The Effect of 'Traffic-Light' Nutritional Labelling in Carbonated Soft Drink Purchases in Ecuador

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Introduction

• Overweight and obesity are now problems in high and low- and middle-income countries (WHO 2016a). In Ecuador, a middle income country, it is estimated that 63% of adults, 26% of teenagers and 30% of children are either overweight or obese (Freire et al. 2014).

• To help reverse its overweight and obesity problem, Ecuador implemented in 2014 a 'Traffic-Light' (TL) supplemental nutritional labelling system. The objective of the policy is to help consumers make educated choices with regard to their consumption of sugar, fat and salt in processed food products.

• Ecuador is the first country to implement a 'Traffic-light' nutritional labelling policy at the national level. Therefore, little information is available with respect to the effectiveness of this type of policy at influencing the consumption habits of the population towards *healthier* food products.

Objective

• The objective of this research is to evaluate the impact of the 'Traffic-Light' supplemental nutritional labelling system in the consumption habits of carbonated soft drinks (CSD) of Ecuadorean consumers.

• We focus our analysis in carbonated soft drinks because of the high level of consumption of these products in the country. Moreover, CSD can be classified in two distinct high and low sugar groups which facilitates the analysis of potential substitution effects between the two groups as a result of the policy (Freire et al. 2014).

The Traffic Light Label

• Approved in November of 2013.

• Applies to all processed food products.

• Medium and large companies had until August 29th of 2014 to comply with the regulation and small companies until November 29th of 2014.

• Additional to the nutrient declaration/facts label.

• Assigns a traffic light color to the content of sugar, fat and salt.

HIGH in SUGAR

MEDIUM in FAT

LOW in SALT
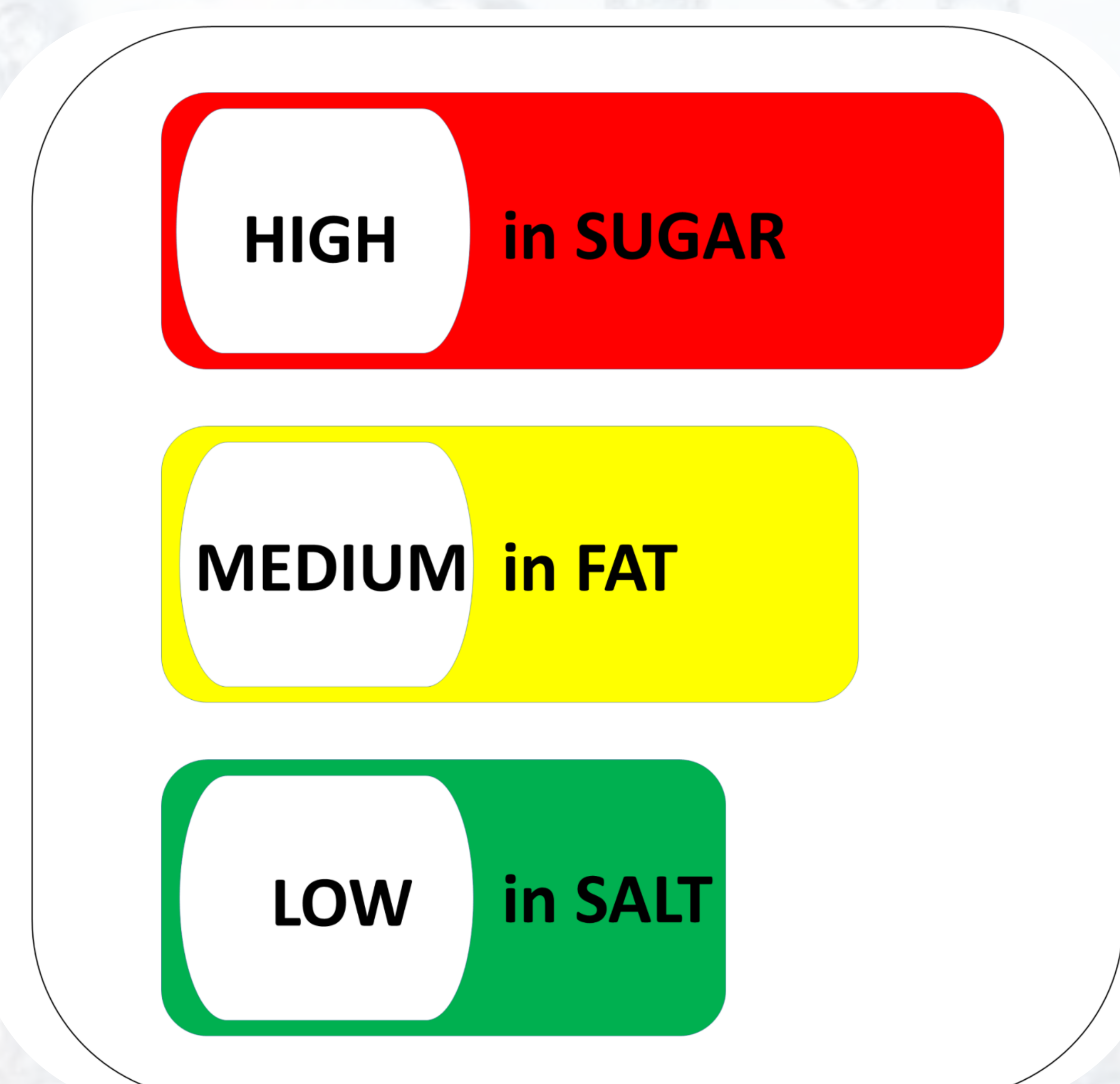
Data

• Aggregated monthly food and drinks purchase data (volume in litters (L) and value in US$) from a Panel of 1,646 Ecuadorean households from January 2013 to December 2015 obtained from Kantar World Panel.

