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Exploring the supply chain of the soft drinks industry to enhance health policies. Lessons from Argentina

Resumen

El estudio tiene como objetivo estimar las elasticidades precio propias y cruzadas de la industria de bebidas azucaradas a nivel agregado y a nivel marca, desde el lado de la oferta, mediante un modelo de elección discreta de la demanda bajo incertidumbre con productos diferenciados. Para ello, se utilizaron datos de Euromonitor internacional para el periodo 2005-2015. El estudio, además, realiza un análisis descriptivo de la estructura productiva de la industria de bebidas azucaradas y su evolución en el tiempo. Los resultados revelan que la elasticidad promedio de la demanda propia de bebidas azucaradas a nivel de marca es de -1.019 en Argentina. En un análisis entre marcas, se observa que la demanda de las segundas marcas o marcas propias de supermercados tienen mayores elasticidades precio propias que las marcas líderes. Adicionalmente, si analizamos por cantidad de calorías, se estima que la demanda de bebidas bajas en calorías responde más a los cambios en sus propios precios que la demanda de bebidas regulares. En conclusión, los resultados muestran que comprender la cadena de suministro de la industria de bebidas azucaradas ofrece herramientas que sirven como medio para promover políticas fiscales informadas con el fin de fomentar dietas más saludables.

Palabras clave: análisis de la cadena de valor, bebidas sin alcohol, modelo de elección discreta, políticas de salud.

Clasificación JEL: L2, L66, I1, C3

Abstract

The objective of this article is to propose a descriptive analysis of the SSB's industry and its evolution during the last decade in Argentina to identify key supply-side determinants that could affect consumption patterns, using them to estimate own and cross price elasticities of demand from supply side. The data of soft drinks industry in Argentina was used from Euromonitor International over the period 2005-2015. An econometric model is estimated using the discrete choice model of demand under uncertainty with differentiated of products. Results reveal that the own-price average elasticity of demand for soft drinks at the brand level is -1.019 in Argentina, and that second or supermarkets own brands have greater own-price elasticities than leading brands with added sugar. The demand of low calories drinks responds more to changes in its own prices than the demand of regular drinks. The results highlight key aspects in the design of health policies that go beyond the traditional analysis from the point of view of the consumer demand. To understand the supply chain of the soft drinks market offers tools that serve as a medium of promoting informed fiscal policies to encourage healthier diets.

Keywords: Supply chain analysis. Soft drinks. Discrete choice model. Health policy

Introduction

Sugar-sweetened beverages (SSB) are associated with an increased risk of weight gain and thus develop overweight and obesity as well as other cardiovascular diseases such as diabetes, metabolic syndrome, and hypertension. [1-5] SSB contain added, naturally derived caloric sweeteners as sucrose (table sugar), high-fructose corn syrup, or fruit-juice concentrates, all of which have similar metabolic effects. [6]

According to Euromonitor International 2017 [7], Argentina leads the intake of carbonates drinks in the world, with 131 liters annual per capita in 2016. At the same time, in Argentina six out of ten adults are overweight, [8] and according to 2010 WHO Global Database on Child Growth and Malnutrition, Argentina has the highest percentage of childhood obesity in children under five years of age in the Latin American region (7.3% prevalence) [9]. Also, 30% of children of school age are overweight and 6% are obese in the country [10].

Several studies have shown that SSB taxation is a cost-effective strategy to reduce the intake of SSB and thereby lowering the burden of disease and health care costs. [11-14] At least nineteen countries have implemented or proposed taxes on SSB as a public health measure, such as Mexico, Hungary, France, South Africa.[15]

In Argentina, no tax measure has yet been implemented or proposed. There is considerable uncertainty about the success of SSB tax in the country. One of the main reasons is the limited evidence on Argentine consumers' sensitivity to changes in SSB prices and other behavioral responses.

Although several studies addressed the estimation of demand price elasticities based on household surveys, limited analysis focused on understanding how supply side characteristics affect the demand for SSB [16-18]. We found only one study that showed a similar analysis to our study. Maurizzo et al (2003) analyzed the determinants of firm size distribution in Carbonated Soft Drinks for the case of Ireland from a perspective of differentiated products [18]. The results show that the differentiation of production by location and product characteristics is an important determinant of brand margins. However, they do not estimate the price elasticities of demand.

