



# Taxing your sweet tooth

**Effective nudge or economic burden?**

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# ▲ The rationale behind the sugar tax

“Our tax proposals include the following... Introduction of a tax on sugar-sweetened beverages.”

*Pravin Gordhan*

*Minister of Finance, South Africa*

# The rationale behind the sugar tax

The prevalence of obesity in South Africa has increased rapidly. Between 2003 and 2012, obesity rates in South Africa increased to 10.6% in men and 39.2% in women. [1] Scientists argue that the rising consumption of sugar-sweetened beverages (SSBs) is a significant contributor to this problem. [2] [3]

In light of the concerns of increasing obesity rates in South Africa and the announcement in the 2016 budget speech of a proposed tax on SSBs (sugar tax) in South Africa<sup>1</sup>; the impact of SSB consumption on public health, consumers and the industry has come into the spotlight. This prompts the question, 'are sugar taxes an effective way to change consumer behaviour?'

Ideally, for tax policy purposes, the sugar tax should lower the consumption of food and beverages with a high sugar content and incentivise industry to adjust the sugar content of its products.

From a philosophical perspective, it is interesting to consider government's role in society: hence, the first part of the inquiry is perhaps to ask why government is concerned about South African's personal sugar consumption decisions? Excessive sugar intake is linked to obesity and diabetes, which places a burden on the healthcare system. [4] [5] Therefore, on an aggregate level, our personal choices regarding sugar consumption can affect public health. In fact, diabetes mellitus is the fifth highest cause of natural deaths in South Africa. [6]

Against this background, the age old question is whether government should come up with policies that guide us in a particular direction through initiatives that modify our default choices.

A sugar tax may encourage a healthier option by making the unhealthy option more expensive, and therefore unattractive. However, when it comes to altering behaviour, tax policy may not always be the best instrument. A more subtle 'nudge', for example, educational awareness programmes, could also be considered.

Sin taxes are founded on the belief that appropriate behaviour can be induced by price incentives, following the expectations of homo economicus.<sup>2</sup> In fact, as we discuss below, there are some studies that show that an excise tax could lead to a decline in consumption. A tax can fill the void where our short-sighted view disregards long-term health considerations. Indeed, our

choices are influenced by a variety of psychological biases, including a tendency to choose the short-term benefits of enjoying sugar over the long-term health benefits of better consumption choices.

Another bias emerges, as price is not the only consideration in the purchase of a product for which consumers may have an emotional preference. [7] Social perceptions and 'herd behaviour'<sup>3</sup> similarly affect consumer behaviour, and could reduce the effectiveness of the proposed sugar tax. [8]

This could suggest that obesity and diabetes have a complex set of causes that requires a multi-faceted analysis that can include: reducing default portion sizes; education campaigns (for instance, among parents); redesigning educational and urban spaces to promote physical activity; and changes in marketing practices. [9]

Lastly, any policy initiative must take account of the realities facing South Africans today. In the pursuit of any policy objective, government should consider the issue of access on a socio-economic and geographical level.



<sup>1</sup> The specific configuration of the tax on SSBs has not been published by National Treasury at the time of publication of this Thought Leadership. As such, a tax on SSBs could for example affect carbonated soft drinks, sweetened milk products, ice teas, sweetened juices, and concentrates, or a combination of these products.

<sup>2</sup> In economics, homo economicus, or economic man, is the concept portraying humans as consistently rational and narrowly self-interested agents who usually pursue their subjectively defined ends optimally. [35]

<sup>3</sup> People have a tendency to follow mass behaviour rather than independently deciding what is best for them. [36]



# International comparison

“The important thing is to educate people so they’re aware of the health effects, because you can’t force anyone not to drink soda.”

*Dr Mercedes Juan López*

*Health Secretary, Mexico*

# International comparison

In this section, we provide a summary of experiences of countries that have implemented excise taxes aimed at curbing unhealthy consumption choices. We present the implications thereof for industry and the consumer. The selected countries represent varying demographics and lifestyles in order to thoroughly examine the potential effects.

