

Brazil

Overview of

TOBACCO USE, TOBACCO CONTROL LEGISLATION, AND TAXATION

World Bank Group
Global Tobacco Control Program
Country Brief

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Overview of Tobacco Use, Tobacco Control Legislation, and Taxation A Country Brief

Executive summary

Brazil has achieved one of the largest significant declines in age-standardized smoking prevalence since 1990 through a combination of tobacco control policies. Smoking prevalence among adults decreased from 35% in 1989 to 18% in 2008. In 2006-2017, according to the telephone surveys of the adult population aged 18 years and older living in the capitals of Brazilian states, smoking prevalence further decreased from 16% to 10%. Smoking prevalence among children also decreased.

In 2011, the government proposed **a change in the cigarette excise tax system** and large increases in excise tax rates. Excise rates were annually increased in 2012-2016; however, the increases in 2014-2016 were rather moderate, and in 2017-2018, the rates were not changed.

Legal cigarette consumption decreased from about 97 billion cigarettes annually in 2009-2011 to about 56 billion cigarettes in 2016-2018, as tobacco affordability in Brazil substantially declined due to the combined effect of the tobacco tax increases and the economic recession in the country.

Real (inflation-adjusted) governmental tobacco tax revenue increased in 2012-2014, but in 2015-2018 it declined, as **the increase in tobacco tax rates was too small** to counterbalance the impacts of the inflation and the decrease of the population real income during the economic recession.

Tobacco taxation policy had the strongest impact on tobacco use in the country. However, **the impact of tax hikes on tobacco consumption was long-term**, and as the tax hikes were not followed by similar tax increases over the following years, the further decline in tobacco consumption exceeded the tax rate increase, and it eventually caused the reduction in tobacco tax revenue.

The decline in legal sales in 2011-2016 was partly compensated by the growth in illicit sales, but, according to the public health experts' estimates, despite some increase in illicit sales, **the total cigarette consumption decreased** from 125 billion in 2012 to 91 billion in 2017, or by 27% in five years.

Illicit cigarettes from Paraguay occupy a substantial part of the real cigarette market in Brazil. While total (licit and illicit) cigarette consumption continues to decline in the country, illicit cigarettes slow down this trend. Illicit cigarettes also reduce tobacco excise revenues. However, the experience of Brazil confirms that **if the tax hike is substantial, it is able to increase revenue despite the widespread cigarette smuggling**.

Despite recent tax increases, cigarettes in Brazil are still sold at lower prices than cigarettes in Argentina, Peru, Suriname, and Uruguay, so **Brazil has great potential for further substantial tobacco tax increases**.

Tobacco taxation policy in Brazil should be more consistent with regard to the annual increase of the specific tobacco excise rate by at least 20% to ensure tobacco affordability reduction. Ad valorem tax rates also should be increased or at least not decreased.

Practices of **tax evasion** for all kinds of tobacco taxes should be investigated, and effective policies to prevent such practices should be developed and enforced. The apparent differences between the

reported cigarette turnover and the taxable sales should be also investigated as it is also a way of tax evasion.

Tobacco use surveillance and monitoring should be further developed in Brazil, including regular surveys with a collection of comprehensive information on tobacco products consumed.

Brazil authorities already implemented some effective policies to counteract tobacco smuggling. Such efforts should be strengthened **in line with the provisions of the FCTC Protocol to Eliminate Illicit Trade in Tobacco Products**, which is already ratified by the country.

Acknowledgments

This country brief was prepared by a team from the World Bank Group Global Tobacco Control Program led by Patricio V. Marquez, including Konstantin Krasovsky, and Tatiana Andreeva.

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Introduction

The Objective of the Country Brief

This country brief presents an overview of current tobacco control legislation, use, and taxation policy in Brazil. Data and information were collected from different sources. The brief is intended to serve as the context for complementary assessments on different aspects of tobacco taxation in the country to be shared with government teams and other national and international stakeholders.

Tobacco control legislation

Brazil ratified the Framework Convention on Tobacco Control on November 3, 2005, and became a Party of FCTC on February 4, 2006.

Unlike some other countries, in Brazil, persistent action led from within the government resulted in strong legislation and in a nationwide, decentralized program, with training and support cascading down the levels of government [1]. The Brazilian government has implemented comprehensive tobacco control legislation since the establishment of the Agência Nacional de Vigilância Sanitária (ANVISA) (an equivalent of the U.S. Food and Drug Administration) in 1999.

Brazil, which has achieved one of the largest significant declines in age-standardized smoking prevalence since 1990, is a noteworthy success story. Brazil accomplished this reduction through a combination of tobacco control policies that began with advertising restrictions and smoking bans in some public places starting in 1996 and culminated with Brazil achieving the highest level of coverage in all MPOWER measures except for monitoring by 2011. Policies were comprehensive and were supplemented with fiscal interventions that included raising taxes and establishing minimum prices for tobacco products. Finally, Brazil has achieved high levels of compliance through enforcement [2]. In 2012, Brazil became the first country to ban the use of additives and flavors, including menthol, in tobacco products.

In 2015 [3], tobacco control policies in Brazil were assessed at 34 out of 37 points.

Smoke-free places

Smoking is prohibited in nearly all enclosed public places and in enclosed workplaces with more than one worker. Smoking is prohibited in aircraft and vehicles of public transportation. Subnational jurisdictions are permitted to enact more stringent smoke-free laws [4]. Percentage of men who reported passive smoking at workplace decreased from 17% in 2009 to 9.6% in 2017 [5].

Tobacco advertising, promotion, and sponsorship

Tobacco advertising and promotion are prohibited, with a sole exemption granted for the display of the products at the point of sale. There are some restrictions on tobacco sponsorship and the publicity of such sponsorship [4]. ANVISA Resolution No. 213 of January 23, 2018, establishes new requirements related to the display of tobacco products at retail points of sale and other forms of tobacco advertising, promotion, and sponsorship.

Tobacco packaging and labeling

In 2001, Brazil became the second country in the world and the first Latin American country to make graphic warning labels mandatory on cigarette packaging. All packs display the phone number for the quitline. The country developed a second group of warnings in 2004, and a third group of warnings was created in 2009 with stronger messages and gruesome images that have shown a significant cognitive and behavioral impact on quitting intention [6].

The law requires the display of a set of nine pictorial health warnings covering 100 percent of the back of the packages. The warnings must rotate. An additional text warning must cover 30 percent of the lower part of the front of the packages, and a qualitative constituents and emissions statement must cover 75 percent of one lateral side. Misleading terms are prohibited on tobacco packaging, but other elements of misleading packaging (e.g., colors, numbers) are not prohibited [4].

ANVISA Resolution No. 195 of December 14, 2017, established the requirements for packaging and labeling, including the health warnings required to appear on the front, back, and side of the packaging.

Ban of additives

In relation to FCTC Articles 9 and 10, Brazil has banned (ANVISA Resolution No. 14 of March 15, 2012) the use of additives in cigarettes and other tobacco products sold in the country [7].

Smoking cessation

In Brazil, the government started funding smoking cessation treatment in 2004. Treatment includes brief advice by healthcare staff and application of pharmaceutical products such as nicotine patches and bupropion provided at no cost to patients. Between 2004 and 2006, 22 of 27 Brazilian states provided help to about 50 000 smokers trying to quit, of whom about 45% used medications, and about 40% remained abstinent after four weeks. Brazil also has a government-sponsored quitline; its telephone number is required to be printed on health warnings for all tobacco products as well as on advertising at retail outlets [8].

Costs of tobacco use

Iglesias et al [9] reported cross-sectional estimates of the cost of smoking for Brazil. Using the epidemiological approach and data from 1996 to 2005, the study estimated the direct healthcare cost—defined as hospital costs for malignant neoplasm, ischemic heart disease, pneumonia, and influenza, but omitting some costs of care due to chemotherapy and radiation therapy associated with hospital admissions. They reported total costs for a 10-year period of analysis (1996–2005). The annual inpatient hospital cost of smoking was US\$ 451.9 million (1.1 billion Brazilian reais) at 2005 rates, which accounted for approximately 0.6% of national health care costs. The distribution of costs by disease category was 49% for ischemic heart disease, 38% for influenza and pneumonia, and 12% for cancer. The distribution of costs by gender was 69% for men and 31% for women. The prevalence of hospitalization due to ischemic heart disease and cancers of the lung, larynx, and esophagus increased between 1999 and 2005, indicating that tobacco-attributable costs may rise for these disease types [10].

On May 21, 2019, Brazil's Office of the Attorney General (Advocacia-Geral da União) filed a lawsuit against multinational tobacco companies to recover funds spent by the Brazil's healthcare system on the treatment of tobacco-related diseases¹. The suit is the first of its kind for Brazil and a significant step towards holding the tobacco companies which do business in Brazil and their parent companies responsible for the enormous financial and health burden caused by tobacco use. Brazil's lawsuit seeks to recover funds from the companies responsible for Brazil's tobacco epidemic – British American Tobacco and Philip Morris International, along with their Brazilian subsidiaries. These are costs that the Brazilian government is legally bound to pay for because health is a constitutional right in Brazil².

¹ https://www.agu.gov.br/page/content/detail/id_conteudo/756818

² <https://www.bloomberg.com/press-releases/2019-05-22/brazil-files-historic-lawsuit-to-hold-global-tobacco-companies-responsible-for-health-harms>

Tobacco surveillance

Strong monitoring systems support tobacco control policies and interventions in Brazil. Brazil's Constitution defines public health surveillance as an essential function of the country's public health system. Since 2000, the Ministry of Health has invested in the National Surveillance System for Noncommunicable Diseases and Risk Factors. In 2003, the National Cancer Institute (INCA) and the Health Surveillance Secretariat conducted a household survey on NCDs and risk behaviors among adults aged 15 years and older in 15 state capitals and in the Federal District. Tobacco monitoring accelerated after Brazil implemented the Global Adult Tobacco Survey in 2008 as a joint initiative by the Ministry of Health and the Brazilian Institute of Geography and Statistics, in collaboration with the Pan-American Health Organization/WHO and the US Centers for Disease Control and Prevention. A consolidated monitoring system included the National Health Survey, which is carried out every 5 years and incorporates the Tobacco Questions for Surveys (TQS) subset of the Global Adult Tobacco Survey.

