CONTROLLING THE ENVIRONMENTAL COSTS OF OBESITY

BY

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Obesity is increasingly viewed as a major health problem across the world. Obesity presents both external and internal costs. Obesity alone may be responsible for 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. 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. 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. 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, Mexico, the Navajo Nation, and the city of Berkeley, 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. Finally, the Article will explore existing U.S. tax provisions to consider how modification of such provisions might help with the problem of obesity.

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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, 13% of adults suffered from obesity in 2014.[2] Obesity leads to adverse health outcomes such as heart disease, stroke, and diabetes—shortening life and reducing the quality of life.[3] Obesity presents both external and internal costs. Some estimate that obesity alone may be responsible for almost three million deaths per year and some $2 trillion in

1 DELBERT MCCLINTON, *I Used to Worry*, *on* NEVER BEEN ROCKED ENOUGH (Curb Records 1992).

2 *Obesity and Overweight*, WORLD HEALTH ORG. (June 2016), https://perma.cc/6JN3-9TSE [hereinafter WHO Fact Sheet].

3 *See infra* notes 37–39 and accompanying text.

medical costs and lost productivity, representing significant external costs.[4] Internal costs occur because people make eating and drinking choices without being aware of the eventual damage to their health.[5]

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.[6] Governmental policy encourages the production of such crops.[7] Being overweight decreases physical activity and personal mobility, leading to increased use of motor vehicles.[8] Airlines have even recognized the increase in the average weight of passengers and the need to use more fuel to carry that heavier load.[9]

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4 RICHARD DOBBS ET AL., OVERCOMING OBESITY: AN INITIAL ECONOMIC ANALYSIS 16 (2014); WORLD HEALTH ORG., GLOBAL HEALTH RISKS: MORTALITY AND BURDEN OF DISEASE ATTRIBUTABLE TO SELECTED MAJOR RISKS 11 (2009), https://perma.cc/QY54-UDU7.

5 *See infra* note 237 and accompanying text.

6 EDWIN D. ONGLEY, CONTROL OF WATER POLLUTION FROM AGRICULTURE 39–40 (1996), https://perma.cc/FD2N-7BGV (noting water pollution increase with traditional fertilizers like manure); WORLD WILDLIFE FUND, FACTS ABOUT SOY PRODUCTION AND THE BASEL CRITERIA 1, 3 (2006), https://perma.cc/52AE-WUNF (noting that 85% of soy is used as livestock feed and that soy farming increases potential fertilizer contamination of water and soil erosion); Jonathan Foley, *It's Time to Rethink America's Corn System*, SCI. AM. (Mar. 5, 2013), https://perma.cc/J3CX-T8YN ("[F]ertilizer use for corn is massive: over 5.6 million tons of nitrogen is applied to corn each year through chemical fertilizers, along with nearly a million tons of nitrogen from manure. Much of this fertilizer, along with large amounts of soil, washes into the nation's lakes, rivers and coastal oceans, polluting waters and damaging ecosystems along the way."); *Overview: Impacts*, WORLD WILDLIFE FUND, https://perma.cc/Q6C7-DBL5 (last visited July 22, 2017) (noting that soil degradation can arise from livestock farming due to practices such as turning the forests into pasture and overgrazing).

7 Foley, *supra* note 6 (suggesting that corn production has been encouraged for its productivity and versatile use such as food, livestock feed, and ethanol production); Tani Lee et al., *Major Factors Affecting Global Soybean and Products Trade Projections*, AMBER WAVES (May 2, 2016), https://perma.cc/27N6-6YXP (noting soybean's value in food, livestock feed, and biodiesel); John Newton & Todd Kuethe, *Changing Landscape of Corn and Soybean Production and Potential Implications in 2015*, FARMDOC DAILY (Mar. 6, 2015), https://perma.cc/J5H8-8MTH (mentioning 1996 Farm Bill and conservation reserve program as reasons for higher returns to the corn and soybean market); *see also infra* notes 113–118 and accompanying text.

8 *Obesity and Driving: Road Hogs*, ECONOMIST (June 15, 2011), https://perma.cc/GF5E-Q23D (finding a strong correlation between greater miles travelled and obesity).

9 In 2005, the Federal Aviation Administration (FAA) increased the average airline passenger weight assumption from 180 pounds for summer passengers (185 for winter passengers) to 190 pounds for summer passengers (195 for winter passengers). *See* FED. AVIATION ADMIN., AC 120-27E, AIRCRAFT WEIGHT AND BALANCE CONTROL 17 tbl.2-1 (2005), https://perma.cc/8XUP-J6QP; Matthew L. Wald, *Weight Estimates on Air Passengers Will Be Increased*, N.Y. TIMES (May 13, 2003), https://perma.cc/E94T-X7WF; *Hawaiian Airlines Weight Survey Results in Assigned Seating*, FOX NEWS (Oct. 14, 2016), https://perma.cc/HKT4-RP6W ("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.").

Environmental factors such as sprawl and transportation policy affect obesity rates.[10] When people cannot walk or take public transportation to work, they spend more time in their cars.[11] They have less time to exercise and prepare healthy meals.[12] They are more likely to visit fast food restaurants and eat in their cars.[13] Hence, both obesity's effect on the environment and the environment's effect on obesity lead to increased carbon emissions and exacerbate climate change.[14]

Taxes can potentially control both the external and internal costs of obesity.[15] By increasing the cost of certain foods, taxes can discourage their consumption.[16] A number of national and subnational jurisdictions have enacted such taxes, including Denmark; Finland; France; Hungary; Mexico; the Navajo Nation; and U.S. cities such as Philadelphia, Pennsylvania; Boulder, Colorado; and Albany, Berkeley, and San Francisco, California.[17]

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.

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10 *See* Thomas J. Christian, *Trade-Offs Between Commuting Time and Health-Related Activities*, 89 J. URB. HEALTH 746, 746 (2012) ("[R]esearch has identified time spent commuting as a potential pathway between sprawl and both obesity and physical inactivity."); *see also infra* notes 393–396 and accompanying text.

11 *See* Richard Florida, *The Geography of How We Get to Work*, ATLANTIC (July 13, 2011), https://perma.cc/4NJZ-BT9K (noting less sprawl and availability of public transportation as some of the factors that influence people to forgo their car for commuting).

12 *See* Christian, *supra* note 10, at 752 ("[E]ach health-related activity [like physical activity and food preparation] decreases with increased time spent commuting.").

13 Matt McMillen, *Long Commute? Your Heart and Waistline May Suffer for It*, TIME, May 8, 2012, https://perma.cc/2G8L-YKBH (surmising that high blood pressure may be common among the long-haul commuters as they "skimp on sleep, eat more fast food"); Brad Tuttle, *10 Things You Didn't Know About the Fast Food Drive-Thru*, TIME, Oct. 8, 2014, https://perma.cc/C9CQ-DUUA ("[W]ait times at the drive-thru are on the rise."); Ben Workman, *How Your Commute Is Killing You*, MEMD (June 19, 2015), https://perma.cc/2K2T-P4EC ("Fast food chains provide an easy and quick option for those who lack time to prepare a meal and fast food is readily available to commuters almost everywhere. Because of time demands many commuters may also eat during their commute, which can also result in unintentional overeating.").

14 *See infra* notes 64–68 and accompanying text.

15 *See infra* Part IV.D.2.

16 *See, e.g.*, Elijah Pratt, *Stop the Sugar: Policy Considerations for an Effective Soda Tax*, TAX ANALYSTS (July 4, 2016), https://perma.cc/24ZN-7L5B.

17 *See infra* Part V.

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."[18] The World Health Organization (WHO) recognizes body mass index (BMI) as a simple way to define whether a person is overweight or obese.[19] A person with a BMI greater than or equal to twenty-five is considered overweight; a person with a BMI greater than or equal to thirty is considered obese.[20] 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.[21]

Weight gain occurs when a person ingests more calories than she expends in activity.[22] 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.[23] Another study found that increased consumption of sugary drinks significantly contributed to increasing obesity levels.[24] Liquid calories do not satisfy hunger as effectively as solid calories, so overconsumption is more likely.[25] In fact, it may surprise some readers just how much sugar beverages can contain. A twenty-ounce Mountain Dew[26] soda contains seventy-seven grams of sugar, as compared to a Cinnabon[27] cinnamon roll, which contains fifty-five grams of sugar.[28] USDA's dietary guidelines recommend consuming less than 10% of daily calories from added sugar.[29] However, added sugars currently constitute more than 13% of the average American's caloric intake, with beverages accounting for 47% of added sugars.[30]

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18 WHO Fact Sheet, *supra* note 2.

19 *Id.* 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. *Calculate Your Body Mass Index*, NAT'L HEART, LUNG, & BLOOD INST., https://perma.cc/H5KZ-2L8K (last visited July 22, 2017).

20 *Defining Adult Overweight and Obesity*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://perma.cc/58Z3-GNK7 (last updated June 16, 2016).

21 U.S. DEP'T OF AGRIC., DIETARY GUIDELINES FOR AMERICANS: 2015–2020, at 2 (2015), https://perma.cc/3J8G-SLLY [hereinafter USDA DIETARY GUIDELINES].

22 WHO Fact Sheet, *supra* note 2.

23 R. BETHENE ERVIN & CYNTHIA L. OGDEN, CONSUMPTION OF ADDED SUGARS AMONG U.S. ADULTS, 2005–2010, at 1 (2013), https://perma.cc/Y7LN-Z8N4.

24 Kelly D. Brownell & Thomas R. Frieden, *Ounces of Prevention—The Public Policy Case for Taxes on Sugared Beverages*, 360 NEW ENG. J. MEDICINE 1805, 1805 (2009).

25 Op-Ed, Katherine Tallmadge, *Stealth Assault on Health: Beverages Pack Caloric Punch*, LIVE SCI. (Aug. 6, 2013), https://perma.cc/Z4BQ-FCPM.

26 Mountain Dew is a registered trademark. MOUNTAIN DEW, Registration No. 86,883,991.

27 Cinnabon is a registered trademark. CINNABON, Registration No. 86,923,441.

28 James J. DiNicolantonio & Sean C. Lucan, *The Wrong White Crystals: Not Salt But Sugar as Aetiological in Hypertension and Cardiometabolic Disease*, OPEN HEART, OCT. 1, 2014, at 1, 5 tbl.1, https://perma.cc/KUQ7-MX8A.

29 USDA DIETARY GUIDELINES, *supra* note 21, at 30.

30 *Id.* at 54, 55 fig.2-10.

Obesity rates have increased rapidly in recent years, not just in the United States, but also around the world.[31] Worldwide obesity has more than doubled since 1980.[32] In 1960, the average weight of an American woman in her twenties was 128 pounds.[33] In 2012, the Centers for Disease Control and Prevention (CDC) reported that the average American woman weighed 166 pounds, the same as an average American man in 1960.[34] CDC also reports race and gender disparities. Black women have an average BMI of 32.0, as compared to white women with an average BMI of 28.2 and Hispanic women with an average BMI of 29.5.[35] 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 28.9, as compared to an average BMI of 28.7.[36]

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.[37] Heart disease, cancer, stroke, and diabetes are among the top ten leading causes of death.[38] Life expectancy in the United States decreased between 2014 and 2015, for the first time since 1993.[39] While average life expectancies decreased overall, the change is not evenly distributed among income groups.[40] Upper income individuals, in both the United States and worldwide, have significantly longer life expectancies than those in lower income groups.[41] Lower income groups are also more likely to be obese, with people

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31 *See* D. Withrow & D.A. Alter, *The Economic Burden of Obesity Worldwide: A Systematic Review of the Direct Costs of Obesity*, 12 OBESITY REVS. 131, 131 (2011) ("Although obesity has traditionally been associated with high caloric intake and low levels of physical activity levels in Western, high income countries, low and middle income countries are increasingly bearing the burden of these conditions." (citation omitted)).

32 WHO Fact Sheet, *supra* note 2.

33 DAVID A. KESSLER, THE END OF OVEREATING: TAKING CONTROL OF THE INSATIABLE AMERICAN APPETITE 5 (2009).

34 CTRS. FOR DISEASE CONTROL & PREVENTION, ANTHROPOMETRIC REFERENCE DATA FOR CHILDREN AND ADULTS: UNITED STATES, 2007–2010, at 8 tbl.4 (2012), https://perma.cc/YMV8-SFME; Christopher Ingraham, *The Average American Woman Now Weighs as Much as the Average 1960s Man*, WASH. POST (June 12, 2015), https://perma.cc/8LD5-6UL9.

35 CTRS. FOR DISEASE CONTROL & PREVENTION, *supra* note 34, at 18 tbl.14 (comparing the groups of females under the control "20 years and over").

36 *Id.* at 19 tbl.15 (comparing the groups of males under the control "20 years and over").

37 *Health Risks of Being Overweight*, NAT'L INST. HEALTH (Feb. 2015), https://perma.cc/BZE9-EP9M. Other literature helps explain why. *See, e.g.*, Darren E.R. Warburton et al., *Cardiovascular Disease and Osteoporosis: Balancing Risk Management*, 3 VASCULAR HEALTH RISK MGMT. 673, 674–75 (2007) (discussing the link between obesity and stoke and osteoporosis); *Overweight and Obesity*, NAT'L HEART, LUNG, & BLOOD INST., https://perma.cc/8GU4-PQAU (last updated Feb. 23, 2017) (discussing the link between obesity and heart disease, hypertension, diabetes, and cancer).

