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Regulation and Redistribution with Lives in the Balance

Daniel J. Hemel

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Daniel Hemel*
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Abstract

A central question in law and economics is whether non-tax legal rules should be designed solely to maximize efficiency or whether they also should account for concerns about the distribution of income. This question takes on particular importance in the context of cost-benefit analysis. Federal agencies apply cost-benefit analysis when writing regulations that generate multibillion dollar impacts on the US economy and profound effects on millions of Americans' lives. In the past, agency cost-benefit analyses typically have ignored the income-distributive consequences of those regulations. That may soon change: On his first day in office, President Biden instructed his Office of Management and Budget to propose procedures for incorporating distributive considerations into cost-benefit analysis, thus bringing renewed relevance to a long-running law-and-economics debate.

This article explores what it might mean in practice for agencies to incorporate distributive considerations into cost-benefit analysis. It uses, as a case study, a 2014 rule promulgated by the National Highway Traffic Safety Administration (NHTSA) requiring new motor vehicles to have rearview cameras that reduce the risk of backover crashes. As with most major federal regulations that impose large dollar costs, the principal benefit of the rear visibility rule is a reduction in premature mortality. Quantitative cost-benefit analysis typically translates mortality reductions into dollar terms based on the "value of a statistical life," or VSL. Any distributive evaluation of the rule will depend critically on a parameter known as the "income elasticity of the VSL," which reflects the relationship between an individual's income and her willingness to pay for mortality risk reductions. Although agency cost-benefit analyses use the same VSL for all individuals regardless of income, the Department of Transportation—of which NHTSA is a part—has issued guidance on the income elasticity of the VSL for other purposes. When this article applies the Department of Transportation's income-elasticity guidance in its distributive analysis, the rear visibility rule appears to be "regressive": it generates net costs for lower-income groups and net benefits for higher-income groups. Rerunning the distributive analysis with equal dollar VSLs at all income levels, the rule appears to be "progressive": lower-income individuals are the primary beneficiaries and higher-income individuals are the losers. The article goes on to explain why

* Professor of Law and Ronald H. Coase Research Scholar, University of Chicago Law School. For helpful comments on earlier drafts, the author thanks Yochai Benkler, Ben Eidelson, Lee Fennell, John Goldberg, Eric Hemel, Kristin Hickman, Shishene Jing, Louis Kaplow, Hajin Kim, Anna Lvovsky, Jonathan Masur, Jennifer Nou, Martha Nussbaum, Lisa Larrimore Ouellette, Eric Posner, Richard Revesz, Kathy Spier, Matthew Stephenson, Cass Sunstein, David Weisbach, and workshop participants at Harvard Law School, the University of Chicago Law School, and the University of San Diego School of Law.

assumptions about the relationship between income and the VSL will have important implications for distributive analyses of other lifesaving regulations.

The article then asks what agencies ought to do: should they incorporate distributive objectives into cost-benefit analysis by assigning greater weight to dollars in lower-income individuals' hands, and should they assign different dollar VSLs to individuals with different incomes? The two questions are closely linked. Incorporating distributive objectives into cost-benefit analysis of lifesaving regulations while maintaining equal dollar VSLs for rich and poor will potentially produce perverse outcomes that—according to standard economic thinking—actually redistribute from poor to rich. After canvassing options, this article ultimately concludes that the status quo approach—equal weights for low-income and high-income individuals' dollars, equal dollar VSLs for low-income and high-income individuals—makes practical sense in light of expressive concerns, informational burdens, and institutional constraints. The article ends by reflecting on the case study's lessons for broader debates over legal system design, and it explains why the issues that arise in the rear visibility case study are likely to affect other efforts to redistribute through non-tax legal rules.

