CONTROLLING THE ENVIRONMENTAL COSTS OF OBESITY

BY

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I used to worry 'bout rich and skinny, 'til I wound up poor and fat[1]

I. INTRODUCTION

Obesity is increasingly viewed as a major health problem across the world. Globally, thirteen percent of adults suffered from obesity in 2014.[2] Obesity leads to adverse health outcomes such as heart disease, stroke, and diabetes, shortening both life and quality of life. Obesity presents both external and internal costs. Some estimate that obesity alone may be responsible for almost 3 million deaths per year and some $2 trillion in medical costs and lost productivity, representing significant external costs. Internal costs occur because people make eating and drinking choices without being aware of the eventual damage to their health.

Although less frequently studied, obesity also carries environmental costs. Consumption of certain energy dense foods made from corn and soy (including meat) increases soil erosion and water pollution from fertilizer use. Governmental policy encourages the production of such crops. Being overweight decreases physical activity and personal mobility, leading to increased use of motor vehicles. Airlines have recognized the increase in the average weight of passengers and the need to use more fuel to carry that heavier load.[3]

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[1] T. Arata & S. Miller, *I used to worry*, Delbert McClinton *Never Been Rocked Enough* (Capitol Records 1992).

[2] World Health Organization (WHO) Fact Sheet: Obesity and Overweight (Jun. 2016), http://www.who.int/mediacentre/factsheets/fs311/en/.

[3] In 2005, the Federal Aviation Administration increased the average airline passenger weight assumption from to 190 pounds. See FAA Advisory Circular, Aircraft Weight and Balance Control 17 (June 10, 2005), https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC120-27E.pdf. In 1980, the FAA assumed the average passenger weighed 160 pounds. See FAA, Advisory Circular 120-27A (1980). See also, Associated Press,

Environmental factors such as sprawl and transportation policy affect obesity rates. When people cannot walk or take public transportation to work, they spend more time in their cars. They have less time to exercise and prepare healthy meals. They are more likely to visit fast food restaurants and eat in their cars. Hence, both obesity's effect on the environment and the environment's effect on obesity lead to increased carbon emissions and exacerbate climate change.

Taxes can potentially control both the external and internal costs of obesity. By increasing the cost of certain foods, taxes can discourage their consumption. A number of national and subnational jurisdictions have enacted such taxes, including Denmark, Finland, France, Hungary, Mexico, the Navajo Nation, and the cities of Philadelphia in Pennsylvania, Boulder in Colorado, and Albany, Berkeley, and San Francisco in California in the United States.

This article will examine a variety of economic instruments for controlling obesity, including regulation, taxes, and nudges. The relative success of governmental measures to reduce tobacco use are also examined to see what lessons might be learned. The article will begin with a definition of obesity, followed by a discussion of the external and internal costs of obesity, focusing on environmental issues. Next, the article will consider the pros and cons of different approaches to controlling obesity, examining current trends in food taxation. Finally, the article will explore existing U.S. tax provisions to consider how modification of such provisions might help with the problem of obesity. For example, advertising deductions could be denied to producers of energy dense, nutrient poor foods that are designed to be hyper-palatable and addictive.

Airlines Weight Survey Results in Assigned Seating (Oct. 14, 2016) ("Hawaiian Airlines executives had a dilemma: Their planes were burning more fuel than projected on their regular 2,600-mile route between Honolulu and American Samoa. Various factors for increased fuel use, like winds, were ruled out. The results of Hawaiian Airlines' six-month voluntary survey found that on average the passengers and their carry-on bags were 30 pounds heavier than anticipated."), http://www.foxnews.com/us/2016/10/14/hawaiian-airlines-weight-survey-results-in-assigned-seating.html.

II. DEFINING OBESITY

What is obesity, and why is it a global problem? Obesity can be defined as excessive fat accumulation that may impair health.[4] The World Health Organization recognizes body mass index (BMI) as a simple way to define whether a person is overweight or obese.[5] A person with a BMI greater than or equal to 25 is considered overweight; a person with a BMI greater than or equal to 30 is considered obese. The United States Department of Agriculture (USDA) noted that more than two-thirds of American adults and nearly one-third of American children are classified as overweight or obese.[6]

Weight gain occurs when a person ingests more calories than she expends in activity.[7] All foods have caloric content, but some foods appear to have a stronger link to obesity. Researchers found that increased consumption of added sugars, in particular, have been linked to increased body weight.[8] Another study found that increased consumption of sugary drinks significantly contributed to increasing obesity levels.[9] Liquid calories do not satisfy hunger as effectively as solid calories, so overconsumption is more likely.[10] It may surprise some readers how much sugar beverages can contain. A twenty-ounce Mountain Dew contains 77 grams of sugar, as compared to a Cinnabon® cinnamon roll, which contains 55 grams of sugar.[11] The U.S. Department of Agriculture (USDA) dietary guidelines recommend consuming less than 10

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[4] WHO Fact Sheet, *supra* note 2.

[5] WHO Fact Sheet, *supra* note 2. WHO defines BMI as "a person's weight in kilograms divided by the square of his height in meters." *Id*. For the math impaired, the National Heart, Lung, and Blood Institute provides an online BMI calculator, available at https://www.nhlbi.nih.gov/health/educational/lose_wt/BMI/bmicalc.htm.

[6] USDA, *Dietary Guidelines for Americans: 2015-2020 (8th ed.) 3,* https://health.gov/dietaryguidelines/2015/resources/2015-2020_dietary_guidelines.pdf, visited Dec. 8, 2016.

[7] WHO Fact Sheet, *supra* note 2.

[8] R. Bethene Ervin and Cynthia L. Ogden, Consumption of Added Sugars Among U.S. Adults 2005-2010, Nat'l Center for Health Statistics (NCHS) Data Brief No. 122 (May 2013), https://www.cdc.gov/nchs/data/databriefs/db122.pdf.

[9] Kelly D. Brownell and Thomas R. Frieden, *Ounces of Prevention — the Public Policy Case for Taxes on Sugared Beverages, New England J. Med.* (Apr. 30, 2009), http://content.nejm.org/cgi/reprint/NEJMp0902392.pdf?resourcetype=HWCIT.

[10] Megan A. McCrory, Vivian M.M. Suen and Susan B. Roberts, *Biobehavioral Influences on Energy Intake and Adult Weight Gain*, 132 *J. Nutr. 3830S (2002).*

[11] James J. DiNicolantonio and Sean Lucan, *The Wrong White Crystals: Not Salt But Sugar as Aetiological in Hypertension and Cardiometabolic Disease, Open Heart (2014),* http://openheart.bmj.com/content/1/1/e000167.

percent of daily calories from added sugar.[12] Added sugars currently constitute more than 13 percent of the average American's caloric intake, with beverages accounting for 47 percent of added sugars.[13]

Obesity rates have increased rapidly in recent years, not just in the United States, but also around the world.[14] Worldwide obesity has more than doubled since 1980.[15] In 1960, the average weight of an American woman in her twenties was 128 pounds.[16] In 2012, the Centers for Disease Control and Prevention (CDC) reported that the average American woman weighs 166 pounds, the same as an average American man in 1960.[17] The CDC also reports race and gender disparities.[18] Black women have an average BMI of 32, as compared to white women with an average BMI of 28.2 and Hispanic women with an average BMI of 29.8.[19] Men have generally lower average BMI figures than women, although black and Hispanic men are slightly higher than white men, with an average BMI of 29, as compared to an average BMI of 28.7.[20]

Obesity causes serious health problems. The National Institutes of Health (NIH) describe the health risks of obesity as including coronary heart disease, hypertension, stroke, diabetes, cancer and osteoarthritis.[21] Heart disease, cancer, stroke and diabetes are among the top ten

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[12] Agata Dabrowska, *Dietary Guidelines for Americans: Frequently Asked Questions* 14, *Cong. Res. Serv. Rep. No. R44360 (*Feb. *2, 2016).*

[13] USDA, *Dietary Guidelines for Americans 2015-2020* 54 (8th ed. Dec. 2015).

[14] D. Withrow and D.A. Alter, *The Economic Burden of Obesity Worldwide: A Systematic Review of the Direct Costs of Obesity,* 12 *Obesity Reviews 131 (2010).*

[15] WHO Fact Sheet, *supra* note 2.

[16] David Kessler, *The End of Overeating: Taking Control of the Insatiable American Appetite* 5 (Rodale 2009), citing C.L. Ogden, C.D. Fryar, M.D. Carroll, and K.M. Flegal, "Mean Body Weight, Hight, and Body Mass Index, United States 1960 – 2002", Advance Data from Vital and Health Statistics 347 (2004).

[17] Christopher Ingraham, *The Average American Woman Now Weighs as Much as the Average 1960s Man*, Wash. Post (June 12, 2015), citing National Center for Health Statistics, Body Measurements, https://www.cdc.gov/nchs/fastats/body-measurements.htm.

[18] CDC, Anthropometric Reference Data for Children and Adults: United States 2007-2010 (Oct. 2012), https://www.cdc.gov/nchs/data/series/sr_11/sr11_252.pdf.

[19] *Id*. at 18, Table 14.

[20] *Id*. at 19, Table 15.

[21] NIH, What are the Health Risks of Overweight and Obesity, https://www.nhlbi.nih.gov/health/health-topics/topics/obe/risks#.

leading causes of death.[22] Life expectancy in the U.S. decreased between 2014 and 2015, for the first time since 1993.[23] While average life expectancies decreased overall, the change is not evenly distributed among income groups. Upper income individuals, in both the U.S. and worldwide, have significantly longer life expectancies than those in lower income groups.[24] Lower income groups are also more likely to be obese, with people living in the poorest counties in the U.S. showing the highest obesity rates.[25]

While correlation does not prove causation, blacks and Hispanics have a higher poverty rate than whites or Asians.[26] U.S. Census data shows that 11.6 percent of whites have incomes below the poverty level, as compared to 25.8 percent of blacks and 23.2 percent of Hispanics.[27] 83 percent of American households receiving supplemental nutrition assistance program (SNAP) benefits live in poverty and a majority of those households have gross income at half or less of the poverty level.[28] While both SNAP and non-SNAP households have soda in their top 10 food expenditures, soda is ranked second in terms of expenditures for SNAP households and fifth for non-SNAP households.[29] Non-SNAP household expenditures on both vegetables and fruits outranked spending on soda.[30]

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[22] Jiaquan Xu, Sherry L. Murphy, Kenneth D. Kochanek and Elizabeth Arias, *Mortality in the United States*, NCHS Data Brief No. 267 (Dec. 2016), https://www.cdc.gov/nchs/data/databriefs/db267.pdf.

[23] Katie Rogers, Life Expectancy in U.S. Declines Slightly, and Researchers are Puzzled, NY Times (Dec. 8, 2016), http://nyti.ms/2h1zCpD.

[24] Barry Bosworth, Gary Burtless and Kan Zhang, *Later Retirement, Inequality in Old Age, and the Growing Gap in Longevity Between Rich and Poor* (Brookings 2016), https://www.brookings.edu/wp-content/uploads/2016/02/bosworthburtlesszhang_retirementinequalitylongevityfullpaper.pdf; see also Sabrina Tavernise, *Disparity in Lifespans between the Rich and the Poor is Growing*, NY Times (Feb. 12, 2016), http://nyti.ms/1RwgE6h.

[25] James A. Levine, Poverty and Obesity in the U.S., 60 *Diabetes 2667 (2011),* http://diabetes.diabetesjournals.org/content/60/11/2667.full-text.pdf

[26] U.S. Census Bureau, Poverty Rates for Selected Detailed Race and Hispanic Groups by State and Place: 2007-2011 (Feb. 2013), http://www.census.gov/prod/2013pubs/acsbr11-17.pdf, Table 1 at 13.

[27] *Id.*

[28] USDA, Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2013, Rep. No. SNAP-14-CHAR (Dec. 2014), https://www.fns.usda.gov/sites/default/files/ops/Characteristics2013.pdf (hereinafter USDA Characteristics).

[29] USDA, Foods Typically Purchased by Supplemental Nutrition Assistance Program (SNAP) Households 5 (Nov. 2016), https://www.fns.usda.gov/snap/foods-typically-purchased-supplemental-nutrition-assistance-program-snap-households (hereinafter USDA Foods).

[30] *Id*. Data like this has lead to calls for reforming SNAP benefits. See e.g., Anna L. Johnson and Steven M. Sheffrin, *Rethinking the Sales Tax Food Exclusion with SNAP Benefits*, *State Tax Notes* (Jan. 11, 2016) and Patricia

This section has shown that obesity leads to adverse health outcomes, that poor people in the U.S. are more likely to suffer from obesity, and that overconsumption of sugar-sweetened beverages can lead to obesity. The next section will focus on the link between the environment and obesity and explore the costs of obesity in more detail.

III. EXTERNAL AND INTERNAL COSTS OF OBESITY

A. Environmental Costs

1. Environmental Causes of Obesity

The idea that obesity is an environmental issue is not new. Almost twenty years ago, nutrition researchers recognized the link between environment and obesity.[31] While many factors contribute to obesity, one study concluded that the "main factors responsible for obesity in industrialized nations are environmental."[32] Such environmental factors include "unlimited access to highly palatable and very calorically dense foods" and a sedentary lifestyle because of the prevalence of labor-saving devices.[33] The study authors also noted that non-Western people who adopt a Western-style diet and lifestyle experienced significant increases in BMI, thereby indicating that obesity is not a genetic issue.[34] In addition to overeating and physical inactivity, low socio-economic status is predictive of obesity. Consistent with the more recent USDA data cited above,[35] the study found that low-income persons eat diets that are less nutritious, more energy-dense, and low in fruits and vegetables.[36] An Australian study of neighborhoods in the city of Melbourne found that those living in areas with the lowest incomes had 2.5 times as many

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Waldron, *Stanford researchers say that banning food stamps to buy sweetened drinks can reduce obesity, diabetes* (June 11, 2014), http://healthpolicy.fsi.stanford.edu/news/stanford_researchers_say_banning_food_stamps_to_buy_sweetened_drinks_can_reduce_obesity_diabetes_20140611.

