# The Obesity Crisis as Market Failure: An Analysis of Systemic Causes and Corrective Mechanisms

ANEEL KARNANI, BRENT MCFERRAN, AND ANIRBAN MUKHOPADHYAY

**ABSTRACT** Obesity has high personal, social, and economic costs. Since medical research demonstrates that the primary cause of obesity is caloric intake, and food is bought and sold in the consumer marketplace, we begin with the argument that obesity represents a case of market failure. Integrating empirical research in consumer behavior with theories from public economics and business strategy, we examine the four possible corrective mechanisms to address market failures: government intervention, corporate social responsibility, industry self-regulation, and social activism. Taking the same lens, we examine how market-level conditions can be applied to correct market failures in the context of obesity, making a critical evaluation of various extant suggestions on how best to address the problem of obesity.

Obesity is common, growing, serious, and costly. Until 1980, less than 10% of the population in industrialized countries was obese (OECD 2012). Today, these rates have doubled or tripled. Rates are projected to increase further, and in some countries two out of three people will be obese within 10 years. Obesity is responsible for around 5% of all global deaths. The global economic impact from obesity is estimated to be $2.0 trillion, or 2.8% of global gross domestic product, roughly equivalent to the global impact from smoking or from armed violence, war, and terrorism (Dobbs et al. 2014). It is a complex problem with no easy solution.

In this research, we start with the proposition that obesity is suboptimal for society. Since medical research demonstrates that the central cause of obesity is caloric overconsumption (e.g., Livingston and Zylke 2012), and since food is bought and sold in the consumer marketplace, we argue that obesity represents a case of market failure (Akerlof and Shiller 2015b). We start with textbook theory of market failure and demonstrate, using prior empirical research, that the food industry suffers from market failures stemming from several sources. According to public economics, government intervention (or regulation) can be required to deal with such market failures (Lerner 1972; Greenwald and Stiglitz 1986; Datta-Chaudhuri 1990; Hindriks and Myles 2013). Research in business strategy (Karnani 2007) suggests a menu of corrective actions, in addition to government regulation, to deal with market failures: corporate social responsibility, industry self-regulation, and social activism. Of course the effectiveness of any corrective mechanism depends critically on consumer behavior in response to an action.

In this conceptual paper, we draw on received theory and prior empirical research from various disciplines (including consumer behavior, marketing, psychology, medicine, and public health) and data from public sources to provide insight into how imperfections in the market for food have contributed to obesity. We critically analyze the success so far of the four potential mechanisms to correct market failures in the context of obesity, again using prior empirical research, and we apply this lens to make suggestions on how best to address the obesity crisis at the market level. Finally, we make some suggestions for future actions.

## THE OBESITY CRISIS

Body mass index (BMI), the most commonly used population-level measure of overweight and obesity, is defined as a person's weight in kilograms divided by the square of his/her height in meters. The World Health Organization (WHO) categorizes a person as overweight if the BMI is between 25 and 30 and as obese if the BMI is greater than 30. In more than half of OECD (Organization for Economic Cooperation

Aneel Karnani (akarnani@umich.edu), professor of strategy, Stephen M. Ross School of Business, University of Michigan. Brent McFerran (brent.mcferran@sfu.ca), assistant professor of marketing, Beedie School of Business, Simon Fraser University. Anirban Mukhopadhyay (anirban.mukhopadhyay@ust.hk), professor of marketing and associate dean, School of Business and Management, Hong Kong University of Science and Technology. We gratefully acknowledge research support from the Social Science and Humanities Research Council of Canada (to the second author) and Hong Kong RGC (to the third author; GRF 692413).

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and Development) countries, the majority of the adult population is now overweight or obese (OECD 2013). By this metric, the prevalence of obesity in the OECD countries has increased from 12.9% in 2000 to 17.8% in 2010, and it is projected to get worse by 2020. A recent study has forecasted that by 2030, 42% of Americans will be obese and 11% will be severely obese (Finkelstein et al. 2012). Far from being only an American problem, obesity is increasing faster in many developed and developing (especially the latter) countries than it is in the United States (OECD 2012; Ng et al. 2014). If the growth rate of obesity continues on its current trajectory, almost half the world's adult population is projected to be overweight or obese by 2030 (Dobbs et al. 2014).

The outcomes of obesity are severe and costly to both individuals and society. Obesity is associated with several chronic diseases, and an obese person incurs significantly higher health expenditures than a person of normal weight. Those who have obesity are at a much higher risk of developing hypertension, dyslipidemia, type-2 diabetes, coronary heart disease, stroke, gall bladder disease, osteoarthritis, sleep apnea and respiratory problems, and multiple types of cancer (National Institutes of Health 1998). In the United States alone, 24 million people are afflicted by type-2 diabetes, with another 79 million people having prediabetes. Because obesity is associated with a higher risk of chronic diseases, it is linked to significant societal health care costs. The OECD estimates obesity to be responsible for 1%–3% of total health expenditures in most countries and 5%–10% in the United States (OECD 2012). A more recent study finds these costs to be significantly higher than thought previously, and it estimates additional medical spending as a result of obesity to be 20.6% of US health care expenditures, or about $210 billion (Cawley and Meyerhoefer 2012). Obese men rack up on average an additional $1,152 a year in medical spending, and obese women account for an extra $3,613 a year on average. The website of the Centers for Disease Control and Prevention estimates the medical care costs of obesity in the United States to be $147 billion in 2008, compared to $170 billion for smoking in 2010. Other research suggests that obesity outranks both smoking and alcoholism in its deleterious effects on both health and health costs (Begley 2012; Cawley and Meyerhoefer 2012). Aside from its physiological and monetary costs, obesity also extracts more indirect societal costs, including an increase in sick leave, disability pensions, and absenteeism in the workplace (Seidell 1998). In addition, obesity is associated with a number of individual-level psychological costs, including prejudice, job discrimination, underachievement in education, higher levels of stress, anxiety, and depression, and lower levels of social functioning (Gorstein and Grosse 1994; Zhao et al. 2009). Putting all these together, a recent McKinsey report estimated that the worldwide cost of obesity was 2 trillion US dollars annually (Dobbs et al. 2014).

## MARKET FAILURE

While there are many correlates of obesity, these can be divided into three underlying causes: factors that affect caloric and nutrient intake, those that affect exercise levels or intensity, and genetic factors. The *Journal of the American Medical Association*, in a recent editorial, concluded, "Clearly, environmental causes of obesity are far more influential than genes. . . . Obesity results from overnutrition and the primary therapeutic target is preventing or reversing overeating. . . . Exercise is associated with weight loss but its duration and intensity has minor effects on weight loss relative to diet" (Livingston and Zylke 2012, 971–72). Scientific evidence now clearly points to "overnutrition" rather than lack of exercise as the dominant cause of obesity (Blair and Brodney 1999; Jakicic et al. 2003; Ledikwe, Ello-Martin, and Rolls 2005), where overnutrition is defined as consuming too many calories and/or eating a diet too rich in salt, sugar, and fat. Indeed, both portion sizes (Young and Nestle 2002, 2012; Steenhuis and Vermeer 2009; Marteau et al. 2015) and diet composition (Hill and Peters 1998; Lustig 2012) have been linked with obesity. Medical literature does not indicate that exercise is of no value; to the contrary, exercise has considerable health benefits and is an important factor in weight control, but the primary driver of obesity is poor diet (Luke and Cooper 2013; Malhotra 2015; Malhotra, Noakes, and Phinney 2015).

Food and beverages (henceforth, we will use the term *food* to include beverages) are bought and sold in a free market around the globe. Many free market–oriented researchers have argued that this market is working efficiently and that obesity is the result of various economic trends in the last several decades: a decline in the real price of (especially energy-dense) food and increases in the real price of less energy-dense and more nutritious food, in female labor force participation, and in television viewing; technological changes that reduce the need for physical effort; and medical technology that has improved the treatment of obesity-related health consequences. Proponents of this position argue that obesity is caused by "many rational, utility-maximizing individuals [engaging] in behaviors

that are obesity promoting simply because—in today's obesity promoting environment—it is just too costly (in economic terms) to weigh less" (Finkelstein and Strombotne 2010, 522S). Rational persons constantly trade off health for competing goods, such as pleasure, income, time, and alternative consumption possibilities, and they have rationally chosen to gain weight (Philipson 2001; Philipson and Posner 2008). From a consumer perspective, research suggests that the most important attributes for individuals' food choices are taste and price and that nutrition and weight control are significantly less important attributes for most consumers (e.g., Glanz et al. 1998). Thus, it could be argued that the food industry has responded appropriately to perceived consumer preferences by providing tasty and inexpensive foods, even if they lead to weight gain.

This approach does not demonstrate that the market is functioning efficiently; rather, it assumes that the market is functioning well and that the consumers maximize their individual utility (Scitovsky 1954; Bernheim and Rangel 2007; Hindriks and Myles 2013, chap. 3). Since the underlying utility function cannot be measured directly, this approach assumes that the preferences of consumers can be revealed by their purchasing behavior. Many economists, especially those in the growing field of behavioral economics, reject this "revealed preferences" argument. Development economist Esther Duflo goes further and calls such logic the "moronic revealed-preferences argument" (Parker 2010). Some marketing studies do measure food attribute importance at the individual level; however, many behavioral economists question whether consumers' stated attitudes and choices are consistent with their own true self-interest. Richard Thaler and Cass Sunstein, in their bestselling book *Nudge*, argue, "Of course, sensible people care about the taste of food, not simply about health, and eating is a source of pleasure in and of itself. We do not claim that everyone who is overweight is necessarily failing to act rationally, but we do reject the claim that all or almost all Americans are choosing their diet optimally" (Thaler and Sunstein 2009, 7). Nobel laureates George Akerlof and Robert Shiller (2015a) argue that "Free markets, as bountiful as they may be, will not only provide us with what we want, as long as we can pay for it; they will also tempt us into buying things that are bad for us, whatever the costs." In other words, in market equilibrium and given a profit motive, we should expect firms to market offerings that are not in our best interest (nor those of our children).