The objective of this article is to propose a descriptive analysis of the SSB's industry and its evolution during the last decade in Argentina to identify key supply-side determinants that could affect consumption patterns, using them to estimate own and cross price elasticities of demand from supply side. In order to contribute to the design of tax policies.

This analysis is based in the argument that the market power associated to brand loyalty allows leader brands to set prices affecting consumers' behavior. Moreover, supply side analysis facilitates measuring the relevance for consumers of non-price variables (flavor, calories, carbonated), providing key learnings in the identification of tax impact over demand.

Any vertical supply chain comprises the array of activities required for the production of a good or service through the different stages of manufacture.[19] These stages or linkages present backward relations, based on investment and cooperation decisions in the production of gross materials and capital goods (needed for the production of finished products), and/or forward relationships in charge of their commercialization and to promote the creation and diversification of new markets. Therefore, a vertical chain of value constitutes the mechanism from which backward and forward linkages are designed and coordinated, identifying the boundaries of the firm as a nexus of contracts.[20]

Vertical upstream or downstream integration decisions have several justifications, associated with particular market characteristics: cost reduction, supply or quality assurance, protection against fluctuations in demand or technological changes, gains and learning associated with networks' operation, effective marketing mechanisms (vertical restraints), strategic behavior.[21]

The economic literature shows that specificity of the requirements (in inputs and marketing) and frequency of vertical transactions defines the level of vertical integration of a company.[22] Moreover, as vertical relationships are developed under asymmetric information it is necessary to design contracts aligning incentives of the parts.[23]

The structure of these chains of value define the market power in each stage of production, as well as firms' strategies to capture a more loyal and/or diversified demand. In turn, these strategies affect their ability for setting prices and for reacting to eventual tax policies. In addition, as products under study are not homogeneous (in design or quality) preferences and income disparities affect demand behavior of users, who do not only consider the price as a variable to select among goods.[24]

Based on this framework, our research firstly analyzes the structure of SSB value chain in Argentina, identifying key actors along the productive chain, their relative power and evolution. Secondly, we study the determinants of market power at the SSB market, by using a model which captures the behavior of consumer decisions using information from the supply side.

Materials and methods

Estimation methodology

The estimation of discrete choice demand model of non-homogeneous products under uncertainty departs from an individual utility function, accumulative across individuals. Such utility function depends on market prices, product characteristics, consumer preferences and an uncertainty component. The implementation uses the framework depicted originally by McFadden (1973)[25] and developed by Berry (1994)[26] for estimating demand functions with differentiated products in a context of uncertainty.

The accumulation of preferences across consumers defines each product's market shares. Their mathematical identification establishes a non-linear model which, after applying logarithms ends up in a linear demand function model to be estimated. After estimation, own and cross price elasticities can be calculated. The model to be estimated is briefly presented below.

Berry (1994)[26] proposes a specification to estimate consumers' choices under uncertainty, departing from an individual utility function:

$$U_{ijt} = \beta x_{jt} - \alpha p_{jt} + \xi_{jt} + \varepsilon_{ijt}$$

Where x_{jt} is a vector of the observed characteristics of j soft drink brand at period t (flavor, main brand, carbonated, regular, sugar free), p_{jt} denotes the price of soft drink brand at period t , β and α are structural parameters to be estimated, ξ_{jt} represents the attributes of soft drinks brand at period t that are observed by consumers and firms, but unobserved by the econometrician, such as firms' advertising efforts, and ε_{ijt} represents consumers' idiosyncratic tastes for brand at period t .

Although unobserved consumers characteristics can generate potential endogeneity with prices, the vector of non-price variables may be able to capture differences in tastes and abilities to pay across consumers in a market characterized by both horizontal and vertical differentiation.

We let $\delta_{jt} = \beta x_{jt} - \alpha p_{jt} + \xi_{jt}$, which is the mean utility level of brand j at period t . Consumer i is assumed to choose the alternative among all $j+1$ alternatives that yields the highest level of utility. As noted by Berry (1994), the market share of brand j at period t , denoted by s_{jt} , is determined by the following equation:

$$s_{jt}(\delta) = \frac{e^{\delta_{jt}}}{\sum_{r=0}^N e^{\delta_r}}$$

The log transformation of relative brand share gives our estimating equation as follows:

$$\ln(s_{jt}) - \ln(s_{0t}) = \beta x_{jt} + \alpha p_{jt} + \xi_j$$

Where s_{0t} is the market share of the outside good, that is, the fraction of the potential market that does not buy a SSB in the period analyzed. The use of tap water as an alternative outside consumption to non-alcoholic beverages stable over time is a plausible assumption in Argentina, where access to clean water is almost generalized. After obtaining estimates of the demand parameters, we can calculate the own-price and cross-price elasticities of demand for each brand, respectively:

$$\eta_{jkt} = \begin{cases} -\alpha p_{jt}(1 - s_{jt}) \\ \alpha p_{kt}s_{jt} \end{cases}$$