[31] Walker S. Carlos Poston II and John P. Foreyt, *Obesity is an Environmental Issue, 146 Atherosclerosis 201 (1999).*

[32] Poston & Foreyt, *supra* note 31, at 203.

[33] Poston & Foreyt, *supra* note 31, at 203.

[34] Poston & Foreyt, *supra* note 31, at 203.

[35] *See supra* note 29.

[36] Poston & Foreyt, *supra* note 31, at 205.

fast-food outlets compared to those living in areas with the highest incomes.[37] A similar study done in Louisiana found that black and low-income neighborhoods had increased exposure to fast food, noting that "this link may suggest environmental exposure to fast food as a contribution to the high prevalence of obesity in black and low-income populations." Significantly, these statistics indicate that the fast food industry is profiting from the obesity and ill-health of low-income and minority communities.

In addition to being filled with fast-food outlets, low-income communities may restrict outdoor activity due to lack of parks and fear of crime. In the U.S., people who live in the lowest income neighborhoods are the most prone to obesity, with counties with poverty rates in excess of 35 percent of the population having obesity rates greater than 145 percent than wealthy counties.[38]

Julie Guthman suggests that obesity is caused by endocrine-disrupting chemicals in the environment, which she calls "obesegens."[39] She notes that obesegens "are present all along food supply chains from farm production to transportation and storage to food processing."[40] Researchers have examined the link between chemical exposure and obesity and concluded that early exposure to chemicals in air pollution and common products such as stain repellents and plastics may increase the risk of obesity.[41] Industrial activity, such as fracking, can increase exposure to endocrine disruptors in people living near such activity.[42]

In short, environmental factors such as access to highly caloric foods, sedentary lifestyle, and exposure to endocrine disrupting chemicals can lead to obesity. However, not only does the

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[37] Daniel D. Reidpath, Cate Burns, Jan Garrard, Mary Mahoney and Mardie Townsend, *An Ecological Study of the Relationship Between Social and Environmental Determinants of Obesity*, *8 Health & Place 141, 144 (2002).*

[38] James A. Levine, *Poverty and Obesity in the U.S.*, *60 Diabetes 2667, 2667 (2011).*

[39] Julie Guthman, *Weighing in: Obesity, food justice and the limits of Capitalism 100* (Univ. Cal. Press 2011).

[40] *Id*. at 109.

[41] Jerrold J. Heindel, Retha Newbold and Thaddeus T. Schug, *Endocrine Disruptors and Obesity*, 11 *Nat. Rev. Endocrinol. 653* (Nov. 2015).

[42] See, e.g., Christopher D. Kassotis, Donald E. Tillitt, J. Wade Davis, Annette M. Hormann and Susan C. Nagel, *Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region*, 155 *Endocrinology* 897 (Mar. 2014).

environment affect obesity rates, but obesity rates affect the environment, as the next section will discuss.

2. Obesity-Related Environmental Costs

"Tackling population fatness may be critical to world food security and ecological sustainability."[43] In 2009, British researchers Phil Edwards and Ian Roberts compared food use and greenhouse gas emissions between a "normal" population with an average BMI of 24.5 and 3.5 percent obesity with an "overweight" population with an average BMI of 29 and 40 percent obesity.[44] They concluded that the overweight population would use 19 percent more food energy, which would result in an increase in GHG emissions of 0.27 gigatons per year. Another study in 2012 came to similar conclusions, finding that "increasing population fatness could have the same implications for food energy demands as an extra half a billion people living on the earth."[45] In particular, the researchers found the North American population to have the highest average body mass of any continent, having 6 percent of the world's population but 34 percent of world human biomass due to obesity.[46] Similarly, and perhaps not coincidentally, North America has outsized carbon emissions at 20.5 percent of the world total.[47]

The foods most linked to obesity also produce the most environmental damage. So-called junk foods are the largest sources of calories in the American diet.[48] Junk foods, such as ice cream, pizza, grain-based desserts, and sugary drinks, are mostly made of corn, soybeans, wheat, milk and meat.[49] People who had the highest consumption of these foods had a 37 percent higher

[43] Sarah Catherine Walpole, David Prieto-Merino, Phil Edwards, John Cleland, Gretchen Stevens and Ian Roberts, *The Weight of Nations: An Estimation of Adult Human Biomass*, 12 *BMC Public Health* 439 (2012), https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-12-439.

[44] Phil Edwards & Ian Roberts, *Population Adiposity and Climate Change*, 38 *Int'l J. Epidemiol.* 1137 (2009).

[45] Walpole et al., *supra* note 43.

[46] Walpole et al., supra note 43.

[47] Carbon Dioxide Information Analysis Center, Fossil-Fuel CO_2 Emissions from North America, http://cdiac.ornl.gov/trends/emis/tre_nam.html, last visited Jan. 15, 2017.

[48] Anahad O'Connor, *How the Government Supports Your Junk Food Habit*, *NY Times* (July 19, 2016), http://well.blogs.nytimes.com/2016/07/19/how-the-government-supports-your-junk-food-habit/?_r=2.

[49] *Id*.

risk of obesity.[50] While the federal government subsidizes these farm products, which is in itself a problem, as will be discussed in a subsequent section, the focus of this section is the environmental damage caused by such products.

Between 30 to 40 percent of the corn grown in the U.S. is used as livestock feed.[51] Another 5 percent of the corn is converted to high-fructose corn syrup.[52] The U.S. uses nearly one-third of its cropland to grow corn—more than any other single crop.[53] Corn uses more than half of all the commercial fertilizer applied to U.S. cropland.[54] Corn uses more fertilizer per acre than other major crops, and most of that fertilizer is nitrogen-based.[55] Fertilizer use has been linked to so-called dead zones in the Gulf of Mexico and the Baltic Sea.[56] Dead zones result from oxygen deficiency (hypoxia) in the water. Hypoxic waters cannot support marine life, reducing fish yields. Hypoxic waters are more prone to harmful algal blooms, which can contaminate shellfish and even cause breathing problems in humans.[57] Corn production directly led to 35 percent of U.S. nitrous oxide emissions from crops in 2008.[58] Nitrous oxide is a greenhouse gas (GHG) that is 300 times more potent than carbon dioxide.[59]

High fructose corn syrup is a sugar substitute, but sugar itself causes significant environmental damage worldwide.[60] About two-thirds of worldwide sugar comes from sugar

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[50] Karen R. Siegel, Kai McKeever Bullard, Guiseppina Imperatore, Henry S. Kahn, Aryeh D. Stein, Mohammed K. Ali, and K.M. Narayan, *Association of Higher Consumption of Foods Derived from Subsidized Commodities With Adverse Cardiometabolic Risk Among US Adults*, *JAMA Intern Med.* doi:10.1001/jamainternmed.2016.2410 (July 2016).

[51] *Id.*

[52] Siegel et al., *supra* note 50.

[53] Brooke Barton and Sarah Elizabeth Clark, Water & Climate Risks Facing U.S. Corn Production: How Companies & Investors Can Cultivate Sustainability 6, *A Ceres Report (*June *2014).*

[54] Barton & Clark, *supra* note 53, at 44.

[55] Barton & Clark, *supra* note 53, at 45.

[56] Jacob Carstensen, Jesper H. Andersen, Bo G. Gustafsson, and Daniel J. Conley, *Deoxygenation of the Baltic Sea During the Last Century*, 111 PNAS (*Proceedings of the National Academies of Sciences)* 5628 (April 15, 2014).

[57] National Oceanic and Atmospheric Administration (NOAA), What Are HABS, https://habsos.noaa.gov/about/ (accessed Jan. 22, 2016).

[58] Barton & Clark, *supra* note 53, at 46.

[59] *Id*.

[60] World Wildlife Fund (WWF), *Sugar and the Environment: Encouraging Better Management Practices in Sugar Production* (2005), http://d2ouvy59p0dg6k.cloudfront.net/downloads/sugarandtheenvironment_fidq.pdf.

cane, with the remainder coming from sugar beets.[61] Cane sugar is grown in tropical and semi-tropical regions, while sugar beets can grow in a variety of climatic conditions. In the United States, farmers grow cane sugar in Florida, Louisiana, Texas, and Hawaii.[62] About 45 percent of U.S. sugar production comes from cane sugar, with the remaining 55 percent from sugar beets.[63] Farmers grow sugar beets in Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, North Dakota, Oregon, Washington, and Wyoming.[64] Both cane sugar and sugar beet cultivation cause significant soil erosion.[65] In Florida, the land has subsided six feet since the Everglades were drained in the 1920s to create the Everglades Agricultural Area.[66] The Everglades have sustained further damage from phosphorus run-off from sugar cane fields, which contribute to the growth of invasive cattails.[67] Sugar beets, particularly those grown in dryland regions like the American West, use large amounts of scarce groundwater.[68]

Soybeans, another crop used in junk food production, accounts for 19 percent of the nitrous oxide emissions from U.S. crops.[69] Half of the U.S. soybean crop is used to feed livestock, and the other half is used to make oils.[70] Meat and dairy production cause significant environmental damage. About 30 percent of the meat consumed in the U.S. is beef, which contributes twice as much to GHG emissions per pound of usable meat as pork and almost four times as much as chicken.[71] Most of the GHG emissions from livestock consist of methane, a

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[61] Id. at .

[62] USDA, Background: Sugar Production, https://www.ers.usda.gov/topics/crops/sugar-sweeteners/background.aspx, visited Mar. 15, 2017.

[63] Id.

[64] Id.

[65] WWF, supra note, at 5.

[66] Nat'l Publ. Radio (NPR), The Environmental Cost of Growing Food, All Things Considered (May 5, 2016), http://www.npr.org/sections/thesalt/2016/05/05/476600965/the-environmental-cost-of-growing-food.

[67] WWF, supra note , at 9.

[68] Id. at 12.

[69] Barton & Clark, *supra* note 53, at 46.

[70] Siegel, *supra* note 50.

[71] Kari Hamerschlag, *Meat Eater's Guide to Climate Change + Health* 5, Env. *Working Group Report* (July 2011), http://static.ewg.org/reports/2011/meateaters/pdf/report_ewg_meat_eaters_guide_to_health_and_climate_2011.pdf?_ga=1.118478479.709427398.1485127086.

GHG that is about 25 times more potent than carbon dioxide.[72] Cattle produced 77 percent of all livestock GHG emissions, with most of the emissions coming from enteric fermentation and the reminder from manure.[73] U.S. produced cheese produces slightly less GHG emissions than pork.[74] Reducing intake of red meat and dairy would not only reduce GHG emission, but would also be expected to provide better health outcomes.[75] A study found that halving the consumption of meat, dairy products and eggs in the European Union would achieve a 25–40% reduction in greenhouse gas emissions.[76] The study estimated that the dietary change would also result in a 40% reduction in the intake of saturated fat, leading to fewer deaths from cardiovascular disease.[77] Indirect health benefits might also occur due to lower use of antibiotics and improved water quality.[78]

The foregoing environmental cost summary illustrates the burden that producing the foods that lead to obesity places on the environment. Before turning to the potential solutions to the environmental costs of obesity, the societal costs of obesity should be briefly overviewed, as those costs have frequently been cited as justifying taking action to control obesity.[79]

3. Societal Costs of Obesity

The non-environmental societal costs of obesity have been examined and debated by many researchers. This section will provide a brief overview. It is not surprising that many

[72] Hamerschlag, *supra* note 71, at 5.

[73] Mario Herrero et al., *Biomass use, production, feed efficiencies, and greenhouse gas emissions from global livestock systems*, 110 Proceedings of the National Academies of Sciences 20888, 20890 (2013), http://www.pnas.org/content/110/52/20888.full.pdf.

[74] Hamerschlag, *supra* note 71, at 34.

[75] Henk Westhoek et al., *Food choices, health and environment: Effects of cutting Europe's meat and dairy intake*, 26 *Global Environmental Change* 196 (2014).

[76] Westhoek, *supra* note 75, at 201.

[77] Westhoek, *supra* note 75, at 199.