Well-functioning markets are supposed to yield the optimal allocation of resources. The prevalence and trend in overnutrition and obesity—which are far from the optimal societal (or individual) outcomes—indicate there is reason to suspect some market failure here. The argument that people are "choosing" obesity rationally seems to be contradicted by the fact that people (particularly Americans) spend large amounts of time, effort, and money to lose weight, although often in vain. According to Marketdata Enterprises, a market research firm, the weight loss market in the United States was $61 billion in 2012. It is very unlikely that people would spend so much money and effort on weight loss if their actions that resulted in weight gain in the first place were rational. Further, there are substantial health, economic, and social costs to obesity (Friedman and Puhl 2012). The idea that one would seek out a higher likelihood of being subject to prejudice, depression, and lower wages in the workplace is hard to reconcile with a rational model of decision making. However, the (free) market for food does have one interesting feature: the companies that produce the calorically-dense food also manufacture and sell potential solutions. Ironically, Slim-Fast is owned by Unilever, Jenny Craig is owned by Nestlé, and Heinz owned Weight Watchers from 1978 to 1999 and still manufactures the brand's food products. The same food companies accused of selling energy-dense food that leads to obesity are also making money from the obesity crisis by selling weight loss products and programs—free markets at work!

What exactly is the relationship between free markets and optimal outcomes? According to standard theory in public economics, the proposition that free markets lead to efficient outcomes is based on a few key assumptions (Hindriks and Myles 2013, chaps. 8–10). When these assumptions are violated, efficiency is not achieved, and there is market failure. First, efficient markets require competitive behavior; this rules out any kind of market power, such as monopolistic firms and monopsonistic buyers (Vickers 1995). The second key assumption is symmetry of information between firms and consumers in the market (Akerlof 1970; Greenwald and Stiglitz 1986), and the third is the absence of an externality (Meade 1952). An externality exists when some economic agent's welfare (utility or profit) is "directly" affected by the actions of another agent (consumer or producer). The qualification "directly" excludes any effects that are mediated by prices (Scitovsky 1954; Hindriks and Myles 2013). Thus, the dominant economic view is that market failures occur due to three causes: market power, asymmetric information, and externalities. We depict these in figure 1 alongside each of the potential clas-

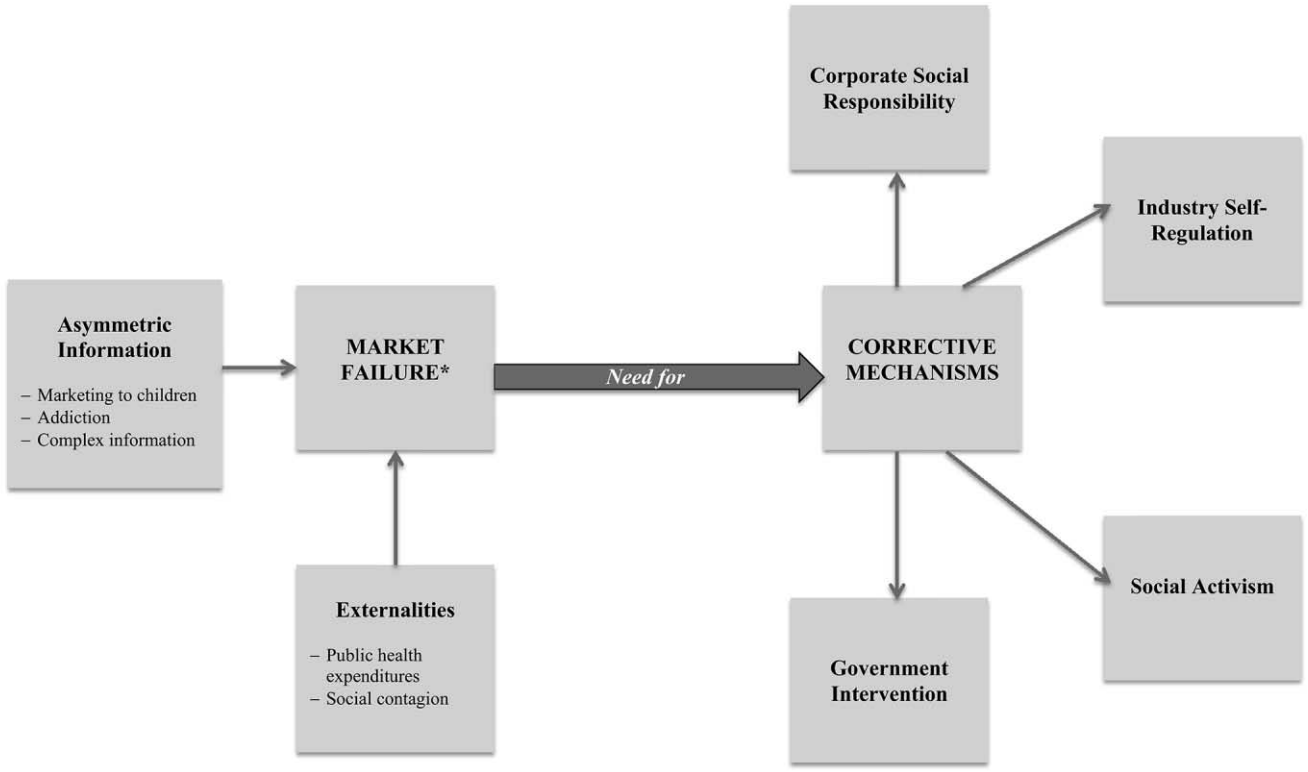


Figure 1. Market failure and corrective mechanisms.

ses of corrective actions to address market failure as the framework we use to guide our critical analyses.

In the context of obesity, the market for food is competitive and fragmented, and a case of failure due to market power is therefore hard to make. However, the market for food suffers significantly from the other two sources of market failure: negative externalities and imperfect information, which renders consumers vulnerable.

### *Externalities*

**Public Health Expenditures.** A straightforward reason why the market for food has negative externalities is that the societal cost of obesity is significantly greater than the private costs. As noted above, there are significant costs in monetary terms of obesity, but these costs are not allocated proportionately to obese individuals. Instead, many of the costs of obesity are often borne by the nonobese.

The higher average medical expenses of the obese are borne by the taxpayers in the case of public health insurance, such as Medicare and Medicaid in the United States and national or regional health care in many developed countries. Because premiums for most private health insurance policies do not depend on weight, lighter people in the same insurance pool pay for the higher medical costs of the obese. Furthermore, the negative health effects of obesity decrease the ability of the obese to pay for other government-mandated social programs.

Attempts have been made to reduce this externality by charging obese people higher premiums for health insurance. The Affordable Care Act passed in the United States in 2010 allows employers to charge obese workers up to 30% more for health insurance if they decline to participate in a qualified wellness program, such as those to promote healthy weight. The law also included incentives to persuade Medicare and Medicaid enrollees to see a primary care physician about losing weight. However, such measures do not sit well with many individuals, and advocacy groups have formed to "end size discrimination." Regardless of one's stance on this particular issue, the end result remains that there are significant negative externalities

in health care costs due to obesity in all developed countries.

Some researchers have argued that the higher medical costs of obesity might be offset by higher mortality rates of obese individuals, thus leading to lower expenditures for nursing homes, Alzheimer's care, and Social Security (Philipson and Posner 2008). To some extent, this also parallels smoking. While smokers do incur higher medical costs than nonsmokers in any given year, their lifetime drain on public and private dollars is less because they die sooner. However, mortality is no longer as significant of a threat to obese individuals as it once was. Beta blockers for heart disease, diabetes drugs, and other treatments are keeping obese individuals alive longer, with the result they incur much higher medical expenses in old age (Begley 2012).

**Social Contagion.** A subtler negative externality is that obesity spreads through social contagion, in effect "causing" other individuals to gain weight when they might not have otherwise done so. In recent years, health researchers have begun to explore how chronic, noninfectious disease might proliferate through social contagion, as people learn from and react to those around them (Smith and Christakis 2008). One of the most important examples of this type of social contagion model appears in the context of obesity. Using longitudinal data over 32 years, Christakis and Fowler demonstrated that obesity spreads through social ties, especially mutual friendships over time (Christakis and Fowler 2007), although some have questioned these conclusions (Cohen-Cole and Fletcher 2008; Lyons 2011).

The underlying mechanisms for such contagion may include both socially shared behaviors (e.g., food choices) and socially shared norms about the acceptability of being overweight. When obesity is relatively rare, it is considered abnormal and undesirable, and anticipated negative responses from others may help to keep it in check. As obesity begins to rise, the negative image of obesity may become less intense because obesity becomes more common (Philipson and Posner 2008). Indeed, studies have found social clustering of both body attitudes and eating behaviors (e.g., Trogdon, Nonnemaker, and Pais 2008).

There is a parallel between this argument and one that was made regarding second-hand smoke, where government intervention was motivated by the discovery that nonsmokers were developing lung cancer and other diseases from breathing smoke-filled air. In fact, it was only after medical research had proven the negative effects of second-hand smoke did policy makers get serious about fighting tobacco (Brownell and Warner 2009). Although, of course, the social contagion effect of obesity is much less harmful than second-hand smoke.

However, just because the social acceptability of obesity may be correlated with its prevalence, this does not mean that stigmatizing obesity to reduce its incidence is a viable solution. "Fat shaming," or stigmatizing obese individuals, has been consistently shown to have adverse effects on the psychological and physiological health of many individuals, particularly those most vulnerable, including adolescent females (Puhl and Brownell 2003, 2006; Puhl and Heuer 2010; Friedman and Puhl 2012).

