

# Socioeconomic and country variations in cross-border cigarette purchasing as tobacco tax avoidance strategy. Findings from the ITC Europe Surveys

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## ABSTRACT

**Background** Legal tobacco tax avoidance strategies such as cross-border cigarette purchasing may attenuate the impact of tax increases on tobacco consumption. Little is known about socioeconomic and country variations in cross-border purchasing.

**Objective** To describe socioeconomic and country variations in cross-border cigarette purchasing in six European countries.

**Methods** Cross-sectional data from adult smokers (n=7873) from the International Tobacco Control (ITC) Surveys in France (2006/2007), Germany (2007), Ireland (2006), The Netherlands (2008), Scotland (2006) and the rest of the UK (2007/2008) were used. Respondents were asked whether they had bought cigarettes outside their country in the last 6 months and how often.

**Findings** In French and German provinces/states bordering countries with lower cigarette prices, 24% and 13% of smokers, respectively, reported purchasing cigarettes frequently outside their country. In non-border regions of France and Germany, and in Ireland, Scotland, the rest of the UK and The Netherlands, frequent purchasing of cigarettes outside the country was reported by 2–7% of smokers. Smokers with higher levels of education or income, younger smokers, daily smokers, heavier smokers and smokers not planning to quit smoking were more likely to purchase cigarettes outside their country.

**Conclusions** Cross-border cigarette purchasing is more common in European regions bordering countries with lower cigarette prices and is more often reported by smokers with higher education and income. Increasing taxes in countries with lower cigarette prices, and reducing the number of cigarettes that can be legally imported across borders could help to avoid cross-border purchasing.

## INTRODUCTION

Tobacco tax increases have been demonstrated to be the single most effective and cost-effective intervention for reducing tobacco use.<sup>1,2</sup> However, not all smokers react to tax increases by quitting smoking because they have several other options.<sup>3</sup> Smokers may not let the tax increase influence their smoking behaviour, they may cut back on the number of cigarettes smoked, or switch to discount brands or rolling tobacco. Moreover, they may use legal tax avoidance strategies, such as internet shopping and cross-border shopping or illegal tax evasion strategies, such as smuggling or buying

counterfeit tobacco.<sup>3</sup> Tax avoidance and evasion strategies may attenuate the impact of tax increases on tobacco consumption<sup>4</sup> (although some have a different view<sup>5</sup>) and reduce tax revenue, and also may undermine confidence in law enforcement.

The European Union (EU) has open borders between EU countries and tax and price rates of tobacco differ substantially between EU countries.<sup>1,6–8</sup> In 2009, cigarette prices varied sixfold and affordability fourfold, between EU countries.<sup>8</sup> Europe's open borders might tempt smokers from countries with high cigarette prices to use cross-border cigarette purchasing as a tobacco tax avoidance strategy. According to the EU regulations, there are no limits on how much tobacco private persons can import from other EU countries, as long as the products are purchased for personal use and transported by the smoker himself. Although EU countries may set guide levels (ie, upper limits) on what may be considered personal consumption, the guide level may not be less than 800 cigarettes or 1 kg of rolling tobacco. Limits for importing tobacco from non-EU countries, however, vary from 40 to 200 cigarettes and 50 to 250 g of rolling tobacco.

Previous research showed that cross-border cigarette purchasing was not a problem in Europe in the 1990s.<sup>6</sup> Not many travellers bought tobacco abroad, and those who did bought only small quantities.<sup>6</sup> This could have changed in the 21st century, because the number of EU countries has grown from 12 countries in 1995 to 27 countries in 2007. Also, the price differentials for the same cigarette brand increased from 240% in 1995<sup>6</sup> to 590% in 2007.<sup>7</sup> Recent studies showed that France has significant amounts of cross-border purchasing,<sup>9–11</sup> mainly from Spain, Belgium and Luxembourg.<sup>8</sup> A European Commission survey showed that in 2008, cross-border purchasing was highest in Ireland, the UK and France.<sup>12</sup> However, this study asked about purchasing cigarettes at their last trip in another EU country and did not take into account how often people crossed the border and purchased cigarettes. People may buy cigarettes when they happen to be in a country for a different reason (eg, vacation or business) or they may purposely cross the border to buy cheaper cigarettes. Purposely crossing the border for cheaper cigarettes might be a frequent activity primarily among smokers living close to the border of a country with lower cigarette prices.<sup>13</sup> A study in Germany showed that cross-border cigarette purchasing was

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strongly associated with living near countries with lower cigarette prices, that is, Luxembourg, Poland and the Czech Republic.<sup>14</sup>

In Europe, smoking is more common among lower than higher socioeconomic status (SES) groups.<sup>12</sup> While tobacco tax increases are found to stimulate tobacco use reduction especially among smokers of lower SES,<sup>1, 4</sup> there may also be socioeconomic differences in tax avoidance. Knowledge about SES differences in tax avoidance is important because it may provide information about possible effects of policies that are designed to reduce tax avoidance and whether these are beneficial or detrimental for low SES smokers. Not much is known about this because few studies have used individual-level data to examine tax avoidance strategies. Three studies that used individual-level data and examined socioeconomic differences did not distinguish between cross-border cigarette shopping and other tax avoidance behaviours.<sup>15–17</sup> The few studies that have examined individual differences in cross-border shopping had mixed results.<sup>12, 14, 18, 19</sup> A study from Germany<sup>14</sup> and an EU-wide study<sup>12</sup> found no educational differences. However, recent studies from the USA found that smokers with higher education and income were more likely to purchase cigarettes in another state.<sup>18, 19</sup>

In this study, we describe socioeconomic and country variations in cross-border cigarette purchasing in France, Germany, the Republic of Ireland, The Netherlands and the UK. The UK and Ireland are the two European countries with the highest cigarette prices.<sup>7</sup> Cigarette prices in France and Germany are somewhat lower, while The Netherlands has the lowest cigarette prices of the countries in this study. France and Germany have large borders with countries that have considerably lower cigarette prices. Therefore, we expect cross-border purchasing to be most prevalent in France and Germany.

The following research questions were examined in this study: (1) are there country variations in the prevalence of cross-border cigarette purchasing? (2) are there socioeconomic variations in the prevalence of cross-border cigarette purchasing?

## METHODS

### Sample

Cross-sectional data from 7873 adult smokers from the International Tobacco Control (ITC) Europe Surveys in France, Germany, Ireland, The Netherlands and the UK were used. Results are reported separately for Scotland and the rest of the UK because the ITC Scotland Survey was a separate survey from the ITC UK Survey with its own representative sample of smokers from Scotland. Because the ITC Ireland Survey ended in 2006 and the ITC Netherlands Survey began in 2008, survey waves closest to 2007 were used for the study. See table 1 for fieldwork periods, sample sizes and cooperation rates for each ITC Survey.

Respondents were recruited using probability sampling methods with fixed line telephone numbers selected at random from the population of each country and were surveyed using telephone interviewing. Respondents were eligible if they had smoked at least 100 cigarettes in their lifetime and currently smoked at least once per month. The Netherlands sample differed in that most respondents were surveyed using web interviewing instead of telephone interviewing.<sup>21</sup> The Dutch web sample was drawn from a large probability-based database with respondents who had indicated their willingness to participate in research on a regular basis. Therefore, multivariate analyses controlled for interviewing mode.

### Ethics

All surveys were cleared for ethics by the Office of Research Ethics of the University of Waterloo, Canada, and also by the appropriate institutions in all participating countries.

### Measurements

The questions used for the ITC Europe Surveys were all adapted from the conceptual model and questionnaire of the ITC Four Country Survey.<sup>22</sup>

Cross-border cigarette purchasing was measured by asking respondents whether they had bought cigarettes outside their country in the last 6 months. Respondents who answered in the affirmative were asked how often they had done this in the

**Table 1** Fieldwork period, sample size of current smokers and cooperation rate for each International Tobacco Control (ITC) Europe Survey

	Fieldwork period	Sample size	Cooperation rate (%)*
Netherlands†			
Telephone sample	March 2008–April 2008	404	78.1
Web sample	April 2008	1668	78.1
France‡	December 2006–February 2007	1735	75.3
Germany§	July 2007–November 2007	1515	94.9
Republic of Ireland¶	February 2006–March 2006	577	71.9
Scotland**	February 2006–March 2006	507	66.7
UK (w/o Scotland)††	September 2007–February 2008	1467	74.6
Total		7873	

\*Cooperation rates were calculated according to the AAPOR definition COOP4: The proportion of all cases interviewed of all eligible respondents who were contacted and capable of doing the interview.<sup>20</sup> The rate for the Republic of Ireland is equal to the retention rate, because respondents lost to follow-up in the preceding wave were not replenished in the survey wave that was used for this study.

†Provinces in The Netherlands: Drenthe (n=63), Flevoland (n=32), Friesland (n=107), Gelderland (n=237), Groningen (n=90), Limburg (n=148), Noord-Brabant (n=327), Noord-Holland (n=324), Overijssel (n=142), Utrecht (n=123), Zeeland (n=35), Zuid-Holland (n=444).

