

Reform Options for Brazil's Tobacco Special Tax

Key Findings

- The tax reforms proposed by the Constitutional Amendment Bill 45/2019 and the Bill PL3887-2020 would bring a new tax scheme to the cigarette industry with consequences for cigarette prices.
- The tobacco tax reform represents an opportunity to increase cigarette prices, tax burden, and tax collection while decreasing cigarette consumption—all without provoking a demand-switching effect to the illicit market. However, there is a real possibility of driving smokers to switch to cheaper cigarettes, which could have the effect of increasing cigarette consumption in Brazil.
 - If the Tobacco Special Tax (TST) is set to match current total revenue-collection levels, some Brazilian states would see a decrease in revenue collection and cigarette consumption would increase in Brazil.
 - In contrast, if the TST is set at 19.74 percent, no state would lose tax revenue and total tobacco tax collection would increase by 3.3 percent (to 12.4 billion BRL) per year.
 - For cheaper cigarettes, the tax burden would be 75.7 percent, and consumption would decrease by 8.7 percent.
 - For premium brands, cigarettes the tax burden would be 72.3 percent, and consumption would decrease by 31.6 percent.
- Consumption of illicit (illegal) cigarettes does not appear to be impacted by price increases of legal brands. However, when illicit cigarette prices increase, many smokers switch to licit cigarettes.
- Stronger controls along the tobacco supply chain would increase illicit cigarette prices. Anti-smuggling efforts would not only reduce illicit trade but also will make illicit cigarettes more expensive and cause a demand-switching effect towards the licit market.
 - Tax collection would rise due to demand-switching by consumers from the illicit to the licit cigarette market after the illicit price increase.
 - The poorest Brazilian states would benefit most from the reduction in the illicit market and the migration of smokers to the licit market since they generally have higher levels of illicit trade.

Introduction

There are two Constitutional Amendment Bills in the National Congress that could result in a change in the tax system at both national and subnational levels. The tax reform would affect cigarette taxation, harmonizing tobacco tax levels across the states.

This Policy Note analyzes alternatives scenarios for tobacco tax reform in Brazil using official individual-level survey data. As illicit trade of cigarettes is one of the main concerns when discussing a potential tax reform on tobacco products in Brazil, this Policy Note also analyzes the potential impacts of the tax reforms on licit

and illicit brands using newly available estimates for own- and cross-price elasticities for cigarettes in Brazil.

Proposed tax reform's potential impact on tobacco products

The reform proposals intend to simplify the tax scheme by unifying different consumption taxes. The plan includes replacing the subnational ICMS with a unique and harmonized VAT-type tax, the Goods and Services Tax (GST). In the case of tobacco taxes, the bills seek to replace the current excise taxes (IPI and PIS/COFINS, which are

levied under a special regime for cigarettes) for a Tobacco Special Tax (TST). In addition, another Bill replaces the PIS/COFINS, a federal tax, with the Social Contribution on Operations with Goods and Services (CBS), which also includes a special regime for tobacco (Table 1).

The tax reform would harmonize tobacco tax levels across the states. How this would affect tobacco consumption and tobacco tax revenue are empirical questions. In this Policy Note, we simulate four different scenarios and compare them to current tobacco consumption tobacco tax revenue and illicit trade in Brazil.

Table 1. Proposed cigarette tax reforms

	Current	Replace with	Note
Constitutional Amendments (45/2019 & 110/2019)	ICMS (a VAT-type state-level tax, unharmonized across the country)	A unique and harmonized VAT-type tax, the Goods and Services Tax (GST) , and a unique Tobacco Special Tax (TST)	Constitutional Amendments 45/2019 & 110/2019 propose the elimination of a series of taxes, consolidating the tax bases in two new taxes: (i) GST (ii) an excise tax on some goods and services (TST for tobacco).
	Excise taxes (IPI, and PIS/COFINS)		
Bill of Law 3887/2020	PIS/COFINS	Social Contribution on Operations with Goods and Services (CBS) , with a special regime for tobacco	Under Bill of Law 3887-2020, there is no change in the IPI and ICMS.