In our case, and in order to calculate the behavioral responses triggered by potential tax policies, we use alternative models of demand, providing information about the intensity of response of potential interventions affecting sales prices. The model is estimated through ordinary least squares (OLS).

In every case, the estimation departs from cumulative individual utility functions defining total sales by type of beverages and looks for identifying coefficients that may be used to calculate own and cross price demand elasticities across healthy and non-healthy products.

Data

The analysis of supply chain of SSB in Argentina involved the search for information in specialized magazines, reports from national and international organizations, as well as the utilization of the report and the database Euromonitor International for the period 2005-2015. [27] In addition, the same source of data allowed the estimation of the demand function.

For each year, Euromonitor International provides a report about non-alcoholic drinks market in Argentina with a high disaggregation data level on characteristics of supply. This report provides information on sales (value and volume) by category, company, brand, price, flavor, beverages types, ingredients, etc.

The database of non-alcoholic drinks presents information on five categories of beverages ready to drink (bottled water, carbonates, juices, RTD tea, sports and energy drinks) and more than ten subcategories based in flavor, carbonated or not, light or regular, etc.

The study used the Euromonitor database to identify trends in the local market, as well as the estimation of demand functions considering as main research arguments those associated to differentiation across products based on brands, preferences and price characteristics.

Complementary, secondary information from reports from national and international organizations, specialized journals, were used for value chain analysis.

Results

Supply chain of Sugar-sweetened beverages

The actors involved in the value chain of SSB industry are concentrate producing companies, sugar producers, high fructose corn syrup (HFCS) and juice producers, packaging producers, bottling companies, wholesale distributors and shops.

Fig 1. Scheme of supply chain of SSB in Argentina

	Suppliers of inputs	Bottling plants	Retail trade
Concentration	<p>Sugar:</p> <ul style="list-style-type: none"> • High vertical integration • 85% of production is concentrated in 8 economics groups • 65% of production is founded in Tucumán <p>High fructose corn syrup:</p> <ul style="list-style-type: none"> • High vertical integration 	<ul style="list-style-type: none"> • High vertical integration forward • 67% of soda production is concentrated in two leading companies. 	<ul style="list-style-type: none"> • Soda sales: <ul style="list-style-type: none"> ○ 32.7% small groceries ○ 23.1% supermarkets ○ 11.9% hypermarkets ○ 32.3% others retail trade
Number of companies	<p>Sugar:</p> <ul style="list-style-type: none"> • More than 5000 Cane growers • 23 sugar mills <p>High fructose corn syrup:</p> <ul style="list-style-type: none"> • 2 companies (Glucovil e Ingredion) 	<ul style="list-style-type: none"> • 100 bottling plants <ul style="list-style-type: none"> ○ 20 franchises of global companies ○ 80 Medium and small national enterprises. 	
Employment	<p>Sugar:</p> <ul style="list-style-type: none"> • 46000 direct employment (cane growers and sugar mills) 	<ul style="list-style-type: none"> • 22,657 direct employment in soft drink 	
Geographic location	<p>Sugar:</p> <ul style="list-style-type: none"> • Tucumán concentrates 99% of cane growers and 65% of sugar mills <p>High fructose corn syrup:</p> <ul style="list-style-type: none"> • Glucovil has a plant in San Luis and Ingredion has two plants in Buenos Aires 	<ul style="list-style-type: none"> • 40% of bottling plants are located in Gran Buenos Aires, 25% in center region, 25% in north region, and 10% in south region of the country. 	

The main link in the value chain is the bottling companies, responsible for the preparation, packaging and marketing of beverages. There are one hundred of bottling companies in the country, where twenty of them belong to the so-called franchise systems of global companies with foreign capital. The rest of the bottling companies belong to medium and small companies of national capitals, with medium technology, and their share in sales are less than 7%.[28] Upstream, inputs producers play a key role, particularly sugar and corn syrup of high fructose producers, which the 60% of its production is demanded for food and drinks industry (mainly the soft drink industry)[29,30]. Downstream, the main actors are supermarkets and hypermarkets, which account 35% of total non-alcoholic sales. Fig 1 summarizes the scheme of main actors in the supply chain of non-alcoholic beverages in Argentina.

