Tax Reform and Selective Tax on Alcoholic Beverages in Brazil

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Abstract

Background

Brazil is currently undergoing a comprehensive tax reform as the government's top priority. The House of Representatives has already approved a constitutional amendment bill (PEC 45-A/2019), which is currently under analysis by the Senate. The tax reform will promote a significant change in the country's tax system, as the dual VAT will be levied on the retail price while the selective tax (ST) will be charged on the ex-factory price. This study provides simulations about how the bill may affect prices, consumption, and tax collection in the alcoholic beverages market.

Methodology

Due to the different tax structures, the simulations focus on beer, which is by far the dominant product in terms of consumption. Not implementing a ST would lead to a reduction in the tax burden, decrease in prices, and increase in consumption of alcohol. This analysis only simulates the ST considering alternative ad valorem tax structures for beer, as estimation for other alcoholic beverages are in preparation.

Results

Assuming a dual VAT of 27 percent (CBS of 10.3 percent and IBS of 16.7 percent) and a price elasticity of -0.62, the ST on beer should be (i) 34.3 percent to prevent any state from losing tax revenue or (ii) 110.4 percent to maximize total tax collection across states.

Conclusions

The nominal ST must be carefully chosen to be higher than the 34.3-percent rate needed to replicate the baseline (that is, nominal ST at least 110.4 percent) to avoid reduction of the tax burden, drops in prices, higher consumption, and declining tax collection on beers. The 10-year tax-reform transition period should not be applied to alcoholic beverages, since it might result in a significantly long period with lower taxes, reduced prices, and higher alcohol consumption. Moreover, using the revenue from the ST to bolster the public health system's alcohol control efforts would be a sound investment by the government, as it would result in further reduction of the costs associated with alcohol-related diseases.

JEL Codes: I18; C21; H29.
Keywords: Alcohol tax reform; selective tax; tax increase, public policy.

Introduction

In its first year in office, the new government in Brazil has declared a comprehensive tax reform as its top priority. Previous attempts to reform the existing tax scheme since the 1988 Constitution have regularly failed, mainly due to the inability to achieve an adequate redistribution of power relations between the parties involved (federal, states, and municipalities) regarding political and financial autonomy, implementation of social programs, and reduction of regional differences (Rezende, 2009). There is agreement on the need to reduce the number of different taxes along the production chain and to reduce complexity from the perspective of companies (Orair & Gobetti, 2021). Currently, the Senate is debating a new, much simpler, value-added tax (VAT)-based system, designed under the constitutional amendment bill already approved by the Chamber of Representatives (PEC 45-A/2019).

In the context of the reform debates, there is also discussion about which products should be subject to a tax burden that is lower or higher than the general VAT tax rate. Governments around the world impose additional taxes on tobacco products and alcoholic beverages because these products are harmful to health and impose enormous economic costs, approximately USD 3 trillion globally in 2012, that society must bear (Chaloupka et al., 2019). In addition, these products are straightforward to classify and are produced by very few manufacturers, such that the tax collection is relatively simple and substantial.

In Brazil, alcohol consumption alone leads to productivity and health declines that are estimated to be worth 7.3 percent of GDP (Silveira et al., 2016). This estimate is significantly higher than the 2.5 percent of GDP in high-income countries (Chaloupka et al., 2019), which is partly explained by a higher amount of per capita pure alcohol consumption in Brazil (7.8 liters) compared to the global average (6.4 liters) in 2016 (WHO, 2018). More than half (58 percent) of the adult population in Brazil acknowledges drinking alcohol at least once a year (Laranjeira et al., 2007), while about 22 percent abuse alcohol (VSB et al., 2023). Beer, which accounts for 86 percent of total production, is by far the most popular type of alcoholic beverage according to data from the Brazilian Institute of Geography and Statistics (IBGE). Interestingly, citizens seem to be aware of the costs and risk involved in alcohol consumption, as the recent Datafolha survey indicates that 94 percent of Brazilians endorse higher VAT rates for products harmful to health.[1]