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Introduction

Cost-benefit analysis (CBA) is the standard method of policy evaluation across U.S. federal executive branch agencies. Executive Order 12866, promulgated by President Clinton in 1993, requires agencies to quantify the costs and benefits—"to the extent feasible"—of all regulatory actions likely to have an annual effect on the economy of $100 million or more[1] and to favor regulations for which benefits justify costs.[2] Executive Order 12866 now has survived four presidential administrations—two of each party—and has come to shape the way that agencies across the executive branch craft their rules.[3] These rules, in turn, profoundly affect large swaths of the American economy and American life. Today, CBA exerts enormous influence over the food we eat,[4] the cars we drive, and the air we breathe.[5]

Since long before CBA became standard practice across the executive branch, scholars of the subject have argued that traditional CBA suffers from a serious flaw: it fails to account for the distribution of income.[6] This criticism has gained greater force in an age of widening income and wealth inequality. Traditional CBA accords the same weight to a dollar in the hands of Amazon CEO Jeff Bezos and to a dollar in the hands of a struggling single parent living at the poverty line, even though virtually everyone agrees that the single parent has greater need for, or derives greater "utility" from, a dollar than Bezos. Especially as the "top 1 percent" and "top 0.1 percent" capture an increasing share of national income,[7] how can CBA continue to justify its indifference toward matters of distribution?

Responding to CBA's perceived "distributive deficit,"[8] scholars have proposed several ways to incorporate redistributive priorities into policy evaluation. The most developed of these proposals involves the application of "distributional weights" that reflect the different social-

[1] Exec. Order 12866, §§ 3(f)(1), 6(a)(3)(C) (1993), 58 Fed. Reg. 51,735, 51,738, 51,741 (Oct. 4, 1993).
[2] Id. § 1(b)(6).
[3] On the influence of CBA, see generally Cass R. Sunstein, The Cost-Benefit Revolution (2018).
[4] See, e.g., Prevention of Salmonella Enteritidis in Shell Eggs During Production, Storage, and Transportation: Final Rule, 74 Fed. Reg. 33,029, 33,050-33,087 (July 9, 2009) (summarizing results of cost-benefit analysis that supported rule); Food Labeling; Gluten-Free Labeling of Foods: Final Rule, 78 Fed. Reg. 47,154, 47,155 (Aug. 5, 2013) (same); Food Labeling; Nutrition Labeling of Standard Menu Items in Restaurants and Similar Retail Food Establishments: Final Rule, 79 Fed. Reg. 71,155, 71,158-71,159 (Dec. 1, 2014) (same).
[5] On the influence of CBA over federal motor vehicle safety standards and air quality standards, see infra Section I.B.
[6] For an early and influential statement, see Burton A. Weisbrod, Income Redistribution Effects and Cost-Benefit Analysis, in Problems in Public Expenditure Analysis 177, 178-184 (Samuel B. Chase ed., 1968). Accord Amartya Sen, The Discipline of Cost-Benefit Analysis, 29 J. Legal Studies 931, 945-46 (2000).
[7] See infra notes 40-45 and accompanying text.
[8] Cf. Lee Anne Fennell & Richard H. McAdams, The Distributive Deficit in Law and Economics, 100 Minn. L. Rev. 1051, 1069 n.56 (2016) (criticizing law and economics generally for failing to take distributive concerns into account, and citing CBA specifically as an area in which this "deficit" manifests).

welfare value of dollars in different individuals' hands.[9] Distributionally weighted CBA typically tallies costs and benefits in dollar or other monetary terms for each individual or income group and then applies a greater weight to costs and benefits incurred by lower-income individuals or groups. It then recommends the policy that yields the greatest weighted welfare gains overall.[10] An alternative approach, which aims to arrive at the same result by less formal means, estimates costs and benefits for each income group and then places greater qualitative emphasis on costs and benefits incurred by lower-income groups.[11] Under this latter approach, the fact that a regulation redistributes from rich to poor is a "soft" variable weighing in its favor, and the fact that a regulation redistributes from poor to rich would be a strike against.[12] (I will use the term "hard weighted CBA" to refer to the version that assigns formal numerical weights to individuals or income groups, "soft weighted CBA" to refer to the version that considers redistributive effects as a qualitative factor in CBA, and "unweighted CBA" to refer to the traditional distribution-neutral approach.)

