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Tobacco taxes and illicit cigarette trade in Colombia

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ABSTRACT

This paper estimates the short-term impact of a twofold increase of the tobacco excise tax on consumption of illicit cigarette trade in Colombia. Using data collected before and after the tax increase from a novel smoker survey (DEICS-Col), the impact is estimated as the change in the probability that a smoker has illicit cigarettes. The methodology follows a difference-in-differences strategy, measuring the year-to-year variation of the proportion of illicit cigarettes between smokers who report buying low-priced cigarettes (the highest treatment intensity) and those who bought high-priced cigarettes (lowest treatment intensity). Estimations of the impact show an average increase of 4–5 percentage points on the proportion of illicit cigarettes relative to an initial penetration of low-priced illicit cigarettes of nearly 5.1 %.

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1. Introduction

Substantial excise taxes on cigarettes can be justified as efficient Pigouvian taxes because they help consumers to internalize the external costs on individual and public health (Gruber and Koszegi, 2004; Hines, 2007). As higher taxes increase prices, price differentials between licit and illicit goods raise the issue of potential increases of illicit trade in discussions of consumption-based tax policies. In tobacco control, Illicit Cigarette Trade (ICT) is an area of concern for policymakers because it limits the effects of packaging regulation and makes cigarettes more affordable, stimulating higher consumption and undermining the public health goal of reduced exposure. It also reduces the tax revenues derived from tobacco taxation (Merriman, 2010; Chaloupka et al., 2012; Chernick and Merriman, 2013; DeCicca et al., 2013; Wang et al., 2016).

Policymakers' concerns about ICT are even broader in economies where shadow markets play an important role in economic activity (Schneider and Enste, 2013) through both legal (informal sector) and illegal activities (money laundering) because shadow

markets can expedite availability and affordability of illicit cigarettes. Scientific evidence on the effect of tobacco taxes on ICT is pivotal evidence to support further tax increases, as the risk of enormous increases of ICT is one of the countervailing effects normally cited against these policies during parliamentary debates (Chaloupka et al., 2012; Van Walbeek et al., 2012; Chaloupka, 2014; Kleiman et al., 2016).

Despite the need for evidence to support further progress on tobacco tax increases, the literature on this area is rather scarce, especially for developing countries where fears of increases of illicit cigarette trade are pervasive in policy discussions due to the prominence of shadow markets. Current research on this area for low and middle income countries focuses on estimations of Penetration of Illicit Cigarettes (PIC) and a description of changes of PIC when tax reforms are implemented (Iglesias et al., 2017; Szklo et al., 2018; Paraje, 2018).¹ This paper estimates the portion of the increase on consumption of illicit cigarette trade that can be related to Colombia's tobacco tax hike in 2016. To our knowledge, this paper is the first to fill the gap in the literature by providing an estimate of the link between tobacco taxes and illicit cigarette

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¹ See appendix 1 for a detailed discussion on the literature about measuring illicit trade penetration.

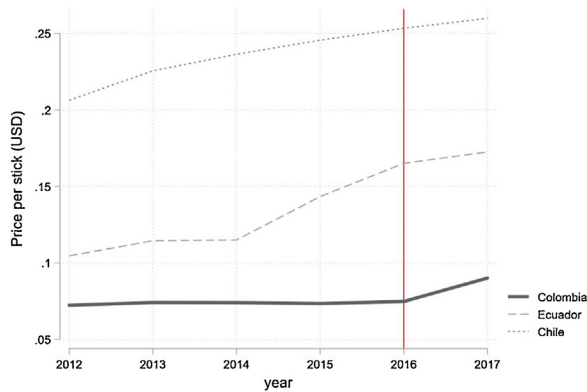


Fig. 1. Tax reform and cigarette price in some countries in the region.

Note: Cigarette PPP prices (2011 base). Prices in PPP dollars of a 20-cigarette pack for Colombia, Ecuador and Chile were taken from the Report on Tobacco Control 2011 made by the Panamerican Health Organization for each country and series were projected based on Tobacco CPI indexes and General CPI indexes, which were taken from each country's national bureau of statistics.

trade. Colombia is a relevant case because is a country where the shadow economy represents nearly half of the GDP (Schneider and Hametner, 2014) and it has relatively low cigarette prices, giving it substantial space for further tax increases (Fig. 1).²

In 2016, the average price of a 20-cigarette pack was around \$2,950 Colombian pesos -COP- (around US\$1), including an excise tax of COP\$700, and Law 1819 of December 2016 increased the excise tax to COP\$1,400 in 2017. We use information from the Demand for Illicit Cigarettes Survey in Colombia (DEICS-COL) (Maldonado et al., 2018), a novel data source that surveyed smokers before (2016) and after (2017) the tax increase in the five largest markets (cities) for cigarettes in Colombia³ to estimate the demand for ICT. Thus, our estimates of PIC are based on observing smokers' cigarette sticks or packs, their brands and price (Maldonado et al., 2018). To control for the potential selection of smokers, the place and time of the interviews and the gender and age range of respondents were kept constant between both surveys.

