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THE PRIVATE COSTS OF BEHAVIORAL INTERVENTIONS

AVISHALOM TOR[†]

ABSTRACT

The increasing popularity of behavioral interventions—also known as nudges—is largely due to their perceived potential to promote public and private welfare at dramatically lower costs than those of traditional regulatory instruments, such as mandates or taxes. Yet, though nudges typically involve low implementation costs, scholars and policymakers alike tend to underestimate their often-substantial private costs. Once these costs are accounted for, most nudges turn out to generate significantly lower net benefits than assumed, and some prove less efficient or less cost-effective than traditional instruments. At other times, the private costs of behavioral interventions are sufficiently large to render them socially costly and undesirable even in the absence of superior traditional instruments. Policymakers who implement nudges without considering their private costs therefore risk doing harm rather than good.

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INTRODUCTION

Whenever governments and other institutions wish to promote some policy goal, they face the question of which of the instruments at their disposal, if any, to choose. Should states expend resources on creating social masking norms during a pandemic or adopt masking mandates instead? Should the federal government try to increase income tax compliance by sending taxpayers reminder letters mentioning deadlines and existing tax penalties or by increasing agency budgets? Should utility companies encourage household energy

conservation by offering rebates for reducing consumption or by delivering personalized reports comparing recipients' energy use to that of their most efficient neighbors? Should cities tax sugar-sweetened beverages, limit the size of the cups in which such beverages are served, or merely require producers to disclose these beverages' contents and nutritional facts on their labels?

From a law and economics perspective, the answer to these and similar questions is simple: An intervention should be employed only when it is the most efficient policy instrument available—namely, when the policy is likely to produce higher net social benefits than its alternatives.¹ Cost-benefit analysis (“CBA”) can ascertain whether this is the case by assessing public and private policy costs and benefits and subtracting the former from the latter.²

Yet scholars and regulators routinely advocate and implement nudges³—that is, regulatory interventions that significantly rely on behavioral means to achieve their policy goals⁴—without cost-benefit scrutiny or any other consideration of their costs, on the often implicit assumption that the public costs of such interventions are small and their private costs negligible.⁵ In reality, however, though behavioral instruments typically impose relatively little burden on government budgets, they can generate substantial private costs.⁶ Accounting for these costs reveals that some nudges are less efficient than traditional instruments and others may even be socially harmful on balance.⁷ Hence, policymakers who continue to ignore the private costs of nudging risk making costly errors in policy selection.

1. ANTHONY E. BOARDMAN, DAVID H. GREENBERG, AIDAN R. VINING & DAVID L. WEIMER, *COST-BENEFIT ANALYSIS: CONCEPTS AND PRACTICE* 2 (5th ed. 2018).

2. *Id.*

3. See RICHARD H. THALER & CASS R. SUNSTEIN, *NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS* 6 (2008). While Thaler and Sunstein's original definition of nudging was more limited, the literature commonly uses the term as a shorthand for all behavioral interventions. Avishalom Tor, *Nudges That Should Fail?*, 4 BEHAV. PUB. POL'Y 316, 319 (2020) [hereinafter Tor, *Nudges That Should Fail?*]; Avishalom Tor, *The Law and Economics of Behavioral Regulation*, 18 REV. L. & ECON. 223, 227 (2022) [hereinafter Tor, *Behavioral Regulation*].

4. Tor, *Behavioral Regulation*, *supra* note 3. See generally Avishalom Tor, *A Better Nudge Definition* (Feb. 15, 2022) (unpublished manuscript) (on file with author) (arguing that nudges should be defined as primarily behavioral instruments to distinguish nudges from other regulatory instruments and promote the evaluation of behavioral policies).

5. *Infra* Part IV.

6. *Infra* Part III.

7. *Infra* Part V.

Governments around the world increasingly turn to behaviorally informed policies in domains ranging from health, safety, education, and finance to environmental protection, tax compliance, public service delivery, and more.⁸ Reports by the European Commission and the Organisation for Economic Co-operation and Development (“OECD”) detail over one hundred case studies of such interventions in Europe, North America, and beyond,⁹ while the U.K.-based Behavioral Insights Team (“BIT”)—the most active organization in this field—reports having run more than 780 projects in dozens of countries between 2010 and 2018.¹⁰

Behavioral interventions draw on empirical findings that reveal how real people make judgments and decisions to encourage behaviors that policymakers find desirable, whether by presenting information more effectively, framing the available options or their outcomes, selecting defaults, shaping or communicating social norms, eliciting emotional reactions, or many other psychologically informed instruments.¹¹ Such interventions are relatively cheap for governments and organizations to implement. For one, they allow people to go their own contrary way and thus involve no costly enforcement expenditures,¹² thereby leading some scholars to argue that nudges can only benefit those who follow them, while imposing no appreciable costs on those who resist them.¹³ Besides being noncoercive, behavioral

8. See, e.g., Cass R. Sunstein, Lucia A. Reisch & Micha Kaiser, *Trusting Nudges? Lessons from an International Survey*, 26 J. EUR. PUB. POL’Y 1417, 1417–18 (2019) (suggesting that public officials in many nations have been drawn to using nudges as a tool in the regulatory repertoire).

9. EUROPEAN COMM’N, BEHAVIORAL INSIGHTS APPLIED TO POLICY: EUROPEAN REPORT 2016, at 6 (2016), <https://publications.jrc.ec.europa.eu/repository/handle/JRC100146> [<https://perma.cc/83R2-QNFM>]; OECD, BEHAVIORAL INSIGHTS AND PUBLIC POLICY: LESSONS FROM AROUND THE WORLD 13 (2017) [hereinafter BEHAVIORAL INSIGHTS AND PUBLIC POLICY], https://read.oecd-ilibrary.org/governance/behavioural-insights-and-public-policy_9789264270480-en [<https://perma.cc/F9J2-62SP>]. Indeed, the OECD website reports of more than two hundred institutions that routinely apply behavioral insights to public policy interventions. *Behavioral Insights*, OECD, <https://www.oecd.org/gov/regulatory-policy/behavioural-insights.htm> [<https://perma.cc/5A6H-6BGP>].

10. BEHAV. INSIGHTS TEAM, ANNUAL REPORT 2017–2018, at 7 (2019), <https://www.bi.team/wp-content/uploads/2019/01/Annual-update-report-BIT-2017-2018.pdf> [<https://perma.cc/AWQ3-6688>].

11. Cass R. Sunstein, *The Council of Psychological Advisors*, 67 ANN. REV. PSYCH. 713, 719–29 (2016) [hereinafter Sunstein, *The Council*].

12. Tor, *Nudges That Should Fail?*, *supra* note 3, at 322.

13. Cass R. Sunstein, “*Better Off, as Judged by Themselves*”: A Comment on Evaluating Nudges, 65 INT’L REV. ECON. 1, 3, 8 (2018).

interventions also do not significantly burden government budgets because they do not use large financial incentives to change behavior.¹⁴

The belief that behavioral interventions make low-cost policies contributes significantly to their appeal, as Professors Cass Sunstein and Lucia Reisch explain: “The reason for the mounting interest [in nudging] should not be obscure. Nations would like to make progress on pressing social problems with tools . . . that do not cost a great deal.”¹⁵ The significance of nudges’ apparently low costs goes well beyond the imperative of using limited government budgets wisely, as becomes clear when the matter is viewed through the lens of CBA—the dominant approach to policy assessment.¹⁶

CBA requires the selection of the highest net-benefit regulatory instrument available so that the lower a policy’s costs, the greater its appeal.¹⁷ The same low-cost appeal also pertains to cost-effectiveness analysis (“CEA”)—the most widely used CBA alternative—which divides the costs of a regulation by its impact (or effectiveness) to enable cost-effectiveness (“CE”) comparisons of competing policies.¹⁸ Since CEA divides costs by effectiveness, lower costs can produce especially attractive CE ratios.¹⁹

However, a closer look reveals that behavioral instruments generate significant private costs—most notably, the opportunity costs borne by those who forgo the benefits of their former course of action.

14. See, e.g., THALER & SUNSTEIN, *supra* note 3, at 5–6 (“A nudge . . . is any aspect of the choice architecture that alters people’s behavior in a predictable way without . . . significantly changing their economic incentives.”).

15. CASS R. SUNSTEIN & LUCIA A. REISCH, TRUSTING NUDGES: TOWARD A BILL OF RIGHTS FOR NUDGING 3 (2019); see also Shlomo Benartzi, John Beshears, Katherine L. Milkman, Cass R. Sunstein, Richard H. Thaler, Maya Shankar, Will Tucker-Ray, William J. Congdon & Steven Galing, *Should Governments Invest More in Nudging?*, 28 PSYCH. SCI. 1041, 1041 (2017) (arguing that nudges are more cost effective than traditional regulatory instruments); Magda Osman, Scott McLachlan, Norman Fenton, Martin Neil, Ragnar Löfstedt & Björn Mede, *Learning from Behavioural Changes That Fail*, 24 TRENDS COG. SCI. 969, 977–78 (2020) (suggesting that the wide adoption of social nudges is partly due to their low implementation costs).

16. See BOARDMAN ET AL., *supra* note 1 (“CBA is a policy assessment method that . . . applies to policies, programs, projects, regulations, demonstrations, and other government interventions.”).

17. See CASS R. SUNSTEIN, THE COST-BENEFIT REVOLUTION 6–8 (2018) [hereinafter SUNSTEIN, COST-BENEFIT REVOLUTION].

18. Richard Layard & Stephen Glaister, *Introduction to COST-BENEFIT ANALYSIS* 21 (Richard Layard & Stephen Glaister eds., 2d ed. 1994); HENRY M. LEVIN & PATRICK J. MCEWAN, COST-EFFECTIVENESS ANALYSIS 10–11 (2d ed. 2001).

19. LEVIN & MCEWAN, *supra* note 18.

For instance, regulators who believe that consumers drink sugar-sweetened beverages (“SSBs”) to excess may adopt a nudge that limits SSBs’ serving size. If successful, such a nudge would reduce SSB consumption, thereby providing consumers with health and cost-saving benefits. Yet the policy’s success would also mean that consumers will have sacrificed some of the enjoyment, short-term mood or energy boosts, or other benefits they previously obtained from their forgone SSB consumption. Biased consumers—like those who underestimate SSBs’ harmful effects—might still benefit from the intervention on balance but not without bearing some private opportunity costs.

Nudges also entail direct consumer costs, such as decision costs, emotional costs, social costs, or other economic costs.²⁰ Some of these costs affect all consumers, as when SSB drinkers must decide whether to order additional servings or to reduce their consumption, repeatedly facing a decision involving potentially unpleasant tradeoffs that may also detract from their enjoyment from drinking SSBs altogether. Other direct costs are borne only by consumers who resist the nudge, who must now purchase more servings at increased inconvenience and likely higher out-of-pocket costs and might even face social disapprobation for so visibly maintaining their former level of SSB consumption.

If consumers were uniformly biased—all underestimating SSBs’ harmful effects to the same extent—regulators might have been better able to set the nudge perfectly to counteract this bias.²¹ Biased consumers who valued the beverages enough to bear the additional direct costs of the nudge would resist the policy, while those who find these costs greater than their perceived benefits from drinking would follow the nudge and reduce their consumption, but both groups would be better off on balance.

In reality, however, individuals are heterogeneous in their rationality and nudge susceptibility.²² Consumers will thus

20. See Avishalom Tor & Jonathan Klick, *When Should Governments Invest More in Nudging? Revisiting Benartzi et al. (2017)*, 18 REV. L. & ECON. 347, 356–57 (2022) (discussing the consumer costs of an energy conservation nudge).

21. Cf. Hunt Allcott & Cass R. Sunstein, *Regulating Internalities*, 34 J. POL’Y ANALYSIS & MGMT. 698, 701 (2015) (discussing a hypothetical nudge with bias).

22. See generally Avishalom Tor, *Understanding Behavioral Antitrust*, 92 TEX. L. REV. 573, 608–18 (2014) [hereinafter Tor, *Understanding Behavioral Antitrust*] (describing the limits of constancy and uniformity of behavioral patterns and the negative consequences of neglecting them).

underestimate SSB harms to different extents and exhibit differing responses to the serving-size nudge. There will be those who follow the nudge to their benefit, but others who would have been better off doing the same will resist it (e.g., continuing to drink SSB excessively) and yet others who would have been better off resisting the nudge (e.g., making net-cost reductions in their SSB consumption) will instead following it to their detriment.

Besides their consumer costs, behavioral policies also impose private costs on third parties in the market.²³ A nudge-induced reduction in SSB consumption diminishes beverage retailers' sales, with concomitant revenue losses. The portion of these costs that constitutes retailers' net revenue losses—primarily their markup over their own costs of purchasing the lost quantity of SSBs—represents a social cost of the successful intervention.²⁴

Finally, the private costs of nudging increase when regulators make honest policy design errors or manipulate consumer behavior to their advantage.²⁵ Policymakers who excessively reduce SSB serving sizes—perhaps because they misjudge the matter or wish to appear as bold public leaders in media reports for political gain—impose additional costs on consumers and may cause more of them to make privately costly reductions in their drinking or to bear additional direct costs for resisting the excessive nudge.

Unsurprisingly, accounting for the private costs of behavioral regulation tends to produce lower net benefits and cost-effectiveness estimates than those yielded by assessments that erroneously ignore or underestimate these costs.²⁶ This corrected accounting may reveal that some nudges are less attractive than traditional instruments, while, on other occasions, behavioral and traditional interventions alike may have to be avoided for failing to generate any net benefits, irrespective of the desirability of their policy goals.²⁷

Part I explains nudges' low-cost appeal, highlighting the centrality of costs under prevailing modes of policy assessment and demonstrating how the low implementation costs of behavioral policies

23. *See infra* Part III.B.2.

24. *Cf.* NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, UNDERSTANDING COST-EFFECTIVENESS OF ENERGY EFFICIENCY PROGRAMS: BEST PRACTICES, TECHNICAL METHODS, AND EMERGING ISSUES FOR POLICY-MAKERS 3-3 (2008) (including such losses in its illustrative assessment).

25. *See infra* Part III.C.

26. Tor & Klick, *supra* note 20.

27. *Id.*

contribute to their appeal. Part II clarifies the significance of private costs and shows how traditional interventions—even paternalistic ones—routinely make at least some consumers worse off. Part III shows that nudges are similarly capable of diminishing private welfare, notwithstanding their mostly noncoercive nature, while Part IV documents the underestimation of the private costs of behavioral interventions. Part V then builds on the preceding analysis to demonstrate the dramatic welfare and policy implications of properly accounting for these private costs.²⁸

I. NUDGE APPEAL: LOW-COST APPEARANCE

Nudges appeal to regulators in significant part because of their promise of advancing private and public welfare at low implementation costs.²⁹ Prominent scholars similarly argue for expanding the use of behavioral instruments based on the claim that they are more cost-effective than traditional instruments.³⁰ This Part therefore clarifies the significance of nudges' perceived low costs within the analytical frameworks commonly used for policy assessment and explains why such policies typically entail low implementation costs.

A. *The Key Role of Costs in Policy Assessment*

Cost-benefit analysis is the dominant approach to domestic policy assessment; it is mandated for federal regulation³¹ and plays an important role in regulatory impact assessments worldwide.³² As its

28. Nudges differ from traditional instruments in other important ways. *See, e.g.*, Allcott & Sunstein, *supra* note 21 (“[N]udges are by definition better targeted than uniform subsidies and standards.”). *See generally* Brian Galle, *Tax, Command . . . or Nudge?: Evaluating the New Regulation*, 92 TEX. L. REV. 837 (2014) (discussing how nudges differ from taxes and subsidies in their impact on actors' preferences, incentives, consequences, and politics).

29. *E.g.*, BEHAVIORAL INSIGHTS AND PUBLIC POLICY, *supra* note 9, at 17 (explaining that “[d]emands for more effective and efficient government interventions have given rise to the importance of applying behavioural insights in public policy”). Additional reasons for why regulators like nudges are discussed in Tor, *Behavioral Regulation*, *supra* note 3, at 236–40.

30. Benartzi et al., *supra* note 15, at 1051–52.

31. *See, e.g.*, Exec. Order No. 12,866, 58 Fed. Reg. 51735 (Oct. 4, 1993) (requiring federal agencies to undergo cost-benefit analyses “[i]n deciding whether and how to regulate”).