‡Regions in France: Alsace (n=53), Aquitaine (n=103), Auvergne (n=40), Bourgogne (n=53), Bretagne (n=102), Centre (n=65), Champagne-Ardenne (n=44), Franche-Comté (n=37), Ile-de-France (n=308), Languedoc-Roussillon (n=61), Limousin (n=15), Pays de la Loire (n=85), Lorraine (n=87), Midi-Pyrénées (n=73), Nord-Pas-de-Calais (n=117), Haute-Normandie (n=69), Basse-Normandie (n=43), Picardie (n=60), Poitou-Charentes (n=42), Provence-Alpes-Côte-d'Azur (n=134), Rhône-Alpes (n=144).

§States in Germany: Baden-Württemberg (n=93), Bavaria (n=245), Berlin (n=78), Brandenburg (n=59), Bremen (n=14), Hamburg (n=42), Hessen (n=116), Mecklenburg-Vorpommern (n=18), Lower Saxony (n=104), North Rhine-Westphalia (n=370), Rhineland-Palatinate (n=85), Saarland (n=19), Saxony (n=85), Saxony-Anhalt (n=66), Schleswig-Holstein (n=68), Thuringia (n=53).

¶Geographic regions in Ireland: Dublin City and County (n=169), Rest of Leinster (n=142), Munster (n=160), Connaught and Part of Ulster (n=106).

\*\*Geographic regions in Scotland: Argyll and Clyde (n=48), Ayrshire and Arran (n=33), Borders (n=5), Dumfries and Galloway (n=9), Fife (n=37), Forth Valley (n=23), Grampian (n=62), Greater Glasgow (n=84), Highland (n=23), Lanarkshire (n=41), Lothian (n=93), Orkney Shetland and Western Isles (n=6), Tayside (n=43).

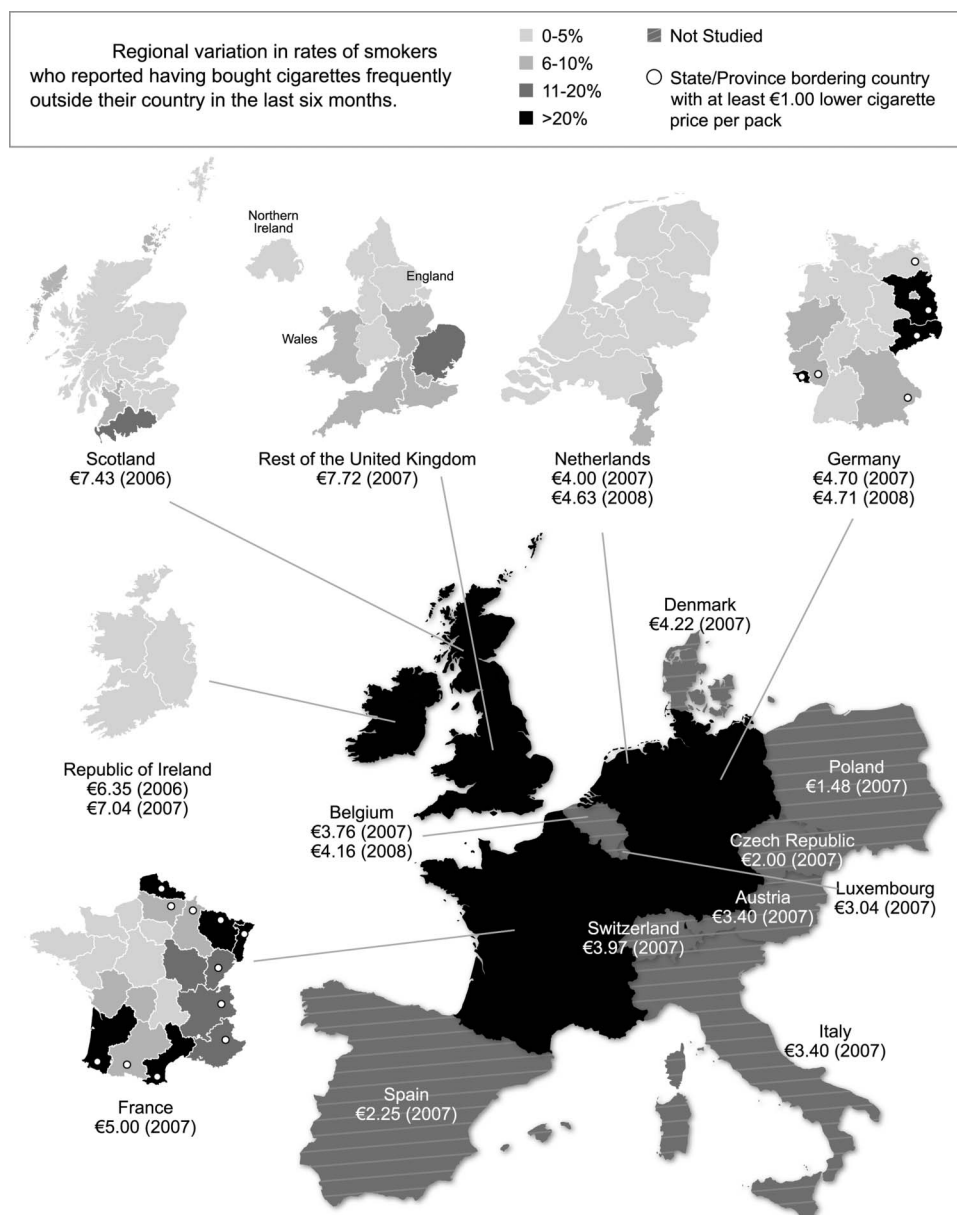
††Regions in UK (w/o Scotland): East Midlands (n=119), Eastern (n=134), London (n=216), North East (n=75), North West (n=160), Northern Ireland (n=53), South East (n=216), South West (n=137), Wales (n=98), West Midlands (n=142), Yorkshire and the Humber (n=117).

previous 6 months. Response categories were 'Only once', 'A few times', 'Many times' and 'All of the time'. A new variable with three categories was constructed for the analyses: (1) no cross-border cigarette purchasing; (2) occasional (ie, only once and a few times) and (3) frequent (ie, many times and all of the time) cross-border cigarette purchasing.

Respondents were categorised as living or not living in a province/state bordering a country that has cigarette prices at least €1.00 lower per pack. The retail price of the most popular price category cigarettes in January of the survey year was used.<sup>23</sup> This is country-level price data, as tobacco taxation does not vary at the regional level within the included countries. The neighbouring countries of The Netherlands, Ireland and Scotland did not have cigarette prices €1.00 lower per pack in the ITC survey year that was used in this study (see figure 1). All neighbouring countries of France and some of the neighbouring countries of Germany (ie, Poland, the Czech Republic and Austria) had cigarette prices at least €1.00 lower per pack. Therefore,

respondents from the French provinces Alsace, Aquitaine, Champagne-Ardenne, Franche-Comté, Languedoc-Roussillon, Lorraine, Midi-Pyrénées, Nord-Pas-de-Calais, Picardie, Provence-Alpes-Côte-d'Azur and Rhône-Alpes, and respondents from the German states of Bavaria, Brandenburg, Mecklenburg-Vorpommern, Rhineland-Palatinate, Saarland and Saxony were categorised as living in a province/state bordering a country that has cigarette prices at least €1.00 lower per pack.

Education and income were used as indicators of SES.<sup>24</sup> Education was categorised into three levels: low (no degree, elementary school and lower secondary education), moderate (secondary vocational education and middle secondary education), and high (upper secondary education, university and post-graduation). The education levels were only partly comparable across countries because of differences in educational systems. Respondents from most countries were asked about their gross household income per month. However, respondents from Germany and France were asked about their net household



**Figure 1** Regional variation in rates of smokers who reported having bought cigarettes frequently outside their country in the last 6 months. Prices in the figure are the retail prices of the most popular price category cigarettes in January of the year shown in brackets.

income. Also, answering categories were not comparable across all countries. Therefore, we created a relative income variable that was categorised into tertiles for each country. Respondents who did not answer the income question ( $n=952$ ) were recorded in a separate category.

Covariates in the multivariate analyses were gender, age group (18–24, 25–39, 40–54 and 55 years and older), employment, smoking status (daily vs occasional smoker), heaviness of smoking, intention to quit (within 6 months vs not within 6 months), smoking exclusively rolling tobacco and/or manufactured cigarettes, and interviewing mode. The Heaviness of Smoking Index (HSI) was created as the sum of two categorised measures: number of cigarettes per day and time before smoking the first cigarette of the day.<sup>25</sup> HSI values ranged from 0 to 6 with higher values indicating stronger nicotine dependence.<sup>25</sup>

### Analyses

To confirm that our measure of cross-border cigarette purchasing is indicative of a tax avoidance strategy, we analysed the differences in the average of self-reported prices for a pack of cigarettes at last purchase between respondents who reported frequent, occasional and no cross-border purchasing in the last 6 months, with  $t$  tests. Country and socioeconomic variations in the prevalence of cross-border cigarette purchasing were examined with  $\chi^2$  tests. Also, a multinomial logistic regression analysis was performed with cross-border cigarette purchasing as the dependent variable. Although the dependent variable had an ordinal distribution, we employed multinomial regression because this analysis was capable of producing estimated ORs for both occasionally and frequently purchasing cigarettes outside the country rather than not purchasing cigarettes outside the country, according to values of the independent variables. Independent variables were gender, age group, educational level, income level, employment, smoking status, heaviness of smoking, intention to quit, smoking exclusively rolling tobacco, country/region and interviewing mode.