This study examines how the proposed tax reform in Brazil may impact prices, consumption, and tax collection for beer. The analysis will first explain and consider the current tax structure. We will then simulate the reform proposal reported in the constitutional amendments currently under discussion in the National Congress with different tax rates for the excise component, called the selective tax (ST), to be levied on

legal addictive and harmful products such as alcoholic beverages. Due to the different tax structures among these products, and due to its dominance in terms of consumption and production, the simulations focus on beer. This analysis only simulates the ST considering alternative ad valorem tax structures for beer, as estimation for other alcoholic beverages are in preparation. (Other tax structures in line with the best practices on alcohol taxation will be considered in forthcoming manuscripts). Finally, we provide policy recommendations based on the research findings.

Current Tax Structure

The present section describes the four taxes levied on the production and sale of alcoholic beverages in the year 2023 focusing on the product under consideration in this study, namely beer.

There are three different taxes at the federal level. The PIS (Contribution for the Social Integration Program) and COFINS (Contribution for Financing Social Security) are levied on the turnover of a company. Differences between the PIS and COFINS exist regarding the revenue destination and the tax rates. Both taxes already impose a special regime for beer taxation. PIS/COFINS may be either a VAT-type tax or not, depending on how the company is taxed under the corporate income tax rules. The IPI (tax on manufactured products) is considered the closest to an excise tax because the tax rate varies according to the relevance of the goods to society. The IPI also foresees a special tax regime for beer. These tax rates are the same for the whole country. Additionally, there is the tax on imports (II), which is levied on imported goods in general, thus including imported alcoholic beverages.

At the state level there is one tax, the ICMS (state tax on the movement of goods and services), which—as its name indicates—is levied on the circulation of goods and services. It is the most important source of tax revenue for the Brazilian states, and its tax rates vary among the states.

The taxes IPI, PIS/COFINS, and ICMS are also levied on imports, but under a different tax basis. Beer is subject to a minimum tax rate, which is a specific tax rate (BRL/liter). This minimum rate prevails against the ad valorem tax rate for IPI and the PIS/COFINS when those result in a smaller tax burden. The current tax rates for beer are illustrated in Table 1.

Table 1. Current tax structure for beer

TAXES	2023 tax rates	Min. tax	Tax basis
IPI (domestic and on imports)	3.9%	YES	Price at manufacturer or at import
PIS/COFINS – domestic	13%	YES	Price at manufacturer
PIS/COFINS – imports	20.97%	YES	Price at import
Tax on imports	20%	NO	Price at import
ICMS (domestic and on imports)	From 22% to 32% (depending on the state)	NO	Retail price

Controls along the current fiscal structure

Federal level

IPI and PIS/COFINS have minimum taxes for beer (beer accounts for about 90 percent of the alcoholic beverages market and is concentrated in a handful of big breweries). It works as a tax avoidance measure[1], as this is important to avoid undervaluation of the products at the manufacturer level.

State level

To avoid tax evasion at the retail level, the ICMS is levied at the point of manufacture, but the tax basis is the retail price. This requires implementing a complex system of calculations, using the market markup margins or price search at the retailers to determine the retail tax basis. The methodology, called "tax substitution," may vary across the 27 states. There is a constitutional provision for it in article 150, § 7º; and Complementary Law n. 87/1966, regulates the mechanism through its articles 6º to 10 (which applies to all states). It is worth mentioning that the treatment is not uniform among the states, as some do not apply this anticipated taxation for wines or spirits, or to beer. But, in general, all alcoholic beverages may be subject to this type of treatment.

[1] Tax controls: At the federal level, the current controlling system for beverages is under revaluation (Rota Brasil Initiative - https://www.gov.br/receitafederal/pt-br/assuntos/noticias/2023/junho/receita-federal-realiza-audiencia-publica-sobre-o-programa-rota-brasil). Beer would be submitted to a quantity control check at the point of manufacture (SICOBE - https://www.gov.br/receitafederal/pt-br/assuntos/orientacao-tributaria/regimes-e-controles-especiais/sistema-de-controle-de-producao-de-bebidas-2013-sicobe), which is currently not operative, while spirits and alike are submitted to tax stamps (wines are not subject to any special type of tax control).