[78] *Id.*

[79] See, e.g., Katherine Pratt, *A Constructive Critique of Public Health Arguments for Anti-obesity Soda Taxes and Food Taxes*, 87 *Tulane L. Rev*. 73 (2012) and Eric A. Finkelstein, Kiersten L. Strombotne, and Barry M. Popkin, *The Costs of Obesity and Implications for Policymakers*, 25 *Choices (2010)*, http://purl.umn.edu/95747.

studies show that obesity increases healthcare costs.[80] On average, these studies show that the incremental per person health care cost of obesity in the United States was $1,723.[81] Put another way, the cost of obesity was 42.7% greater than the cost of normal weight.[82] As a percentage of overall healthcare spending in 2008, between 4.8 and 6.2 percent of costs were due to overweight and obesity.[83] A more recent study using different methodology found significantly higher increases in medical expenditures due to obesity, raising costs by roughly 150 percent.[84] The trend of increasing healthcare costs due to obesity is occurring not only in the United States, but also worldwide, with simultaneous increases in obesity in almost all developed countries.[85]

Studies have shown that, in addition to increasing healthcare costs, obesity reduces employee productivity.[86] Society incurs substantial indirect costs from obesity because of decreased years of disability-free life, increased mortality before retirement, early retirement, disability pensions, and work absenteeism or reduced productivity.[87] The cost of lost productivity is, by some estimates, several times larger than medical costs.[88]

The next section will begin to consider approaches to controlling obesity, beginning with an examination of the food system's contribution to the problem. One study that examined food waste concluded that [t]he obvious possible drivers of the epidemic are in the food system: the increased supply of cheap, palatable, energy-dense foods; improved distribution systems to make

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[80] Adam Gilden Tsai, David F. Williamson, Henry A. Glick, *Direct medical cost of overweight and obesity in the United States: a quantitative systemic review*, 12 *Obes. Rev.* 50 (2011) (reviewing 50 studies conducted between 1968 and 2009).
[81] *Id.*
[82] *Id.*
[83] *Id.*
[84] John Cawley and Chad Meyerhoefer, *The medical care costs of obesity: An instrument variables approach*, 31 *J. Health Econ*. 219, 224 (2012).
[85] Boyd A. Swinburn et al., *The global obesity pandemic: shaped by global drivers and local environments*, 378 *The Lancet* 804 (2011).
[86] Finkelstein, *supra* note 79.
[87] Y. Claire Wang, Klim McPherson, Tim Marsh, Steven L. Gortmaker, Martin Brown, *Health and economic burden of the projected obesity trends in the USA and the UK*, 378 *The Lancet* 815, 817 (2011).
[88] *Id.*

food much more accessible and convenient; and more persuasive and pervasive food marketing."[89]

IV. Assessing Approaches to Controlling Obesity

A. Reforming Subsidies

If the availability of cheap, palatable, energy-dense foods is a significant factor in the obesity epidemic, what are the factors enabling this availability? One factor may be government subsidies for commodity crops. Governments subsidize crop production, and the largest subsidies go to the crops that are the primary constituents of junk food.[90]

Farm subsidies have a long history in the United States, and a full analysis is beyond the scope of this article.[91] Therefore, I will briefly describe the history of farm subsidies to illustrate how we got to where we are today. The first farm bill was enacted during the Great Depression, and was designed to help farmers suffering from low prices due to overproduction of certain crops.[92] Although the original farm bill was intended to help the "yeoman farmer" idealized by Thomas Jefferson, subsequent enactments have shifted the bulk of government support to the industrial farms producing a limited number of commodity crops.[93] Ninety percent of federal farm subsidies paid between 2005 and 2014 went to just five crops: corn, cotton, wheat, rice, and soybeans.[94] One commentator concluded that "[t]he Farm Bill is directly responsible for many of the public health disasters in our nation such as hunger, malnutrition, lack of plentiful fruits and

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[89] Kevin D. Hall, Juen Guo, Michael Dore, Carson C. Chow, *The Progressive Increase in Food Waste in America and Its Environmental Impact*, 4 *PLoS ONE* e7940 (2009).

[90] Mike Russo, *Apples to Twinkies: Comparing Federal Subsidies of Fresh Produce and Junk Food* 3, *U.S. PIRG Education Fund* (2011).

[91] For a detailed analysis of farm subsidies in the United States, see Sarah J. Morath, The Farm Bill: *A Wicked Problem Seeking a Systematic Solution*, 25 *Duke Envt'l L. Pol. F.* 389 (2015).

[92] Agricultural Adjustment Act of 1933, Pub. L. No. 73-10, 48 Stat. 31 (1933), *available* at http://www.nationalaglawcenter.org/assets/farmbills/1933.pdf. See also, William S. Eubanks II, *A Rotten System: Subsidizing Environmental Degradation and Poor Health with Our Nation's Tax Dollars*, 28 *Stan. Envt'l L. J.* 213, 219 (2009).

[93] Eubanks, *supra* note 92, at 221.

[94] Dennis A. Shields, *Farm Commodity Provisions in the 2014 Farm Bill* (P.L. 113-79) 2, *Cong. Res. Serv. Rep.* R43448 (2014).

vegetables for poorer Americans, and the obesity epidemic."[95] Other commentators have denied a link between crop subsidies and obesity, noting that the price of corn, for example, is only a small part of the price of processed foods.[96] The most recent Farm Bill, enacted in 2014, received mixed reviews, with some noting that the bill primarily benefits large agribusinesses[97] and others commenting "it could have been worse."[98]

Sugar is also a major constituent of junk food, but the U.S. federal government does not technically subsidize sugar. However, the U.S. federal government does provide substantial support for the sugar industry by providing non-recourse loans to sugar processors and import tariffs to reduce the amount of competition from imported sugar.[99] About 70 percent of the sugar consumed in the U.S. is produced in the U.S.[100] The sugar support system, like the farm bill, has been the subject of controversy, with the American Sugar Alliance (a growers' industry group) complaining that U.S. retail prices for sugar are too low, and the Sugar Users Association (representing companies that use sweeteners in their products) complaining that prices are too high.[101]

If farm subsidies do lead to obesity, the obvious solution would be to eliminate subsidies for crops that are used to produce unhealthy foods. Journalist Daniel Imhoff argued that the real beneficiaries of farm subsidies are the companies that buy commodity crops, like the top four

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[95] Eubanks, supra note 92, at 239.

[96] See Julian M. Alston, Bradley J. Rickard, and Abigail M. Okrent, *Farm Policy and Obesity in the United States*, 25 *Choices* (2010) (finding that U.S. farm subsidies have had generally modest and mixed effects on prices and quantities of farm commodities, with negligible effects on the prices paid by consumers for food and thus negligible influence on dietary patterns and obesity.)

[97] Interview by Lynne Rossetto Kasper with Marion Nestle, Paulette Goddard Professor of Nutrition, Food Studies, and Public Health, New York University (Feb. 11, 2014), *available at* http://www.splendidtable.org/story/nyus-marion-nestle-farm-bill-benefits-agribusiness-not- small-family-farms.

[98] The Editorial Board, *The Farm Bill Could Have Been Worse*, N.Y. TIMES, Jan. 29, 2014, at A26, *available at* http://www.nytimes.com/2014/01/30/opinion/the-farm-bill-could-have- been-worse.html.

[99] Mark A. McMinimy, *U.S. Sugar Program Fundamentals*, *Cong. Res. Serv. Rep. R43998* (Apr. 6, 2016).

[100] USDA, Sugar and Sweetener Yearbook Tables, Table 1, World Production, Supply, and Distribution, https://www.ers.usda.gov/data-products/sugar-and-sweeteners-yearbook-tables/

[101] McMinimy, supra note 99, at 14.

chicken producers who saved nearly $9 billion on feed costs between 1996 and 2006.[102] However, one report argued that removing subsidies would do little to discourage producers of junk food, but instead would harm small farmers.[103]

Harming small farmers would not help the obesity epidemic, but the Farm Bill is a complex piece of legislation, and its myriad consequences are difficult to untangle.[104] Conditioning subsidies on sustainable agricultural practices, like limiting pesticide and fertilizer use, would be helpful to the environment, and the Farm Bill does that to a limited degree. The Farm Bill contains a number of conservation programs, including some mandatory programs such as sodbuster, swampbuster, and sodsaver.[105] In total, the conservation programs constitute 6% of the total federal spending under the Farm Bill.[106] Sodbuster applies to highly erodible land. Farmers cultivating this sort of land may only receive benefits if they use an approved conservation plan, and if they fail to use an approved conservation plan, they can lose benefits.[107] Swampbuster applies in a similar manner to wetlands.[108] Sodsaver applies to farmers who cultivate crops on native sod in Minnesota, Iowa, North Dakota, South Dakota, Montana, and Nebraska.[109] Violation of sodsaver results in a reduction in federal crop insurance benefits.[110] While these mandatory programs have had a beneficial effect by certain measures,[111] if the

[102] Daniel Imhoff, *Overhauling the Farm Bill: the Real Beneficiaries of Subsidies, the Atlantic* (Mar. 21, 2012). See also, Timothy A. Wise, *Identifying the Real Winners from U.S. Agricultural Policies, Global Development and Environment Institute*, Working Paper No. 05-07 (Dec. 2005).

[103] *Do Farm Subsidies Cause Obesity?* 11, Food & Water Watch & the Public Health Institute (2011) ("When the government stopped managing commodity supplies, overproduction and low prices became the norm Current federal farm programs do nothing to stop this treadmill.") Id.

[104] See Morath, supra note 91, at 390.

[105] Megan Stubbs, *Conservation Programs in the 2014 Farm Bill* (P.L. 113-79), *Cong. Res. Serv. R43504* (Apr. 24, 2014), at 6.

[106] Id. at 4.

[107] Id. at 15, citing 7 U.S.C. § 1501 et seq.

[108] Id.

[109] Id. at 17.

[110] Id.

[111] Megan Stubbs, *Conservation Compliance and U.S. Farm Policy*, *Cong. Res. Serv. R42439* (Oct. 6, 2016) at 11 (noting that between 1982 and 2012, farmers reduced total cropland soil erosion by 44 percent).

problem is the junk food producers, who increase their profits by taking advantage of subsidized crops, the solution may be better directed at those producers rather than at farm subsidies.[112]

The U.S. Federal government also provides food assistance to food insecure households through various programs, some of which are based in the farm bill.[113] About 14 percent of U.S. households were food insecure in 2014, defined as households that had reduced the quality, variety, and desirability of their diets.[114] 5.6 percent of the households had very low food security, defined as households in which at times during the year, eating patterns of one or more household members were disrupted and food intake reduced because the household lacked money and other resources for food.[115] The primary food assistance program in the farm bill is the Supplemental Nutrition Assistance Program (SNAP).[116] SNAP is the largest of the domestic food and nutrition assistance programs administered by the USDA.[117] Recipients must meet several income tests to be eligible for SNAP benefits.[118] SNAP benefits may not be used to purchase alcohol or tobacco products, non-food items such as soap, or foods that will be eaten in the store.[119] During 2013, $76.1 billion in SNAP benefits were delivered to eligible households.[120] SNAP is administered by the Food and Nutrition Service (FNS), a branch of the USDA whose mission is "to provide children and needy families with improved access to food and a more healthful diet."[121]

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[112] See discussion of taxes, infra section . . .

[113] Randy Alison Aussenberg and Kirsten J. Colello, Domestic Food Assistance: Summary of Programs, *Cong. Res. Serv. Rep.* R42353 (2016).

[114] Aussenberg & Colello, supra note 113, at 2.

[115] Aussenberg & Colello, supra note 113, at 2.

[116] Food and Nutrition Act of 2008 (originally P.L. 95-113, most recently amended by P.L. 111-296).

[117] USDA Characteristics, supra note 28, at 1.

[118] In general, eligible households must meet a gross income test (monthly cash income below 130% of the federal poverty guidelines), net income (monthly cash income subtracting SNAP deductible expenses at or below 100% of the federal poverty guidelines), (for FY2016) liquid assets under $2,250 (assets under $3,250 if elderly or disabled household members). Aussenberg & Colello, supra note 113, at 10.

[119] USDA, Supplemental Nutrition Assistance Program (SNAP): Eligible Food Items, https://www.fns.usda.gov/snap/eligible-food-items, visited Mar. 4, 2017.

[120] USDA Characteristics, supra note 28, at 1.

[121] USDA Foods, supra note 29, at 7.

As noted earlier in this article, people living in the poorest counties in the U.S. have the highest obesity rates.[122] Furthermore, a USDA report indicates that SNAP recipients are spending a large portion of their benefits (about 20 percent) on a broad category of junk foods including sweetened beverages, desserts, salty snacks, candy and sugar.[123] This data would suggest that the significant government subsidy provided by SNAP benefits should be restricted to healthier foods. In contrast to farm subsidies, SNAP benefits used to purchase unhealthy foods have a more direct link to obesity. SNAP benefits may be used to purchase soft drinks, candy, cookies, snack crackers, and ice cream.[124] Although many cities, states, and medical groups have urged limiting the use of SNAP benefits, the USDA has denied every request.[125] The USDA has valid reasons for concern, noting that any new restriction on SNAP eligible foods could "increase the embarrassment and stigma associated with SNAP use and thereby deter SNAP use."[126] In a 2007 report, the USDA gave four reasons why SNAP benefits should not be further restricted: (1) no clear standards exist to define food as healthy or not healthy; (2) food restrictions would pose implementation challenges by increasing the complexity of the program; (3) even if unhealthy foods like sweetened beverages were excluded from SNAP benefits, participants may spend their own income to purchase such beverages, thereby continuing to be at risk for obesity; and (4) no evidence exists of the link between SNAP benefits and obesity.[127]

The last two reasons are less convincing. A 2016 study conducted in Minnesota with low-income consumers who were not in the SNAP program provides support for restricting benefits, albeit in connection with incentives for healthy foods.[128] Researchers randomized study participants into four groups. One received incentives to purchase fruits and vegetables; the

[122] U.S. Census Bureau, supra note 26.

[123] USDA Foods, supra note 29, at .

[124] USDA, SNAP eligible, supra note 119.

[125] O'Connor, supra note 48, quoting Marion Nestle.

[126] Anne Barnhill, *Impact and Ethics of Excluding Sweetened Beverages from the SNAP Program*, 101 *Am. J. Pub. Health* 2037, 2038 (2011), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3222381/.

[127] USDA, Implications of Restricting the Use of Food Stamp Benefits (Mar. 1, 2007), https://www.fns.usda.gov/sites/default/files/arra/FSPFoodRestrictions.pdf.