38 JIAQUAN XU ET AL., MORTALITY IN THE UNITED STATES, 2015, at 3 fig.3 (2016), https://perma.cc/A474-363A.

39 Katie Rogers, *Take a Number 78.8*, N.Y. TIMES, Dec. 13, 2016, at D5.

40 *Id.*

41 BARRY BOSWORTH ET AL., LATER RETIREMENT, INEQUALITY IN OLD AGE, AND THE GROWING GAP IN LONGEVITY BETWEEN RICH AND POOR 87 tbl.IV-4 (2016), https://perma.cc/GY3Z-48Z2; *see also* Sabrina Tavernise, *Life Spans of the Rich Leave the Poor Behind*, N.Y. TIMES, Feb. 13, 2016, at A1.

living in the poorest counties in the United States showing the highest obesity rates.[42]

While correlation does not prove causation, blacks and Hispanics have a higher poverty rate than whites or Asians.[43] U.S. Census data from 2007–2011 shows that 11.6% of whites have incomes below the poverty level, as compared to 25.8% of blacks and 23.2% of Hispanics.[44] According to 2013 USDA data, 83% of American households receiving supplemental nutrition assistance program (SNAP) benefits live in poverty, and 43% of those households have gross income at half or less of the poverty level.[45] While both SNAP and non-SNAP households have soda in their top-ten food expenditures, soda is ranked second in terms of expenditures for SNAP households and fifth for non-SNAP households.[46] Non-SNAP household expenditures on both vegetables and fruits outranked spending on soda, and the inverse was true for SNAP household expenditures.[47]

This Part has shown that obesity leads to adverse health outcomes, that poor people in the United States are more likely to suffer from obesity, and that overconsumption of sugar-sweetened beverages can lead to obesity. The next Part will focus on the link between the environment and obesity and will 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.[48] While many factors contribute to obesity, the

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42 James A. Levine, *Poverty and Obesity in the U.S.*, 60 DIABETES 2667, 2667, 2668 fig.1 (2011), https://perma.cc/3A6F-HQW3.

43 SUZANNE MACARTNEY ET AL., U.S. CENSUS BUREAU, POVERTY RATES FOR SELECTED DETAILED RACE AND HISPANIC GROUPS BY STATE AND PLACE: 2007-2011, at 13 tbl.1 (2013), https://perma.cc/L6TU-UF23.

44 *Id.* at 2–3.

45 KELSEY FARSON GRAY, U.S. DEP'T OF AGRIC., REP. NO. SNAP-14-CHAR, CHARACTERISTICS OF SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM HOUSEHOLDS: FISCAL YEAR 2013, at 13–14 (2014), https://perma.cc/FB2H-TRPS [hereinafter USDA CHARACTERISTICS].

46 STEVEN GARASKY ET AL., U.S. DEP'T OF AGRIC., FOODS TYPICALLY PURCHASED BY SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM (SNAP) HOUSEHOLDS 5 exhibit 1 (2016), https://perma.cc/GD3D-VM6F.

47 *Id.* Data like this has led to calls for reforming SNAP benefits. *See, e.g.*, Anna L. Johnson & Steven M. Sheffrin, *Rethinking the Sales Tax Food Exclusion with SNAP Benefits*, ST. TAX NOTES, Jan. 11, 2016, at 149 (analyzing the implications of non-taxability of SNAP benefits); Patricia Waldron, *Stanford Researchers Say Banning Food Stamps to Buy Sweetened Drinks Can Reduce Obesity, Diabetes*, STANFORD: FREEMAN SPOGLI INST. (June 11, 2014), https://perma.cc/8785-N6PF (reporting on the use of computerized simulations to estimate the positive effects of a ban on sweetened beverages).

48 Walker S. Carlos Poston II & John P. Foreyt, *Obesity is an Environmental Issue*, 146 ATHEROSCLEROSIS 201, 201 (1999).

study concluded that "the main factors responsible for obesity in industrialized nations are environmental."[49] 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.[50] The researchers 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.[51] In addition to overeating and physical inactivity, low socioeconomic status is predictive of obesity.[52] Consistent with the more recent USDA data cited above,[53] the study found that low-income persons eat diets that are "less nutritious, more energy-dense, and low in fruits [and] vegetables."[54] An Australian study of neighborhoods in the City of Melbourne found that those living in areas with the lowest incomes had 2.5 times the exposure to fast-food outlets compared to those living in areas with the highest incomes.[55] A similar study done in Louisiana found that black and low-income neighborhoods had increased exposure to fast food, noting that "[t]his link may suggest environmental exposure to fast food as a contribution to the high prevalence of obesity in black and low-income populations."[56] 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.[57] In the United States, people who live in the lowest income neighborhoods are the most prone to obesity, with counties with poverty rates in excess of 35% of the population having obesity rates 145% greater than wealthy counties.[58]

Julie Guthman suggests that obesity is caused by endocrine-disrupting chemicals in the environment, which she calls "obesegens."[59] She notes that obesegens "are present all along food supply chains from farm production to transportation and storage to food processing."[60] 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

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49 *Id.* at 203.

50 *Id.*

51 *Id.* at 203–04.

52 *Id.* at 205.

53 *See* GARASKY ET AL., *supra* note 46, at 13.

54 Poston II & Foreyt, *supra* note 48, at 205.

55 Daniel D. Reidpath et al., *An Ecological Study of the Relationship Between Social and Environmental Determinants of Obesity*, 8 HEALTH & PLACE 141, 144 (2002).

56 Jason P. Block et al., *Fast Food, Race/Ethnicity, and Income: A Geographic Analysis*, 27 AM. J. PREVENTATIVE MED. 211, 217 (2004), https://perma.cc/24G7-9NE3.

57 Levine, *supra* note 42, at 2667.

58 *Id.*

59 JULIE GUTHMAN, WEIGHING IN: OBESITY, FOOD JUSTICE, AND THE LIMITS OF CAPITALISM 100–01 (2011).

60 *Id.* at 109.

repellents and plastics may increase the risk of obesity.[61] Industrial activity, such as fracking, can increase exposure to endocrine disruptors in people living near such activity.[62]

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 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."[63] 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% obesity with an "overweight" population with an average BMI of 29 and 40% obesity.[64] They concluded that the overweight population would use 19% more food energy, which would result in an increase in GHG emissions of 0.27 gigatons per year.[65] In 2012, another study 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."[66] In particular, the researchers found the North American population to have the highest average body mass of any continent, "hav[ing] 6% of the world's population but 34% of world human biomass due to obesity."[67] Similarly, and perhaps not coincidentally, North America has outsized carbon emissions at 20.5% of the world total.[68]

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.[69] Junk foods, such as ice cream, pizza, grain-based desserts, and sugary drinks are mostly made of corn, soybeans, wheat, milk, and

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61 *See generally* Jerrold J. Heindel et al., *Endocrine Disruptors and Obesity*, 11 NATURE REVS. ENDOCRINOLOGY 653 (2015) (analyzing various chemicals' and plastics' effects as an "obesegen").

62 *See, e.g.*, Christopher D. Kassotis et al., *Estrogen and Androgen Receptor Activities of Hydraulic Fracturing Chemicals and Surface and Ground Water in a Drilling-Dense Region*, 155 ENDOCRINOLOGY 897, 905–06 (2014) (explaining that ground water samples collected near a fracking-dense region of Colorado exhibited more endocrine disruptors than water in reference sites in regions without fracking).

63 Sarah Catherine Walpole et al., *The Weight of Nations: An Estimation of Adult Human Biomass*, 12 BMC PUB. HEALTH 439, 444 (2012).

64 Phil Edwards & Ian Roberts, *Population Adiposity and Climate Change*, 38 INT'L J. EPIDEMIOLOGY 1137, 1137 (2009).

65 *Id.* at 1138.

66 Walpole et al., *supra* note 63, at 439.

67 *Id.* at 441.

68 *Fossil-Fuel CO_2 Emissions from North America*, CARBON DIOXIDE INFO. ANALYSIS CTR. (Sept. 26, 2012), https://perma.cc/DE2L-XGDR.

69 *Top 10 Sources of Calories in the U.S. Diet*, HARV. MED. SCH., https://perma.cc/4NUK-A6LT (last visited July 22, 2017).

meat.[70] According to a recent study, people with the highest consumption of these foods have a 37% higher risk of obesity.[71] While the federal government subsidizes these farm products, which is, in itself, a problem as will be discussed in Part IV, the focus of this Section is the environmental damage caused by such products.

Between 30% and 40% of the corn grown in the United States is used as livestock feed.[72] Another 5% of the corn is converted to high-fructose corn syrup.[73] The United States uses nearly one-third of its cropland to grow corn, more than any other single crop.[74] Corn uses more than half of all the commercial fertilizer applied to U.S. cropland.[75] Corn uses more fertilizer per acre than other major crops, and most of that fertilizer is nitrogen-based.[76] Fertilizer use has been linked to so-called dead zones in the Gulf of Mexico and the Baltic Sea.[77] Dead zones result from oxygen deficiency (hypoxia) in the water.[78] Hypoxic waters cannot support marine life, reducing fish yields.[79] Hypoxic waters are more prone to harmful algal blooms, which can contaminate shellfish and even cause breathing problems in humans.[80] Corn production directly led to 35% of U.S. nitrous oxide emissions from crops in 2008.[81] Nitrous oxide is a greenhouse gas (GHG) that is 300 times more potent than carbon dioxide.[82]

High fructose corn syrup is a sugar substitute, but sugar itself causes significant environmental damage worldwide.[83] About two-thirds of worldwide sugar comes from sugar cane, with the remainder coming from

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70 Anahad O'Connor, *How the Government Supports Your Junk Food Habit*, N.Y. TIMES: EAT WELL BLOG (July 19, 2016), https://perma.cc/AMF4-AEPB.

71 Karen R. Siegel et al., *Association of Higher Consumption of Foods Derived from Subsidized Commodities with Adverse Cardiometabolic Risk Among US Adults*, 176 JAMA INTERNAL MED. 1124, 1129 (2016).

72 *Id.* at 1125.

73 *Id.*

74 BROOKE BARTON & SARAH ELIZABETH CLARK, CERES, WATER & CLIMATE RISKS FACING U.S. CORN PRODUCTION: HOW COMPANIES & INVESTORS CAN CULTIVATE SUSTAINABILITY 6 (2014), https://perma.cc/8Y2P-V399.

75 *Id.* at 44.

76 *Id.* at 45.

77 *See id.* at 5; Roddy Sheer & Doug Moss, *What Causes Ocean "Dead Zones"?*, SCI. AM., https://perma.cc/2889-67G2 (last visited July 22, 2017) ("[A] huge dead zone in the Black Sea largely disappeared in the 1990s following the fall of the Soviet Union, after which there was a huge spike in the cost of chemical fertilizers throughout the region.").

78 Jacob Carstensen et al., *Deoxygenation of the Baltic Sea During the Last Century*, 111 PROCEEDINGS NAT'L ACAD. SCI. 5628, 5628 (2014).

79 *Id.*

80 *What Are HABs*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Dec. 14, 2016), https://perma.cc/578W-Q99K.

81 BARTON & CLARK, *supra* note 74, at 46 & exhibit 4B.

82 *Id.*

83 *See* WORLD WILDLIFE FUND, SUGAR AND THE ENVIRONMENT: ENCOURAGING BETTER MANAGEMENT PRACTICES IN SUGAR PRODUCTION 4 (2005), https://perma.cc/2UT4-7K2T [hereinafter WWF, SUGAR AND THE ENVIRONMENT] ("The cultivation and processing of sugar produce environmental impacts through the loss of natural habitats, intensive use of water, heavy use of agro-chemicals, discharge and runoff of polluted effluent and air pollution.").

sugar beets.[84] Cane sugar is grown in tropical and semi-tropical regions, while sugar beets can grow in a variety of temperate climatic conditions.[85] In the United States, farmers grow cane sugar in Florida, Louisiana, Texas, and Hawaii.[86] About 45% of U.S. sugar production comes from cane sugar, with the remaining 55% from sugar beets.[87] Farmers grow sugar beets in Colorado, Idaho, Michigan, Minnesota, Montana, Nebraska, North Dakota, Oregon, Washington, and Wyoming.[88] Both cane sugar and sugar beet cultivation cause significant soil erosion.[89] In Florida, the land has subsided six feet since the Everglades were drained in the 1920s to create the Everglades Agricultural Area.[90] The Everglades have sustained further damage from phosphorus run-off from sugar cane fields, which contribute to the growth of invasive cattails.[91] Sugar beets, particularly those grown in dryland regions like the American West, use large amounts of scarce groundwater.[92]

Soybeans, another crop used in junk food production, accounts for 19% of the nitrous oxide emissions from U.S. crops.[93] Half of the U.S. soybean crop is used to feed livestock, and the other half is used to make oils.[94] Meat and dairy production cause significant environmental damage. About 30% of the meat consumed in the United States 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.[95] About half of the GHG emissions from livestock consist of methane, a GHG that is about twenty-five times more potent than carbon dioxide.[96] One study found that cattle produced 77% of all livestock GHG emissions, with most of the emissions coming from enteric fermentation and the remainder from manure.[97] U.S.-produced cheese produces slightly more GHG emissions than pork.[98]

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84 *Id.*

85 *Sugar & Sweeteners: Background*, U.S. DEP'T AGRIC., https://perma.cc/CB4D-X5GH (last updated Apr. 28, 2017).

86 *Id.*

87 *Id.*

88 *Id.*

89 WWF, SUGAR AND THE ENVIRONMENT, *supra* note 83, at 5.

90 Dan Charles, *The Environmental Cost of Growing Food*, NAT'L PUB. RADIO (May 5, 2016), https://perma.cc/CB4D-X5GH.

91 WWF, SUGAR AND THE ENVIRONMENT, *supra* note 83, at 9.

92 Linzy Carlson & Jim Bauder, *Sugarbeet Agronomy 101*, MONT. ST. U, https://perma.cc/YT8D-EXZR (last visited July 22, 2017) ("Sugar beets require 22–28" of water during the growing season. Considering that sugarbeets are considered a moderately long-season crop, averaging more than 120 days of vegetative growth, this amount of water equates to 0.15-0.18 inches per day, on the average."); Charles, *supra* note 90.

93 BARTON & CLARK, *supra* note 74, at 46 exhibit 4B.

94 Siegel, *supra* note 71, at 1125.

95 KARI HAMERSCHLAG, MEAT EATER'S GUIDE TO CLIMATE CHANGE + HEALTH 5 (2011), https://perma.cc/V7RQ-BY8W.

96 *Id.*

97 Mario Herrero et al., *Biomass Use, Production, Feed Efficiencies, and Greenhouse Gas Emissions from Global Livestock Systems*, 110 PROCEEDINGS NAT'L ACAD. SCI. 20,888, 20,890 (2013), https://perma.cc/T76R-3NT3.