Other issues

Most of the tax burden on alcoholic beverages is based on the subnational tax. The federal excise on beverages (IPI) is uniform across the country, which could make the tax policy efficient in terms of tax collection. However, the current IPI and PIS/COFINS tax rates are low. The federal tax rates (IPI and PIS/COFINS, with the non-cumulative rate) summed up together come to 16.9 percent for beer, 15.75 percent (most common) for wines, and 25.5 percent on average for spirits.

The ICMS, which may vary among states (and therefore it is not under federal control) ranges between 22 percent and 32 percent for beers, while for wines and spirits it ranges from 25 percent to 39 percent.

The complex existing tax structure does not leave much room for improvement, except for a potential increase in the IPI, which could make it more effective to increase both tax collection and tax burden. However, because the total tax burden may vary a lot among the states, it is not efficient because some states have lower tax burden than others.

After the tax reform is fully implemented, the IBS (state level) and CBS (federal) will have the same tax rates for alcohol and for other goods and services. They will be levied at the same general tax rate rule. That means that defining the tax level and tax structure of the new excise tax that Brazil will implement, will be crucial to keep the taxes on alcoholic beverages high. Also, as the ST will be defined and managed by the central government (federal level), the tax policy on alcoholic beverages will be less affected by practices that reduce tax collection, resulting in a more effective policy throughout the states.

Methodology

The following simulations are based on a static partial equilibrium model that uses information about tax structure, population, per capita beer consumption, and beer prices in each of the 27 Brazilian states.

First, the model is calibrated to reproduce the actual federal tax collection from IPI and PIS/COFINS under the current tax regime. This requires a set of simulations based on a combination of microdata from the most recent versions of the Household Expenditure Survey (POF-IBGE) from 2018/19, the National Health Survey (PNS-IBGE) from 2019, the current tax structure, and aggregate IPI tax collection from the Tax Burden Report 2021 by the Brazilian Federal Revenue Service (RFB).[2]

[2] Report at https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/estudos/carga-tributaria/carga-tributaria-no-brasil-2021/@@download/file. Tables at https://www.gov.br/receitafederal/pt-br/centrais-de-conteudo/publicacoes/estudos/carga-tributaria/tabelas-carga-tributaria-no-brasil-2021/@@download/file

To derive the IPI tax collection for beer from the reported total tax collection of all alcoholic beverages we use the correction factor 0.9 as the market share of beer consumption (IBGE, 2021).

To estimate beer consumption, we use the POF, that registers consumption values by product categories, including beer. However, participants are only asked to report consumption at home for seven days, leading to a significant underestimation of total beer consumption. An advantage of this survey is that it includes residents aged 15 years or older, meaning that part of minors' consumption is captured. Due to the incomplete beer consumption coverage, we take the PNS and calculate the share of individuals who report consuming alcoholic drinks at least once over the last 12 months. Both data sets are representative for the Brazilian population. With this information, we calculate the implied annual per capita beer consumption in liters for each federal state with the number of citizens aged 15 years or older from the IBGE. Monetary values are adjusted to the reference year 2021 by using the National Consumer Price Index (IPCA).

Based on this information, we calculate the implied IPI tax collection, calibrate/correct both the annual per capita consumption and the proportion of consumers to account for the underreporting in the data (by construction). Therefore, our baseline scenario (year 2021) in the simulations exactly replicates the IPI tax collection of BRL 2.7 billion in 2021. The PIS/COFINS revenue is inferred using both tax rates—that is, multiplying the IPI value times 13/3.9, since both are levied on the same tax basis. The ICMS and our estimates for average prices and aggregate beer consumption per year in each federal state are also calculated using the official tax rates.