In addition to household surveys, a telephone-based survey (VIGITEL³) has been conducted annually since 2006 [11] to collect information on NCDs and their risk factors from adults aged 18 years and older in all 26 state capitals and the Federal District. Actions to specifically monitor tobacco use among adolescents started in 2002 when Brazil, through INCA, joined the Global Tobacco Surveillance System and implemented the Global Youth Tobacco Survey (GYTS) in several state capitals. Beginning in 2009, the Ministry of Health and the Brazilian Institute of Geography and Statistics agreed to implement the National School Health Survey, which integrates questions from GYTS, every 3 years. These actions have contributed to the development of a sustainable monitoring system led by the Ministry of Health. Information produced throughout the national surveillance system enables Brazil to effectively monitor key tobacco control indicators and respond to global commitments on NCDs [12].

Tobacco use among adults

Tobacco consumption in Brazil grew throughout the 1970s and 1980s, fueled by a significant increase in the proportion of females smoking [1]. In 1971, 37% of adults aged 15-74 in Brazil were current smokers (54% among men and 26% among women) [13, 14]. According to the 1988 Gallup data [13], 40% of men and 36% of women were current smokers, and thus the prevalence of smoking among women in Brazil was the highest in the region. In 1989, 39.9% of men and 25.4% of women in Brazil were estimated to be smokers [15]. A survey of pregnant women conducted in 2004-2005 [16] found that 20.6% of women in Brazil had ever smoked regularly; of these, 27.9% kept smoking during pregnancy which constituted 6.1% of all surveyed pregnant women.

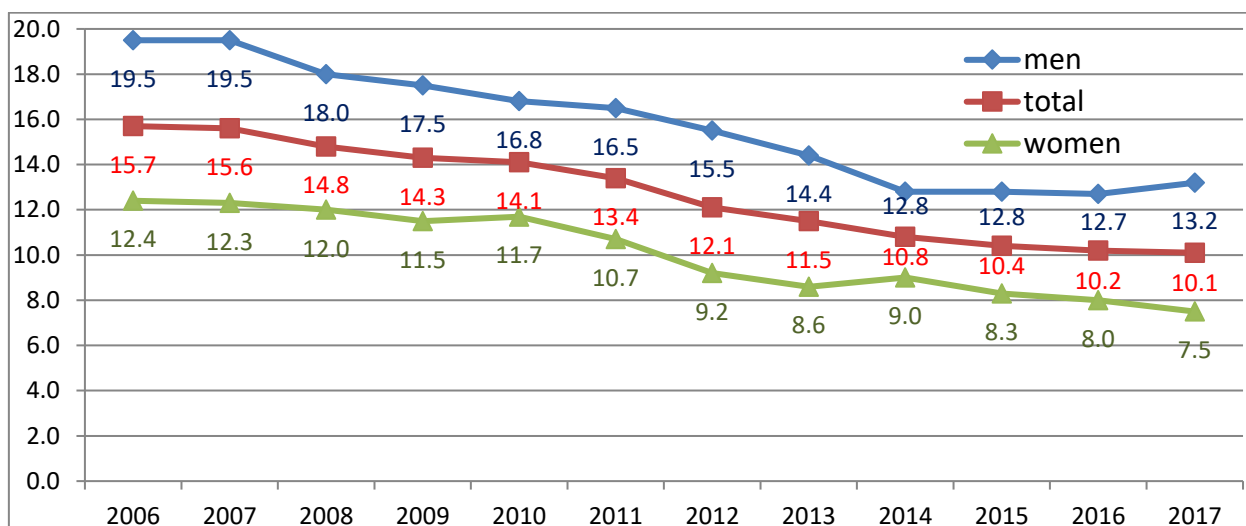
In 2005, according to the PATIOS online database (Organización Panamericana de la Salud 2005), 21.4% of men and 12.7% of women in Brazil were smokers [17].

The Surveillance System for Risk and Protective Factors for Chronic Illnesses Using a Telephone Survey (VIGITEL - see Figure 1) is functioning in Brazil. Telephone surveys of the adult population aged 18 years and older living in the capitals of Brazilian states was conducted since 2006. Analysis of the first of these surveys [18] revealed that the risk of smoking was associated with lower education. Analysis of VIGITEL surveys conducted in 2006-2009 [19] found a decrease in the prevalence of smoking in some age groups and some territories and not the others. The comparison of VIGITEL results in 2006-2011 showed that the overall prevalence of smoking decreased from 16.2 to 14.8%. Most pronounced changes in the prevalence of smoking were seen among people aged 35-54 years, with 9-11 years of education [20].

³ <http://portals.saude.gov.br/component/tags/tag/vigitel>

Analysis of VIGITEL data between 2006 and 2014 [21] shows a 0.645p.p. per year drop in smoking prevalence. The most recent reports representing the results of the telephone survey conducted in 2016 [22] and in 2017 [5] demonstrated a great decline in smoking prevalence. In 2017, the prevalence of current smoking was 10.1% (13.2% among men and 7.5% among women) while in 2006 it was 15.7% (19.5% among men and 12.4% among women).

Figure 1. Smoking prevalence in Brazil, %, VIGITEL surveys



The survey also measured the percentage of respondents who smoked 20 cigarettes per day or more. This percentage in 2017 constituted 2.6% (3.8% among men and 1.6% among women).

In Brazil, the Global Adult Tobacco Survey (GATS) [23] was conducted in 2008 on a subsample of National Household Sample Survey (PNAD) [24] which allowed to substantially increase the survey sample. The Global Adult Tobacco Survey conducted among people aged 15 years and older found that 21.6% of men and 13.1% of women were current tobacco smokers, 18.9% and 11.5% respectively were daily smokers [25]. Among women, smoking was more prevalent in older age groups, i.e. among those aged 15-24 years the prevalence of current smoking constituted 6.4 (5.6–7.4)%, among those aged 25-34 years 12.6 (11.6–13.8)%; and among those older than 35 years 17.6 (16.4–18.9) [26].

Results of the national surveys which included questions on smoking are presented in Table 1.

Table 1. Smoking prevalence in Brazil among persons 18 years and older⁴

Survey	Year	Total	Men	Women
National Health and Nutrition Survey	1989	34.8%	43.3%	27.0%
World Health Survey	2003	22.4%	27.1%	18.4%
Special Tobacco Survey (GATS)	2008	18.5%	22.9%	13.9%
National Health Survey	2013	14.7%	18.9%	11.0%

⁴ <https://www.inca.gov.br/observatorio-da-politica-nacional-de-controle-do-tabaco/dados-e-numeros-prevalencia-tabagismo>

Estimates of trends in adult smoking

According to published international estimates [27], the age-standardized adult smoking prevalence in Brazil decreased from 25.9% in 1980 to 16.5% in 2012 among men and from 15.6% in 1980 to 11.0% in 2012 among women.

The comparison of two household surveys of the Brazilian population conducted in 1989 and 2003 [28] showed a substantial decrease in the prevalence of smoking (from 34.8% to 22.4%).

For Brazil, two-point comparisons of adult prevalence were conducted between 1989 and 2003 [28] as well as between 1989 and 2008 [29] and yielded average annual rates of decrease of 3.1% and 3.3%, respectively, whereas in a two-point comparison of students aged 11–18 years in ten Brazilian provincial capitals between 1997 and 2004, lifetime cigarette use decreased at an average annual rate of 3.8%. These studies, however, did not identify the effect of the tobacco control campaign initiated by Brazil in 2003 [30].

Brazil recorded the largest overall reduction in prevalence for both male and female daily smoking, which dropped by 56.5% (51.9–61.1) and 55.8% (48.7–61.9), respectively, between 1990 and 2015 [2]. The annualized rate of change constituted in 1990–2015 among female, –0.3 (–1.2 to 0.6); among male, –0.7 (–1.3 to –0.2). The comparison of surveys conducted in 2008 and 2013 [31] showed a 19% reduction in current tobacco smoking prevalence from 18.5% (2008) to 14.7% (2013). The reduction was –17.5% for men and –20.7% for women.

The International Tobacco Control Policy Evaluation Project (the ITC Project) was launched in Brazil in 2009 to evaluate Brazil's progress in implementing the FCTC. Between 2009 and 2017, three survey waves were conducted among a cohort of 1200 adult smokers and 600 non-smokers in Rio de Janeiro, São Paulo, and Porto Alegre [32].

As the prevalence of smoking declined in Brazil, there has been an increase in the proportion of ever smokers who have quit. In addition, remaining smokers seem to be making more quit attempts. Among men with low educational level or younger than 25 years old, as compared to their counterparts, the cessation rate showed an even greater increase over time. Moreover, the proportion of light smokers, who represent the vast majority of smokers, did not decrease. All these observations suggest that tobacco control interventions implemented in Brazil in the past years seem to be effectively reaching the smoking population [33].

Tobacco use among youth

A survey conducted in 1990 among 1025 teenagers enrolled in the 8th, 9th, 10th and 12th grades in public and private city schools [34] revealed that 37.9% were ever tobacco users, 17.3% - last year tobacco users, 15.4% - last month, and 2.7% daily tobacco users. A study conducted among 2,059 Brazilian adolescents [35] revealed a lower prevalence of current smoking (8%) than in most Latin American countries.