98 HAMERSCHLAG, *supra* note 95, at 6 fig.1.

Reducing intake of red meat and dairy would not only reduce GHG emissions, but it would also be expected to provide better health outcomes. 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.[99] 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.[100] Indirect health benefits might also occur due to lower use of antibiotics and improved water quality.[101]

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 reviewed, as those costs have frequently been cited as justifying taking action to control obesity.[102]

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 studies show that obesity increases healthcare costs.[103] Averaging the results of thirty-three prior studies, one report found that the incremental per person health care cost of obesity in the United States was $1,723.[104] The same report, here averaging twenty-four prior studies, found that "the cost of obesity was 42.7% greater than the cost of normal weight."[105] As a percentage of overall healthcare spending in 2008, between 4.8% and 6.2% of costs were due to overweight and obesity.[106] A more recent study using different methodology found significantly higher increases in medical expenditures due to obesity, raising healthcare costs by roughly 150%.[107] The trend of increasing healthcare costs due to obesity is

99 Henk Westhoek et al., *Food Choices, Health and Environment: Effects of Cutting Europe's Meat and Dairy Intake*, 26 GLOBAL ENVTL. CHANGE 196, 201 (2014).

100 *Id.* at 199.

101 *Id.*

102 *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, 77 (2012) (discussing junk food taxes as a way of internalizing the high health care costs of obesity); Eric A. Finkelstein et al., *The Costs of Obesity and Implications for Policymakers*, CHOICES, 3rd Quarter 2010, https://perma.cc/6FZF-XKGH (estimating the direct and indirect costs of obesity from an annual and lifetime perspective).

103 *See* Adam Gilden Tsai et al., *Direct Medical Cost of Overweight and Obesity in the USA: A Quantitative Systematic Review*, 12 OBESITY REVS. 50, 50–51 (2011) (reviewing 33 studies conducted between 1992 and 2008).

104 *Id.* at 56.

105 *Id.*

106 *Id.*

107 John Cawley & Chad Meyerhoefer, *The Medical Care Costs of Obesity: An Instrument Variables Approach*, 31 J. HEALTH ECON. 219, 224 (2012).

occurring not only in the United States, but also worldwide, with simultaneous increases in obesity in almost all countries.[108]

Studies have shown that, in addition to increasing healthcare costs, obesity reduces employee productivity.[109] 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."[110] The cost of lost productivity is, by some estimates, "several times larger than medical costs."[111]

The next Part will begin to consider approaches to controlling obesity, beginning with an examination of the food system's contribution to the problem. As one article concluded: "The 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 food much more accessible and convenient; and more persuasive and pervasive food marketing."[112]

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.[113]

Farm subsidies have a long history in the United States, and a full analysis is beyond the scope of this Article.[114] Therefore, I will only briefly describe the history of farm subsidies to illustrate how we got to where we are today. The first farm bill[115] was enacted during the Great Depression, and was designed to help farmers suffering from low prices due to overproduction of certain crops.[116] Although the original farm bill was

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108 *See* Boyd A. Swinburn et al., *The Global Obesity Pandemic: Shaped by Global Drivers and Local Environments*, 378 LANCET 804, 805 & figs.1 & 2 (2011).

109 Finkelstein, *supra* note 102.

110 Y. Claire Wang et al., *Health and Economic Burden of the Projected Obesity Trends in the USA and the UK*, 378 LANCET 815, 817 (2011).

111 *Id.*

112 Swinburn et al., *supra* note 108, at 807.

113 *See* MIKE RUSSO, U.S. PUB. INTEREST RESEARCH GRP. EDUC. FUND, APPLES TO TWINKIES: COMPARING FEDERAL SUBSIDIES OF FRESH PRODUCE AND JUNK FOOD 1, 5–6 (2011).

114 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 ENVTL. L. & POL'Y F. 389, 394–96 (2015).

115 Agricultural Adjustment Act of 1933, ch. 25, 48 Stat. 31 (codified as amended at 7 U.S.C. §§ 601–627 (2012)).

116 *See* William S. Eubanks II, *A Rotten System: Subsidizing Environmental Degradation and Poor Public Health with Our Nation's Tax Dollars*, 28 STAN. ENVTL. L.J. 213, 219 (2009)

intended to help the "yeoman farmer" idealized by Thomas Jefferson, subsequent enactments have shifted the bulk of government support to industrial farms producing a limited number of commodity crops.[117] In fact, 90% of federal farm subsidies paid between 2005 and 2014 went to just five crops: corn, cotton, wheat, rice, and soybeans.[118] 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 vegetables for poorer Americans, and the obesity epidemic."[119] 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.[120] The most recent farm bill,[121] enacted in 2014, received mixed reviews, with some noting that the bill primarily benefits large agribusinesses[122] and others commenting "[it] [c]ould [h]ave [b]een [w]orse."[123]

Sugar is also a major constituent of junk food, but the U.S. government does not technically subsidize sugar.[124] However, the U.S. government does provide substantial support for the sugar industry by providing non-recourse loans to sugar processors and import quotas to reduce the amount of competition from imported sugar.[125] About 70% of the sugar consumed in the United States is produced in the United States.[126] 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

(describing that, "[i]n essence, the 1933 Farm Bill was designed to save small farming in America").

117 *Id.* at 216, 219, 221–27.

118 DENNIS A. SHIELDS, CONG. RESEARCH SERV., R43448, FARM COMMODITY PROVISIONS IN THE 2014 FARM BILL (P.L. 113-79) 2 (2014), https://perma.cc/9F85-9WJP.

119 Eubanks II, *supra* note 116, at 239.

120 *See* Julian M. Alston et al., *Farm Policy and Obesity in the United States*, CHOICES, 3rd Quarter 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"); Michael Pollan, *You Are What You Grow*, N.Y. TIMES (Apr. 22, 2007), https://perma.cc/6TEE-DRYR.

121 Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649 (codified as amended in scattered sections of 7 and 16 U.S.C.).

122 *See, e.g.*, Lynne Rossetto Kasper, *NYU's Marion Nestle: Farm Bill Benefits Agribusiness, Not Small Family Farms*, SPLENDID TABLE (Feb. 20, 2014), https://perma.cc/RD6S-5FE3 (interviewing Marion Nestle, Paulette Goddard Professor of Nutrition, Food Studies, and Public Health at New York University).

123 Editorial, *The Farm Bill Could Have Been Worse*, N.Y. TIMES, Jan. 30, 2014, at A26.

124 *Policy*, U.S. DEP'T AGRIC., https://perma.cc/EZ7K-GTAT (last updated Nov. 1, 2016) ("The U.S. sugar program uses price supports, domestic marketing allotments, and tariff-rate quotes (TRQs) to influence the amount of sugar available to the U.S. market.").

125 MARK A. MCMINIMY, CONG. RESEARCH SERV., R43998, U.S. SUGAR PROGRAM FUNDAMENTALS 1–6 (2016), https://perma.cc/676Q-NMN2.

126 *Sugar and Sweeteners Yearbook Tables: Table 1—World Sugar Production, Supply, and Distribution*, U.S. DEP'T AGRIC., https://perma.cc/Y52S-N6QP (last updated Aug. 4, 2017) (providing that only 23,000 metric tons were exported in 2016–2017, while 128,000 metric tons were exported in 2000–2001).

prices for sugar are too low,[127] and the Sugar Users Association (representing companies that use sweeteners in their products) complaining that prices are too high.[128]

If farm subsidies do lead to obesity, one 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,[129] like the top four chicken producers who saved nearly $9 billion on feed costs between 1996 and 2006.[130] However, one report argued that removing subsidies would do little to discourage producers of junk food but, instead, would harm small farmers.[131]

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.[132] 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.[133] The farm bill contains a number of conservation programs, including some mandatory programs such as sodbuster, swampbuster, and sodsaver.[134] In total, the conservation programs constitute 6% of the total projected federal spending under the 2014 Farm Bill.[135] Sodbuster applies to highly erodible land.[136] 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.[137] Swampbuster applies in a similar manner to wetlands.[138] Sodsaver applies to farmers who cultivate crops on native sod in

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127 *See generally Foreign Subsidies: Jeopardizing Free Trade and Harming American Farmers: Hearing Before the H. Comm. On Agric.*, 114th Cong. (2015) (statement of Jack Roney, Director of Economics and Policy Analysis, American Sugar Alliance).

128 MCMINIMY, *supra* note 125, at 14–15.

129 Daniel Imhoff, *Overhauling the Farm Bill: The Real Beneficiaries of Subsidies*, ATLANTIC (Mar. 21, 2012), https://perma.cc/V487-83GZ. *See also* Timothy A. Wise, *Identifying the Real Winners from U.S. Agricultural Policies* 1–2 (Global Dev. & Env't Inst., Working Paper No. 05-07, 2005), https://perma.cc/2554-N8NB.

130 *Feeding the Factory Farm*, TUFTS U., https://perma.cc/4GAX-GNGZ (last visited July 22, 2017).

131 FOOD & WATER WATCH & PUB. HEALTH INST., DO FARM SUBSIDIES CAUSE OBESITY?: DISPELLING COMMON MYTHS ABOUT PUBLIC HEALTH AND THE FARM BILL 11 (2011), https://perma.cc/2P65-KVFR ("When the government stopped managing commodity supplies, overproduction and low prices became the norm. Current federal farm programs do nothing to stop this treadmill.").

132 *See* Morath, *supra* note 114, at 390 (stating that the farm bill is an integral part of the complex U.S. food system).

133 *See* MEGAN STUBBS, CONG. RESEARCH SERV., R43504, CONSERVATION PROVISIONS IN THE 2014 FARM BILL (P.L. 113-79) 6 tbl.1 (2014), https://perma.cc/P6MQ-CADR (noting the prohibitions on producers receiving federal program benefits when conservation requirements are not met).

134 *Id.*

135 *Id.* at 4.

136 *Id.* at 14.

137 *Id.* at 14–15.

138 *Id.* at 15.

Minnesota, Iowa, North Dakota, South Dakota, Montana, and Nebraska.[139] Violation of sodsaver results in a reduction in federal crop insurance benefits.[140] While these mandatory programs have had a beneficial effect by certain measures,[141] if the 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.

The U.S. government also provides food assistance to food-insecure households through various programs, some of which are based in the farm bill.[142] In 2014, about 14% of U.S. households were food insecure, defined as households that "had reduced the quality, variety, and desirability of their diets."[143] In addition, 5% of the households had very low food security, defined as households in which, "[a]t 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."[144] SNAP is the primary food assistance program in the farm bill[145] and "is the largest of the . . . domestic food and nutrition assistance programs administered by [USDA]."[146] Recipients must meet several income tests to be eligible for SNAP benefits.[147] 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.[148] During 2013, $76.1 billion in SNAP benefits were delivered to eligible households.[149] SNAP is administered by the Food and Nutrition Service (FNS), a branch of USDA whose mission is "to provide children and needy families with improved access to food and a more healthful diet."[150]

As noted earlier in this Article, people living in the poorest counties in the United States have the highest obesity rates.[151] Furthermore, a USDA report indicates that SNAP recipients are spending a large portion of their benefits (about 20%) on a broad category of junk foods, including sweetened

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139 *Id.* at 17.

140 *Id.* at 2.

141 *See* MEGAN STUBBS, CONG. RESEARCH SERV., R42459, CONSERVATION COMPLIANCE AND U.S. FARM POLICY 11 (2016), https://perma.cc/2AG8-4PPA (noting that between 1982 and 2012, farmers reduced total cropland soil erosion by 44%).

142 RANDY ALISON AUSSENBERG & KIRSTEN J. COLELLO, CONG. RESEARCH SERV., R42353, DOMESTIC FOOD ASSISTANCE: SUMMARY OF PROGRAMS 6, 9–10 tbl.1 (2017), https://perma.cc/ZT2Z-S7GE.

143 *Id.* at 2.

144 *Id.*

145 *Id.* at 7.

146 USDA CHARACTERISTICS, *supra* note 45, at xv.

147 *See* AUSSENBERG & COLELLO, *supra* note 142, at 9 tbl.1 ("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 [fiscal year] 2016) liquid assets under $2,250 (assets under $3,250 if elderly or disabled household members).").

148 *Supplemental Nutrition Assistance Program (SNAP): Eligible Food Items*, U.S. DEP'T AGRIC. (Mar. 22, 2017), https://perma.cc/G5EU-QSW4 [hereinafter *SNAP Eligible*].

149 USDA CHARACTERISTICS, *supra* note 45, at xv ("The average monthly SNAP benefit for all participating households in fiscal year 2013 was $275.").

150 GARASKY ET AL., *supra* note 46, at 7.

151 *See supra* notes 41–42 and accompanying text.

beverages, desserts, salty snacks, candy, and sugar.[152] 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.[153] Although many cities, states, and medical groups have urged limiting the use of SNAP benefits, USDA has denied every request.[154] USDA has valid reasons for concern, as any new restriction on SNAP eligible foods could "increase the embarrassment and stigma associated with SNAP use and thereby deter SNAP use."[155] In a 2007 report, 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.[156]

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. The study randomized study participants into four groups: one received incentives to purchase fruits and vegetables; the 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.[157] After following the groups for three months, researchers found that only the third, the "incentive plus restriction" group, ate significantly fewer prohibited foods and more fruits and vegetables, while consuming about ninety-six fewer calories per day.[158] 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.[159] SNAP-eligible foods are exempt from sales taxes in the thirty-three states

152 GARASKY ET AL., *supra* note 46, at 4.

153 *SNAP Eligible*, *supra* note 148.

154 Anahad O'Connor, *In the Shopping Cart of a Food Stamp Household: Lots of Soda*, N.Y. TIMES, Jan. 14, 2017, at A1.

155 Anne Barnhill, *Impact and Ethics of Excluding Sweetened Beverages from the SNAP Program*, 101 AM. J. PUB. HEALTH 2037, 2038 (2011), https://perma.cc/V9F8-MCER.

156 U.S. DEP'T OF AGRIC., IMPLICATIONS OF RESTRICTING THE USE OF FOOD STAMP BENEFITS (2007), https://perma.cc/X3SU-RWPY.

157 Lisa Harnack et al., *Effects of Subsidies and Prohibitions on Nutrition in a Food Benefit Program: A Randomized Clinical Trial*, 176 JAMA INTERNAL MED. 1610, 1611 (2016).