In some instances, the sin tax was found to alter patterns of decision making to reduce the consumption of the taxed good. However, consumers also reacted in surprising ways such as hoarding, in anticipation of the introduction of the tax, and cross-border shopping. There have also been instances of negative effects on the industry and lower-income households. Denmark repealed its tax on fatty foods for a variety of reasons, including the administrative burden and emergence of cross-border shopping. Researchers in Mexico have yet to conclude that the sugar tax has led to a reduction in obesity, as Mexico's sugar tax was introduced only a year ago. Hungary and the United States maintain their sugar taxes have shown mixed effects - while consumption has decreased, the effect may not have been as large as originally anticipated.

**Table 1 - Country comparison**

	Tax type	Purpose of tax	Use of tax revenue	Intended outcomes	Unintended outcomes
<b>Hungary</b> 	Tax on pre-packaged foods high in salt, sugar and fat, and SSBs. [10]	Combat obesity and promote healthy eating. [11]	Finance heavily indebted healthcare system and direct funds to measures for the prevention of obesity. [12]	Cola prices increased by 3.4%, 1.2% and 3.1% and consumption decreased by 2.7%, 7.5% and 6% from 2011 to 2013, respectively. [13]	Government revenues less than expected, jobs lost and low-income earners affected negatively. [13]
<b>Denmark</b> 	Excise tax on saturated fat in food products. [14]	Decrease risk of lifestyle-related diseases, and help fund welfare state. [14]	Support public health expenditures. Finance tax cuts and welfare state funding. [14] [13]	Researchers believe the consumption of fat decreased while in place. 1.2 billion DKK in tax revenues in 2012. [14] [13]	Hoarding, higher calorie intake, administrative burden and reduced competitiveness. [15]
<b>Mexico</b> 	1 Peso/litre of drinks that contain added sugar. Tax on calorie-dense foods. [16]	Address very high prevalence of obesity. 7% of national health budget spent on obesity-related diseases. [17]	Part of the taxes are used to provide potable water to public schools, particularly in low-income areas. [18]	Moderate reduction in consumption. [19]	1 700 jobs lost. Disproportionate effect on lower-income households. Smaller effect on obese individuals thus missing the target market. [16]
<b>Berkeley, US</b> 	Tax on distributor for the privilege of distributing - \$0.01 per fluid ounce of SSBs. [20]	Reduce consumption of SSBs to reduce the human and economic costs of diseases associated with excessive sugar consumption. [21]	Tax imposed as general tax. SSB committee created to advise City of Berkeley on actions and investments for reducing sugar consumption. [22]	Consumption data not yet available, as it is implemented only in a part of California.	Concerns regarding cross-border shopping. Price pass-through lower than anticipated – lesser fall in consumption and thus lower health improvements. [23]



# ▲ Potential implications of introducing a sugar tax in South Africa

“In principle, the introduction of a tax on sugary drinks was right. It is ethically justified by virtue of soft drinks being a demerit good and taxation mitigating the wider costs to society. However, this does not at all correlate to its effectiveness.”