The Brazilian Survey of School Health conducted among 59 992 high school students aged 13-15 years in May-June 2009 [36] revealed that 24% had already experimented with cigarettes, half of them before the age of 12 years. The prevalence of regular (last 30 days) smoking was 6.3%.

The Youth Risk Behavior Survey (YRBS) was conducted among first-year students aged from 18 to 26 years at the University of São Paulo-Ribeirão Preto in the early 2000s [37]. Cigarette smoking at least once in their life was reported by 65%; 44.5% reported that they had smoked on at least one occasion in

the last 6 months; 17.5% reported that they had smoked at least once in the last few days; and 14% reported that they had smoked in the last 30 days while at the university. The number of days per month that students smoked was low: the majority reported smoking 1 or 2 days a month.

The survey of students from the USP Campus of São Paulo reported that the prevalence of tobacco use was 50.5% lifetime and 20.2% in the last few days [38].

The Global Youth Tobacco Survey (GYTS) was conducted in Brazil first in Curitiba in 2002 and then in 2006 [39]. This choice of survey site was probably predetermined by the fact that Curitiba had the highest prevalence of smoking according to the 1997 survey data [40]. Twenty-three studies were carried out between 2002 and 2005 in various Brazilian capitals [41] with the prevalence of tobacco use varying from 6.2% to 17.7%. According to a systematic review of studies devoted to measuring the prevalence of tobacco use among Brazilian adolescents aged 10-19 years, the prevalence of current tobacco use ranged from 2.4% to 22.0% with the mean prevalence of 9.3% [42].

A study of adolescents aged 15 to 19 years in the city of Belo Horizonte between August 2009 and February 2010 [43] reported that the overall prevalence of tobacco use was 18.9%. Female adolescents had 3.8-fold greater odds of reporting weekly to daily tobacco use compared to male adolescents. The prevalence of tobacco use was reportedly associated with higher area-level socioeconomic status.

The analysis of multiple surveys conducted among adolescents in ten state capitals of Brazil between 1989 and 2010 revealed the overall decline of the tobacco smoking prevalence [40]. In 1989, past-year tobacco use was reported by 12.8-20.2% of adolescents. By 1997, the prevalence increased in some cities and constituted 15.7-31.7%. In 2010, the prevalence of past-year tobacco use ranged from 7.8 to 15.4%.

In the first Brazilian National Alcohol Survey, which gathered information on the use of psychoactive substances in 761 participants aged 14 to 19 years old, regular cigarette smoking was reported by 7.7% of male participants and 6.5% of females [44],.

In the National Adolescent School-based Health Survey (PeNSE) conducted in 2012, 22.7% had experimented with cigarettes, and 6.1% were regular smokers [45]. The use of other tobacco products besides cigarettes was reported by 4.8% high school pupils [46].

In the Study of Cardiovascular Risks in Adolescents (ERICA) which is a school-based cross-sectional study that evaluated 12- to 17-year-old adolescents living in municipalities with over 100 thousand inhabitants in 2013/2014, 18.5% had smoked at least once in life, 5.7% smoked at the time of the research (last month), and 2.5% smoked often (last week) [47].

Tobacco use among health professionals

In 1996, a survey was conducted among 9 105 (76.5%) male physicians and 2 804 (23.5%) female physicians [48]. Among them, 6.4% were regular smokers, and 34.3% were ex-smokers.

Global Health Professions Students survey conducted in 2006 in Rio de Janeiro revealed that among male medical students, 19.5(17.5–21.6)% were current cigarette smokers and among female students, 14.6 (13.1–16.3)% [49]. The survey conducted in 2007 among dental students in Rio de Janeiro reported that the prevalence of current cigarette smoking among male students was 24.4 (20.2–29.2)%, among female student 18.3(15.7–21.3)% [50]. An international review of tobacco smoking among dental students listed Brazil among the countries where smoking among dental students is uncommon [51].

Among nursing students in 2006 in Rio de Janeiro, the prevalence of current cigarette smoking among males was 10.8(4.1–25.3)% and among females 12.9(8.8–18.6)%; additionally, about 4% of students used other tobacco products [52].

Although the surveys of health professions students in 2006-2007 revealed that only about 20% of students received any formal training in smoking cessation [49, 50, 52], the ITC project reported that there was a high rate of physicians advising smokers to quit – a cost-effective intervention to encourage cessation. A quarter of smokers received advice to quit smoking by their physicians in the last 6 months - the third highest rate of 11 ITC LMICs [32].

Cigarette consumption

Cigarette consumption per capita in Brazil increased and reached a plateau at about 2000 cigarettes per year in the 1970s and the 1980s, which was rather similar to the level of consumption in neighboring Argentina but a bit higher than in Latin America as a whole [13]. Estimated cigarette consumption per capita among adults (>15 years of age) increased in Brazil from 1330 in 1970-72 to 1750 in 1980-82 and then decreased to 1500 in 1990-92 [15] and then to 800 by 2000 [53].

In 2017, according to the National Cancer Institute (INCA), estimated 91 billion licit and illicit cigarettes were consumed in Brazil⁵. With about 160 million people aged 15 years and older living in Brazil, current per capita cigarette consumption is about 570 cigarettes per person per year.

Tobacco growing

Brazil is the second world producer of raw tobacco and the world leading tobacco exporter for the last 24 years⁶; 90% of the tobacco produced in Brazil is shipped abroad.

According to the FAO database [54], raw tobacco production in Brazil increased from about 168,000 tons a year in 1961 to over 951,933 tons in 2011, but then it decreased to 880,881 tons in 2017. The area harvested for tobacco increased from about 230,000 hectares in the early 1960s to almost 500,000 hectares in 2006 and 2007, but then it decreased to 398,418 hectares in 2017.

The ministry of agricultural development announced that in 2011 it invested six million dollars in technical support and agricultural extension services for approximately 10,000 family farmers who wished to diversify away from growing tobacco⁷. The funds have been used principally for families in the seven tobacco-growing states: Alagoas, Sergipe, Bahia and Paraíba in the north-east and Rio Grande do Sul, Santa Catarina and Paraná in the south. The government planned to increase to 50,000 the number of families receiving aid from the National Program to Support Product Diversification in Tobacco-Growing Areas created in 2005. According to the authorities, this program was part of one of the country's largest inter-ministerial initiatives created to meet the guidelines of the World Health Organization (WHO) Framework Convention on Tobacco Control.

Tobacco production and sales

Souza Cruz, the local subsidiary of British American Tobacco, continued to dominate in cigarette production in Brazil over recent years with its market share of about 70%. However, in 2016, BAT

⁵ <https://www.terra.com.br/vida-e-estilo/saude/consumo-de-cigarros-pirateados-ou-contrabandeados-cai-no-brasil,55d727836afa51a869df4afdc004643d0edwdm14.html>

⁶ https://www.coresta.org/sites/default/files/abstracts/2017_Opening-01_Schunke.pdf

⁷ <http://www.ipsnews.net/2011/12/brazil-providing-alternatives-for-small-scale-tobacco-farmers/>

announced the closure of production facilities at its Cachoeirinha location in Porto Alegre⁸, which was responsible for producing around 20% of its cigarettes in the country. Currently, Souza Cruz has only one production plant in Brazil in the state of Minas Gerais.

Philip Morris is the second biggest cigarette manufacturer in the country, and its market share increased from 16% in 2013 to 22% in 2017 [55]. The company's only production plant in Brazil is located in the state of Rio Grande do Sul.

In 2018, JTI opened a tobacco factory in Santa Cruz do Sul, which is expected to produce up to 4 billion cigarettes per year⁹.

According to the Federal Revenue Secretariat (RFB)¹⁰, there are 13 more manufacturers authorized to operate in Brazil, but two of them are under investigation for tax evasion.

Monthly data on cigarette production and export are regularly published by the RFB¹¹. Data on cigarette import are available on another governmental site called COMEX STAT¹².

Legal cigarette turnover (= production + import – export) increased from 97 billion cigarettes in 2000 to 110 billion cigarettes in 2004 but then decreased to 55 billion cigarettes in 2016 (Figure 2). First substantial decline of the turnover was observed in 2008-2009 when it decreased by 12 billion cigarettes. In 2012-2016, the turnover decreased every year, while in 2017 it increased. In January-December 2018 cigarette turnover was 57.4 billion cigarettes, which is 0.3 billion cigarettes less, than in 2017. In January-March 2019, cigarette production minus export was 15.58 billion cigarettes¹³, 4% more than in January-March 2018.