158 *Id.* at 1614, 1615 tbl.3.

159 *See* Barnhill, *supra* note 155, at 2040 ("[E]xcluding sweetened beverages from SNAP effectively increases the price of soft drinks for SNAP participants by at least 5.2% on average.").

that impose taxes on food.[160] Excluding a food from SNAP benefits would subject that product to sales taxes where applicable, which would increase the price, in theory decreasing demand.[161] As will be further described below, whether consumers notice the increase in cost may depend on the way the tax is designed.[162]

B. Regulatory Approaches

Regulatory approaches specifically targeted towards obesity in the United States are usually aimed at children.[163] This approach has scientific validity, as studies have shown that obese children tend to become obese adults.[164] At the federal level, regulations specify nutrition standards for all food sold in primary and secondary schools.[165] Originally, the rules applied to free or reduced meals provided to low-income students under the National School Lunch Program (NSLP), which provides over thirty-one million meals a day to qualifying children.[166] In recognition that many schools offered competitive lunches, in 2013, FNS issued regulations that extended the rules to all food sold in schools, in compliance with the Healthy, Hunger-Free Kids Act of 2010.[167] The proposed rules 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."[168] The proposed rules also cited research that found that

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160 *Id.*; *see also* Johnson & Sheffrin, *supra* note 47, at 151–52 (explaining the Constitutional basis for requiring states to not tax purchases made by individuals under SNAP).

161 *See, e.g.*, TIMOTHY TAYLOR, THE INSTANT ECONOMIST: EVERYTHING YOU NEED TO KNOW ABOUT HOW THE ECONOMY WORKS 15 (2012) ("When economists talk about demand for a good, they're referring to the relationship between the price of the good and the quantity of that good that's demanded. For most goods, most of the time, as the price of the good goes up, the quantity demanded tends to drop.").

162 *See infra* Part IV.D.2. *See also* Raj Chetty et al., *Salience and Taxation: Theory and Evidence*, 99 AM. ECON. REV. 1145, 1146 (2009) (analyzing the effect of "salience" on consumer behavior responses to commodity taxation).

163 INST. OF MED. OF THE NAT'L ACADS., ACCELERATING PROGRESS IN OBESITY PREVENTION: SOLVING THE WEIGHT OF THE NATION 250–54 (Dan Glickman et al. eds., 2012), https://perma.cc/8RPL-MUS6.

164 *See, e.g.*, Solveig A. Cunningham et al., *Incidence of Childhood Obesity in the United States*, 370 NEW ENG. J. MED. 403, 409 (2014); *see also* Gina Kolata, *Obesity Is Found to Gain Its Hold in Earliest Years*, N.Y. TIMES, Jan. 30, 2014, at A1.

165 *See, e.g.*, 7 C.F.R. § 210.11(c) (2016).

166 U.S. DEP'T OF AGRIC., NATIONAL SCHOOL LUNCH PROGRAM ¶ 1 (2013), https://perma.cc/X7WT-KLKR.

167 Pub. L. No. 111-296, 124 Stat. 3183 (codified as amended in scattered sections of 7 and 42 U.S.C.); 7 C.F.R. § 210.11; National School Lunch Program and School Breakfast Program: Nutrition Standards for All Foods Sold in School as Required by the Healthy, Hunger-Free Kids Act of 2010, 78 Fed. Reg. 9530 (Feb. 8, 2013) (to be codified at 7 C.F.R. pts. 210 and 220).

168 National School Lunch Program and School Breakfast Program: Nutrition Standards for All Foods Sold in School as Required by the Healthy, Hunger-Free Kids Act of 2010, 78 Fed. Reg. at 9544.

"[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."[169] Under the final rules, acceptable "competitive foods" must have less than or equal to 35% calories from fat, less than 10% of calories from saturated fat, and less than or equal to 35% of sugar by weight.[170] Sugar-added beverages may not contain more than sixty calories per twelve fluid ounces.[171]

At the state level, an examination of the CDC's website shows sixty legislative or regulatory initiatives in twenty-eight states that address obesity by focusing on sugar-sweetened beverages.[172] Most of these policies relate to children.[173] For example, a regulation in New York prohibits child-care centers from serving sugar-sweetened beverages.[174] In California, the California Childhood Obesity Prevention Act[175] prohibits the sale of sugar-sweetened beverages in schools.[176] Massachusetts, North Carolina, Oregon, Arkansas, and Oklahoma all restrict foods that may be served to children in schools.[177] The New York General Assembly has proposed legislation that would take a comprehensive approach to the obesity problem. The Omnibus Obesity and Respiratory Illness Reduction Act[178] would, inter alia,

> promote[] the availability of healthy foods and beverages; regulat[e] . . . 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.[179]

One of the most famous regulatory attempts at controlling obesity was New York City's so-called "soda ban."[180] This was not a ban per se, but rather a rule limiting the size of sodas to sixteen ounces.[181] The "Portion Cap Rule"

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169 *Id.*

170 7 C.F.R. 210.11(f).

171 *Id.* § 210.11(m)(viii).

172 *Chronic Disease State Policy Tracking System*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://perma.cc/A4B3-FE72 (last visited July 22, 2017) (select Filter Options: health category (obesity), policy topics (sugar- sweetened beverages), status (enacted)).

173 Forty-nine out of sixty policies are in either the early care and education setting or the school/after school setting. *See id.* (filter above search criteria by setting).

174 *See* N.Y. COMP. CODES R. & REGS. tit. 18, § 418-2.12 (2016).

175 2003 Cal. Stat., ch. 415 (codified at Cal. Educ. Code §§ 49431–49431.5 (2016)).

176 CAL. EDUC. CODE § 49431.5 (West 2017) (providing elementary and middle school beverage restrictions); *id.* § 49431.2 (providing middle school and high school food restrictions).

177 *See* MASS. GEN. LAWS ANN. ch. 111, § 223 (West 2017); N.C. GEN. STAT. ANN. § 115C-264.3 (West 2017); OR. REV. STAT. ANN. § 336.423 (West 2017); 005-15-15 ARK. CODE R. § 8.00 (LexisNexis 2017); OKLA. ADMIN. CODE § 210:10-3-112 (2017).

178 A.B. 5037, 239th Gen Assemb., Reg. Sess. (N.Y. 2017).

179 *A05037 Summary*, N.Y. ST. ASSEMBLY, https://perma.cc/JEH8-DHV9 (last visited July 22, 2017) (summarizing the Omnibus Obesity and Respiratory Illness Reduction Act).

180 N.Y.C., N.Y., HEALTH CODE § 81.53, *repealed* Mar. 10, 2015; Michael M. Grynbaum, *Health Panel Approves Restriction on Sale of Large Sugary Drinks*, N.Y. TIMES, Sept. 14, 2012, at A24.

181 *Id.*

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.[182] 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.[183]

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.[184] Professor Shi-Ling Hsu estimated that the profits of the Coca-Cola Company in New York City alone to be $240 million per year.[185] Fountain drinks, which are made at food service establishments by mixing carbonated water with syrup, were estimated to have an astonishing 90% profit margin.[186] 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.[187] Although the Portion Cap Rule would have been effective in reducing the costs of obesity, it could not last against the well-funded opposition.[188] This would have been no surprise to researchers studying barriers to state action against childhood obesity. When researchers interviewed state policymakers, the policymakers cited the influence of lobbyists for manufacturers of unhealthy foods and beverages as the most significant barrier to anti-obesity legislation.[189]

C. Nudges

According to behavioral economists, a "nudge" is a strategy used by "choice architects" to help people make better decisions.[190] 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."[191] Researchers have found nudges to be effective in

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182 *See* Shi-Ling Hsu, *A Cost-Benefit Analysis of Sugary Drink Regulation in New York City*, 10 J. FOOD L. & POL'Y 73, 74 (2014) (citing N.Y.C., N.Y. HEALTH CODE § 81.03(a)–(c), (s)).

183 N.Y. Statewide Coal. of Hispanic Chambers of Commerce v. N.Y.C. Dep't of Health & Mental Hygiene, 16 N.E.3d 538, 549 (N.Y. 2014).

184 *See* Michael M. Grynbaum, *Fighting Soda Rule, Industry Focuses on Personal Choice*, N.Y. TIMES, July 2, 2012, at A10 (noting the industry created a coalition called "New Yorkers for Beverage Choices).

185 Hsu, *supra* note 182, at 81 & n.33.

186 *Id.* at 80.

187 *Id.* at 104.

188 Maura Kennelly et al., *Addressing Supersized Sugary Drink Portion Sizes: New York City's (NYC) Portion Cap Rule*, AM. PUB. HEALTH ASS'N (Nov. 5, 2013), https://perma.cc/CW32-C2N7.

189 Elizabeth A. Dodson et al., *Preventing Childhood Obesity Through State Policy: Qualitative Assessment of Enablers and Barriers*, 30 J. PUB. HEALTH POL'Y S161, S170 (2009).

190 *See* RICHARD H. THALER & CASS R. SUNSTEIN, NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 3–4 (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.

191 *Id.* at 3.

encouraging healthy eating.[192] For example, one study showed that placing foods first on a buffet line "dramatically biases what [foods] diners take."[193] 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.[194] Even USDA has recognized that behavioral economics affects dietary choices.[195]

Humans have a strong tendency to accept default options.[196] Whether in a restaurant or home setting, portion size can significantly affect caloric intake.[197] A recent study found that plate size had "a considerable effect overall on amount self-served and consumed."[198] 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.[199] Restaurants, in particular, advertise large portions as a way of providing value to their customers.[200] Unsurprisingly, studies show that supersized portions lead to increased consumption.[201] 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.[202] 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,[203] 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

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192 *See, e.g.*, Jessica Wisdom et al., *Promoting Healthy Choices: Information Versus Convenience*, AM. ECON. J.: APPLIED ECON., Apr. 2010, at 164, 164–65.

193 Brian Wansink & Andrew S. Hanks, *Slim by Design: Serving Healthy Foods First in Buffet Lines Improves Overall Meal Selection*, PLOS ONE 4 (Oct. 23, 2013), https://perma.cc/7ZFF-QEMR.

194 *Id.* at 3–4.

195 DAVID R. JUST ET AL., U.S. DEP'T OF AGRIC., REP. NO. 43, COULD BEHAVIORAL ECONOMICS HELP IMPROVE DIET QUALITY FOR NUTRITION ASSISTANCE PROGRAM PARTICIPANTS?, at iii–iv (2007), https://perma.cc/DBZ3-CKEU.

196 THALER & SUNSTEIN, *supra* note 190, at 8.

197 *See* Pierre Chandon, *How Package Design and Packaged-Based Marketing Claims Lead to Overeating*, 35 APPLIED ECON. PERSP. & POL'Y, 13–18 (2013) ("With the exception of children under three, larger serving sizes significantly increase consumption." (citation omitted)).

198 Stephen S. Holden et al., *Whether Smaller Plates Reduce Consumption Depends on Who's Serving and Who's Looking: A Meta-Analysis*, 1 J. ASS'N FOR CONSUMER RES. 134, 142 (2016).

199 Brian Wansink et al., *Bottomless Bowls: Why Visual Cues of Portion Size May Influence Intake*, 13 OBESITY RES. 93, 96 (2005).

200 W.M. Vermeer et al., *Small, Medium, Large or Supersize? The Development and Evaluation of Interventions Targeted at Portion Size*, 38 INT'L J. OBESITY S13, S13 (2014).

201 *Id.*

202 Paul W. Dobson & Eitan Gerstner, *For a Few Cents More: Why Supersize Unhealthy Food?*, 29 MARKETING SCI. 770, 773 (2010).

203 *See* 21 C.F.R. § 101.1 (2016). The final rule received over 500 comments. *See* Food Labeling: Revision of the Nutrition and Supplement Facts Labels, 81 Fed. Reg. 33,742, 33,971 (May 27, 2016) (responding to comment number 544).

can then exercise free choice about whether or not to consume the product.[204] USDA noted that "[h]istorically, providing information about diet and health has been the most widely used tool to help consumers make more healthful food choices."[205] The federal Nutrition Labeling and Education Act[206] (NLEA) requires that all packaged food bear a nutrition label stating: 1) the serving size or other common household unit; 2) the number of servings per container; 3) the number of calories per serving and derived from total fat and saturated fat; 4) the amount of total fat, cholesterol, sodium, total carbohydrates, sugars, added sugars, total protein, and dietary fiber per serving or other unit; and 5) the vitamins, minerals, or other nutrients.[207]

Each of the caloric amounts listed must also be expressed as a percentage of recommended daily amounts.[208] States are not in the food labeling business, as the NLEA generally prohibits states from establishing or enforcing any labeling requirement for a food that is not identical to the federal act.[209] The European Union also requires nutrition labeling in a similar format.[210] 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.[211] 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,[212] as the example below shows.

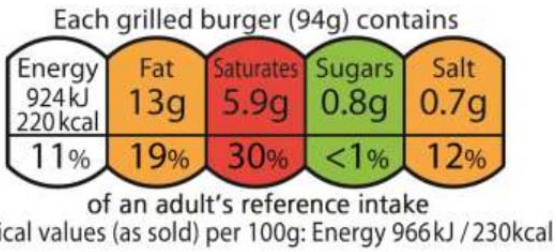

Figure 1: Illustration of a model "signposting system"[213]

204 *See* H.R. REP. NO. 101-538, at 7–8 (1990) (describing the purpose of the Nutrition Labeling and Education Act).

205 JUST ET AL., *supra* note 195, at 4.

206 Nutrition Labeling and Education Act of 1990, Pub. L. No. 101-535, 104 Stat. 2353 (codified as amended in scattered sections of 21 U.S.C.)

207 21 U.S.C. § 343(q)(1) (2012).

208 21 C.F.R. § 101.9(d)(6).

209 21 U.S.C. § 343–1(a).

210 Council Regulation 1169/2011 of Oct. 25, 2011, Food Information to Consumers, art. 30, 2011 O.J. (L 304).

211 DEP'T OF HEALTH ET AL., GUIDE TO CREATING A FRONT OF PACK (FOP) NUTRITION LABEL FOR PRE-PACKED PRODUCTS SOLD THROUGH RETAIL OUTLETS 6, 10, 31 (2016), https://perma.cc/3R7V-P39J.