The second step in the simulation procedure is to change the tax structure according to the Constitutional Amendment proposal PEC 45-A/2019. The focus of our simulations is on the selective tax (ST) on beer, which will be defined by a complementary law. This analysis only simulates the ST considering alternative ad valorem tax structures on beer, as other tax structures in line with the best practices of alcoholic beverages taxation (including specific component or tax by alcoholic content, etc) will be considered in forthcoming manuscripts). Analysis only simulates the ST considering alternative ad valorem tax structures for beer, as estimation for other alcoholic beverages are in preparationmight be driven from the baseline model. This analysis assumes the ST would be applied on the ex-factory price.

We simulate the following three scenarios::

- Scenario I: ST replicates the overall total tax revenue of the baseline.
- Scenario II: ST is chosen such that no state loses tax revenue, assuming that the distribution of tax revenue across states will be based on the alcohol consumption per state.

- Scenario III: ST is chosen to maximize aggregate tax revenue, keeping the assumption that the distribution of tax revenue across states will depend on the alcohol consumption per state.

The three scenarios are then simulated and compared to the baseline regarding beer prices, consumption, tax collection, and tax burden. In all scenarios, we assume a CBS (federal VAT) component of 10.3 percent and an IBS (state VAT) of 16.7 percent according to the comprehensive study by Orair and Gobetti (2021). The CBS and IBS tax rates may slightly change in the final version of the tax reform because their levels will be set to maintain overall tax collection comparable to the pre-reform total tax collection.

Our model accounts for the fact that consumers are responsive to prices. The so-called price elasticity of demand indicates the percent decrease in consumption when prices increase by one percent. The literature has produced a relatively wide range of price elasticities for alcoholic beverages, depending crucially on the country, methodology, sample period, and whether consumption is on- or off-premises. Due to the lack of recent estimates from Brazil (Almeida, 2017; Pintos-Payeras, 2009), we apply both an inelastic (-0.62) and an elastic (-1.15) value for each of the three simulated tax-reform scenarios. These values provide a reasonable bound according to the meta study by Clements et al. (2022).

Another key issue that demands attention is the tax basis that is applied to calculate the payable tax amount and the implied tax burden. The POF provides retail prices, while the aggregate (federal-level) ex-factory price is calculated from the RFB database. Therefore, the average industry profit margin—that is, the difference between ex-factory and retail prices—free of taxes is equal to 14 percent. Currently, for beer, IPI and PIS/COFINS are levied on the ex-factory price and ICMS on retail price. After the tax reform, we assume the selective tax will be levied on the ex-factory price and the CBS and IBS on the retail price. Once the tax rates, the profit margin, and the retail price are known, the state-by-state ex-factory price can be obtained implicitly. The details of the scenarios' construction can be found in Appendix I.

Results

Table 2 shows a summary of the results aggregated at the national level for the three scenarios compared to the baseline. For each scenario, we apply both the elastic (-1.15) and inelastic (-0.62) price elasticity of beer demand. Note first that, under the current tax structure (baseline scenario), the average tax burden is equal to 36.89 percent and annual tax collection is BRL 37.3 billion. If the government aims to keep that amount of tax collection unchanged after the reform (Scenario I), it should implement a selective tax for beer equal to 23 percent. Columns (3) and (4) indicate that the price elasticity makes virtually no difference in this scenario. The average tax burden would fall to 34.5 percent,

meaning that retail prices could also decrease slightly. Consequently, consumption would increase, by about two to four percent.

In fact, Figure 1 (Appendix II) shows that all but the two principal producer states, Rio de Janeiro and São Paulo, would record lower consumption, while in the remaining 25 states the consumption would be higher. This result can be explained by the current lower state ICMS tax in the two manufacturing states, a difference which would cease to exist after the proposed tax reform. This environment implies a higher tax burden for Rio de Janeiro and São Paulo and a lower one for everyone else, as shown in Figure 2 (Appendix II).