⁸ <http://www.gamaconsumer.com/brazil-santa-cruz-ceases-operations-at-porto-alegre-plant/>

⁹ <http://www.gaz.com.br/conteudos/regional/2018/09/25/130378->

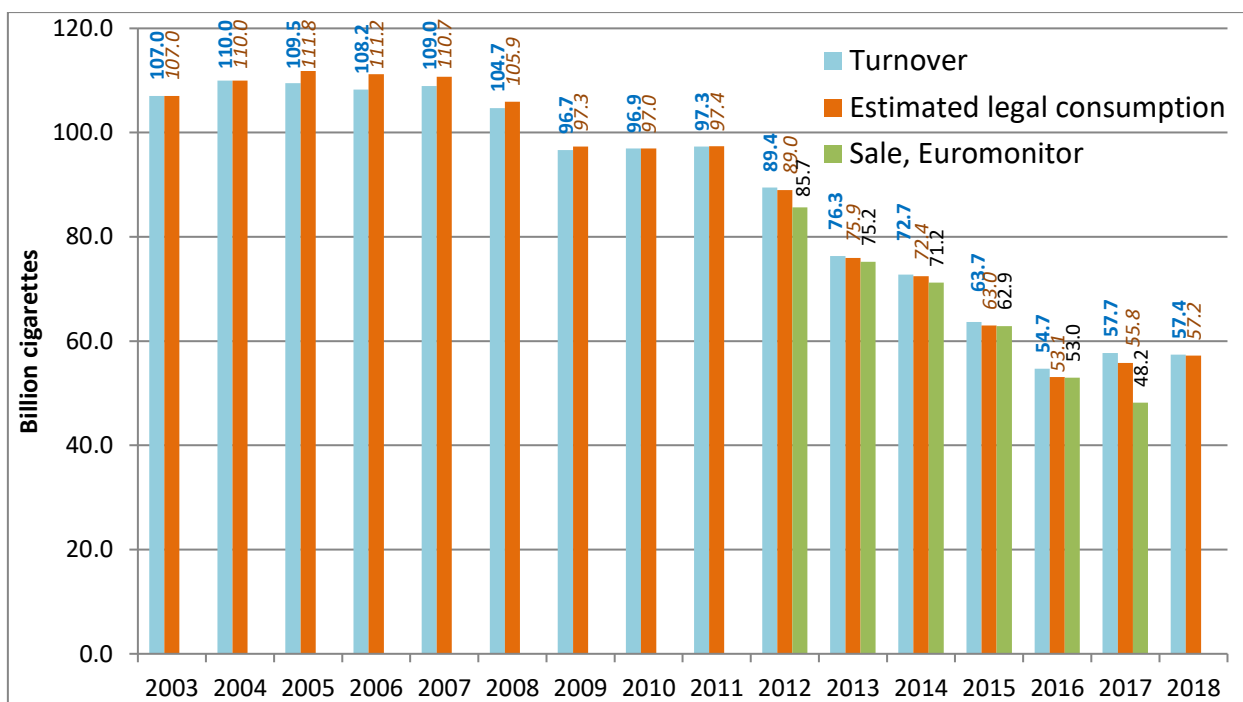
[quanto_a_nova_fabrica_de_cigarros_da_jti_vai_render_para_santa_cruz.html.php](http://www.gaz.com.br/conteudos/regional/2018/09/25/130378-quanto_a_nova_fabrica_de_cigarros_da_jti_vai_render_para_santa_cruz.html.php)

¹⁰ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais/cigarros-estabelecimentos-fabricantes-autorizados-a-operarem-no-brasil-1>

¹¹ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais>

¹² <http://comexstat.mdic.gov.br/en/home>

¹³ <http://receita.economia.gov.br/orientacao/tributaria/regimes-e-controles-especiais/producao-de-cigarros-no-brasil-2019>

Figure 2. Cigarette turnover (production – export + import), estimated consumption and sale, billion cigarettes

Source: Production and export – Receita Federal¹⁴, import – Comex Stat¹⁵, consumption: 2003–2012 [56]; 2011–2016 AFUBRA¹⁶, sales – Cigarettes in Brazil, 2018

Data on legal cigarette consumption show that in 2005–2009, consumption was higher than the turnover. However, according to the data, presented by the Brazilian Tobacco Growers Association (AFUBRA), since 2012 the consumption has been lower than the turnover, especially in 2015 and 2016. In 2017, the estimated legal consumption was 55.8 billion cigarettes¹⁷, which is also lower than the turnover. André Szklo, the researcher of the Cancer Institute, informed that in 2018, the sale volume was 1.4 billion cigarettes higher than in 2017¹⁸.

Data on cigarette sales published by Euromonitor demonstrate that in 2012–2016, estimated annual sales were lower than the turnover by 0.8–3.7 billion cigarettes, while in 2017 the difference was 9.5 billion cigarettes. According to the Philip Morris International Annual report, in 2018 total estimated total cigarette market in Brazil decreased by 6.2%¹⁹. However, according to the RFB data, the legal turnover increased during this period of time (see above).

Tobacco taxation

Several different taxes are applied to tobacco products in Brazil.

¹⁴ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais>

¹⁵ <http://comexstat.mdic.gov.br/pt/home>

¹⁶ <https://afubra.com.br/fumicultura-brasil.html#tab-cigarros-e-impostos>

¹⁷ <https://www.terra.com.br/vida-e-estilo/saude/consumo-de-cigarros-pirateados-ou-contrabandeados-cai-no-brasil,55d727836afa51a869df4afd004643d0edwdm14.html>

¹⁸ <https://www.terra.com.br/economia/criacao-de-grupo-para-discutir-reducao-de-imposto-sobre-cigarro-e-criticada-dentro-do-governo,18a41d3ad2a70a47804494fef05ba303j5ldon1h.html>

¹⁹ <http://phx.corporate->

ir.net/External.File?item=UGFyZW50SUQ9NzA1MTcxFeNoaWxkSUQ9NDE3MjgzfFR5cGU9MQ==&t=1

IPI (Imposto sobre Produto Industrializado) is an excise tax which applies either to the output of national goods from the factory or to customs clearance when the product comes from abroad. It is a federal tax paid by the industry owner and by the importer of the goods.

Until 1999, IPI was an ad valorem tax corresponding to 41.25% of the retail sale price of cigarettes, and then it became a tiered specific tax [9]. For the purpose of the IPI tax, cigarettes were divided into 6 tiers according to their packaging and length. The multi-tiered specific system was implemented in June 1999, and initially, the specific rates per pack of 20 cigarettes ranged from 0.35 to 0.70R\$. After that, the specific rates were adjusted in December 2002, January 2004, July 2007 and May 2009²⁰, but the increases were usually below the inflation rates [57]. From May 2009, the rates ranged from 0.764 to 1.397 R\$ per pack.

In 2011, the tax authorities proposed a change in the cigarette excise tax system and large increases in excise tax rates. Presidential Decree 7555/2011²¹, modified by the Decree 7.593/2011 and then by the Law 12.546 established the detailed rates of the new tobacco excise system created for 2012-2015. Then, the Decree no. 8,656, of January 29, 2016²², established the rates for 2016, which are still used (Table 2).

There were two excise taxation system options for each tobacco producer to choose from:

1. **The general system.** Companies choosing the general system would pay an ad valorem rate of 300% on a tax base established as 15% of the consumer price. This means that the ad valorem rate would be 45% of the consumer price.
2. **The special system** offers a mixed system, with both specific and ad valorem rates. The law sets both specific and ad valorem rates which were increased almost every year (Table 2).

Table 2. Cigarette excise (IPI) rates from December 2011

VALIDITY	Excise rates			Minimum price per pack
	AD VALOREM	SPECIFIC per pack		
		Soft pack	Hard box	
01/12/2011 to 04/30/2012	0%	R \$ 0.80	R \$ 1.15	-
05/01/2012 to 31/12/2012	40.0%	R \$ 0.90	R \$ 1.20	R \$ 3.00
01/01/2013 to 12/31/2013	47.0%	R \$ 1.05	R \$ 1.25	R \$ 3.50
01/01/2014 to 12/31/2014	54.0%	R \$ 1.20	R \$ 1.30	R \$ 4.00
01/01/2015 to 04/30/2016	60.0%	R \$ 1.30	R \$ 1.30	R \$ 4.50
05/01/2016 to 11/30/2016	63.3%	R \$ 1.40	R \$ 1.40	R \$ 5.00
From 1 December 2016	66.7%	R \$ 1.50	R \$ 1.50	

Ad valorem IPI rate is calculated from the base which constitutes 15% of the final retail price, so the current actual ad valorem rate is $0.15 \times 0.667 = 10,005\%$. For cigarettes with minimum price (currently 5 R\$), the specific tax is 1.50 R\$ or 30% of the final tax, so the maximum IPI share in the final retail price is $40\% = 30\%$ (specific) + 10% (ad valorem), which is less than 45% ad valorem rate of the general IPI system, so all cigarette producers and importers use the special IPI system.

²⁰ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais/cigarros-tributacao>

²¹ http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/Decreto/D7555.htm

²² http://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2016/Decreto/D8656.htm#art6

ICMS “Imposto sobre operações relativas à circulação de mercadorias e serviços de transporte interestadual e intermunicipal e de comunicações” – or simply ICMS, is a value-added tax that is collected by the states. The ICMS rate was set as 25% by Article 34 of the law 6374 of 1989²³, but in 2015, this rate had been adjusted in 20 states and the Federal District. The rate increased by 10% in the Federal District and by 7% in São Paulo state. In this state, the Law 16005²⁴ of 24/11/2015 increased the main rate to 30%, and the Law 16006 established the State Fund to Combat and Eradicate Poverty with an additional 2% excise rate. So the total ICMS rate in São Paulo is 32%, effective from February 23, 2016.

PIS (Programa de Integração Social) is a federal ad valorem tax that applies to gross revenues earned by legal entities. The rate applied to tobacco products is of 0.65%, but the tax base is the retail sale price multiplied by some coefficient. Before 2006, it was 1.38; then in 2006-2009, it was 1.98, and from July 2009 it is 3.42 [58]. Currently, the final rate is $0.65 \times 3.42 = 2.223\%$.

COFINS (Contribuição Social para o Financiamento da Seguridade Social) is a tax which supports health and social programs. It is a state ad valorem tax with a 3% rate, and the tax base is the retail sale price multiplied by some coefficient, which was 1.18 before 2006; 1.69 in 2006-2009 and 2.9169 from July 2009)²⁵. Currently, the final rate is $3 \times 2.9169 = 8.75\%$.

In 2009, the PIS and COFINS combined rate was increased from 6.36% to 10.97%.

Selo de controle (excise stamp) tax is specific (0.063 R\$), but it is reimbursed²⁶.

Currently, the total ad valorem rate for cigarettes (in São Paulo state) is: 10% (IPI) + 32% (ICMS) + 11% (PIS and COFINS) = 53% of the final retail price.