Support for distributionally weighted CBA in the academy is growing.[13] And interest in weighted CBA extends well beyond the ivory tower. President Biden, on his first day in office,

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[9] For an introduction to distributional weights, see David A. Weisbach, Distributionally Weighted Cost-Benefit Analysis: Welfare Economics Meets Organizational Design, 7 J. Legal Analysis 151 (2015). My argument here is informed by countless hours of conversation with Weisbach, and we both come down against distributional weights for (different) institutional reasons, though we disagree on the use of equal dollar vs. income-elastic values of a statistical life. See id. at 168-69 (arguing that agencies should assign different values of a statistical life based on income).

[10] See, e.g., Kenneth J. Arrow, Social Choice and Individual Values 46-60 (1st ed. 1951); Weisbrod, supra note 6, at 190-208; Partha Dasgupta, Amartya Kumar Sen & Stephen A. Marglin, Guidelines for Project Evaluation (1972); Ian Malcolm David Little & James A. Mirrlees, Project Appraisal and Planning for Developing Countries (1974); Richard Layard, On the Use of Distributional Weights in Social Cost-Benefit Analysis, 88 J. Pol. Econ. 1041 (1980); Robert J. Brent, Use of Distributional Weights in Cost-Benefit Analysis: A Survey of Schools, 12 Pub. Fin. Q. 213 (1984); Matthew D. Adler, Benefit-Cost Analysis and Distributional Weights: An Overview, 10 Rev. Envtl. Econ. & Pol'y 264 (2016); Marc Fleurbaey & Rossi Abi-Rafeh, The Use of Distributional Weights in Benefit-Cost Analysis: Insights from Welfare Economics, 10 Rev. Envtl. Econ. & Pol'y 286 (2016).

[11] See Robert W. Hahn & Cass R. Sunstein, A New Executive Order for Improving Federal Regulation? Deeper and Wider Cost-Benefit Analysis, 150 U. Pa. L. Rev. 1489, 1499-1500 (2002).

[12] See, e.g., Weisbrod, supra note 6, at 185-90; Anthony E. Boardman, David H. Greenberg, Aidan R. Vining & David L. Weimer, Cost-Benefit Analysis: Concepts and Practice 464-65 (2d ed. 2001); Richard Williams & James Broughel, Principles for Analyzing Distribution in Regulatory Impact Analysis (2015), https://www.mercatus.org/system/files/Williams-Analyzing-Distribution-RIA-MOP.pdf. In an important recent contribution, Richard Revesz argues that "agencies should report distributional inequities to OIRA *alongside* conventional cost-benefit analysis results." A rule that meets a threshold inequity level would then trigger either a rule change or "mitigating measures." Richard L. Revesz, Regulation and Distribution, 93 N.Y.U. L. Rev. 1489, 1570-71 (2018).

[13] For recent endorsements of hard weighted CBA, see, for example, Matthew D. Adler, Measuring Social Welfare: An Introduction (2019); Robin Boadway, Cost-Benefit Analysis, in The Oxford Handbook of Well-Being and Public Policy 47 (Matthew D. Adler & Marc Fleurbaey eds., 2016); Anthony E. Boardman, David H. Greenberg, Aidan R. Vining & David L. Weimer, Efficiency without Apology: Consideration of the Marginal Excess Tax Burden and Distributional Impacts in Benefit–Cost Analysis, 11 J. Benefit-Cost Anal. 457 (2020); and Marc Fleurbaey & Rossi Abi-Rafeh, The Use of Distributional Weights in Benefit–Cost Analysis: Insights from Welfare Economics, 10 Rev. Envtl. Econ. & Pol'y 286 (2016). For a creative and detailed proposal to incorporate a form of soft weighted CBA into regulatory review, see Revesz, supra note 12.