*Dr Rajiv Chandegra*

*GP Registrar, United Kingdom*

# Potential implications of introducing a sugar tax in South Africa

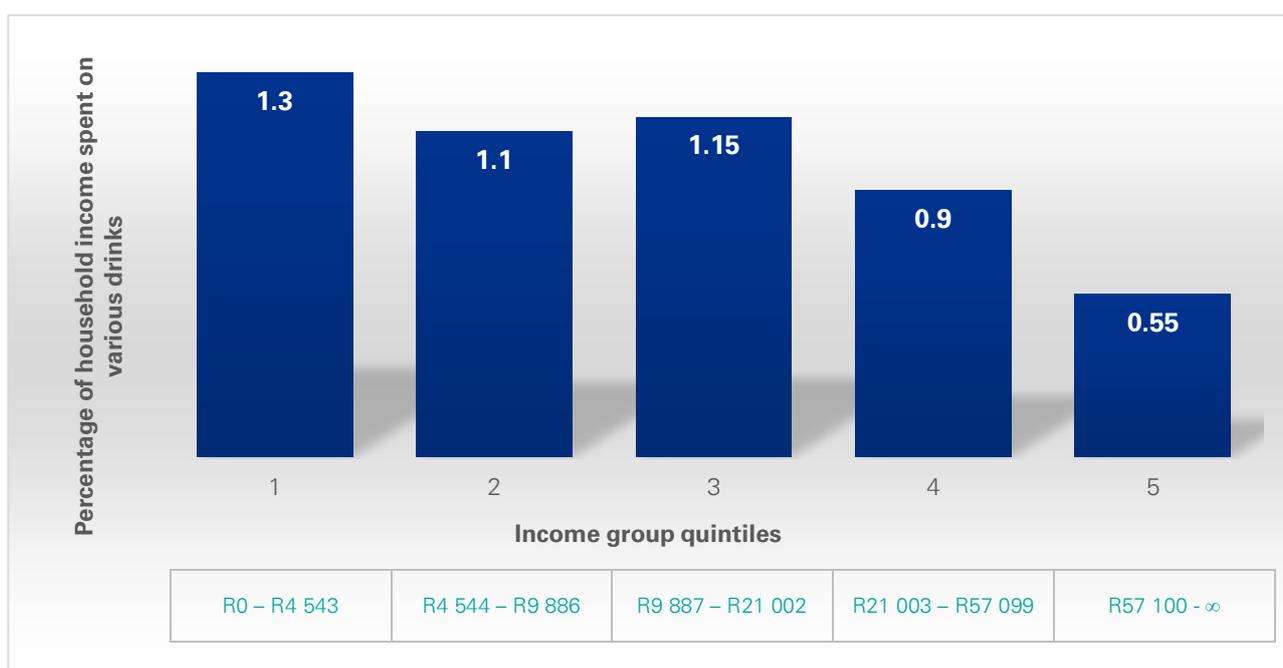
## Potential implications for the consumer

Observational and experimental studies show that the consumption of SSBs is a major source of weight gain in adults and children. [24]

The rationale for a tax on SSBs is that the resulting increase in the cost of SSBs would reduce the net consumption of sugar, reduce the total intake of calories and hence lower levels of obesity in South Africa. While various studies provide evidence of a reduction in obesity levels following a tax on SSBs, the reduction in obesity is often not large, with the limitations of such studies often calling the results into question. [25]

The possibility of a tax induced reduction in obesity should be balanced against the resulting burden on households, particularly, lower-income South African households. The proposed tax on SSBs could be regressive in nature because it is likely to burden poorer households more than their rich counterparts. This could be due to differences in the composition of household expenditure baskets. As shown in Figure 1, poorer households tend to spend a comparatively larger proportion of their income on consumption goods, including SSBs. [26]

Figure 1 - Percentage of household income spent on mineral water, soft drinks, and fruit & vegetable juices



Source: Survey of Income and Expenditure of Households, StatsSA, 2010

South African consumers are facing challenging times. Increasing inflationary pressures, driven by food, petrol, and electricity price increases and interest rate hikes put growing pressure on consumers. In South Africa, more consumers seek credit to cover daily living costs than in any other country, with 86% of South Africans borrowing money, relative to a global average of 40%. [27] Indeed, the number of South Africans seeking debt relief through debt relief counselling is growing exponentially. [28]

How poor households manage their budget constraints affects their ability to switch between different products, which may have implications for their responsiveness to changes in the price of SSBs. Therefore, it may be worth investigating the extent to which poorer households are able to switch to healthier products.

## Potential implications for industry

The purpose of the tax on SSBs is to bring about behavioural change. Yet, there may be a risk that with the intended behavioural changes, there may also be undesirable implications for the manufacturing sector and labour market.

Manufacturers, employees and shareholders could lose following the introduction of a tax on SSBs. Upon the announcement of a possible sugar tax in the UK in March 2016, the share prices of AG Barr, Britvic and Vimto, three large beverage manufacturing firms, fell sharply. [29]

The intended effect of the tax on SSBs is to reduce consumption, possibly leading to a reduction of the demand for labour along the value chain. South Africa is expected to harvest the least amount of sugar in the 2015/16 season since 1995, and 22% less than in the previous year. [30] The sugar industry currently employs 79 000 people directly and 350 000 indirectly, all of whom could be subject to reductions in wages or dismissals if the sugar tax has a negative effect on profitability. [30] A reported 1 700 jobs were lost due to the SSB- and calorie dense food tax implemented in Mexico in 2014. [31] In fact, the Beverage Association South Africa, whose members include prominent industry players, finds the proposed tax to be discriminatory. This could mean that business is anticipating a negative impact on industry. [32]



## Potential implications for the fiscus

While international data and evidence on the impacts and effectiveness of sin taxes is very limited, there are countries that have recently introduced such taxes with the effect of changing consumer behaviour and overall health conditions. The sugar tax could also contribute towards funding for the South African public health sector.