Working group to discuss the reduction of taxes on cigarettes

In March 2019, the Minister of Justice and Public Security, Sérgio Moro set up a working group to discuss the reduction of taxes on cigarettes²⁷. The aim would be "to reduce consumption of low-quality foreign cigarettes, smuggling and recurring health risks."

The ACT Health Promotion, a non-governmental organization that acts to combat smoking, sent an open letter to the Ministry of Justice signed by 60 entities that disagree with the intention to reduce the excise rates²⁸. The Federal Revenue evaluation revealed that a possible tax reduction would have a limited capacity to reduce smuggling. The main factor behind the smuggling issue is the low price of cigarettes in Paraguay, the origin of much of the illegal tobacco products consumed in Brazil. There, each package costs less than R \$ 1. Even if taxation is reduced and the price of cigarettes falls from the current R \$ 5.5 to R \$ 3, they calculate, there would be no way to neutralize the attractiveness of the illegal market²⁹.

²³ <https://www.al.sp.gov.br/repositorio/legislacao/lei/1989/lei-6374-01.03.1989.html>

²⁴ <https://www.contabeis.com.br/legislacao/631311/lei-sp-16005-2015/>

²⁵ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais/cigarros-tributacao>

²⁶ http://www.who.int/tobacco/surveillance/policy/country_profile/bra.pdf

²⁷ <https://gauchazh.clicrbs.com.br/politica/noticia/2019/03/moro-cria-grupo-para-discutir-reducao-de-impostos-sobre-cigarros-e-entidades-reagem-cjtqakyor00z601prnhssm5ma.html>

²⁸ <https://www.folhadelondrina.com.br/geral/reducao-de-impostos-sobre-cigarros-divide-opinioes-2941840e.html>

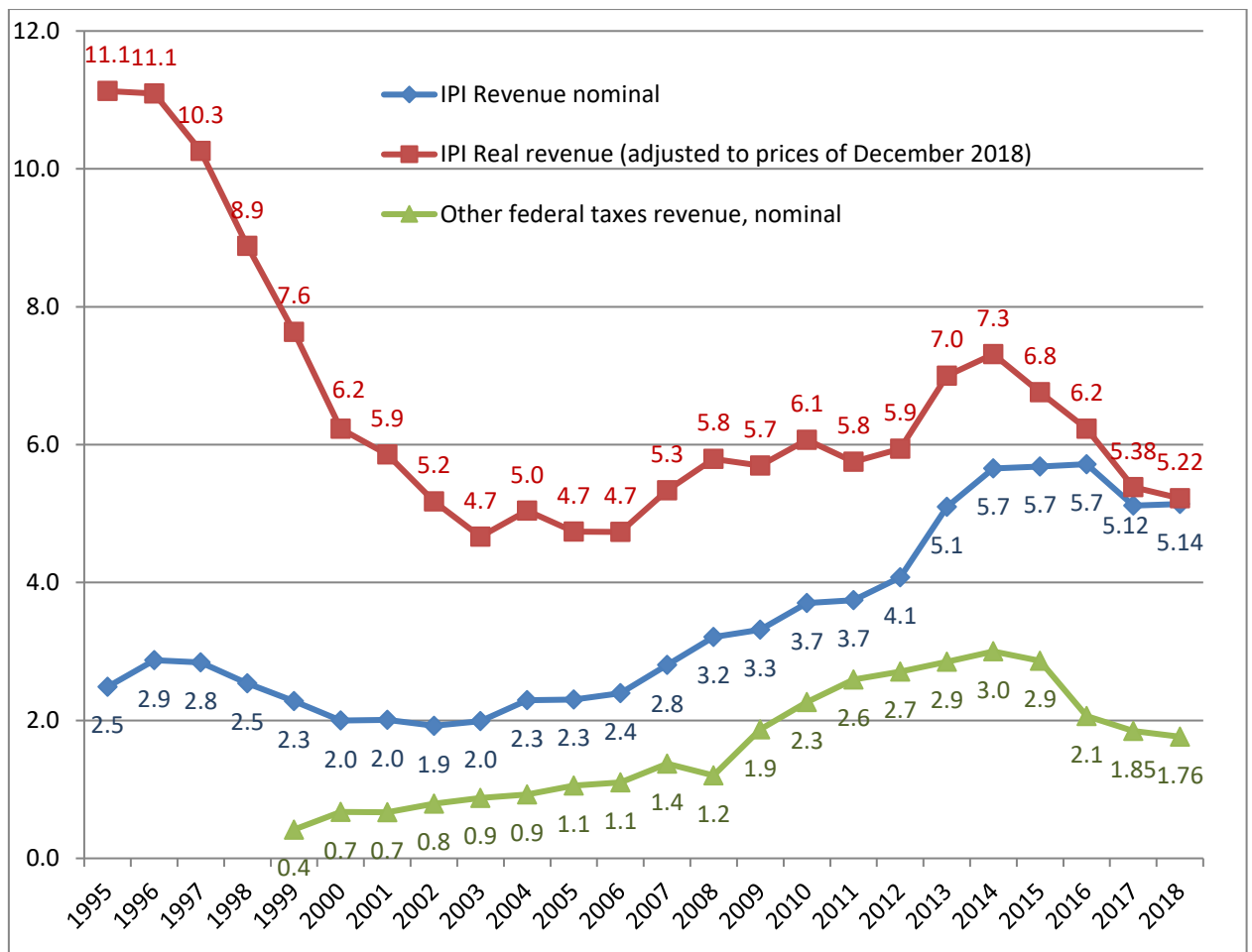
²⁹ <https://www.terra.com.br/economia/criacao-de-grupo-para-discutir-reducao-de-imposto-sobre-cigarro-e-criticada-dentro-do-governo,18a41d3ad2a70a47804494fef05ba303j5ldon1h.html>

In 2017 to 2018, legal cigarette sales increased, said the researcher of the Cancer Institute, André Szklo. "With the freeze on cigarette tax increases since 2016, there has been an expansion of the market," he said. According to the researcher, prices stabilized in the last two years have led the population to get accustomed to these stabilized values. And the effect on health indicators is already felt. "The latest surveys by the Ministry of Health indicate an increase in the number of smokers among the youngest population," he said. "Tobacco smuggling is not tackled with tax cuts but with security measures. It is not a fiscal issue but a fight against corruption," said the executive secretary of the National Commission for the Implementation of the Tobacco Framework Convention, Tania Cavalcante.

Tobacco tax revenue

Secretariat of Federal Revenue of Brazil (RFB) publishes annual and monthly data on revenue from IPI excise tax³⁰ and revenue from other federal taxes³¹. RFB also recalculated the nominal IPI revenue into real (inflation-adjusted) revenue (Figure 3).

Figure 3. Tobacco tax revenue.



Source: Secretariat of Federal Revenue of Brazil.

Both nominal and real IPI revenue decreased in 1996-2002. Then, nominal revenue annually increased, while in 2014-2016 the curve was flat, and eventually, the nominal IPI revenue declined in 2017.

³⁰ <http://idg.receita.fazenda.gov.br/dados/receitadata/arrecadacao/relatorios-do-resultado-da-arrecadacao>

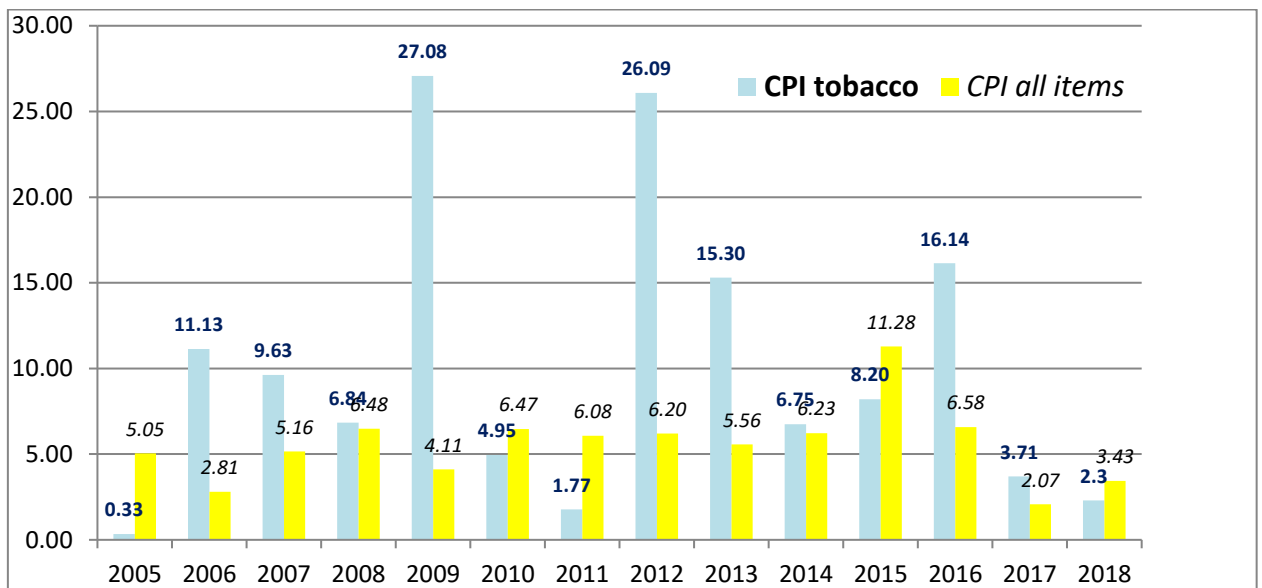
³¹ <http://idg.receita.fazenda.gov.br/orientacao/tributaria/regimes-e-controles-especiais/arrecadacao-de-tributos-federais-2016>

Real revenue increased in 2007-2008 and then in 2012-2014, but in 2015-2017, real IPI revenue declined by 26% in three years, while nominal revenue declined only in 2017 by 10.5%. In 2018, nominal revenue was almost the same as 2017³², while real revenue continued to decline.