directed the Office of Management and Budget to "propose procedures that take into account the distributional consequences of regulations."[14] Presidents Clinton and Obama took the more modest step of allowing (but not requiring) agencies to engage in soft weighted CBA.[15] The Trump administration, for its part, emphasized the distributional effects of federal regulations in its public statements—in particular, arguing for the repeal of environmental, health, and safety regulations on the ground that they impose a "disproportionate burden" on lower-income individuals.[16] Indeed, President Trump told supporters in 2020 that his administration had cut a record number of regulations "because regulation is stealth taxation, especially on the poor."[17] Although no administration has incorporated hard or soft distributional weights into agency CBAs on a wide scale,[18] and although Republican and Democratic Presidents don't see eye to eye on what exactly distributional analysis would entail, they appear to agree—in theory—that regulatory choices should account for distributive concerns.[19]

Apart from these high-profile statements, the idea of incorporating income-distributive concerns into CBA will likely have intuitive appeal to many readers. Income inequality is a serious problem—"the defining challenge of our time," in President Obama's words.[20] Federal

[14] See Memorandum for the Heads of Executive Departments and Agencies: Modernizing Regulatory Review, The White House (Jan. 20, 2021), https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/modernizing-regulatory-review. The full instruction tells OMB that the procedures should "propose procedures that take into account the distributional consequences of regulations, including as part of any quantitative or qualitative analysis of the costs and benefits of regulations, to ensure that regulatory initiatives appropriately benefit and do not inappropriately burden disadvantaged, vulnerable, or marginalized communities." Id. It remains to be seen whether OMB's proposed procedures will focus on broad income-distributive effects or specifically on effects on particular racial and ethnic communities. This article focuses primarily on the income-distributive dimension.

[15] See Exec. Order 12866, § 1(a), (b)(5), 58 Fed. Reg. at 51,735-36.

[16] See, e.g., White House Council of Economic Advisers, The Growth Potential of Deregulation 7 (Oct. 2, 2017), https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/The%20Growth%20Potential%20of%20Deregulation_0.pdf ("[T]he burden of government regulation falls most heavily on low-income Americans, who spend a larger proportion of their income on regulated goods, including transportation, gasoline, utilities, food, and heath care."). For a further argument to this effect by the former White House Council of Economic Advisers chief economist, see Casey B. Mulligan, Trumping Poverty: The President's Rollback of Onerous Regulations Has Helped Low-Income Americans, City J. (Apr. 23, 2020), https://www.city-journal.org/costs-of-revival-of-regulatory-state.

[17] See, e.g., Remarks by President Trump at the 2020 Conservative Political Action Conference, National Harbor, MD (Feb. 29, 2020), https://www.whitehouse.gov/briefings-statements/remarks-president-trump-2020-conservative-political-action-conference-national-harbor-md (describing regulation as "stealth taxation, especially on the poor").

[18] See Lisa A. Robinson, James K. Hammitt & Richard J. Zeckhauser, Attention to Distribution in U.S. Regulatory Analyses, 10 Rev. Envtl. Econ. & Pol'y 308 (2016).

[19] Across the Atlantic, Her Majesty's Treasury has already adopted hard weighted CBA as a permissible approach to policy evaluation. HM Treasury, The Green Book: Central Government Guidance on Appraisal and Evaluation 80 (2018). The World Bank explicitly adopted hard weighted CBA for project appraisal in 1980, though implementation was somewhat scattershot. I. M. D. Little & J. A. Mirrlees, Project Appraisal and Planning Twenty Years On, 4 World Bank Rev. 351, 359 (1991).