32. OECD, OECD BEST PRACTICE PRINCIPLES FOR REGULATORY POLICY, REGULATORY IMPACT ASSESSMENT 22–23 (2020), <https://www.oecd.org/gov/regulatory-policy/regulatory-impact-assessment-7a9638cb-en.htm> [<https://perma.cc/EM2T-2FZL>]; EUROPEAN COMM'N, BETTER REGULATION GUIDELINES 60–61 (2017) [hereinafter BETTER REGULATION GUIDELINES], <https://ec.europa.eu/info/sites/info/files/better-regulation-guidelines.pdf> [<https://perma.cc/7SER-JLBS>]. *See generally* HANDBOOK OF REGULATORY IMPACT ASSESSMENT

name indicates, CBA quantifies in monetary terms the social consequences of legal interventions. While its application involves various normative challenges and technical considerations, CBA's conceptual framework is straightforward: from the perspective of economic efficiency, the value of a policy to society depends on its net benefits—that is, the overall public and private benefits it generates minus its overall public and private costs.³³

One immediate implication of regulatory assessment based on net benefits is that a policy that fails to offer any net benefits is inefficient and thus undesirable. When comparing alternative interventions, moreover, CBA directs us to select the option that offers the highest net benefits. It may mandate the selection of a policy that offers relatively low benefits, for instance, if it is accompanied by sufficiently low costs so that it produces higher net benefits than competing instruments whose higher benefits are associated with even higher costs. The net-benefits metric therefore renders low-cost interventions particularly attractive.³⁴

The centrality of cost considerations under CBA is further magnified under cost-effectiveness analysis—the most common alternative policy assessment method.³⁵ Analysts employ CEA primarily when they are unwilling or unable to monetize policy benefits, as is frequently the case in the areas of health and medicine (in which benefit monetization requires placing a value on human life or quality of life),³⁶ but also in fields such as education,³⁷ energy and the environment,³⁸ and more.³⁹

CEA monetizes policy costs just like CBA but measures benefits in terms of policy effectiveness vis-à-vis the status quo, using whatever

(Claire A. Dunlop & Claudio M. Radaelli eds., 2016) (reviewing regulatory impact assessment around the world).

33. BOARDMAN ET AL., *supra* note 1.

34. SUNSTEIN, COST-BENEFIT REVOLUTION, *supra* note 17, at 7.

35. LEVIN & MCEWAN, *supra* note 18. Policy costs are similarly central to other cost-based approaches to policy assessment. *Id.* at 19–26.

36. Layard & Glaister, *supra* note 18, at 21–23.

37. E.g., Henry M. Levin & Clive Belfield, *Guiding the Development and Use of Cost-Effectiveness Analysis in Education*, 8 J. RES. ON EDUC. EFFECTIVENESS 400, 401 (2015).

38. See Toshi H. Arimura, Shanjun Li, Richard G. Newell & Karen Palmer, *Cost-Effectiveness of Electricity Energy Efficiency Programs*, 33 ENERGY J. 63, 64 (2012).

39. BOARDMAN ET AL., *supra* note 1, at 511 (noting CEA is also used when assessments of competing intermediate goods—such as standardized test scores—whose effectiveness can be readily compared but difficultly monetized are required).

metric a given policy's concrete goals offer—like the number of lives saved—instead of calculating their monetary value.⁴⁰ Policy costs are then divided by effectiveness to generate cost-effectiveness comparisons, with a lower CE ratio indicating that a policy offers a better “return on investment” than competing policies.⁴¹ Hence, a low-cost policy bearing only modest benefits can yield a lower CE ratio—and therefore appear more attractive—than a more effective but costlier alternative. In fact, the consequences of a given change in policy costs are more pronounced under CEA, which *divides* these costs by effectiveness, than under CBA, which only *subtracts* them from monetized policy benefits.

Notwithstanding the centrality of costs under both CBA and CEA, however, the different methods used by the two approaches can produce divergent policy selections. In particular, CBA neither condones inefficient regulation nor recommends less efficient interventions over more efficient ones, but CEA can only identify the most cost-effective policy available while implicitly assuming that some intervention is desirable.⁴² At any rate, because all common methods of legal policy assessment instruct analysts to attend to policy costs, a low-cost tag goes a long way toward making an intervention more appealing.

B. Nudges' Low Implementation Costs

Nudging proponents correctly point to its implementation cost advantage.⁴³ Traditional regulation that seeks universal compliance can entail substantial implementation costs. A law mandating that drivers wear a seatbelt requires significant regulatory resources to monitor drivers, identify and prosecute violators, and adjudicate disputed violations. Many of these costs are avoided, however, when

40. LEVIN & MCEWAN, *supra* note 18, at 10–19.

41. *Id.* at 137. Very occasionally, the same data is used instead to calculate the reciprocal effectiveness-cost (EC) ratio, describing effectiveness of each unit of cost (e.g., effectiveness per \$1 spent), *see* Benartzi et al., *supra* note 15, at 1043–44.

42. *See* BOARDMAN ET AL., *supra* note 1, at 511 (“CEA compares (mutually exclusive) alternatives in terms of the ratio of their costs to a single quantified, but not monetized, measure of benefits (effectiveness).”).

43. SUNSTEIN & REISCH, *supra* note 15; *see also* Anne-Lise Sibony & Alberto Alemanno, *The Emergence of Behavioural Policy-Making: A European Perspective*, in *NUDGE AND THE LAW: A EUROPEAN PERSPECTIVE* 1, 2 (Alberto Alemanno & Anne-Lise Sibony eds., 2015) (emphasizing the appeal of nudges' low costs).

lawmakers also encourage seatbelt use via behavioral instruments directed at drivers, such as by requiring car manufacturers to install a reminder alarm that is triggered when a driver starts a vehicle without fastening their seatbelt. Manufacturers still need to design and install the alarm, but the per-driver implementation costs are small, infrequently incurred, and a mere fraction of the enforcement costs of a standalone seatbelt mandate.

Traditional financial interventions, such as taxes or subsidies, may also carry a substantial budgetary price tag.⁴⁴ For example, when lawmakers offer tax deductions to facilitate charitable donations, the more donations increase, the more they diminish the government's tax revenue. In contrast, a policy that raises donation rates through purely behavioral means—such as by encouraging or emphasizing social norms favoring donations⁴⁵—imposes little budgetary burden.

In fact, a group of nine scholars from the fields of behavioral economics, judgment and decision-making, behavioral public policy, and law recently argued that governments should invest more in nudging based on an analysis that hinges on behavioral policies' implementation cost advantage over traditional instruments.⁴⁶ These authors reviewed studies in major policy areas to assess the effectiveness and implementation costs of behavioral versus traditional (primarily financial) interventions, finding the most effective nudge in each area substantially more cost-effective than the competing traditional policies.⁴⁷

To illustrate, in the domain of retirement saving contributions, studies of financial incentives yielded CE rates ranging from \$0.07 to

44. Note that while the administrative costs required to implement such policies are true economic costs, the budgetary burdens of financial instruments are mere resource transfers that may concern policymakers but do not constitute economic costs. *E.g.*, BOARDMAN ET AL., *supra* note 1, at 361–62 (noting that transfers, such as tax payments or welfare payments, have distributional effects but constitute neither a cost nor a benefit from the perspective of society as a whole). However, taxes also generate a deadweight loss. R. PRESTON MCAFEE, TRACY R. LEWIS & DONALD J. DALE, *INTRODUCTION TO ECONOMIC ANALYSIS* 70–74 (2008).

45. *E.g.*, Homa S. Zarghamee, Kent D. Messer, Jacob R. Fooks, William D. Schulze, Shang Wu & Jubo Yan, *Nudging Charitable Giving: Three Field Experiments*, 66 J. BEHAV. & EXPERIM. ECON. 137, 140–44 (2017) (studying the effect of social-norm supporting activities, including cheap talk and voting, on charitable donations).

46. *See* Benartzi et al., *supra* note 15, at 1051–52.

47. *Id.* at 1045. As already noted, Benartzi and his coauthors report their findings using the relative effectiveness-cost ratio rather than the literature's standard CE measure, to which the results reported here are converted. *Id.* at 1043–44.

\$0.81 per \$1 of increased retirement savings contributions, while a “required choice” nudge that asked employees to select their preferred contribution rate within thirty days of hiring generated a CE of merely \$0.01 per \$1 of increased contributions.⁴⁸ A closer look reveals, however, that this dramatic advantage resulted primarily from the low implementation costs of the nudge—estimated by economist Shlomo Benartzi and his coauthors at merely \$2 per employee and far below their implementation cost estimates for the traditional interventions—a pattern that repeated itself in the other policy domains these authors examined.⁴⁹

II. THE PRIVATE COSTS OF TRADITIONAL REGULATION

The costs of regulation matter greatly for its assessment, but these costs include not only implementation costs but also the private costs it imposes on the individuals subject to the regulation (“consumer costs”) and third parties (“nonconsumer costs”). Of these, the opportunity costs to consumers whose behavior is modified by an intervention typically are most significant, though direct consumer costs and nonconsumer costs may also be substantial at times. Finally, regulatory shortcomings can further increase the various private costs of government policies. This Part will consider each of these four costs in turn.

A. *Consumer Opportunity Costs*

All policies that change behavior—even when they benefit consumers on balance—entail opportunity costs, due to the inevitably forgone benefits that consumers obtained from their previous course of action.⁵⁰ This is obvious for consumers who modify their conduct to comply with a mandate or a ban. The opportunity costs imposed on drivers by a seatbelt mandate are the benefits lost to those who previously enjoyed driving without a seatbelt but now comply with the mandate. Yet financial instruments also generate opportunity costs. A person who decides to go to college instead of working because the state subsidizes her education thereby forgoes the benefits of the employment income now lost to her.

48. *See id.* at 1046.

49. *See id.*; Tor & Klick, *supra* note 20, at 364 tbl. 2.

50. *E.g.*, MCAFEE ET AL., *supra* note 44, at 10.

Opportunity costs are even incurred by traditional interventions that merely provide information. When a disclosure policy that requires calorie labeling on food packaging causes consumers to purchase fewer high-calorie products, these consumers inevitably sacrifice the benefits they previously enjoyed from consuming the forgone high-calorie products, irrespective of their resulting health benefits.

Thus, the more effective a policy instrument is in changing behavior, the more pervasive its opportunity costs. Mandates or bans that are fully enforced modify the behavior of all who would have otherwise exceeded their limits, as when all drivers are expected to obey the seatbelt law. These policies guarantee compliance by forcing behavior change irrespective of the greater private benefits—now forgone—that some drivers would have obtained from driving without a seatbelt. Financial instruments, on the other hand, permit those who believe they benefit more from retaining their previous course of action to do so. People offered subsidized college education who believe its benefits are lower than those obtained from their current employment will retain the latter and bear no opportunity costs.

Even regulations that make consumers better off on balance entail opportunity costs. Yet some policies go further, leading consumers to make privately detrimental behavior changes. Certain interventions do so by design, in the pursuit of public welfare goals, like the reduction of harmful environmental externalities. Policies that lead consumers to conserve energy require them to sacrifice some private welfare (e.g., by diminishing their indoor comfort level). Some instruments—like financial rebates—can still make better off on balance households who voluntarily reduce their energy use. Other policy tools, however, such as energy-use caps or energy-consumption taxes, diminish the private welfare of consumers whom they cause to reduce their privately beneficial consumption.⁵¹

Indeed, even paternalistic interventions—whose goal is the promotion of private welfare—inevitably make some individuals worse off because consumers are heterogeneous.⁵² Policymakers who believe average retirement savings are too low for projected retirement needs may strive to increase employees' contributions. However, optimal contribution levels vary with factors like age, gender, health, life

51. See generally OECD, TAXING ENERGY USE 2019: COUNTRY NOTE – THE UNITED STATES (2019) (providing an overview of how the United States taxes energy consumption).

52. See, e.g., Allcott & Sunstein, *supra* note 21, at 700–01.

expectancy, marital status, income, other assets, risk preferences, and so on, which may affect the benefits, if any, to consumers from increased savings at the expense of present consumption. Hence, a mandate set at the optimal average contribution level (e.g., 6 percent of employees' salary) would be privately costly to employees who have more valuable present uses for their income—say, better nutrition or healthcare—and thus would have been better off with a lower rate (e.g., 3 percent).⁵³

Paternalistic regulations that employ financial instruments similarly impose net costs on some consumers, as illustrated by the literature on “sin taxes”—that is, taxes whose primary goal is to reduce individuals' excessive consumption of potentially harmful goods, such as alcohol, tobacco, or sugary beverages.⁵⁴ The private welfare of individuals who overconsume sin goods (say, because they underestimate their harmful effects or have limited self-control) can be improved, in principle, by imposing “corrective” consumption taxes that increase the price of these goods and thereby lead consumers to substitute away from them.⁵⁵ At the same time, however, given the inevitable heterogeneity of consumers, sin taxes also impose net costs on those who did not overconsume the sin good pretax.⁵⁶ These individuals now must direct more of their resources to consuming their welfare-maximizing quantity of these goods or forgo some privately beneficial consumption.

53. Cf. Hunt Allcott & Dmitry Taubinsky, *Evaluating Behaviorally Motivated Policy: Experimental Evidence from the Light Bulb Market*, 105 AM. ECON. REV. 2501, 2504 (2015) (noting that, in the context of lightbulb subsidies, banning incandescent lightbulbs would impose losses on a large group of consumers).

54. See, e.g., Ted O'Donoghue & Matthew Rabin, *Optimal Sin Taxes*, 90 J. PUB. ECON. 1825, 1825–27 (2006) (noting that though bounded rationality is needed to justify such taxes, they can also promote public welfare goals by reducing public expenditures).

55. B. Douglas Bernheim & Dmitry Taubinsky, *Behavioral Public Economics*, in 1 HANDBOOK OF BEHAVIORAL ECONOMICS 381, 423–25 (B. Douglas Bernheim, Stefano Dellavigna & David Laibson eds., 2018).

56. Hunt Allcott, Benjamin Lockwood & Dmitry Taubinsky, *Regressive Sin Taxes, with an Application to the Optimal Soda Tax*, 134 Q.J. ECON. 1557, 1582 (2019); see also Bernheim & Taubinsky, *supra* note 55, at 436 (discussing distributional concerns of sin tax revenue). Heterogeneity is a familiar challenge for the optimal tax literature. See generally James A. Mirrlees, *An Exploration in the Theory of Optimum Income Taxation*, 38 REV. ECON. STUD. 175 (1971) (grappling with heterogeneity in devising a theory of the optimal income tax); Emmanuel Farhi & Xavier Gabaix, *Optimal Taxation with Behavioral Agents*, 110 AM. ECON. REV. 298 (2020) (developing a model of optimal taxation that accounts for boundedly rational and heterogeneous agents and showing how it changes some basic results in the theory of optimal taxation).

B. Other Private Costs

In their quest to change behavior, regulatory instruments also generate some direct costs, some of which, such as consumers' judgment and decision costs, are imposed on consumers regardless of their ultimate course of action. This is true for coercive policies (e.g., a seatbelt mandate) so long as they are not perfectly enforced, and even more so for financial interventions (e.g., an energy conservation subsidy). Whenever consumers face more than one course of action, as is commonly the case, they must choose. Often, they also need to collect information, make judgments under uncertainty about the available options, evaluate their likely consequences, and so on.⁵⁷

Judgment and decision costs are often modest, such as when regulatory interventions present consumers with familiar decisions or choices that involve little uncertainty (e.g., how much gasoline to purchase for one's vehicle given state taxes). Yet these costs can be substantial when consumers face complex decisions or choices with large economic consequences, such as how much to contribute to a tax-advantaged retirement savings plan.⁵⁸

Other direct costs are borne only by consumers who do not change their behavior. Drivers who refuse to wear a seatbelt when it is mandated may face enforcement actions and sanctions. Households who do not reduce their energy use in the face of a consumption tax will bear higher out-of-pocket energy costs. Although these costs are primarily monetary, consumers who violate mandatory legal rules that are viewed as injunctive norms (e.g., a masking mandate during a pandemic) may also face social disapprobation and occasionally even social sanctions.⁵⁹

Finally, the changes in consumer behavior produced by regulation can also have direct effects for nonconsumers in the market. These third-party effects often amount to a significant fraction of the overall

57. See, e.g., Cass R. Sunstein, *Choosing Not To Choose*, 64 DUKE L.J. 1, 40 (2014) (briefly discussing the burden of choice).