Cigarette prices

The Brazilian Institute of Geography and Statistics (IBGE) publishes annual Statistical Yearbooks³³, which have monthly data on changes in consumer price indices (CPI) for different products, including tobacco products. We used such data to calculate CPI (December to December each year) for tobacco products (Figure 4).

Figure 4. The consumer price index, change (%) December to December each year



Source of data: IBGE Annual Statistical Yearbook

The tobacco price increase was substantially higher than inflation in: (1) 2006-2007; (2) 2009; (3) 2012-2013; (4) 2016. In some years (2005, 2010, 2011, 2015, 2018) the inflation rate exceeded cigarette price increase.

Short-run price elasticity of demand in the 1990s in Brazil was estimated to range between -0.11 and -0.35 , while long-run price elasticity of demand was between -0.48 and -0.80 . Income elasticity was: short-run between 0.23 and 0.31 and long-run between 0.76 and 0.80 [59]. According to Iglesias et al [60], price elasticities were: short-run -0.25 and long-run -0.42 , income elasticity 0.05 to 0.36 [61].

There are no official data on average annual cigarette prices in Brazil. Various sources [56, 62],³⁴ provide different estimates of the average price for the same year. So we used an average price 2.14 R\$ per pack in 2005, which is the same in two sources, and then calculated average prices for next years, using official CPI data (see Figure 4). Then we used the data on the legal cigarette consumption (see Figure 2) and calculated the volume of legal cigarette market in money terms as follows: Average price per pack x Cigarette consumption in packs (Table 3).

³² <http://receita.economia.gov.br/dados/receitadata/arrecadacao/relatorios-do-resultado-da-arrecadacao/arrecadacao-2018/dezembro2018/analise-mensal-dez-2018.pdf>

³³ <https://biblioteca.ibge.gov.br/biblioteca-catalogo?view=detalhes&id=720>

³⁴ <https://afubra.com.br/fumicultura-brasil.html#tab-cigarros-e-impostos>

Table 3. Average cigarette prices and cigarette market estimates

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Average price, R\$ per pack of 20 cigarettes	2,14	2,38	2,61	2,79	3,54	3,71	3,78	4,77	5,50	5,87	6,35	7,37	7,65
Consumption, bln cigarettes	111,8	111,2	110,7	105,9	97,3	97,0	97,4	89,0	75,9	72,4	63,0	53,1	48,2
Market, billion R\$	12,0	13,2	14,4	14,7	17,2	18,0	18,4	21,2	20,9	21,2	20,0	19,6	18,4

Cigarette market in monetary terms gradually increased in 2006-2008. Then it substantially increased in 2009 despite the reduction of cigarette consumption. The next sharp increase of the market took place in 2012, and then the market was rather stable in 2012-2014 while cigarette sales declined, but this decline was compensated by the price growth. From 2015, the cigarette market decreased, and in 2017, it was 13% lower than in 2014 as the reduction of cigarette sales exceeded the price increase.

Euromonitor reports that cigarette sales value increased from 22 billion R\$ in 2012 to 24.7 billion R\$ in 2014 and then decreased to 23 billion R\$ in 2017, so the cigarette market did not change much in monetary terms in 2012-2017. Probably, the IBGE underestimated the increase of cigarette prices over recent years as the AFUBRA reports³⁵ that the average cigarette price in 2016 was 8.32 R\$ per pack, while the CPI-calculated price is only 7.37R\$.

We also collected the data on prices for cigarette brand Derby, which was the most sold brand until 2017. Then we calculated taxes according to the scheme presented at INCA website³⁶ and tax rates for the relevant years (Table 4) and also calculated the net-of-tax price (= Final price – All taxes).

Table 4. Prices and taxes of Derby cigarettes, R\$ per soft pack of 20 cigarettes

	2012	2013	2014	2015	2016	2017	2018
Retail price	4,25 ³⁷	5,00 ³⁸	5,75	6,25 ³⁹	7,00 ⁴⁰	7,50 ⁴¹	8,25 ⁴²
<i>Change of retail price, %</i>		17,6	15,0	8,7	12,0	7,1	10,0
Specific IPI excise	0,90	1,05	1,20	1,30	1,40	1,50	1,50
Ad valorem IPI excise	0,26	0,35	0,47	0,56	0,66	0,75	0,83
Other federal tax	0,47	0,55	0,63	0,69	0,77	0,825	0,91
ICMS tax, São Paulo state	1,06	1,25	1,44	1,56	2,24	2,40	2,64
All taxes	2,69	3,20	3,74	4,11	5,07	5,48	5,87
% tax	63,2	64,1	65,0	65,8	72,5	73,0	71,2
Net-of-tax price	1,57	1,80	2,01	2,14	1,93	2,02	2,38
<i>Change of net-of-tax price, %</i>		14,9	12,1	6,1	-9,9	5,2	17,4
<i>Inflation, % change December to December previous year</i>	6,2	5,6	6,2	11,3	6,6	2,1	

³⁵ <https://afubra.com.br/fumicultura-brasil.html#tab-cigarros-e-impostos>

³⁶

http://www2.inca.gov.br/wps/wcm/connect/observatorio_controle_tabaco/site/status_politica/precos_impostos

³⁷ http://www.receita.fazenda.gov.br/publico/destinacaoMercadorias/Cigarros/MarcaPreco/PRECO_SOUZA_CRUZ_23ago2012.pdf

³⁸ <https://economia.estadao.com.br/noticias/negocios,souza-cruz-eleva-preco-de-cigarro-em-16-em-20-estados,136214e>

³⁹ <http://atarde.uol.com.br/economia/noticias/1649287-cigarros-da-souza-cruz-terao-alta-media-de-85>

⁴⁰ <http://www.betaredacao.com.br/quanto-custa-o-seu-vicio-tabagismo/>

⁴¹ <https://www.pressreader.com/brazil/valor-econ%C3%B4mico/20170125/281809988611518>

⁴² Price for São Paulo state http://gerencialpublico.cmb.gov.br/PRECO_SOUZA_CRUZ.html

In 2013-2015, the increase of retail prices was caused not only by an increase in tax rates but also by the increase of the industry part of the price (net-of-tax price). In 2013 and 2014, the increase of the net-of-tax price was much higher than inflation. However, in 2015, net-of-tax increase was below inflation. Some decline of the calculated net-of-tax price in 2016 was mainly caused by a sharp increase of the ICMS rate in São Paulo state, but probably in São Paulo Derby cigarettes had a higher price in 2016 and 2017 than in other states. Anyway, in 2015-2018 in São Paulo state, the net-of-tax price of Derby cigarettes increased from 2.14 to 2.38 R\$ or by 11%, while the inflation rate over those three years was 21%. Apparently, the tobacco industry had different price policy in 2012-2014 and in 2015-2017.

Tax share in the final price increased moderately in 2012-2015: from 63% to 66%, but from 2015 the share exceeds 70%.

The WHO Global Tobacco Report, 2017 [12] contains information on cigarette prices and taxes in Brazil and other Latin American countries in 2016 (Table 5).

Table 5. Cigarette prices and taxes in Brazil and some neighboring countries in 2016

Country	Price of a 20-cigarette pack of the most sold brand			Taxes as a % of price of the most sold brand						Net-of-tax part of the price, US\$
	In reported currency	Reported currency	In US\$	Specific excise	Ad valorem excise	Total Excise	VAT/ Sales tax	TOTAL TAX, %	TOTAL TAX, US \$	
Argentina	40,00	ARS	2,67	0,00%	76,10%	76,10 %	4,15%	80,25 %	2,14	0,53
Bolivia	11,00	BOB	1,59	0,00%	27,85%	27,85 %	11,50%	39,36 %	0,63	0,96
Brazil	6,24	BRL	1,91	22,44%	9,54%	31,98 %	25,00%	67,95 %	1,30	0,61
Colombia	2 726,00	COP	0,88	25,72%	10,00%	35,72 %	13,79%	49,51 %	0,44	0,44
Guyana	350,00	GYD	1,69	0,00%	10,89%	10,89 %	13,79%	24,68 %	0,42	1,27
Paraguay	2 000	PYG	0,36	0,00%	8,31%	8,31% %	9,09%	17,40 %	0,06	0,30
Peru	10,50	PEN	3,13	34,29%	0,00%	34,29 %	15,25%	49,54 %	1,55	1,58
Suriname	17,00	SRD	2,36	55,98%	0,00%	55,98 %	7,54%	63,90 %	1,51	0,85
Uruguay	110,00	UYU	3,70	47,47%	0,00%	47,47 %	18,03%	65,51 %	2,42	1,28

We calculated the net-of-tax price of the most popular cigarette brand as follows: Price in USD * (1 – Total tax share). Cigarettes in Brazil had lower retail prices and taxes than in Suriname, Argentina, Peru, and Uruguay, but the net-of-tax cigarette price in Brazil was higher than in Argentina. The price differences are high enough to motivate smuggling of cigarettes from Paraguay and Colombia to Brazil but also from Brazil to Argentina, Peru, and Uruguay.

Tobacco affordability

The Guidelines for the implementation of Article 6 of the WHO FCTC [63] recommend: “When establishing or increasing their national levels of taxation Parties should take into account – among other things – ... changes in household income, to make tobacco products less affordable over time in order to reduce consumption and prevalence”. In the Guidelines, “affordability” means price relative to per capita income.

Cigarette affordability in Brazil has been increasing since around 1998. If the price of cigarettes was following the variation in income between 1998 and 2013, its price would be 11% higher [56].