Tax reform simulations

We define the baseline scenario using 2019 data on the Brazilian smoking profile. Data on average cigarette pack prices, by price categories and federal states (UFs), the share of smokers in the country, and their daily consumption are obtained from the National Health Survey (PNS, 2019). The baseline scenario (as well as all the tax reform scenarios) includes the population aged 15 years or older in 2019 in each federal state,

according to information from the Brazilian Institute of Geography and Statistics (IBGE). In 2019, the total tobacco tax revenue was about 6.9 billion Brazilian reais (BRL), representing 0.0931 percent of Brazil's gross domestic product (GDP). These data, obtained from the Brazilian National Revenue Service (RFB), are used to calibrate the tobacco tax revenue at the federal level in 2019. Using these data, the adjusted size of the illicit market in 2019 is obtained in the calibration process.

The reform scenarios are designed as a combination of the Constitutional Amendment Bill 45/2019 and the Bill of Law 3887/2020, both under discussion in the Brazilian House of Representatives. From Bill of Law 3887/2020, the CBS replaces the PIS/COFINS, which includes a special regime for tobacco products. From Constitutional Amendment 45/2019, the subnational GST replaces the ICMS. Also, from Constitutional Amendment 45/2019, the TST replaces the IPI.

This merging of proposals is feasible because there is a high probability that the Bill of Law will be first approved, and then the National Congress will have to adapt the Constitutional Amendment. Hence, the resulting tax scheme would be composed of:

- CBS at federal level with an ad valorem tax rate of 22 percent charged on the highest pack price per cigarette brand across the Brazilian states, plus a specific value tax of 1.10 BRL per pack (the CBS rate and the specific value are defined in the Bill of Law 3887/2020);
- GST at state level with an ad valorem tax rate of 16.7 percent (the GST rate is taken from Odair and Gobetti (1) who estimated the neutral tax rate for the new GST and proposed a distribution of the aggregate tax rate among the subnational units); and
- TST, whose tax rate is yet to be defined in the bills. We simulate alternative scenarios in this research.

To define alternative tax scenarios for the TST, we consider the impact on overall tax revenue, which is one of the main concerns of the executive branch and the National Congress when debating the tax reforms. We define scenarios to match the baseline total tobacco tax collection. Additionally, choosing the TST that maximizes the tax collection is in line with the literature that considers a tradeoff between taxation and revenue (see, for instance, Miravete et al (2)).

Following Divino et al. (3), we simulate the impact of the tax reform under the hypothesis that the cigarette prices will change only if the tax burden changes. The rationale is that if the production and logistical costs and profits of the manufacturer are kept constant, the retail price of illicit cigarettes will vary only due to tax changes. In this sense, if the tax burden increases (decreases) after reform, the prices will increase (decrease) as well.

The novelty here is to assume the possibility that when cigarette manufacturers face a decreasing tax burden in some locations, they will not reduce prices but instead keep the same ones from before the tax reform. This hypothesis is feasible since the tobacco industry, not only in Brazil but also around the world, has significant market power and faces mostly inelastic demand for their products. The TST rate is chosen according to the hypothetical tax reform scenarios detailed in Table 2.

The overall impact of the tax reform in terms of prices will be the result of the federal taxes on cigarettes (TST) and the federal consumption tax (GST), plus the uniform subnational Tax on Goods and Services (GST).

Table 2. Tax reform scenarios

	The cigarette pack prices across states will increase or decrease according to the variation on the tax burden from the reform.	The cigarette pack prices across states will only increase or remain constant according to the variation on the tax burden from the reform.
The TST is chosen to match the total tobacco tax revenue of the baseline scenario.	Scenario I.a	Scenario I.b
The TST is chosen to maximize the total tobacco tax revenue.	Scenario II.a	Scenario II.b

Impact of the tax reform on cigarette prices

To perform the simulations, we consider three different categories of cigarettes: illegal, cheap legal brands, and premium legal brands:

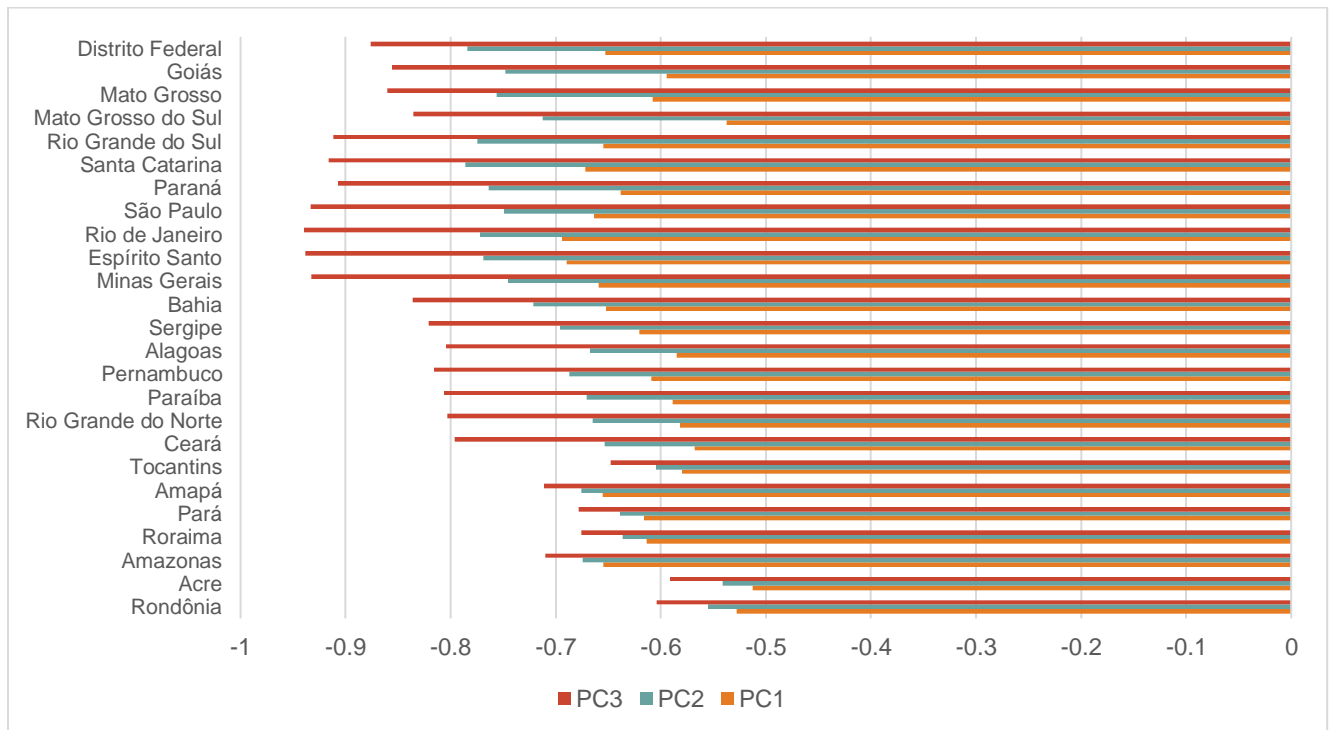
- *Illegal brands*: This price category 1 (PC1) corresponds to those cigarettes reported illicit on the PNS 2019;
- *Cheap legal brands*: This price category 2 (PC2) covers the cigarette packs not reported as illicit on PNS 2019 and sold above the minimum price but below the median price for the legal market; and
- *Premium legal brands*: This price category 3 (PC3) covers the cigarette packs not reported as illicit on PNS 2019 and sold above the median price for the legal market.

The estimation of consumers' price responsiveness consists of two parts: the percent decrease in smoking prevalence due to an increase in cigarette prices (unconditional price elasticity) and the decrease in consumption among those smokers who keep smoking after the price increase (the conditional price elasticity).

Both the conditional and unconditional elasticity are combined to yield the total price elasticity (see Divino et al. (4) for further details). Figure 1 summarizes the elasticity estimates by state and by price category. The price elasticities then serve as an essential input in our partial equilibrium tax reform simulations.

The results indicate how different tax reform scenarios would affect cigarette prices, cigarette consumption, and tobacco tax revenue in each federal state.

Figure 1. Total price elasticity by state and by price category (PC)



Source: Divino et al. (4)

Impact of tax reforms on cigarette price, consumption, and revenue collection

Table 3 provides a summary of the simulations for all the scenarios. When the goal is matching the total tobacco tax revenue before the tax reform, the tobacco special tax (TST) rate is 11.2 percent or 15.2 percent, depending on the assumption

regarding cigarette price variation. When prices are allowed to increase or decrease according to the tax burden difference after the reform (Scenario I.a), the TST rate required to match the previous revenue collection would be 11.2 percent, whereas when price decreasing is not allowed (Scenario I.b), the TST is 15.2 percent.