[20] White House Office of the Press Sec'y, Remarks by the President on Economic Mobility (Dec. 4, 2013), https://obamawhitehouse.archives.gov/the-press-office/2013/12/04/remarks-president-economic-mobility.

regulations often impose costs and generate benefits in the billions of dollars.[21] When deciding whether and how to regulate, why shouldn't agencies consider whether these billions of dollars of benefits and burdens will be incurred by the rich or by the poor?

The case for distributionally weighted CBA encounters significant complications, however, in the context of environmental, health, and safety regulations—by far the most expensive categories of regulations that the modern administrative state imposes. The challenge is this: CBA requires us to decide how many dollars we are willing to spend in order to save a life. CBA as practiced by federal agencies accords equal value to everyone's dollars and equal dollar value to all lives.[22] Thus, CBA as practiced by federal agencies recommends the same dollars-for-lives tradeoffs no matter whose dollars and whose lives are at stake. Distributionally weighted CBA typically does something different. It recognizes that low-income individuals and high-income individuals make different dollars-for-lives tradeoffs—not because low-income people value their lives less, but because they value their dollars more. The way that weighted CBA typically reflects this recognition is by assigning a lower dollar value to low-income individuals' lives but then assigning a higher welfare weight to low-income individuals' dollars.[23] This combination of moves does not necessarily mean that low-income individuals' lives carry less social value, but it does mean that distributionally weighted CBA will often recommend different dollars-for-lives tradeoffs for low-income people and for high-income people.

To illustrate: Imagine that the National Highway Traffic Safety Administration (NHTSA), a federal agency within the Department of Transportation (DOT), is deciding whether to adopt a new federal motor vehicle safety standard that will impose a cost of $9 per vehicle and save one life per million vehicles sold. Assume, as appears to be the case,[24] that motor vehicle manufacturers pass costs along to consumers roughly dollar for dollar. Also assume that NHTSA uses a $10 million value of a statistical life, or VSL. (It actually uses a slightly higher figure,[25] but $10 million has the virtue of making the math a lot easier.) Under the status-quo approach of unweighted CBA, NHTSA would compare the $9 per vehicle cost against the $10 benefit (i.e., 1 life/1 million cars x $10 million/life). Since dollarized benefits exceed dollarized costs, unweighted CBA would favor the regulation.

Weighted CBA in its typical form would not do that. If $10 million is the population-average VSL, weighted CBA in its typical form will assign a VSL of less than $10 million to lower-income individuals. For many lower-income individuals, the VSL will be less than the $9 million necessary to render the safety standard breakeven. There are two potential practical implications. First, weighted CBA might recommend weaker safety standards for vehicles purchased by lower-income individuals than for vehicles purchased by higher-income individuals. Alternatively, either because of statutory constraints or out of concern for expressive harms,

[21] See infra Table 1.

[22] More precisely, CBA as practiced by federal agencies accords equal value to all *American* lives. See Eric A. Posner & Cass R. Sunstein, Dollars and Death, 72 U. Chi. L. Rev. 537, 580 (2005). This paper will focus on within-country income-distributive consequences, though it is worth emphasizing that air quality and fuel economy regulations would likely look much more progressive if we properly accounted for the interests of very low-income individuals abroad.

[23] See, e.g., Robin Boadway, Principles of Cost-Benefit Analysis, 2 Pub. Pol'y Rev. 1, 3-4, 26 (2006).

[24] See infra note 125 and accompanying text.

[25] See infra note 113 and accompanying text.

practitioners of weighted CBA might seek to reflect the (supposed[26]) interests of lower-income individuals by adopting lower safety standards for everyone. Whatever one thinks of either outcome as a normative matter, this is probably not what most people have in mind when they first hear the argument that CBA should account for distributive concerns.