These considerations also make clear that the primary effect of the proposed tax structure is to reduce the tax burden for regular goods. In other words, without the selective tax on products harmful to health, such as alcohol and cigarettes, their prices would decrease, consumption would increase, and tax collection would fall. This incidence would, however, gradually worsen both the health status of the population and the public budget, due to higher costs for treatment of alcohol-related diseases.

Table 2. Summary of the simulated scenarios

	Baseline	**Scenario I**		**Scenario II**		**Scenario III**	
Selective tax	-	22.90%	23.05%	33.84%	34.26%	59.30%	110.35%
Price elasticity	-	-1.15	-0.62	-1.15	-0.62	-1.15	-0.62
Total tax revenue (billions BRL)	37.342	37.342	37.342	41.83	43.87	46.15	64.56
Change (baseline ref)	-	0.00%	0.00%	12.01%	17.48%	23.60%	72.89%
Tax burden (average)	36.89%	34.43%	34.50%	39.28%	39.46%	48.20%	59.99%
Consumption (average change)	-	4.32%	2.26%	-4.53%	-2.62%	-25.11%	-35.79%

Source: authors' calculations.

If the government aims to prevent federal states from losing tax revenue (Scenario II), it should opt for a higher ST of about 34 percent. This scenario can be considered more realistic, given that a major obstacle to passing the tax reform has been distributional conflicts between federal states and the central government. Implementing a ST equal to 34 percent would increase the tax burden to about 39.5 percent, while tax collection would increase from 12 to 17.5 percent, depending on whether the price elasticity is elastic or inelastic, respectively. In the elastic case, consumption obviously decreases more (-4.5 percent) than in the inelastic case (-2.6 percent) in comparison to the baseline.

Finally, the third scenario provides the ST rate consistent with the highest possible amount of aggregate tax collection. In this case, the differences between elastic and inelastic price elasticities of demand are expressive. The theoretical concept behind our results in this scenario is the well-known Laffer Curve, which expresses the relation between tax rate and tax revenue. At low tax rates, the Laffer Curve has a positive but marginally decreasing form because the tax rate increases more than it compensates for the diminishing demand for the taxed product. If consumers are more price-sensitive, the maximum amount of tax collection is reached at a lower ST rate (59.3 percent) than in the case of price-inelastic consumers (110.4 percent). Column (7) also indicates that, under the assumption of a constant price elasticity at −0.62, it would be possible to increase aggregate revenue by 73 percent to an annual volume of BRL 64.6 billion. In that case, consumption would drop by almost 36 percent and the tax burden for beer would be equal to 60 percent. On the other hand, an elastic demand for beer would allow the government to set the ST at 59.3 percent and increase its tax revenue to BRL 46.2 billion, having a 25.1-percent lower consumption of beer. It is thus highly recommended that future research estimates the price elasticity of beer and other alcoholic beverages using the most recent available data to narrow this parameter's interval and reach more precise recommendations regarding the ST tax rate that maximizes tax collection.

Conclusions and Recommendations

The tax reform represents an opportunity to increase the tax burden on products that are harmful to health, such as alcoholic beverages, which would result in higher prices, reduced consumption, and increased tax collection.

The selective tax must be chosen in such a way as to avoid loss of tax collection, considering states' consumption levels. Otherwise, the tax reform would cause a drop in prices and an increase in the consumption of alcoholic beverages, as we show in the case of the beer market. That is, an inappropriate choice of the selective tax rate would lead to a higher incidence of consumption-related diseases, and an overload for the public unified health system.

If we consider a CBS rate of 10.3 percent and IBS rate of 16.7 percent, the selective tax on beer must be at least 15.9 percent to ensure there is no decrease in tax collection from consumption within the states and no reduction in the price of beer. Higher specific tax rates would lead to an even greater tax collection compared to the present.

The tax reform transition period should not be applied to goods that are harmful to health, including alcohol. It will be very complex to make a gradual substitution of tax rates for these products and simultaneously avoid a decrease in tax burden, fall in prices, and increase in consumption. To mitigate such risks, the proposed tax reform—including the

CBS, IBS, and selective tax—should be fully and immediately implemented for alcoholic beverages.