Table 3. Tax reform simulations across different scenarios

	Baseline	Scenario I.a (TST=11.2%)	Scenario I.b (TST=15.2%)	Scenario II.a (TST=18.3%)	Scenario II.b (TST=19.7%)
Tax revenue (billions BRL/year)	12.0351	12.0351	12.0351	12.4892	12.4334
Change (baseline ref)	-	-	-	3.77%	3.31%
Price category 2 (BRL)	6.81	5.81	6.55	7.31	7.72
Standard deviation	0.27	0.52	0.72	0.86	0.89
Tax burden	72.46%	67.22%	71.26%	74.38%	75.73%
Standard deviation	3.57%	1.60%	1.60%	1.60%	1.60%
Share in tax revenue	62.10%	61.81%	61.88%	63.84%	64.54%
Consumption (% change)	-	18.24%	6.04%	-3.92%	-8.66%
Price category 3 (BRL)	10.96	10.87	12.24	13.56	14.23
Standard deviation	0.86	1.01	1.10	1.21	1.26
Tax burden	64.15%	63.83%	67.88%	70.99%	72.34%
Standard deviation	3.28%	2.80%	2.80%	2.80%	2.80%
Share in tax revenue	37.90%	38.19%	38.12%	36.16%	35.46%
Consumption (% change)	-	1.83%	-12.91%	-25.44%	-31.63%

However, it is worth highlighting some differences: in Scenario I.a, the tax reform would reduce the tax burden for both PC2 and PC3. Therefore, for PC2 and PC3 the prices would decrease by 14.64 percent and 0.9 percent, respectively, and consumption would increase by 18.24 percent and 1.83 percent, respectively.

For Scenario I.b, prices would only decrease for PC2. That means that in Scenario I.b prices for the cheap legal brands would decrease by 3.8 percent and consumption will increase by 6.04 percent. In the same scenario, premium brand (PC3) prices would increase 11.7 percent and consumption would decrease 12.91 percent.

On the other hand, when the goal is defined to maximize the total tobacco tax revenue the TST rate goes to 18.3 percent and 19.7 percent for scenarios II.a and II.b, respectively. The general results for both scenarios are the same. The prices would increase (7.4 percent and 13.4 percent, for PC2 in scenarios II.a and II.b, respectively, and 23.7 percent and 29.9 percent, for PC3), and the consumption would decrease (3.9 percent and 8.7 percent for PC2 in scenarios II.a and II.b, respectively, and 25.4 percent and 31.6 percent for PC3).

Another interesting result is that, after the tax reform, the standard deviation for the tax burden is smaller and the same for each price category while the standard deviation for prices is increasing. This means that when there is a price increase in illicit cigarettes, many smokers would switch to legal cigarettes, but there is no effect in the other direction when legal prices increase.

Therefore, if policy makers seek to keep the same total tobacco tax revenue after the tax reform, it is worth noting there is a serious chance the tax burden for the legal cheaper brands (PC2) would decrease, reducing cigarette prices and increasing cigarette consumption. Moreover, the overall effect of the reform may also result in cheaper premium brands, increasing overall legal cigarette consumption.

On the other hand, defining a higher TST would not only increase the total revenue collection

(total tax revenue would increase about 3.8 percent and 3.3 percent under scenarios II.a and II.b, respectively) but also reduce cigarette consumption in Brazil.

Impact of the tax reform on illicit and licit consumption

A higher TST would increase revenue collection and decrease consumption. However, a frequent concern about increasing tobacco taxes in Brazil is the potential impact on illicit trade. This research takes advantage of previous work by Divino et al. (2022). By using a propensity score matching (PSM) approach with the PNS, 2013, 2019 data and the aggregate population statistics from 2019 obtained from IBGE (6), we estimate own-price as well as cross-price elasticities of demand for legal and illegal cigarettes. Table 4 below shows the main results for conditional price elasticities.

Table 4. Conditional own- and cross-price elasticities

	Illicit quantity	Licit quantity
Licit cigarette price	-0.076	-0.412***
Illicit cigarette price	-0.253***	0.075*

Source: Divino et al. (5) Note: *p < 0.1, **p < 0.01, ***p < 0.001

A tax increase that leads to a 10-percent price increase would reduce consumption of legal cigarettes by 4.12 percent, while a 10-percent price increase on illegal cigarettes would reduce consumption of illicit cigarettes by 2.53 percent.

This means that both an increase in the price of legal brands and an increase in the price of illicit brands would reduce consumption in their respective markets. Therefore, contrary to the frequent claims of the cigarette industry, a cigarette tax increase would not cause a demand-switching effect towards the illicit market.

Moreover, the effect of an increase in legal cigarette prices on illicit cigarette consumption is not statistically different from zero. However, the effect of an increase in illicit cigarette prices on licit cigarette consumption is positive, suggesting that increasing illicit cigarette prices encourages smokers to switch to the licit market. Thus, the consumption of legal cigarettes is positively related to the price of illegal cigarettes: as illegal cigarette prices increase, legal cigarette consumption also increases.