## RESULTS

### Sample characteristics

Sample characteristics for each country and (border or non-border) regions are shown in table 2. There were significant country/region differences in all variables that were used in this study. Differences between countries were relatively large for educational level. However, it should be noted again that educational levels were only partly comparable across countries. The Netherlands had the highest percentage of smokers not willing to answer the question about their income. Unemployment among smokers was highest in Scotland. Smokers from Scotland and the rest of the UK were most often daily smokers and scored highest on the HSI. Smokers from Scotland had the highest intention to quit smoking within 6 months. Smokers from The Netherlands were more likely to report smoking exclusively rolling tobacco, while smoking factory made cigarettes exclusively or alongside rolling tobacco was reported most often by smokers from Ireland.

There were some significant differences in sample characteristics between smokers living in border and non-border provinces/states in France and Germany. Smokers from border provinces of France were less educated, had lower income levels, and were more often unemployed than smokers from non-border provinces of France. Smokers from border states of Germany were more often male, were less educated and smoked more often factory made cigarettes than smokers from non-

border states. These differences may affect or be affected by the decision to purchase cigarettes across the border.

### Confirmation of cross-border cigarette purchasing measure

Respondents who reported having frequently purchased cigarettes outside their country in the last 6 months paid significantly less for their cigarettes (on average €4.24 for one pack) than respondents who reported having occasionally purchased cigarettes outside their country (€4.64) ( $t=2.57$ ,  $p=0.011$ ). There was no significant difference in price paid for a pack of cigarettes between respondents who reported having occasionally purchased cigarettes outside their country and respondents who reported not having purchased cigarettes outside their country in the last 6 months (€4.85) ( $t=0.93$ ,  $p=0.351$ ).

The same pattern was found in each country except Ireland. In Ireland, smokers who frequently bought cigarettes outside their country paid significantly more for their cigarettes than other respondents. The decrease in price between smokers who frequently bought cigarettes outside their country and those who bought them occasionally was largest in France and Germany.

### Country variations in cross-border cigarette purchasing

As can be seen in table 3, there were large differences in cross-border cigarette purchasing between countries and regions ( $\chi^2(14)=771.59$ ,  $p<0.001$ ). Highest rates of smokers reporting frequently purchasing cigarettes outside their country in the last 6 months were found in the border regions of France (24%) and Germany (13%). In non-border regions of France and Germany, only 5% reported frequent cross-border cigarette purchasing in the last 6 months. Highest rates of smokers reporting not having purchased cigarettes outside their country were found in The Netherlands (83%), Scotland (78%) and Ireland (74%).

### Socioeconomic variations in cross-border cigarette purchasing

Table 3 shows that there were significant variations in cross-border cigarette purchasing between educational levels ( $\chi^2(4)=130.19$ ,  $p<0.001$ ) and income levels ( $\chi^2(6)=184.88$ ,  $p<0.001$ ), in particular for occasional purchasing. Of smokers with a high educational level, 31% reported occasionally buying cigarettes outside their country, and 8% reported frequently buying cigarettes outside their country in the last 6 months. For smokers with a low educational level, the percentages were 18% and 5%, respectively. Of smokers with a high income level, 32% reported occasionally buying cross-border and 8% frequently. Of smokers with a low income level, 19% reported occasionally buying cross-border and 6% frequently.

### Correlates of cross-border cigarette purchasing

The multinomial logistic regression analysis in table 4 shows that occasionally buying cigarettes outside the country was more frequently reported by younger smokers, smokers with a higher education and income level, employed smokers, daily smokers, smokers who smoked factory made cigarettes, and telephone respondents. The correlates of frequently buying cigarettes outside the country were mostly comparable, with a few notable differences. Smokers who reported frequently purchasing cigarettes outside their country were more likely to be heavier smokers and were less likely to plan to quit smoking. Smoking factory made cigarettes was not associated with frequent cross-border purchasing. The strongest correlate of frequent cross-border cigarette purchasing was country and region. Respondents living in a border province of France, a border



**Table 2** Differences in demographic and smoking characteristics across country and (border or non-border) region (%)

	Netherlands (n=2072)	France Border provinces* (n=879)	Non-border provinces (n=856)	Germany Border states† (n=469)	Non-border states (n=1046)	Ireland (n=577)	Scotland (n=507)	UK (w/o Scotland) (n=1467)	Test of differences between country/ region
<i>Demographic characteristics</i>									
Gender									
Female	45.7	46.3	42.4	36.8	44.8	45.4	45.8	49.8	$\chi^2$ (7)=29.16
Male	54.3	53.7	57.6	63.2	55.2	54.6	54.2	50.2	p<0.001
Age group									
18–24	11.5	17.9	17.0	14.5	13.4	19.9	11.5	13.4	$\chi^2$ (21)=167.42
25–39	29.3	33.2	38.0	27.7	32.5	34.8	25.5	35.5	p<0.001
40–54	34.7	35.0	30.0	36.0	36.2	25.8	33.2	30.4	
55 years and older	24.5	13.9	14.9	21.7	17.9	19.4	29.8	20.7	
Educational level									
Low	35.4	16.8	17.0	29.3	19.5	31.1	23.0	24.0	$\chi^2$ (14)=452.03
Moderate	44.7	39.0	33.6	34.7	38.0	32.3	35.3	31.5	p<0.001
High	19.9	44.2	49.4	36.0	42.5	36.5	41.7	44.5	
Income level									
Low	24.9	27.2	23.9	24.5	21.8	37.6	38.1	28.6	$\chi^2$ (21)=477.60
Moderate	23.0	30.0	26.5	24.1	28.8	20.8	28.2	31.4	p<0.001
High	30.1	40.0	45.4	36.7	35.9	33.4	25.2	30.7	
No answer	22.0	2.7	4.1	14.7	13.6	8.1	8.5	9.3	
Employment									
Unemployed	39.3	33.1	28.4	28.3	25.7	33.1	46.6	39.1	$\chi^2$ (7)=124.48
Employed	60.7	66.9	71.6	71.7	74.3	66.9	53.6	60.9	p<0.001
<i>Smoking characteristics</i>									
Smoking status									
Daily smoker	92.7	92.0	90.7	92.3	90.7	89.6	93.3	95.8	$\chi^2$ (7)=39.55
Occasional smoker	7.3	8.0	9.3	7.7	9.3	10.4	6.7	4.2	p<0.001
Heaviness of smoking†									
0–1	28.4	44.5	48.2	43.2	37.7	30.4	23.0	23.7	$\chi^2$ (14)=311.70
2–4	63.7	52.1	48.3	51.4	56.9	61.2	63.7	68.4	p<0.001
5–6	7.9	3.4	3.5	5.4	5.5	8.4	13.2	8.0	
Intention to quit									
Not within 6 months	78.5	62.8	61.3	77.4	73.3	64.6	58.4	73.1	$\chi^2$ (7)=189.05
Within 6 months	21.5	37.2	38.7	22.6	26.7	35.4	41.6	26.9	p<0.001
Smokes exclusively rolling tobacco									
Yes, exclusively rolling tobacco	32.1	13.1	11.3	10.0	13.9	4.3	17.0	27.5	$\chi^2$ (7)=451.03
No, factory made cigarettes or both	67.9	86.9	88.7	90.0	86.1	95.7	83.0	72.5	p<0.001

\*State/province bordering country with cigarette prices at least €1.00 lower per pack (retail price of the most popular price category cigarettes in January of the survey year).

†Heaviness of smoking is used as a continuous variable in the regression analyses; HSI values ranged from 0 to 6 with higher values indicating stronger nicotine dependence.

state of Germany, and respondents living in the UK (excluding Scotland) were more likely to frequently buy cigarettes outside their country than respondents from The Netherlands. The Netherlands was chosen as the reference country because cross-border purchasing was lowest in this country.

### Cross-border cigarette purchasing in border regions

As illustrated in figure 1, the highest rates of frequent cross-border purchasing were found in the French provinces Nord-Pas-de-Calais, Lorraine, Alsace, Aquitaine and Languedoc-Roussillon, and in the German states of Brandenburg, Saxony and Saarland. These provinces/states border Belgium (Nord-Pas-de-Calais and Lorraine), Luxembourg (Lorraine and Saarland), Switzerland and Germany (Alsace), Spain (Aquitaine and Languedoc-Roussillon), Poland (Brandenburg and Saxony) and the Czech Republic

(Saxony). Please note that figure 1 provides merely an indication of regional variations as the number of respondents is low for some provinces/states (see footnotes of table 1). In other analyses, respondents from all border provinces/states were taken together per country which yielded a satisfactory number of respondents per category (see table 2).

An additional multinomial logistic regression analysis was performed on respondents from the above mentioned French provinces and German states with the highest rates of frequent cross-border cigarette purchasing (n=552, not shown in tables). A notable difference with the correlates of cross-border purchasing among all respondents of the study was that higher income was not associated with frequent cross-border purchasing but it was associated with fewer reports of occasional cross-border purchasing.