[128] Aaron E. Carroll, How Restricting Food Stamp Choices Can Fight Obesity, NY Times (Sept. 22, 2016).

second was prohibited from buying sweetened beverages, candy, or sweet baked goods; the third got both the incentives of the first group and the prohibitions of the second group; and the fourth had no restrictions or incentives, serving as a control. After following the groups for three months, researchers found that only the third group ate significantly fewer prohibited foods and more fruits and vegetables, consuming about 96 fewer calories per day.[129] With respect to the third reason, excluding sweetened beverages from SNAP would in effect impose an additional tax on those products, which might discourage purchases.[130] SNAP eligible foods are exempt from sales taxes in the 33 states that impose taxes on food.[131] Excluding a food from SNAP benefits would subject that product to sales taxes, where applicable, which would increase the price, in theory decreasing demand.[132] As will be further described below, whether consumers notice the increase in cost may depend on the way the tax is designed.[133]

B. Regulatory Approaches

Regulatory approaches specifically targeted towards obesity in the United States are usually aimed at children. This approach has scientific validity, as studies have shown that obese children tend to become obese adults.[134] At the federal level, regulations specify nutrition standards for all food sold in primary and secondary schools.[135] Originally, the rules applied to free or reduced meals provided to low-income students under the National School Lunch Program (NSLP), which provides over 31 million meals a day to qualifying children.[136] In recognition that many schools offered competitive lunches, in 2013, the Food and Nutrition

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[129] Add JAMA cites when receive articles. This info from Carroll article note 128.

[130] Barnhill, supra note 126, at 2040.

[131] Johnson & Sheffrin, supra note 30, at 151 (explaining the Constitutional basis for requiring states to not tax purchases made by individuals under SNAP).

[132] See, e.g., Timothy Taylor, *The Instant Economist: Everything You Need to Know About How the Economy Works* 15 (Plume 2012).

[133] See D. Incentives and Taxes, *infra*. See also, Raj Chetty, Adam Looney, Kory Kroft, *Salience and Taxation: Theory and Evidence*, 99 *Am. Econ. Rev*. 1145, 1146 (2009).

[134] Solveig A. Cunningham, Michael R. Kramer, and K.M. Venkat Narayan, *Incidence of Childhood Obesity in the United State*s, 370 *N. Engl. J. Med*. 403 (2014), and Gina Kolata, *Obesity Is Found to Gain Its Hold in Earliest Years, NY Times* A1 (Jan. 29, 2014).

[135] 7 C.F.R. § 210.11 (2016).

[136] USDA, National School Lunch Program, https://www.fns.usda.gov/sites/default/files/NSLPFactSheet.pdf.

Service of the USDA issued regulations that extended the rules to all food sold in schools, in compliance with the Healthy, Hunger-Free Kids Act of 2010.[137] The preamble to the regulations noted that "obesity has become a major public health concern in the U.S., with one-third of U.S. children and adolescents now considered overweight or obese" and that research indicated that "obese children feel they are less capable, both socially and athletically, less attractive, and less worthwhile than their non-obese counterparts."[138] The preamble cited research that found that "[s]trong policies that prohibit or restrict the sale of unhealthy competitive foods and drinks in schools are associated with lower proportions of overweight or obese students."[139] "Acceptable foods" must have less than or equal to 35 percent calories from fat, less than 10 percent of calories from saturated fat, and less than or equal to 35 percent of sugar by weight.[140] Sugar added beverages may not contain more than 60 calories per 12 fluid ounces.[141]

At the state level, an examination of the Centers for Disease Control's (CDC) website shows 60 legislative or regulatory initiatives in 28 states that address obesity by focusing on sugar sweetened beverages.[142] Most of these policies relate to children.[143] For example, a regulation in New York prohibits child-care centers from serving sugar-sweetened beverages.[144] In California, the California Childhood Obesity Prevention Act prohibits the sale of sugar-sweetened beverages in schools.[145] Arkansas, Oklahoma, Oregon, Massachusetts, and North Carolina all restrict foods that may be served to children in schools.[146] The New York General

[137] Section 208, P.L. 111-296 (2010).
[138] *Id.*
[139] *Id.*
[140] *Id.*
[141] *Id.*
[142] Center for Disease Control (CDC), Chronic Disease State Policy Tracking System, search criteria: health category (obesity), policy topics (sugar sweetened beverages), status (enacted), https://nccd.cdc.gov/CDPHPPolicySearch/.
[143] 49 out of 60 policies are in either the early care and education setting or the school/after school setting.
[144] *N.Y. Comp. Codes R. & Regs. Tit.* 18 § 418-2.12 (Nutrition in Small Day Cares)
[145] *Cal. Educ. Code* § 49431.5 (elementary and middle school beverages); *Cal. Educ. Code § 49431.2* (middle school and high school foods).
[146] *Code Ark. R.* 005.15.15-8.00 General Requirements for Food and Beverages in Public Schools; *Okla. Admin. Code* 210:10-3-112 – Smart Snacks in Schools; *Or. Rev. Stat. Ann.* § 336.423 – Food and beverages permitted in

Assembly has proposed legislation that would take a comprehensive approach to the obesity problem.[147] The "Omnibus Obesity and Respiratory Illness Reduction Act" would (*inter alia*) promote availability of healthy foods and beverages; regulate the use of trans fats; expand the collection and reporting of data on obesity in the state; provide for expanded obesity prevention and screening; expand ease of breastfeeding in child day care centers and at work; require day care centers to provide healthy foods and exercise; and provide for state office building bicycle parking. [148]

One of the most famous regulatory attempts at controlling obesity was New York City's so-called soda ban. This was not a ban per se, but rather a rule limiting the size of sodas to 16 ounces. The "Portion Cap Rule" would have applied to beverages served in food service establishments, which not only included restaurants and coffee shops, but also movie theaters, sports venues, food trucks, and street carts.[149] The Portion Cap Rule was struck down by the New York Court of Appeals, which held that the New York City Board of Health had exceeded its authority in promulgating the rule.[150]

The Portion Cap Rule had been opposed by a coalition of beverage industry groups, and no wonder—the beverage industry stood to lose a lot of money from the rule.[151] Professor Shi-Ling Hsu estimated that the profits of the Coca-Cola Company in New York City alone to be $240 million per year.[152] Fountain drinks, which are made at the food service establishment by mixing carbonated water with syrup, were estimated to have an astonishing 90 percent profit

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schools; *Mass. Gen. Laws Ann. Ch.* 111, § 223 – Nutritional standards for sale or provision of foods or beverages in public schools; *N.C. Gen. Stat. Ann.* § 115C-264.3 – Vending Machine Sales.

147 New York Assembly Bill 5037, introduced Feb. 2, 2017.

148 Id.

149 *New York City Health Code* § 81.53 (2012).

150 N.Y. Statewide Coal. of Hispanic Chambers of Commerce v. N.Y.C. Dep't of Health & Mental Hygiene, 23 N.Y.3d 681, 701, 16 N.E.3d 538, 549, 992 N.Y.S.2d 480, 491 (2014).

151 See Michael M. Grynbaum, *Fighting N.Y.C. Soda Ban, Industry Focuses on Personal Choice*, *NY Times* A10 (July 1, 2012).

152 Shi-Ling Hsu, *A Cost-Benefit Analysis of Sugary Drink Regulation in New York City,* 10 J. Food L. & Pol. 73, 81 (2014).

margin.[153] Hsu calculated the cost-benefit ratio for the soda ban to be between 6:1 and 26:1 in favor of the health benefits to New Yorkers.[154] Although the Portion Cap Rule would have been effective in reducing the costs of obesity, it could not last against the well-funded opposition. This would have been no surprise to researchers studying barriers to state action against childhood obesity. When researchers interviewed state policy makers, they cited the influence of lobbyists for manufacturers of unhealthy foods and beverages as the most significant barrier to anti-obesity legislation.[155]

C. Nudges

According to behavioral economists, a "nudge" is a strategy used by "choice architects" to help people make better decisions.[156] A choice architect can be an employer, a doctor, a parent or a governmental entity, anyone who has "the responsibility for organizing the context in which people make decisions."[157] Researchers have found nudges to be effective in encouraging healthy eating.[158] For example, one study showed that placing foods first on a buffet line "dramatically biases what [foods] diners take."[159] The researchers described two impacts of the food order: (1) over 75% of the diners took the first food offered and (2) the first three foods encountered by the diner comprised 66% of all the foods they took.[160] Even the USDA has recognized that behavioral economics affects dietary choices.[161]

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[153] *Id*. at 80.

[154] *Id*. at 104.

[155] Elizabeth A. Dodson, Chris Fleming, Tegan K. Boehm, Debra Haire-Joshu, Doglas A. Luke, and Ross C. Brownson, *Preventing Childhood Obesity Through State Policy: Qualitative Assessment of Enablers and Barriers*, 20 J. *Pub. Health Pol.* S161, S170 (2009).

[156] See Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (Yale Univ. Press 2008). Thaler and Sunstein use the term "libertarian paternalism" to describe nudges, which allow free choice but attempt to influence choosers to make better choices. *Id*. at 5.

[157] *Id*. at 3.

[158] See, e.g., Jessica Wisdom, Julie S. Downs, and George Loewenstein, *Promoting Healthy Choices: Information versus Convenience*, 2 *Am. Econ. J.: Applied Econ.* 164 (2010).

[159] Brian Wansink and Andrew S. Hanks, *Slim by Design: Serving Healthy Food First in Buffet Lines Improves Overall Meal Selection*, 8 PLOS One e77055 (Oct. 2013), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0077055.

[160] *Id.*

[161] David R. Just, Lisa Mancino, and Brian Wansink, *Could Behavioral Economics Help Improve Diet Quality for Nutrition Assistance Program Participants*?, *USDA Econ. Res. Rep.* 43 (June 2007).

Humans have a strong tendency to accept default options.[162] Whether in a restaurant or home setting, portion size can significantly affect caloric intake.[163] A recent study found that plate size had "a considerable effect overall on the amount self-served and the amount consumed."[164] A fascinating study found that research subjects faced with a soup bowl that magically never emptied ate much more than a control group with a normal soup bowl.[165] Restaurants, in particular, advertise large portions as a way of providing value to their customers.[166] Unsurprisingly, studies show that supersized portions lead to increased consumption.[167] Super-sized portions also add to food vendor profits, either by allowing a higher charge for "regular" sizes or if the incremental cost of the larger portion is less than the additional profit made by higher sales.[168] Although providing a smaller portion would promote the societal benefit of reduced obesity, it is unlikely that moral suasion alone will induce food vendors to give up profits.

Nutrition labeling, although generally accomplished by regulations,[169] falls more naturally in the "nudge" category, at least from the perspective of the consumer. In contrast to prohibitions against sale or limitations on serving size, nutrition labeling provides information to the consumer, who can then exercise free choice about whether or not to consume the product. The USDA noted that "historically, providing information about diet and health has been the

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[162] Thaler & Sunstein, *supra* note 156, at 8.

[163] Pierre Chandon, *How Package Design and Packaged-Based Marketing Claims Lead to Overeating*, 35 APPLIED ECON. PERSPECTIVES & POL'Y 7, 13–18 (2013).

[164] Stephen S. Holden, Natalina Zlatevska, and Chris Dubelaar, *Whether Smaller Plates Reduce Consumption Depends on Who's Serving and Who's Looking: A Meta-Analysis*, 1 *J. Assoc. Cons. Res.* 134 (2016).

[165] Brian Wansink, James E. Painter, and Jill North, *Bottomless Bowls: Why Visual Cues of Portion Size May Influence Intake*, 13 *Obes. Res.* 93 (2005).

[166] WM Vermeer, IHM Steenhuis, and MP Poelman, *Small, Medium, Large or Supersize? The Development and Evaluation of Interventions Targeted at Portion Size*, 38 *Int'l J. Obes.* S13 (2014).

[167] *Id*.

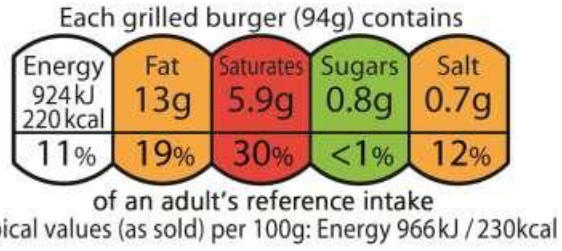
[168] Paul W. Dobson and Eitan Gerstner, *For a Few Cents More: Why Supersize Unhealthy Food?*, 29 *Marketing Science* 770, 773 (2010).

[169] The Nutrition Labeling and Education Act of 1990 (NLEA, P.L.101-535), codified at 21 U.S.C. § 343(q). The most recent regulations under NLEA were promulgated on May 27, 2016, at 21 CFR § 101. The final rule received over 500 comments. See 81 FR 33,967 (2016) (last page of comments showing 546 comments).

most widely used tool to help consumers make more healthful food choices."[170] The federal Nutrition Labeling and Education Act (NLEA) requires that all packaged food bear a nutrition label stating the:

1. serving size or other common household unit;
2. number of servings per container;
3. number of calories per serving and derived from total fat and saturated fat;
4. amount of total fat, cholesterol, sodium, total carbohydrates, sugars, added sugars, total protein, and dietary fiber per serving or other unit; and
5. vitamins, minerals, or other nutrients.