58. See generally Jacob Goldin, Tatiana Homonoff, Richard Patterson & William Skimmyhorn, *How Much To Save? Decision Costs and Retirement Plan Participation*, 191 J. PUB. ECON. 104 (2020) (offering empirical evidence of employees' decision costs); CASS R. SUNSTEIN, *CHOOSING NOT TO CHOOSE: UNDERSTANDING THE VALUE OF CHOICE*, at ix (2015) (explaining that "[c]hoice . . . can also be an immense burden [because] . . . [t]ime and attention are precious commodities, and we cannot focus on everything, even when our interests and our values are at stake").

59. See ERIC A. POSNER, *LAW AND SOCIAL NORMS* 8 (2000).

welfare effects of regulation and are routinely included in policy assessment.⁶⁰ Consider, for example, traditional demand-side management policies in the energy sector, which primarily rely on financial incentives—such as monetary rebates—to reduce household energy consumption.⁶¹ When they succeed, demand-side management policies produce losses to energy retailers, like electrical utilities, from lost sales to consumers. The “markup” portion of these lost sales—that is, the retailers’ net revenue losses after subtracting their avoidable energy and capacity costs—represents an actual cost, which can amount to a large portion of policy benefits.⁶²

C. *Regulatory Shortcomings*

Nearly all regulatory interventions that change behavior generate some private costs. This is apparent for public welfare policies—which aim to address societal challenges (e.g., climate change) and are largely unconcerned with individual well-being—that intentionally impose costs on consumers and nonconsumers alike that exceed their private benefits. Yet, as the following Section shows, even the best-designed paternalistic interventions—which aim to improve individual well-being—routinely make some of their heterogeneous targets worse off. Moreover, both public welfare and paternalistic regulations can produce even greater private costs when regulators err due to their limited information or intentionally manipulate policies to their own ends.

The problem of honest error on the part of government actors who cannot possess all of the information necessary to guide complex economic processes—also known as the “knowledge problem”⁶³—is of particular concern for paternalistic policies. To increase consumer welfare, regulators must identify when, how, and to what extent

60. E.g., BOARDMAN ET AL., *supra* note 1, at 119–59 (discussing these effects and distinguishing them from indirect effects in secondary markets).

61. See, e.g., Arimura et al., *supra* note 38, at 66.

62. See, e.g., Hunt Allcott & Judd B. Kessler, *The Welfare Effects of Nudges: A Case Study of Energy Use Social Comparisons*, 11 AM. ECON. J.: APPLIED ECON. 236, 264, 266 tbl.7 (2019) (calculating retailers’ net revenue losses at 40 percent of consumers’ retail savings from a natural gas conservation intervention).

63. Mario J. Rizzo & Douglas Glen Whitman, *The Knowledge Problem of New Paternalism*, 2009 BYU L. REV. 905, 909; see F.A. Hayek, *The Use of Knowledge in Society*, 35 AM. ECON. REV. 519, 519–20 (1945); see also R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 41–42 (1960) (discussing the limitations of the information available to regulators).

individual judgments and decisions fall short; determine how different deviations from rationality interact both within and between individuals; find the most effective means to address these failings; and more.⁶⁴ The great complexity and scope of the necessary information increase the likelihood of error in the selection and implementation of paternalistic interventions.⁶⁵

In addition, the limits of rationality revealed by behavioral research, which apply to regulators as they do to other individuals, exacerbate the knowledge problem and other institutional challenges these decision-makers face,⁶⁶ so much so that scholars draw on them to oppose all paternalistic policymaking.⁶⁷ Yet, despite their limitations, regulators also possess certain rationality advantages, because they are personally distanced from the individual choices they seek to shape and may enjoy the benefits of expert advice and deliberation.⁶⁸

At any rate, even some advocates of paternalism admit the possibility of honest error by boundedly rational policymakers.⁶⁹ And while not all such errors make people worse off, regulators may mistakenly select the wrong instrument for the task (e.g., banning an activity they should have taxed or selecting an excessively high sin tax

64. See Tor, *Nudges That Should Fail*, *supra* note 3, at 321–23; cf. Rizzo & Whitman, *supra* note 63, at 960–61 (analyzing the challenges facing policymakers who aim to improve subjective welfare).

65. Cf. generally Cass R. Sunstein, *Ruining Popcorn? The Welfare Effects of Information*, 58 J. RISK & UNCERTAINTY 121 (2019) (providing an instructive discussion of the difficulties involved in assessing the private welfare effects of traditional information disclosures).

66. See Edward L. Glaeser, *Paternalism and Psychology*, 73 U. CHI. L. REV. 133, 142–49 (2006) [hereinafter Glaeser, *Paternalism*] (finding that “when cognitive errors are in some sense endogenous, then economic theory pushes us to think that private decisions will often be more accurate than public decisions”); see also Jan Schnellenbach & Christian Schubert, *Behavioral Political Economy: A Survey*, 40 EUR. J. POL. ECON. 395, 407–10 (2015) (offering an overview of scholarship evaluating influences on individual political decision-making and the choices of “bureaucrats, regulators, and lobbyists”).

67. See, e.g., Brian F. Mannix & Susan E. Dudley, *The Limits of Irrationality as a Rationale for Regulation*, 34 J. POL’Y ANALYSIS & MGMT. 705, 710–11 (2015); Brian F. Mannix & Susan E. Dudley, *Please Don’t Regulate My Internalities*, 34 J. POL’Y ANALYSIS & MGMT. 715, 716–17 (2015); W. Kip Viscusi & Ted Gayer, *Behavioral Public Choice: The Behavioral Paradox of Government Policy*, 38 HARV. J.L. & PUB. POL’Y 973, 991–96 (2015).

68. See Cass R. Sunstein, Christine Jolls & Richard H. Thaler, *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1541–45 (1998) (noting that “a degree of insulation from populist pressures, combined with knowledge of behavioral economics” could counteract the inherent bounded rationality of bureaucrats); Avishalom Tor, *The Methodology of the Behavioral Analysis of Law*, 4 HAIFA L. REV. 237, 250, 263 (2008) [hereinafter Tor, *Methodology*].

69. See, e.g., Cass R. Sunstein, *Nudges vs. Shoves*, 127 HARV. L. REV. F. 210, 211 (2014).

level) or even intervene when no available policy is capable of improving private welfare.

Paternalistic interventions may also diminish private welfare when they intentionally manipulate behavior to policymakers' benefits, contrary to their stated purpose. Public choice scholarship examines at length how public decisionmakers may favor personal or institutional considerations at public expense.⁷⁰ In particular, bureaucrats may act to expand their power and tend to provide inefficiently high levels of regulation,⁷¹ both of which motivations apply to paternalistic regulators.

Furthermore, public choice research notes that policymakers can be "captured" by interest groups, such as regulated firms, that have the incentives and the means to promote regulatory actions that benefit them at the expense of the diffuse public.⁷² These dynamics can hamper paternalistic policies, if to a lesser degree than in the familiar case of direct industry regulation, when such interventions generate substantial (if indirect) benefits to market participants—such as the investment flows to financial institutions from increased retirement savings contributions due to paternalistic policies.⁷³

Captured policymakers whose interventions must appear paternalistic are also more constrained in their ability to cater to interest groups than industry regulators. Once again, however, this constraint may reduce the benefits of regulator capture but does not eliminate them. For example, appliance manufacturers can benefit from a paternalistic policy that leads consumers to buy more energy-efficient appliances to reduce consumers' lifetime energy expenditures, just as they benefit from a public welfare intervention that subsidizes

70. See generally DENNIS C. MUELLER, *PUBLIC CHOICE III*, at 343–47, 359–84 (2003) (evaluating rent seeking and the impact of bureaucratic preferences).

71. E.g., *id.* at 333–35, 360 (explaining rent seeking and the bureaucratic desire for "power"); see also JAMES Q. WILSON, *BUREAUCRACY: WHAT GOVERNMENT AGENCIES DO AND WHY THEY DO IT* 69–70 (1989) (noting the view that bureaucrats are "zealous empire-builders determined to expand their power at the expense of the public").

72. Sam Peltzman, *Toward a More General Theory of Regulation*, 19 J.L. & ECON. 211, 217 (1976); see also George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 10–12 (1971) (explaining how industries seek "grant[s] of power from the state").

73. For an example of paternalistically motivated direct regulation, see KAREN A. GOLDMAN, FED. TRADE COMM'N, *OPTIONS TO ENHANCE OCCUPATIONAL LICENSE PORTABILITY* 3–4 (2018), <https://www.ftc.gov/reports/options-enhance-occupational-license-portability> [<https://perma.cc/3NPF-83CM>].

the production of such appliances to curb harmful environmental externalities.

III. THE PRIVATE COSTS OF BEHAVIORAL INTERVENTIONS

Regulation routinely imposes private costs and frequently makes some consumers and third parties worse off on balance. Yet scholars and regulators erroneously believe that nudges can avoid making any consumers worse off.⁷⁴ The intuitive reasoning underlying this misconception is as follows: nudges are non-coercive, so consumers can easily resist them to avoid being made privately worse off. Therefore, when consumers accede to a nudge, they reveal that they have not been made worse off. In reality, however, behavioral regulation is capable of diminishing consumer welfare and producing nonconsumer costs resembling those generated by traditional instruments. These private costs can render some nudges as privately costly as traditional regulations and occasionally even more so.

A. *Consumer Opportunity Costs*

Since the private opportunity costs of regulation are a function of the behavior changes it causes, rather than the means policymakers employ to achieve these changes, successful nudges necessarily generate opportunity costs. Furthermore, behavioral instruments are fully capable of making consumers privately worse off.

1. *The Opportunity Costs of Public Welfare Nudges.* Public welfare nudges commonly lead consumers to act in privately costly ways. Regulators pursuing reductions in harmful environmental externalities may nudge consumers to conserve electricity by sending them reports that compare their energy use to that of their neighbors and imply the presence of a social norm favoring energy conservation.⁷⁵ Households that are successfully nudged by this “social information” intervention must forgo the benefits of their previous, higher electricity usage (e.g., greater indoor comfort). Moreover, consumers who reduce their usage to avoid the psychological or social costs of violating a

74. The nonconsumer welfare effects of nudges are usually ignored altogether. *See infra* Part IV.

75. Cf. Hunt Allcott, *Social Norms and Energy Conservation*, 95 J. PUB. ECON. 1082, 1083–84 (2011) [hereinafter Allcott, *Social Norms*] (providing the first empirical study of a social information nudge aimed at energy conservation).

perceived social norm bear opportunity costs that exceed their private energy savings benefits, just like consumers who reduce energy use in the face of a traditional consumption tax.⁷⁶

Other public welfare nudges further illustrate how behavioral policies can make consumers worse off. Scholars Felix Ebeling and Sebastian Lotz tested the effect of default arrangements on consumers' willingness to choose contracts that offered more expensive energy from renewable sources over cheaper energy from nonrenewable sources.⁷⁷ One half of the consumers were presented with the more expensive, renewable energy contract as a default (from which they could opt out); the other half were presented with the cheaper, nonrenewable energy contract as the default, so they needed to opt into the renewable energy contract if they wished to select it.⁷⁸ The defaults had a dramatic effect: in the former group, 69.1 percent of the purchased contracts retained the renewable energy default, but in the latter, opt-in, group only 7.2 percent of the purchased contracts were for renewable energy.⁷⁹

Clearly, the green default nudge succeeded in making consumers forgo cheaper, nonrenewable energy for a privately costlier renewable alternative. It may have increased the welfare of consumers who retained the renewable default contract since it reminded them they actually preferred costlier renewable energy. But those of their peers who succumbed to the default due to inattentiveness or because they could not resist its implied recommendation that they prioritize environmental concerns over their private interests were hardly made better off.⁸⁰

Behavioral public welfare policies generate comparable effects in other domains, as illustrated by the burgeoning literature on nudging to promote prosocial behaviors, like charitable donations. Indeed, research shows that default contribution levels, social norm and social

76. See Edward L. Glaeser, *The Supply of Environmentalism: Psychological Interventions and Economics*, 8 REV. ENV'T ECON. & POL'Y 208, 209 (2014) [hereinafter Glaeser, *Supply of Environmentalism*] (explaining that nudges may operate as psychic taxes).

77. Felix Ebeling & Sebastian Lotz, *Domestic Uptake of Green Energy Promoted by Opt-Out Tariffs*, 5 NATURE CLIMATE CHANGE 868, 868 (2015).

78. *Id.*

79. *Id.* at 869.

80. See generally Jon Jachimowicz, Shannon Duncan, Elke U. Weber & Eric J. Johnson, *When and Why Defaults Influence Decisions: A Meta-Analysis of Default Effects*, 3 BEHAV. PUB. POL'Y 159 (2019) (examining the empirical evidence on defaults' effectiveness).

comparison information, reminders, and deadlines can all increase donations.⁸¹ Yet, studies also find that some consumers try to avoid being targeted by the same charitable donation nudges they find difficult to resist, while others ostensibly submit to such nudges but ultimately fail to honor their donation pledges; both of these behaviors suggest that these instruments cause some consumers to act contrary to their personal preferences.⁸²

2. Rationality and the Opportunity Costs of Paternalistic Nudges.

Paternalistic policies are needed only when people's actions fail to advance their well-being, as when individuals' judgments are biased or they make personally harmful decisions.⁸³ Ideal paternalistic nudges debias consumers, helping them become more rational—removing errors that led to their privately suboptimal behavior without otherwise changing their beliefs or preferences—so that their actions will increase their private welfare.⁸⁴ Yet true debiasing is difficult and time consuming and necessitates interventions that usually are unavailable to regulators.⁸⁵ Hence, only a minute fraction of the numerous

81. See generally, e.g., Steffen Altmann, Armin Falk, Paul Heidhues, Rajshri Jayaraman & Marrit Teirlinck, *Defaults and Donations: Evidence from a Field Experiment*, 101 REV. ECON. & STAT. 808 (2019) (finding that defaults had a “strong impact on individual donor behavior” although they did not meaningfully affect aggregate donation levels); Indranil Goswami & Oleg Urminsky, *When Should the Ask Be a Nudge? The Effect of Default Amounts on Charitable Giving*, 53 J. MKTG. RSCH. 829 (2016) (finding that defaults can increase donation revenue depending on the “combined net effect of . . . scale-back and lower-bar effects”); Zarghamee et al., *supra* note 45; Rahul Deb, Robert S. Gazzale & Matthew J. Kotchen, *Testing Motives for Charitable Giving: A Revealed-Preference Methodology with Experimental Evidence*, 120 J. PUB. ECON. 181 (2014) (studying the importance of social comparisons on individual charitable giving); Mette Trier Damgaard & Christina Gravert, *The Hidden Costs of Nudging: Experimental Evidence from Reminders in Fundraising*, 157 J. PUB. ECON. 15 (2018) [hereinafter Damgaard & Gravert, *Hidden Costs*] (finding that reminders increased both charitable donations and avoidance behavior); Mette Trier Damgaard & Christina Gravert, *Now or Never! The Effect of Deadlines on Charitable Giving*, 66 J. BEHAV. & EXPERIM. ECON. 78 (2017) (finding that deadlines did not affect individuals' propensity to donate but did have a “now-or-never” effect as individuals made donations “immediately or not at all”).

82. See Damgaard & Gravert, *Hidden Costs*, *supra* note 81, at 19–20; Alexia Gaudeul & Magdalena C. Kaczmarek, *Going Along with the Default Does Not Mean Going on with It: Attrition in a Charitable Giving Experiment*, 6 BEHAV. PUB. POL'Y 385, 385 (2019).

83. Bernheim & Taubinsky, *supra* note 55, at 381, 421–26; Eyal Zamir, *The Efficiency of Paternalism*, 84 VA. L. REV. 229, 256–61 (1998).

84. Tor, *Methodology*, *supra* note 68, at 292–99; cf. Allcott & Sunstein, *supra* note 21 (providing a theoretical discussion of ideal nudges whose only effect is to remove bias).

85. Tor, *Methodology*, *supra* note 68, at 297–300.

paternalistic nudges implemented to date aim truly to debias their targets.⁸⁶

Instead, most nudges encourage behaviors that regulators believe to be desirable, using “choice architecture”—structuring the decision environment and choices people face.⁸⁷ Choice architecture shapes people’s conduct by activating a variety of behavioral processes through cognitive or emotional heuristics that individuals rely on to make rapid judgments,⁸⁸ from concerns about violating social norms or considerations of social standing,⁸⁹ to consumers’ intuitive responses to environmental cues when making decisions, and more.⁹⁰

Most of these processes impact behavior without improving rationality.⁹¹ A nudge that sets a default retirement contribution rate of 6 percent of salary does not address the cause for some employees’ previously inadequate contributions. Inattentive employees or those who are disinclined to exert cognitive effort may increase their contributions by following the new default, and so may those who believe it signals the employer’s assessment of their optimal contribution rate.⁹² In these and similar cases, employees’ increased

86. ADAM OLIVER, *THE ORIGINS OF BEHAVIOURAL PUBLIC POLICY* 110–11 (2017).

87. THALER & SUNSTEIN, *supra* note 3, at 3. *See generally* Richard H. Thaler, Cass R. Sunstein & John P. Balz, *Choice Architecture*, in *THE BEHAVIORAL FOUNDATIONS OF PUBLIC POLICY* 428 (Eldar Shafir ed., 2013) (explaining the considerations of “choice architect[s]” when structuring the decision environment).