212 *Id.* at 21.

213 *Id.* Please visit *Environmental Law*'s online database to view the image with color, which more accurately reflects the signposting system. http://elawreview.org/articles/.

Nutrition labeling is no panacea for the problems caused by obesity, such as ill health and environmental degradation. One researcher said, "there is little compelling scientific evidence that health information alone is effective in reducing risky behaviours."[214] Another study conducted in Europe found that "[c]onsumers' attention and motivation remain major barriers to using nutrition labels, thus limiting any potential impact on health."[215] A study of French adults showed that the signposting labels were more effective than the GDA labels in communicating nutritional information.[216] 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.[217] Impatient people would be more likely to read clearer labels but would also tend to be significantly influenced by food cost.[218]

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 ten pounds with a bonus of about $280 if the resident kept the weight off for five months.[219] A doctor in Virginia pays his patients a dollar per pound lost.[220] The National Health Service in the United Kingdom paid up to £425 to patients who signed up for a thirteen-month weight loss program,

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214 Matteo M. Galizzi, *Label, Nudge or Tax? A Review of Health Policies for Risky Behaviours*, 1 J. PUB. HEALTH RES. 14, 15 (2012).

215 Stefan Storcksdieck genannt Bonsmann & Josephine M. Wills, *Nutrition Labeling to Prevent Obesity: Reviewing the Evidence from Europe*, 1 CURRENT OBESITY REPS. 134, 137 (2012) (citations omitted).

216 Pauline Ducrot et al., *Effectiveness of Front-of-Pack Nutrition Labels in French Adults: Results from the NutriNet-Santé Cohort Study*, PLOS ONE 12 (Oct. 28, 2015), https://perma.cc/Z6ZD-3ZS4; *see also Obesity and the Economics of Prevention: Fit not Fat - France Key Facts*, ORGANISATION FOR ECON. CO-OPERATION & DEV., https://perma.cc/ZM75-MV38 (last visited July 22, 2017) (noting also that obesity rates in France are among the lowest in the OECD).

217 Charles J. Courtemanche et al., *Impatience, Incentives and Obesity*, 125 ECON. J 1, 28–29 (2015).

218 *See id.* at 30–31 ("As economic factors lower the opportunity cost of food consumption, impatient individuals gain weight while the most patient individuals do not.").

219 *Italian Town to Pay Residents to Shed Flab*, REUTERS, Aug. 13, 2007, https://perma.cc/9LSL-Q5JR.

220 Veronica Chufo, *Doctor Pays Patients to Lose Weight*, DAILY PRESS (July 10, 2010), https://perma.cc/L2S3-DQ6S (noting the program also costs patients a dollar for every pound gained).

seven months to lose weight and six months to keep it off.[221] Private programs and private citizens enter into agreements to get paid for losing weight or pay for gaining weight.[222] The latter strategy may be more effective.[223] Yale economists Dean Karlan and Ian Ayres created a website (www.stickK.com) where anyone can define a goal (e.g., to lose weight) and create both financial incentives for reaching the goal and financial penalties for failure.[224] Having financial stakes increases the probability of success.[225] In a randomized trial comparing monthly weigh-ins, participants were assigned to either a lottery incentive program, or a deposit contract in which the participants deposited their own money.[226] Lottery incentive participants received a chance to win a daily lottery if they were, at the time of the lottery, meeting their weight loss goal.[227] In the deposit contract alternative, the participants would lose their deposit if they failed to achieve their goal.[228] The trial found that the odds of achieving the weight loss goal were significantly greater in both the deposit group and the lottery group.[229] 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.[230] In the case of unhealthy food, the cost of such food does not reflect the societal and environmental costs of obesity.[231] 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

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221 Nick Allen, *NHS Pays Overweight People £425 to Lose Weight*, TELEGRAPH (Apr. 12, 2009), https://perma.cc/JZ4G-4LLM.

222 *See* Michael S. Rosenwald, *An Economy of Scales: Paying People to Lose Weight Helps Drop Pounds and Health-Care Costs*, WASH. POST (Nov. 11, 2007), https://perma.cc/KU66-W2NW (describing some of the various programs and agreements people enter to lose weight).

223 *See* Alex Imas et al., *Do People Anticipate Loss Aversion?* 36–38 (Stanford Univ. Inst. for Theoretical Econ., Working Paper, 2015), https://perma.cc/5GM9-88EX (explaining how people selectively enter into loss contracts as a commitment device to improve performance).

224 Temma Ehrenfeld, *A New Way to Lose Weight and Keep It Off*, PSYCHOLOGY TODAY (Mar. 25, 2016), https://perma.cc/D75E-JE7N.

225 *Id.* (citing *FAQ – About stickK*, https://perma.cc/39GP-5ZSS (last visited July 22, 2017)).

226 Kevin G. Volpp et al., *Financial Incentive-Based Approaches for Weight Loss: A Randomized Trial*, 300 JAMA 2631, 2632–34 (2008).

227 *Id.* at 2633.

228 *Id.* at 2632–33.

229 *Id.* at 2634–35.

230 *See* ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE 192–93 (4th ed. 1932) (describing situations where social costs and private costs diverge).

231 *See* Brownell & Frieden, *supra* note 24, at 1806 ("The contribution of unhealthful diets to health care costs is already high and is increasing—an estimated $79 billion is spent annually for overweight and obesity alone—and approximately half of these costs are paid by Medicare and Medicaid, at taxpayers' expense.").

found that for every 10% increase in the price of sugar-sweetened beverages, consumption decreases by 7.8%.[232]

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."[233] However, scholars and policymakers have concluded that food taxes are the most likely to succeed solution to the obesity epidemic.[234] 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."[235] Yale research scientists Michelle Novak and Kelly Brownell agreed, stating, "[f]iscal interventions like taxes can be a powerful tool to improve the economic landscape of the food environment."[236] 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.[237]

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.[238] Should the focus be on sugar-sweetened beverages or fats? Should it be imposed by volume or sugar content? Perhaps the most simply expressed solution would be to tax calories, irrespective of their source, similar to a carbon tax.[239] How should the revenue from such taxes be directed—to reducing other taxes or to

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232 *Id.*

233 Victor Fleischer, *Curb Your Enthusiasm for Pigovian Taxes*, 68 VAND. L. REV. 1673, 1676–77 (2015) (discussing limits of taxes designed to change public behavior).

234 *See, e.g.*, Robert H. Lustig et al., *The Toxic Truth About Sugar*, 482 NATURE 27, 28–29 (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").

235 WORLD HEALTH ORG., FISCAL POLICIES FOR DIET AND PREVENTION OF NONCOMMUNICABLE DISEASES 11 (2016), https://perma.cc/E2XB-WGGF [hereinafter WHO FISCAL POLICIES].

236 Nicole L. Novak & Kelly D. Brownell, *Role of Policy and Government in the Obesity Epidemic*, 126 CIRCULATION: J. AM. HEART ASS'N 2345, 2349 (2012).

237 DONALD MARRON ET AL., TAX POLICY CTR., SHOULD WE TAX UNHEALTHY FOODS AND DRINKS? 18 (2015), https://perma.cc/UBH8-52XE.

238 *Id.* at 15.

239 *See* WILLIAM A. BOGART, REGULATING OBESITY?: GOVERNMENT, SOCIETY, AND QUESTIONS OF HEALTH 115 (2013) (citing Abigail M. Okrent & Julian M. 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 by Okrent and Alston found that a calorie tax was more efficient than a sugar tax. Okrent & Alston, *supra*, at 633. It is worth noting that 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? It would undoubtedly make it difficult to split restaurant checks with friends, unless Venmo adds a calorie function to its check-splitting app. Teddy Wayne, *An App for Our Inner Cheapskate*, N.Y. TIMES, July 23, 2017, at ST2. Venmo is a registered trademark. VENMO, Registration No. 86,933,056.

providing health services? The next Part 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.[240] However, like regulatory efforts, these taxes have been met with mixed success.[241] 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.[242] Governments can choose to design nutrition taxes to tax content, volume, or sales, and the design choice can change the response to the tax.[243]

According to several empirical studies, existing sales taxes have not had much effect on obesity rates.[244] In general, sales taxes do not significantly affect consumer behavior—in other words, sales taxes lack salience.[245] 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.[246] Therefore, although sales taxes on junk food like soda are relatively widespread,[247] this analysis will focus on food excise taxes.[248]

Denmark, the country that brought the world one of its first carbon taxes in 1992,[249] enacted the first "fat tax" in 2011.[250] Although Denmark's carbon tax is alive and well, its fat tax ended in 2013.[251] Denmark's fat tax added an extra three dollars per kilogram to the cost of foods containing more than 2.3% saturated fat by weight.[252] However, Danish consumers easily avoided the unpopular tax by traveling to nearby Germany and Sweden to

240 MARRON ET AL., *supra* note 237, at 8.

241 WHO FISCAL POLICIES, *supra* note 235, at 13–14.

242 *Id.* at 18.

243 MARRON ET AL., *supra* note 237, at 15.

244 *See* Jessica E. Todd & Chen Zhen, *Can Taxes on Calorically Sweetened Beverages Reduce Obesity*, CHOICES, 3rd Quarter 2010, https://perma.cc/QBQ6-SGSK (summarizing three such studies).

245 *See* Chetty et al., *supra* note 162, at 1146 (analyzing the effect of "salience" on commodity taxation and finding that "most consumers do not normally take sales tax into account").

246 *See id.*; *but see* Candice Choi & Kristen De Groot, *'Soda Tax' Stakes Escalate in Pivotal Philadelphia Fight*, U.S. NEWS (Mar. 17, 2017), https://perma.cc/8MGX-HPPT (reporting that retailers in Philadelphia are posting signs by soda displays showing the excise tax).

247 INST. OF MED. OF THE NAT'L ACADS., *supra* note 163, at 63.

248 JOINT COMM. ON TAXATION, JCX-99-15, PRESENT LAW AND BACKGROUND INFORMATION ON FEDERAL EXCISE TAXES 1 (2015), https://perma.cc/K9UX-7P7U.

249 JENNY SUMNER ET AL., CARBON TAXES: A REVIEW OF EXPERIENCE AND POLICY DESIGN CONSIDERATIONS 1, 12 (2009), https://perma.cc/BU4E-ZHFE.

250 WHO FISCAL POLICIES, *supra* note 235, at 14; Caroline Franck et al., *Taxing Junk Food to Counter Obesity*, 103 AM. J. PUB. HEALTH 1949, 1949 (2013).

251 WHO FISCAL POLICIES, *supra* note 235, at 14.

252 Franck et al., *supra* note 250, at 1949.

buy their butter and ice cream.[253] Thus, 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.[254] Finland enacted the "sweets tax" to raise revenue, not to combat obesity, but reportedly, consumption of sweets declined by about 5%.[255] Finland ended the tax in 2017, not because of homegrown criticism, but because of E.U. concerns that it violated state support rules, as exported products were exempt from the tax.[256] However, Finland's sugar-sweetened beverage tax remains in effect,[257] and under that tax, beverages containing more than 0.5% sugar are taxed at €0.22 per liter (volume).[258]

Hungary, in many ways, represents a success story for food taxes. Hungary enacted the Public Health Product Tax[259] (PHPT) in 2011. The PHPT taxes "non-staple food products that carry proven health risks when consumed."[260] Hungary based the tax on the Pigovian principle that the producers of unhealthy foods should bear part of the burden for public health costs created by their products.[261] Products covered by the PHPT include soft drinks with more than eight grams of sugar and less than 25% fruit content, pre-packaged candies, chocolate products with high sugar but low cocoa content, salty snacks, and other foods with high salt content.[262] 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.[263] According to a WHO report published in 2012, 40% of manufacturers changed their ingredients, and 12% completely eliminated the

253 Stephanie Strom, *Fat Foods Tax Is Repealed in Denmark*, N.Y. TIMES, Nov. 13, 2012, at B4.

254 Elin Hofverberg, *Finland: Tax on Chocolate and Sweets to be Eliminated 2017*, LIBR. CONGRESS (Oct. 7, 2015), https://perma.cc/8XXD-C248.

255 *Id.*

256 *See* WHO FISCAL POLICIES, *supra* note 235, at 15 (explaining that exported products were exempt from the excise taxes); Hofverberg, *supra* note 254.

257 Hofverberg, *supra* note 254.

258 WHO FISCAL POLICIES, *supra* note 235, at 15.

259 2011. (évi CIII.) törvény a népegészségügyi termékadóról (Act CIII of 2011 on Public Health Product Tax) (Hung.).

260 WHO FISCAL POLICIES, *supra* note 235, at 15.

261 *See* WORLD HEALTH ORG., ASSESSMENT OF THE IMPACT OF A PUBLIC HEALTH PRODUCT TAX 3 (2015), https://perma.cc/X588-3NVM (explaining that the tax affected producers by decreasing "the supply and turnover of products containing ingredients with proven harmful effects on health"); *Food Taxes—What is Their Impact?*, EUR. POL'Y CTR. (Nov. 25, 2014), https://perma.cc/Y4NM-FQCG; *see also supra* notes 230–231 and accompanying text.

262 FERENC NEMES, U.S. DEP'T OF AGRIC., GLOBAL AGRICULTURAL INFORMATION NETWORK, H1103, CHIPS TAX FOR A HEALTHIER DIET 2 (2011), https://perma.cc/P2B8-B5XE.