The Euromonitor database identified 28 firms and 111 brands of soft drinks in 2015. The greatest diversity of brands is presented in carbonates. However, Table 1 shows that carbonates represents the 52.6% of sales in the soft drinks market in 2015, and only regular cola carbonates refers 24.5% of SSB market. In addition, new market segments arise, such as flavored waters, RTD tea, low-calorie sodas, sports and energy drinks at the time that mineral water and juice consolidate their participation.

Table 1. Description of Soft Drinks market in Argentina, year 2015

Segments	Sales volume (million liters)	Share market of total soft drinks (%)	Evolution % of sales volume 15/05	Total Firms	No. Brands
Water	5200.6	43.2	50.2	10	38
Carbonated Water	2491.8	20.7	-6.1	6	12
Flavored Water	1194.2	9.9	280.8	8	14
Still Bottled Water	1513.6	12.6	204.9	7	12
Carbonates	6342.7	52.6	-8.1	11	53
Low Calorie Cola	1018.8	8.5	51.8	8	11
Regular Cola	2950.0	24.5	-35.0	4	4
Lemonade/Lime	1185.3	9.8	53.1	9	12
Mixers	71.9	0.6	26.1	4	4
Orange	534.2	4.4	22.3	9	11
Others	582.5	4.8	37.9	9	11
Juice	364.4	3.0	330.2	8	12
RTD Tea	2.8	0.0	nc	1	1
Sports and Energy Drinks	137.0	1.1	459.2	7	7
Total Soft drinks	12047.5	100.0	15.1	28	111

Source: Euromonitor International, 2016

nc: not correspond

At firm level, the diversification allowed to Coca-Cola Company to increase its market share in the last five years, with 20%. Meanwhile, the two top domestic capital companies producing second brands -Refresh Now and Pritty- show an important increase of their market shares, reaching 36% y 125%, respectively (Table 2).

Table 2. Ranking and evolution of market share of top ten SSBs companies

Companies	Market Share of sales volume (%)				Market share of sales value (%)			
	Ranking	2010	2015	Evolution % (15/10)	Ranking	2010	2015	Evolution % (15/10)
Coca-Cola Argentina SA	1	48.4	57.6	19.0	1	53.4	64.6	20.9
Cervecería y Maltería Quilmes SAICAYG	2	17.0	16.5	-3.1	2	17.8	17.5	-2.0
Refresh Now SA	3	4.0	5.4	35.6	4	2.9	4.4	54.3
Pritty SA	4	2.3	5.1	125.1	3	2.3	3.2	38.3
Carrefour SA	5	3.0	3.0	1.7	6	2.1	1.5	-27.5
Oeste Embotelladora SA	6	2.3	2.0	-13.1	5	1.4	1.4	-3.8
Coto CICSA	7	2.3	2.0	-13.2	7	1.3	1.1	-13.4
Produnoa SA	8	1.1	1.2	12.0	8	0.5	0.6	7.8
Frutafiel SA	9	0.5	0.5	-11.4	9	0.4	0.3	-12.4
Salvador Marinero & Hijo SRL	10	0.6	0.2	-67.4	10	0.4	0.1	-67.9
Others		18.5	6.5	-65.0		17.6	5.4	-69.3
Total		100.0	100.0			100.0	100.0	

Source: Euromonitor International, 2016

In the carbonated beverages market, second brands produced by domestic capital firms and own brands commercialized by large supermarket chains (Carrefour, Coto), become followers of main international firms and brands, looking for higher market participation. Beyond that, Coca-Cola brand is the most-sold carbonated beverage in Argentina, with 35.4%. The market share of all other brands does not exceed 10% (Table 3).