The challenge of valuing lives in weighted CBA is not a small wrinkle in an odd corner of the administrative state that addresses life-and-death issues. Lifesaving regulations are not an administrative-state sideshow—they are the main act. Really expensive regulations generally do one of three things. They (a) reduce the risk of death or serious illness from air pollution, (b) reduce the risk of death or serious injury from motor vehicle traffic crashes, and/or (c) reduce greenhouse gas emissions.[27] Note that a primary—probably *the* primary—reason why we worry about greenhouse gas emissions is that global warming will lead to death and serious illness on a vast scale, so (c) is largely subsumed by (a).[28] Moreover, in most of these cases, costs and benefits fall on broad swaths of the population—rich and poor—so the challenges emphasized in the previous paragraphs are front and center.

This article seeks to clarify the stakes of the issue and illuminate its implications through a case study of a real-world lifesaving regulation. It focuses on NHTSA's 2014 "rear visibility rule," which requires new vehicles starting in 2018 to include rearview cameras expected to reduce the number of deaths and serious injuries resulting from backovers.[29] One upside of focusing on the rear visibility rule is that all of the basic inputs into a distributive analysis can be gleaned from NHTSA's own evaluation of the rule as well as DOT data and directives.[30] Most importantly, DOT has adopted department-wide guidance regarding the *income elasticity of the value of a statistical life* (IEVSL), or the percent change in the VSL for a percent change in income.[31] Agencies within DOT rely on this guidance to make year-to-year updates to the VSL in light of overall income growth, which they then apply across the board—they do *not* draw individual-level

[26] As Jeremy Horpedahl notes, there is relatively little evidence that lower-income Americans actually want lower product safety standards. See Jeremy Horpedahl, Do the Poor Want To Be Regulated? Public Opinion Surveys on Regulation in the United States, 1981-2002, 180 Pub. Choice 27 (2019). Analyzing responses to surveys administered from 1981 and 2002 regarding regulatory policy, Horpedahl finds that, contrary to what one might expect on the basis of economic theory, lower-income individuals often express greater support for health and safety regulations than higher-income individuals do. See id. at 30 tbl.1. The environment is a notable exception, where support for stronger regulation is slightly higher among higher-income individuals—though remarkably robust across the board. See id.

[27] See infra Table 1.

[28] See, e.g., Tamma A. Carleton et al., Valuing the Global Mortality Consequences of Climate Change: Accounting for Adaptation Costs and Benefits 36 (Nat'l Bureau of Econ. Research, Working Paper No. 27599, July 2020), http://www.nber.org/papers/w27599 (indicating that mortality risk accounts for half or more of climate-change costs).

[29] Federal Motor Vehicle Safety Standards; Rear Visibility, 79 Fed. Reg. 19,178 (Apr. 7, 2014).

[30] See infra Section III.C.

[31] For the most recent version, see Memorandum from Molly J. Moran, Acting General Counsel, & Carlos Monje, Assistant Secretary for Transportation Policy, Office of the Secretary of Transportation, Department of Transportation, Guidance on Treatment of the Economic Value of a Statistical Life (VSL) in U.S. Department of Transportation Analyses—2016 Adjustment (Aug. 8, 2016), https://www.transportation.gov/sites/dot.gov/files/docs/2016%20Revised%20Value%20of%20a%20Statistical%20Life%20Guidance.pdf.

income distinctions in their unweighted CBAs. Nonetheless, DOT's income-elasticity guidance allows us to see how NHTSA's distributive analysis would turn out if the agency used the same income-elasticity parameter for weighted CBA that it already uses for other purposes.

The case study of the rear visibility rule highlights a number of general points. The first is that the income elasticity of the VSL matters enormously to whether a rule survives distributionally weighted CBA. Based on DOT's income-elasticity figure, the rear visibility rule appears to be "regressive"[32]: it imposes net costs on lower-income individuals and yields net benefits for higher-income individuals. Using equal dollar VSLs for everyone, the conclusions flip: the rear visibility rule appears to be quite progressive. Equal dollar VSLs in the weighted CBA context likely can't be justified on economic or ethical grounds, but the 180-degree reversal of results serves to underscore the practical importance of assumptions about the income-VSL relationship. Another takeaway is that distributionally weighted CBA with different dollar VSLs for high-income and low-income individuals will make it much harder for policymakers to justify lifesaving motor vehicle safety standards—and will potentially have a similar effect in other areas of regulation where lives are on the line. The case study helps us to see what exactly turns on the debate over distributionally weighted CBA and why the resolution of this debate will have profound implications for the administrative state.