263 Suzanne Daley, *Hungary Tries a Dash of Taxes to Promote Healthier Eating Habits*, N.Y. TIMES, Mar. 3, 2013, at A6.

unhealthy, taxed ingredients.[264] WHO noted that "[h]ealthier products due to product reformulation are a positive consequence of tax avoidance."[265]

The Hungarian government, working with WHO, has been monitoring the impact of this tax, and WHO issued a final report in November 2015.[266] According to the study, between 11% and 28% of Hungarian consumers changed their consumption patterns as a result of the tax.[267] 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."[268] The study also found that overweight and obese people were more likely to change their consumption.[269] "Price increase was more likely to be selected as the reason for reduced consumption by people with [lower] education[al]" attainment.[270] The PHPT is levied on about 750 companies, and the top fifty companies pay about 90% of the total tax.[271] The PHPT raised about €200 million over the four-year study period, which was roughly in line with the predicted revenue.[272] Hungary directs all revenues from the PHPT to a public health fund, which has increased the wages of ninety-five thousand health care workers.[273]

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.[274] 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."[275] Second, it is imposed at the company level, which reduces the administrative burden of collecting the tax.[276] Third, the revenues are directed towards health care initiatives, thereby linking the tax to its

264 WORLD HEALTH ORG., PUBLIC HEALTH PRODUCT TAX IN HUNGARY: AN EXAMPLE OF SUCCESSFUL INTERSECTORAL ACTION USING A FISCAL TOOL TO PROMOTE HEALTHIER FOOD CHOICES AND RAISE REVENUES FOR PUBLIC HEALTH (2015), https://perma.cc/NE3N-69AL.

265 *Id.*

266 *See generally* WORLD HEALTH ORG., *supra* note 261.

267 *Id.* at 5.

268 *Id.* at 6.

269 *Id.* at 8.

270 *Id.* at 14.

271 *Id.* at 16 & tbl.3.

272 *Id.* at 15 & fig.19.

273 *Id.* at 18.

274 NORTON FRANCIS ET AL., THE PROS AND CONS OF TAXING SWEETENED BEVERAGES BASED ON SUGAR CONTENT 7 (2016); NEMES, *supra* note 262, at 2. The Hungarian government's first idea for a fat tax was even more ambitions. They planned to tax fast food served in restaurants. The government decided to limit the tax to packaged foods because of lobbying by the fast-food industry. *See Daley*, *supra* note 263.

275 FRANCES ET AL., *supra* note 274, at 4.

276 WHO FISCAL POLICIES, *supra* note 235, at 15, 18.

objective.[277] And finally, ex poste assessments show that it has been effective at changing behavior.[278] However, anecdotal evidence from Hungary is less glowing. Lobbying activity by the fast food industry led to their exemption from the tax, thereby limiting its effectiveness.[279]

Many governments, like Finland, are focusing their attentions on sugar-sweetened beverages.[280] 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."[281] Moreover, studies have found that liquid calories do not produce a feeling of fullness, unlike solid calories, therefore leading to greater caloric consumption.[282]

In 2011, France adopted a volume-based levy on beverages containing added sugar or other sweeteners.[283] In 2014, the tax raised approximately €300 million in revenue, all of which was allocated to the National Social Health Insurance.[284] Research indicated that the cost of the tax imposed on retailers was fully passed through to consumers.[285] Low-income groups and young people showed the largest decrease in soda consumption.[286] The French public has a favorable perception of the sugar-sweetened beverage tax, believing that it the has potential to improve the health of the population.[287]

In 2014, Mexico adopted volume-based taxes on sugar-sweetened beverages and ad valorem taxes on junk food.[288] Mexico has a serious public health problem. Half of Mexican adults qualify as obese, and Mexico has the highest rate of hospitalizations for diabetes related health problems of all the countries in the Organisation for Economic Co-operation and Development (OECD).[289] In 2011, Mexico had the highest per capita consumption of soft drinks beverages.[290] A study shows the significant impact of Mexico's soda tax:

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277 *Id.*

278 *See supra* notes 266–272 and accompanying text.

279 Daley, *supra* note 263 (quoting a Hungarian shop owner saying: "The food tax . . . is a joke.").

280 MARRON ET AL., *supra* note 237, at 1, 9.

281 *Id.* at 15.

282 An Pan & Frank B. Hu, *Effects of Carbohydrates on Satiety: Differences Between Liquid and Solid Food*, 14 CURRENT OPINION CLINICAL NUTRITION & METABOLIC CARE 385, 387 (2011).

283 WHO FISCAL POLICIES, *supra* note 235, at 15.

284 *Id.*

285 Nicoletta Berardi et al., *The Impact of a 'Soda Tax' on Prices: Evidence from French Micro Data* 18 (Banque de France, Working Paper No. 415, 2012), https://perma.cc/HRQ8-P9YD.

286 WHO FISCAL POLICIES, *supra* note 235, at 15.

287 Chantal Julia et al., *Public Perception and Characteristics Related to Acceptance of the Sugar-Sweetened Beverage Taxation Launched in France in 2012*, 18 PUB. HEALTH NUTRITION 2679, 2686 (2015), https://perma.cc/8GKX-FAJ6.

288 MARRON ET AL., *supra* note 237, at 9.

289 M. Arantxa Colchero et al., *Beverage Purchases from Stores in Mexico Under the Excise Tax on Sugar Sweetened Beverages: Observational Study*, BRIT. MED. J. 1 (Nov. 15, 2016), https://perma.cc/TZP4-XBF9.

290 *Id.*

> 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.[291]

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.

More recently, U.S. cities have been adopting soda taxes.[292] Philadelphia, Pennsylvania's $0.015 per ounce soda tax went into effect in January 2017,[293] and the first month's revenue exceeded projections.[294] Philadelphia's goal for its soda tax was purely to raise revenue—no public health goals were mentioned.[295] Berkeley, California 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."[296] A study conducted one year after enactment of the tax by researchers at Cornell University found that less than one half of the tax was passed through to consumers,[297] which would tend to limit its effectiveness as an anti-obesity measure. The researchers used San Francisco, California as a counterfactual in the study, comparing soda prices in Berkeley to those in San Francisco.[298] 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.[299] However, in November 2016, San Francisco and neighboring Albany, California enacted their own soda

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291 *Id.* at 5.

292 Jacob Sullum, *Five More U.S. Jurisdictions Imposed Soda Taxes Last Week*, REASON (Nov. 15, 2016), https://perma.cc/T2YU-SJ9Z.

293 Phila., Pa., Ordinance 160,176 (June 16, 2016).

294 Elaine S. Povich, *Philadelphia Soda Tax Receipts Double First-Month Predictions*, PEW CHARITABLE TR. (Feb. 24, 2017), https://perma.cc/T46F-MK27.

295 *See* Margot Sanger-Katz, *Pointing to Cash, Not Health, to Make a Soda Tax Palatable*, N.Y. TIMES, Apr. 4, 2016, at A1 ("[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.").

296 Berkeley, Cal., Ordinance No. 7,388–N.S., Imposing a General Tax on the Distribution of Sugar-Sweetened Beverage Products (Dec. 18, 2014); *see* Karen Kaplan, *World Health Officials Want Super-Size Tax on Soda and Sugary Drinks, But Are Countries Ready to Swallow That?*, L.A. TIMES (Oct. 12, 2016), https://perma.cc/8HQQ-7AVH ("[The tax] passed with 75% of the vote.").

297 John Cawley & David E. Frisvold, *The Pass-Through of Taxes on Sugar-Sweetened Beverages to Retail Prices: The Case of Berkeley, California*, 36 J. POL'Y ANALYSIS & MGMT. 303, 308, 319 (2017).

298 *Id.* at 308, 309 tbl.1, 310–12, 313 tbl. 2.

299 *Id.* at 314.

taxes.[300] Recently, Boulder, Colorado and Cook County, Illinois (where Chicago is located) also enacted soda taxes.[301] The Navajo Nation also enacted a junk food tax, citing the tribe's skyrocketing rates of diabetes.[302]

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.[303] 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.[304] A national food tax could readily be imposed on manufacturers.[305]

Although some predict more widespread adoption of soda taxes, it is unlikely that the soft-drink industry will give up the fight.[306] In Philadelphia, a bottler for Canada Dry has already laid off employees as a result of sales declines, and PepsiCo is threatening to do to the same.[307] As noted earlier, the influence of lobbyists for manufacturers of unhealthy foods and beverages may be the most significant barrier to anti-obesity legislation.[308] In 2016 alone, the American Beverage Association spent $38 million trying to stop soda taxes, without success.[309] 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.[310] The next Part will explore other tax mechanisms that could impact the cost, and therefore, the consumption of unhealthy foods.

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300 Albany, Cal., Ordinance 2016-02 (Dec. 5, 2016); S.F., Cal., Sugary Drinks Distributor Tax Ordinance (Nov. 8, 2016); Mike Esterl, *Soda Taxes Approved in Four Cities, Vote Looms in Chicago's Cook County*, WALL STREET J. (Nov. 9, 2016), https://perma.cc/4GTY-ZVJN.

301 BOULDER, COLO, REV. CODE ch. 3-16-1 (2017); Cook County, Ill., Ordinance 16-5931, (Nov. 10, 2016); *see* Che Odom, *Corporate Income Tax Cuts, Legal Pot More Likely in States*, BLOOMBERG (Nov. 17, 2016), https://perma.cc/2QXE-ECCL.

302 Healthy Dine Nation Act of 2014, NAVAJO NATION CODE ANN. tit. 11, §§ 1001–1024 (2016); Leilani Clark, *The Navajo Nation Will Soon Have the Country's First-Ever Junk-Food Tax*, MOTHER JONES (Mar. 25, 2015), https://perma.cc/CT9G-KV4M; Eliza Barclay, *Navajos Fight Their Food Desert with Junk Food and Soda Taxes*, NAT'L PUB. RADIO (Apr. 1, 2015), https://perma.cc/KM5M-64BJ.

303 FRANCIS ET AL., *supra* note 274, at 2.

304 *Id.*

305 *Id.* at 7.

306 *See* Anahad O'Connor & Margot Sanger-Katz, *Soda Taxes Gain Acceptance, City by Revenue-Hungry City*, N.Y. TIMES, Nov. 27, 2016, at A1.

307 Choi & De Groot, *supra* note 246.

308 *See supra* note 189 and accompanying text.

309 Stephanie Strom, *Creeping Progress in Pledge to Cut Calories in Sugary Soda*, N.Y. TIMES (Nov. 22, 2016), https://perma.cc/GXU3-CWXH.

310 *See, e.g.*, Paul C. Barton, *Does Clinton's Soda Stance Violate Tax Pledge*, ST. TAX NOTES, Apr. 25, 2016; Joseph J. Defelice, *Supports of Regressive Soda Tax Never Learned 2016 Election's Lesson*, HILL: BLOG (Apr. 11, 2017), https://perma.cc/SJY7-T8DS (discussing the backlash from Republicans that Philadelphia's soda tax received, positing that the tax contributed to the state voting Republican in the 2016 Presidential election).

VI. ANALOGIES

Food writer Mark Bittman asked, "[i]s soda the new tobacco?"[311] Bittman quoted CDC director Dr. 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 they are not marketing to children."[312] The parallels are striking: smoking leads to heart disease and diabetes.[313] So does obesity.[314] Members of minority groups and low-income individuals are more likely to smoke,[315] and are more likely to be obese.[316] Youth smoking leads to adult smoking[317]—youth obesity leads to adult obesity.[318] Smokers find it difficult to quit and often relapse.[319] Overweight individuals find it difficult to lose weight and often gain it back.[320] Perhaps most significant for purposes of this Article, both cigarettes and junk food are specifically designed to be addictive.[321]

Smoking rates have precipitously declined in the United States.[322] The Daily Mail in the United Kingdom published a map that brilliantly illustrated

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311 Opinion, Mark Bittman, *A Sin We Sip Instead of Smoke?*, N.Y. TIMES, Feb. 14, 2010, at WK1.

312 *Id.*

313 *Smoking and Diabetes*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://perma.cc/K7KM-QRH2 (last updated Jan. 23, 2017).

314 *See* USDA DIETARY GUIDELINES, *supra* note 21, at 3.

315 Phineas Baxandall, *Taxing Habits*, REGIONAL REV., Q1 2003, at 19, 26, https://perma.cc/AF7W-Z26J ("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.").

316 *See supra* notes 42–44 and accompanying text.

317 *Smoking & Tobacco Use*, CTRS. FOR DISEASE CONTROL & PREVENTION, https://perma.cc/5YAT-8G6W (last updated June 20, 2017).

318 INST. OF MED. OF THE NAT'L ACADS., *supra* note 163, at 2; *see also supra* note 164 and accompanying text.

319 *See generally* John R. Hughes et al. *Shape of the Relapse Curve and Long-Term Abstinence Among Untreated Smokers*, ADDICTION, May 19, 2003, at 29 (analyzing "the success of a given quit attempt").

320 *See* Priya Sumithran et al., *Long-Term Persistence of Hormonal Adaptations to Weight Loss*, NEW ENG. J. MED. 1597, 1602 (2011) ("Although short-term weight loss is readily achieved through dietary restriction, only a small minority of obese people maintain diet-induced weight loss in the long term.").

321 U.S. DEP'T OF HEALTH & HUMAN SERVS., THE HEALTH CONSEQUENCES OF SMOKING—50 YEARS OF PROGRESS: A REPORT OF THE SURGEON GENERAL 803 (2014), https://perma.cc/R96S-32Y5 ("[T]obacco companies intentionally designed cigarettes to make them more addictive."); *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), https://perma.cc/NPS4-WWNS ("Both [the tobacco industry and the food industry] are manipulating consumer behavior to sell products that can harm health.").

322 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), https://perma.cc/W85C-JDF3.

this decline.[323] As this moving map probably cannot be duplicated in a law review article, suffice to say that adult smoking rates in the United States have more than halved, from 42% in 1965 to 18% in 2012.[324] 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.[325] Successful litigation against the tobacco industry by states' attorneys general seeking reimbursement of public money spent for the costs of tobacco-related illnesses also played a large role.[326] This combination of strategies shifted public opinion about smoking: it is now viewed as "a filthy, dangerous addiction."[327]

Some of these tools have already been used in the food area. USDA educates consumers about food choices.[328] 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 [(94%)] among children."[329] The federal government requires nutrition labeling on packaged foods.[330] However, the food industry heavily markets to children,[331] and governments are just beginning to use food taxes.[332]

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

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323 *Id.*

324 U.S. DEP'T OF HEALTH & HUMAN SERVS., *supra* note 321, at 12.

325 BOGART, *supra* note 239, at 149.

326 *See generally* TOBACCO CONTROL LEGAL CONSORTIUM, THE MASTER SETTLEMENT AGREEMENT: AN OVERVIEW (2015), https://perma.cc/47HV-YZTB (describing forty-six states' settlement with major cigarette manufacturers, receiving costs incurred in treating sick and dying cigarette smokers in exchange for giving up any future legal claims they might have based on the cigarette companies' actions at issue in the settled lawsuit); *see also* Richard P. Ieyoub & Theodore Eisenberg, *State Attorney General Actions, the Tobacco Litigation, and the Doctrine of Parens Patriae*, 74 TULANE L. REV. 1859, 1860–62 (2000) (describing the unprecedented success the attorneys general had against the undefeated tobacco industry).