**Table 3** Differences in cross-border cigarette purchasing between country/region, educational levels and income levels (%)

	No cross-border purchasing	Occasional cross-border purchasing	Frequent cross-border purchasing	Test of differences in cross-border purchasing
Country and region				
Netherlands	82.7	14.9	2.4	$\chi^2$ (14)=771.59 p<0.001
Border provinces of France	48.6	27.8	23.7	
Non-border provinces of France	66.5	28.9	4.6	
Border states of Germany	52.6	34.0	13.4	
Non-border states of Germany	64.3	30.8	4.9	
Ireland	73.5	23.4	3.1	
Scotland	77.9	17.6	4.5	
UK (w/o Scotland)	63.3	30.1	6.6	
Educational level				
Low	76.5	18.2	5.3	$\chi^2$ (4)=130.19 p<0.001
Moderate	69.4	23.5	7.1	
High	61.4	30.7	7.8	
Income level				
Low	75.7	18.5	5.8	$\chi^2$ (6)=184.88 p<0.001
Moderate	69.0	23.6	7.4	
High	59.2	32.4	8.4	
No answer	75.7	19.7	4.5	

## DISCUSSION

This study showed that in most of the European countries studied, only a small minority of smokers reported frequent cross-border cigarette purchasing. The proportion was, however, higher in French and German provinces/states bordering countries with lower cigarette prices (ie, Belgium, Luxembourg, Switzerland, Spain, Poland and the Czech Republic), where 24% of French smokers and 13% of German smokers reported purchasing cigarettes frequently outside their country. In non-border regions of France and Germany, Ireland, the UK and The Netherlands, frequently purchasing cigarettes outside the country was reported by only 2–7% of smokers. Occasionally purchasing cigarettes outside the country was more commonly reported, but this might not always be indicative of tax avoidance. Smokers who occasionally purchased cigarettes outside the country did not pay significantly less on average for their cigarettes than smokers who never purchased outside the country, whereas smokers who frequently purchased outside the country did pay significantly less on average. Therefore, we suspect that smokers who cross the border frequently and buy cigarettes may do this intentionally to avoid taxes, whereas smokers who do this occasionally may be outside their country in the normal course of their activities, and could take advantage of such travelling by purchasing cheaper cigarettes.

Cross-border cigarette purchasing was more prevalent among smokers with higher education and income. This is a somewhat counterintuitive finding, and seems contradictory to earlier findings that low SES smokers use contraband cigarette purchasing as a strategy to deal with the increased cost of cigarettes.<sup>11–26</sup> However, other studies have also shown that higher SES smokers are more likely to purchase cigarettes from low or untaxed sources than lower SES smokers.<sup>15–17</sup> A possible explanation is that cross-border purchasing incurs travel costs, which smokers with lower education and income may not be able to pay up-front,<sup>16</sup> while purchasing contraband cigarettes is often possible in the immediate social environment of low SES smokers.<sup>26</sup> Additionally, the larger percentage of more highly educated and high-income smokers who occasionally purchase cigarettes abroad

may reflect the fact that smokers with higher education and income levels travel abroad more often for vacations and work.<sup>27</sup>

## Limitations

Because cross-sectional data were used for this study, no conclusions on causal links between predictor variables and cross-border cigarette purchasing could be drawn.

Fieldwork periods differed across countries, and the mode of interviewing was different for most of the ITC Netherlands sample. Also, educational levels and income levels were only partly comparable across countries because of differences in educational systems and differences in income variables. However, we explored different categorisations of educational levels and income levels and these yielded comparable results. Therefore, we do not think this has influenced our results.

We assumed that smokers who reported frequently purchasing cigarettes outside their country did this intentionally to avoid taxes. Alternatively, these smokers may routinely travel to other countries in the normal course of their activities, for example, because they work across the border. Another issue is that we were not able to distinguish between legal tax avoidance and illegal tax evasion, because we did not ascertain the quantities of cigarettes imported. Future research should therefore assess cross-border cigarette purchasing in more detail, including quantities of cigarettes bought.

Living close to an open border with a country with lower cigarette prices was operationalised as living in certain border provinces/states. This is a very rough measure that is affected by the shape and size of the province/state. It would have been better to know the actual distance between respondents' homes and the country border. Also, because the number of respondents was low for some provinces/states, we could only provide an indication of regional variations.

## Future research

In this study, respondents were only asked whether they bought cigarettes outside their country and how often they did this. In

**Table 4** Multinomial logistic regression analysis of correlates of occasional and frequent categories of cross-border cigarette purchasing—no cross-border purchasing is reference category (n=7752)

	Occasional vs no cross-border purchasing OR (95% CI)	Frequent vs no cross-border purchasing OR (95% CI)
Gender		
Female	1.00	1.00
Male	1.10 (0.98 to 1.23)	1.07 (0.88 to 1.30)
Age group		
18–24	1.00	1.00
25–39	0.74 (0.61 to 0.90)**	0.71 (0.51 to 0.98)*
40–54	0.78 (0.66 to 0.93)**	0.58 (0.43 to 0.77)***
55 years and older	0.75 (0.64 to 0.89)***	0.77 (0.58 to 1.01)
Educational level		
Low	1.00	1.00
Moderate	1.23 (1.06 to 1.43)**	1.21 (0.93 to 1.57)
High	1.51 (1.30 to 1.76)***	1.36 (1.05 to 1.78)*
Income level		
Low	1.00	1.00
Moderate	1.25 (1.07 to 1.47)**	1.33 (1.02 to 1.73)*
High	1.87 (1.61 to 2.17)***	1.76 (1.36 to 2.27)***
No answer	1.16 (0.94 to 1.43)	1.08 (0.73 to 1.60)
Employment		
Unemployed	1.00	1.00
Employed	1.25 (1.09 to 1.42)***	1.19 (0.95 to 1.49)
Smoking status		
Daily smoker	1.00	1.00
Occasional smoker	0.68 (0.54 to 0.85)***	0.40 (0.24 to 0.68)***
Heaviness of smoking	0.99 (0.95 to 1.03)	1.11 (1.04 to 1.19)**
Intention to quit		
Not within 6 months	1.00	1.00
Within 6 months	0.94 (0.84 to 1.06)	0.62 (0.50 to 0.78)***
Smokes exclusively rolling tobacco		
Yes, exclusively rolling tobacco	1.00	1.00
No, factory made cigarettes or both	1.31 (1.13 to 1.53)***	0.81 (0.64 to 1.03)
Country and region		
The Netherlands	1.00	1.00
Border provinces of France	1.83 (1.34 to 2.48)***	12.42 (6.82 to 22.59)***
Non-border provinces of France	1.30 (0.96 to 1.76)	1.66 (0.86 to 3.21)
Border states of Germany	2.13 (1.53 to 2.96)***	6.42 (3.40 to 12.10)***
Non-border states of Germany	1.56 (1.16 to 2.08)**	1.77 (0.94 to 3.36)
Ireland	1.04 (0.75 to 1.44)	1.05 (0.50 to 2.21)
Scotland	0.85 (0.60 to 1.21)	1.54 (0.76 to 3.14)
UK (w/o Scotland)	1.66 (1.25 to 2.20)***	2.34 (1.28 to 4.29)**
Interviewing mode		
Telephone	1.00	1.00
Web	0.61 (0.46 to 0.82)***	0.60 (0.31 to 1.16)

\*p&lt;0.05.

\*\*p&lt;0.01.

\*\*\*p&lt;0.001.

future research, respondents should be interviewed in more detail about their cross-border shopping behaviours. Important questions are: why did they buy cigarettes abroad? Was buying cigarettes the goal of travelling to another country or were they abroad for other purposes such as vacation or work? In which country did they buy cigarettes? How many cigarettes did they buy, and how often? Did a friend or acquaintance buy cigarettes abroad for them or did they buy cigarettes for others? The answers to these questions could give more insight into the actual reasons behind socioeconomic and country differences in cross-border cigarette purchasing.

### Policy recommendations

Tobacco tax avoidance strategies, such as cross-border cigarette purchasing, may attenuate the impact of tax increases on tobacco consumption.<sup>4</sup> We found in our study that cross-border purchasing was most common in regions bordering countries that have considerably lower cigarette prices. Therefore, increasing tobacco taxes in countries with lower cigarette prices could help to limit cross-border shopping and help motivate smokers from both these countries and from their neighbouring countries to quit smoking.

The EU can also help to limit cross-border cigarette purchasing.<sup>7 28</sup> The EU is urged to implement policy measures to

reduce price differences between EU countries,<sup>28</sup> and also to reduce to 200 per person the number of cigarettes that can be legally imported for personal consumption, or 250 grams of rolling tobacco.<sup>7</sup> These measures make it less lucrative to cross the border for cheaper cigarettes.

## CONCLUSIONS

Cross-border cigarette purchasing was relatively common in French and German provinces/states that border countries with considerably lower cigarette prices (eg, Luxembourg, Spain and Poland). Twenty-four percent of smokers from these French provinces and 13% of smokers from these German states reported frequently purchasing cigarettes outside their country. In non-border regions of France and Germany and in Ireland, the UK and The Netherlands, frequently purchasing cigarettes outside the country was reported by only 2–7% of smokers. Cross-border cigarette purchasing is more prevalent among smokers with higher education and income. Increasing tobacco taxes in countries with lower cigarette prices, and reducing the number of cigarettes that can be legally imported across borders could help to limit cross-border purchasing by smokers from countries with higher cigarette prices.