• The data set contains purchase information of 13 food groups and 17 drinks groups, including information on 23 brands of carbonated soft drinks.

Demand Model

• We estimated a unconditional non-linear Almost Ideal Demand System (Deaton and Muelbauer 1980).

• The demand system consists of the following 5 equations: 1) Coca-Cola, 2) Dark colored high sugar Coca-Cola substitutes, 3) Low and non-sugar CSD, 4) Fruit flavored and all other CSD, and 5) a numeraire good that includes all other foods and drinks.

• A dummy variable was included to evaluate the effect of the 'Traffic-Light' label, in addition to dummy variables for socio-economic status, quarter and a time trend.

• To account for heteroscedasticity, autocorrelation and clustering, the standard errors of the parameters estimates, elasticities and marginal effects were estimated using a moving blocks and clustered bootstrapping procedure (Boonsaeng et al. 2008, Goncalves and White 2005).

Results

Table 2 Mean uncompensated price and expenditure elasticities.

CSD categories	Market share	Price elasticities				Expenditure elasticities
		Coca-Cola	Dark colored high-sugar	Low- and non-sugar	All others sodas	
Coca-Cola	57.9%	**-0.5710**	-0.4057***	0.2273**	0.2886	0.4956***
Dark colored high-sugar	9.6%	-1.6129	**-1.3850***	0.3656	2.3866	0.9334
Low- and non-sugar	3.22%	1.4934	0.6061*	**-1.4489**	-0.6024	0.5875
All other sodas	29.28%	0.4141	0.8700***	-0.1339	**-0.7587**	0.6640***

*, **, *** denote significance at α=0.1, 0.05 and 0.01, respectively.

Table 3 Mean effect of the demand shifters in quantity consumed (L./per-capita).

	Consumption (L./per-capita)	High socio-economic status	Medium socio-economic status	Time trend	Traffic light labelling	1st quarter	2nd quarter	3rd quarter
Coca-Cola	0.967	-0.0535*	0.0228	-0.0026***	**-0.0133**	0.0543***	0.0214*	-0.0169
Dark colored high-sugar	0.160	-0.0867***	-0.0608***	-0.0002	**0.0056**	0.0039	0.0033	-0.0009
Low- and non-sugar	0.054	0.0148***	0.0050	0.0007***	**0.0081***	-0.0019	0.00003	0.0009
All other sodas	0.460	-0.0767***	-0.0128	-0.0009*	**0.0315***	0.0237***	0.0155**	-0.0073

*, **, *** denote significance at α=0.1, 0.05 and 0.01, respectively.

Figure 2 Examples of 'Traffic-Light' label is CSD.

Discussion

• The Ecuadorian CSD market is clearly dominated by one brand. Out of the 1.67 L. per-capita per month that are consumed at home, Coca-Cola accounts for 58% of consumption.

• Own price elasticities suggest that Ecuadorean are sensitive to price changes in dark colored and low- and non-sugar CSD categories but not for Coca-Cola and all other CSD categories. Cross price elasticities suggest that Coca-Cola is a substitute of low- and non-sugar CSD and that low- and non-sugar and all other CSD are substitutes of dark colored CSD.

• The expenditure elasticities suggest that CSD are necessary goods.

• Relative to low income households, households in the highest socio-economic status group consume less high sugar CSD and more low- and non-sugar CSD.

• During the period of observation, we observed a downward trend in the consumption of Coca-Cola (-0.27%/month) and all other CSD and an upward trend in the consumption of low- and non-sugar CSD (+1.30%/month).

• A joint test of effect of the 'Traffic-Light' label dummies in the demand system ($F_{4,108}$=4.645) suggest that the labeling policy did have an effect in the consumption of CSD. The effects are small relative to the total consumption of drinks. Low and non-sugar CSD are estimated to have increased by about 0.0081 L/per-capita after the policy was implemented. Contrary to expectations, high sugar CSD are also estimated to have increased by 0.0238 L./per capita after the introduction of the policy; however, this estimated aggregate effect is not statistically different from zero.

Conclusions

• We find some evidence that the introduction of 'Traffic-Light' labelling policy had an effect in the consumption of CSD in Ecuador; however, relative to the overall level of CSD consumption the estimated effects are very small. Moreover, we do not find evidence of a reduction in the consumption of high sugar CSD which was the main policy objective.

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