327 BOGART, *supra* note 239, at 149.

328 *See generally* USDA DIETARY GUIDELINES, *supra* note 21 (providing national dietary guidelines encouraging healthy eating).

329 Cheryl Rivard et al., *Taxing Sugar-Sweetened Beverages: A Survey of Knowledge, Attitudes and Behaviours*, 15 PUB. HEALTH NUTRITION 1355, 1357 (2012).

330 *See* 21 U.S.C. § 343(q) (2012) (requiring nutritional information for food intended for human consumption); *see also supra* notes 203–207 and accompanying text.

331 *See* FED. TRADE COMM'N, A REVIEW OF FOOD MARKETING TO CHILDREN AND ADOLESCENTS: FOLLOW-UP REPORT, at ES-1 (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."). The medical profession has advised restricting food marketing to children, calling it "a cost-effective way to manage the subsidy of young minds and wallets to the food industry." Raj Patel, Commentary, *How Society Subsidizes Big Food and Poor Health*, JAMA INTERNAL MED., July 5, 2016, at E1, E1, https://perma.cc/74YW-AQYJ.

332 *See* discussion *supra* Part V.

the associated bad publicity would be effective in pressuring the food industry to take responsibility for its long-term contributions to the obesity problem."[333] The food industry is taking preemptive steps to avoid the risk of litigation. The Commonsense Consumption Act,[334] promoted by the American Legislative Exchange Council, 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 known condition allegedly caused by or allegedly likely to result from long-term consumption of food."[335] This legislation was introduced at the federal level four times between 2003 and 2014 but failed to be enacted each time.[336] However, the food industry has been more successful at the state level, with twenty-six states enacting Commonsense Consumption Acts.[337] 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 had an effect.[338] 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."[339] The U.S. government imposes a $1.01 excise tax on each package of cigarettes sold.[340] The federal cigarette excise tax raised more than $13 billion in 2014.[341] There are also federal excise taxes on cigars, chewing tobacco, snuff, pipe tobacco, and cigarette papers.[342] States and localities also impose excise taxes on cigarettes at varying rates. The average state cigarette tax rate is $1.69 per pack, ranging from a high of $4.35 in New York to a low of $0.30 in

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333 Bonnie Hershberger, *Super-Sized America: Are Lawsuits the Right Remedy?*, 4 J. FOOD L. & POL'Y 71, 77 (2008).

334 *Commonsense Consumption Act*, AM. LEGIS. EXCHANGE COUNCIL (Jan. 28, 2013), https://perma.cc/LY3Y-KCTM (providing a model Commonsense Consumption Act).

335 *Id.*

336 Commonsense Consumption Act of 2009, H.R. 812, 111th Cong. (2009); Commonsense Consumption Act of 2007, S. 1323, 110th Cong. (2007); Commonsense Consumption Act of 2005, S. 908, 109th Cong. (2005); Commonsense Consumption Act of 2003, S. 1428, 108th Cong. (2003).

337 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, 306 (2014).

338 Although, studies have shown that workplace smoking bans were also effective. *See* William N. Evans et al., *Do Workplace Smoking Bans Reduce Smoking?*, 89 AM. ECON. REV. 728, 729 (1999) (finding workplace smoking bans reduced cigarette consumption by 10% and reduced smoking participation by about 6%).

339 U.S. DEP'T OF HEALTH & HUMAN SERVS., *supra* note 321, at 12.

340 *See* I.R.C. § 5701 (2012) ($50.33 per 1,000 cigarettes is equivalent to $1.0066 per pack); ORZECHOWSKI & WALKER, THE TAX BURDEN ON TOBACCO: HISTORICAL COMPILATION VOLUME 49, at iv (2014), https://perma.cc/2UYP-DW8N (providing the federal excise revenue for fiscal year 2014).

341 ORZECHOWSKI & WALKER, *supra* note 341, at iv.

342 I.R.C. § 5701.

Virginia,[343] a major tobacco producing state.[344] The states collected more than $16 billion in cigarette taxes in 2014.[345]

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.[346] The first study, in Chicago, showed that only a quarter of the littered cigarette packs had paid the city's cigarette tax, which was more than $3 per pack higher than in neighboring Indiana.[347] The New York City study was done in four 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.[348] A portion of the study area was also relatively close to a Native American reservation, which does not impose state taxes on cigarettes.[349] The researchers found that avoidance rates increased after the tax increase but also that cigarette consumption declined.[350] As high as cigarette taxes are, they do not approach the Pigovian ideal of equaling the social cost of harm.[351] 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 save between 10,000 and 50,000 lives.[352] Even doubling the federal cigarette tax would not come close to estimated smoking related health costs, with one estimate as high as $19.16 per pack.[353]

Like many food taxes, tobacco taxes fall most heavily on the poorest populations. As Professor Phillip Cook noted, "[i]mposing 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

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343 *See generally* ANN BOONN, CAMPAIGN FOR TOBACCO-FREE KIDS, STATE CIGARETTE EXCISE TAX RATES & RANKINGS (2017), https://perma.cc/R2BY-T56Z (showing state cigarette excise tax rates and rankings).

344 *Tobacco Production by State*, WORLDATLAS, https://perma.cc/C2H4-UBJX (last modified Feb. 21, 2017) (ranking Virginia fourth among states).

345 ORZECHOWSKI & WALKER, *supra* note 341, at iv.

346 Howard Chernick & David Merriman, *Using Littered Pack Data to Estimate Cigarette Tax Avoidance in NYC*, 66 NAT'L TAX J. 635, 636 (2013).

347 *Id.* at 639.

348 *Id.* at 640, 643.

349 *Id.* at 649, 651 ("Traveling to [the] Poospatuck [Native American Reservation in Suffolk County, Pennsylvania] will save consumers about $4.25 per pack but the reservation is only a single location that is probably an unfamiliar location to most individuals.").

350 *Id.* at 663–64.

351 *See* Lila Smith, *Are Pigovian Taxes a Good Thing?*, ODYSSEY (June 28, 2016), https://perma.cc/ZX33-8ENM.

352 JASON FURMAN, SIX LESSONS FROM THE U.S. EXPERIENCE WITH TOBACCO TAXES 7 (2016), https://perma.cc/7VRW-8GWJ.

353 BOONN, *supra* note 343. However, if the health care costs "saved" by smokers dying prematurely are factored in, the social cost of smoking might be significantly lower. *See* Baxandall, *supra* note 315, at 22.

justified by the benefit they provide to those who pay them."[354] The next Part 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."[355]

Taxes do not prevent people from making choices, but rather changes the immediate costs of those choices. Nonetheless, the food industry argues that junk food taxes violate consumers' freedom of choice.[356] As a general matter of tax policy, tax provisions should be designed to be fair, economically efficient, and simple.[357] 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.[358] The definitions of vertical equity and horizontal equity, themselves, lack satisfactory clarity. Vertical equity holds that differently situated taxpayers should be taxed differently and justifies a progressive tax rate structure on the theory that wealthier taxpayers have a greater ability to pay.[359] However, food taxes generally have a regressive impact for two reasons: 1) lower income individuals spend more of their income on food; and 2) lower income individuals tend to purchase more foods that are considered unhealthy, and therefore, they are more likely to be subject to taxation.[360] 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.[361] 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.[362] Finally, fairness (and public acceptance) of food taxes could be enhanced by earmarking the revenue to obesity prevention.[363]

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354 Ryan Finley, *Federal Cigarette Taxes Should Be Doubled, Furman Says*, TAX NOTES TODAY, May 25, 2016 (quoting Philip Cook, ITT/Terry Sanford professor at Duke University).

355 JANIS JOPLIN, *Me and Bobby McGee*, *on* PEARL (Columbia Records 1971).

356 *See, e.g.*, DAREN BAKST, HERITAGE FOUNDATION, GOVERNMENT CONTROL OF YOUR DIET: THREATS TO "FREEDOM TO EAT" 1 (2013), https://perma.cc/QL2T-3W5L ("Government should respect the voluntary choices made by individuals when it comes to their diets.").

357 *See* C. EUGENE STEUERLE, CONTEMPORARY U.S. TAX POLICY 12–14 (2004) (describing the efficiency principle as creating "a situation in which there are no losers and at least some households are better off after the reform").

358 *Id.* at 10–11.

359 *Id.* at 11.

360 Franck et al., *supra* note 250, at 1951.

361 *See id.* ("[L]ow-income individuals might be more likely to change their consumption behaviors and experience long-term health benefits.").

362 *See* Baxandall, *supra* note 315, at 22 (discussing tobacco taxes).

363 Brownell & Frieden, *supra* note 24, at 1807 (describing how New York residents' support for a soda tax increased from 52% to 72% when told revenue from the tax would be used for obesity prevention).

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?[364] Changes in economic behavior are viewed as "deadweight loss."[365] 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 as one of the three most cost-effective policy interventions.[366] Moreover, food taxes' regressive impact could enhance their efficiency, as "low-income populations may be more sensitive to price changes than the overall population."[367]

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 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.[368] This Part 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

364 *See generally* Alan J. Auerbach & James R. Hines Jr., *Taxation and Economic Efficiency*, *in* HANDBOOK OF PUBLIC ECONOMICS 1347 (Alan J. Auerbach & Martin Feldstein ed. 2002).

365 *See id.* at 1347. No pun intended.

366 THEO VOS ET AL., ASSESSING COST-EFFECTIVENESS IN PREVENTION 2–3, 5 (2010), https://perma.cc/6F6L-WP5Z.

367 Tatiana Andreyeva et al., *The Impact of Food Prices on Consumption: A Systematic Review of Research on the Price Elasticity of Demand for Food*, 100 AM. J. PUB. HEALTH 216, 220 (2008).

368 *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, 1351 (2000) ("examin[ing] the possible consequences of repealing the home mortgage interest deduction, focusing on the economic consequences of repeal and comparing the tax treatment of home ownership and home ownership rates in other countries").

dependents.[369] 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."[370] The Internal Revenue Service (IRS) considers obesity a disease,[371] 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. However, the IRS ruled that the cost of weight-loss programs to improve appearance or general health is not deductible.[372] Only the amount that exceeds 10% of the taxpayer's adjusted gross income is deductible.[373] Only 32% of taxpayers overall itemize deductions, and among taxpayers with incomes below $20,000, only 6% itemize deductions.[374] Only 4% of taxpayers with incomes below $20,000 claimed the medical expense deduction.[375] 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.[376] The fringe benefits most pertinent to the obesity epidemic are gym membership, public transportation, and bicycle commuting.[377]

The gym membership benefit is limited to the value of an "on-premises athletic facility."[378] It must be "located on the premises of the employer, . . . operated by the employer, and . . . substantially all the use [of the athletic facility] is by the employees . . . , their spouses, and . . . dependent[s]."[379] However, only a few large corporations offer on-premises gyms.[380] 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.[381] Studies indicate that commuting by car increases the

369 I.R.C. § 213(a) (2012).

370 *Id.* § 213(d)(1)(A) (emphasis added).

371 Rev. Rul. 2002-19, 2002-1 C.B. 778.

372 *Id.*

373 SEAN LOWRY, CONG. RESEARCH SERV., R43012, ITEMIZED TAX DEDUCTIONS FOR INDIVIDUALS: DATA ANALYSIS 2 (2014), https://perma.cc/ANY7-Y4CX.

374 *Id.* at 2–3.

375 *Id.* at 5 tbl.2.

376 *See* I.R.C. § 132(a) (2012).

377 *See id.* § 132(f)(1)(B)–(C); *id.* § 132(j)(4)(B)

378 *Id.* § 132(j)(4)(B).

379 *Id.*

380 *The Fortune 100 and Their Fitness and Wellness Programs*, HEALTH FITNESS REVOLUTION (Aug. 15, 2015), https://perma.cc/VX69-K84J (citing Walmart, General Motors, and Phillips 66 as having on-premises gyms).

381 I.R.C. § 132(f)(1)(B).

likelihood of obesity.[382] Conversely, commuting by public transportation reduces the likelihood of obesity.[383] However, free parking increases the likelihood of driving,[384] and the IRC also exempts the value of parking provided by the employer.[385] The United States Department of Transportation noted that public transportation offers significant greenhouse gas emission savings over driving.[386]

Bicycle commuting emits no greenhouse gas emissions at all and provides calorie-burning benefits.[387] 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.[388] 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.[389] The mortgage interest deduction is a blunt policy instrument.[390] Ostensibly "designed" to promote homeownership, the mortgage interest deduction increases as the cost of the home increases.[391] 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.[392] Therefore, a taxpayer in the 15% tax bracket will see a $1,500 reduction in tax liability from a $10,000 mortgage interest deduction. A taxpayer in the 39.6% 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-

382 *E.g.*, Christine M. Hoenhner et al., *Commuting Distance, Cardiorespiratory Fitness, and Metabolic Risk*, 42 AM. J. PREVENTATIVE MED. 571, 576 (2012).

383 Ellen Flint et al., *Associations Between Active Commuting, Body Fat, and Body Mass Index: Population Based, Cross Sectional Study in the United Kingdom*, BRIT. MED. J. 3 (Aug. 19, 2014), https://perma.cc/LZD9-VYK7 (concluding that people who used public modes of transport had significantly lower BMI and percentage body fat than their counterparts who used private transport).

384 Luz Lazo, *DC Wants Employer to Pay Workers Not to Drive to Work*, WASH. POST (Mar. 17, 2017), https://perma.cc/8974-H8AA.

385 I.R.C. § 132(f)(1)(C); *see also id.* § 132(f)(5)(C) (defining "qualified parking").

386 U.S. DEP'T OF TRANSP., PUBLIC TRANSPORTATION'S ROLE IN RESPONDING TO CLIMATE CHANGE 1 & fig.1 (2010), https://perma.cc/PXG4-CW2C.