88. *See* Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, 185 *SCIENCE* 1124, 1128 (1974); Thomas Gilovich & Dale Griffin, *Introduction – Heuristics and Biases: Then and Now*, in *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* 1, 3–4 (Thomas Gilovich, Dale Griffin & Daniel Kahneman eds., 2002).

89. P. Wesley Schultz, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein & Vidas Griskevicius, *The Constructive, Destructive, and Reconstructive Power of Social Norms*, 18 *PSYCH. SCI.* 429, 432–33 (2007).

90. *See generally* Eric J. Johnson, Suzanne B. Shu, Benedict G.C. Dellaert, Craig Fox, Daniel G. Goldstein, Gerald Häubl, Richard P. Larrick, John W. Payne, Ellen Peters, David Schkade, Brian Wansink & Elke U. Weber, *Beyond Nudges: Tools of a Choice Architecture*, 23 *MKTG. LETTERS* 487 (2012) (listing the tools of a choice architect).

91. George Loewenstein, Leslie John & Kevin G. Volpp, *Using Decision Errors To Help People Help Themselves*, in *THE BEHAVIORAL FOUNDATIONS OF PUBLIC POLICY*, *supra* note 87, at 361, 362–63; Robert Münscher, Max Vetter & Thomas Scheuerle, *A Review and Taxonomy of Choice Architecture Techniques*, 29 *J. BEHAV. DECISION MAKING* 511, 511 (2015); *see* Tor, *Behavioral Regulation*, *supra* note 3, at 227–31.

92. *Cf.* Craig R.M. McKenzie, Michael J. Liersch & Stacey R. Finkelstein, *Recommendations Implicit in Policy Defaults*, 17 *PSYCH. SCI.* 414, 417–18 (2006) (offering evidence that defaults can serve as implicit recommendations for a specific course of action).

contributions reflect the employer's judgment of what makes them better off rather than their improved rationality.

In fact, the 6 percent default contribution nudge may even distort the decisions of formerly unbiased employees who were contributing at a different rate but end up adhering to it, making them worse rather than better off. More generally, because paternalistic nudges typically advance regulators' policy goals based on regulators' beliefs of what makes their targets better off, their success in changing behavior sheds no further light on their private welfare effects. These interventions still risk leading consumers to make privately costly behavior changes.

Additionally, the problem with nudges that do not debias consumers is further exacerbated by the heterogeneity of consumer rationality. Individuals deviate from rationality in different ways and to different extents and thus exhibit different reactions to the same nudge.⁹³ Therefore, much like traditional instruments, a nudge can improve the welfare of some consumers even while leading others to make costly behavior changes. To illustrate, regulators may nudge to reduce the consumption of prepackaged, high-fat, foods—say, by placing on them colorful hazard symbols—because they believe that the consumer costs and health risks of these foods exceed their nutritional enjoyment and other consumer benefits.⁹⁴ If the policy is effective because it draws attention to the high-fat content of the foods, previously inattentive consumers may benefit. But the hazard symbols may also lead previously attentive consumers excessively to reduce their consumption of pre-packaged, high-fat, foods, whether by causing them to overestimate their health risk, diminishing their enjoyment from eating the marked foods, or increasing the social costs of purchasing these foods. In any of these cases, the paternalistic nudge will have led some consumers to make behavior changes whose opportunity costs exceed their private benefits.

93. Tor, *Understanding Behavioral Antitrust*, *supra* note 22, at 608–18 (describing these findings).

94. In reality, such policies are also employed for public welfare (public health policy) reasons. *E.g.*, J.M. Bauer & L.A. Reisch, *Behavioural Insights and (Un)healthy Dietary Choices: A Review of Current Evidence*, 42 J. CONSUMER POL'Y 3, 4 (2019).

B. Other Private Costs

Besides their opportunity costs, nudges also generate direct consumer costs and private, nonconsumer costs, much like traditional interventions.

1. *Direct Consumer Costs.*⁹⁵ Behavioral interventions can impose a variety of direct costs on consumers, including judgment or decision costs, emotional or psychological costs, social costs, and even some financial costs. For the successfully nudged, direct consumer costs are often smaller on per-consumer basis than the opportunity costs of behavioral instruments. Nonetheless, direct consumer costs can still be substantial in the aggregate because they also affect those who resist nudges.

Nudges impose judgment or decision costs when they lead people to pay greater attention to their choices, process more information, engage in more thorough deliberation, or even simply make a choice they would have avoided but for the nudge. For example, employees in a study by Professor Gabriel Carroll and his coauthors were asked to choose their preferred retirement savings contribution rate within thirty days of their hiring, but they remained free to decide whether to join the plan and how much to contribute.⁹⁶ This nudge imposed on all new hires the cognitive and time costs required to read the form and grapple immediately upon hiring with the significant decision of whether and how much to contribute to their retirement savings. These costs may have been meaningful not only for the 28 percent of employees who decided to join the plan but also for the 31 percent among them who actively chose not to contribute and thus obtained no benefit from the intervention.⁹⁷ For all the employees who made an active choice, therefore, the decision entailed the cognitive costs to process all the relevant information, other psychological and emotional costs associated with making a difficult tradeoff between savings and consumption, and the economic costs of the time spent over the decision.⁹⁸

95. This section draws on Tor, *Behavioral Regulation*, *supra* note 3.

96. Gabriel D. Carroll, James J. Choi, David Laibson, Brigitte C. Madrian & Andrew Metrick, *Optimal Defaults and Active Decisions*, 124 Q.J. ECON. 1639, 1640–41 (2009). Additionally, no de facto penalty was imposed on those who failed to make the choice. *Id.*

97. See *id.* at 1648–49 (detailing problems planners face in nudging employees toward more optimal choices for retirement savings).

98. Cf. Goldin et al., *supra* note 58.

The potential emotional costs of difficult decisions are sufficiently large that policymakers can exploit them to nudge consumers more forcefully toward their preferred choices. Scholars Punam Anand Keller, Bari Harlam, George Loewenstein, and Kevin Volpp tested “enhanced active choice” policies that not only asked people to make choices (as simple “active choice” nudges do) but also formulated the available options to highlight the costs of not choosing the options favored by policymakers.⁹⁹ The researchers found that this “enhanced” behavioral instrument successfully triggered both loss aversion and regret aversion—two processes through which individuals seek to minimize the negative emotional or psychological reactions they experience in the face of undesirable outcomes—to drive participants more forcefully toward specific options.¹⁰⁰

In fact, nudges commonly operate as emotional taxes (also known as “moral taxes”) that impose direct emotional costs, either incidentally or intentionally in an effort to encourage behavior change.¹⁰¹ Professors Mette Trier Damgaard and Christina Gravert demonstrated how even relatively benign instruments, such as mere email reminders sent to potential donors who previously provided their address to a charity, can produce such costs.¹⁰² Their first study found that a reminder increased both the number of actual donors and the rate at which potential donors unsubscribed from the email list, while the second study further estimated the average “annoyance cost” of the reminder at approximately \$2.¹⁰³ Notably, this small cost per reminder still nearly fully offset the almost hundred-fold greater “warm glow” benefit to the few actual donors among all the nudged—that is, the former cost was borne by all potential donors on the list, while the latter benefited only the 1.2 percent among them who were successfully nudged to donate in any given month.¹⁰⁴

99. Punam Anand Keller, Bari Harlam, George Loewenstein & Kevin G. Volpp, *Enhanced Active Choice: A New Method To Motivate Behavior Change*, 21 J. CONSUMER PSYCH. 376, 379–81 (2011).

100. *Id.*

101. E.g., Glaeser, *Paternalism*, *supra* note 66, at 153; Glaeser, *Supply of Environmentalism*, *supra* note 76.

102. Damgaard & Gravert, *Hidden Costs*, *supra* note 81.

103. *Id.* at 23; see also Linda Thunström, *Welfare Effects of Nudges: The Emotional Tax of Calorie Menu Labeling*, 14 JUDGMENT & DECISION MAKING 11, 16–17 (2019) (similarly finding that informational nudges that merely make some information more salient can also impose emotional costs).

104. Damgaard & Gravert, *Hidden Costs*, *supra* note 81, at 24.

Common social information interventions, which provide consumers with social comparisons as well as suggestions of actual or purported social norms, also impose some emotional or psychological costs. For instance, Professors Hunt Allcott and Judd Kessler's extensive field study of the welfare effects of Home Energy Reports ("HERs")—a ubiquitous social information nudge to encourage energy conservation—estimated that the marginal social cost of the HERs exceeded a substantial majority of recipients' (59 percent) willingness to pay for the reports.¹⁰⁵ And while the minority who found the nudge beneficial valued it highly enough to make the HERs net beneficial in the aggregate, the direct costs they imposed on the majority of the targeted consumers greatly diminished these net benefits.¹⁰⁶

The emotional costs of behavioral instruments are even more notable for policies that exploit consumers' emotions to impact behavior. The World Health Organization considers graphic warning labels ("GWLs") the most effective tool for tobacco control, and recently estimated that regulation mandating such labeling covers 3.9 billion people in ninety-one countries.¹⁰⁷ Importantly, though GWLs increase consumers' knowledge about smoking harms, their effects on smoking behavior are larger than those of plain text warnings, indicating that these labels do more than merely provide information.¹⁰⁸ A meta-analysis of experimental studies further

105. Allcott & Kessler, *supra* note 62, at 268. Notably, moreover, when considering only the consumer effects of the nudge, the difference between the mean willingness to pay for the HERs (\$2.81) and consumers' retail energy expenditure savings (\$4.91) implied that consumers' overall incurred on average meaningful non-energy costs (\$2.10). *Id.*

106. *Id.*

107. WHO, WHO REPORT ON THE GLOBAL TOBACCO EPIDEMIC, 2019: OFFER HELP TO QUIT TOBACCO USE 91 (2019).

108. See Noel T. Brewer, Marissa G. Hall, Seth M. Noar, Humberto Parada, Al Stein-Seroussi, Laura E. Bach, Sean Hanley & Kurt M. Ribisl, *Effect of Pictorial Cigarette Pack Warnings on Changes in Smoking Behavior: A Randomized Clinical Trial*, 176 JAMA INTERNAL MED. 905, 909–11 (2016); Seth M. Noar, Diane B. Francis, Christy Bridges, Jennah M. Sontag, Kurt M. Ribisl & Noel T. Brewer, *The Impact of Strengthening Cigarette Pack Warnings: Systematic Review of Longitudinal Observational Studies*, 164 SOC. SCI. & MED. 118, 125–28 (2016) [hereinafter Noar et al., *Systematic Review*]; Seth M. Noar, Marissa G. Hall, Diane B. Francis, Kurt M. Ribisl, Jessica K. Pepper & Noel T. Brewer, *Pictorial Cigarette Pack Warnings: A Meta-Analysis of Experimental Studies*, 25 BRIT. MED. J. 341, 352 (2016) [hereinafter Noar et al., *Pictorial Warnings*]; Seth M. Noar, Diane B. Francis, Christy Bridges, Jennah M. Sontag, Noel T. Brewer & Kurt M. Ribisl, *Effects of Strengthening Cigarette Pack Warnings on Attention and Message Processing: A Systematic Review*, 94 JOURNALISM & MASS COMMUN. Q. 416, 437 (2017) [hereinafter Noar et al., *Effects of Strengthening*].

concluded that GWLs generate negative emotional reactions, such as fear or disgust,¹⁰⁹ while a randomized trial found that they reduce smoking enjoyment significantly more than plain text warnings do.¹¹⁰ In sum, there is substantial evidence that GWLs generate negative affect—a cost that is once again imposed on all cigarette consumers despite failing to change the smoking behavior of their overwhelming majority of them, who thus obtained no benefit from the intervention.¹¹¹

In addition, nudges can produce social costs, particularly for those who resist them. Individuals who refuse to follow a popular nudge may be subjected to social disapprobation or even social sanctions for failing to conform, much like those who violate social norms.¹¹² Yet such social costs are more likely for nudges that publicly highlight individuals' performance on a socially relevant metric, as illustrated dramatically by Professor Luigi Butera and his coauthor's "public recognition" interventions.¹¹³ In one field study at a YMCA the nudge revealed each participant's attendance and donation amount to all other participants, while another online experiment used an even stronger manipulation, in which participants' Red Cross contributions were publicly shared with others through a webpage that posted

109. Noar et al., *Pictorial Warnings*, *supra* note 108, at 343, 347.

110. Daniel Romer, Stuart G. Ferguson, Andrew A. Strasser, Abigail T. Evans, Mary Kate Tompkins, Joseph Macisco, Michael Fardal, Martin Tusler & Ellen Peters, *Effects of Pictorial Warning Labels for Cigarettes and Quit-Efficacy on Emotional Responses, Smoking Satisfaction, and Cigarette Consumption*, 52 ANNALS BEHAV. MED. 53, 61–62 (2018).

111. E.g., Brewer et al., *supra* note 108, at 909 (finding that GWLs increased quitting for at least seven days among the study's participants by 1.9 percent more than plain text warning); Noar et al., *Systematic Review*, *supra* note 108, at 125 (reviewing the mixed results of nineteen studies that assessed the behavior change effects of GWLs, with some studies showing no effects or even negative effects on smoking cessation and others finding mostly small decreases in cigarette consumption).

112. See generally, e.g., Michael W. Morris, Ying-yi Hong, Chi-yue Chiu & Zhi Liu, *Normology: Integrating Insights About Social Norms To Understand Cultural Dynamics*, 129 ORG. BEHAV. & HUM. DECISION PROCESSES 1 (2015) (comparing "social exclusion of" norm violators in the United States with Korea, where people "sanction norm violators through monetary punishment"); Sophie Legros & Beniamino Cislighi, *Mapping the Social-Norms Literature: An Overview of Reviews*, 15 PERSPS. ON PSYCH. SCI. 62 (2020) (detailing that "social pressure," "subtle encouragement," and "active enforcement" all create an "external influence" to follow norms).

113. Luigi Butera, Robert Metcalfe, William Morrison & Dmitry Taubinsky, *Measuring the Welfare Effects of Shame and Pride*, 112 AM. ECON. REV. 122, 123 (2022) (reiterating that "field studies confirm that public recognition of individuals' behavior has substantial effects in a number of economically important domains").

photos, the amount they raised, their rank relative to other participants, and participants' names.¹¹⁴ Unsurprisingly, the researchers found less than 27 percent of participants indifferent to their public recognition manipulation, with an even smaller proportion—merely 7 percent and 11 percent, respectively—of participants exhibiting such indifference in the two samples in which they were likely to know or recognize each another.¹¹⁵ Clearly, these consumers were concerned about the social costs of being less responsive to the public recognition nudge.¹¹⁶

Finally, some nudges require consumers to bear financial expenditures to succeed, as when they encourage individuals to increase their donations.¹¹⁷ On other occasions, behavioral instruments generate incidental financial costs, as when they facilitate deliberation and require consumers to spend more resources on information search and processing.¹¹⁸ In yet other cases, moreover, nudge-resisting consumers may bear financial consequences following other costs, like sanctions for deviating from a social-norm nudge¹¹⁹ or diminished long-term financial prospects due to a reduced social status for being insufficiently responsive to a social recognition nudge.¹²⁰

2. *Nonconsumer Costs.* As with traditional regulation, the behavior changes produced by nudging can impose economic costs on nonconsumer third parties. To illustrate, HERs that lead consumers to

114. *Id.* at 124 (describing experiment conducted on two of three subject pools).

115. *Id.* at 125 (“The fraction of participants with positive WTP to either opt in or opt out of public recognition at some level of performance is 93 percent, 73 percent, 78 percent, and 89 percent in the YMCA, Prolific, Berkeley, and BU samples, respectively.”).