The recent announcement of the tax on SSBs by the Finance Minister, Pravin Gordhan, has been met with interest and calls for further discussion with industry. According to the Socio-Economic Impact Assessment System (SEIAS), approved by Cabinet in early 2015, the National Treasury will consult with industry prior to the implementation of a sugar tax. During this process, more information about the composition and potential effect of the sugar tax will emerge.

A sugar tax could potentially raise revenues. In the most liberal scenario, where price has no impact on quantity consumed, we estimate that SARS would collect up to around R2.17 billion.<sup>4</sup> These funds could be used for initiatives such as subsidising initiatives that educate the public about healthy lifestyle choices, as well as aid in the supply of fresh water to rural areas. Comparing the expected revenue from the SSB tax to other tax revenue sources, it seems that revenue may not be the main goal.<sup>5</sup> Indeed, excise tax collection on beer alone was almost 5 times that of the expected SSB tax revenue for 2015.

As seen in Denmark and California, where similar taxes have been implemented, hoarding and cross-border shopping could lead to a reduction in tax revenue collected through the sugar tax. Should any of South Africa's bordering countries not adopt a similar tax, it will become more attractive to purchase the beverages in these bordering countries and illegally bring them into South Africa. If this occurs on a large scale, the tax would not succeed fully in revenue collection or changing consumer behaviours for the better.

However, it is also important to look at the potential overall health benefit of such an intervention for public finances. Recent mathematical modelling by University of Witwatersrand researchers suggests that a 20 percent sugar tax has the potential to save approximately R10 billion over the next 20 years in the cost of treating type 2 diabetes. [33] This is no small number if one considers that diabetes is expected to cost South Africa as much as R2 billion per year by the year 2030 in costs such as hospitalisations and medication. [33]

<sup>4</sup> Based on 2015 consumption and population data, and a 20% ad valorem tax on SSBs.

<sup>5</sup> Excise tax collection on beer alone was almost five times that of the maximum sugar tax revenue estimated for 2015.

## Potential implications for consumer prices

Below, we provide a simulation of the impact a sugar tax can have on the price of a 2 litre carbonated SSB.

If we assume that the proposed sugar tax is a specific excise tax, then a certain amount will be levied on a certain quantity of sugar in every beverage. For example, Table 2 shows that a tax of R0.01 per gram of sugar results in a price increase of R2.00 for a 2 litre bottle. This constitutes a 13.34% price increase.

**Table 2 - Simulation 1**

Case of specific excise tax on SSBs	
Pre-tax price (2 litre)	R14.99
Pre-tax price (100ml) (derived)	R0.75
Hypothetical amount of sugar per 100ml	10g
Total sugar tax of R0.01 per g/100ml	R2.00
Post tax price (2 litre)	R16.99

Source: StatsSA, BMI, Statista and KPMG calculations

Table 3 illustrates that an ad valorem excise duty of 20 per cent on every 100ml of a popular soft drink would result in a price increase of R2.99 for every 2 litre bottle.

**Table 3 - Simulation 2**

Case of ad valorem excise tax on SSBs	
Pre-tax price (2 litre)	R14.99
Pre-tax price (100ml) (derived)	R0.75
Hypothetical amount of sugar per 100ml	10g
Total sugar tax of 20% per 100ml of SSB	R2.99
Post-tax price (2 litre)	R17.98

Source: StatsSA, BMI, Statista and KPMG calculations

Both of these examples show the significant effects on consumers. Lower-income households will be affected most by this price increase, as their budget and income are already stretched. It is important to bear in mind our assumption of a full price pass-through of the tax to consumers. The second assumption is that despite a price increase there is no change in consumption. As a consequence, the results reflected in the following simulation show the maximum potential revenue from a sugar on carbonated SSBs.