### What this paper adds

- ▶ Cross-border cigarette purchasing was most common in French and German provinces/states bordering countries such as Luxembourg, Spain and Poland where cigarette prices are considerably lower.
- ▶ In non-border regions of France and Germany, Ireland, the UK and The Netherlands, few smokers reported crossing the border frequently to buy cigarettes.
- ▶ Cross-border cigarette purchasing was more prevalent among smokers with higher education and income.

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# 作为烟草避税策略的跨境卷烟购买的社会经济和国家差异—国际烟草控制政策评估项目 (ITC) 欧洲调查结果

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## 摘要

**背景** 合法的烟草避税策略例如跨境购买卷烟，可能会减弱烟草税增加对烟草消费的影响。目前，我们对跨境购买卷烟中社会经济和国家的差异了解甚少。

**目的** 描述6个欧洲国家跨境卷烟购买的社会经济和国家差异。

**方法** 采用来自于法国（2006/2007年），德国（2007年），爱尔兰（2006年），荷兰（2008年），苏格兰（2006年）和英国其他地区（2007/2008年）的ITC的成年吸烟者的横向调查数据（样本量为7873）。调查对象被问及过去6个月内是否曾跨境购买卷烟以及购买的频率。

**结果** 在法国和德国一些接壤卷烟价格较低国家的边境省/州，分别有24%和13%的吸烟者经常在境外购买卷烟。在这两国的非边境地区，以及爱尔兰、苏格兰、英国的其它地区和荷兰，2-7%的吸烟者经常在境外购买卷烟。比较而言，境外购买卷烟的人更多来自教育程度或收入较高的吸烟者、年轻的吸烟者、每天吸烟者、重度吸烟者以及不打算戒烟者。

**结论** 跨境卷烟购买多见于欧洲靠近卷烟价格较低国家的边境地区，而且常见于较高学历和较高收入的吸烟人群。在卷烟价格较低的地区加税，同时减少可以合法跨境购买卷烟的数量，可有效避免卷烟的跨国购买。

## 前言

提高烟草税已被证实是减少烟草使用最有效和符合成本效益的干预措施<sup>[1,2]</sup>。然而，并不是所有的吸烟者会因烟草税增加而戒烟，因为他们有其他的选项<sup>[3]</sup>。吸烟者可能会避免让烟草税增加影响他们的吸烟行为，如他们可能会减少吸烟量，换成低价品牌或手工卷烟。此外他们可能会采取合法避税策略，如网上购买或跨境购买，或非法逃税策略，如走私或购买假冒烟草<sup>[3]</sup>。避税和逃税策略可能减弱加税对烟草消费的影响<sup>[4]</sup>（虽然存在不同的看法<sup>[5]</sup>），减少税收，并可能削弱执法信心。

欧盟国家间有开放的边境，烟草价格和税收在不同欧盟国家之间大不相同<sup>[1,6-8]</sup>。2009年，欧盟国家间的卷烟价格存在着六倍的差异，购买力存在着四倍的差异<sup>[9]</sup>。欧洲开放的边境可能会诱使高价卷烟国家的吸烟者通过跨境购买卷烟来避税。根据欧盟法规，只要烟草是吸烟者个人使用和携带，对个人从其他欧盟国家回国时携带烟草的数量没有限制。虽然欧盟国家可以在考虑个人消费水平基础上设置参考量（比如上限），但这参考量不会低于800支卷烟或1千克手工卷烟。然而，从非欧盟国家进口的烟草量被限制在40-200支卷烟和50-250克手工卷烟。

以往的研究表明，20世纪90年代的欧洲，跨境购买卷烟还不足以成为一个问题<sup>[6]</sup>。没有多少游客从国外购买烟草，即使购买也只是少量<sup>[6]</sup>。这种情况应该在21世纪发生了变化，因为欧盟国家的数量已经从1995年的12个增加到2007年的27个，而且同种品牌卷烟的价格差异从1995年的240%<sup>[6]</sup>增加到2007年的590%<sup>[7]</sup>。最近的研究表明，法国跨境购买卷烟的数量明显<sup>[9-11]</sup>，主要来源于西班牙、比利时和卢森堡<sup>[8]</sup>。一项欧盟委员会调查结果显示，2008年跨境购买率最高的是爱尔兰、英国和法国<sup>[12]</sup>。然而这项研究只调查了购买者最近一次出入其他欧盟国家购买卷烟的量，并没有考虑跨境购买的频率。人们可能恰巧由于各种不同的原因（如假期或商务）在另一个国家而购买卷烟，或者是有目的的跨境购买更便宜的卷烟。有目的的跨境购买可能经常发生在住在靠近卷烟低价国的边境地区的吸烟者中<sup>[13]</sup>。德国的一项研究表明，跨境购买卷烟与住在卷烟低价国（也就是卢森堡，波兰和捷克）的边境地区具有密切的关联<sup>[14]</sup>。

在欧洲，吸烟在低于较高社会经济地位的人群中更为常见<sup>[12]</sup>。提高烟草税被发现可刺激烟草使用的减少（尤其对于较低社会经济地位的吸烟者<sup>[1,4]</sup>），同时也可产生由于社会经济地位不同造成的避税差异。对这种差异的了解很重要，因为这些信息可以帮助了解减少避税的相关政策的可能效果，同时了解这些政策对社会经济地位较低的吸烟者是否有利。

## 引用建议:

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23:i30-i38.

目前的研究对此了解不多,因为很少有研究用个人层面的数据来验证避税策略。三项用到个人层面数据的研究验证了社会经济的差异,但没有区分开跨境购买卷烟和别的避税行为<sup>[15-17]</sup>。在一些验证了跨境购买的个体差异的研究中,得出的结论各不相同<sup>[12,14,18,19]</sup>。德国的<sup>[14]</sup>一项研究和一项欧盟范围的研究<sup>[12]</sup>没有发现教育的差异。不过,美国最近的研究发现,教育程度较高、收入较高的吸烟者更有可能跨境购买卷烟<sup>[18,19]</sup>。

在本项研究中,我们描述了法国、德国、爱尔兰、荷兰和英国跨境购买卷烟的社会经济和国家差异。英国和爱尔兰是卷烟价格最高的两个欧洲国家<sup>[7]</sup>。卷烟价格在法国和德国稍低,而荷兰是这项研究中卷烟价格最低的国家。法国和德国有很大的边境与一些卷烟价格相当低的国家接壤,因此我们预计跨国购买卷烟在法国和德国最普遍。

本项研究对以下问题进行了验证:(1)跨境购买卷烟的比率有无国家差异?(2)跨境购买卷烟有无社会经济差异?

## 方法

### 样本

采用ITC欧洲横向调查数据(样本量为7873),调查对象来源于法国、德国、爱尔兰、荷兰和英国。ITC苏格兰调查是一项独立于ITC英国调查的研究,有独立的来自苏格兰的有代表性的吸烟者的样本,因此苏格兰和英国其他地区的结果分开进行了报告。因为爱尔兰的调查结束于2006

年,荷兰的调查始于2008年,所以本研究采用了最接近2007年的数据。该数据的实地调查期间,样本大小和应答率见表1。

采用概率统计的方法,该调查对每个国家的人口用从固定电话号码中进行随机选取的方法进行了抽样调查来收录调查对象,并进行了电话调查。调查对象需要满足以下条件,即一生至少吸过100支卷烟而且目前每月至少吸烟一次。荷兰样本的不同之处在于大多数受访者使用了网络调查,而不是电话调查<sup>[21]</sup>。荷兰网络样本抽样于一个大型的基于概率的数据库,并且回应者曾表示愿意参与定期的研究。因此,本研究的多变量分析对调查模式进行了控制。

### 伦理

所有的调查都通过了加拿大滑铁卢大学研究伦理办公室的伦理审核,并通过了所有参与国相关机构的伦理审核。

### 度量标准

ITC欧洲调查的问题均改编自ITC四国调查的概念模型和问卷<sup>[22]</sup>。

跨境购买卷烟是通过询问调查对象在过去6个月是否购买过外国的卷烟来判断。回答购买过的调查对象会被问在过去6个月内的购买频率。答案分类为“只有一次”、“有几次”、“很多次”和“一直”。本研究构建了一个新的三级分类变量进行分析:(1)没有跨境购买卷烟;(2)偶尔跨境购买(即“只有一次”和“有几次”)和(3)经常跨境购买(即“很多次”和“一直”)。

表1 ITC欧洲现场调查时间、样本量和应答率

	调查时间	样本量	应答率(%)*
荷兰†			
电话样本	2008.3–2008.4	404	78.1
网络样本	2008.4	1668	78.1
法国‡	2006.12–2007.2	1735	75.3
德国§	2007.7–2007.11	1515	94.9
爱尔兰¶	2006.2–2006.3	577	71.9
苏格兰**	2006.2–2006.3	507	66.7
英国(不包括苏格兰)††	2007.9–2008.2	1467	74.6
合计		7873	

\*应答率根据美国舆论研究协会定义的COOP4计算:即成功受访人数相对于进行了接触并有能力受访的符合条件的人数的比率。爱尔兰共和国的应答率等于调查保留率,因为上一轮的调查对象失访后没有在当前一轮用于本项研究的调查中进行后续补充。