The inappropriate choice or the inexistence of zero selective tax would reduce the price and substantially expand the consumption of beer in the country, causing an increase in consumption-related diseases and overloading the public unified health system.

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Appendix I

Theoretical aspects of the simulation

Consider the amount of tax paid by an agent (firm, consumer, country) in a given period of time as a proportion of the retail price,

$$B = \frac{Amount\ of\ tax}{P_r} \tag{1}$$

where B is the tax burden and P_r is the retail price.

In general, the retail price is computed as

$$P_r = Amount\ of\ tax + P_f(1+m), \tag{2}$$

where P_f is the factory value of the product, and m is the industry average profit margin over the factory value.

Dividing (2) by P_r, and solving for the tax burden one gets

$$B = 1 - \frac{P_f}{P_r}(1+m). \tag{3}$$

Considering the Brazilian current tax structure, the retail price is

$$P_r = \tau_f P_f + \tau_r P_r + P_f(1+m)$$

where τ_i is the tax rate applied over the factory value (τ_f) or the retail price (τ_r). Thus, the prices ratio is given by

$$\frac{P_f}{P_r} = \frac{1-\tau_r}{1+\tau_f+m}, \tag{4}$$

Replacing (4) into (3) the tax burden is given by

$$B = \frac{\tau_f+\tau_r(1+m)}{1+m+\tau_f}. \tag{5}$$

Since the retail price, the tax rates, and the profit margin are known, the factory value can be implicitly obtained through (4) and (5).

This result enables us to construct the baseline scenario.

The tax burden after tax reform is not that given by (5) since the tax structure will be different. Thus, to obtain B_i, the tax burden for the simulating scenario i, consider the following:

according to the constitutional amendment approved by the lower house, the retail price can be computed as

$$P_r = (1 + \tau_{ST} + m)P_f + (1 + \tau_{ST} + m)P_f \cdot \tau_{GST},$$

where τ_{ST} is the selective tax rate, and τ_{GST} is the total goods and services tax rate (federal plus state level).

Solving for the price's ratio,

$$\frac{P_f}{P_r} = \frac{1}{(1+\tau_{GST})(1+\tau_{ST}+m)}, \tag{6}$$

and, again, replacing (6) into (3) and solving for B, one finds that:

$$B_i = 1 - \frac{(1+m)}{(1+\tau_{GST})(1+\tau_{ST}+m)}. \tag{7}$$

From (3) it is quite easy to see that, in general,

$$P_r = \frac{1+m}{1-B} P_f. \tag{8}$$

Considering P_f and m fixed, that is, the firms' production costs, and profit margin do not change with the tax reform, using (8), the retail price change due to a tax reform can be expressed as

$$\frac{\Delta P_r}{P_r} = \frac{P_r^i - P_r^0}{P_r^0}$$

$$\frac{\Delta P_r}{P_r} = \left(P_f \left(\frac{1+m)}{1-B_i} \right) - P_f \left(\frac{1+m)}{1-B_0} \right) \right) \frac{1}{P_f} \left(\frac{1-B_0}{1+m)} \right)$$

$$\frac{\Delta P_r}{P_r} = \frac{B_i - B_0}{1-B_i}.$$

The subscript 0 indicates baseline scenario values and [illegible] any other reform scenario. Therefore, the only sort of price changing is the tax burden change.