### *Asymmetric Information*

**Marketing to Children.** A critical assumption of efficient markets is that individual consumers are capable of making judgments to maximize their long-term utility. Clearly free market arguments about individual responsibility and choice cannot be applied to children. Children are generally accepted to be unable to weigh the future consequences of their actions, and it is on this logic most countries restrict the sale and marketing of tobacco and alcohol to minors. The same logic holds true for the food market for several reasons. For one, empirical evidence suggests that obese children and adolescents often become obese adults (The et al. 2010). Childhood and adult obesity are highly correlated; a review of eight studies finds that one-third of obese preschool children and one-half of obese grade-school children become obese adults (Bouchard 1997). The Centers for Disease Control and Prevention, on its website, concludes that "childhood obesity has both immediate and long-term effects on health and well-being." As food habits are significantly shaped during childhood by one's family (Poti et al. 2014), it is highly likely that food consumption patterns and habits formed in childhood persist to some degree as children become adults (Gibson et al. 2012). "The physiologic conditioning of flavor preferences for foods high in energy density may have the greatest effect on children's liking of energy-dense foods among families in which those foods are most available and accessible" (Birch and Fisher 1998, 542). This suggests that poor food choices made early in life might not result in obesity at a young age but could very well later on. One study found that parental pressure-to-eat was significantly higher among nonoverweight adolescents and that this adversely affected the way those children ate as they grew older by reducing their ability to self-regulate energy intake (Loth et al.

2013). Coupled with the fact that many of the negative consequences of overnutrition (e.g., cancers, heart disease) are not manifest until much later in one's life, it is hard to argue that children are in a position to act rationally in their long-term self-interest.

Further, children are often the target of much advertising of unhealthy foods, advertising that would be illegal for products like cigarettes and alcohol almost everywhere. Studies of weekday afternoon and Saturday morning programs found that half of all ads during children's television shows are for food (Center for Science in the Public Interest 2003). The overwhelming majority of food ads aimed at children are for foods high in sugars, fat, and salt, such as sugary cereals, sweetened drinks, fast food, candy, and chips. Eleven percent of food advertising geared to children is advertising for fast food alone, and only 2% of food advertising is for fruits, vegetables, grains, and beans combined.

Research supports a positive relationship between advertising exposure of children, their food consumption patterns, and weight gain. A study commissioned by the Food Standards Agency of the United Kingdom found television advertising to children leads to an increase in consumption not only of the product of a given brand but also of all the products in the category in question (Hastings et al. 2003). In other words, if children see an advertisement for Coca-Cola, they will prefer Coca-Cola to Pepsi, but they also increase their consumption of all fizzy sugary drinks to the detriment of other categories of drinks such as water, milk, or fruit juices. Halford et al. (2007) found that children increased their food intake significantly after watching food advertisements. A group of 60 children between the ages of 5 and 7 were shown either food ads or toy ads followed by a cartoon. Food intake following the food ads was significantly higher compared with the toy ads, with the obese children increasing their consumption by 134%, the overweight children by 101%, and normal weight children by 84%.

**Addiction.** Beyond youth, it can also be argued that there is a market failure even for adults, some of whom are vulnerable consumers because food can be addictive. While it may seem counterintuitive to argue that food can be addictive when there are so many costs (economically and socially) to being obese, there is a growing literature demonstrating precisely that in diverse research fields, including economics, sociology, psychology, psychotherapy, and general social science (Cawley 2007). There is also medical research showing food, or at least certain foods, has addictive potential (Blumenthal and Gold 2010). Robert Lustig, a pediatric endocrinologist, argues that food can be physiologically addictive (Lustig 2012). He argues that while fat and salt increase the appeal of the fast food meal, it is the sugar and the caffeine that are the true addictive hooks. Processed foods rich in salt, sugar, and fat have a powerful effect on the reward centers in the brain involving neurotransmitters like dopamine (Avena, Rada, and Hoebel 2008). Nora Volkow, the head of the National Institute on Drug Abuse, argues that food can be as addictive as drugs and that understanding the commonalities between food and drug addictions could offer insights into all types of compulsive behavior (Szalavitz 2012). Somewhat in tune with this logic, in June 2013, the American Medical Association declared obesity a disease. If it is a disease, it is somewhat harder to hold individuals personally responsible for the consequences of their choices, a necessary condition for rational choice in well-operating markets.

**Complex and Imperfect Information.** Another source of market failure is that consumers of food have imperfect information, which can take several forms in this context. First, consumers are very poor at judging the calorie content of various foods (Lichtman et al. 1992; Wansink 2006). Further, they are equally poor at judging the calories burned via various forms of exercise. In one study, participants were made to walk on a treadmill for 28 minutes expending about 200 calories. When asked to estimate how many calories they had burned, the average answer was 825, with the range being 120 to 4,000 (not a typo!) calories (Willbond et al. 2010). In general, people overestimate (sometimes vastly overestimate) their calorie expenditure. To make matters worse, people also underestimate their calorie intake. In the above study, the participants were asked to consume 200 calories from a buffet. The average amount consumed was 556 calories.

Several jurisdictions have enacted laws requiring additional calorie labeling. Nowadays, people also consume prepared food outside at restaurants, and therefore labeling regulations have been strengthened recently in the United States and now apply to chain restaurants and grocery stores. However, the documented efficacy of such information on reducing obesity is low (Balasubramanian and Cole 2002; Elbel et al. 2009; Kiszko et al. 2014). There are many reasons why the simple provision of nutrition information does not translate into observable health outcomes. First,

how healthy (or unhealthy) a particular food item is depends on its ingredients as well as its calorie content, and people's understanding of such subcategories (e.g., sugar, salt, fat, but also others like fiber, vitamins, and micronutrients) is even more limited than their understanding of calories. Second, even if they are motivated to process this information (which most people do not attend to), they may not have the ability. Much consumer research has shown the perils of asking people to process so much information (Jacoby 1984; Malhotra 1984; Balasubramanian and Cole 2002). Third, even if packaged food and "restaurant-type" foods (to use FDA language) become better labeled in the store, this helps little with some items (e.g., prepared deli meats, bulk candy). A recent meta-analysis highlighted the failure of this effort, concluding that "current evidence does not support a significant impact [of labeling] on calories ordered" (Long et al. 2015). Indeed, one study found that even trained dietitians underestimated the calorie content of restaurant meals by an average of 37% and the fat content by 49% (Kuchler et al. 2005). And, finally, even if they were able to process the nutrition information provided to them, people are also poorly informed about the linkage between calories and weight gain/loss, and on the relationship between weight and health risks. For example, McFerran and Mukhopadhyay (2013) found that many people are misinformed about overnutrition being the primary cause of obesity. In sum, there are considerable information gaps in the marketplace that may result in many adults being classified as "vulnerable" in addition to the vulnerable status that can more clearly be ascribed to young consumers.

The above discussion about how vulnerable consumers are in the market for food should be placed in perspective and viewed as a matter of degree. In spite of the above evidence regarding how consumers are vulnerable in the market for food, clearly many people (including children) do not become overweight or obese and maintain a healthy body weight. Markets also "work" in the sense that the food industry does provide healthier products to the extent consumers are able and willing to purchase these options. It is also possible that various social and cultural forces mitigate any market failures. For example, incidence of adult obesity in 2010 in Japan was only 3.5% compared to 35.9% in the United States, perhaps due to cultural factors such as diet (Karnani, McFerran, and Mukhopadhyay 2014). Still, the balance of evidence indicates that the market failures we discuss above lead to a higher average incidence of obesity than would be the case in the counterfactual situation where there are no such failures.

## CORRECTIVE MECHANISMS

Adam Smith wrote in his famous book '*Wealth of Nations*' more than 200 years ago:

> Every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. . . . He intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. By pursuing his own interest he frequently promotes that of the society more effectually then when he really intends to promote it. (Smith 1776, chap. 2)

The genius of Smith was to understand the harmony between private interest and public welfare. Adam Smith's "invisible hand" argument, of course, critically depends on the markets being "efficient." Due to the invisible hand, firms pursuing rational self-interest do maximize social welfare, even if unintentionally. If there is a market failure, then there is a divergence between private profits and public interest. Conversely, as Akerlof and Shiller (2015b) argue, if there is a divergence between private profits and public interest, market failure is inevitable. Relaxing the assumption of perfect rationality necessarily leads to the conclusion that free markets can lead to negative social outcomes, that is, they can "fail" (Akerlof and Shiller 2015b). The profit-maximizing behavior of firms results in negative consequences to public interest, and some corrective mechanism is needed to change the behavior of companies or consumers such that society's goals are achieved. According to standard theory in public economics, government intervention is required to correct market failures, provided, of course, that the societal cost of correcting the failure is less than the cost of the failure itself (Hindriks and Myles 2013). While public economics focuses exclusively on government intervention to correct market failures, research in business strategy identifies three additional mechanisms to address market failures (Karnani 2007, 2014; Sammeck 2012).

The first possibility is that firms could voluntarily act in the public interest, even to the detriment of their profits, because of their corporate social responsibility (CSR). The second possibility is that firms in an industry or sector could come together and self-regulate themselves to achieve the societal goals. The third possibility is that social activism could pressure companies to act in the public interest. The fourth corrective mechanism is for the government to in-

tervene in the market and force or incentivize companies to act in the public interest (Karnani 2011). These are depicted in figure 1. We next discuss these four corrective mechanisms, and assess the effectiveness of each to correct the failures in the food market.

### *Corporate Social Responsibility*

The idea that firms have a CSR to better society has caught the attention of executives, academics, and public officials everywhere. The annual reports and websites of virtually every large company claims its mission is to serve some larger social purpose besides making profits. Much of the contemporary literature on CSR emphasizes its link to profitability, or "win-win" approaches (Vogel 2005). The business case for CSR states that as companies behave more responsibly, they also become more profitable—the so-called doing well by doing good proposition. While appealing, some have argued this is a fundamentally wrong proposition (Karnani 2011; Mackey and Sisodia 2013). This is because profitable activities that simultaneously increase public welfare are best described as intelligent operation of business, not as CSR. In an efficient market, that is, in the absence of market failures, societal welfare and private profits are perfectly aligned, and there is no need for CSR. The concept of CSR is relevant and has teeth only in the context of socially desirable activities that are not profitable, or, in other words, in the case of market failure (when societal welfare and private profits are divergent).