116. Unsurprisingly, similar patterns appeared with respect to public behavior during the COVID-19 pandemic. *See, e.g.,* Markus Kemmelmeier & Waleed A. Jami, *Mask Wearing as Cultural Behavior: An Investigation Across 45 U.S. States During the COVID-19 Pandemic*, FRONTIERS PSYCH., July 21, 2021, at 13 (finding participants who were high in interdependence or from more collectivistic U.S. states received significantly more social recognition from other people when wearing a mask).

117. *Supra* notes 81–82 and accompanying text.

118. *Supra* notes 96–98 and accompanying text.

119. *E.g.,* Ernst Fehr & Urs Fischbacher, *Third-Party Punishment and Social Norms*, 25 EVOLUTION & HUM. BEHAV. 63, 85 (2004).

120. *See generally* Sheryl Ball, Catherine Eckel, Philip J. Grossman & William Zame, *Status in Markets*, 116 Q.J. ECON. 161 (2001) (finding “that average prices are higher in markets where higher-status sellers face lower-status buyers, and lower when buyers have higher status than sellers”); Leonardo Bursztyn & Robert Jensen, *Social Image and Economic Behavior in the Field: Identifying, Understanding, and Shaping Social Pressure*, 9 ANN. REV. ECON. 131 (2017) (showing that “social pressure may often lead to undesirable outcomes”).

reduce their energy consumption produce net revenue losses for energy retailers due to their diminished sales just like the effects of demand-side management policies that cause similar changes in consumer behavior.¹²¹ From the perspective of energy retailers, the losses from reduced consumption are the same irrespective of the mechanism employed to change consumer behavior. Importantly, these losses represent a deadweight loss to society—that is, consumers were willing to pay this amount over the costs required to supply them with energy that now is not supplied because of the policy intervention.¹²² Similar net revenue losses can occur in other domains and even following paternalistic behavioral interventions that lower retail consumption, such as nudges that reduce sales of sugar-sweetened beverages.¹²³

C. *Regulatory Shortcomings*

When policymakers nudge, the familiar error and manipulation shortcomings of traditional regulation are exacerbated by the twin challenges of calibration and distortion.

1. *Calibration.* Behavioral instruments are varied and flexible,¹²⁴ but these advantages also render nudges exceedingly challenging to calibrate so that they achieve their intended policy goals with any precision. Regulators who wish to nudge must make numerous, detailed decisions about instrument design, and subtle design changes can produce large behavioral effects, so that seemingly comparable nudges may end up producing very different outcomes.

Regulators who decide to use a social information nudge to reduce the average consumption of fatty foods by 20 percent would need to design the specific contours of their nudge to achieve this goal. They would have to determine which comparison information to provide consumers with (e.g., calories vs. quantity consumed), to whom the comparison should be made (e.g., how many other consumers and

121. Allcott & Kessler, *supra* note 62, at 266 (assessing this cost for a natural gas conservation nudge); *id.* app. at 61, <https://www.aeaweb.org/content/file?id=8612> [<https://perma.cc/2PNV-YZF3>] (assessing this cost for an electricity conservation nudge); Tor & Klick, *supra* note 20, at 358–59 (assessing this cost for an electricity conservation nudge).

122. See, e.g., Allcott & Kessler, *supra* note 62, at 242.

123. This assumes consumers do not substitute other drinks from the same retailers for these beverages.

124. See Johnson et al., *supra* note 90, at 488; Sunstein, *The Council*, *supra* note 11, at 718; Tor, *Behavioral Regulation*, *supra* note 3, at 225.

based on which variables should these consumers be selected), which units to use to describe the information provided (e.g., absolute numbers vs. percentages), how the information would be displayed (e.g., verbally or graphically, using bar charts, pie charts, or other illustrations); and numerous further nudge design decisions.

A recent megastudy of nudges encouraging patients to get vaccinated at an upcoming doctor's appointment demonstrates how the multitudinous design decisions necessitated by such interventions are not only unavoidable but also capable of producing dramatic differences in policy effectiveness.¹²⁵ Forty-four researchers, at different institutions, tested nineteen variations of a simple text message nudge aiming to boost adoption of the influenza vaccine, finding that though all of the tested nudges increased vaccination rates somewhat, only six (less than one-third) produced a statistically significant effect.¹²⁶

Strikingly, the differences between the more and less successful text-message variants turned in large part on factors that were only apparent in post-hoc comparisons, if at all.¹²⁷ The problem of calibration becomes apparent, for instance, when comparing the best-performing and worst-performing of the nineteen nudge variants. The best-performing version (which increased vaccination by 11 percent from the baseline or by an absolute increase of 4.6 percent) consisted of two text messages: the first, sent seventy-two hours before the patient's appointment, noting that "it's flu season," "a flu vaccine is available for you," and that a "vaccine reminder" would be sent before the appointment; the second, sent twenty-four hours before the appointment, simply stated that "this is a reminder that a flu vaccine has been reserved for your appointment."¹²⁸ The worst-performing version (which had a negligible effect), on the other hand, consisted of a single text message sent at 6 p.m. one day before the appointment, stating that "[g]etting a flu shot is an easy way to be healthy."¹²⁹

125. See generally Milkman et al., *A Megastudy of Text-Based Nudges Encouraging Patients To Get Vaccinated at an Upcoming Doctor's Appointment*, PNAS, Apr. 29, 2021 (observing differences in effectiveness between approaches to encouraging vaccination at doctors' appointments).

126. *Id.*

127. *Id.*

128. *Id.*

129. *Id.*

The researchers did not predict the dramatically diverging outcomes of the most and least successful versions of the nudge based on differences in language, emphasis, timing, or frequency. In fact, one two-text version of the nudge that stated “Don’t forget to get a flu shot” produced a significant effect even while another two-text version stating “Protect yourself by getting a flu shot” did not.¹³⁰ Two of the six nudges that produced a significant effect employed only a single text message, moreover, even while eight of the thirteen nonsignificant versions used two messages.¹³¹

Because calibrating nudges is so difficult, a nudge can easily miss its mark. On many common occasions this simply means that behavioral interventions produce weaker effects than hoped for.¹³² Overly weak nudges can produce net harm (e.g., when they entail fixed costs and fail to achieve sufficient benefits to make them net-beneficial), but policies that yield excessive, costly behavior changes are of greater concern.

Recent research on how vividness effects can increase retirement savings rates illustrates the potential harm of nudges that overshoot their mark.¹³³ Vividness-based nudges using age-processed computerized avatars¹³⁴ or tasks that require one to imagine many details of a future self to make people’s future selves and their concomitant future needs seem more real.¹³⁵ However, this heightened emotional engagement with future selves can hardly be calibrated to counteract the biases that may cause insufficient future-oriented behavior like retirement savings contributions (e.g., myopia or present bias). Excessive engagement of this sort can lead individuals to overweight their future needs and divert too much of their limited

130. *Id.*

131. *Id.*

132. On the evidence regarding nudge effectiveness, see generally Stefano DellaVigna & Elizabeth Linos, *RCTs to Scale: Comprehensive Evidence from Two Nudge Units*, 90 *ECONOMETRICS* 81 (2022) (studying the impact of nudges across 126 studies covering 23 million people); Tor, *Behavioral Regulation*, *supra* note 3, at 233–36.

133. See Hal E. Hershfield, Daniel G. Goldstein, William F. Sharpe, Jesse Fox, Leo Yeykelis, Laura L. Carstensen & Jeremy N. Bailenson, *Increasing Saving Behavior Through Age-Progressed Renderings of the Future Self*, 48 *J. MKTG. RSCH.* S23, S29–30 (2011).

134. *Id.* at S26.

135. Hal E. Hershfield, Elicia M. John & Joseph S. Reiff, *Using Vividness Interpretations To Improve Financial Decision Making*, 5 *POL’Y INSIGHTS FROM BEHAV. & BRAIN SCI.* 209, 211 (2018) [hereinafter Hershfield et al., *Vividness*].

income to retirement savings at the expense of present consumption, making them worse off on balance.

All in all, calibrating nudges so that they achieve their desired goals is clearly very difficult. Extensive field-testing of alternative nudge designs, in the specific context and circumstances under which regulators wish to adopt a behavioral policy, would help. To date, however, behavioral regulation rarely engages with thorough pretesting that might allow for its proper calibration.

2. *Distortion.* The calibration challenge is further exacerbated when nudges distort people's judgment and decision processes. Behavioral instruments that exploit cognitive heuristics—mental shortcuts that people use to make rapid, nearly automatic, intuitive judgments—demonstrate this problem.¹³⁶ Cognitive heuristics allow people to make rapid and reasonably accurate judgments, even while generating some biased outcomes in predictable circumstances as a byproduct.¹³⁷ Regulators can deploy heuristics to steer people toward desirable behaviors, at the price of manipulating their judgments. For example, consumers' tendency to overestimate the likelihood of better-noted or remembered events—known as the availability heuristic—may be exploited by placing large, boldly colored tickets on vehicles for parking violations, which may lead drivers to overestimate their probability of receiving a ticket and thereby increase compliance.¹³⁸ Such a strategy distorts drivers' rationality so as to cause them to act contrary to their self-interest and diminish their private welfare, though it may well benefit society on balance by increasing compliance with parking regulations.

Unlike the case of increasing compliance with parking regulations, however, the employment of comparable judgment-distorting nudges toward paternalistic ends is more problematic. A case on point is the Chicago Lake Shore Drive nudge, lauded by Professors Richard Thaler and Cass Sunstein, who describe how policymakers sought to distort drivers' perceptions to reduce the likelihood they will suffer harm from car accidents.¹³⁹ Because some drivers underestimate the danger of a

136. Tversky & Kahneman, *supra* note 88, at 1128; Gilovich & Griffin, *supra* note 88.

137. Tor, *Methodology*, *supra* note 68, at 245–51.

138. Sunstein et al., *supra* note 68, at 1538.

139. THALER & SUNSTEIN, *supra* note 3, at 37–39. Although used here to illustrate the problem of paternalistic distortion, like other such interventions, this nudge presumably also aims

repeatedly curving stretch of the scenic Lake Shore Drive and occasionally cause accidents, the city painted on the road a series of white stripes that grow closer, giving drivers the false sensation that their vehicle's speed is increasing so as to cause them instinctively to slow down.¹⁴⁰

Whatever its benefits for the few drivers it helps avoid an accident, the Lake Shore Drive nudge diminishes the welfare of all drivers who unnecessarily reduce their speed, lose a few moments, and excessively wear their cars' breaks. Such costs may be very small on a per-driver basis (though one can imagine a rare instance in which someone arrives slightly too late to a hospital with a life-threatening condition because the nudge led them instinctively to slow down), their cumulative effects over all drivers can be substantial. More importantly, however, nudges in other domains that would seek similarly to make people better off by bypassing their conscious judgment (say, rendering the packaging of a high-calorie food instinctively unappealing) risk producing significant private costs.

Paternalistic nudges may also distort beliefs by triggering emotions rather than exploiting cognitive heuristics or altogether bypassing conscious judgment. Research shows that people often make judgments based on affective "tags" they associate with the subjects of their judgment.¹⁴¹ Consider the possibility of encouraging employees to save more for retirement by exposing them to graphic images of retirees living in penury due to inadequate savings (e.g., a gentler version of cigarette GWLs). If this nudge turned out to be effective due to the emotional response it generated, the policy will have diminished the welfare of employees who excessively increased their savings in response.¹⁴²

at the public welfare goals of increasing public safety and reducing negative externalities from accidents.

140. *Id.* at 39.

141. Paul Slovic, Melissa L. Finucane, Ellen Peters & Donald G. Macgregor, *The Affect Heuristic*, in *THE CONSTRUCTION OF PREFERENCE* 434, 434–37 (Sarah Lichtenstein & Paul Slovic eds., 2006). *See generally* George F. Loewenstein, Elke U. Weber, Christopher K. Hsee & Ned Welch, *Risk as Feelings*, 127 *PSYCH. BULL.* 267 (2001) (discussing the effect of emotions when individuals make decisions in risky situations).

142. A comparison with the empirical evidence on the effects of graphic warning labels on cigarette packages is instructive. *E.g.*, Ron Borland, Hua-Hie Yong, Nick Wilson, Geoffrey T. Fong, David Hammond, K. Michael Cummings, Warwick Hosking & Ann McNeill, *How Reactions to Cigarette Packet Health Warnings Influence Quitting: Findings from the ITC Four-Country Survey*, 104 *ADDICTION* 669, 672–74 (2009).

Other research reveals that even seemingly innocuous nudges can carry emotional connotations that lead to incidental, yet costly, distortions. Professor Linda Thunström and her coauthors tested a money-saving reminder to consumers that stated: “Remember that the less you spend in this study, the more money you will have for other purchases.”¹⁴³ Participants who already spent too little (because they found spending more emotionally painful) responded to the nudge by further reducing their spending, to their detriment.¹⁴⁴ The reminder’s gentle nature did little to prevent it from making a substantial fraction of its targets worse off.

3. *Manipulation.* The twin challenges of calibration and distortion also provide regulators with further opportunities for self-interested, manipulative nudging. The difficulty of ascertaining whether a behavioral intervention increases private welfare means that it is also difficult to distinguish honestly paternalistic policies from purportedly paternalistic ones that benefit regulators while harming their targets. Consequently, manipulative interventions are less likely to be identified and disciplined when they rely on nudging than when regulators employ traditional instruments.

Take two competing policies—one traditional, the other behavioral—that encourage the purchase of expensive, energy-efficient, home appliances, whose expected lifetime costs are lower than those of cheaper, less-efficient appliances. Both policies strive to lower consumers’ long-term energy expenditures in response to people’s purported failure to make privately optimal energy decisions.¹⁴⁵ The traditional policy offers a 7 percent rebate on the purchase price of high-efficiency appliances, while the behavioral policy places on the same appliances a highly visible, “Energy Star” certification instead.¹⁴⁶

The challenge of calibrating nudges means that it is easier to predict consumers’ demand response to the 7 percent price reduction

143. Linda Thunström, Ben Gilbert & Chian Jones Ritten, *Nudges That Hurt Those Already Hurting—Distributional and Unintended Effects of Salience Nudges*, 153 J. ECON. BEHAV. & ORG. 267, 270 (2018).

144. *Id.* at 274–75.

145. This claim is known as the “energy efficiency gap,” whose proponents assert that interventions addressing it increase not only public, but private, welfare. *See* Hunt Allcott & Michael Greenstone, *Is There an Energy Efficiency Gap?*, 26 J. ECON. PERSPS. 3, 4 (2012).

146. *See, e.g.*, Sébastien Houde, *How Consumers Respond to Product Certification and the Value of Energy Information*, 49 RAND J. ECON. 453, 462 (2018) (discussing utility rebate programs in the U.S. electricity market).

than to forecast their reaction to the Energy Star certification. The former prediction can draw on extant market data on demand responses to similar changes in appliance prices. The behavioral effects of the certification, on the other hand, can vary greatly with its specific design depending on factors such as its color, size, wording, or placement and therefore require extensive testing to determine the precise design whose effects best approximate those of the 7 percent rebate.

If that were not enough, the distortion problem would render the certification effects ambiguous even if it were successfully calibrated. The rebate simply lowers the price of more efficient appliances, which makes them more attractive relative to their less-efficient substitutes.¹⁴⁷ The nudge presents a more complex case, however: Energy Star certification that merely provides information consumers were previously lacking could help them make better purchase decisions. Yet consumers may also misinterpret the certification's meaning, erroneously inferring that Energy Star certified appliances are of higher quality, in which case they might purchase efficient appliances whose price exceed their private benefits.¹⁴⁸

Importantly, these calibration and distortion challenges also mean that the Energy Star nudge can be more easily exploited than the competing rebate. For instance, regulators beholden to industry interests can employ the certification to inflate consumers' beliefs in the quality of efficient appliances and offer manufacturers higher profit margins. Such manipulation would be far more difficult to detect and discipline than an intervention that employs an excessive price rebate—whose magnitude and effects are apparent—to the same end.¹⁴⁹

147. In reality, U.S. efficient appliance rebates fail to produce meaningful energy savings. Sébastien Houde & Joseph E. Aldy, *Consumers' Response to State Energy Efficient Appliance Rebate Programs*, 9 AM. ECON. J.: ECON. POL'Y 227, 228–29 (2017).

148. Houde, *supra* note 146, at 473 (“This suggests that the coarse [Energy Star] certification is more akin to a brand that some consumers value highly without knowing the precise meaning of the [Energy Star] certification requirement.”). Alternatively, the provision of energy-benefits information can facilitate (unfounded) positive beliefs about the certified products. *Cf.* Slovic et al., *supra* note 141, at 437–49.