Table 3. Market share of top twenty brands of carbonated beverage, year 2015

Brand	Market share % of total carbonated	Average price per litre
Coca-Cola	35.4	6.1
Sprite	7.5	5.9
Pepsi	5.9	5.6
7-Up	5.5	5.7
Pritty	4.3	4.7
Fanta	4.2	6.5
Manaos	3.4	3.3
La Bichy Ahora	2.9	2.5
Carrefour	2.6	2.4
Diet Coke	2.5	7.4
Coca-Cola Zero	2.4	7.5
Talca	1.7	4.1
Ciudad del Lago	1.7	3.0
Doble Cola	1.4	3.8
Paso de los Toros	1.4	6.6
Secco	1.1	2.8

Mirinda	1.0	5.8
Crush	0.5	3.6
Frutafiel	0.5	3.6
Diet Pepsi	0.4	6.9
Others	13.7	4.2
Total	100.0	

Source: Euromonitor International, 2016

Discrete choice model with differentiated products

Table 4 shows the results originated in the proposed econometric estimations from the discrete choice model with differentiated products. The relation between the price and brand market share, estimated at the average value, is -1.02. This implies that an increase of 10 percent of the price will reduce the quantities of non-alcoholic beverages demanded in 10.2 percent, a more than proportional change. On the other hand, no-price variables (cola, regular, main brand) are all positive and statistically significant determinants of demand choices, in some cases with stronger effects than prices, indicating the relevance of product differentiation in these non-homogeneous markets. Being a leading brand is the one with the greatest weight in market share of brands of soft drinks, which shows in part the loyalty to the brand of consumers. To unsure of robustness of the econometric estimation, this estimation was evaluated through several tests (multicollinearity, homoscedasticity of residuals, model specification, normality of residuals and non-linearity).

Table 4. Results of estimation of discrete choice model

Dependent Variable: $\ln(s_{jt})$	
Explained Variables	OLS Coefficients
ln(brand price)	-1.019*** (0.0882)
Main brand	1.887*** (0.113)
Cola flavor	1.485*** (0.164)
Lima flavor	0.881*** (0.158)
Regular	0.696*** (0.141)
Sugar free	0.514*** (0.161)
Carbonated	0.242* (0.124)
Constant	-3.938*** (0.227)
Years dummies	Yes
Observations	1,108
R-squared	0.309

Notes: $\ln(s_{jt})$ is the natural logarithm of the market share of brand in soft drinks, measured in sales in liters. Reference variables: own and second brand, other flavors, light and no carbonated. Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

Finally, the Table 5 shows the own and cross price elasticities of demand for selected brands of carbonated beverages with different flavors, carbonated contents, regular and low calories, main and second/own brands. All estimated own-price elasticities show negative and very responsive, ranging from -1.546 in Sprite to -1.992 in Diet Coke. In addition, cross price elasticities are significantly lower, reflecting relatively high responses to other prices raises (0.370) to quite insignificant substitutability in other cases (0.019). In all cases, results show the relevance of leading brands. Observing the map of cross-price elasticities, Coca-Cola is the most favored beverage by changes in the price of the rest of the brands. An increase of 10% in price of the rest of the brands, the demand of Coca-Cola is increased between 3% and 3.7%.

Table 5. Own- and Cross- Price Elasticities by selected brands

Brand	Leading Brands						Second and own brands			
	Coca Cola	Sprite	Pepsi	7 Up	Fanta	Diet Coke	Pritty	Manaos	La Bichy Ahora	Carrefour
Coca Cola	-1.605	0.077	0.060	0.056	0.043	0.026	0.043	0.035	0.024	0.029
Sprite	0.295	-1.546	0.049	0.046	0.035	0.021	0.035	0.029	0.019	0.024
Pepsi	0.306	0.065	-1.620	0.048	0.037	0.022	0.037	0.030	0.020	0.025
7 Up	0.319	0.068	0.053	-1.692	0.038	0.023	0.038	0.031	0.021	0.026
Fanta	0.313	0.067	0.052	0.049	-1.895	0.022	0.038	0.031	0.020	0.026
Diet Coke	0.370	0.079	0.062	0.058	0.044	-1.992	0.044	0.036	0.024	0.030
Pritty	0.318	0.068	0.053	0.050	0.038	0.023	-1.694	0.031	0.021	0.026
Manaos	0.354	0.075	0.059	0.055	0.042	0.025	0.042	-1.844	0.023	0.029
La Bichy Ahora	0.342	0.073	0.057	0.053	0.041	0.024	0.041	0.034	-1.847	0.028
Carrefour	0.344	0.073	0.057	0.054	0.041	0.024	0.041	0.034	0.023	-1.847

Note: The own-price elasticities by brand are in bold and in the diagonal. The rest are cross-price elasticities.