In spite of the tremendous volume of literature on CSR, the field cannot agree on a definition of CSR. Even its proponents acknowledge that the concept often remains "vague and ambiguous" or even "tortured" (Rivoli and Waddock 2011). We define CSR simply as when a company voluntarily undertakes socially desirable behavior that decreases its profits (Karnani 2011). We acknowledge that this is a narrower definition of CSR than some have taken (e.g., Porter and Kramer 2011), but consider it one that is necessarily consistent with the overall focus of this paper on market failures. Say, for example, some customers of McDonald's demand a healthful meal, and the company finds it profitable to sell salads. Under a broader definition of CSR that includes win-win approaches, it could be argued that McDonald's is using CSR in offering such products. However, given that it is profitable to market the salads, there is no market failure in this example; in fact, the market is efficiently providing the salads to wanting consumers. Our focus in this paper is on market failures—which always involve a trade-off between social and economic goals—as the cause of obesity. Win-win approaches have no tension between social and economic goals; they fail to deal with the trade-offs between economic and social value creation (Crane et al. 2014) and cannot correct market failures. Hence, under the definition of CSR adopted by us, in theory, CSR does have the potential to correct market failure.

However, the problem is that, in practice, most companies are motivated by self-interest and seek to maximize profits. In fact, managers in publicly listed companies have a fiduciary responsibility to do so. Critics of the CSR movement have argued that "much of CSR thinking is itself in crisis," which manifests itself in four respects: "CSR thinking is largely ahistorical, empirically weak, theoretically thin, and politically naïve" (Utting and Marques 2010, 3). Regardless of the conceptual argument toward CSR that one adopts, many firms in practice are driven by self-interest and end up talking a lot about CSR and doing very little, derisively referred to as "greenwashing." There is evidence that the food industry follows this pattern.

Although food companies are responsible for producing a vast array of high-calorie, nutrient-poor foods that lead to obesity (Brownell 2012), virtually every food company claims to be a "part of the solution" to the obesity problem (Coca-Cola Company 2012). Kraft says, "Helping children and their families make healthy food choices while encouraging physical activity has become part of how Kraft gives back to communities" (Kraft 2008). At the request of the World Health Organization, Lewin, Lindstrom, and Nestle studied the promises and actual practices of two leading food companies in the United States and found systematic discrepancies. Kraft remained heavily engaged in marketing of unhealthful products to children despite promises to fight childhood obesity (Lewin, Lindstrom, and Nestle 2006). McDonald's marketed unhealthful products to children with toys, games, and movie tie-ins. Another study concluded that food companies in the United States "lobby vociferously against policies to improve children's health; make misleading statements and misrepresent their policies at government meetings and in other venues; and make public promises of corporate responsibility that sound good, but in reality amount to no more than a public relations campaign" (Simon 2006, 233).

Research has found that the food companies, far from being part of the solution, actually exacerbate the obesity crisis. Food firms take an active role in deflecting rhetoric about poor diet being the primary cause of obesity, and they promote a message focused on exercise and other factors—

a phenomenon termed "leanwashing" (Karnani et al. 2014). These authors argued that industry messaging across multiple channels is consistently and overwhelmingly focused on incorrectly indicting exercise and/or a lack of a "balanced" lifestyle as the main cause of obesity. Consequently, as mentioned, about half the population is misinformed about a poor diet being the dominant cause of obesity (McFerran and Mukhopadhyay 2013), and food companies are in part responsible for this (Karnani et al. 2014). More critically, these mistaken beliefs have consequences. People who mistakenly underestimate the importance of bad diet are in fact more overweight than people who correctly believe that a poor diet is the primary cause of obesity (McFerran and Mukhopadhyay 2013). This problem is exacerbated because false information not only causes consumers to behave inappropriately today, leading to obesity, but also undermines confidence in the correct information when it is heard in the future (Lewandowsky et al. 2012; Schwarz 2015).

In sum, companies practicing CSR to correct the market failure has shown little promise to this point. In fact, food industry messaging is at least partly responsible for the misinformed public, whiich worsens the market failure and is thus culpable in perpetuating the obesity epidemic. This is not to say there are not companies making sincere efforts; however, if a particular industry suffers from market failure, it is not enough for one company to practice CSR—all, or almost all, firms in the industry have to practice CSR to ameliorate the market failure. This is harder to achieve in fragmented and global industries, such as food. As it stands, it is hard to see how CSR alone can play a positive, corrective role in the obesity crisis.

### *Industry Self-Regulation*

Self-regulation is almost always justified as a way to reduce the public costs of regulation, especially when the government lacks the expertise and administrative capacity to design and implement regulation in a complex environment. Self-regulation might also be a response to strong or pervasive antagonism to the use of government power. In the United States in recent times, public and political opinion has moved decisively to favor free markets; governmental interventions have been viewed as heavy-handed and ineffective, and they have attracted much political, and even popular, opposition.

The Institute of Medicine's report published in 2005 "*Food Marketing to Children and Youth: Threat or Opportunity?*" marked a turning point in the public debate on obesity by focusing attention on marketing to children (Institute of Medicine 2005). This fits with our earlier discussion that a major cause of failure in the market for food is that children are vulnerable consumers. Many civil society organizations, including the Center for Science in the Public Interest, the American Academy of Pediatrics, and the American Psychological Association, called for governmental restrictions on food marketing to children (Wilde 2009). However, given the public and political opinion in the United States, it is not surprising that the primary approach for correcting this market failure has been industry self-regulation with minimal government oversight. Government intervention has been more common in other OECD countries, as the next section will show. The Federal Trade Commission chairman, Deborah Platt Majoras, emphasized parental responsibility and the "tremendous benefits" of "effective self-regulation" in a workshop on food marketing to children (Federal Trade Commission and Department of Health and Human Services 2006). Food companies clearly prefer industry self-regulation to government regulation, and they have made highly visible pledges to curtail children's food marketing. In an unusually frank (perhaps inadvertent) admission, General Mills states that "a determination that there is a need for governmental intervention would also necessarily hinge on a conclusion that the food industry is not, on its own, moving enough with its own self-regulatory efforts" (Federal Trade Commission 2011, 107).

Self-regulation is quite common in many industries, such as accounting, financial services, software, and agriculture. Nobel Prize winner Elinor Ostrom has demonstrated that self-regulation of common pool resources such as forests, grazing lands, and fishery resources can effectively avoid the "tragedy of the commons" (Ostrom 1990). A major factor that might explain this success is that the collective interests of the firms in the industry are aligned with the public interests of society. In the forestry business, both the industry and society would like to avoid deforestation, and self-regulation has been quite successful. This logic also applies to other industries involving scarce natural resources, such as marine fisheries.

However, self-regulation has not been successful when the interests of the industry and society are divergent. In such cases, self-regulation has the same problem as CSR: given the trade-off between profits and public interest, firms are unlikely to voluntarily act in the public interest at the sacrifice of shareholder interests. The call for self-regulation has often been a tactic of deflection by the busi-

ness community. Whenever an industry faces popular support for regulation that will harm its financial interests, managers often champion self-regulation in order to preempt more onerous government regulation. It is not surprising that many scholars, public officials, and social activists view self-regulation with suspicion, just as they view proclamations of CSR with suspicion (Karnani 2011).

One example of dramatic failure of self-regulation has been the financial services industry. One of the causes of the recent financial crisis was the failure of self-regulation, as Alan Greenspan, the former governor of the Federal Reserve, acknowledged (Greenspan 2008). Nobel laureate Joseph Stiglitz, reflecting on the causes of the financial crisis, also concluded that "self-regulation is preposterous" (Stiglitz 2009). Another example of disastrous self-regulation is the tobacco industry. In response to public and government outcries over marketing to youth, the tobacco industry developed several youth smoking prevention programs in the early 1980s. Research has found no evidence that these programs decreased the rate of youth smoking and evidence that they may in fact have caused more harm than good (Landman, Ling, and Glantz 2002).

The success of self-regulation by the food industry depends critically on whether the marketing efforts of individual companies merely cause brand switching by consumers or significantly raise the level of consumer demand for the whole category of products. As mentioned earlier, research supports a positive relationship between advertising exposure of children and their food consumption patterns and weight gain, not just brand switching. Another study, based on a large-scale survey of fast-food consumers, concluded that brand switching accounted for a rather small share of sales increase in response to promotional marketing, while "the principal effect is to cause fast-food consumers to purchase more often, or buy more on each visit" (Richards and Padilla 2007, 30). This conflict between the interests of the industry and public interest suggests that self-regulation in the food industry is unlikely to succeed. According to Sharma, Teret, and Brownell (2010, 245), "Where industry and public health objectives conflict, an industry has incentives to create a public image of concern and to promise change, but then to create weak standards with lax enforcement."

It is not surprising that the food industry has championed self-regulation and has supported several initiatives in response to concerns about marketing to children, including two major initiatives, Children's Advertising Review Unit (CARU) and Children's Food and Beverage Advertising Initiative (CFBAI), and a host of smaller programs. Research (outlined below) shows that these initiatives have at best had modest impact and usually have not achieved societal objectives.

The CARU is administered by the Council of Better Business Bureaus (CBBB), and its members include 17 of the largest food companies in the United States. Broadly, CARU asks advertisers not to be untruthful, misleading, or inappropriate for the target audience of children under the age of 12 years. According to James Sargent, the lead author of a recent study (Bernhardt et al. 2013), "Fast-food companies use free toys and popular movies to appeal to kids, and their ads are much more focused on promotion, brands, and logos—not on the food" (Robert Wood Johnson Foundation 2013). "These are techniques that the companies' own self-regulatory body [CARU] calls potentially misleading" (Morrison 2013). Images of food packaging—as opposed to the food itself—were present in 88% of the ads directed at kids, versus 23% of ads aimed at adults. The study concluded that McDonald's and Burger King did not follow through with their self-regulatory promises during the period 2009–10. Even when CARU cites a member company for violating its guidelines, it has no impact on the subsequent behavior of the company, largely because CARU has no enforcement power. A detailed case study concluded, "Since CARU has no power to fine or otherwise punish advertisers, it appears many are quite willing to continue using misleading and deceptive techniques that increase sales. When called to task, these advertisers succeed in satisfying CARU's concerns with pacifying statements or minor, temporary adjustments to advertising techniques" (Fried 2006, 136). CARU espouses reasonable standards, but its enforcement is very lax, and the end result is an ineffective self-regulatory process.

