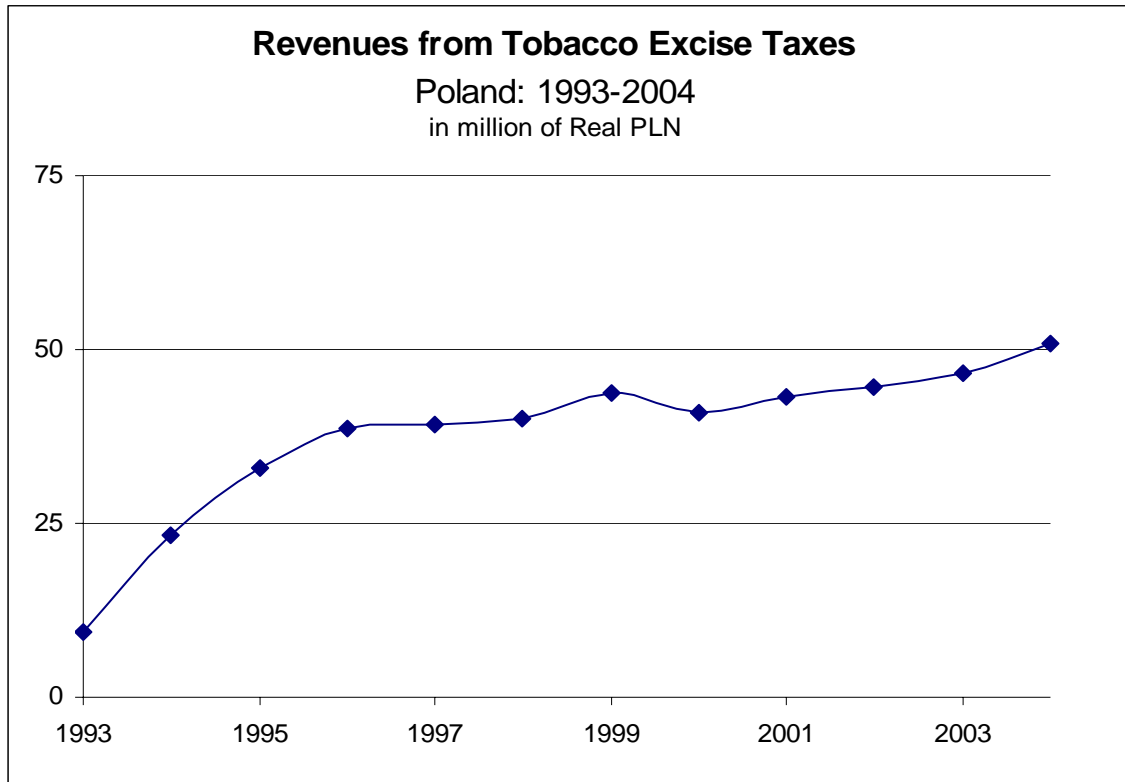


Figure 5 – Data provided by the Ministry of Finance of the Republic of Poland

These study findings negate the tobacco industry’s arguments which adamantly state that smokers, in response to higher cigarette prices, will, in large numbers turn to consuming cigarettes derived from the black market. The finding that rates of illicit cigarette pack prevalence has not significantly increased over the last couple of years is encouraging and suggests that Poland, in its new role as the EU’s external eastern border, has been successful in keeping a cap on illegal border crossing between Russia, Byelorussia and the Ukraine. However, in-country enforcement which would monitor compliance among fixed-stall, open market retailers of tobacco products or help limit/ban the number of mobile street sellers within Poland’s borders remains lacking.

Cigarette smuggling in Poland does not stand alone but rather, resonates from a larger regional and global cigarette smuggling problem. This study has produced estimates of the levels and sources of smuggled cigarette sales in Poland and in doing so, has provided some scientific evidence to help Poland’s government move a step closer towards a most effective mix of tobacco control measures. Although the economic implications of fiscal and legislative tobacco control tools remain unclear, this study sets forth a few policy suggestions including: continued increases in tobacco tax rates as a means to increasing governmental tax revenues

and improving public health; sustained efforts or if possible, continued improvements in the efficacy of Poland's Eastern border control in keeping illicit cigarette packs out of the EU; as well as the initiation of proactive efforts on the part of the legal authorities, in enforcing bans on the sale of illegal products, particularly among mobile street-vendors and open-air markets.