149. *Cf.* Glaeser, *Paternalism*, *supra* note 66, at 155–56 (“Advocating soft paternalism is akin to advocating an increased role of the incumbent government as an agent of persuasion.”).

IV. THE NEGLECT AND UNDERESTIMATION OF PRIVATE COSTS

Nudges entail substantial private costs, but that is not the impression one receives from the literature. Until recently, scholars were almost exclusively concerned with the potential benefits and efficacy of behavioral regulation.¹⁵⁰ The handful of studies that do take the private costs of nudging into account, moreover, prove the general rule of their neglect and still tend to underestimate their scope.

A. *Neglecting Private Costs*

The neglect of behavioral policies' costs—not to mention their private costs—is illustrated by a recent review of seventy-two empirical studies of pro-environmental nudging, which notes that only a few of the reviewed studies addressed any costs of the tested interventions.¹⁵¹ A similar pattern emerges in another review of forty-four higher-quality papers containing 105 independent effects of energy conservation nudges.¹⁵² Even among these better studies, which controlled for selection effects and permitted causal inference, only a handful sought to assess any nudge costs.¹⁵³ In the same vein, Benartzi and coauthors note that few of the behavioral studies in the key policy areas they examined reported sufficient cost data to allow for CE calculations.¹⁵⁴

Moreover, the few authors who consider any costs of nudging enumerate their purportedly low costs among their key virtues. As Thaler and Sunstein stated, “[W]e believe that . . . many of those [behavioral] policies cost little or nothing; they impose no burden on taxpayers at all.”¹⁵⁵ This early assertion, much like the large body of

150. Allcott & Kessler, *supra* note 62, at 237 (“As with most evaluations of other nudges, this ignores benefits and costs (other than energy cost savings) experienced by nudge recipients.”).

151. Hilary Byerly, Andrew Balmford, Paul J. Ferraro, Courtney Hammond Wagner, Elizabeth Palchak, Stephen Polasky, Taylor H. Ricketts, Aaron J. Schwartz & Brendan Fisher, *Nudging Pro-Environmental Behavior: Evidence and Opportunities*, 16 FRONTIERS ECOLOGY & ENV'T 159, 162, 166–67 (2018).

152. Mark A. Andor & Katja M. Fels, *Behavioral Economics and Energy Conservation—A Systematic Review of Non-Price Interventions and Their Causal Effects*, 148 ECOLOGICAL ECON. 178, 178 (2018).

153. *Id.* at 186.

154. Benartzi et al., *supra* note 15, at 1042.

155. THALER & SUNSTEIN, *supra* note 3, at 13.

scholarship and commentary that followed it since, focuses on nudges' low implementation costs.¹⁵⁶

The same emphasis is vividly demonstrated by Benartzi and his coauthors' recent call on governments to invest more in nudging.¹⁵⁷ These scholars argue that nudges have proved more cost-effective than traditional instruments in important policy domains—including retirement savings, college enrollment, energy conservation, and adult influenza vaccination—based on calculations that include only government implementation costs and ignore the private costs of the competing interventions.¹⁵⁸

The prominence of Benartzi and his coauthors has led most recent scholarship to embrace their conclusions without scrutiny.¹⁵⁹ The assertion that nudges are more cost-effective than traditional policy instruments is now routinely repeated by scholars who favor increased reliance on behavioral instruments,¹⁶⁰ including some sophisticated economists.¹⁶¹ In fact, the ubiquity of the argument is such that even some researchers who criticize nudges on other grounds mistakenly concede that these instruments “impose nearly zero costs on consumers.”¹⁶² On occasion, moreover, commentators go so far as to erroneously assert that Benartzi and his coauthors showed that nudges

156. See, e.g., BETTER REGULATION GUIDELINES, *supra* note 32, at 4–5; Sibony & Alemanno, *supra* note 43, at 2–3; SUNSTEIN & REISCH, *supra* note 15.

157. Benartzi et al., *supra* note 15, at 1052.

158. *Id.* at 1044–51.

159. Google Scholar, for instance, counts over 750 citations of the article since its 2017 publication. List of articles citing *Should Governments Invest More in Nudging?*, GOOGLE SCHOLAR, https://scholar.google.com/scholar?cites=13664277105797787324&as_sdt=800005&sciodt=0,15&hl=en [<https://perma.cc/CBP8-7X8G>].

160. See, e.g., Alec Brandon, John A. List, Robert D. Metcalfe, Michael K. Price & Florian Rundhammer, *Testing for Crowd Out in Social Nudges: Evidence from a Natural Field Experiment in the Market for Electricity*, PNAS, Mar. 19, 2019, at 5293 (considering how household electricity consumption responds to social nudges); Hershfield et al., *Vividness*, *supra* note 135, at 212 (“[T]o keep costs low relative to benefits, policy makers should consider research that explores how the context of the policy problem affects the design of the vividness intervention.”); David Tannenbaum, Craig R. Fox & Todd Rogers, *On the Misplaced Politics of Behavioural Policy Interventions*, 1 NATURE HUM. BEHAV. 1, 1 (2017) (referring to behavioral policy interventions as a way to make public policy more cost efficient).

161. DellaVigna & Linos, *supra* note 132, at 84.

162. David Hagmann, Emily H. Ho & George Loewenstein, *Nudging Out Support for a Carbon Tax*, 9 NATURE CLIMATE CHANGE 484, 484 (2019).

are more efficient—not merely more cost-effective—than traditional regulation.¹⁶³

Only limited scholarly attention has been given, on the other hand, to the private costs of nudging, and the few scholars who explicitly address some of these costs largely neglect consumers' opportunity costs and nonconsumer costs. For instance, Professor Colin Camerer and his coauthors, among the early advocates of behaviorally informed regulation, were well aware that nudges may harm some consumers.¹⁶⁴ They, therefore, favored an "asymmetric paternalism" that offers substantial benefits to the boundedly rational while imposing much smaller direct costs on the more rational.¹⁶⁵ Notably, however, even these authors did not recognize that nudges can also entail significant opportunity costs for consumers whom they cause to make privately detrimental behavior changes (nor did they consider these policies' nonconsumer costs).¹⁶⁶

Similarly, while Thaler and Sunstein noted in passing that nudges have some private costs, they only identified taxpayers' fractional burden of funding the implementation of behavioral policies and the direct costs to consumers who resist nudges,¹⁶⁷ rather than either the substantial opportunity costs borne by the successfully nudged or any nonconsumer costs.

B. Underestimating Private Costs

There are very few exceptions to the common pattern of neglecting the private costs of behavioral instruments, and even the scholars who are aware of these costs tend to underestimate their scope, as this Part illustrates.

1. *Sunstein: The Cost-Benefit Revolution.* The Cost-Benefit Revolution, a recent book by Sunstein, who is a leading advocate of

163. Patricia De Jonge, Marcel Zeelenberg & Peeter W.J. Verlegh, *Putting the Public Back in Behavioral Public Policy*, 2 BEHAV. PUB. POL'Y 218, 218 (2018).

164. See Colin Camerer, Samuel Issacharoff, George Loewenstein, Ted O'Donoghue & Matthew Rabin, *Regulation for Conservatives: Behavioral Economics and the Case for "Asymmetric Paternalism,"* 151 U. PA. L. REV. 1211, 1219 (2003) (discussing how paternalistic policies may impose costs on fully rational consumers by restricting behavior).

165. *Id.* at 1247–50.

166. See *id.*

167. See THALER & SUNSTEIN, *supra* note 3, at 13 (discussing how "policies suggested by libertarian paternalism . . . impose no burden on taxpayers at all").

both nudging and CBA, provides an illuminating example.¹⁶⁸ In the course of his discussion of mandatory labeling laws, Sunstein rightly notes that such laws can lead people to forego some consumer surplus—that is, to bear opportunity costs—when they change behavior.¹⁶⁹ Yet this uncommon recognition of opportunity costs’ relevance for policy analysis is an instructive exception.

Tellingly, at the same time that Sunstein concedes that “there is no question that [opportunity costs] exist[] and that [they] might turn out to be a significant fraction of the benefits [to consumers from their new course of action],” he also asserts repeatedly, without adducing any empirical evidence to the claim, that mandatory labeling probably makes those whose behavior it changes better off on balance.¹⁷⁰ However, our earlier analysis suggests this claim may not always hold.

For example, when discussing mandatory calorie labeling, Sunstein suggests that the welfare of consumers who substitute salad for a cheeseburger due to such labeling is probably improved.¹⁷¹ Given heterogeneity, however, this is unlikely to be the case for all consumers. After all, not all consumers benefit equally—in terms of either health or enjoyment—from substituting lower calorie foods for higher calorie ones, and some may be better off consuming the latter on at least some occasions.¹⁷² But individuals with high self-control are more likely than those with low self-control to adjust their behavior to calorie menu labeling.¹⁷³ In other words, those most likely to modify their behavior due to the nudge are also those who are least likely to benefit from it, given that they already control their calorie intake, and may even engage in excessive avoidance of certain higher-calorie foods.¹⁷⁴ The reverse is true, moreover, for the consumers most likely to benefit from the nudge, who are unlikely to change their behavior

168. SUNSTEIN, COST-BENEFIT REVOLUTION, *supra* note 17.

169. See generally *id.* at 117–45 (presenting an overview of mandatory labeling and different approaches agencies may take to quantify its costs and benefits).

170. See *id.* at 126 (noting how projecting the benefits of mandatory labeling “would not give an adequate estimate of the (net) benefits”).

171. *Id.* at 126–27.

172. This may be particularly true beyond the extreme salad-for-cheeseburger case, once we consider the many common food substitutions due to calorie labeling effects.

173. See Thunström, *supra* note 103, at 13 (“[I]t seems that the [calorie salience] nudge taxes the ‘right’ people—it typically represents an emotional tax (cost) to people with low self-control and an emotional subsidy to people with high self-control.”).

174. See *id.* (explaining how the information on calories may enable a person with high self-control to “perfectly adjust calorie consumption to some individual-level ideal consumption”).

and thus bear the policy's direct private costs without obtaining any of its benefits.¹⁷⁵

The underestimation of private costs is also reflected in the second example Sunstein uses to illustrate opportunity costs, which describes consumers who buy a more expensive, fuel-efficient vehicle instead of a cheaper one that is less fuel-efficient because of mandatory fuel-efficiency labeling.¹⁷⁶ Notably, when discussing this example, Sunstein presumes the nudged behavior is always privately beneficial on balance,¹⁷⁷ even when consumers substitute a more fuel-efficient car for one that is superior in other respects.¹⁷⁸ In reality, however, there is little reason to assume all consumers currently would be better off buying fuel-efficient cars, since their benefits from such a vehicle depend on factors such as cost differences between EVs and their less-efficient alternatives, annual mileage and other conditions of usage, personal valuations of different car features, or the distance from a reliable EV charging station. More likely, some—perhaps many—consumers who are led to choose more fuel-efficient vehicles end up bearing net private costs.¹⁷⁹

2. *Allcott: Social Norms and Energy Conservation.* Allcott evaluated a series of HERs that employ social-information nudges to promote household energy conservation.¹⁸⁰ One of the ways in which Allcott assesses these reports is by their cost-effectiveness, based only on implementation costs—that is, the costs of producing and delivering the reports to consumers.¹⁸¹ However, Allcott notes that while this narrow measure of costs, which focuses on the costs that are most

175. See *id.* (“[I]f a person with low self-control experiences negative emotions from the nudge, while those emotions are not strong enough to incentivize (beneficial) reductions in high calorie consumption, he/she can only lose out from being nudged.”).

176. SUNSTEIN, COST-BENEFIT REVOLUTION, *supra* note 17, at 126.

177. *Id.*

178. *Id.*

179. Such an outcome is not necessarily problematic, insofar as fuel-efficiency standards are primarily concerned with the public welfare goal of energy conservation and thus willingly impose some net private costs. *But see* Allcott & Greenstone, *supra* note 145, at 3, 5 (explaining that private welfare is commonly cited as a benefit of energy efficiency interventions despite the limited evidence that policies in this area in fact benefit consumers); Hunt Allcott, *Paternalism and Energy Efficiency: An Overview*, 8 ANN. REV. ECON. 145, 149–51 (2016) [hereinafter Allcott, *Paternalism and Energy Efficiency*] (discussing arguments concerning the private welfare benefits of energy efficiency policies).

180. Allcott, *Social Norms*, *supra* note 75, at 1084–85.

181. *Id.* at 1088–89.

readily measured and matter most to program administrators, is useful for comparison with existing work, it provides “a highly incomplete accounting of welfare effects.”¹⁸² He then identifies private opportunity costs to energy consumers as important but difficult to quantify.¹⁸³

Allcott further observes that the HERs’ consumer welfare effects depend on the specific mechanisms through which their social-information nudges exert their effects. He correctly notes that if these effects are due to an increased “moral cost” of consumption—that is, by making energy use psychologically or emotionally costlier—the individuals who reduce their energy consumption experience a utility loss.¹⁸⁴ Allcott thus explicitly recognizes at least one circumstance in which the programs generate net private costs.

But even this careful analysis understates the prevalence of such costs. When considering another potential set of psychological mechanisms underlying the efficacy of the energy conservation programs, Allcott states that if such nudges reduce energy use “only by improving information or facilitating social learning, consumers have an unambiguous welfare gain.”¹⁸⁵ Indeed, one can imagine a number of ways in which information and social learning may increase people’s well-being when causing them to consume less energy. Better information can improve private welfare by helping correct mistaken energy use beliefs, as when consumers who underestimate their cost-savings from energy conservation reduce their consumption once better informed.

Yet we saw how the provision of information can also make consumers worse off. Some households may reduce consumption because they pay excessive attention to the reports’ most optimistic projections of cost saving from modifying energy behavior (“save up to \$100 a year”), react emotionally to the monetary savings highlighted by the nudge, and so on.¹⁸⁶ Other consumers may be troubled by the nudge but still resist it, bearing direct costs while obtaining no benefits.

182. *Id.* at 1089.

183. *Id.*

184. *Id.* at 1084.

185. *Id.* at 1089.

186. A related but distinct possibility that is beyond the scope of the present analysis is that the social information actually transformed some people’s energy consumption preferences. *See* Tor, *Nudges That Should Fail*, *supra* note 3, at 338 (noting that “[rationality-exploiting nudges] sometimes override or transform antecedent preferences”).

And energy retailers inevitably suffer net revenue losses when consumers are successfully nudged.

In sum, until recently the private costs of nudging were nearly absent from the scholarly assessments of its merits and demerits. A handful of analyses, like Allcott's, recognized the significance of accounting for private costs generally and opportunity costs in particular.¹⁸⁷ Sunstein also considers this issue in passing while discussing a CBA of mandatory labeling regulations rather than in the course of his extensive writings that focus on nudging. Nevertheless, even these rare instances in which scholars attend to private costs manifest a systematic underestimation of the frequency with which nudges generate net private costs.

V. WELFARE AND POLICY IMPLICATIONS

The extant literature on nudging largely neglects their private costs, and the few scholars who consider them underestimate their scope and import. This Section therefore describes the effects of accounting for private costs in cost-benefit and cost-effectiveness analyses of nudges respectively and considers the implications of this reassessment for the relative appeal of behavioral regulation versus its alternatives.

A. *Cost-Benefit Analysis of Behavioral Interventions*

The immediate and obvious implication of accounting for private costs under CBA is to diminish the net benefits of nudging, which can be significant because a nudge that appears attractive when these costs are neglected will usually turn out to be less attractive when they are considered.

1. *Public Welfare Nudges: Two Energy Conservation Interventions.* Energy conservation nudges are among the most common types of behavioral regulation, seeking to reduce negative externalities by leading households to lower their consumption of electricity, natural

187. Over the last few years, a small but growing body of economics research began considering the welfare effects of nudges. *See, e.g.*, Allcott & Kessler, *supra* note 62, at 239 (listing several analyses that researched the welfare effects of nudges). Yet even among these studies few consider private costs. *See infra* Part V.A.

gas, or water.¹⁸⁸ Importantly, however, like many other public welfare policies,¹⁸⁹ energy conservation nudges also generate substantial private benefits and costs as part of their overall welfare effects under CBA.