The CFBAI has 17 participants that represent about 80% of child-directed TV food advertising in the United States; it is administered by the CBBB, but separately from CARU. The goal of the initiative is shift the mix of child-directed advertising to encourage healthier dietary choices and healthy lifestyles. A recent study evaluated the effectiveness of this program and concluded that "no significant improvement in the overall nutritional quality of foods marketed to children has been achieved since industry self-regulation was adopted" (Kunkel, Castonguay, and Filer 2015, 1). The Department of Health and Human Services categorizes food into three categories: Go, Slow, and Whoa. "Go" foods are rich in nutrients and low in calories, fat, and added sugar, and they include vegetables, non-fat milk,

and diet soda. "Slow" foods are higher in calories, fat, and added sugar, and they include broiled hamburgers, peanut butter, most pastas, and pure juice. "Whoa" foods are high in calories, fat, and added sugar, and they are low in nutrients; they include fried chicken, cookies, and regular soda. Using this framework, child-directed advertisements in 2013 were as follows: 80.5% for Whoa foods, 18.4% for Slow foods, and only 1.1% for Go foods. This mix was actually slightly worse in 2013 than in 2007 when self-regulation started. Paradoxically the study also found that the industry has done everything it promised: all participating companies advertise only products that meet their nutritional guidelines. The problem is that the nutritional guidelines are specified by the individual parent corporations! Many companies classify a product as healthy if a small portion of the undesirable ingredients is removed from its original formulation. This accounts for the disparity between the CFBAI and industry claims that companies promote only healthier foods to children, as well as the study's findings that over 80% of the products advertised to children fall in the poorest nutritional category. In CARU, the standards are reasonable, but enforcement is very lax. In CFBAI, the standards are very weak. The study concludes, "Given that corporate profit concerns unavoidably mitigate more stringent industry-based reforms, continued reliance upon self-regulation to resolve this problem seems destined to yield only modest benefits. With a persistent national obesity crisis, the failure to act more strongly holds adverse implications for America's children" (Kunkel et al. 2015, 6).

The Responsible Advertising and Children (RAC) Program is a self-regulatory body that represents advertisers, agencies, and the media worldwide. Its website proclaims that "its members share a common vision for the promotion of responsible marketing communications" (Responsible Advertising and Children 2009a). RAC is "acutely aware" of the issue of childhood obesity, and it advocates a "holistic response to a multi-factorial problem." The website text goes on to argue: "Many studies have pinpointed the lack of physical activity as the single most important cause of obesity. . . . Research also unequivocally demonstrates the importance of socio-economic determinants, while illustrating how children's diets and their consumption of particular product categories (such as chocolate and soft drinks) are in no way linked to their Body Mass Index" (Responsible Advertising and Children 2009b). Given such egregious disregard for truth, science, and medical research, it is impossible for RAC to help correct the market failure that leads to obesity; rather, it exacerbates the market failure. We should not be surprised that self-regulation is ineffective given the conflicting interests of the food industry and society.

### *Social Activism*

A different corrective force on market failure stems not from the firms or the industry but from activism by civil society, that is, organizations such as consumer movements, nongovernmental organizations, and charitable foundations. Civil society acting as advocate and watchdog can pressure companies to change behavior to increase societal welfare. While this strategy has worked in several instances, we argue below that it is unlikely to succeed in the context of obesity. Another possibility is for civil society to agitate and prod the government to enact and enforce regulation that is in the public interest. This strategy too has worked in several instances and is more likely to succeed in the fight against obesity; this argument sets the stage for the next section on government intervention.

One of the more common tactics is to "name and shame" companies into changing behavior that is contrary to public interest—as Justice Louis Brandeis said, "Sunshine is the best disinfectant." Morgan Spurlock directed and starred in the 2004 documentary *Super Size Me*, which followed him for 1 month during which he ate only McDonald's food. As a result, Spurlock gained 24.5 pounds in weight and suffered various health problems. Six weeks after the film premiered, McDonald's discontinued the Super Size option and made other changes to its menu. McDonald's denied that this had anything to do with the film (Sood 2004). The documentary received positive reviews and several awards, including the Grand Jury Prize for direction at the Sundance Film Festival. The film also received much criticism, including, of course, from McDonald's. On a website, the company claimed to have made several changes to offer healthful food; it explained: "What can't change overnight is people's perceptions, but we would like to think that in five to 10 years' time we may be as famous for our salads, our fruit or organic food as we are for our Hamburgers" (McDonald's 2007). It is safe to say that McDonald's has not achieved its ambitious goal 12 years after the documentary came out.

At times civil society has gone further and tried to organize boycotts against companies to get them to change behavior. For example, there has been a continuing civil campaign since the 1970s against Nestlé, prompted by concerns about the company's marketing of infant formula in less developed countries. Rainforest Action Network (RAN) is an activist organization that agitates, often quite effectively,

for environmental protection and sustainability. Its website states: "Our campaigns leverage public opinion and consumer pressure to turn the public stigma of environmental destruction into a business nightmare for any American company that refuses to adopt responsible environmental policies" (Rainforest Action Network 1995). RAN has been particularly active in changing forestry practices among US retailers. Examples of successful civil movements include "Just Say No" against illegal drugs and "Mothers Against Drunk Driving." The Women's Christian Temperance Union was the first women's mass movement in the United States, and it helped ban alcohol in 1920.

The public health community has not succeeded at launching a large-scale civil movement to fight obesity; there are several reasons for this failure. The scope of the obesity problem is much larger than the problems of tobacco, alcohol, or drugs. "It touches on the food we eat, the beverages we drink, the amount of television we watch, how much we exercise, the way our cities are designed, and more" (Graham 2012). Everybody eats food, whereas only a fraction of the population consumes products like tobacco. Tobacco is a single substance with a small number of companies producing cigarettes. By contrast, food includes many products, and there is an enormous number of companies involved in the food, beverage, grocery retail, and restaurant industries.

Demonizing users (or the products) is a powerful force in civil movements targeting drug addicts, drunk drivers, and second-hand smoke (Kersh and Morone 2002). The negative externalities of these products were easy to explain and persuade people about: tobacco (second-hand smoke), alcohol (drunk driving), and drugs (increased crime). Anti-obesity activists cannot portray overweight people as dangerous to society. The best argument might be that obesity consumes enormous health care resources, but that is too abstract and does not provoke the same sense of personal outrage.

Obesity has not stirred popular awareness on a large scale. Overeating and unhealthy foods are fuzzily, subjectively, and variously defined, whereas we can all agree on what smoking and cigarettes are (Lee 2013). "Obesity is seen as a pejorative term that people don't connect with. They think 'I'm just 30 or 40 pounds overweight, but I am not obese,'" said William Diets, director of the division of nutrition, physical activity, and obesity at the US Centers for Disease Control and Prevention (Graham 2012).

Medical findings about the dangers of tobacco and the direct causal relationship with lung cancer led to concerted pressure against its use. The linkage between food and obesity and the relationship between obesity and health impacts are not as clear-cut. Obesity is not so much a disease (or, not only a disease) but rather a risk factor associated with higher incidence of illnesses such as diabetes and heart diseases. Where lung cancer and other smoking-related diseases resist effective treatment, the obesity-related diseases of diabetes and hypertension are highly treatable.

Where smoking or drugs can be banned, overeating cannot be banned. Curbing childhood obesity is much more complicated than tobacco use. The message against tobacco can be "Don't do this." For obesity, the message has to be "Make good choices, do this in moderation, set boundaries"—which is much more difficult to convey.

"When I look at what's going on with obesity, it reminds me of what was going on with tobacco in the '50s, '60s and '70s, when there was a lot of emphasis on personal responsibility, voluntary self-regulation, and trying to make safe cigarettes," said Stanton Glantz, director of the Center for Tobacco Control Research and Education at the University of California, San Francisco (Graham 2012). That approach did not work, and efforts to reduce smoking succeeded only after a shift in emphasis to community-based activism, holding cigarette manufacturers accountable, and government intervention. Similarly, to fight obesity, civil society needs to shift its emphasis to prod the government to intervene.

## GOVERNMENT INTERVENTION

The analysis above indicates that it is unlikely that the market failure leading to obesity can be corrected via CSR, industry self-regulation, or social activism; that leaves a final possibility: government intervention. There are three main levers that policy makers can use to correct market failure: taxes/subsidies, market restrictions, and education (Nestle and Jacobson 2000; Soman 2015). We evaluate each option in turn, drawing on experiences from jurisdictions around the world, as well as theory and findings from consumer research and adjacent disciplines.

### *Taxation and Subsidies*

The cost of producing food has decreased over time (e.g., Cutler, Glaser, and Shapiro 2003; Lakdawalla, Philipson, and Bhattacharya 2005), and as a result, real food prices have declined, particularly in the unhealthiest and most processed categories (Brownell and Frieden 2009). One frequently suggested manner in which market failure may be addressed is by raising the price (via taxation) of unhealthy

foods; another would be to lower the price (via rebates or subsidies) of healthier alternatives. The argument is that by doing so, prices will fall into line with what is better for society, and consumers' demand functions will shift accordingly. Further, revenue from such taxes can be directed to targeting the treatment of obesity, so that more of the costs are borne by the purchaser.