In order to illustrate the somewhat limited potential of the proposed sugar tax to boost revenue collection, we make a hypothetical assumption of no reduction in the consumption of SSBs, following the tax induced price increase. Despite this unlikely and liberal assumption, the revenue collected is comparatively small. Based on our estimations, South Africa would have collected more than R2 167 million in tax revenue in 2015 from the ad valorem sugar tax, 0.22% of total revenue for the financial year 2014/15. This is not a negligible amount. However, in terms of other revenues collected, this tax represents just 20% of the revenues collected from the excise tax on beer. Figure 2 below confirms that the estimated revenue from the proposed sugar tax is lower when compared to the revenue collected from sin taxes on beer and cigarettes. While the revenue from the sin tax on beer and cigarettes are R 10 665 million and R 12 845 million respectively, the estimated revenue from the sugar tax is R 2 167 million.

**Figure 2 - South African revenue collected from excise taxes: 2015 calculation**



Source: StatsSA, BMI, Statista and KPMG calculations<sup>6</sup>



<sup>6</sup> South African population data as well as per capita spending on soft drinks in 2015 are used to estimate total national spending on soft drinks. We adjust this figure to account for the spending on diet or no-sugar-added options of soft drinks (1.5%). In a hypothetical scenario, we assume a 20% ad valorem tax on sugar-added soft drinks, and assume that the price increases by the same proportion, but spending habits are left unchanged. The difference between pre-tax spending (ZAR) on soft drinks and after-tax spending (20% increase in ZAR) reflects the potential tax revenue in this simulation.



# Conclusion

“What is “good” regulation? That is not an easy question to answer, but regulation that has a clear focus of what it needs to achieve, where the benefits outweigh the costs and where potential unintended consequences are anticipated and addressed as soon as possible, certainly goes a long way towards being considered “good” ”

*Lullu Krugel*

*KPMG Chief Economist and  
Director, South Africa*

# Conclusion

There are wide-spread concerns about public health, growing levels of obesity and diabetes, high sugar consumption and the associated costs in South Africa. The goal for policymakers is to incentivise consumers to make healthier lifestyle choices that improve their quality of life and capacity to contribute to society. However, before a solution can be introduced, a solid behavioural and economic analysis is necessary to ensure that consumers react as intended and the benefits of the regulatory change outweigh the costs.

Research estimates that a 20% tax on SSBs in South Africa could reduce obesity by between 0.6% and 7.1% in men and 0.4% and 4.4% in women. [1] However, taking into account the assumptions in this research, the recommendations pertaining to the effect of a sugar tax should be explored further.

Indeed, the proposed tax has raised questions due to mixed results in other countries. The demand for SSBs can be sensitive to price changes and substitution to products that hold a higher health risk. [34] As a result, even prior to further analysis, the potential reduction in obesity does not seem definitive.

Moving forward, government will consult with various stakeholders on the proposed sugar tax including industry and consumers. Indeed, the promulgation of 'good regulation' is central to the South African government's agenda. A range of initiatives are in progress to address South Africa's policy coordination and implementation challenges. In early 2015, Cabinet approved the replacement of the Regulatory Impact Assessment (RIA) system with the SEIAS to achieve a broader assessment of policy initiatives. SEIAS will consider the impacts on different stakeholders and take the country's socio-economic context into account while advancing the government's developmental policies.

As part of the broader regulatory impact assessment of the sugar tax, as envisioned by the SEIAS, the exploration of the effect of sin taxes on consumption patterns is paramount. Research suggests that consumers may resist price increases and may continue to purchase SSBs with little consideration of the tax induced price increase. Furthermore, those who do respond may not be the main target of policy – health-conscious consumers tend to make healthier choices that pre-empt the intended effect of a tax. Therefore, investigating how consumers will respond to the tax in terms of their behavioural changes is strongly recommended.

Furthermore, as part of the implementation of the SEIAS, stakeholders should investigate the impact of the sugar tax in terms of potential unintended consequences such as job losses or unnecessarily burdening consumers. How the sugar tax will affect the government's goals around poverty alleviation and reducing income inequality is central to understand. As part of the broader regulatory impact assessment, an analysis of the effects of the sugar tax on the entire economy in terms of economic growth, household expenditure, investment, tax revenue and employment levels by industry and skills level can allow policymakers to balance the demands of various stakeholder in society.

Lastly, the SEIAS suggests an investigation of alternative options for achieving the desired policy outcomes. The question emerges whether more so than on its own, the sugar tax combined with focused education and awareness initiatives could 'nudge' South Africans towards healthier diets and lifestyles. [9] Various recent breakthroughs in behavioural science can assist policymakers and other stakeholders to nudge consumers towards healthier lifestyle choice, for their benefit as well as society's.