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APPENDIX A. Summary of Tobacco Control Legislation in Poland: 1995-present

On November 9th, 1995, the Law on the Protection of Public Health Against the Effects of Tobacco Use was ratified by the Parliament of the Republic of Poland. Poland became the first of the former Soviet Bloc countries to adopt a progressive tobacco control program. Specific provisions include:

Restrictions on Smoking in Public Places – pertain to all of the following except in areas expressly set aside for smokers:

- health care establishments
- schools and other educational facilities
- closed spaces on the premises of institutions of employment and other public service buildings
- cinemas, theaters
- airline flights

Restrictions on Cigarette Sales – total ban on the sale of:

- cigarettes to minors (under the age of 18)
- individual cigarettes
- packages containing less than 20 cigarettes
- vending machine sales
- all forms of smokeless tobacco

Also, given restrictions on smoking in public places, sales of tobacco in public places (i.e. vending in or at the cinema, theatres, medical centers, schools domestic flights) has also been banned.

Counter-Advertising

I. Ingredient Labels

Since 1991, tar and nicotine information have been required to be present on all packs sold in the country. Over the last decade, this requirement has been substantially revised, sharpened and enforced through parliamentary regulation.

Content labels must occupy information about the levels of tar and nicotine per one cigarette. Note, since 1991, tar and nicotine listings have been required on all packs sold in the country. This requirement has been sharpened through amendments in recent years:

- 1998: maximum tar and nicotine yields set at 15 mg tar; 1.5 mg nicotine
- 2000: maximum tar and nicotine yields set at 12 mg tar; 1.2 mg nicotine
- 2004/2006: maximum tar and nicotine yields set at 10 mg tar; 1 mg nicotine; CO 10 mg (must occupy not less than 10% of the total area which they are displayed on).

II. Health Warning Labels

Original law established in 1996: required tobacco packaging to display at least two different labels warning against the adverse effects of tobacco use. These warnings had to occupy at least 30% of each of the largest sides of a single tobacco package. This law also encompassed tobacco advertising. Health warning labels had to occupy at least 20% of any cigarette advertisement. Message content included:

- “Smoking causes heart disease”
- “Smoking causes cancer”

Amended in 2004/2006: requires the presence of at least two different labels warning against the adverse effect of tobacco use.

Spatial/content requirements are as follows:

- The Primary Label: must occupy at least 30% of the total area of the largest side of the packaging. The content of the primary label must include either:

- "Smoking kills"; or
- "Smoking hurts you and those around you"

- Additional Label(s): must occupy at least 40% of the total area of the second largest side of the packaging. The content of the additional label may include any of the following:

- "Tobacco smokers die younger"
- "Tobacco smoking clogs arteries and causes heart attacks and strokes"
- "Tobacco smoking causes fatal lung cancer"
- "Tobacco smoking when pregnant harms your baby"
- "Protect children: don't make them breathe your tobacco smoke"
- "Your doctor or your pharmacist can help you stop smoking"
- "Tobacco smoking is highly addictive, do not start smoking"
- "Stopping smoking reduces the risk of fatal heart and lung diseases"
- "Tobacco smoking can cause a slow and painful death"
- "By calling 0801108108, you will receive help to stop smoking"
- "Tobacco smoking may reduce the blood flow and causes impotence"
- "Smoking causes aging of the skin"
- "Smoking can damage the sperm and decreases fertility"
- "Smoke contains benzene, nitrosamines, formaldehyde and hydrogen cyanide"

Restrictions on Tobacco Advertising and Promotion

In 1995, original tobacco control law required:

(a) Ban on tobacco and imitation tobacco product ads in:

- public places (cinema; educational, cultural and health institutions)
- electronic media (radio, television)
- in publications aimed at younger people

(b) Ban on promotional activities including sponsorship of political and social events. Ads featuring persons under 25 years of age were also prohibited. Fines for violation measure up to 50,000 PLN (\$1~ 3 PLN)

On September 10th, 1999, amendment added requiring a total industry ban by:

- December 2000, comprehensive ban of all street level (i.e. billboards) tobacco advertisements
- December 2001, comprehensive ban of all tobacco advertising in all remaining printed media