Conclusions

The House of Representatives in Brazil is considering a comprehensive tax reform that includes a change to the tax burden for cigarettes. This analysis shows that the tobacco tax reform represents an opportunity to increase cigarette prices, tax burden, and tax collection while decreasing cigarette consumption—all without provoking a demand-switching effect to the illicit market.

However, this study also cautions that if TST is defined only to match current revenue-collection levels, there is a genuine possibility of encouraging smokers to switch to cheaper cigarettes, which could have the effect of increasing cigarette consumption in Brazil.

Therefore, according to the simulated tax reform scenarios **the new TST should be set at 19.74 percent** in order to maximize the tax collection such that no Brazilian state would lose tax revenue relative to the baseline year of 2019.

This would result in a total tobacco tax collection of 12.4 billion BRL per year, which corresponds to a 3.3-percent increase.

Average prices would reach 7.7 and 14.2 BRL for the cheaper and premium brands, respectively.

The former price is well above the current official minimum price of 5.00 BRL. For cheaper cigarettes the tax burden would be 75.7 percent, and consumption would decrease by 8.7 percent.

This analysis also provides another insight regarding the advantageous impact of increasing control along the tobacco supply chain. **Fighting cigarette smuggling will not only reduce illicit trade but also will make illicit cigarettes more expensive and cause a demand-switching effect towards the licit market**, thus decreasing consumption and increasing tax collection simultaneously.

These combined effects suggest that anti-smuggling efforts are a very effective public policy to reduce cigarette consumption. Tax collection would rise due to demand-switching by consumers from the illicit to the licit cigarette market after the illicit price increase. Most importantly, the poorest states in the country would benefit most from the reduction in the illicit market and the migration of smokers to the licit market, since they generally have higher levels of illicit trade than the wealthier states.

In sum, policy makers should define the new TST to effectively increase cigarette prices in Brazil, and evidence shows it is unlikely to increase the size of the illegal cigarette market. Such a policy would result in declines in cigarette consumption and an increase in revenue collection. Moreover, cigarette price increases at this level would lead to demand-switching by consumers from the illicit to the licit market—but not the other way around—a situation favorable for both public health and fiscal health. In addition, higher taxes lead to higher revenue collection because the increase in prices more than compensates for the decline in consumption. Thus, contrary to the cigarette industry's claims, cigarette tax increases benefit society as whole.

References

- (1) Odair, R. O., & Gobetti, S. W. (2019). Reforma tributária e federalismo fiscal: Uma análise das propostas de criação de um novo imposto sobre o valor adicionado para o Brasil. Brasília: Instituto de Pesquisa Econômica Aplicada – IPEA. http://repositorio.ipea.gov.br/bitstream/11058/9596/1/TD_2530.PDF
- (2) Miravete, E. J., Seim, K., & Thurk, J. (2018). Market power and the Laffer curve. *Econometrica*, 86, 1651-1687. <https://doi.org/10.3982/ECTA12307>
- (3) Divino, J. A., Ehrl, P., Candido, O., & Valadão, M. (2021). Effects of the Brazilian tax reform plans on the tobacco market. *Tobacco Control*, Sep;31(Suppl 2):s65-s73. doi: 10.1136/tobaccocontrol-2021-056822. Epub 2021 Sep 15. PMID: 34526409
- (4) Divino, J. A., Ehrl, P., Candido, O., & Valadão, M. (2021). An extended cost-benefit-analysis of tobacco taxation in Brazil. *Tobacco Control*. 04 October 2021. doi: 10.1136/tobaccocontrol-2021-056806
- (5) Divino, J. A., Ehrl, P., Candido, O., Valadão, M. & Rodriguez-Iglesias, G (2022). Tobacco tax reform and demand-switching effects between the licit and the illicit markets in Brazil. Institute for Health Research and Policy, Tobacconomics. Chicago: University of Illinois at Chicago. <https://www.tobacconomics.org/files/research/788/20220810-wp-ucb-2021-clean-md-2.pdf>
- (6) Brazilian Institute of Geography and Statistics (IBGE). (2020). Pesquisa Nacional de Saúde (PNS) 2019: Percepção do estado de saúde, estilos de vida, doenças crônicas e saúde bucal: Brasil e grandes regiões. Rio de Janeiro: IBGE. <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101764.pdf>.