Each of the caloric amounts listed must also be expressed as a percentage of recommended daily amounts.[171] States are not in the food labeling business, as NLEA generally prohibits states from establishing or enforcing any labeling requirement for a food that is not identical to the federal act.[172] The European Union also requires nutrition labeling in a similar format.[173] In the United Kingdom, food producers may use a voluntary "signposting" system to report nutritional information in addition to a "guideline daily amount" (GDA) system.[174] The signposting system uses "traffic-light" labels that use red, amber and green signals to show consumers whether a product is high, medium or low in fat, saturated fat, sugars and salt, as the example below shows:[175]



[170] Just et al., *supra* note 161, at 4.
[171] 21 CFR § 101.9(d).
[172] 21 U.S.C. § 343-1(a).
[173] EU Reg. No. 1169/2011, Art. 30 (2011).
[174] UK Food Standards Agency, *Guide to creating a front of the pack (FoP) nutrition label for pre-packed products sold through retail outlets* 10 (updated Nov. 2016), https://www.food.gov.uk/sites/default/files/multimedia/pdfs/pdf-ni/fop-guidance.pdf
[175] *Id*. at 21.

Nutrition labeling is no panacea for obesity and its collateral consequences of ill health and environmental degradation. One researcher said, "there is little compelling scientific evidence that health information alone is effective in reducing risky behaviours."[176] Another study conducted in Europe found that "consumers' attention and motivation remain major barriers to using nutrition labels, thus limiting any potential impact on health."[177] A study of French adults showed that the signposting labels were more effective than the GDA labels in communicating nutritional information.[178] That study did not consider whether the labels would be effective in reducing obesity, but rather focused on the comprehension of the information contained on the labels. However, another study considered the role of impatience in obesity, concluding that people who are impatient tend to have higher BMIs.[179] Impatient persons would be more likely to read clearer labels, but also tend to be significantly influenced by food cost.[180]

D. Incentives and Taxes

1. Incentives

Would overweight individuals lose weight if they were paid to do so? The mayor of an Italian town paid residents to lose weight, about $70 for losing 10 pounds with a bonus of about $280 if the resident kept the weight off for five months.[181] A Virginia doctor pays his patients a

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[176] Matteo M. Galizzi, *Label, nudge or tax? A review of health policies for risky behavior*, 1 *J. Pub. Health Res.* E5 (2012).

[177] Stefan Storcksdieck genannt Bonsmann and Josephine M. Wills, *Nutrition Labeling to Preven Obesity: the Evidence From Europe*, 1 *Curr. Obes. Rep*. 134, 137 (2012), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410024/pdf/13679_2012_Article_20.pdf

[178] Pauline Ducrot, Caroline Méjean, Chantal Julia, Emmanuelle Kesse-Guyot, Mathilde, Léopold Fezeu, Serge Hercberg, and Sandrine Péneau, *Effectiveness of Front-Of-Pack Labels in French Adults: Results from the NutriNet-Santé Cohort*, 10 PLOS ONE DOI:10.1371/journal.pone.0140898 (2015). It should be noted that obesity rates in France are among the lowest in the OECD. *Obesity and the Economics of Prevention: Fit not Fat - France Key Facts***,** http://www.oecd.org/els/health-systems/obesityandtheeconomicsofpreventionfitnotfat-francekeyfacts.htm.

[179] Charles J. Courtemanche et al., *Impatience, Incentives, and Obesity, Nat'l Bureau of Econ. Research, Working Paper No. 17483* (2011), *available at* http://www.nber.org/papers/w17483.

[180] *Id.* at 30 ("As economic factors lower the opportunity cost of food consumption, impatient individuals gain weight while the most patient individuals do not.").

[181] Italian town paid to shed flab (Aug. 13, 2007), http://www.reuters.com/article/us-italy-obesity-idUSL1368102020070813.

dollar per pound lost.[182] The National Health Service in the United Kingdom paid up to £425 to patients who signed up for a 13 month weight loss program, seven months to lose weight and six months to keep it off.[183] Private programs and private citizens enter into agreements to get paid for losing weight or pay for gaining weight.[184] The latter strategy may be more effective.[185] Yale economists Dean Karlan and Ian Ayres created a website (www.stickK.com) where anyone can define a goal (for example, to lose weight) and create financial incentives for reaching the goal and financial penalties for failure.[186] Having financial stakes increases the probability of success.[187] In a randomized trial comparing monthly weigh-ins, a lottery incentive program, or a deposit contract in which the participants deposited their own money, which they lost if they failed to achieve their goals, the odds of achieving the weight loss goal were significantly greater in both the deposit group and the lottery group.[188] However, these incentives and penalties are voluntary, and only motivated persons will use these methods. Obesity is not a problem that is limited to the motivated. Taxes can send a price signal that can be noticed without voluntary action.

2. Taxes

Taxes can influence behavior in a number of ways. Economist A.C. Pigou theorized that taxes could correct the market's failure to take external costs into account.[189] In the case of

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[182] Veronica Chufo, *Doctor Pays Patients to Lose Weight*, *Newport News Daily Press* (July 10, 2010), http://dollarsfordieting.com/files/Daily%20Press%20News.pdf.

[183] Nick Allen, *NHS pays overweight people £425 to lose weight*, *The Telegraph* (12 Apr. 2009), http://www.telegraph.co.uk/news/health/news/5145012/NHS-pays-overweight-people-425-to-lose-weight.html.

[184] Michael S. Rosenwald, *An Economy of Scales: Paying People to Lose Weight Helps Drop Pounds and Health-Care Costs*, *Wash. Post* F01 (Nov. 11, 2007).

[185] See Alex Imas, Sally Sadoff, and Anya Samek, Do People Anticipate Loss Aversion? (June 22, 2015), https://site.stanford.edu/sites/default/files/imas_sadoff_samek_anticipation_of_loss_aversion_june_2015.pdf (People selectively enter into loss contracts as a commitment device to improve performance).

[186] Temma Ehrenfeld, *A New Way to Lose Weight and Keep it Off: Put your Money at Risk*, *Psychology Today* (Mar. 25, 2016), https://www.psychologytoday.com/blog/open-gently/201603/new-way-lose-weight-and-keep-it.

[187] *Id.*

[188] Kevin G. Volpp, Leslie K. John, Andrea B. Troxel et al., *Financial Incentive Based Approach for Weight-Loss: A Randomized Trial*, 300 JAMA 2631 (2008).

[189] *See* Arthur C. Pigou, *The Economics of Welfare* 172, 192–93 (4th ed. 1932) (describing situations where social costs and private costs diverge).

unhealthy food, the cost of such food does not reflect the societal and environmental costs of obesity. Imposing taxes at the level of the marginal social cost of obesity on unhealthy food should discourage consuming such food by increasing its cost. One study cited in the New England Journal of Medicine found that for every 10% increase in price of sugar sweetened beverages, consumption decreases by 7.8%.[190]

Of course, it is not that simple. As law professor Victor Fleischer noted, "when marginal social cost varies, average cost does not equal marginal cost, and Pigovian taxes may not lead to an optimal allocation of economic resources."[191] However, scholars and policy makers have concluded that food taxes are the most likely-to-succeed solution to the obesity epidemic.[192] The World Health Organization (WHO) noted that "[f]iscal policies to improve diet – particularly taxation and subsidies – are key population-based policy interventions to reduce the consumption of calorie-dense foods and address obesity and diabetes."[193] Yale research scientists Michelle Novak and Kelly Brownell agreed, stating, "fiscal interventions like taxes can be a powerful tool to improve the economic landscape of the food environment."[194] Economist Donald Marron notes that taxes can also correct for internal costs, that is, when individuals make consumption choices without being fully aware of the potential future damage to their health.[195]

Aside from the question of marginal social cost, many issues remain in designing a tax to control obesity. In designing any tax, a critical inquiry is how to define the base on which the tax is imposed. Should the focus be on sugar-sweetened beverages or fats? Should it be imposed by

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[190] *See* Kelly D Brownell & Thomas R. Frieden, *An Ounce of Prevention – The Public Policy Case for Taxes on Sugared Beverages*, 360 *N. Engl. J. Med*. 1805, 1806 (2009).

[191] Victor Fleischer, *Curb Your Enthusiasm for Pigouvian Taxes*, 68 *Vand. L. Rev.* 1673, 1676-77 (2015).

[192] See Robert H. Lustig, Laura A. Schmidt and Claire D. Brodis, *The Toxic Truth About Sugar*, 482 *Nature* 27 (2012) (arguing that evidence shows that individually focused approaches, such as school-based interventions that teach children about diet and exercise, have limited effectiveness but control strategies such as taxation lower both consumption of the product and the accompanying health harms by curbing availability.) *Id*. at 28.

[193] WHO, *Fiscal Policies for Diet and Prevention of Noncommunicable Diseases* 11, Technical Meeting Report (May 2016).

[194] Nicole L. Novak and Kelly D. Brownell, *Role of Policy and Government in the Obesity Epidemic*, 126 *Circulation* 2345, 2349 (2012).

[195] Donald Marron, Maeve Gearing, and John Iselin, *Should We Tax Unhealthy Food and Drink*, *Tax Policy Center* (Dec. 2015), http://www.taxpolicycenter.org/publications/should-we-tax-unhealthy-foods-and-drinks.

volume, or sugar content? Perhaps most simply expressed solution would be to tax calories, irrespective of their source, similar to a carbon tax.[196] How should the revenue from such taxes be directed – to reducing other taxes or to providing health services? The next section will examine these issues in detail, beginning with a survey of global trends in food taxation.

V. GLOBAL TRENDS IN FOOD TAXATION

Countries, subnational governments, and cities throughout the world are beginning to respond to the global obesity epidemic by taxing unhealthy food. However, like regulatory efforts, these taxes have met with mixed success. Effective price policies should consider factors such as possible substitution effects, whether the tax would be passed through to consumers or absorbed by producers, and the potential impact on health inequalities.[197] Governments can choose to design nutrition taxes to tax content, volume, or sales, and the design choice can change the response to the tax.[198] According to several empirical studies, existing sales taxes have not had much effect on obesity rates.[199] In general, sales taxes do not significantly affect consumer behavior—in other words, sales taxes lack salience.[200] If a product is subject to sales tax, it is added to the bill only at the register, after the consumer has already made the decision to purchase.[201] Therefore, although sales taxes on junk food like soda are relatively widespread, this analysis will focus on food excise taxes.[202]

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[196] See *William A. Bogart, Regulating Obesity: Government, Society, and Questions of Health* 115 (Oxford Univ. Press 2012), citing A. Okrent & J. Alston, *The Effects of Farm Commodity and Retail Food Policies on Obesity and Economic Welfare in the United States*, 94 *Am. J. Agric. Econ.* 611 (2012). The study found that a calorie tax was more efficient than a sugar tax. Okrent & Alston, supra, at 633. However simple in description, the calorie tax would be difficult to implement. Would everyone need to keep a log of their consumption? Or would all points of sale for food need to be programmed to add a tax based on calorie content? That would make it difficult to split restaurant checks with friends.

[197] WHO, Fiscal Policies, supra note 193, at 18.

[198] Marron et al., supra note 195, at 15.

[199] Jessica E. Todd and Chen Zhen, Can Taxes on Calorically Sweetened Beverages Reduce Obesity, 25 Choices (2010).

[200] See Chetty et al., supra note 133, at 1146.

[201] But see Candice Choi and Kristen De Groot, War Over 'Soda Tax', Eugene Register-Guard B4 (Mar. 18, 2017) (Retailers in Philadelphia are posting signs by soda displays showing the price minus the excise tax).

[202] Inst. of. Med. (IOM), *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation* 63 (2012) (Thirty-four states and Washington, DC, have sales taxes on sodas); see also Joint Committee on Taxation, Present Law and Background Information on Federal Excise Taxes, JCX-99-15 (July 13, 2015) (defining excise taxes), https://www.jct.gov/publications.html?func=startdown&id=4798.

Denmark, the country that brought the world one of its first carbon taxes, in 1992,[203] enacted the first fat tax in 2011.[204] Although Denmark's carbon tax is alive and well, its fat tax ended in 2013.[205] Denmark's fat tax added an extra $3 per kilogram to the cost of foods containing more than 2.3 percent saturated fat by weight.[206] Danish consumers easily avoided the unpopular tax by traveling to nearby Germany and Sweden to buy their butter and ice cream.[207] The Danish tax likely failed because consumers could readily substitute products purchased in Germany and Sweden for the taxed products in Denmark.

In 2011, Finland enacted a €0.95 per kilogram tax on producers of sweets and ice cream. Finland enacted the sweets tax to raise revenue, not to combat obesity, but reportedly consumption of sweets declined by about 5 percent.[208] Finland ended the tax in 2017, not because of homegrown criticism, but because of European Union concerns that it violated state support rules (exported products were exempt from the tax).[209] Finland's sugar-sweetened beverage tax remains in effect.[210] Beverages containing more than 0.5 percent sugar are taxed at €0.22 per liter (volume).[211]

Hungary, in many ways, represents a success story for food taxes. Hungary enacted the Public Health Product Tax (PHPT) in 2011. The PHPT taxes "non-staple food products that carry known health risks when consumed."[212] Hungary based the tax on the Pigovian principle that the producers of unhealthy foods should bear part of the burden for public health costs

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[203] Jenny Sumner, Lori Bird, and Hillary Smith, Carbon Taxes: A Review of Experience and Policy Design Considerations 12, Nat'l Renew. Ener. Labs. Tech. Rep. NREL/TP-6A2-47312 (Dec. 2009), http://www.nrel.gov/docs/fy10osti/47312.pdf.

[204] Caroline Franck, Sonia M. Grandi, and Mark J. Eisenberg, Taxing Junk Food to Counter Obesity, 103 Am. J. Pub. Health 1949 (Nov. 2013).

[205] WHO, Fiscal Policies, supra note 193, at 14.

[206] Franck et al., supra note 204.

[207] Stephanie Strom, 'Fat Tax' in Denmark Is Repealed After Criticism, NY Times B4 (Nov. 13, 2012).