Discussion

When countries propose increasing SSB prices via taxes to reduce their intake, it is crucial to understand not only behavioral changes of consumers as their responses to tax-induced price increases, but also how SSB producers position themselves in a concentrated market where traditional brands coexist with new products. This paper is the first attempt to analyze the supply chain of soft drinks and to apply a discrete choice model of product differentiation to study Argentina's SSB market, estimating own-price as well as cross-price elasticities of SSB demand at the brand level. This perspective, alternative to those based on household surveys, allows more in detail analysis of substitution across products with different characteristics (sugar contents, carbonates, flavor, etc.).

In the Argentine SSB supply chain analysis, two main elements were identified. Firstly, the increases of the level of concentration. The sector is dominated by international companies (first brands) which strategies are mainly defined by their parent companies abroad. Coca-Cola Company controls more than 50% of the overall market for carbonates, as well as a substantial portion of the flavored water segment. In the ranking is followed by PepsiCo and Nestle, while Danone is in sixth place. The last two firms lead the market of flavored bottled waters. On the other hand, the SSB market shows also higher diversity in production. The companies extend to other food lines, such as milk-related products and snacks to gain market share (i.e. Danone, Pepsi).

Complementary, in the global SSB market, some main trends can be identified: emergence of second brands and own brands (product differentiation), and changes in consumption towards healthier products (consumer's change of habits). Regular cola beverages have experimented a 35% reduction in their participation during the last decade, while low calories cola and lemonade/lime carbonates show an increase of 52% and 53%, respectively. Meanwhile, market shares in new non-alcoholic beverages, mainly flavored waters shown sustained growth against traditional sodas with higher caloric value. This is the reason why leading companies innovate in these new segments, diversifying production. In addition, the two top national producers of second brands show a significant jump of their market shares, 36% y 125%, respectively, supported by lower unit prices.

Based on annual nationwide sales data from 2005 to 2015, the results suggest that on average, SSB demand is elastic in Argentina with a sales-weighted overall own-price elasticity of 1.02, and second and own brands have higher own-price elasticities than main brands. Estimations result similar to those obtained by a companion paper [31], calculated from local household surveys, showing complementarity of both approaches, as well as the capacity of the methodology for capturing the effect of non-price variables on demand.

This approach has the limitation of excluding potential relevant household characteristics in the determination of the demand for SSB, particularly income. However, data shows that the market participation of second brands on total sales -usually oriented to lower income groups-, are relatively low: top four main brands have 54.4% of market sales in 2015, while top four second brands explain 6.97%, suggesting that purchasing patterns are relatively more homogeneous in these types of products than in other components of a family's food basket.

Beyond that, this study confirms the importance of consumers' brand-switching behavior as response to potential tax-induced price increases and identifies the substitution patterns in Argentina's SSB market based on price and non-price characteristics. It is observed that, in

general, second or own (supermarket) brands have greater own-price elasticities than SSB leading brands, highlighting the relevance of brand loyalty. This result can be interpreted in the way that the price elasticities of demand of second and own brands are more elastic than main brands of SSB, being more affected by price changes. Finally, cross price elasticities allow to identify different levels of substitution across brands and flavors, being more probable to switch within first brands than with second brands, where in general cross price elasticities between them are significantly lower.

Conclusions

The study looks for demonstrating the relevance of understanding the organization of supply chain when designing public policies associated with the intake of SSB. They require knowing the structure of the producer market and its marketing chains, to identify proper spaces for intervention and the potential strategic reactions generated in response to the same policy.

Specifically, in the case of the SSB industry, high levels of market concentration and consumers loyalty to main brands challenge the Government's ability to implement a sound regulatory policy. In addition, the trend towards product diversification within the same firm enables the presence of cross subsidies between presentations/brands as a response to selective taxes pointed to high sugar content beverages.

Moreover, the presence of second brands makes it easier, at certain income levels, to substitute first brands for second or supermarkets-own brands, affecting the potential effectiveness of a tax policy.

In Argentina a change in users' consumption patterns towards non-carbonate beverages, and with lower sugar content has been observed, regardless of the introduction of the tax. On the other hand, results show a significantly elasticity of demand for these kind of beverages, opening the room for fiscal policies. Therefore, the design of a policy to reduce the intake of SSB should combine the design of taxes combined with other interventions, for example labeling, and education and information campaigns, so on.

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