The recent work of Allcott and Kessler on the welfare effects of natural gas HERs is probably the best available empirical scholarship that assesses the full public and private effects of a nudge.¹⁹⁰ As the preceding analysis describes in detail, these authors' conservative estimate is that accounting for the private costs of this public welfare nudge eliminates more than 50 percent of its apparent net benefits.¹⁹¹

HERs are the most widespread social-information intervention to date, having been sent to 15 million utility customers in nine countries already by 2017,¹⁹² and totaling over one billion (!) reports to date.¹⁹³ The reports' front page prominently compares the energy use of the recipient household to that of its one hundred geographically nearest neighbors in houses of a similar size, using a three-bar comparison graph.¹⁹⁴ The graph displays the household's usage against two comparison targets: the mean of the neighbor distribution ("All Neighbors") and the 20th percentile of these neighbors ("Efficient Neighbors").¹⁹⁵ Next to the graph, the HERs' front page also displays a box that signals normatively desirable behavior. Consumers with below-average usage earn one smiley face, while those below the 20th

188. See generally Byerly et al., *supra* note 151 ("Experimental evidence suggests that information about social norms and changes to the decision context can encourage pro-environmental behavior, especially in relation to water conservation, sustainable land management, and reduced meat consumption.").

189. Cf. Allcott & Taubinsky, *supra* note 53, at 2501 (analyzing the welfare effects of nudges in the lightbulb market).

190. See Allcott & Kessler, *supra* note 62, at 238 ("We study a program providing HERs to about 10,000 residential natural gas consumers at a utility in upstate New York over the 2014–2015 and 2015–2016 winter heating seasons.").

191. *Id.* at 269 ("[T]he standard program evaluation approach (ignoring non-energy costs) suggests social welfare gains of \$1.22 billion. Accounting for our estimate of non-energy costs decreases that estimate to \$600 million. Thus, failing to account for non-energy costs causes the social value of these nudges to be overstated by \$620 million.").

192. *Id.* at 239.

193. Melissa Laymon, *One Billion Home Energy Reports and Counting*, ORACLE ENERGY & WATER BLOG (Oct. 3, 2022), <https://blogs.oracle.com/utilities/post/one-billion-home-energy-reports-and-counting> [<https://perma.cc/23Q8-5UUY>].

194. Allcott & Kessler, *supra* note 62, at 245. Note the description of the HERs here represents their appearance in the 2010s, at the time of the studies described in the text.

195. *Id.*

percentile earn two.¹⁹⁶ The back page of the report provides further information about household behaviors and home-improvement investments that can reduce energy consumption.¹⁹⁷

Hence, HERs might reduce energy use due to any combination of their nonsocial and social components. They communicate nonsocial information through energy conservation tips, which may also remind consumers of energy-saving behaviors and investments they knew of but did not previously implement.¹⁹⁸ But the efficacy of these mechanisms largely depends on capital investments (e.g., purchasing a programmable thermostat or weather-stripping doors and windows) that most households are unlikely to make.¹⁹⁹ At any rate, nonsocial information is unlikely to diminish private welfare insofar as it primarily encourages energy-saving actions on the part of those who already believe these actions could make them better off.²⁰⁰

In addition to nonsocial information, however, the HERs prominently convey two forms of social information. The front page prominently displays social comparisons of the household's consumption with that of the average and of the most efficient nearby, similarly sized homes.²⁰¹ These comparisons may lead people to make greater energy conservation efforts to outdo their neighbors, or at least to avoid being outperformed by them.²⁰² Additionally, the social comparison graphic and the adjacent box displaying a normatively

196. *Id.*

197. *Id.*

198. *Id.*

199. While Allcott and Kessler did not measure whether the HERs increased such investments, other recent empirical research found an exceedingly low propensity of households to avail themselves even of free coverage of similar energy conservation investments. See Meredith Fowlie, Michael Greenstone & Catherine Wolfram, *Do Energy Efficiency Investments Deliver? Evidence from the Weatherization Assistance Program*, 133 Q.J. ECON. 1597, 1599–1600 (2018) (reporting the same among the findings of a large scale randomized controlled trial of a weatherization assistance program).

200. Nonsocial information can still produce net private costs if it leads consumers to overestimate the benefits they will obtain from energy conservation investments.

201. Allcott & Kessler, *supra* note 62, at 245.

202. See Stephen M. Garcia, Zachary A. Reese & Avishalom Tor, *Social Comparison Before, During, and After the Competition*, in SOC. COMPARISON, JUDGMENT & BEHAV. 105, 109–11 (Jerry Suls, Rebecca L. Collins & Ladd Wheeler eds., 2020) (discussing the motives behind competitiveness); Stephen M. Garcia, Avishalom Tor & Tyrone M. Schiff, *The Psychology of Competition: A Social Comparison Perspective*, 8 PERSPS. ON PSYCH. SCI. 634, 637–41 (2013) (discussing factors that increase competitiveness).

laden message about the value of energy conservation also pressure recipients to comply with a purported injunctive social norm.²⁰³

Unlike nonsocial mechanisms, social information can readily lead to privately costly behavior changes. It may benefit those who seek to conserve more energy than their neighbors or to comply with extant conservation norms but lack accurate social information.²⁰⁴ Yet social information can also increase the psychological or emotional costs of engaging in behavior that generates unpleasant upward social comparisons or violates perceived social norms, causing some households to make net cost energy reductions much like the effects of traditional consumption taxes.²⁰⁵

Furthermore, social information mechanisms can also generate net private costs by inadvertently distorting consumer beliefs. For example, households may reduce energy use to their own detriment because the very provision of the HER and social information therein leads them to overestimate the personal or environmental benefits they could produce by reducing energy use. This concern is supported by Allcott and Kessler's findings that a majority of experienced recipients of natural gas HERs have likely dramatically overestimated their private savings from energy conservation.²⁰⁶ Had these biased consumers realized the true, smaller magnitude of their benefits, on the

203. See, e.g., Jessica M. Nolan, P. Wesley Schultz, Robert B. Cialdini, Noah J. Goldstein & Vlades Griskevicius, *Normative Social Influence Is Underdetected*, 34 PERSONALITY & SOC. PSYCH. BULL. 913, 920–22 (2008) (discussing the impact of social influences on private decisions to conserve energy); Schultz et al., *supra* note 89 (same).

204. If, instead of conveying extant norms, HERs misinform (e.g., determining the descriptive “norm” based on average rather than median household behavior) or construct new norms (e.g., increasing the normative social value of energy conservation), they may diminish private welfare in additional ways that are beyond the present scope. See Tor, *Nudges That Should Fail*, *supra* note 3, at 333–38 (noting that some nudges routinely transform or override individuals’ preferences, causing those who employ nudges to advance social goals contrary to targets’ preferences).

205. See Glaeser, *Paternalism*, *supra* note 66, at 150 (“Many examples of soft paternalism make people think that a particular behavior is particularly harmful.”); Glaeser, *Supply of Environmentalism*, *supra* note 76, at 209 (“When successful, these types of interventions motivate policy action or individual behavior by providing information about the impacts of vilified activity, causing psychic Pigouvian taxes to be imposed on the undesirable activity or creating a social norm that discourages the activity.”).

206. Allcott & Kessler, *supra* note 62, app. at 69, <https://www.aeaweb.org/content/file?id=8612> [<https://perma.cc/2PNV-YZF3>].

other hand, they might well have retained their previous, higher level of consumption.²⁰⁷

In sum, HER-induced reductions in energy use are probably due to some combination of the various information mechanisms. Nonsocial information tends to make such changes privately beneficial on balance to consumers, but the effects of social information are more complex, benefiting some consumers even while harming others.

These consumer costs are manifested in Allcott and Kessler's comprehensive study,²⁰⁸ which assessed a program that sent HERs to approximately ten thousand residential natural gas consumers in upstate New York over two winters, using an experimental design that allowed for the random assignment of nearly twenty thousand households into either a treatment condition or a control.²⁰⁹ The treatment group received standard HERs during one winter followed by surveys that measured their willingness to pay for another season of HERs.²¹⁰ The effects of the reports on energy use and consumers' associated cost savings were then measured.²¹¹ Allcott and Kessler also assessed the other public welfare effects of the nudge, including the public externality reduction benefit due to consumers' lower energy use, the private nonconsumer net revenue loss to the energy retailer, and the nudge's implementation costs.²¹²

Allcott and Kessler estimated that the HERs produced an average net benefit of \$0.77 per recipient over the heating season,²¹³ suggesting that the reports were (slightly) socially beneficial on balance, though they entailed substantial consumer costs. In particular, the study found

207. Indeed, a study that tested a social information nudge that also provided electricity consumers with detailed and frequent reports of their consumption and its costs to them led to a non-significant increase—rather than any decrease—in their energy use. *See* Omar I. Asensio & Magali A. Delmas, *Nonprice Incentives and Energy Conservation*, PROC. NAT'L ACAD. SCI. E510, E512–13 (2015) (noting that “participants who received messages informing them about monetary savings did not produce significant conservation by the end of the experimental period”).

208. The study relies on consumers' revealed willingness to pay (“WTP”) for the HERs as a measure of their private benefits from receiving the reports and similarly assumes that changes in energy use reflect the value of these changes to consumers. Allcott & Kessler, *supra* note 62, at 238. While these assumptions are necessary for the study's highly informative welfare analysis, they inevitably ignore the possibility that the nudge itself distorts consumers' beliefs and, therefore, their WTP for the HERs or their energy-saving behavior.

209. *Id.* at 244–46.

210. *Id.*

211. *Id.* at 263.

212. *Id.* at 266 tbl.7.

213. *Id.*

consumers' mean willingness to pay (\$2.81) for the reports substantially lower than their savings from lower energy expenditures (\$4.91), implying that the reports themselves imposed on consumers private costs (\$2.10) amounting to 43 percent of their energy savings (\$2.10/\$4.91).²¹⁴ These costs might have included the disutility from the social information "tax" aspect of the reports or the opportunity costs of reduced energy use (e.g., a colder home in the winter).

Instructively, Allcott and Kessler also found a great deal of heterogeneity in consumers' willingness to pay, with only 41 percent of households willing to pay more than the marginal public cost of the nudge (\$1.88).²¹⁵ However, a portion of this sizable minority valued the HERs highly enough to more than make up for the net private costs incurred by the remaining 59 percent of the consumers.²¹⁶ At the same time, we already noted that Allcott and Kessler's consumers dramatically overestimated their energy savings from the HERs, which suggests that consumers' willingness to pay was biased upwards and their true private costs substantially greater than the authors' main estimate.²¹⁷ It is quite likely, in fact, that the natural gas consumers' bias exceeded the reports' estimated net social benefits of \$0.77 per household, in which case this public welfare intervention will have turned out to be socially harmful on balance.²¹⁸

Of further note is the dramatic difference between the outcomes of the study's more comprehensive CBA and the approach typically used to assess nudges. Specifically, studies of energy-saving nudges routinely consider implementation costs and direct energy cost savings to consumers only. Taking such an approach here would have erroneously suggested a private welfare gain of \$2.69 per consumer and a public welfare gain that is more than double Allcott and Kessler's baseline estimate.²¹⁹

Another recent study of an energy conservation intervention with a significant behavioral component similarly illustrates how accounting

214. *Id.* at 268–69.

215. *Id.* at 268.

216. *Id.*

217. *Id.* app. at 70, <https://www.aeaweb.org/content/file?id=8612> [<https://perma.cc/2PNV-YZF3>].

218. This conjecture is further supported by the findings of Asensio & Delmas. *See supra* note 207 and accompanying text.

219. Due to average consumer energy cost savings of \$4.91 minus \$2.22 in implementation costs.

for private costs can reveal a policy's net benefits are lower than they seem. Houde examined a policy that introduced Energy Star certification of household appliances that designates certified appliances as energy efficient with a prominent label, finding the labeling generated only small net consumer benefits (and perhaps even net consumer costs) once the policy's consumer costs—particularly the opportunity costs to consumers who purchased certified appliances—were included in the analysis.²²⁰

In addition, Houde's study demonstrates how nudging can generate unintended net private costs. The Energy Star policy sought to provide appliance buyers with clear and easily comprehensible information concerning the energy efficiency of different products.²²¹ Yet the evidence indicated that the certification may have also distorted product quality beliefs, because consumers erroneously interpreted it as a signal of product quality.²²² This distortion, in turn, likely led consumers to overpay for Energy Star-certified appliances.²²³

2. *A (Largely) Paternalistic Nudge: Cigarette GWLs.*²²⁴ The cost-benefit evidence on cigarette packaging GWLs also reveals the potentially dramatic effects of accounting for consumer costs. As we saw, this widespread policy involves substantial behavioral elements beyond information disclosure, as GWLs can produce negative emotional reactions like fear or disgust and reduce enjoyment from smoking.²²⁵ At the same time, a recent systematic review of longitudinal observational research found that GWLs cause a small but significant reduction in the frequency of smoking,²²⁶ and a recent

220. Houde, *supra* note 146, at 454, 473.

221. *Id.* at 454.

222. *Id.* at 470.

223. Houde concluded that some energy savings were still realized despite the opportunity costs borne by consumers, because manufacturers reacted competitively to energy standards by producing more efficient appliances. *Id.* at 473. Hence, the nudge may have made an efficient intervention, on balance, albeit not necessarily for its targets.

224. A reduction in the rate of smoking also entails substantial public benefits as well as private benefits to non-smokers, but the direct effects on smokers are central to the case for GWLs, as illustrated by the FDA's CBA. See Helen G. Levy, Edward C. Norton & Jeffrey A. Smith, *Tobacco Regulation and Cost-Benefit Analysis: How Should We Value Foregone Consumer Surplus?*, 4 AM. J. HEALTH ECON. 1, 4 (2018) (describing the FDA's CBA for GWLs and the subsequent debate over its methodology).

225. *Supra* notes 108–111 and accompanying text.

226. Noar et al., *Effects of Strengthening*, *supra* note 108, at 435 (noting strengthened warnings increased perceived effectiveness of outcomes).

randomized clinical trial found that they increase short-term cessation.²²⁷

Domestically, the Food and Drug Administration (“FDA”) recently introduced its final GWL regulation, having already conducted the CBA mandated by the law.²²⁸ Importantly for present purposes, the agency conceded that the assessed range of the monetized health benefits to smokers from GWLs in its CBA “overstate[s] . . . the net internal (*i.e.*, intrapersonal) benefits . . . of reduced smoking because they . . . do not account for any lost consumer surplus.”²²⁹ According to the FDA’s estimates, accounting for the opportunity costs to smokers who change their behavior due to GWLs—the aforementioned “lost consumer surplus”—has a dramatic effect.²³⁰ The highest estimate of these opportunity costs—which included their full monetary value despite the addictive nature of cigarettes—amounted to approximately 93 percent of the rule’s benefits, while the lowest estimate put them at merely 10 percent of the same.²³¹ Both the FDA’s analysis and most scholarship thus discount the lost consumer benefits from smoking because of the addictive nature of cigarettes, with some even arguing that these costs should be completely ignored.²³²

One need not take a stance on the appropriate discounting of the benefits to consumers from an addictive, hazardous product like cigarettes to recognize the dramatic effect of the degree to which these consumer benefits are discounted on how the GWL rule fares under CBA. As Professor Helen G. Levy and her coauthors note, “[T]he FDA analysis suggested that *somewhere between almost none and almost all of the health benefits to smokers from reduced smoking are*

227. Brewer et al., *supra* note 108, at 6–7.

228. 21 C.F.R. § 1141 (2022). This regulation incorporates a portion of the Family Smoking Prevention and Tobacco Control Act of 2009, requiring tobacco companies to add indelible, visible graphic warnings as displayed in “Cigarette Required Warnings.” § 1141.12.

229. Required Warnings for Cigarette Packages and Advertisements, 76 Fed. Reg. 36628, 36772 (June 22, 2011) (codified at 21 C.F.R. § 1141).

230. *See id.* at 36735 (noting that accounting for lost consumer surplus greatly increases estimated costs).

231. *See id.*; *see also* Levy et al., *supra* note 224, at 5.

232. *See* Frank J. Chaloupka, Jonathan Gruber & Kenneth E. Warner, *Accounting for “Lost Pleasure” in a Cost-Benefit Analysis of Government Regulation: The Case of the Food and Drug Administration’s Proposed Cigarette Labeling Regulation*, 162 ANNALS INTERNAL MED. 64, 65 (2015) (concluding lost consumer benefits should not be considered a cost in CBA of tobacco regulations).

offset by lost enjoyment.”²³³ This observation is especially important for an activity that clearly harms people’s health, since a policy that successfully reduces the incidence of smoking will tend to generate substantial private health benefits. Nevertheless, the conclusion that, unless discounted, consumers’ opportunity costs would offset nearly all of the GWLs’ benefits highlights the potential impact of accounting for these costs of nudging more generally.