[208] Elin Hofverberg, Finland: Tax on Chocolates and Sweets To Be Eliminated 2017, Global Legal Monitor (Oct. 7, 2015), http://www.loc.gov/law/foreign-news/article/finland-tax-on-chocolate-and-sweets-to-be-eliminated-2017/

[209] *Id.* See also WHO, Fiscal Policies, supra note 193, at 15.

[210] Hofverberg, supra note 208.

[211] WHO, Fiscal Policies, supra note 193, at 15.

[212] *Id.*

created by their products.[213] Products covered by the PHPT include soft drinks with more than 8 grams of sugar and less than 25 percent fruit content, pre-packaged candies, chocolate products with high sugar but low cocoa content, salty snacks, and other foods with high salt content.[214] In the first year of the tax, revenues fell $13 million short of the anticipated $88 million, in part because of manufacturers reformulating products to avoid the tax.[215] According to a report published in 2012, 40% of manufacturers changed their ingredients, and 30% completely eliminated the taxed, unhealthy ingredients.[216] The WHO noted that "[h]ealthier products due to product reformulation are a positive consequence of tax avoidance."[217]

The Hungarian government, working with the WHO, has been monitoring the impact of this tax, issued a final report in November 2015.[218] According to the study, between 11 and 28 percent of Hungarian consumers had changed their consumption patterns due to the tax's introduction.[219] Most people changed their consumption patterns because of the increased prices of products subject to the PHPT, and those reducing their consumption were "two or three times more aware that the product was unhealthy."[220] The study also found that overweight and obese people were more likely to change their consumption.[221] Price increase was more likely to be selected as the reason for reduced consumption by people with lower educational attainment.[222] The PHPT is levied on about 750 companies, and the top 50 companies pay about 90 percent of

[213] Eva Martos et al, Assessment of the Impact of the Public Health Product Tax 3, WHO Final Report (Nov. 2015), http://www.euro.who.int/__data/assets/pdf_file/0008/332882/assessment-impact-PH-tax-report.pdf?ua=1 European Policy Centre, Sustainable Prosperity for Europe, Food Taxes--What Is Their Impact (Nov. 25, 2014, http://www.epc.eu/prog_details.php?cat_id=6&pub_id=5117&prog_id=2.

[214] Ferenc Nemes, Chips Tax For a Healthier Diet, USDA Glob. Agric. Info. Rep. (GAIN) H1103 (Nov. 15, 2011),

[215] Suzanne Daley, Hungary Tries a Dash of Taxes to Promote Healthier Eating Habits, NY Times A6 (Mar. 3, 2013).

[216] WHO, Good Practice Brief: Public Health Product Tax in Hungary (2015), http://www.euro.who.int/__data/assets/pdf_file/0004/287095/Good-practice-brief-public-health-product-tax-in-hungary.pdf?ua=1

[217] Id.

[218] Martos, supra note .

[219] Id. at 1.

[220] Id. at 6.

[221] Id. at 8.

[222] Id. at 14.

the total tax.[223] The PHPT raised about €200 million over the four year study period, which was roughly in line with the predicted revenue.[224] Hungary directs all revenues from the PHPT to a public health fund, which has increased the wages of 95,000 health care workers.[225]

The Hungarian tax model is appealing for several reasons. First, it is a broad-based tax that covers many products, and is based on the *content* of unhealthy ingredients, such as salt and sugar. Targeting the unhealthy content of products both encourages consumers to reduce the amount of harmful ingredients consumed as well as encourages businesses to offer healthier products. In a study of sugar-sweetened beverage taxes, researchers at the Tax Policy Center concluded that taxing the sugar content is more efficient than taxing volume "if the goal is reducing sugar consumption."[226] Second, it is imposed at the company level, which reduces the administrative burden of collecting the tax. Third, the revenues are directed towards health care initiatives, thereby linking the tax to its objective. And finally, the ex poste assessments show that it has been effective at changing behavior.

Many governments, like Finland, are focusing their attentions on sugar-sweetened beverages. As a report from the Tax Policy Center notes, "consumer demand for soft drinks appears quite responsive to prices, making them a relatively good target for taxes."[227] Moreover, studies have found that liquid calories do not produce a feeling of fullness, unlike solid calories, therefore leading to greater caloric consumption.[228]

In 2011, France adopted a volume-based levy on beverages containing added sugar or other sweeteners. In 2014, the tax raised approximately €300 million in revenue, all of which

[223] Id. at 16.
[224] Id. at 15.
[225] Id. at 19.
[226] Norton Francis, Donald Marron, and Kim Rueben, *The Pros and Cons of Taxing Sweetened Beverages Based on Sugar Content, Tax Policy Center* (Dec. 2016), http://www.taxpolicycenter.org/publications/pros-and-cons-taxing-sweetened-beverages-based-sugar-content-0/full.
[227] Marron et al., supra note 195, at 15.
[228] An Pan and Frank B. Hu, *Effects of Carbohydrates on Satiety: Differences Between Liquid and Solid Food*, 14 *Current Opinion in Clinical Nutrition & Metabolic Care* 385 (2011).

was allocated to the National Social Health Insurance.[229] Research indicated that the cost of the tax, imposed on retailers, was fully passed through to consumers.[230] Low-income groups and young people showed the largest decrease in soda consumption.[231] The French public has a favorable perception of the sugar-sweetened beverage tax, believing that it has potential to improve the health of the population.[232]

In 2014, Mexico adopted volume-based taxes on sugar-sweetened beverages and ad valorem taxes on junk food.[233] Mexico has a serious public health problem. Half of Mexican adults qualify as obese.[234] Mexico has the highest rate of hospitalizations for diabetes related health problems of all the countries in the OECD.[235] In 2011, Mexico had the highest per capita consumption of sugar-sweetened beverages.[236] A study shows the significant impact of Mexico's soda tax:

> The average volume of taxed beverages purchased monthly was 6% lower in 2014 compared with expected purchases with the tax absent. Moreover, the reductions accelerated, reaching a 12% decline by December 2014. The reduction was greatest among households of low socioeconomic status, averaging −9.1%, and reaching −17.4% by December 2014. Purchases of untaxed beverages were 4% higher than the counterfactual, mainly related to bottled water.[237]

While it is too soon to measure the impact of the tax on obesity rates, the reduction in sugar-sweetened beverages purchases bodes well for the future health of Mexicans.

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[229] WHO, Fiscal Policies, supra note 193, at 15.

[230] Berardi, Nicoletta and Sevestre, Patrick and Tepaut, Marine and Vigneron, Alexandre, The Impact of a 'Soda Tax' on Prices: Evidence from French Micro Data 10 (December 2012). Banque de France Working Paper No. 415. Available at SSRN: https://ssrn.com/abstract=2192470

[231] WHO, Fiscal Policies, supra note 193, at 15.

[232] Chantal Julia, Caroline Méjean, Sandrine Péneau, Florence Vicari, and Serge Hercberg, *Public perception and characteristics related to acceptance of the sugar-sweetened beverage taxation launched in France in 2012*, 18 *Public Health Nutri.* 2679, 2686 (2015).

[233] Marron et al., supra note 195, at 9.

[234] M. Arantxa Colchero, Barry M. Popkin, Juan A. Rivera, and Shu Wen Ng, *Beverage purchases from stores in Mexico under the excise tax on sugar sweetened beverages: observational study*, 352 *Brit. Med. J.* h6704 (2016).

[235] Id.

[236] Id.

[237] Id.

More recently, U.S. cities have been adopting soda taxes. Philadelphia's $0.015 per ounce soda tax went into effect in January 2017, and the first month's revenue exceeded projections.[238] Philadelphia's goal for its soda tax was purely to raise revenue--no public health goals were mentioned.[239] Berkeley enacted a $0.01 per ounce soda tax in 2014, with the stated purpose to "diminish the human and economic costs of diseases associated with the consumption of sugary drinks by discouraging their distribution and consumption in Berkeley through a tax."[240] A study by researchers at Cornell University conducted one year after enactment of the tax found that less than one half of the tax was passed through to consumers, which would tend to limit its effectiveness as an anti-obesity measure.[241] The researchers used San Francisco as a counterfactual in the study, comparing soda prices in Berkeley to those in San Francisco. Vendors in Berkeley may have absorbed the cost of the tax, reasoning that it would be simple for consumers to avoid by purchasing their soda in nearby San Francisco. However, in November 2016, San Francisco and neighboring Albany, California, enacted their own soda taxes.[242] Boulder, Colorado and Cook County, Illinois (where Chicago is located) also enacted soda taxes.[243] The Navajo Nation enacted a junk food tax, citing the tribe's skyrocketing rates of diabetes.[244]

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[238] Elaine S. Povich, Philadelphia Soda Tax Receipts Double First-Month Predictions, Pew Charitable Trusts Stateline (Feb. 24, 2017), http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2017/02/24/philadelphia-soda-tax-receipts-double-first-month-predictions.

[239] Margot Sanger-Katz, Making a Soda Tax More Palatable, NY Times (Apr. 3, 2016). "[Philadelphia Mayor] Kenney is taking a different political tack. Instead of the usual eat-your-vegetables pitch of public health reformers, he is offering Philadelphians something delicious: a giant pot of money to fund popular city projects."

[240] Berkeley Muni. Code § 7.72.010 (2014).

[241] John Cawley and David Frisvold, The Incidence of Taxes on Sugar-sweetened Beverages: the Case of Berkeley, California, NBER Working Paper 21465 (Aug. 2015), http://www.nber.org/papers/w21465.

[242] Mike Esterl, Soda Taxes Approved in Four Cities, Vote Looms in Chicago's Cook County, Wall St. J. (Nov. 9, 2016).

[243] Che Odom, Corporate Income Tax Cuts, Legal Pot More Likely in States, BNA Daily Tax Report (Nov. 17, 2016).

[244] Leilani Clark, Navajo Nation Will Soon Have the Country's First Ever Junk Food Tax, Mother Jones (Mar. 25, 2015), http://www.motherjones.com/environment/2015/03/navajo-nation-junk-food-tax; Healthy Dine Nation Act of 2014, 24 Navajo Nation Code Ann. § 1003 (22d Navajo Nation Council 2014), http://www.navajotax.org/Navajo%20Taxes/CN-54-14_JunkFoodTax.pdf.

The ability of municipalities and other small governmental units to collect food taxes is limited by the ability of consumers and noncompliant businesses to shift purchases to neighboring jurisdictions.[245] A national food tax would be harder to avoid. In addition, municipalities cannot impose a tax on food manufacturers who reside outside their jurisdiction, which is why most cities tax distributors. A national food tax could readily be imposed on manufacturers.[246]

Although some predict more widespread adoption of soda taxes, it is unlikely that the soft-drink industry will give up the fight.[247] In Philadelphia, bottlers for Canada Dry and PepsiCo are threatening to lay off workers because of sales declines.[248] As noted earlier, the influence of lobbyists for manufacturers of unhealthy foods and beverages may be the most significant barrier to anti-obesity legislation.[249] In 2016, the American Beverage Association spent $38 million trying to stop soda taxes, without success.[250] However, if food taxes were imposed at the national level, we can anticipate an even stronger response by industry groups. In addition, the political climate is not favorable to tax increases.[251] The next section will explore other tax mechanisms that could impact the cost and therefore the consumption of unhealthy foods.

VI. ANALOGIES

Food writer Mark Bittman asked, "is soda the new tobacco?"[252] Bittman quoted Center for Disease Control (CDC) director Thomas Frieden, who drew a direct analogy between tobacco and soda, saying "[t]here are aspects of the food industry that are reminiscent of tobacco — the sowing of doubt where there's no reasonable doubt, funding of front groups, use of so-called experts, claims that new products which are safer for consumers are available, and the claim that

[245] Francis et al., supra note , at 2.
[246] *Id*. at 9.
[247] Anahad O'Connor and Margot Sanger-Katz, As Soda Taxes Gain Wider Acceptance, Your Bottle May Be Next, NY Times A1 (Nov. 26, 2016).
[248] Choi and De Groot, supra note 201, at B4.
[249] Dodson et al, supra note 155, at S170.
[250] Stephanie Strom, Creeping Progress in Pledge to Cut Calories in Sugary Soda, NY Times (Nov. 22, 2016).
[251] See, e.g., Paul C. Barton, *Does Clinton's Soda Stance Violate Tax Pledge*, 2016 TNT 79-3 (Apr. 25, 2016).
[252] Mark Bittman, Soda: A Sin We Sip Instead of Smoke, NY Times (Feb. 12, 2010).

they are not marketing to children."[253] The parallels are striking: smoking leads to heart disease and diabetes. So does obesity. Members of minority groups and low-income individuals are more likely to smoke,[254] and are more likely to be obese.[255] Youth smoking leads to adult smoking—youth obesity leads to adult obesity. Smokers find it difficult to quit and often relapse. Overweight individuals find it difficult to lose weight, and often gain it back. Perhaps most significantly for purposes of this article, both cigarettes and junk food are specifically designed to be addictive.[256]

Smoking rates have precipitously declined in the United States. The Daily Mail in the UK published a map that brilliantly illustrated this decline.[257] As this moving map probably cannot be duplicated in a law review, suffice to say that adult smoking rates in the U.S. have more than halved, from 42 percent in 1965 to 18 percent in 2014.[258] The government used the full spectrum of policy tools to curb the use of tobacco: education about the dangers of smoking, restrictions on the use of advertising, prohibition of sale of cigarettes to children, warning label requirements on packaging, restrictions on smoking in public places, and increased taxation.[259] Successful litigation against the tobacco industry by states' attorney generals seeking reimbursement of

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[253] Id.