APPENDIX B. Historical Tobacco Taxes: Poland: July 5, 1993 - May 31, 2000

Year	Month	Domestic			International
		Regular Non-Filtered	Regular Filtered	King Size	All Brands
1993	July	8	9.7	11.9	31.7
	November	10	11.7	13.9	31.7
1994	March	12	13.7	16.9	31.7
	September	16.5	19	21.5	36.2
1995	April	21.5	24	26.5	40.7
	June	26.5	29	31.5	45.6
	December	33.8	36.3	38.8	51.3
1996	April	40.3	42.8	46.8	58.3
1997	February	44.3	46.1	52.6	64.1
1998	January	50	51.5	65.5	76.5
1999	January	55	56.7	72.1	84.2
	March	57.8	59.5	75.7	88.4
	June	60.6	62.5	79.4	92.8
	September	63.7	65.6	83.4	97.4
2000	January	70.1	72.16	91.74	107.1

July 1993: all cigarette packs (domestic and imported) required to display excise stamps.

APPENDIX C. Tobacco Tax System: Poland: June 1, 2000 - present

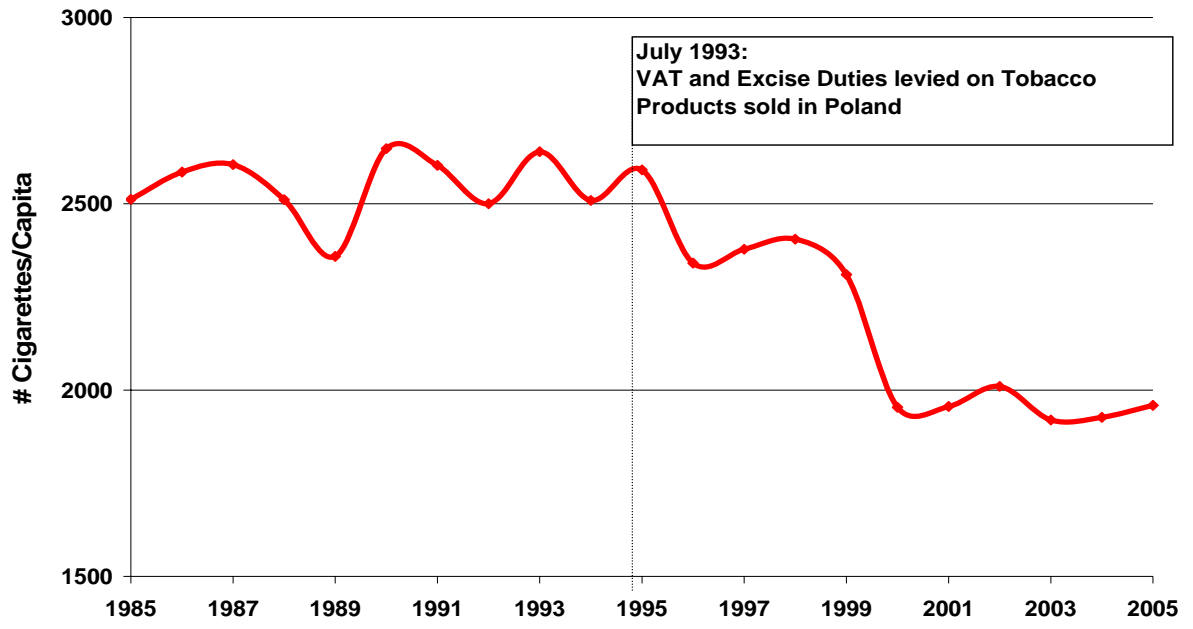
Year	Month	VAT	Specific Tax	Ad valorem Tax
2000	June	22%	37.50	25.00%
	October	22%	42.00	25.00%
2001	January	22%	50.00	25.00%
2002	January	22%	52.00	25.00%
2003	January	22%	57.00	25.00%
2004	January	22%	64.00	25.00%
	May	22%	64.00	26.67%
2005	January	22%	68.38	28.48%
2006	January	22%	75.12	31.30%
2007	January	22%	80.87	33.70%

Notes:

- 1) Additionally, the minimum excise tax on cigarettes beginning 17.12.2004: 115.80 PLN/1000 pieces
- 2) Additionally, the minimum excise tax on cigarettes beginning 26.03.2005: 129.44 PLN/1000 pieces
- 3) Additionally, the minimum excise tax on cigarettes beginning 17.01.2007: 150.00 PLN/1000 pieces

May 2001: New tax system requires individual packaging to display retail price at point

**Appendix D. Annual Consumption of Cigarettes per Capita
Poland: 1993-2005**



Source: Central Statistical Office