# Reference list



# Reference list

- [1] M. Manyema, L. Veerman, L. Chola, A. Tugendhaft, B. Sartorius, D. Labadarios and K. Hofman, "The potential Impact of a 20% Tax on Sugar-Sweetened Beverages on Obesity in South African Adults: A Mathematical Model," *PLoS ONE*, vol. 9, no. 8, 2014.
- [2] Heart and Stroke Foundation South Africa, "National Obesity Week: South Africa's weighty problem," Rogerwilco, 2015. [Online]. Available: <http://www.heartfoundation.co.za/media-releases/national-obesity-week-south-africa%E2%80%99s-weighty-problem#sthash.kzCNgMI8.dpuf>. [Accessed 17 March 2016].
- [3] L. Cornelsen, R. Green, A. Dangour and R. Smith, "Perspectives: Why fat taxes won't make us thin," *Journal of Public Health Advance Access*, pp. 1-4, 22 May 2014.
- [4] V. S. Malik, B. M. Popkin, G. A. Bray, J.-P. Despres, W. C. Willet and F. B. Hu, "Sugar-Sweetened Beverages and Risk of Metabolic Syndrome and Type 2 Diabetes: A Meta-analysis," *Diabetes Care*, vol. 33, no. 11, pp. 2477-2483, 2010.
- [5] Z. Mapumulo, "R23bn in nine years: Will obesity sink SA's healthcare system?," City Press, 8 June 2015. [Online]. Available: <http://citypress.news24.com/News/R23bn-over-nine-years-and-its-only-getting-worse-20150606>. [Accessed 13 April 2016].
- [6] Statistics South Africa, Mortality and causes of death in South Africa, 2013: Findings from death notification, Pretoria: Statistics South Africa, 2014.
- [7] Z. Kenesei and S. Todd, "The Use of Price in the Purchase Decision," *Journal of Empirical Generalisations in Marketing Science*, vol. 8, pp. 1-21, 2003.
- [8] O. T. Ahtola, "Price as a Give Component in an Exchange Theoretic Multicomponent Model," *Advances in Consumer Research*, vol. 11, 1984.
- [9] R. Dobbs, C. Sawers, F. Thompson, J. Manyika, J. Woetzel, P. Child, S. McKenna and A. Spatharou, "Overcoming Obesity: An initial economic analysis," McKinsey Global Institute, 2014.
- [10] O. Mytton, D. Clarke and M. Rayner, "Taxing unhealthy food and drinks to improve health," *British Medical Journal*, vol. 2012, no. 244, 2012.
- [11] A. Alemanno and I. Carreno, "Fat taxes in the EU between fiscal austerity and the fight against obesity," *Journal of Risk Regulation*, vol. 4, 2011.
- [12] R. Lavin and H. Timpson, "Exploring the Acceptability of a Tax on Sugar-Sweetened Beverages: Brief Evidence Review," Applied Health and Wellbeing Partnership, Liverpool, 2013.
- [13] L. Cornelsen and A. Carreido, "Health-related taxes on food and beverages," Food Research Collaboration, 2015.
- [14] J. Jensen and S. Smed, "The Danish tax on saturated fat: Short run effects on consumption and consumer prices of fats," Institute of Food and Resource Economics, Frederiksberg, 2012.
- [15] S. Smed, "Food taxes: Opportunities and blocks to their use in policy making.," in *World Public Health Nutrition Association Conference*, Oxford, 2014.
- [16] D. Agren, "Benefits of Mexican sugar tax disputed as congress approves cut," The Guardian, 22 October 2015. [Online]. Available: <http://www.theguardian.com/world/2015/oct/22/benefits-of-mexican-sugar-tax-disputed-as-congress-approves-cut>. [Accessed 25 May 2016].
- [17] M. Horstman and T. Clabbers, "Diabetes & Obesity in Mexico," Kingdom of the Netherlands, 2014.
- [18] M. Colchero, B. Popkin, J. Rivera and S. Ng, "Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study," *British Medical Journal*, vol. 2016, no. 352, 2016.
- [19] P. Luciani, "What Canada can learn from Mexico's sugar tax: It's no panacea for obesity," The Globe and Mail, 18 January 2016. [Online]. Available: <http://www.theglobeandmail.com/report-on-business/rob-commentary/what-canada-can-learn-from-mexicos-sugar-tax-its-no-panacea-for-obesity/article28233833/>. [Accessed 25 May 2016].
- [20] City of Berkeley, *Ordinance: Imposing a general tax on the distribution of sugar-sweetened beverage products*, City of Berkeley.
- [21] City of Berkeley, "2014 Ballot Measures," City Council, 4 November 2016. [Online]. Available: [https://www.cityofberkeley.info/Clerk/Elections/Election\\_\\_2014\\_Ballot\\_Measure\\_Page.aspx](https://www.cityofberkeley.info/Clerk/Elections/Election__2014_Ballot_Measure_Page.aspx). [Accessed 25 May 2016].
- [22] Power up for health, "Case study: Taxing the distribution of sugar-sweetened beverages in Berkeley (California), July 2015," 2015.
- [23] J. Cawley and F. Frisvold, "The Incidences of Taxes on Sugar-Sweetened Beverages: the Case of Berkeley, California," *NBER*, vol. 21465, 2015.
- [24] Harvard School of Public Health, "The Global Economic Burden of Non-communicable Diseases.," September 2011. [Online]. Available: [http://www3.weforum.org/docs/WEF\\_Harvard\\_HE\\_GlobalEconomicBurdenNonCommunicableDiseases\\_2011.pdf](http://www3.weforum.org/docs/WEF_Harvard_HE_GlobalEconomicBurdenNonCommunicableDiseases_2011.pdf). [Accessed 13 April 2016].
- [25] C. Escobar, S. Tollman, M. Bertram and K. Hofman, "Evidence that a tax on sugar sweetened beverages reduces the obesity rate: a Meta-analysis," *BMC Public Health*, vol. 13, no. 1072, p. 6, 2013.