[254] Phineas Baxandall, *Taxing Habits*, *Boston Fed. Reg. Rev.* (2013), https://www.bostonfed.org/-/media/Documents/RegionalReview/taxhabits.pdf.
"For cigarettes, the problem is exacerbated by the fact that the poor do smoke more than the better-off. According to Harvard Law School Professor Kip Viscusi, over 30 percent of people earning less than $10,000 a year were smokers in 1990, compared to less than 20 percent of those earning over $50,000 annually." *Id*. at 26.

[255] IOM, supra note 202, at 268.

[256] *U.S. Dept. of Health and Human Services (HHS), The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General* 803 (2014), (tobacco companies intentionally designed cigarettes to make them more addictive) https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf; see also Lyndsey Layton, Crave Man: David Kessler Knew that Some Foods are Hard to Resist; Now He Knows Why, Wash. Post (Apr. 27, 2009) (both the tobacco industry and the food industry are manipulating consumer behavior to sell products that can harm health), http://www.washingtonpost.com/wp-dyn/content/article/2009/04/26/AR2009042602711_pf.html

[257] Belinda Robinson, How the U.S. Stubbed Out Their Cigarettes: Incredible Map Shows How Americans Stopped Smoking Over 40 Years, Daily Mail (Sept. 9, 2014), http://www.dailymail.co.uk/news/article-2749552/Growing-numbers-Americans-quit-smoking-past-40-years-Study-finds-higher-taxes-tobacco-awareness-dangers-people-quit.html.

[258] *U.S. Dept. of Health and Human Services (HHS), The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General* 7 (2014), https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf.

[259] Bogart, supra note 196, at 149.

public money spent for the costs of tobacco-related illnesses also played a large role.[260] This combination of strategies shifted public opinion about smoking: it is now viewed as a filthy, dangerous habit.[261]

Some of these tools have already been used in the food area. The USDA educates consumers about food choices.[262] In a survey about taxing sugar-sweetened beverages, most survey respondents knew that frequent consumption of soft drinks increases the risk of obesity (91%), diabetes (90%) and dental cavities among children (94%).[263] The federal government requires nutrition labeling on packaged foods.[264] However, the food industry heavily markets to children[265] and governments are just beginning to use food taxes.[266]

As noted above, successful litigation against the tobacco industry accelerated government action to reduce smoking and forced the industry to go along with the plan. Some believe that "only the threat of litigation and the associated bad publicity would be effective in pressuring the food industry to take responsibility for its long-term contributions to the obesity problem."[267] The food industry is taking preemptive steps to avoid the risk of litigation. The Commonsense Consumption Act, promoted by the American Legislative Exchange Council (ALEC), provides that the food industry (as broadly defined) "shall not be subject to civil liability . . . arising out of weight gain, obesity, a health condition associated with weight gain or obesity, or other generally

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[260] See Tobacco Control Legal Consortium, The Master Settlement Agreement: An Overview, http://www.publichealthlawcenter.org/sites/default/files/resources/tclc-fs-msa-overview-2015.pdf. See also Richard P. Ieyoub and Theodore Eisenberg, *State Attorney General Actions, the Tobacco Litigation, and the Doctrine of Parens Patriae*, 74 Tulane L. Rev. (2000).

[261] Bogart, supra note 196, at 149.

[262] See USDA, *Dietary Guidelines for Americans*, supra note 6.

[263] Cheryl Rivard, Danielle Smith, Susan E. McCann and Andrew Hyland, Taxing sugar-sweetened beverages: a survey of knowledge, attitudes and behaviours, 15 Pub. Health Nutri. 1355, 1357 (2011).

[264] See NLEA, Pub. L. 101-535 (1990), codified at 21 U.S.C. 343. See discussion supra note 169 and accompanying text.

[265] Federal Trade Commission, A Review of Food Marketing to Children and Adolescents: Follow Up Report (2012) (noting that companies use a wide variety of highly effective techniques to reach young people, combining traditional media, Internet, digital marketing, packaging, and often using cross-promotions with popular movies or TV characters.) *Id*. at ES-1.

[266] See Food Tax Trends, supra.

[267] Bonnie Hershberger, Super-Sized America: Are Lawsuits the Right Remedy, 4 J. Food L. & Pol'y 71, 76 (2008).

known condition allegedly caused by or allegedly likely to result from long-term consumption of food."[268] This legislation was introduced at the federal level four times between 2003 and 2014, and failed to be enacted each time.[269] However, the food industry has been more successful at the state level, with twenty-six states enacting Commonsense Consumption Acts.[270] This legislative effort makes it unlikely that litigation against the food industry will be as successful as it ultimately was against the tobacco industry.

Although it is difficult to identify which of the government actions resulted in which portion of the decline in smoking, tobacco taxes clearly have had an effect.[271] The 2014 Surgeon General's report concluded that "increases in the prices of tobacco products, including those resulting from excise tax increases, prevent initiation of tobacco use, promote cessation, and reduce the prevalence and intensity of tobacco use among youth and adults."[272] The U.S. federal government imposes a $1.01 excise tax on each package of cigarettes sold.[273] The federal cigarette excise tax raised more than $13 billion in 2014.[274] There are also federal excise taxes on cigars, chewing tobacco, snuff, pipe tobacco, and cigarette papers.[275] States and localities also impose excise taxes on cigarettes, at varying rates. The average state cigarette tax rate is $1.61 per pack, ranging from a high of $4.35 in New York and a low of $0.30 in Virginia (a major

[268] https://www.alec.org/model-policy/commonsense-consumption-act/

[269] Mary Hoshall Hodges, The Hamburglar, Friend or Foe: WHAT IS THE BEST SOLUTION FOR LAWSUITS ALLEGING OBESITY CAUSED BY FAST FOOD OUTLETS WHEN NO CAUSAL LINK BETWEEN CONSUMPTION AND OBESITY CAN BE FOUND?, 10 J. Food L. & Pol'y 281, 302 (2014).

[270] Id. at 306.

[271] But see, William N. Evans, Matthew C. Farrelly, and Edward Montgomery, *Do Workplace Smoking Bans Reduce Smoking*, 89 *Am. Econ. Rev*. 728 (1999) (finding that workplace smoking bans reduce cigarette consumption by 10 percent, and reduced smoking participation by about 6 percent). *Id*. at 734.

[272] HHS, Surgeon General's Report, supra note 258, at 12.

[273] 26 U.S.C. § 5701.

[274] Orzechowski & Walker, The Tax Burden on Tobacco, 49 Historical Compilation iv (2014), https://www.healthdata.gov/dataset/tax-burden-tobacco-volume-49-1970-2014.

[275] JCT, Excise Taxes, supra note 202, at 38.

tobacco producing state).[276] The states collected more than $16 billion in cigarette taxes in 2014.[277]

In another potential parallel to food taxes, differing tax levels in different jurisdictions lead to opportunities for tax avoidance. Showing true dedication to their work, economists picked up cigarette pack litter in Chicago and New York City to examine the level of avoidance of local cigarette taxes.[278] The first study, in Chicago, showed that only a quarter of the littered cigarette packs had paid the city cigarette tax, which was more than $3 per pack higher than in neighboring Indiana.[279] The New York City study was done in several stages: the first before a $1.25 planned state cigarette tax increase, the second immediately after the tax increase had gone into effect, the third three months after the tax increase, and the last one year and three months after the tax increase.[280] The study area was also relatively close to a Native American reservation, which does not impose state taxes on cigarettes.[281] The researchers found that avoidance rates increased after the tax increase, but also that cigarette consumption declined.[282] As high as cigarette taxes are, they do not approach the Pigovian ideal of equaling the social cost of harm. Former Chair of the White House Council of Economic Advisors Jason Furman suggested that raising the federal tax on cigarettes from $1.01 per pack to $1.95 per pack would

[276] See Campaign for Tobacco-Free Kids, State Cigarette Excise Tax Rates & Rankings (Jan. 3, 2017), https://www.tobaccofreekids.org/research/factsheets/pdf/0097.pdf.
[277] Orzechowski & Walker, supra note 274, at iv.
[278] Howard Chernick and David Merriman, *Using Littered Pack Data to Estimate Cigarette Tax Avoidance in NYC*, 66 *Nat'l Tax J.* 635 (2013).
[279] Id. at 639.
[280] Id. at 635.
[281] Id. at 651. ("Traveling to [the] Poospatuck [Native American Reservation in Suffolk County] will save consumers about $4.25 per pack but the reservation is only a single location that is probably unfamiliar location to most individuals.")
[282] Id. at 663.

save between 10,000 and 50,000 lives.[283] Even doubling the federal cigarette tax would not come close to estimated smoking related health costs of $19.16 per pack.[284]

Like many food taxes, tobacco taxes fall most heavily on the poorest populations. As Professor Phillip Cook noted, "imposing a further financial burden on a disproportionately ill and low-income population through a regressive excise tax by itself lacks moral appeal, but cigarette taxes can be justified by the benefit they provide to those who pay them."[285] The next section will consider how food taxes affect disparate income groups.

VII. FREEDOM OF CHOICE, INEQUALITY, AND REGRESSIVITY

Freedom's just another word for nothing left to lose[286]

Taxes do not prevent people from making choices, but rather change the immediate costs of those choices. Nonetheless, the food industry argues that junk food taxes violate consumers' freedom of choice.[287] As a general matter of tax policy, tax provisions should be designed to be fair, economically efficient, and simple.[288] Yet even this apparently non-controversial statement is fraught with potential for confusion and disagreement. What does "fair" mean? In the tax context, there are two dimensions of fairness: vertical equity and horizontal equity.[289] The definitions of vertical equity and horizontal equity themselves lack satisfactory clarity. Vertical equity holds that differently situated taxpayers should be taxed differently. Vertical equity justifies a progressive tax rate structure, on the theory that wealthier taxpayers have a greater ability to pay. However, food taxes generally have a regressive impact for two reasons: first, lower income individuals spend more of their income on food and second, lower income

[283] Ryan Finley, Federal Cigarette Taxes Should Be Doubled, Furman Says, 2016 Tax Notes Today 101-8 (May 25, 2016).
[284] Campaign for Tobacco-Free Kids, supra note 276. However, if the health care costs "saved" by smokers' dying prematurely are factored in, the social cost of smoking might be significant lower. See Baxandall, supra note 254, at 22.
[285] Finley, supra note 283.
[286] Kris Kristofferson & Fred Foster, *Me and Bobby McGee* (1969) (1971 Billboard number 1 single performed by Janis Joplin on her *Pearl* album).
[287] See, e.g., Grynbaum, supra note 151.
[288] *C. Eugene Steuerle, Contemporary U.S. Tax Policy* 10 – 15 (Urban Inst. Press 2004).
[289] Id.

individuals tend to purchase more foods that are considered unhealthy and therefore more likely to be subject to taxation.[290] On the other hand, if food taxes are designed to reduce consumption of unhealthy foods, the taxes should fall on those most likely to consume those foods.[291] Further, some might argue that fairness requires taxing unhealthy behavior to compensate and correct for the otherwise unpaid costs that behavior imposes on the healthcare system.[292] Finally, fairness (and public acceptance) of food taxes could be enhanced by designating the revenue towards obesity prevention.[293]

Efficiency in the tax context generally refers to economic efficiency and relates to the following question: does the tax raise revenue without changing economic behavior? Changes in economic behavior are viewed as "deadweight loss." For food taxes, weight loss could be considered a design feature, not a flaw. For taxes designed to change behavior, efficiency might mean changing that behavior most effectively at the lowest cost. A study of obesity conducted in Australia identified a tax on unhealthy foods and beverages as one of the three most cost-effective policy interventions.[294] Moreover, food taxes' regressive impact could enhance their efficiency: low-income populations may be more sensitive to price changes than the overall population.[295]

Using the income tax system as a vehicle for preventing obesity could ease concerns about the regressive impact of food excise taxes. The income tax system is already designed to be progressive. Income tax changes could be designed to incentivize healthy behavior, and

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[290] Todd & Zhen, supra note 199.

[291] See Franck et al., supra note 204, at 1951 ("It follows that low-income individuals might be more likely to change their consumption behaviors and experience long-term health benefits.")

[292] See Baxandall, supra note 254, at 22 (discussing tobacco taxes).

[293] Kelly D. Brownell and Thomas R. Frieden, Ounces of Prevention—The Public Policy Case for Taxes on Sugared Beverages, 360 New Engl. J. Med. 1805, 1807 (2009) (New York residents support for a soda tax increased from 52 percent to 72 percent when told revenue would be used for obesity prevention.).

[294] Vos T, Carter R, Barendregt J, Mihalopoulos C, Veerman L, Magnus A, Cobiac L, Bertram M, Wallace A. Assessing Cost-Effectiveness in Prevention (ACE-Prevention). 2010, https://public-health.uq.edu.au/files/571/ACE-Prevention_final_report.pdf.

[295] Tatiana Andreyeva, Michael W. Long, and Kelly D. Brownell, *The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food*, 100 Am. J. Public Health 216, 220 (2008).

penalize a food industry that creates junk food addicts. While potential increases to the tax liability of food producers may not be as salient to consumers as a food excise tax, it may be salient enough to cause reformulation of food products.

VIII. CONSIDERING INCOME TAX SOLUTIONS

The income tax system in the United States has long been studied for its intended and unintended consequences.[296] This section will examine provisions in the Internal Revenue Code (IRC) that may reduce obesity as written, those which could be modified to reduce obesity, and those which could serve as a model for more targeted provisions.