In Colombia tobacco taxes, as well as other tobacco control policies such as smoke-free areas and bans on tobacco advertising, promotion and sponsorship, are implemented at the national level. Therefore, year-to-year differences in PIC may result from an ongoing trend, or macroeconomic shocks as well as changes in tobacco taxation. For that reason, we cannot exploit exogenous tax differences within county borders to study illicit trade as is done in many studies of the U.S. (Merriman, 2010; Chernick and Merriman, 2013). Instead, our estimates are based on treatment intensity: as this is an excise tax, it increases the relative prices of low-priced cigarettes more than it does on high-priced cigarettes. In other words, the per pack tax increase represented a much larger percentage increase in after-tax prices of low-priced cigarettes as compared to high-priced cigarettes. For instance, for a low priced 20-cigarette pack (0.5 times the mean price) whose price is around COP\$1,500, the tax increase from COP\$700 to COP\$1,400 is expected to increase price in 46% to 2,200 (= 1,500 + 700); meanwhile, for a high-priced pack (1.5 times the mean price) whose price is around COP\$4,500 the tax is expected to increase price in 15.5% to 5,200 (= 4,500 + 700). Since the tax increase caused

a higher percentage increase in the price of low-priced licit cigarettes, it is expected to see greater reactions in low-priced markets. We exploit this fact to construct a difference-in-differences (DiD) estimate of the impact of the tax increase. One possible reaction to a price increase is an expansion of ICT, and differences in treatment intensity suggest that a higher increase in illicit trade is expected for low-priced relative to high-priced cigarettes. The estimates presented in this paper represent the impact of the tax as the difference in the year-to-year variation of the proportion of ICT of low-priced relative to high-priced cigarettes.

The rest of this paper is organized as follows. First, the data and descriptive statistics are presented. Second, the empirical strategy is described. Third, the results are presented. Finally, we finish with discussion of results and conclusions.

2. Methods

2.1. Context

Colombia is an upper-middle income country located in South America with moderate smoking prevalence: in 2015, the tobacco smoking prevalence for Colombia was 10.9%, approximately half of the global average (22.7%) and two-thirds of the Americas' average (17.2%) (WHO, 2015). For those aged 12–65, the *Psychoactive Substances Consumption Survey 2013* (PSCS-2013) showed a last-month prevalence of cigarette⁴ smoking in urban areas equal to 12.95% in 2013, and a decreasing trend from 17.06% in 2008 (Ministerio de la Protección Social and Dirección Nacional de Estupefacientes, 2008, 2013). More recent surveys also confirm the decline in smoking, including the period after the tax hike. In particular, the Quality of Life Survey shows a reduction in smoking prevalence (extensive margin) in individuals older than 10, from 8.6% in 2016 to 7.3% in 2017 (DANE, 2019).

Colombia ratified the Framework Convention on Tobacco Control in 2008, and since then tobacco control policies have been a permanent public health issue for governments. Regarding tobacco taxes, Colombia increased them several times during the first two decades of the 21st century. However, the most relevant interventions were implemented in 2010, with a unified tax base and a moderate consumption tax jump, followed by a steep excise tax hike on cigarette packs in 2016: the average price of a 20-cigarette pack was around \$2950 Colombian pesos -COP- (around US\$1) in 2016, including an excise tax of COP\$700, and Law 1819 of December 2016 increased the excise tax to COP\$1400 in 2017.

The informal market would be a potential channel for increases in ICT, given the business opportunities that a higher price generates in the shadow market retail. This is the main argument against the implementation of tobacco taxes. Thus, it is important to evaluate the relationship between taxes and illicit trade in a setting where shadow markets play an important role in the economy. Colombia exhibits some of the largest shadow markets for many economic activities in the region. Some studies have estimated that the informal labour market makes up approximately 48.2%, and informal activities represent 42.2% of the retail sector (DANE, 2019). Street vendors in this retail sector are the main distribution channel of cigarettes (Maldonado et al., 2018). It is therefore important to determine whether informal street vendors play a role as potential drivers of the impact of tax hikes on ICT.

Following Ross (Ross, 2015), this paper defines Illicit Cigarette Trade (ICT) as cigarettes produced abroad that do not fulfil all obligations from customs and sanitary authorities. ICT includes

² In Chile, by 2016 we calculate the average price of a single stick price of 0.25 USD, in Ecuador of 0.17 USD, while for Colombia it was around 0.07 USD. See online appendix 2 for a more detailed description of the Colombian tobacco control context.

³ These cities represent 63% of the national market.

⁴ In Colombia, Consumption of tobacco products other than cigarettes is negligible.