In the current analysis, a modified tobacco affordability index (TAI) [64] is used to estimate the changes in tobacco affordability. TAI was calculated as the percentage annual change in real (inflation-adjusted) average income per capita (only for 2012–2017 as consistent income data for previous years were not available) published by the IBGE⁴³ divided by the real tobacco price increase: $TAI = (\text{income increase} * \text{CPI_all_items} / \text{CPI_tobacco} - 100)$. A negative TAI value means that tobacco became less affordable, and tobacco consumption is expected to decrease. We also used as income proxy the World Bank indicator “Annual percentage growth rate of GDP per capita based on constant local currency”⁴⁴. TAI for 2005-2017 was calculated as follows: GDP annual change divided by the (inflation-adjusted) tobacco price increase minus 100: $(\text{GDP growth} * \text{CPI_all_items} / \text{CPI_tobacco} - 100)$. The results of the Tobacco Affordability Index estimation are presented in Table 6.

Table 6. Tobacco affordability in Brazil

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
GDP growth (annual %), previous year = 100	103,2	104,0	106,1	105,1	99,9	107,5	104,0	101,9	103,0	100,5	96,5	96,5	101,0
Growth of real household income per capita, previous year = 100	x									102,4	92,8	101,3	98,9
CPI tobacco, previous year = 100	100,3	111,1	109,6	106,8	127,1	104,9	101,8	126,1	115,3	106,8	108,2	116,1	103,7
CPI all items, previous year = 100	105,1	102,8	105,2	106,5	104,1	106,5	106,1	106,2	105,6	106,2	111,3	106,6	102,1
TAI GDP	8,1	-3,8	1,7	4,7	-18,2	9,1	8,4	-14,1	-5,7	0,0	-0,8	-11,4	-0,6
TAI income										1,9	-4,6	-7,0	-2,6

It was reported⁴⁵ that since 2004, household income per capita has been growing at an average rate of 4.5% per annum above inflation, from R \$ 687 in 2003 to R \$ 932 in 2011 or by 36%. Real tobacco prices combined increased only by 25%, so cigarettes became more affordable over those years. TAI calculated on GDP data confirms this general conclusion but demonstrates that tobacco affordability in Brazil substantially declined in 2009 due to the excise-driven cigarette price increase, while GDP did not increase that year.

From 2012 to 2017, the decline in tobacco affordability is observed. The real cigarette price increased in those years, but the main cause of the affordability reduction was the per capita household income and GDP stagnation (and even the income reduction in 2015). From the beginning of 2015 onwards, economic and political crises have ensued [65].

⁴³ <https://www.ibge.gov.br/estatisticas-novoportal/sociais/trabalho/9173-pesquisa-nacional-por-amostra-de-domicilios-continua-trimestral.html?edicao=21240&t=renda-domiciliar-per-capita>

⁴⁴ <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BR>

⁴⁵ <http://www.brasil.gov.br/noticias/educacao-e-ciencia/2013/02/estudo-reune-dados-sobre-o-desenvolvimento-do-pais>

Illicit cigarette sales

The illicit tobacco trade has been a concern for the Brazilian authorities since the mid-1990s. The Brazilian illicit cigarette market grew rapidly from approximately half a billion sticks in 1992 to 8 billion sticks in 1993 [66]. In 1998, Brazilian manufacturers were exporting 34 billion cigarettes to neighboring countries, many of which returned illegally to Brazil as contraband [61]. Estimates by the Tobacco Growers Association for 2000 suggest that contraband could account for 30 to 34 percent of consumption - approximately 49 billion sticks⁴⁶.

To deal with this problem, the government imposed an export tax of 150% on cigarettes to neighboring countries. After the export tax was introduced, exports of cigarettes declined rapidly, but cigarette smuggling continued, as newly established factories in Paraguay kept fueling the contraband market. Large volumes of cigarettes continue to be exported to Brazil illegally from Paraguay. Despite factories from Paraguay have no officially reported cigarette exports to Brazil, according to a law enforcement official, Brazil accounts for about 70% of such factories profit [66]. Brazilian customs authorities seized 341.1 million packs of cigarettes coming from Paraguay between 2010 and 2013.

In addition to the smuggling problem, 14 domestic cigarette companies were not paying the taxes on cigarettes in the 2000s. The production of illegal cigarettes in Brazil reached some 9 billion cigarettes in 2007, about 6.4% of the total cigarette market [67]. The size of the illegal market in Brazil was estimated to be about 30% of total sales [67].

According to industry estimates, contraband was responsible in 2012 for 17.4% of the Brazilian market. Another 10.9% refers to the informal market, that is, to the production and marketing of cigarettes produced in Brazil without the payment of taxes [56].

In May 2015, KPMG agency issued a report called "Project Frost" [68] funded by British American Tobacco (BAT). The study had to consider the smuggling and the counterfeit segments of the tobacco market in 16 Latin American markets (including Brazil) and Canada (with a focus on Ontario). Most data for the study (sales, prices, taxes) were provided by the BAT. The estimates of illicit sales were based on so-called empty pack surveys (EPS). BAT provided the results of EPS to KPMG. According to the EPS results shown in the 'Project Frost' report [68], contraband and counterfeit cigarettes accounted for 29.3% of cigarettes consumed in Brazil in 2014, a volume of 31.12 billion cigarettes: 30.23 billion smuggled from Paraguay; 0.5 billion – counterfeit cigarettes and 0.39 billion – other illicit cigarettes.

We took estimates of illicit cigarette sales (Table 7) made by:

- 1) Tobacco industry for 2000-2011 [56] and Euromonitor for 2012-2017 [55];
- 2) Public health experts - Iglesias et al. [65, 69, 70] for 2008 and 2012-2017.

Table 7. Estimates of illicit cigarette sales in Brazil, billion cigarettes

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Legal cigarettes consumption	96,6	106,5	102,1	107,0	110,0	111,8	111,2	110,7	105,9	97,3	97,0	97,4	89,0	75,2	71,2	62,9	53,0	48,2
Tobacco industry estimates																		
Total consumption	143	157	150	152	155	158	151	150	143	134	133	135,3	118,0	108,0	104,3	98,0	91,1	90,1

⁴⁶ <http://www.fao.org/docrep/006/y4997e/y4997e0c.htm>

Illicit consumption	46,4	50,5	47,9	45,0	45,0	46,2	39,8	39,3	37,1	36,7	36,0	37,9	32,3	32,8	33,1	35,1	38,2	41,9
Illicit share, %	32,4	32,2	31,9	29,6	29,1	29,2	26,4	26,2	25,9	27,4	27,1	28,0	27,4	30,4	31,7	35,8	41,9	46,5
Public health experts estimates																		
Illicit share, Iglesias %									17,0				28,6	32,3	28,8	36,5	42,8	38,5
Illicit consumption									21,5				35,8	36,2	29,3	36,2	39,7	34,9
Total consumption,									127,4				125,2	112,1	101,7	99,2	93,0	90,7

According to the industry estimates, total cigarette consumption increased in 2000-2005 as illicit consumption did not decline while legal sales increased. Then, in 2006-2010, both licit and illicit consumption decreased. In 2012-2017, according to the Euromonitor estimates, licit and illicit consumption had opposite trends, but total cigarette consumption decreased from 118 billion to 90 billion or by 24% in five years.

According to estimates by Szklo et al. [65], the decline in legal sales in 2008-2012 was almost fully compensated by the growth in illicit sales, but then, despite some increase in illicit sales, total cigarette consumption decreased from 125 billion in 2012 to 93 billion in 2016, or by 26% in four years. Szklo et al. [65] suggested that the sharp increase of the illicit market from the beginning of 2015 onwards was caused by the economic and political crises: inflation has spiked up, consumer confidence has plummeted, and the president was impeached by the Brazilian Congress.

A study coordinated by the National Cancer Institute (INCA) indicated that the consumption of smuggled cigarettes in the country fell from 39.7 billion in 2016 to 34.9 billion in 2017⁴⁷.

Despite the difficulties, the government used various strategies to contain smuggling. One of the ways to combat smuggling and the spread of illegal cigarettes is more strict control of supply. In Brazil, one of the main tools in the containment of the illegal production of cigarettes inside the country is the Scorpions System, which anticipates an automatic control of the production. The system controls the number of cigarettes produced, and the Secretariat of Federal Revenue of Brazil - RFB has promoted the closure of factories that did not adhere to the special production regime that includes the installation of Scorpions. Another option, also adopted in Brazil, is the use of control stamps with traceability of cigarettes, using serial numbers and portable reading equipment. Lack of stamps and problems with reading identify illegal products. The establishment of minimum prices, as was done in Brazil from 2012, is also a strategy to combat the illegal market.

According to the Brazilian Ministry of Finance, the implementation of the program in the mid-2000s led to the closure of several companies that did not comply with the licensing rules [61].

The RFB reported that in 2017 four illicit cigarette factories were closed, which on average produced approximately 100,000 packs of cigarettes per day, and for two of these factories, the special registration of cigarette manufacturers was canceled because of tax evasion through tax fraud and other criminal offenses⁴⁸.

However, despite the administrative advances promoted by the RFB, some fundamental factors to counteract illegal cigarette sales are still to be implemented. The lack of border structure, poor

⁴⁷ <https://www.terra.com.br/vida-e-estilo/saude/consumo-de-cigarros-piratedados-ou-contrabandeados-cai-no-brasil,55d727836afa51a869df4afdc004643d0edwdm14.html>

⁴⁸ <http://idg.receita.fazenda.gov.br/sobre/acoes-e-programas/operacao-deflagrada/operacoes-e-acoes-realizadas/operacao-com-cigarros/operacoes-com-cigarros>

surveillance on the roads, the absence of more severe punishments and the enormous gains from smuggling remain and weaken the efforts undertaken to reduce this market.