387 A 160-pound person bicycling at fourteen to sixteen miles per hour for one half hour burns 363 calories, according to the *Cycling Calories Burned Calculator*, BICYCLING (June 27, 2017), https://perma.cc/K6VX-ZMGK.

388 I.R.C. § 132(f)(5)(F)(i)–(ii).

389 *See* Mann, *supra* note 368, at 1389.

390 *Id.* at 1350, 1396–97.

391 *Id.* at 1387–88.

392 *Id.* at 1359–63.

density urban areas.[393] Low-density means more driving.[394] Homeowners have longer commutes than renters in forty-three out of America's fifty largest metropolitan areas.[395] Several studies show that longer commutes lead to overweight, obesity, and associated health problems.[396] However, there may be some good news on the horizon, as the tax reform plan proposed by the United States House of Representatives would double the standard deduction and make the mortgage interest deduction less relevant for all but the wealthiest taxpayers going forward.[397] 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.[398]

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.[399] When Congress wants to show its displeasure with an activity, it can deny a deduction for that activity. Lobbying expenses,[400] business expenses of the illegal drug trade,[401] and excessive employee compensation[402] are all examples of Congress exercising its ability to deny deductions. Congress also limits deductions for various activities, such as meals and entertainment,[403] luxury vehicle depreciation,[404] and losses from passive activities.[405]

As noted previously, there are strong restrictions on advertising tobacco products as part of the overall strategy to reduce smoking.[406] Researchers have identified food marketing to children as a factor in the

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393 JOINT CTR. FOR HOUS. STUDIES OF HARVARD UNIV., THE STATE OF THE NATION'S HOUSING 2016, at 8 (2016), https://perma.cc/2EAF-7SB4.

394 ANTHONY DOWNS, BROOKINGS INST., TRAFFIC: WHY IT'S GETTING WORSE, WHAT GOVERNMENT CAN DO 5–6 (2004), https://perma.cc/RJL8-FADB.

395 Mark Uh, *Best and Worst Cities for Commuting*, TRULIA (Mar. 3, 2016), https://perma.cc/Q8FE-2F44.

396 Christian, *supra* note 10, at 746 (noting time spent commuting is a pathway between sprawl and both obesity and physical inactivity); Margo Hilbrecht et al., *Highway to Health? Commute Time and Well-Being Among Canadian Adults*, 56 WORLD LEISURE J. 151, 151 (2014) ("Lengthy commutes have been linked to poor physical . . . health outcomes such as . . . obesity."); Hoenhner et al., *supra* note 382, at 574 (conducting a study of drivers in Texas which showed commuting distance resulted in less physical activity and more weight gain).

397 *See* John L. Buckley, *House GOP Tax Reform Plan: A Case Study*, TAX NOTES, Mar. 13, 2017, at 1383 (discussing the proposed tax reform).

398 *See* I.R.C. § 63(c) (2012).

399 *Id.* § 162.

400 *Id.* § 162(e).

401 *Id.* § 280E.

402 *Id.* § 162(m).

403 *Id.* § 274(n).

404 *Id.* § 280F(a)(1).

405 *Id.* § 469(a)(1).

406 *See* U.S. DEP'T OF HEALTH & HUMAN SERVS., *supra* note 321, at 799; *see also supra* note 325 and accompanying text.

obesity epidemic.[407] Around the world, governments have identified reducing the harmful effects of youth-targeted food and beverage marketing as a policy priority.[408] In the United States, the food industry spends about $2 billion per year marketing to children.[409] The Stop Subsidizing Childhood Obesity Act[410] 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."[411] The proposed legislation directs the promulgation of regulations defining important elements of the provisions like "directed at children" and "food of poor nutritional quality."[412] Professor Mona Hymel analyzed proposals to limit deductibility of advertising.[413] She noted that "[h]istorically, imbedded in section 162 is the notion that certain deductions should be disallowed because they violate public policy."[414] 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.[415] Donald Marron of the Urban-Brookings Tax Policy Center said the proposal "is at best an indirect way of solving the obesity problem."[416] 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 on the effectiveness of denying deductions by examining the provisions denying deductions for lobbying and excessive employee renumeration.[417]

C. Tax Credits for Healthy Foods

While taxes that increase prices could be considered "sticks," tax credits that provide incentives for behavior could be considered "carrots."[418]

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407 INST. OF MED. OF THE NAT'L ACADS., *supra* note 163, at 252; Novak & Brownell, *supra* note 227, at 2349.

408 Novak & Brownell, *supra* note 236, at 2349.

409 FED. TRADE COMM'N, *supra* note 331, at ES-2

410 H.R. 5232, 114th Cong. (2016).

411 *Id.* § 280I(a)(1).

412 *Id.* § 280I(d).

413 Mona L. Hymel, *Consumerism, Advertising, and Tax Policy*, 20 VA. TAX REV. 347, 444, 448–62 (2000).

414 *Id.* at 452.

415 Kat Lucero, *To Curb Obesity, Health Advocates Target Tax Breaks*, TAX NOTES, July 11, 2016, at 178.

416 *Id.*

417 *See, e.g.*, Gregg D. Polsky, *Controlling Executive Compensation Through the Tax Code*, 64 WASH. & LEE L. REV. 877, 881–82 (2007) (showing similar work on denying deductions).

418 *See, e.g.*, Brian Galle, *Carrots, Sticks, and Salience*, 67 Tax L. Rev. 53, 59–60 (2013).

A tax credit reduces federal income tax liability for the holder of the credit.[419] As discussed above in Part III, low-income neighborhoods that are plagued by high obesity rates are well supplied with fast-food outlets.[420] At the same time, those neighborhoods suffer from a lack of healthy food alternatives—they are "food deserts."[421] A food desert is defined as a "low-income census tract where either a substantial number or share of residents has low access to a supermarket or large grocery store."[422] Access may be defined as proximity, that is, distance to the supermarket, or in terms of mobility.[423] While a supermarket that is within five miles is no problem for a consumer with a car, for consumers relying on infrequent or non-existent public transportation, that supermarket may be out of reach. USDA estimates that nineteen million Americans, about 6.2% of the U.S. population, have limited access to a supermarket or grocery store.[424] The study concluded, however, that "income and resource constraints may be greater barriers to accessing healthy food retailers than proximity."[425]

The food desert problem presents a parallel to the affordable housing problem. The low-income housing tax credit (LIHTC) provides incentives for developers to build or rehabilitate affordable housing.[426] In 2013, about 7.7 million American households lacked affordable housing.[427] There is an economic link between affordable housing, obesity, and healthy food choices.[428] In 2013, 97% of renters with worst-case housing needs spent over half their income on housing costs.[429] The more a family spends on housing, the less they have available to spend on food. Housing is considered "affordable" if it costs no more than 30% of the occupant's income.[430] The LIHTC, as the largest federal program for the production and preservation of affordable housing, has financed the construction or rehabilitation of 2.2

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419 *Refundable vs. Non-Refundable Tax Credits: There Are Two Main Types of Credits That Can Reduce Your Tax Bill*, INTERNAL REVENUE SERV., https://perma.cc/ENP8-3AP4 (last visited July 22, 2017).

420 *See supra* notes 55–56 and accompanying text.

421 *See, e.g.*, Levine, *supra* note 42, at 2667.

422 Press Release, U.S. Dep't of Agric., Food Desert Locator (May 2, 2011), https://perma.cc/DY38-4973.

423 U.S. DEP'T OF AGRIC., ACCESS TO AFFORDABLE AND NUTRITIOUS FOOD: MEASURING AND UNDERSTANDING FOOD DESERTS AND THEIR CONSEQUENCES, REPORT TO CONGRESS 62, 119 (2009), https://perma.cc/TFM5-FQLS [hereinafter USDA REPORT TO CONGRESS].

424 ALANA RHONE ET AL., U.S. DEP'T OF AGRIC., LOW-INCOME AND LOW-SUPERMARKET ACCESS CENSUS TRACTS, 2010–2015, at 12 (2017), https://perma.cc/S4K8-NZU2.

425 *Id.* at 14.

426 I.R.C. § 42 (2012).

427 BARRY L. STEFFEN ET AL., U.S. DEP'T OF HOUS. & URBAN DEV., WORST CASE HOUSING NEEDS: 2015 REPORT TO CONGRESS 1 (2015), https://perma.cc/J47X-Z427 [hereinafter HUD REPORT].

428 USDA REPORT TO CONGRESS, *supra* note 423, at iii.

429 HUD REPORT, *supra* note 427 at 2.

430 DANILO PELLETIERE, NAT'L LOW INCOME HOUS. COALITION, GETTING TO THE HEART OF HOUSING'S FUNDAMENTAL QUESTION: HOW MUCH CAN A FAMILY AFFORD? 1 (2008), https://perma.cc/Q3VF-5EPT.

million affordable housing units.[431] Developers who receive LIHTCs either use the credits or (more often) sell them to "tax equity" investors to raise capital.[432] By reducing developers' financing costs, the LIHTC expands the supply of affordable rental housing at an estimated loss of revenue to the federal government of about $9 billion per year.[433] For new construction, the subsidy provided by the LIHTC approximates 70% of the cost of the project.[434]

Just as the LIHTC increases access to affordable housing for low-income Americans, a "healthy food access" tax credit (HFATC) could increase the availability of food choice for low-income Americans, with the hopeful consequence of reducing obesity. "Food retailers typically have high costs and small profit margins, especially in low-income areas," and so may be reluctant to take on the additional risk of opening a location in a food desert.[435] The HFATC, as proposed in this Article, would apply to supermarket developers that build in low-income census tracts and agree to provide certain undersupplied foods such as fruits and vegetables at an affordable price. The HFATC could also incorporate elements of the New Markets Tax Credit (NMTC), which is a more general tax credit that applies to individuals and corporations making qualified equity investments (QEIs) in qualified community development entities (CDEs).[436] QEIs are expected to result in the creation of jobs and material improvement in the lives of residents of low-income communities, such as "financing small businesses, improving community facilities [like] daycare centers, and increasing homeownership opportunities."[437] While food markets are eligible for the NMTC, the process of applying for the NMTC is complex and must be made through a CDE, which may limit the availability of the credit.[438] Food-based projects represented less than 2% of total NMTC allocations between 2003 and 2010.[439]

To better leverage private investment in healthy food markets, the HFATC should be targeted, like the LIHTC. While both the LIHTC and the NMTC are based on an allocation of federal funding which is then distributed through the tax credits, the LIHTC is simpler because it does not

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431 MOELIS INST. FOR AFFORDABLE HOUS. & FURMAN CTR. FOR REAL ESTATE & URBAN POLICY, WHAT CAN WE LEARN ABOUT THE LOW-INCOME HOUSING TAX CREDIT BY LOOKING AT THE TENANTS? 1 (2012), https://perma.cc/55X5-G2FF.

432 MARK P. KEIGHTLEY, CONG. RESEARCH SERV., RS22389, AN INTRODUCTION TO THE LOW-INCOME HOUSING TAX CREDIT 1 (2017), https://perma.cc/9QZF-K2VT.

433 *Id.*

434 *Id.*

435 Teresa Garcia, *NMTC Investors Show Appetite for Healthy Food Financing Activities*, NAVOGRADAC J. TAX CREDITS, Dec. 2015, at 1, 2.

436 I.R.C. § 45D (2012).

437 INTERNAL REVENUE SERV., NEW MARKETS TAX CREDIT 1 (2010), https://perma.cc/6LNE-RQKY.

438 DONALD J. MARPLES & SEAN LOWRY, CONG. RESEARCH SERV., RL34402, NEW MARKETS TAX CREDITS: AN INTRODUCTION 3–4 (2016), https://perma.cc/4ETD-2JBR.

439 ERNST & YOUNG, THE NEW MARKETS TAX CREDIT: OPPORTUNITIES FOR INVESTMENT IN HEALTHY FOODS AND PHYSICAL ACTIVITY, at i (2013), https://perma.cc/5C5C-QZMJ.

depend on CDEs.[440] Moreover, under the NMTC, projects in food deserts are competing against many other types of projects for funding.[441] If the government becomes serious about providing healthy food alternatives in food deserts, it should provide a targeted credit.

This Part has described several ways that the federal income tax system could be used to reduce obesity. From employee fringe benefits for gym membership to tax credits for investment in food deserts, the federal income tax system has many potential solutions that could be unleashed with minor modifications.

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?[442] 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.[443] 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

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440 *Compare* I.R.C. § 42, *with id.* § 45D.

441 James Lang & Justin Mayor, *$7B and Unclear Future for New Markets Tax Credits*, LAW360 (Mar. 21, 2017), https://perma.cc/9D6F-3JJC ("[T]he latest allocation . . . emphasized . . . investment in metropolitan areas, job creation, expansion of minority-owned businesses, provision of healthcare to underserved communities, and extension of access to healthy foods within current food deserts."). While the largest category of project type—"office, retail, mixed-use, and hotel"—constituted 46% of the total projects and could have included grocery stores, other categories included arts/culture, education, manufacturing, agriculture, and housing. MARTIN ABRAVANEL ET AL., NEW MARKETS TAX CREDIT (NMTC) PROGRAM EVALUATION: FINAL REPORT 76 tbl.6.2 (2013), https://perma.cc/8E5T-P5BH.

442 A Big Gulp has 364 calories and 91 grams of sugar. *Beverages*, SUGAR STACKS, https://perma.cc/8ANW-7EFU (last visited July 22, 2017). A Big Mac has 540 calories (250 from fat) and 9 grams of sugar. *The One and Only. Big Mac: View Nutrition Summary*, MCDONALD'S, https://perma.cc/7Q9W-AQPL (last visited July 22, 2017). A Double Chocolaty Chip Crème Frappuccino Blended Crème has 420 calories (180 from fat) and 52 grams of sugar. *Double Chocolaty Chip Crème Frappuccino Blended Crème*, STARBUCKS, https://perma.cc/XTW8-XRN5 (last visited July 22, 2017).

443 *See* Donald B. Marron, *Should We Tax Internalities Like Externalities?* 18 (Tax Policy Ctr., Working Paper, 2015).

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 taxes. Taxes based on content—e.g., 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 and 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.