There is considerable economic research examining the effect of food prices on consumer behavior. In a review of 160 price elasticity studies, Andreyeva, Long, and Brownell (2010) found that within-category price elasticities differed considerably by category, with food away from home, soft drinks, juice, and meats being most elastic (typically around 0.7–0.8), suggesting that price increases (i.e., "fat" or "sugar" taxes) could be effective in reducing demand for these high-calorie categories.

Several jurisdictions have implemented such taxes, including Denmark (fat tax), Hungary (salt, sugar, and high caffeine), France (soft drink tax), Mexico (soda tax), and Finland (soft drinks). Norway and several Polynesian countries also have import and/or excise taxes on sugared beverages. Berkeley, California, became the first city in the United States to institute a tax on high-calorie sugary drinks in 2015. Several other countries, states, and cities have additional legislation in proposal stages.

With most being so new, there is little direct, peer-reviewed evidence (in either direction) on the effectiveness of these taxes. There are, however, several studies examining the expected effect that taxes on fat and/or sugar would have on consumer response. One example is Khan, Misra, and Singh (2016), which finds that for milk, within category demand is highly price elastic, especially for low-income consumers, and thus a fat tax would be effective in getting consumers to switch to lower fat alternatives, for example, from whole milk to low-fat milk. Other experimental studies show that reducing the price of healthy food can increase its consumption (e.g., French et al. 2001; Epstein et al. 2010).

However, there is some evidence suggesting limits to taxation. While higher prices may indeed depress consumer demand for some food categories, demand within other categories that have high calorie densities (e.g., eggs, fats, and oils) are very inelastic, suggesting that a small tax is unlikely to be effective. Further, there is little work on cross-category elasticities or substitution effects that convincingly point to the overall effectiveness of taxation (Andreyeva et al. 2010; see also Chandon and Wansink 2011). This is an important area for future research.

Implementation is also clearly important, as Denmark's fat tax lasted only a year; several problems included a small population, high administrative costs, and easy access to jurisdictions (neighboring countries) where purchases could be made tax-free (Kliff 2012). Further, there is disagreement on what exactly should be taxed: should it be a tax on products or a tax on specific ingredients or nutrients? Should all fats be taxed (leading to an avocado tax and an omega-3 tax) or only certain kinds? Should the tax be added on top of the sticker price (like most North American consumption taxes) or bundled into the purchase price (like gasoline, cigarettes, and many European VATs)? The former would increase the salience of the tax (and thus its effectiveness; Chetty, Looney, and Kroft 2009; Finkelstein 2009), but it also might make it less palatable from a consumer (and political) standpoint.

Another issue is properly calibrating the size of the tax. All of the introduced taxes have been quite small, and they do not resemble comparable "sin" taxes. For instance, New York City's tobacco tax is $5.85 per pack (average price of a pack is approximately $10.80; Burritt 2010). A tax of approximately half of the purchase price will be a deterrent, but no food tax of such magnitude has been proposed. Of course food is a necessity and tobacco is not, so comparisons are challenging, but it is hard to claim taxation is ineffective when taxes of the magnitude designed to deter consumption have never been implemented. Further, matching the tax to human physiology is also near impossible. No amount of tobacco is good for you, but people need food to survive, with a typical recommendation of approximately 2,000 calories per day for adults. One possible strategy that would match human needs would be a consumption tax of 0% on the first 2,000 daily calories but one that would then rises steeply and progressively thereafter. Of course such a tax is pragmatically impossible to implement. Another, slightly more plausible, variant would be to tax "large" portions progressively, with smaller portions remaining untaxed. While intuitively appealing, this would be also very challenging to implement ("What is "large"? Does "large" vary by food or beverage type? These are empirical questions for future research). Of course consumers could always buy two smaller portions in lieu of one larger one to avoid the tax, but given the highly nonlinear pricing structures of food products as portion sizes increase, such a choice could easily cost the consumer more than paying a tax. How to structure a tax that has the desired dissuasive effect without creating new problems is therefore an important question for policy makers and researchers.

A final limitation to taxes on unhealthy foods is that such taxes are potentially regressive. Obesity, in developed countries, is higher among those of lower socioeconomic status, the same people who consume disproportionally more of the unhealthy foods. Critics of such taxes argue that such taxes penalize the poor. However, the same argument can be made for taxes on cigarettes, alcohol, and gambling—all of which are typically heavily taxed. As well, there is reason to believe that taxes might be particularly effective among the poor: the poor generally demonstrate more price elasticity and thus the tax may work more effectively for the poor, the very people at the greatest risk of obesity. Such a tax could, in theory, benefit the poor by shifting their food consumption to healthy foods.

Recent socioeconomic and demographic trends paint a mixed picture of consumers' price sensitivity and likely response to financial incentives. On the one hand, the growth of expensive premium organic and specialty retailers is evidence that many consumers are willing to pay more for high-quality, generally healthier, alternatives. On the other hand, given that most of the economic gains of the best several decades have gone to a small percentage of consumers, a sizable base of consumers remain highly price sensitive. In fact, 50% of consumers in the United States live in a household where one or more members receive some form of income assistance (Izzo 2012), and 47.6 million Americans receive SNAP (supplemental nutrition assistance program) benefits (Food and Nutrition Service, USDA 2015). Against this backdrop, it is hard to determine at the macro level how consumers will respond to various policies.

We contend that, like most policy interventions, effects will depend on specific characteristics. Given the low cost of food, it seems probable that a small tax might not deter consumers from purchasing items they want. This is supported by decades of research in economics, showing that the price elasticity of demand is low when a good represents a very small share of wallet (as many individual junk food purchases would, for example). On the other hand, it is popularly believed, and has been shown in some research, that consumers have a strong aversion to taxes of all kinds (Sussman and Olivola 2011; Lamberton 2013), although how much "dislike" of a tax translates into "avoids purchasing" clearly varies. As well, perhaps even a modest change in behavior would be sufficient for many consumers. For example, a Starbucks Venti Java Chip Frappucino contains 580 calories, which is more than people generally expect. Worse, people neither appreciate the time and effort it would take to walk this one drink off (about 4 hours) nor the weight they could lose by eliminating just this drink daily (over 50 pounds in a year; see Wansink [2006]). To summarize, it appears as if taxation of any sort would be highly unpopular, especially in the United States. However, the extant empirical evidence for this claim is less extensive than anecdotes and opinion pieces might lead one to believe, and this is an area open for investigation.

An alternative to taxation would be the alteration of agricultural policy and the subsidies that the upstream industry receives. Many argue that policy currently subsidizes food that is high in calories (e.g., high fructose corn syrup, meat), thus reducing the sticker price of these foods to consumers relative to healthier alternatives. Given the power of the agricultural lobby and the fact that the public rarely blames these policies as a cause of obesity, the removal of the subsidies may be desirable but is highly unlikely (Seiders and Petty 2004). There is, of course, no extant data on effect of removing or modifying such subsidies. However, it may be possible to estimate this econometrically.

A slightly more probable option might be for public policy to subsidize healthy food, or food grown "healthily" or sustainably. However, anecdote and experimental studies both show that there is considerable pushback to consumers using "welfare" benefits to purchase healthier alternatives (Olson et al. 2016), suggesting that the expansion of access to higher quality foods is likely to be met with political resistance, and the labeling of "healthy," as with "natural" and "organic," becomes a matter of argumentation and lobbying.

Soman (2015, 33) states that economic incentives such as taxes and subsidies work when consumers' behavior is motivated by costs and benefits and the market is in line with the incentives and does not work against them. By these criteria, is seems unlikely that such (dis)incentives would work. However, as discussed above, we feel that there are several unanswered questions regarding the nature, scope, and implementation of such mechanisms.

### *Marketing Regulations*

While taxes and subsidies may serve to tilt demand curves one way or the other, an alternative approach would be to impose restrictions on the supply side. There are several possible regulations that may serve to correct the market failures of obesity. The three that garner the most discussion are restrictions on advertising, restrictions on distribution, and restrictions on the product itself. The discourse around the first two areas tends to focus on the effect of marketing actions on children's consumption.

**Advertising.** Food is one of the most marketed categories, especially fast food. In 2012, fast food companies spent $4.6 billion in advertising in the United States alone, and children and teens were a major target. More troubling, most food advertisements aimed at children are for unhealthy offerings, and these make up about one-third of TV ads in children's programs (Desrochers and Holt 2007). In addition to mainstream TV and print ads, companies invest heavily on the promotion of their products through event sponsorship, celebrity endorsements, branded product tie-ins, and social media. The central theme of food marketing is that "unhealthy eating (e.g., frequent snacking on calorie-dense and nutrient-poor food) is normal, fun, and socially rewarding" (Chandon and Wansink 2011, 128).

Do food industry promotional strategies and tactics increase unhealthy food consumption? Clearly the revealed preferences of marketers suggest that they find advertising to be highly effective and important to their business, as do several empirical studies (e.g., Connor 2006; Taveras et al. 2006; Chou, Rashad, and Grossman 2008; Andreyeva, Kelly, and Harris 2011). However, many studies that correlate TV viewing with increased consumption do not disentangle the effect of watching TV itself (filled with food ads) from the advertising present during the TV ads. Moreover, TV viewing is a sedentary activity, which would have some effect on body mass over time.

From a policy standpoint, there are a few jurisdictions that have restricted food advertising, usually only for ads directed at children. Since 1980, Quebec has banned advertising targeting children under 13. Sweden and Norway have also introduced similar bans, and the United Kingdom more recently introduced a ban on advertising products high in salt, sugar, or fat to children under the age of 16.

Econometric studies examining the effects of such bans are rare. Dhar and Baylis (2011; see also Goldberg 1990) examined the effect of Quebec's ban on advertising targeting children by comparing French- and English-speaking households in Quebec (which had the ban) and neighboring province Ontario (which did not). The empirical results showed that the ban decreased fast-food consumption by $88 million per year—compared to fast food industry sales of $23 billion in Canada, and Quebec makes up about 23% of Canada's population (Canadian Press 2015). As with taxation, there is a need for more empirical evidence of the effects of such restrictions across product categories and jurisdictions.