Appendix II. Results by State

Figure 1. Consumption change for Scenario I

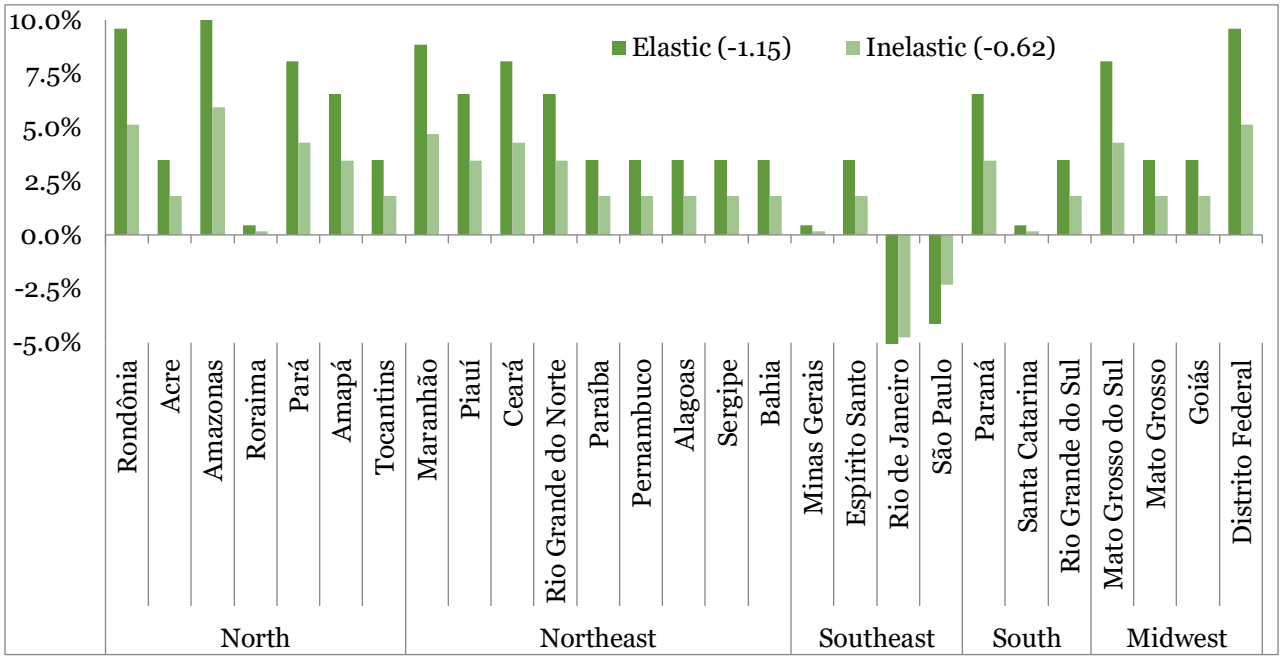

Figure 2. Tax burden change for Scenario I