A. Existing and Modifiable Provisions

1. Medical Expense Deduction

If obesity is a medical problem, the medical expense deduction is a logical place to begin our examination of the IRC. Section 213 allows a deduction for the expenses for the medical care of the taxpayer, spouse, and dependents.[297] Medical care includes prescription drugs as well as amounts paid for the "diagnosis, cure, mitigation, treatment, or *prevention of disease*, or for the purpose of affecting any structure or function of the body."[Emphasis added] The Internal Revenue Service (IRS) considers obesity a disease, so the cost of participation in a weight-loss program prescribed by a doctor is deductible, provided that the taxpayer elects to itemize their deductions.[298] However, the IRS ruled that the cost of weight-loss programs to improve appearance or general health is not deductible.[299] Only the amount that exceeds 10 percent of the taxpayer's adjusted gross income is deductible. Only one-third of taxpayers itemize deductions, and only six percent of taxpayers with incomes below $20,000.[300] Only four percent of taxpayers

[296] See, e.g., Roberta F. Mann, *The (Not So) Little House on the Prairie: The Hidden Costs of the Home Mortgage Interest Deduction*, 32 Ariz. St. L. J. 1348 (2000).
[297] 26 USC § 213(a).
[298] Rev. Rul. 2002-19.
[299] Rev. Rul. 79-151.
[300] Sean Lowry, Itemized Tax Deductions for Individuals: Data Analysis 3, Cong. Res. Serv. Rep. R43012 (Mar. 31, 2013).

with incomes below $20,000 claimed the medical expense deduction.[301] Therefore, the medical expense deduction is not an efficient or effective way to prevent obesity.

2. Employee Fringe Benefits

Although generally any benefit received from an employer may be taxed to the employee, certain enumerated fringe benefits are excluded from gross income.[302] The fringe benefits most pertinent to the obesity epidemic are gym membership, public transportation, and bicycle commuting.

The gym membership benefit is limited to the value of an "on-premises athletic facility." It must be operated by the employer and located on the premises of the employer, and substantially all the use of the athletic facility must be by the employees, their spouses, and dependents. However, only a few large corporations offer on-premises gyms.[303] Extending the tax-free fringe benefit to employees whose employers reimburse the cost of gym membership would greatly increase the availability of this tax benefit.

The IRC exempts the value of public transportation passes supplied by the employer.[304] Studies indicate that commuting by car increases the likelihood of obesity.[305] Conversely, commuting by public transportation reduces the likelihood of obesity.[306] However, free parking increases the likelihood of driving,[307] and the IRC also exempts the value of parking provided by

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[301] Id. at 5.

[302] See 26 U.S.C. § 132.

[303] Health Fitness Revolution, The Fortune 100 and Their Fitness and Wellness Programs (Aug. 15, 2015), http://www.healthfitnessrevolution.com/fortune-100-fitness-wellness-programs/ (Citing Walmart, General Motors, and Phillips 66 as having on-premises gyms).

[304] 26 U.S.C. § 132(f).

[305] Christine M. Hoenhner, Carolyn E. Barlow, Peg Allen and Mario Schootman, Commuting Distance, Cardiorespiratory Fitness, and Metabolic Risk, 42 Am. J. Prev. Med. 571 (June 2012), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3360418/pdf/nihms371568.pdf.

[306] Ellen Flint, Steven Cummins, and Amanda Sacker, Associations between active commuting, body fat, and body mass index: population based, cross sectional study in the United Kingdom, 349 Brit. Med. J. g4887 (Aug. 19, 2014), http://www.bmj.com/content/bmj/349/bmj.g4887.full.pdf (concluding that people who used public modes of transport had significantly lower BMI and percentage body fat than their counterparts who used private transport).

[307] Luz Lazo, DC wants employer to pay workers not to drive to work, Wash. Post (Mar. 17, 2017), https://www.washingtonpost.com/news/dr-gridlock/wp/2017/03/17/d-c-wants-employers-to-pay-workers-not-to-drive-to-work/?utm_term=.d38541c43620.

the employer.[308] The U.S. Department of Transportation noted that public transportation offers significant greenhouse gas emission savings over driving.[309] Bicycle commuting emits no greenhouse gas emissions at all, and provides calorie-burning benefits.[310] The bicycle commuter benefit excludes reasonable costs (limited to $20 per month) for purchase of a bicycle, repairs, and storage if the bicycle is regularly used for commuting to work.[311] Eliminating the parking pass and enhancing the transit pass and bicycling commuting exclusions would improve the environmental and obesity related benefits of the transportation fringe tax exclusion.

3. Mortgage Interest Deduction

The mortgage interest deduction as currently structured incentivizes sprawl development and excessive driving.[312] The mortgage interest deduction is a blunt policy instrument. Ostensibly "designed" to promote homeownership, the mortgage interest deduction increases as the cost of the home increases. The tax benefit also increases as the tax bracket of the taxpayer increases, because as a deduction, the tax benefit is a function of the amount of the deduction multiplied by the tax rate imposed. Therefore, a taxpayer in the 15 percent tax bracket will see a $1,500 reduction in tax liability from a $10,000 mortgage interest deduction. A taxpayer in the 39.6 percent tax bracket will see a $3,960 reduction in tax liability on the same payment.

According to Harvard's Joint Center for Housing Studies, a majority of single-family homes built between 2000 and 2014 were constructed in low-density urban areas.[313] Low-density means more driving. Homeowners have longer commutes than renters in 43 out of America's 50

[308] 26 U.S.C. § 132(f)(5)(C) (defining "qualified parking.")

[309] U.S. Dept. of Trans., Public Transportation's Role in Responding to Climate Change (Jan. 2010), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/PublicTransportationsRoleInRespondingToClimateChange2010.pdf.

[310] A 160-pound person bicycling at 14-16 miles per hour for one half hour burns 363 calories, according to the Cycling Calories Burned Calculator, http://www.bicycling.com/training/weight-loss/cycling-calories-burned-calculator.

[311] 26 U.S.C. § 132(f)(5)(F).

[312] See Mann, supra note 296.

[313] Jt. Cent. Hous. Studies, The State of the Nation's Housing 8 (2016) http://www.jchs.harvard.edu/sites/jchs.harvard.edu/files/jchs_2016_state_of_the_nations_housing_lowres.pdf.

largest metropolitan areas.[314] Several studies show that longer commutes lead to overweight, obesity, and associated health problems.[315] However, there may be some good news on the horizon: the tax reform plan proposed by the U.S. House of Representatives would double the standard deduction and make the mortgage interest deduction less relevant for all but the wealthiest taxpayers going forward.[316] Therefore, the cost of the home (and the length of the commute) would be unrelated to the size of the tax benefit, because a taxpayer may take the standard deduction without regard to the expenses incurred.[317]

B. Models for Targeted Provisions: Denying or Limiting Deductions

In the usual course of most tax systems, when businesses incur expenses, they may take a deduction, which will reduce their tax liability.[318] When Congress wants to show its displeasure with an activity, it can deny a deduction for that activity. Lobbying expenses,[319] business expenses of the illegal drug trade,[320] and excessive employee compensation[321] are all examples of Congress exercising its ability to deny deductions. Congress also limits deductions for various activities, such as meals and entertainment,[322] luxury vehicle depreciation,[323] and losses from passive activities.[324]

As noted previously, there are strong restrictions on advertising tobacco products as part of the overall strategy to reduce smoking.[325] Policy makers have identified food marketing to

[314] Richard Florida, One More Disadvantage of Buying a House: Longer Commutes, The Atlantic (Mar. 11, 2016).

[315] Hoenhner et al., supra note 305 (study of drivers in Texas showed commuting distance resulted in less physical activity and more weight gain); Margo Hilbrecht, Bryan Smale & Steven E. Mock, Highway to Health: Commute Time and Well-Being Among Canadian Adults, 56 World Leisure J. 151 (2014) (lengthy commutes have been linked to poor physical health outcomes such as obesity); Thomas J. Christian, Trade-Offs Between Commuting Time and Health-Related Activities, 89 J. Urb. Health 746 (2012) (time spent commuting is a pathway between sprawl and both obesity and physical inactivity).

[316] John L. Buckley, House GOP Tax Reform Plan: A Case Study, 154 Tax Notes 1383, 1385 (Mar. 13, 2017).

[317] 26. U.S.C. § 63(c).

[318] 26 U.S.C. § 162.

[319] 26 U.S.C. § 162(e).

[320] 26 U.S.C. § 280E.

[321] 26 U.S.C. § 162(m).

[322] 26 U.S.C. § 274(n).

[323] 26 U.S.C. § 280F.

[324] 26 U.S.C. § 469.

[325] See supra note 259.

children as a factor in the obesity epidemic.[326] Around the world, governments have identified reducing the harmful effects of youth-targeted food and beverage marketing as a policy priority.[327] In the U.S., the food industry spends about $2 billion per year marketing to children.[328] The "Stop Subsidizing Childhood Obesity Act" would prohibit a deduction for "any marketing directed at children for food of poor nutritional quality or brands primarily associated with food of poor nutritional quality."[329] The proposed legislation directs the promulgation of regulations defining important elements of the provisions like "directed at children" and "food of poor nutritional quality."[330] Professor Mona Hymel analyzed proposals to limit deductibility of advertising.[331] She noted that "historically, imbedded in section 162 is the notion that certain deductions should be disallowed because they violate public policy."[332] Critics of the Stop Subsidizing Childhood Obesity Act cast doubt on its effectiveness. David Just of the Cornell Center for Behavioral Economics in Child Nutrition Programs opined that the proposal would be largely symbolic and have a minimal impact on obesity.[333] Donald Marron of the Urban-Brookings Tax Policy Center said the proposal "is at best an indirect way of solving the obesity problem."[334] However, this approach has attractive policy features, and deserves more study. Consumers are viewed as the victims of the obesity epidemic, and denying deductions targets companies that gain wealth by harming these consumers. If the companies pass on the cost to consumers, that would discourage consumption, thereby creating the health benefits sought by the proposers of the bill. If companies reduce their marketing spending, that should also reduce consumption, leading to health benefits. In a future project, I intend to conduct further research

[326] IOM, supra note 202, at 252.
[327] Novak & Brownell, supra note 194, at 2349.
[328] FTC, supra note 265, at ES-2
[329] H.R. 5232, 114th Cong., 2d Sess. (2016). See also S. 2936, 114th Cong., 2d Sess. (2016).
[330] Id.
[331] Mona L. Hymel, Consumerism, Advertising, and Tax Policy, 20 Va. Tax Rev. 347 (2000).
[332] Id. at 452.
[333] Kat Lucero, To Curb Obesity, Health Advocates Target Tax Breaks, 2016 Tax Notes Today 129-4 (July 6, 2016).
[334] Id.

on the effectiveness of denying deductions, by examining the provisions denying deductions for lobbying and excessive employee renumeration.[335]

IX. Conclusions and Recommendations

Obesity is a global problem that is getting progressively worse. Obesity imposes costs on individuals, society, and the environment. Taxation is a way to discourage unhealthy eating, and generate revenues to recoup the costs to society. Reducing obesity would also reduce the impact of unhealthy nutrition choices on the environment.

This article has examined the environmental causes and costs of obesity. We have explored potential solutions: reforming farm subsidies, changing food assistance programs, regulatory fixes, nudges such as nutrition labeling, incentives to lose weight, and taxes. As a fiscal solution that does not compel behavior, many researchers favor taxes.

Given all the problems in the world today, who could blame you for wanting a Big Gulp®, a Big Mac®, or a Double Chocolaty Crème Frappuccino Blended Crème®?[336] That sort of thinking exemplifies the internal costs of obesity—which fall most heavily on consumers who overlook future costs, like ill health and disability.[337] Recognizing that overlooking future costs correlates with lower incomes, taxing obesity to correct for both internal and external costs will have a regressive impact, which should be corrected with governmental policies that benefit lower income taxpayers. Those policies might include using revenues from fat or soda taxes to reduce payroll taxes, or to invest in health care.

To change behavior, taxes should be designed so that taxpayers notice them—for maximum salience. Excise taxes, included in the price of the food, are more salient that sales

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[335] See, e.g., Gregg D. Polsky, Controlling Executive Compensation Through the Tax Code, 64 Wash. & Lee L. Rev. 877 (2007).

[336] Big Gulp: 364 calories, 91 grams of sugar, http://www.sugarstacks.com/beverages.htm; Big Mac: 540 calories, 250 from fat, 9 grams of sugar, https://www.mcdonalds.com/us/en-us/product/big-mac.html; Starbucks Double Chocolaty Chip Frappuccino: 420 calories, 180 from fat, 52 grams of sugar. https://www.starbucks.com/menu/drinks/frappuccino-blended-beverages/double-chocolaty-chip-frappuccino-blended-cr%C3%A8me. 7 11

[337] See Donald B. Marron, Should We Tax Internalities Like Externalities?, Tax Policy Center Working Paper (Nov. 2015), http://www.taxpolicycenter.org/publications/should-we-tax-internalities-externalities.

taxes. Taxes based on content, for example, the sugar content of sugar-sweetened beverages, are more effective than those based on volume. Targeting the unhealthy content of products both encourages consumers to reduce the amount of harmful ingredients consumed as well as encourages businesses to offer healthier products. Imposing the tax on manufacturers or distributors is more efficient than imposing it on consumers, as there are many fewer points of collection.

Finally, tax reform may provide an opportunity to address obesity through the income tax system. A proposal to deny deductions for marketing unhealthy food to children could raise revenue and potentially bend the curve of obesity. Other minor changes to the income tax system, like enhancing employee fringe benefits for gym membership and commuting by transit, could add to the cumulative effect. Like calories, tax policy changes can add up. Carefully drafted, these changes can lead to positive benefits for people and the environment.