In sum, advertisers clearly view promotion an important part of their business model, and studies do show that these tactics have an effect on unhealthy food consumption. Restrictions on advertising appear to have demonstrable effects on consumer demand.

**Distribution.** A second class of regulation is restricting access to unhealthy food and/or increasing access to healthier alternatives. The central idea here is that distribution drives consumption, and by making food more (or less) convenient, diets can be shaped. This notion is strongly supported scientifically (see Chandon and Wansink 2011). Given that much consumption is "mindless" and that the mere visibility of food within a kitchen alters its consumption (Wansink 2014), even small changes to access can alter consumers' food choices.

A well-known policy example is snack food vending machines in schools. On the one hand, these machines provide a source of revenue to schools that is valuable to them (Seiders and Petty 2004). On the other hand, historically the machines have been stocked with unhealthy foods and soft drinks, perhaps partly in response to consumer demand. While there are clearly many places where students can access such items besides school, in some areas these machines have a local monopoly. While unhealthy items are indeed available elsewhere, healthy items may not be available in the school. Many jurisdictions have implemented restrictions or bans on what can be sold in school vending machines, suggesting that more are likely to follow soon.

There are other areas where limited access to healthy food itself is an issue. During the late 1990s, the term "food deserts" was applied to neighborhoods with little or no access to large grocery stores offering affordable, nutrient-rich foods (Wrigley 2002; but see also Sanger-Katz 2015). Instead, these areas often contain many fast food outlets and convenience stores. Sadly, food deserts are likely to be impoverished neighborhoods. Such areas may have a small tax base and little power over potential developers or retailers who wish to set up shop wherever they choose. Others have considered heavy-handed alternatives to deal with food access. London has proposed legislation that gives local councils the ability to ban fast food restaurants from locating within 400 meters of schools, for example (Lydall 2014). Such a ban would be based on science: one study (Davis and Carpenter 2009) found that proximity of schools within a half-mile of fast food restaurants predicted pupils' fruits and vegetable consumption (negatively), serv-

ings of soda (positively), and likelihood of being overweight (positively). Another study (Currie et al. 2010) found similar results for schoolchildren as well as expecting mothers. In sum, while restricting children's access to unhealthy food products is becoming a politically more palatable solution, access predicts the food consumption of young and old alike.

**Ingredient and Product Bans.** Stronger than merely restricting distribution is an outright ban on certain products. Such bans are rare, but they are not unheard of. For instance, New York City and several municipalities in and around Boston have banned artificial trans-fats. Studies have shown that the New York ban indeed reduced trans-fat consumption without increasing saturated fats, an effect that cuts across socioeconomic strata (Angell et al. 2012; Lichtenstein 2012). While such a ban seems to be free of serious adverse consequences and has improved the quality of food eaten outside of the home for many, the effects of the ban on obesity and population health remain undocumented. As well, it is unclear how the effects of an ingredient ban generalize to bans of say, entire product lines. From a consumer standpoint, most ingredients are relatively invisible, while products are highly salient. Caution should be considered given that, at least for some young consumers, the banning of a product could increase its appeal via reactance (e.g., McLaren 2014).

There is good reason to believe that widespread bans of ingredients (and especially products) are unlikely. These tend to face stiff opposition from both industries (who fear for their profits) and consumers (who do not like being told what they cannot consume). Unless an ingredient is proved to be dangerous, there is little to be gained politically from most bans. Further, it is not always clear how banning certain ingredients will result in less obesity, unless the ingredient is replaced with something that is both less harmful and lower in calories. Banning certain sizes of products, such as large soda drinks or family packs, has the additional problem of being easily circumvented (say, by purchasing more than one) and may be regressive in that the consumer of a family pack may indeed be a large family. Much like zoning restrictions, a regional patchwork set of regulations likely means disappointing results. In addition, without geographically comprehensive legislation, there will remain free access to products outside of the ban area for many consumers.

**Nudging.** A less coercive approach than formal bans on marketing actions are subtler "nudges" that can be employed to guide people to make better choices. Hotly discussed and much researched across several fields (see Thaler and Sunstein 2008), nudges preserve choice while also encouraging consumers to make choices that may correct market failures that can result from human biases. "Preserving choice" is seen as an important element that serves as a foil to more stringent regulations, which are often deemed antichoice or "nanny state" policies (Wiley, Berman, and Blankey 2013). Both the US and the UK governments have behavioral science advisory groups that focus on nudges that can improve public well-being across several domains, and other governments around the world are following suit (Halpern 2015).

Despite the relative youthfulness of the field of behavioral economics, there are already several documented examples of effective nudges in the context of food (e.g., Thorndike et al. 2011, 2014; Hanks et al. 2012). Some present clear wins, such as Brian Wansink's school lunchroom redesign work (see Wansink 2014), where simple acts such as relabeling vegetables to sound more appealing increases children's consumption of them. Indeed, the 2014 McKinsey Report (Dobbs et al. 2014) suggested that the simple act of portion control would be the most cost effective intervention for obesity, meaning that nudges to lower portion sizes would be of value (Vermeer, Steenhuis, and Poelman 2014). An example might be eliminating the routinely asked question "Would you like that in small, medium, large or super-size?" instead of giving all customers automatically the smallest size by default unless they specifically request otherwise. One study found that making food slightly more difficult to reach (by varying its proximity by about 10 inches) or changing the serving utensil (spoon or tongs) modestly but reliably reduces food intake in the range of 8%–16% (Rozin et al. 2011). The creative design of such interventions and the quantification of their effects are currently areas of much emerging interest.

However, others suggest that there are pragmatic and ethical concerns with nudging, and they caution on placing too much hope on nudging as a sufficient means to lower population obesity rates (e.g., Marteau et al. 2011; Blumenthal-Barby and Burroughs 2012). There are also questions regarding effective implementation of nudges: nudges generally focus on micro-level consumer behavior. An individual nudge may indeed be effective in a single cafeteria, when implemented by, say, a school district. However, such interventions may be context-dependent, and there is as yet no evidence that a nudge that works in one situation on a given set of consumers may have the same effect in a different situation with other consumers. More-

over, it is unclear, even for a successful intervention, how one scales up that success without some kind of mandate? If nudges become legislated, do they "undermine active and informed citizenship," as some have claimed (Kersh 2015)? Matching the scale, scope, and fit of any possible treatment is challenging, and even renowned behavioral economists have noted that nudging may work best when aligned with other regulations or incentives (Soman 2015) and probably is not the best way to solve the obesity crisis (Loewenstein and Ubel 2010).

### *Education*

Education is often proposed as a solution to the obesity epidemic, based on the belief that those who are overweight or obese cannot tell how (un)healthy foods are, but with education, this problem could be ameliorated. In other words, education could potentially correct market failures by reducing the information gap in the marketplace that exists between those who produce the food and those who consume it. Even free market believers can support education, since it preserves individual choice and increases the likelihood that an individual is making rational choices according to standard utility models.

The empirical evidence on the effectiveness of education is mixed (Contento et al. 1995; Contento 2008; Chapman-Novakoski 2014). Some educational interventions have been shown to be effective, but many others have not. In what should be of little surprise to consumer researchers, interventions that target actual behavior versus awareness, attitudes, or intentions have been shown to be more effective at changing consumption (Contento et al. 1995). Even at that, many interventions fail because they fail to sufficiently address consumer motivation, ability to take action, or the environmental factors at play (Contento 2008). For example, education is not going to help if one lacks access and financial ability to eat healthy.

While education can help people make better choices, the idea that we can merely educate consumers out of being obese is misguided and does not fit the data. People are aware that fast food is not good for them, as adults are quick to correctly classify food into virtuous and vice, or good and bad (e.g., Stein and Nemeroff 1995; Rozin, Ashmore, and Markwith 1996; Oakes and Slotterback 2004–5; Laran 2010; Chernev 2011). Despite this knowledge, consumers still spend billions each year on unhealthy offerings. Unhealthy food does not face an awareness problem. Still, one could argue that while some foods are obviously "good" and "bad," there are many where the distinction is not so clear. Even if we grant the premise that, at least for certain foods, consumers are unable to tell good from bad, simply giving them more information to do so rarely helps, and it does little to address the expanding portion sizes. Although correlational, the United States has some of the strictest food labeling laws in the world, and it also has one of the highest obesity rates. Scientific studies consistently show mixed or little effect (Balasubramanian and Cole 2002; Harnack et al. 2008; Elbel et al. 2009; Bollinger, Leslie, and Sorensen 2011; see also Grunert, Bolton, and Raats 2011) or even backfire effects (Wansink and Chandon 2006) of nutrition labeling on consumers' food choices. Further, while some information, such as calories, may be relatively easy to understand (although the "serving size" associated with the calories is often misleading; see Young and Nestle 2012), a label provides a host of other information that may overwhelm the typical consumer. Not that this information is not important, but the cognitive and behavioral consequences of information overload are well known to consumer researchers (e.g., Jacoby 1984; Schacter 2001; Kahneman 2011), and people with lower levels of education and socioeconomic status are less likely to use and to understand the labels (Guthrie et al. 1995), the very people who are already making poorer food choices and have higher rates of obesity.

We contend that for the average consumer food product, there are so many ingredients that keeping track of all of them is impossible, even if a consumer were to be given a perfect education right before walking into the store. Further, consumers are bombarded with all sorts of pseudo-educational messages from all kinds of media and peers, as well as packaging with confusing, poorly regulated labels including "light," "natural," and "low carb" that take advantage of common heuristics and catchphrases (Mariotti et al. 2010). Fad diets are also quick to tout (or vilify) certain foods (e.g., trans-fats, carbohydrates, gluten), which are replaced with new "good" and "bad" foods at an alarming rate.