†荷兰:德伦特(N=63),弗莱福兰(N=32),弗里斯兰省(N=107),海尔德兰省(N=237),格罗宁根(N=90),林堡省(N=148),北布拉班特(N=327),北荷兰省(N=324),上艾瑟尔省(N=142),乌得勒支(N=123),泽兰(N=35),南荷兰省(N=444)。

‡法国:阿尔萨斯省(N=53),阿基坦大区(N=103),奥弗涅省(N=40),勃艮第省(N=53),布列塔尼大区(N=102),中部省(N=65),香槟-阿登省(N=44),弗朗什孔泰省(N=37),法兰西岛大区(N=308),朗格多克-鲁西永省(N=61),利木赞省(N=15),卢瓦尔河地区(N=85),洛林省(N=87),南比利牛斯省(N=73),北加来海峡省(N=117),上诺曼底省(N=69),下诺曼底省(N=43),皮卡第大区(N=60),普瓦图-夏朗德省(N=42),普罗旺斯-阿尔卑斯-蓝色海岸省(N=134),罗纳-阿尔卑斯省(N=144)。

§德国:巴登-符腾堡(N=93),巴伐利亚(N=245),柏林(N=78),勃兰登堡(N=59),不来梅(N=14),汉堡(N=42),黑森州(N=116),梅克伦堡-前波莫瑞州(N=18),下萨克森(N=104),北莱茵-威斯特法伦州(N=370),莱茵兰-普法尔茨州(N=85),萨尔(N=19),萨克森(N=85),萨克森-安哈特(N=66),石勒苏益格-荷尔斯泰因(N=68),图林根(N=53)。

¶爱尔兰:都柏林市和县(N=169),伦斯特省其他地区(N=142),蒙斯特(N=160),诺和阿尔斯特部分(N=106)。

\*\*苏格兰:阿盖尔和克莱德(N=48),艾尔郡和阿伦(N=33),边界(N=5),邓弗里斯和加洛韦(N=9),法夫(N=37),第四谷(N=23),嘉林(N=62),大格拉斯哥(N=84),高地(N=23),兰克郡(N=41),洛锡安(N=93),奥克尼和设得兰群岛西部岛屿(N=6),泰赛德(N=43)。

††在英国地区(不包括苏格兰):东米德兰兹(N=119),东区(N=134),伦敦(N=216),东北(N=75),西北(N=160),北爱尔兰(N=53),东南(N=216),西南(N=137),威尔士(N=98),西米德兰兹郡(N=142),约克郡和亨伯河(N=117)。

调查对象按照是否居住在一个边境省/州，并且与其接壤的邻国比调查对象所在地区每包卷烟至少便宜1欧元进行了分类。卷烟价格采用了调查当年一月份最流行的卷烟的零售价<sup>[23]</sup>。采用这类国家级的价格数据是因为参与研究的国家的烟草税没有地区的差异。在用于本研究的ITC调查的当年，荷兰、爱尔兰和苏格兰的邻国的卷烟价格没有比本国便宜1欧元（见表1）。法国的所有邻国和德国的一些邻国（如波兰，捷克和奥地利）卷烟价格至少比本国便宜1欧元。因此，来自法国阿尔萨斯省、阿基坦大区、香槟-阿登省、弗朗什孔泰省、朗格多克-鲁西永省、洛林省、南比利牛斯省、北加来海峡省、皮卡第大区、普罗旺斯-阿尔卑斯-蓝色海岸省和罗纳-阿尔卑斯省的调查对象，以及来自德国巴伐利亚州、勃兰登堡、梅克伦堡-前波莫瑞州、莱茵兰-普

法尔茨州、萨尔州和萨克森州的调查对象被划分为居住在边境省/州，并且与其接壤的邻国比调查对象所在地区每包卷烟至少便宜1欧元。

本研究用教育和收入水平作为衡量社会经济地位的指标<sup>[24]</sup>。教育被分为三个等级：低等（无学历，小学和低等中学教育），中等（中等职业教育和中等中学教育），和高等（高中教育，大学和研究生）。因为教育系统的差异，只有部分教育等级可进行跨国比较。大多数国家的调查对象被问及每月的家庭总收入。然而，德国和法国的调查对象被问及他们的家庭净收入。此外，答案的分类并不能确保所有的国家都可进行比较。因此，我们为每个国家创建了一个四个等级的相对收入变量。没有回答收入问题的调查对象（样本量为952）被分在一个单独的等级。

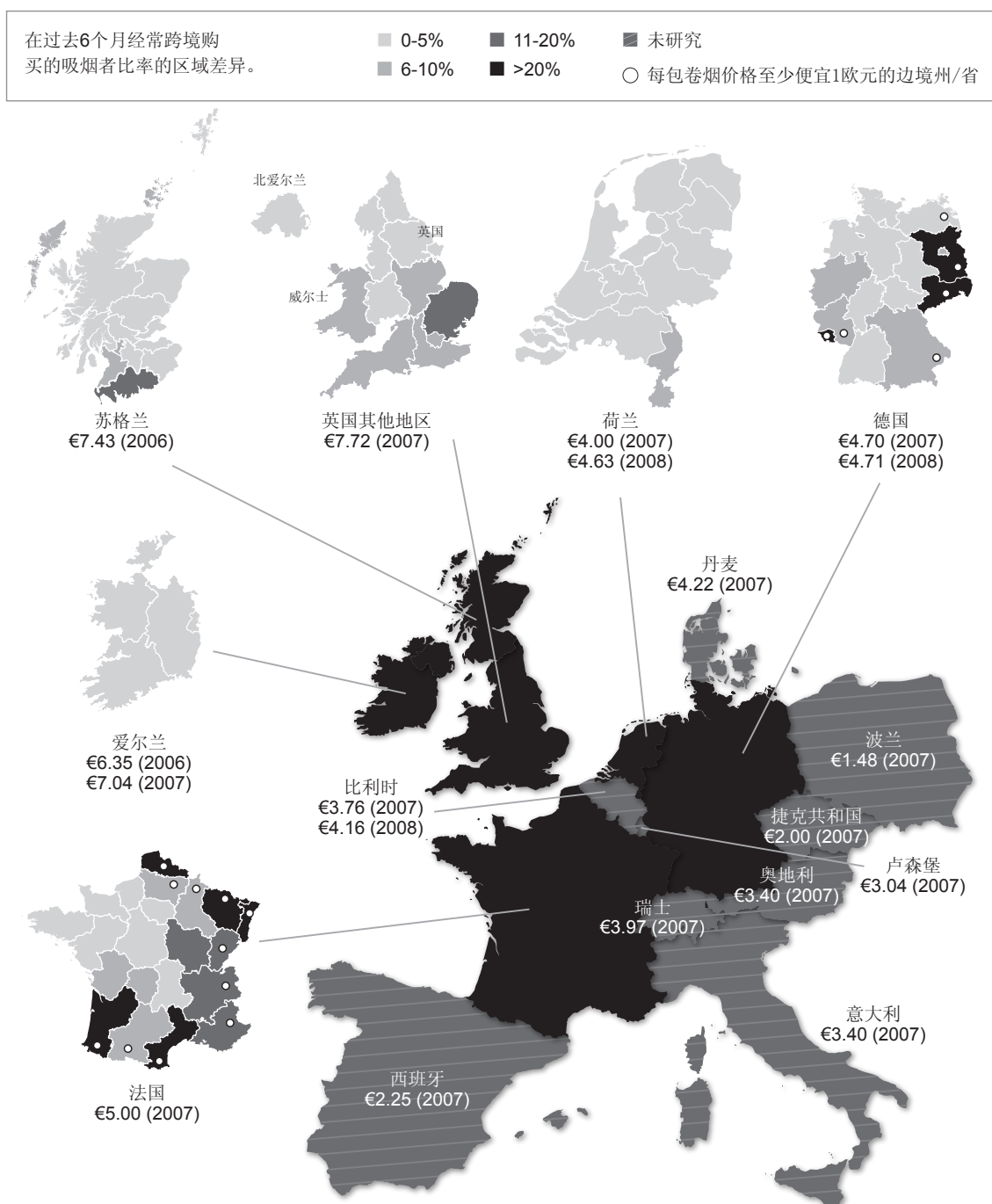


图1 在过去6个月经常跨境购买卷烟的吸烟者比率的区域差异。图中价格是调查当年（见括号内数值）一月份最流行的卷烟的零售价。



本研究的多变量分析中的协变量包括性别、年龄组（18-24, 25-39, 40-54, 55岁及以上）、职业、吸烟状况（每日/偶尔）、烟瘾程度、戒烟意愿（6个月内/6个月后）、吸手工卷烟和/或成品卷烟和调查模式。烟瘾程度指数（HSI）来自于两个分类指数的和：每天吸烟支数和每天吸第一支烟的时间<sup>[25]</sup>。该指数的值介于0到6之间，值越高表示尼古丁依赖性越强<sup>[25]</sup>。

## 分析

为了证实我们的跨境购买卷烟指标对避税措施有指示性，我们采用t检验，对在过去6个月经常、偶尔和没有跨境购买卷烟的调查对象最近一次购买一包卷烟的自报平均价格差异进行了比较。跨境购买率的国家和社会经济差异采用 $\chi^2$ 检验进行了比较。此外，采用多项Logistic回归方法，我们对对应变量——即跨境采购卷烟——进行了回归分析。尽管该应变量具有有序分布，我们仍采用了多项回归分析，因为根据自变量的值，这种分析能够同时生成偶尔或经常跨境购买卷烟相对于从不跨境购买卷烟的几率比。自变量包括了性别、年龄组、教育程度、收入水平、职业、吸烟状况、烟瘾程度、戒烟意愿、是否只吸手工卷烟、国家/地区和调查模式。