- [26] E. Wang, "The Impact of Soda Taxes on Consumer Welfare: Implications of Storability and Taste Heterogeneity," *The RAND Journal of Economics*, vol. 46, no. 2, pp. 409-441, 2014.
- [27] Times Live Staff Reporter, "SA leads the world in living on credit," Times Live, 3 June 2015. [Online]. Available: <http://www.timelive.co.za/thetimes/2015/06/03/SA-leads-the-world-in-living-on-credit>. [Accessed 13 April 2016].
- [28] A. Van der Poel, "Hard times ahead for South African Consumers," Times Live, 2016.
- [29] S. Butler, "Coca-Cola and other soft drinks firms hit back at sugar tax plan," Guardian News and Media Limited, 17 March 2016. [Online]. Available: <http://www.theguardian.com/business/2016/mar/17/coca-cola-hits-back-at-sugar-tax-plan>. [Accessed 13 April 2016].
- [30] Z. Shabalala, "South Africa's drought-hit sugar harvest to be smallest since 1995 -industry body," Reuters, 24 February 2016. [Online]. Available: <http://www.reuters.com/article/safrica-sugar-idUSL8N16347X>. [Accessed 25 May 2016].
- [31] A. Aguilar, E. Gutierrez and E. Seira, "Taxing Calories in Mexico," 2015.
- [32] Fin24, "Sugar tax: Beverage industry to meet Treasury," Fin24, 13 April 2016. [Online]. Available: <http://www.fin24.com/Economy/sugar-tax-beverage-industry-to-meet-treasury-20160413>. [Accessed 24 May 2016].
- [33] M. Manyema, L. Veerman, L. Chola, A. Tugendhaft, D. Labadarios and K. Hofman, "Decreasing the Burden of Type 2 Diabetes in South Africa: The Impact of Taxing Sugar-Sweetened Beverages," *PLoS ONE*, vol. 10, no. 11, 2015.
- [34] R. Lyons and C. Snowdon, "Sweet Truth: Is there a market failure in sugar?," *Institute of Economic Affairs Discussion Paper*, vol. 62, pp. 6-20, 2015.
- [35] R. H. Thaler, "From Homo Economicus to Homo Sapiens," *The Journal of Economic Perspectives*, vol. 14, no. 1, pp. 133-141, 2000.
- [36] T. C. Leonard, "Richard H. Thaler, Cass R. Sunstein, Nudge: Improving decision about health, wealth, and happiness," *Constitutional Political Economy*, vol. 19, no. 4, pp. 356-360, 2008.





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