Discussion

Trends in smoking prevalence and cigarette consumption

Brazil experienced a substantial decline in smoking prevalence among adults between 1989 and 2008: from 34.8% to 18.5% (see Table 1) or by 46% in 19 years. Smoking prevalence among children also decreased. According to the SimSmoke model estimates [71], 46% of the reduction in adult prevalence was explained by price increases, 14% by smoke-free air laws, 14% by marketing restrictions, 8% by health warnings, 6% by mass media campaigns, and 10% by cessation treatment programs. So, tax and price increase was the strongest factor of the smoking decline.

In 2006-2017, the prevalence of smoking in large cities (measured by the VIGITEL survey) decreased from 15.7% to 10.1% or by 36% in 11 years. The decrease was steeper in 2008-2009 and 2012-2014 (see Figure 1). Estimated cigarette consumption (licit and illicit combined), according to the tobacco industry estimates, was rather stable in 2001-2007 (about 150 billion cigarettes), but then declined to 90 billion cigarettes in 2017 (see Table 6), so it decreased by 40% in 10 years. However, R. Iglesias [57] suggested that the industry substantially overestimated illicit cigarettes sales in the mid-2000s, and, according to his estimates, in 2008, total cigarette consumption was 127 billion cigarettes. The INCA estimated that in 2017, total cigarette consumption constituted about 91 billion cigarettes, so in 2008-2017, it decreased by 36 billion cigarettes, or by 28% in 9 years.

Both prevalence of smoking and estimated cigarette consumption had higher rates of decline in 2008-2009 and then in 2012-2014 (see Figure 1 and Table 7). In those years, tobacco affordability in Brazil was substantially reduced (see Table 6).

In both cases, the main factor of affordability reduction was the increase in tobacco tax rates: (1) the increase in tier taxes in July 2007 and May 2009; (2) the cigarette excise tax reform of 2011.

Initially, the increased tax rates significantly enhanced the government revenues and reduced the prevalence of smoking and consumption despite the widespread smuggling of tobacco products [57]. However, the taxation policy was not consistent, and the sharp tax hikes were followed by periods of (1) stable tax rates in 2010-2011 and 2017-2018; (2) rather moderate tax rate increases in 2014-2016.

In 2015-2018, the pace of the decline of tobacco use in Brazil slowed down. It was partly caused by the changes in the tobacco industry pricing policy, which did not increase its part of the price above inflation as it used to do in previous years. Due to the economic recession, the affordability of legal cigarettes continued to decline (see Table 6), and it caused a decrease in legal cigarette sales and consumption (see Figure 2). On the other hand, the share of illicit cigarettes, according to public health experts estimates [69], increased to 40% in 2016, and the increase of cigarette prices on the real (illicit + licit combined) market was much lower than the tobacco CPI. So, the real cigarette affordability reduction was modest compared to the one estimated on the basis of licit sales presented in Table 6, and the rates of tobacco use decline were smaller than expected.

The estimate of the actual consumption is distorted by large differences between the cigarette turnover reported by the RFB and cigarette sales reported by Euromonitor (see Figure 2). In 2012-2016 combined, estimated sales were lower than the turnover by 9.0 billion cigarettes, while in 2017 alone the

difference was 9.5 billion cigarettes. Such difference is important for understanding the tobacco tax revenue trends.

Trends in tobacco taxes revenue

The IPI tobacco tax revenue increased in nominal terms from 2002 to 2014, it almost did not change in 2015-2016 but declined in 2017.

In 2014-2017, the average IPI specific excise rate increased from 1.25 to 1.5R\$ per pack or by 20% in three years (see Table 2) while the inflation over those three years was 26% (see Figure 4). Licit cigarette turnover (see Figure 2) decreased in 2014-2017 from 72.7 to 57.7 billion cigarettes or also by 20%, so the nominal specific revenue (measured as the rate multiplied by the turnover volume) should not change. However, the cigarette sales reported by the Euromonitor declined even more in 2017: to 48.2 billion cigarettes or by 32% (see Figure 2). If the IPI tax was paid from those sold cigarettes, the nominal revenue should decline as the growth of tax rate was smaller than the rate of sales reduction.

We calculated expected IPI revenue using the Euromonitor sales data, tax rates from Table 2 and average cigarette prices from Table 3 in 2013-2017 and compared them with actual IPI revenue reported by the RFB (Table 8).

Table 8. Estimated and actual IPI revenue

	2013	2014	2015	2016	2017
Retail price, R\$ per pack	5,50	5,87	6,35	7,37	7,65
Specific IPI excise, R\$ per pack	1,15	1,25	1,3	1,4	1,50
Ad valorem IPI excise, R\$ per pack	0,39	0,48	0,57	0,70	0,77
Sales (Euromonitor), billion cigarettes	75,2	71,2	62,9	53,0	48,2
Specific calculated IPI revenue, million R\$	4324	4451	4088	3707	3614
Ad valorem calculated IPI revenue, million R\$	1458	1693	1797	1853	1844
Total calculated IPI revenue, million R\$	5782	6144	5885	5559	5458
<i>Actual IPI revenue (RFB), million R\$</i>	<i>5097</i>	<i>5654</i>	<i>5682</i>	<i>5717</i>	<i>5118</i>
Difference, %	-13	-9	-4	3	-7

The actual revenue is lower than the estimated one, especially in 2013 and 2014. Probably, the industry used forestalling (paid the tax in the previous year, when the tax rate was lower, but sold cigarettes the next year). However, the difference is rather moderate, and we have to conclude that the actual revenues are close enough to the expected ones, provided that the tax was paid from the sales volumes. The revenue reduction was caused by a too small increase of the excise rates, especially the specific ones. Exactly the estimated specific revenue declined annually starting from 2014, while the ad valorem revenue was growing in 2015-2016. The amount of the specific revenue is much higher in monetary terms than the ad valorem amount, so, it is no surprise that the real IPI revenue declined annually from 2014 (see Figure 3). This was predetermined by the fact that the increase in the specific rate was smaller than required by the inflation and the extent of the decline in the number of taxed cigarettes.

But if the IPI tax was paid from the turnover volume, the revenue would be higher. For example, in 2017, the expected nominal revenue would be 6.5 billion R\$ or 28% higher than the actual one.

Nominal revenue from other federal taxes (see Figure 3) gradually increased almost every year until 2014, especially in 2009. However, in 2015-2018, this kind of revenue substantially declined (by 41% in nominal terms).

The ICMS tax is collected by states. According to the reports⁴⁹ of the most populous state São Paulo, the nominal revenue from different ICMS goods, including tobacco, increased annually from 289 million R\$ to 540 million R\$ in 2011. In 2011-2015, the revenue was rather stable (ranging from 521 to 542 million R\$ annually), but then it declined by 30% in 2015-2017 to 377 million R\$.

So, in 2015-2017, a substantial decline of nominal revenues from several ad valorem excises was observed, while the nominal revenue from the ad valorem IPI excise was rather stable in 2015-2017 (see Table 8). Total nominal revenue from ad valorem excises can decline due to three causes: (1) total sale of taxed products declined in monetary terms (however, according to Euromonitor it decreased only by 7%); (2) ad valorem excise rates were decreased (but the ICMS rate increased in 2016, and other tax rates did not change); (3) rules to determine the tax base to calculate ad valorem excise were changed in a way to decrease such tax base.

More detailed data are needed to investigate all causes of tobacco tax revenue reduction in 2015-2017, but the main factor is clear: the increase in tobacco tax rates was too small to counterbalance the impacts of the inflation and the decrease of the population real income during the economic recession.

Conclusions

1. For the last 30 years, Brazil conducts comprehensive tobacco control policies and experiences a substantial decline in both prevalence of smoking and tobacco consumption.
2. Tobacco taxation policy had the strongest impact on tobacco use in the country. After the substantial tax hikes, which reduced the tobacco affordability, tobacco consumption declined while tobacco tax revenue increased. However, the impact of tax hikes on tobacco consumption was long-term, and as the tax hikes were not followed by similar tax increases over the following years, the further decline in tobacco consumption could exceed the tax rate increase, and it eventually caused the reduction in tobacco tax revenue.
3. Illicit cigarettes from Paraguay occupy a substantial part on the real cigarette market in Brazil. While total (licit and illicit) cigarette consumption continues to decline in the country, illicit cigarettes slow down this trend. Illicit cigarettes also reduce tobacco excise revenues. However, the experience of Brazil confirms that the substantial tax hike is able to increase revenue despite the widespread cigarette smuggling.
4. Despite recent tax increases, cigarettes in Brazil are still sold at lower prices than cigarettes in Argentina, Peru, Suriname, and Uruguay, so Brazil has great potential for further substantial tobacco tax increases.

Recommendations

Tobacco taxation policy should be more consistent with regard to the annual increase of the specific tobacco excise rate by at least 20% to ensure tobacco affordability reduction. Ad valorem tax rates also should be increased or at least not decreased.

Practices of tax evasion for all kinds of tobacco taxes should be investigated, and effective policies to prevent such practices should be developed and enforced. The apparent differences between the reported cigarette turnover and the taxable sales should be also investigated as it is also a way of tax evasion.

⁴⁹ https://portal.fazenda.sp.gov.br/acessoinformacao/Downloads/Relatorios-da-Receita-Tributaria/2018/fevereiro/INTERNET_fevereiro18.pdf

Tobacco use surveillance and monitoring should be further developed in Brazil, including regular surveys with a collection of comprehensive information on tobacco products consumed.

Brazil authorities already implemented some effective policies to counteract tobacco smuggling. Such efforts should be strengthened in line with the provisions of the FCTC Protocol to Eliminate Illicit Trade in Tobacco Products, which is already ratified by the country. While cigarette smuggling is a problem, it should not be overestimated and used as an argument against further excise increases. The FCTC Article 6 Guidelines state [63]: *The development, implementation and enforcement of tobacco tax and price policies as part of public health policies should be protected from commercial and other vested interests of the tobacco industry, including tactics of using the issue of smuggling in hindering implementation of tax and price policies.*

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