## 结果

### 样本特征

每个国家和地区（边界或非边界）的样本特征见表2。本研究中采用的所有变量均显示出明显的国家/区域差异。国家间的教育水平的差异相对较大。但应该再次指出，教育水平在各国只有部分可比性。荷兰吸烟者中不愿意回答关于收入问题的比例最高。吸烟者中无业者最高的是苏格兰。来自苏格兰和英国其它地区的吸烟者中每日吸烟者和烟瘾程度指数最高。苏格兰的吸烟者在过去6个月内戒烟意愿最高。荷兰的吸烟者更倾向于吸手工卷烟，爱尔兰吸烟者更常只吸成品卷烟（或同时吸部分手工卷烟）。

在法国和德国，居住在边境地区和非边境地区的样本特征有显著差异。法国边境地区的吸烟者往往比非边境地区的吸烟者受教育程度低、收入水平低、并且失业率较高。德国边境地区的吸烟者相比非边境地区，更多是男性、受教育程度较低、且更常吸成品卷烟。这些差异可能影响跨境购买卷烟的决定或反之受其影响。

### 跨境购买卷烟行为确认

在过去6个月中，经常跨境购买卷烟的调查对象购买卷烟的支出（平均4.24欧元一包）明显少于偶尔跨境购买的调查对象的支出（4.64欧元）（ $t=2.57$ ,  $P=0.011$ ）。在过去6个月中，偶尔跨境购买卷烟的调查对象与未跨境购买卷烟的调查对象的支出（4.85欧元）无显著差异（ $t=0.93$ ,  $P=0.351$ ）。

除爱尔兰之外的其余国家存在同样的结论。在爱尔兰，经常跨境购买卷烟的调查对象购买卷烟支出明显多于其他调查对象。经常跨境购买卷烟的吸烟者的支出相比于偶尔跨境购买的吸烟者的支出差价最大的是法国和德国。

### 跨境购买卷烟的国家差异

从表3可以看出，跨境购买卷烟存在很大的国家和地区差异（ $\chi^2(14)=771.59$ ,  $P<0.001$ ）。过去6个月经常跨境购买卷烟的吸烟者比例最高的是在法国和德国的边境地区，

分别为24%和13%。在法国和德国的非边境地区，只有5%吸烟者在过去的6个月经常跨境购买卷烟。荷兰、苏格兰和爱尔兰的吸烟者未跨境购买卷烟的比例最高，分别为83%、78%和74%。

### 跨境卷烟购买的社会经济差异

表3显示，跨境购买卷烟人群的教育水平（ $\chi^2(4)=130.19$ ,  $P<0.001$ ）和收入水平（ $\chi^2(6)=184.88$ ,  $P<0.001$ ）均有显著差异，尤其在偶尔跨境购买卷烟的群体中。在过去6个月中，具有较高教育水平的吸烟者偶尔跨境购买卷烟的比例为31%，经常跨境购买卷烟的比例为8%。而教育水平较低的吸烟者的比例分别为18%和5%。较高收入水平的吸烟者，32%的人表示偶尔会跨境购买，8%的人表示经常跨境购买。而较低收入的吸烟者的比例分别为19%和6%。

### 跨境卷烟购买的相关因素

表4中的多项Logistic回归分析结果显示，偶尔跨境购买卷烟更频繁地发生在年轻、具有较高教育和收入水平、有工作的、每日吸烟者、吸成品卷烟的吸烟者、以及电话模式的被调查者中。跨境购买卷烟的影响因素大多具有可比性，同时伴随有几个明显的差异。经常跨境购买卷烟的吸烟者烟瘾程度更大而且不太可能有戒烟的打算。经常跨境购买卷烟的频率与吸成品卷烟无相关性。与其有最强相关性的是国家和地区差异。居住在法国和德国的边境地区、以及英国（不包括苏格兰）的调查对象相比于荷兰的调查对象更倾向于跨境购买卷烟。荷兰因为跨境购买卷烟比例最低，被用作参照国家。

### 边境地区的跨境卷烟购买

如图1所示，跨境购买卷烟率最高的地区为法国的北加来海峡省、洛林省、阿尔萨斯省、阿基坦大区 and 朗格多克-鲁西荣省，以及德国的勃兰登堡、萨克森州和萨尔州。这些省/州接壤于比利时（北加来海峡省和洛林省）、卢森堡（洛林省和萨尔州）、瑞士和德国（阿尔萨斯省）、西班牙（阿基坦大区和朗格多克-鲁西荣省）、波兰（勃兰登堡和萨克森州）和捷克共和国（萨克森州）。请注意，因为一些省/州的调查对象人数少，图1仅提供地区差异的表征。在其他分析中，所有边境省/州的调查对象按国家分类合在一起计算，从而保证了每个分类有足够的样本量（见表2）。

对上面提到的经常跨境购买卷烟比例最高的法国和德国各省/州的调查对象（ $N=552$ ，表中未显示）进行了额外的一个多项Logistic回归分析。与所有调查对象参与的回归分析的结果有显著不同的是较高收入与经常跨境购买无关，但与偶尔跨境购买卷烟负向相关。

## 讨论

本项研究表明，在大多数参与此研究的欧洲国家中，只有少数吸烟者表示经常跨境购买卷烟。然而，法国和德国的一些边境省/州比例较高，与其接壤的邻国有更低的卷烟价格（即比利时、卢森堡、瑞士、西班牙、波兰和捷克共和国），其中法国24%的吸烟者和德国13%的吸烟者表示经常跨境购买卷烟。在法国和德国的非边境地区、爱尔兰、英国和荷兰，仅有2-7%的吸烟者表示经常跨境购买卷烟。调查中国外偶尔购买卷烟的现象更常见，但这并不总是能反映避税行为。

表2 不同国家和（边境/非边境）地区在人口特征和吸烟特征上的差异（%）

	荷兰	法国		德国		爱尔兰	苏格兰	英国（不包 括苏格兰）	国家/地区差异 分析
	(n=2,072)	边境省* (n = 879)	非边境省 (n = 856)	边境州* (n = 469)	非边境州 (n=1,046)	(n=577)	(n=507)	(n=1,467)	
人口特征									
性别									
女性	45.7	46.3	42.4	36.8	44.8	45.4	45.8	49.8	$\chi^2(7) = 29.16$ $p < 0.001$
男性	54.3	53.7	57.6	63.2	55.2	54.6	54.2	50.2	
年龄									
18-24	11.5	17.9	17.0	14.5	13.4	19.9	11.5	13.4	$\chi^2(21) = 167.42$ $p < 0.001$
25-39	29.3	33.2	38.0	27.7	32.5	34.8	25.5	35.5	
40-54	34.7	35.0	30.0	36.0	36.2	25.8	33.2	30.4	
55岁及以上	24.5	13.9	14.9	21.7	17.9	19.4	29.8	20.7	
受教育水平									
低等	35.4	16.8	17.0	29.3	19.5	31.1	23.0	24.0	$\chi^2(14) = 452.03$ $p < 0.001$
中等	44.7	39.0	33.6	34.7	38.0	32.3	35.3	31.5	
高等	19.9	44.2	49.4	36.0	42.5	36.5	41.7	44.5	
收入等级									
低等	24.9	27.2	23.9	24.5	21.8	37.6	38.1	28.6	$\chi^2(21) = 477.60$ $p < 0.001$
中等	23.0	30.0	26.5	24.1	28.8	20.8	28.2	31.4	
高等	30.1	40.0	45.4	36.7	35.9	33.4	25.2	30.7	
未回答	22.0	2.7	4.1	14.7	13.6	8.1	8.5	9.3	
职业状况									
在职	39.3	33.1	28.4	28.3	25.7	33.1	46.6	39.1	$\chi^2(7) = 124.48$ $p < 0.001$
失业	60.7	66.9	71.6	71.7	74.3	66.9	53.6	60.9	
吸烟特征									
吸烟状态									
每日	92.7	92.0	90.7	92.3	90.7	89.6	93.3	95.8	$\chi^2(7) = 39.55$ $p < 0.001$
偶尔	7.3	8.0	9.3	7.7	9.3	10.4	6.7	4.2	
烟瘾程度†									
0-1分	28.4	44.5	48.2	43.2	37.7	30.4	23.0	23.7	$\chi^2(14) = 311.70$ $p < 0.001$
2-4分	63.7	52.1	48.3	51.4	56.9	61.2	63.7	68.4	
5-6分	7.9	3.4	3.5	5.4	5.5	8.4	13.2	8.0	
戒烟意愿									
最近6个月无	78.5	62.8	61.3	77.4	73.3	64.6	58.4	73.1	$\chi^2(7) = 189.05$ $p < 0.001$
最近6个月有	21.5	37.2	38.7	22.6	26.7	35.4	41.6	26.9	
吸手工卷烟									
是	32.1	13.1	11.3	10.0	13.9	4.3	17.0	27.5	$\chi^2(7) = 451.03$ $p < 0.001$
否（或均可）	67.9	86.9	88.7	90.0	86.1	95.7	83.0	72.5	