Of course, GWLs may be *sui generis* in important respects. For example, the addictive nature of tobacco may not only diminish the efficacy of soft interventions in changing smoking behavior but also produce higher opportunity costs compared to nonaddictive substances, given the increased pain of forgoing smoking. In this case, opportunity costs may constitute a much smaller fraction of the benefits of nudges in other domains.

At the same time, the fact that most smokers do not reduce smoking after exposure to GWLs may indicate that the small minority that responds to the nudge consists mostly of those who find it somewhat easier to reduce smoking, whether because they do not enjoy the activity as much as other smokers do or because they are less susceptible to developing nicotine dependence.²³⁴ If this were the case, the magnitude of the estimated opportunity costs from reduced smoking relative to its health benefits might be more comparable to those of successful nudges that target non-addictive behaviors.

Moreover, even the FDA’s highest consumer costs estimate does not consider the possibility that some individuals reduce their rate of smoking because the GWLs distort their beliefs or preferences. For instance, GWLs could lead certain smokers to overestimate their personal risk of suffering some of the more horrific effects of smoking or even to directly diminish others’ enjoyment from smoking by associating the activity with an unpleasant emotional reaction to GWLs. In either case, some such individuals may reduce their smoking beyond the level needed to correct for whatever bias previously led

233. Levy et al., *supra* note 224, at 5 (emphasis added).

234. See Francis J. McClernon, Rachel V. Kozink & Jed E. Rose, *Individual Differences in Nicotine Dependence, Withdrawal Symptoms, and Sex Predict Transient fMRI-BOLD Responses to Smoking Cues*, 33 NEUROPSYCHOPHARMACOLOGY 2148, 2152 (2008) (finding a correlation between self-reported nicotine dependence and certain brain activity); see also Saul Shiffman & Stephanie M. Paton, *Individual Differences in Smoking: Gender and Nicotine Addiction*, 1 NICOTINE & TOBACCO RES. S153, S156 (1999) (noting a correlation between gender and nicotine dependence).

them to smoke excessively and thus entail an additional welfare loss beyond standard opportunity costs.

While our discussion focused on GWLs' main consumer costs—namely, their opportunity costs—the same psychological processes that change the behavior of a small minority of smokers are also likely to impose direct costs on all other smokers who continue smoking despite the nudge. The GWLs may reduce their enjoyment, operating as a “psychological tax,” so that they benefit less from smoking even while retaining their former, harmful, course of action. Indeed, because they can lower the enjoyment of a great many smokers, even very small per-smoker direct costs of this sort may be substantial in the aggregate.

Finally, whenever they reduce the rate of smoking, GWLs also produce net revenue losses to cigarette manufacturers, in the same way that the conservation of energy by consumers affects energy retailers. In both cases, the net losses due to a reduced volume of sales is a private, nonconsumer cost.

Caveats of this sort obviously are of limited significance in the case of policies aiming to control tobacco—an addictive, hazardous substance—and are thus unlikely to trouble most analysts.²³⁵ However, similar effects could also produce large reductions in the net benefits of paternalistic nudges in areas like retirement savings or nutrition, for instance, in which the harms of people's pre-nudge behavior are less pronounced or more varied.

B. Cost-Effectiveness Analysis of Behavioral Interventions

As with CBA, accounting for private costs generally and opportunity costs in particular tends to reveal outcomes that are less cost-effective than they seem when these costs are ignored or underestimated, as illustrated by Allcott and Kessler's recent study of natural gas home energy reports discussed above.²³⁶

Allcott and Kessler estimated that the HERs led to an average reduction of 6.59 centum cubic feet (“ccf”), equal to 659 cubic feet, in natural gas use for the season they studied.²³⁷ The reports entailed an implementation cost of \$2.22,²³⁸ so a CEA that takes the common

235. See Levy et al., *supra* note 224, at 10 (summarizing multiple tobacco regulation analyses that find regulation to be welfare-enhancing).

236. Allcott & Kessler, *supra* note 62, at 264 (noting how including private costs affects the program's estimates).

237. *Id.* at 263.

238. *Id.* at 266.

approach and includes only these two effects yields a cost of \$0.34 per 1 ccf reduction of energy use (\$2.22/6.59 ccf).

While their study was neither able to measure all the potential opportunity costs of the nudge nor to separate these from those consumer costs that were reflected in recipients' willingness to pay for the HERs, Allcott and Kessler estimated the average private nonenergy costs imposed on recipient households at \$2.10.²³⁹ Accounting for these costs yielded a total cost of \$4.32 (\$2.22 implementation costs + \$2.10 consumer costs) and, naturally, a CE ratio of \$0.66 per ccf saved (\$4.32/6.59 ccf)—more than twice as high than if these costs were neglected.²⁴⁰

Furthermore, the HERs also produced private nonconsumer costs—that is, the natural gas retailer's net revenue losses from the reduction in consumers' energy use. The researchers estimated these costs at \$0.38 per ccf,²⁴¹ implying that the actual CE ratio of the HERs was \$1.04 per ccf saved (\$0.66 consumer and implementation costs + \$0.38 nonconsumer private costs per ccf saved). In other words, a CEA that includes the reports' full private costs as well as their implementation costs reveals the nudge was in fact about three-fold costlier per ccf than an erroneous analysis that ignores private policy costs would appear to show.

C. *Behavioral Interventions and Their Alternatives*

Despite their lower implementation costs compared to some traditional instruments, behavioral policies can entail substantial private costs. Consequently, the seeming cost advantage of nudges may diminish or even disappear upon further examination, with important implications for when and how regulators should use behavioral instruments.²⁴²

1. *Behavioral Interventions vs. Traditional Instruments.* With few exceptions, all successful interventions entail private costs—particularly opportunity costs, but the magnitude of these costs depends in large part on the potential of a given instrument to produce net consumer costs and its effectiveness.

239. *Id.* at 268.

240. *Id.* at 263–64, 266, 268.

241. *Id.* at 263–64.

242. See Tor, *Nudges That Should Fail*, *supra* note 3. For some “choice of instrument” comparing nudges to traditional policies, see generally Galle, *supra* note 28.

Instruments that facilitate only net-beneficial behaviors generate net consumer benefits, by definition, whatever their other private or public benefits and costs. Additionally, the more effective such instruments are the more likely are their overall benefits to exceed their nonconsumer and implementation costs. Hence, policies that produce substantial net consumer benefits often tend to be socially beneficial on balance.²⁴³

Most interventions, however, generate net costs at least for some consumers besides their nonconsumer and implementation costs, rendering the balance of their consumer benefits and costs important for their overall efficiency. That is, the higher the fraction of consumers who benefit from a policy on balance and the larger the magnitude of their net benefits compared to the net costs suffered by their peers, the more attractive the policy tends to be. Unlike the former case, of instruments that produce only net consumer benefits, here the relationship between effectiveness and private costs plays a more complex role. Increased effectiveness makes a policy more attractive when it leaves more consumers with net benefits, while the opposite tends to hold when it produces greater net consumer costs.

These observations shed some light on the potential advantage of certain nudges over alternative instruments. Traditional policies usually cannot avoid generating net private costs, as we saw with respect to both coercive interventions that routinely force involuntary costly behavior changes²⁴⁴ and noncoercive financial instruments.²⁴⁵

In contrast, ideal debiasing nudges—which only correct people’s deviations from rationality—never cause behavior changes that diminish their targets’ private welfare.²⁴⁶ For example, debiasing consumers’ underestimation of some product (e.g., motorcycle) risks would reduce the demand for the product only on the part of consumers who previously overconsumed it due to their bias, without

243. This would not be the case for interventions whose negative external effects exceed their private benefits, but these are unlikely to make attractive candidates for adoption to begin with.

244. Recent scholarship that draws on evidence of bounded rationality to justify coercive legal responses tends to show the neglect or underestimation of private costs. See Ryan Bubb & Richard H. Pildes, *How Behavioral Economics Trims Its Sails and Why*, 127 HARV. L. REV. 1593, 1676 (2014).

245. See *supra* Part II.B.

246. Cf. Allcott & Sunstein, *supra* note 21 (comparing uniform subsidies, which are “a compromise that is too weak for relatively biased agents and too strong for unbiased agents,” to nudges which “can help misinformed and inattentive consumers without affecting the already informed and attentive types”).

causing previously unbiased consumers to forgo privately beneficial consumption.²⁴⁷ Such nudges would also tend to entail only limited direct costs to unbiased consumers. They can still produce some apparent nonconsumer costs, due to the net revenue losses to retailers from lost sales to debiased consumers. Yet, these are not true economic costs because they only represent a correction of formerly excessive, socially harmful consumption. However, we already noted that debiasing is difficult and usually impractical, so true debiasing nudges are rare in practice.²⁴⁸

Instead, we saw that most realistically available nudges generate some net private costs.²⁴⁹ Once these costs are considered, nudges' advantage over their traditional alternatives tends to diminish. While there is little available empirical research that directly compares behavioral and traditional interventions, a recent reassessment of Benartzi and his coauthors' effectiveness-cost comparisons is instructive.²⁵⁰ Using these authors own data, the evidence they evaluate, and additional empirical findings, this author and Professor Jonathan Klick conducted an illustrative CBA of the four energy conservation policies that Benartzi and his coauthors examined.²⁵¹ Unsurprisingly, this analysis showed that once the competing policies' private welfare effects are properly included (and mere resource transfers excluded), the net social benefits of the most successful nudge were at best slightly higher or, more likely, somewhat lower than those of the traditional financial instruments that otherwise appeared significantly inferior to it.²⁵²

In sum, while ignoring private costs can inflate the apparent net benefits of all interventions, it is particularly likely to make nudges—whose absolute benefits are often modest²⁵³ and implementations costs typically low—seem more efficient than traditional interventions

247. Debiassing could also correct systematic biases in perceived product prices, such as when consumers underestimate the expected costs of low-efficiency appliances or sugary drinks. Cf. David M. Cutler, Amber Jessup, Donald Kenkel & Martha A. Starr, *Valuing Regulations Affecting Addictive or Habitual Goods*, 6 J. BENEFIT COST ANALYSIS 247, 254 (2015) (modeling the effects of misperceptions of addictive products' health costs).

248. See Tor, *Methodology*, *supra* note 68, at 298–99.

249. See *supra* Part III.

250. Tor & Klick, *supra* note 20, at 350.

251. *Id.* at 352–61.

252. *Id.* at 360–61.

253. DellaVigna & Linos, *supra* note 132.

bearing higher benefits and implementation costs, contrary to the true state of affairs.

2. *When All Interventions Produce Net Costs.* Finally, a careful analysis will sometimes reveal that no available instrument is expected to produce net benefits, irrespective of the desirability of the policy goal policymakers wish to promote. In such cases, accounting for private costs alerts us that all interventions should be avoided at present, at least until some net-benefit instrument has been identified. This is patently true for paternalistic policies that fail to generate the net consumer benefits that are their *raison d'être*, but even public welfare interventions—that might produce sufficiently large public benefits to offset all of their public and private costs and more—increasingly risk being socially harmful on balance when they impose large net private costs.

Allcott and Kessler's HER study, discussed above, demonstrates this point in the context of an energy conservation nudge.²⁵⁴ The study concluded that the natural gas reports generated some net benefits, albeit substantially smaller ones than an analysis that neglects private costs would have erroneously suggested.²⁵⁵ Most pertinently, however, the estimated per-recipient net benefits of this ubiquitous public welfare intervention were wholly due to its *consumer* benefits, rather than its public, externality reduction benefits.²⁵⁶ The externality reduction benefit of the program per-consumer (\$2.71) was substantially lower than its implementation costs and private nonconsumer costs (\$2.22 and \$2.53, respectively), amounting to a net loss of -\$2.04.²⁵⁷ Allcott and Kessler still found the nudge yielded net benefits of \$0.77 per household, because they estimated consumers' average WTP for the HERs at \$2.81.²⁵⁸

These results illustrate a number of important insights: first, the small absolute magnitude of the program's estimated net benefits suggest caution regarding its widespread use, at least in its current form, the more than one billion HERs delivered to date notwithstanding. As Allcott and Kessler note, if implementation costs

254. Allcott & Kessler, *supra* note 62, at 269.

255. *Id.*

256. *See id.*

257. *Id.* at 266.

258. *Id.* at 268–69.

were 35 percent higher or consumers' WTP were 28 percent lower, "the base case social welfare point estimate would be negative."²⁵⁹ Such alternative estimates were not implausible because smaller programs have higher per-report implementation costs and most of the study's alternative assumptions for estimating WTP led to lower and even negative net welfare effects, which would militate against the universal adoption of HERs.

Second and related, the study's WTP estimates all assumed that consumers' survey responses provided unbiased estimates of the reports' effects on their net welfare.²⁶⁰ As previously explained, however, the authors' evidence reveals that consumers likely dramatically overestimated the private energy savings benefits they obtain from receiving the reports.²⁶¹ Yet, in this case, the study's estimates clearly overstate the HERs consumer welfare gains, and the downward adjustment of these estimates would be even more likely to show that the HERs were socially costly on balance.

If that were not enough, the potentially inflated WTP estimates might also overstate the HERs' benefits. To wit, consumers who overestimate the reports' contribution to their private energy saving behavior might also overestimate the externality reduction benefits they produce. Such a bias could further inflate households' WTP for the HERs, increasing the risk that an unbiased consumer WTP would have shown the HERs generated net social costs.

At any rate, this discussion shows that even public welfare nudges can produce sufficiently large consumer costs to render their adoption ill-advised. In these circumstances, regulators who possess no alternative net-benefit policy should avoid intervention, no matter the importance of the goal they wish to promote.

CONCLUSION

Private costs are an essential input for regulatory assessment yet are routinely ignored or underestimated, particularly where nudges are concerned. This neglect is significant because accounting for private costs reveals that many behavioral policies offer lower net benefits or are less cost-effective than they otherwise appear. At times, moreover, the overall costs of nudges exceed their benefits, in which case they

259. *Id.* at 267.

260. *Id.* at 262.

261. *Id.* app. at 70, <https://www.aeaweb.org/content/file?id=8612> [<https://perma.cc/2PNV-YZF3>].

should not be adopted. In these instances, efficient traditional interventions may be appropriate, but if these are lacking, regulators should stay their hand altogether.

In principle, behavioral policies ought to be subjected to the same cost-benefit scrutiny required of traditional regulation to the extent possible. In practice, however, a full CBA appears to be a challenging prospect even for traditional regulation²⁶² and can be all the more difficult for behavioral policies.²⁶³ Indeed, this difficulty likely encourages the mistaken, prevailing view that there is little risk in adopting nudges without running the CBA gauntlet.²⁶⁴

In the absence of full-fledged CBAs, however, regulators should at least consider more closely the degree to which different nudges tend to facilitate or inhibit rational judgments and decisions by their targets, given that these “rationality effects” offer a rough and ready proxy for the likely consumer welfare effects of behavioral interventions. For instance, instruments that help debias consumers are less likely to encourage privately costly behavior changes than nudges that distort consumer beliefs in the service of some desired policy goal (e.g., using affect-laden advertising to increase retirement savings or energy conservation).²⁶⁵

262. E.g., Jerry Ellig, Patrick A. McLaughlin & John F. Morrall III, *Continuity, Change, and Priorities: The Quality and Use of Regulatory Analysis Across US Administrations*, 7 REG. & GOVERNANCE 153, 155, 161 tbl.3 (2013) (noting that “[t]he quality of [regulatory] analysis remains far short of the ideal enunciated in executive orders and OMB guidance” and finding low quality generally, and lack of a full CBA specifically, for most federal regulations promulgated between 2008 and 2010).

263. See, e.g., Allcott, *Paternalism and Energy Efficiency*, *supra* note 179, at 153–66 (discussing and offering solutions to some of the unique challenges of assessing nudges); Tor & Klick, *supra* note 20, at 371–73 (noting that whether the assessed energy conservation nudge was more or less efficient than the most efficient demand-side management policies turned out to depend on assumptions concerning the calculation of the nudge’s consumer costs); Hunt Allcott & Todd Rogers, *The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation*, 104 AM. ECON. REV. 3003, 3021–25 (2014) (explaining the challenge of estimating long-run behavioral effects); Allcott & Taubinsky, *supra* note 53, at 2524–29 (describing the difficulty of estimating the effects of a behaviorally motivated traditional policy).

264. See *supra* Part IV.A.

265. Tor, *Behavioral Regulation*, *supra* note 3, at 249–57; Avishalom Tor, *All Nudges Are Not the Same: Why Rationality Matters for Welfare* 5 (Dec. 2020) (unpublished manuscript).