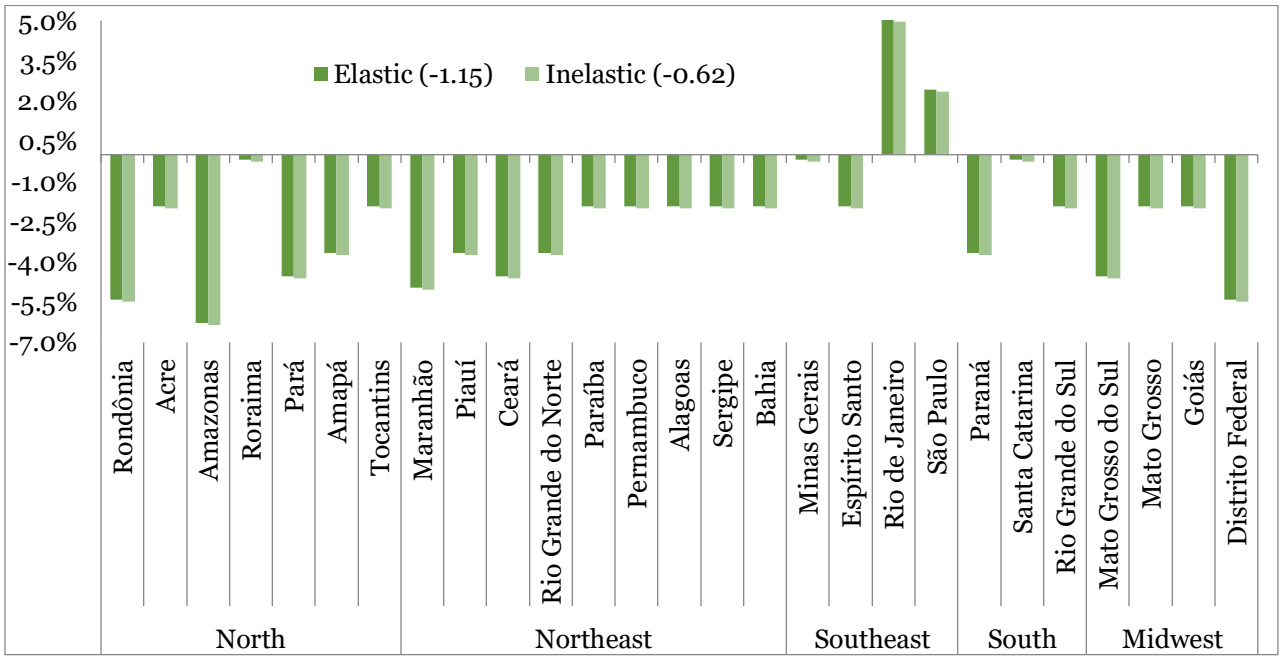

Figure 3. Consumption change for Scenario II

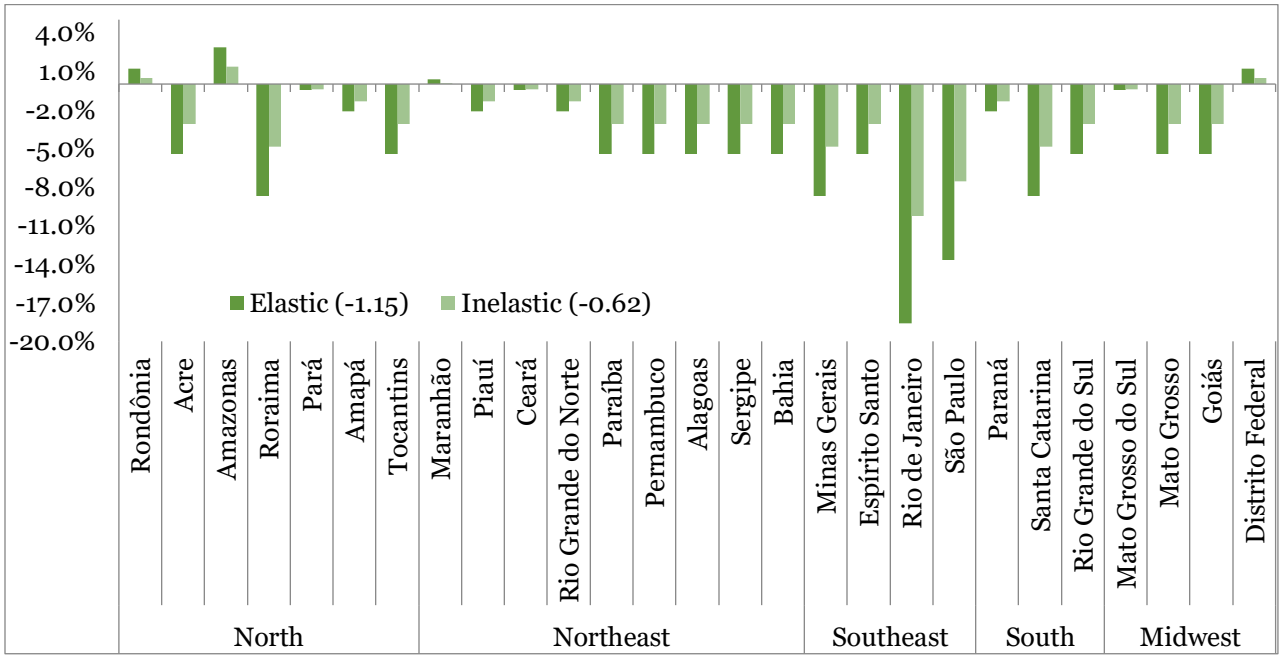

Figure 4. Tax burden change for Scenario II