\*边境省/州，卷烟价格至少便宜1欧元/包（以调查当年一月份最常见的卷烟的零售价为卷烟的价格）。

†烟瘾程度被用作一个回归分析变量，该指数值介于0至6之间，数值越高，表示尼古丁依赖性越强。

相对于从未跨境购买卷烟的吸烟者，偶尔跨境购买卷烟的吸烟者并没有显著减少的平均支出，而经常跨境购买的吸烟者在平均支出上有显著减少。因此，我们猜想经常跨境购买卷

烟的吸烟者可能是有目的的避税，而偶尔跨境购买卷烟的吸烟者可能恰好在境外进行常规活动，并利用旅行之便购买便宜的卷烟。

表3 跨境卷烟购买的国家/地区、受教育水平和收入水平差异比较 (%)

	无跨境购买卷烟	偶尔跨境购买卷烟	经常跨境购买卷烟	差异比较
国家和地区				
荷兰	82.7	14.9	2.4	$\chi^2 (14) = 771.59$ $p < 0.001$
法国边境省	48.6	27.8	23.7	
法国非边境省	66.5	28.9	4.6	
德国边境省	52.6	34.0	13.4	
德国非边境省	64.3	30.8	4.9	
爱尔兰	73.5	23.4	3.1	
苏格兰	77.9	17.6	4.5	
英国 (不含苏格兰)	63.3	30.1	6.6	
受教育水平				
低等	76.5	18.2	5.3	$\chi^2 (4) = 130.19$ $p < 0.001$
中等	69.4	23.5	7.1	
高等	61.4	30.7	7.8	
收入等级				
低等	75.7	18.5	5.8	$\chi^2 (6) = 184.88$ $p < 0.001$
中等	69.0	23.6	7.4	
高等	59.2	32.4	8.4	
未回答	75.7	19.7	4.5	

跨境卷烟购买在有较高文化程度和收入的群体中较普遍。这是一个有些违背常识的发现, 并似乎与一些早期的研究结果相矛盾, 如社会经济地位较低的吸烟者常购买走私卷烟作为应对卷烟价格增长的一项策略<sup>[11, 26]</sup>。然而其他研究也表明, 较高社会经济地位的吸烟者比较低社会经济地位的吸烟者更有可能从低税或未上税的渠道购买卷烟<sup>[15-17]</sup>。一种可能的解释是跨境购买会产生旅行费用, 文化程度和收入较低的吸烟者可能无法前期支付<sup>[16]</sup>, 而他们周围的社会环境使得他们购买走私卷烟更有可能<sup>[26]</sup>。另外, 更大比例的高学历和高收入吸烟者偶尔跨境购买卷烟也反映了这些人出国旅游和工作的机会更多<sup>[27]</sup>。

### 研究局限性

由于这项研究采用横向数据, 因此预测变量和跨境卷烟购买之间不能得出因果关系的结论。

不同国家的调查时间各不相同, 大部分ITC荷兰样本的调查模式不同。另外, 因为不同国家的教育系统和收入变量存在差异, 国家间的文化程度和收入水平只有部分可比性。然而, 我们试验了教育水平和收入水平的不同分类方法, 均产生了类似的结果。因此, 我们不认为分类的不同会影响结果。

我们假设经常跨境购买卷烟的吸烟者是有目的的逃税。另一种可能是这些吸烟者可能需要常规的来往其他国家, 例如越境工作。另一个问题是, 因为我们没有调查进口卷烟的数量, 我们没能区分合法避税与非法逃税。因此, 未来的研究应更详细的评估跨境卷烟购买, 包括购买的卷烟数量。

本研究按居住在靠近卷烟低价国的开放的边境地区来界定是否居住在边境省/州。这是一种很粗略的界定, 并受省/州的地形和大小影响。如果知道调查对象的家和边境之间的实际距离将会更好。同时, 因为一些省/州调查对象人数较少, 我们只能提供区域差异的大概指征。

### 未来研究

在这项研究中, 调查对象仅被问到是否跨境购买卷烟及购买的频率。在未来的研究中, 应对调查对象跨境购买卷烟的行为进行更详尽的了解。一些重要的问题包括: 为什么出国买烟? 是为买烟而出国, 还是有其他目的, 例如度假或工作? 他们在哪个国家购买的卷烟? 购买卷烟的数量及频率? 有没有朋友或熟人帮他们或其他人在国外购买卷烟? 这些问题的答案可以帮助更深入地了解跨国购买卷烟的社会经济和国家差异背后的实际原因。

### 政策建议

烟草避税策略, 如跨境购买卷烟, 可以减弱加税对烟草消费的影响<sup>[9]</sup>。我们在研究中发现, 跨国购买最常见于和烟草价相当低的国家接壤的地区。因此, 提高烟草低价国家的烟草税, 有助于限制跨境购买卷烟, 并鼓励这些国家和邻国的吸烟者戒烟。

欧盟也可限制跨境卷烟购买提供帮助<sup>[7, 28]</sup>。欧盟正致力于落实降低欧盟国家之间卷烟价格差异的政策措施, 同时致力于限制个人跨境购买卷烟量减少到200支卷烟以下或250克手工卷烟以下<sup>[7]</sup>。这些措施使跨境购买便宜卷烟变得不那么有利可图。

表4 对于经常和偶尔跨境购买卷烟的相关因素的多项logistic回归分析-无跨境购买作为参照类别(n=7752)

	偶尔与无跨境采购香烟的 几率比 OR (95% CI)	经常与无跨境采购香烟的 几率比 OR (95% CI)
性别		
女	1.00	1.00
男	1.10 (0.98 to 1.23)	1.07 (0.88 to 1.30)
年龄		
18-24	1.00	1.00
25-39	0.74 (0.61 to 0.90)**	0.71 (0.51 to 0.98)*
40-54	0.78 (0.66 to 0.93)**	0.58 (0.43 to 0.77)***
55岁及以上	0.75 (0.64 to 0.89)***	0.77 (0.58 to 1.01)
文化程度		
低等	1.00	1.00
中等	1.23 (1.06 to 1.43)**	1.21 (0.93 to 1.57)
高等	1.51 (1.30 to 1.76)***	1.36 (1.05 to 1.78)*
收入等级		
低等	1.00	1.00
中等	1.25 (1.07 to 1.47)**	1.33 (1.02 to 1.73)*
高等	1.87 (1.61 to 2.17)***	1.76 (1.36 to 2.27)***
未回答	1.16 (0.94 to 1.43)	1.08 (0.73 to 1.60)
职业状况		
失业	1.00	1.00
在职	1.25 (1.09 to 1.42)***	1.19 (0.95 to 1.49)
吸烟状态		
每日	1.00	1.00
偶尔	0.68 (0.54 to 0.85)***	0.40 (0.24 to 0.68)***
烟瘾程度	0.99 (0.95 to 1.03)	1.11 (1.04 to 1.19)**
戒烟意愿		
近6个月无	1.00	1.00
近6个月有	0.94 (0.84 to 1.06)	0.62 (0.50 to 0.78)***
吸手工卷烟		
是	1.00	1.00
否, 吸机制卷烟或均可	1.31 (1.13 to 1.53)***	0.81 (0.64 to 1.03)
国家和地区		
荷兰	1.00	1.00
法国边境地区	1.83 (1.34 to 2.48)***	12.42 (6.82 to 22.59)***
法国非边境地区	1.30 (0.96 to 1.76)	1.66 (0.86 to 3.21)
德国边境地区	2.13 (1.53 to 2.96)***	6.42 (3.40 to 12.10)***
德国非边境地区	1.56 (1.16 to 2.08)**	1.77 (0.94 to 3.36)
爱尔兰	1.04 (0.75 to 1.44)	1.05 (0.50 to 2.21)
苏格兰	0.85 (0.60 to 1.21)	1.54 (0.76 to 3.14)
英国 (不含苏格兰)	1.66 (1.25 to 2.20)***	2.34 (1.28 to 4.29)**
调查模式		
电话	1.00	1.00
网络	0.61 (0.46 to 0.82)***	0.60 (0.31 to 1.16)

\*p<0.05.

\*\*p<0.01.

\*\*\*p<0.001.



## 结论

跨境购买卷烟在法国和德国一些靠近卷烟低价国（例如卢森堡、西班牙和波兰）的边境省/州相对常见。法国这些地区经常跨境购买卷烟的吸烟者比例为24%，德国这些地区为13%。在法国和德国的非边境地区，以及爱尔兰、英国和荷兰，表示经常跨境购买卷烟的吸烟者比例仅为2-7%。较高文化程度和较高收入的吸烟者跨境购买卷烟更普遍。提高卷烟低价国的烟草税，并减少可以跨境购买卷烟的数量将有助于限制卷烟高价国的吸烟者跨境购买卷烟。

## 本文贡献

- ▶ 跨境购买卷烟最常见于法国和德国的一些靠近卷烟价格显著偏低国家（例如卢森堡、西班牙和波兰）的边境省/州。
- ▶ 在法国和德国的非边境地区、爱尔兰、英国和荷兰，很少的吸烟者表示会经常跨境购买卷烟。
- ▶ 跨境购买卷烟在较高文化程度和较高收入的吸烟者中较为普遍。

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