Even in the presence of perfect education at some point in time, this education is going to always be under attack from other sources, often sources with deep pockets. To produce "lasting" change, education would need to combat misinformation at a continual rate, at an expense that is probably prohibitive. The topic of the classification of foods may be moot (or close to it), given that portion size, rather than specific food choice, is likely more predictive of obesity (e.g., Foster et al. 2010; but see also Mozaffarian et al. 2011). In conclusion, education, properly targeted, has been shown to have some effect, but education alone, with-

out other structural changes, will certainly fail in addressing the obesity problem.

## CONCLUSION

Obesity is a complex, serious, costly, and growing problem throughout the world. Given that obesity is driven primarily by the overconsumption of food, we focus on the food industry and argue that this industry suffers from market failure due to significant externalities and consumers' imperfect information. The central contribution of this article is to draw on prior empirical research in various disciplines (including consumer behavior, marketing, psychology, medicine, and public health) and to use the lens of market failure to systematically classify and analyze the various causes of obesity. In MacInnis's (2011) framework of conceptual contributions in marketing, this is a reconceptualization of a specific domain—that of the interface between food marketing and societal obesity. MacInnis (2011) argues that such conceptualizations can lend themselves to any of several different types of contributions, which include envisioning, explicating, relating, and debating. This research contributes on the last of these fronts—to the debate on corrective mechanisms for the obesity crisis—because we apply this market failure lens to possible solutions to the crisis.

Critically assessing each of the four potential corrective mechanisms, and looking systematically at how consumers have responded or are likely to respond to each approach, allows us to arrive at a clear conclusion. Specifically, our analysis shows that three of the four corrective mechanisms—corporate social responsibility, consumer social activism, and industry self-regulation—are unlikely to be effective on their own. Rather, analyzing the obesity crisis as an instance of market failure points up the conclusion that business, government, and civil society all need to play a role in a holistic solution. We conclude that market failures in the food industry cannot be corrected without government intervention. This conclusion is consistent with MacInnis's observation that conceptual articles such as this one, which contribute via debate, often conclude with a point of advocacy.

### *Evaluation of Alternative Intervention Remedies for Obesity*

Governments may intervene in any of a number of ways, so what exactly should policy makers do? We have outlined several possible approaches, and table 1 summarizes our conclusions about these possible government interventions to address obesity. Each approach can, and perhaps should, be part of a multifaceted effort to address the complex obesity problem. In summary, the evidence shows that nudging, while sometimes very effective and efficient, is unlikely to be a systematic solution to obesity. Neither is it a substitute for traditional regulation, but it should rather be viewed as a complement. Certainly more evidence is needed regarding the scalability and generalizability of specific nudges. Education does not have a significant impact; however, consumers do respond positively to some well-designed educational interventions. Restrictions on marketing actions are more effective, but these face significant political resistance. An exception that shows much promise might be regulations that restrict marketing of unhealthy foods to children. Taxes at very high levels would likely deter overnutrition, but they face high political hurdles, and no country or state has even proposed (let alone implemented) such high taxes on unhealthy foods.

Our argument for government intervention hinges critically on proving that there is a market failure. The counterargument against government intervention is that there are many reasons for, and examples of, government regulatory failure (Winston 2006). One possibility is that the government overestimates the extent of market failure; in that case, regulatory policy could end up forcing the economy and consumers to incur unnecessary costs. Another cause of government failure could be poor implementation of policies by shortsighted, inflexible, or incompetent government agencies. A flawed political system might allow certain interest groups to "capture" regulation to accrue economic rents. The challenge is to weigh the risks of market failure versus the risks of government failure, or, to put it differently, the benefits versus the costs of government regulation. Of course, this is at least partly a political or ideological debate.

The debate on public health issues is often framed on a continuum from "individualizing" to "systemic" extremes (Lawrence 2004). Individualizing frames emphasize personal freedom and responsibility and favor solutions involving minimal or no government intervention, while systemic frames mean government intervention is favored. Given the tilt toward the individual side of the scale in American politics and discourse in recent years, it is not surprising that government intervention to address obesity has encountered much political, and even popular, resistance in the United States. For example, several state and local governments (e.g., those of Vermont, Texas, New York City, and Philadelphia) have proposed a tax on soft drinks, but they have not succeeded at passing the law—the only

Table 1. Summary of Government Intervention Remedies to Address Obesity

| Policy tool | Market failure addressed | Upside | Downside |
|---|---|---|---|
| Taxes | Externalities (public health expenditures) | Taxes at high levels could be effective (as with tobacco). | Unlikely to get political support, especially at high levels. Potentially regressive. Difficult to implement properly. Never tried at levels most likely to significantly change behavior. |
| Restrictions on marketing to adults | Asymmetric information (complexity, motivation to process, ability to comprehend) | Could have significant impact (as with tobacco). | Strong political opposition. Untested—not tried anywhere yet. |
| Restrictions on marketing to children | Asymmetric information (children as vulnerable consumers) | Demonstrable benefits. Somewhat less political opposition. | Political opposition. Patchwork of regulations. |
| Restrictions on distribution | Asymmetric information (children as vulnerable consumers) | Evidence of effectiveness. | Political opposition. Hard to implement, impossible in some cases. |
| Product bans | Asymmetric information | Might work for clearly harmful ingredients. | Very unlikely to get political support unless clear evidence of harm. |
| Nudging | Human biases in information processing and decision making | Less coercive. Possibly less political opposition. Demonstrably effective at individual level. | Difficult to scale up. Cross-context generalizability unclear. |
| Labeling rules | Asymmetric information (complex and possibly deceptive information) | Less political opposition. | Unlikely to have large impact. Potentially long lag before impact. |
| Education | Asymmetric information | Noncontroversial. | Very mixed results. Tried before. Costly. |

exception is Berkeley, California, which is certainly not representative of the American polity. As another example, then Mayor Michael Bloomberg supported an initiative to limit the size of soft drinks sold in New York City. Compared to soda taxes, this was a rather mild government intervention. In spite of that, this became a controversial proposal that was opposed by the food industry and by 60% of New Yorkers (Grynbaum and Connelly 2012). Subsequently, the New York Supreme Court invalidated the proposed law.

The prestigious medical journal *The Lancet*, in an editorial concluded, "The obesity epidemic will not be reversed without government leadership" (The Lancet 2011, 741). This is consistent with Kersh's (2015) call to "embrace the nanny state" in this context. Ironically, solutions to the obesity problem that have much public support—CSR and education—are unlikely to be sufficiently effective. In contrast, solutions that are likely to be more effective—restrictions on marketing and high taxes on unhealthy foods—face significant political resistance. Unfortunately, it is unlikely that the incidence of obesity will decline globally in the near future. It is noteworthy that the World Health Organization's Global Action Plan for the Prevention of Non-Communicable Diseases in 2013 called for zero increase in worldwide prevalence of obesity from 2010 to 2025—hardly an ambitious target.

While we believe that the government must play the leading role in addressing the obesity crisis, there is a role for business and civil society as well. Ultimately, there is a need for a "cultural change" (Kersh 2015) in the way we as a society respond to food and its marketing. An ideal solution would probably involve strategies that food companies could pursue that are both profitable and would help reduce obesity, that is, free market solutions to the problem of obesity. Publicizing these win-win solutions would costlessly help reduce obesity. However, such solutions are not immediately apparent, and hence academia too has much to contribute in its quest.

### *Directions for Future Academic Research*

Given our conclusion that market failures in the food industry cannot be corrected without government intervention, we contend that the area where research is most needed is on government policies to address the obesity crisis. Specifically, how would consumers respond to steep food taxes? How can such taxes be presented (and sold) to constituents to make them more palatable? What about outright bans on products or advertising to certain groups? What is the content and structure of laypeople's belief systems? How do their beliefs about obesity interact with other related beliefs, about, for example, nutrients, supply chain (e.g., monocultures, organic farming), consumption norms, and taste? While there is now a growing body of research on nutrition labeling, these other areas are more sparsely examined in the literature. It would arguably be convenient to wait for case studies on government intervention that has succeeded in reducing obesity and then analyze the causes of these successes, but this approach will take time. The behavioral sciences have many tools that can address such questions without clear before-and-after marketplace data. If we are going to have a larger voice, we are probably going to need to answer the question of how consumers are likely to respond to hypothetical policies to a greater degree than we examine currently.

Similarly, we need to examine research outside of our traditional academic boundaries. For instance, our colleagues in the political sciences have long been interested in how policies can overcome opposition from business and the democratic polity. Can any lessons from there be applied in this context? We could also look to learn from other industries. When, for example, has industry self-regulation worked well, and what were the causes of this success? We can then try to replicate these instances in other situations. When have social activists succeeded? What strategies work well for increasing public awareness and helping to hold business and government to be accountable?

Another direction for future research could be to ask how the three sectors—business, government, and social activists—might work together to address obesity. How should these sectors best work within a system of checks and balances, and when should they cooperate? Again, the answering of such questions will likely require more of a willingness to go without concrete data from the past. Finally, as the causes of obesity are varied and complex, addressing obesity will require a multifaceted approach implemented over the long term. It is likely that the causes of obesity differ across various consumer segments; therefore, effective solutions are also likely to differ across consumer segments, defined perhaps by education, socioeconomic strata, demographics, and other social and cultural factors. This is an intriguing area for future research.

Finally, we have outlined several potential tools for policy makers and areas for future research. It is worth noting that these would probably not stand alone. There would potentially be several interaction effects among these that would be worthy of examination.

*Summary*

We believe that the obesity crisis represents an instance of market failure. Viewing the obesity crisis using the theoretical lens of market failure allows us to classify the different triggers of the problem and to analyze the effectiveness (or lack thereof) of proposed solutions. We conclude that considerable government intervention will be required if there is to be a meaningful reduction in the prevalence of obesity. For this to happen in a democratic society, there needs to be a widespread understanding of the problem, its causes, and its potential solutions. This requires a broad public debate rooted in medical science, an understanding of the relevant evidence regarding consumer behavior, and business logic, rather than ideological positions and vested interests. It is our hope that this article contributes to this debate.

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