# Brown Sugar, how come you taste so good?
# The impact of a soda tax on prices and consumption

Judite Gonçalves and João Pereira dos Santos[1]

Nova School of Business and Economics

**Abstract**

Increasing obesity-related problems and rising healthcare expenditures have led governments in developed countries to consider the introduction of soda taxes. We study a recent such tax, implemented in Portugal in February 2017 —one of the first soda taxes worldwide that increases with sugar content (0.08 euros per liter for drinks with less than 80 grams of sugar per liter, and 0.16 euros per liter for drinks with 80 grams or more sugar per liter, plus VAT). We use extremely detailed panel data from one of the two largest retailers in the country, covering the period between February 2015 and January 2018. We take advantage of the tax breakdown by sugar levels to examine how soda prices and quantities purchased reacted. For identification, we rely on difference-in-differences models with various vectors of fixed effects, comparing each group of products to water.

For drinks with more than 80 grams of sugar per liter, results indicate almost full price pass-through to the consumer. For drinks with less than 80 grams of sugar per liter, price pass-through surpassed 100%. Regarding consumption, our findings suggest stockpiling behavior in the quarter when the tax was approved and before it was actually implemented. In the implementation period, there are no significant changes in quantities purchased for most beverages vis-à-vis water, with the exception of soda drinks with comparatively low levels of sugar. This suggests that benefits of the soda tax in terms of reducing sugar intake are mainly due to reformulation, as producers reduced the sugar content of some drinks to fall below the 80 grams per liter threshold.

*Keywords: soda tax, sugar-sweetened beverages tax, pass-through, policy evaluation, Portugal*
*JEL classification: C23, D12, H20, I18, Q18*

---

[1] Nova School of Business and Economics, Universidade Nova de Lisboa, Campus de Carcavelos, Rua da Holanda 1, 2775-405 Carcavelos, Portugal.

Email addresses: judite.goncalves@novasbe.pt, joao.santos@novasbe.pt

João Pereira dos Santos acknowledges financial support by Fundação para a Ciência e Tecnologia (grant no. PD/BD/128121/2016). The authors are grateful for comments from two anonymous reviewers, Pedro Pita Barros, Judit Vall Castelló, Alexander Coutts, David Cutler, Randall Ellis, Jonathan Gruber, Albert Ma, Martin O'Connell, Jim Poterba, Nigel Rice, Susana Peralta, José Tavares, and participants at a Nova SBE-ISEG seminar, a Nova Health Economics and Management KC meeting, the VIII Taller EvaluAES (Universitat de les Illes Balears), the Workshop on Economics of Taxation & Social Expenditure (Universitat de Barcelona), the XXXIX Jornadas de la Asociación de Economía de la Salud (Albacete), the 13th Annual Meeting of the PEJ (Évora), the International Health Economics Association Congress (Basel), the 2019 EuHEA PhD student-supervisor conference, and the conference of the Portuguese Health Economics Association. We thank Mafalda Luís for excellent technical assistance. All errors are our own.