After laying out the various approaches and showing how they play out in the rear visibility case, this article offers a tentative defense of status quo CBA—both its commitment to equal dollar VSLs for all individuals regardless of income and its default approach of distribution neutrality. That defense cannot rest entirely on efficiency grounds: status quo CBA's commitment to equal dollar VSLs is inconsistent with conventional notions of efficiency. Nor can the defense of status quo CBA rest on purely moral or ethical grounds. I will assume (at least for purposes of this article) that it is a bedrock moral principle that the government should assign equal value to all lives regardless of income.[33] But that bedrock moral principle does not tell us whether "value" should be defined in dollars or in units of welfare. As this article illustrates, approaches to CBA that assign equal welfare-unit values to all lives nonetheless will produce different dollar VSLs, and approaches that assign equal dollar VSLs to all lives may correspond to unequal welfare-unit values. So although the principle that all lives have equal value is powerful, that principle alone won't resolve our challenge.

Instead, this article offers a pragmatic defense of status quo CBA. I argue that the status quo approach—which assigns the same value to the lives and dollars of high-income and low-income individuals alike—makes practical sense for US federal agencies even if its theoretical foundations are somewhat shaky. The pragmatic defense emphasizes three points:

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[32] There is much discussion in tax scholarship about what precisely it means for a policy to be "regressive" or "progressive." See, e.g., David Kamin, Note, What Is a Progressive Tax Change: Unmasking Hidden Values in Distributional Debates, 83 N.Y.U. L. Rev. 241 (2008); Daniel Hemel & Kyle Rozema, Inequality and the Mortgage Interest Deduction, 70 Tax L. Rev. 667 (2017). For present purposes, we can define "regressive" as imposing net costs on low-income individuals and yielding net benefits for high-income individuals, and we can define "progressive" as the opposite. This leaves out, of course, policies that result in net benefits or net costs across the board. As discussed in Section III.E, it is not always so clear what scholars of regulation mean when they say a particular rule or family of rules is "regressive."

[33] For an argument against the equal-value-for-all-lives principle, see Cass R. Sunstein, Valuing Life: A Plea for Disaggregation, 54 Duke L.J. 385, 389-90 (2004).

First, approaches to CBA that assign different dollar VSLs to rich and poor individuals raise real concerns about expressive harms. If we were to try to assign dollar VSLs that accurately reflect willingness to pay for mortality risk reduction, we would likely end up with VSLs for individuals in the top 1 percent of the income distribution that are somewhere between 9 and 18 times the VSLs of other Americans.[34] This doesn't mean that top 1 percenters are 9 to 18 times as valuable as average Americans in a moral sense, but it's not hard to imagine that VSL differentials of that magnitude might be interpreted as implying that the federal government cares many times more about high-income Americans than about others. Bad optics are not necessarily a reason for the government to reject a policy, but the concern here is not only about optics. It is also a concern about the harmful—though not easily quantifiable—effects of agency procedures and policies that predictably send a message to some Americans that their lives are worth less.

Second, alternatives to the status quo—whether they use different dollar VSLs for high-income and low-income individuals, different distributional weights for high-income and low-income individuals' dollars, or both—entail significant informational burdens. In some cases, these burdens will simply raise data-gathering costs for agencies—making life more difficult for agency employees but not inflicting any grievous injury. In other cases, though, the cost and complexity of these approaches may come into conflict with other values that CBA vindicates. In particular, the large number of degrees of freedom available to practitioners of distributionally weighted CBA will increase the risk that cognitive biases, illegitimate preferences, and interest group pressures may shape agency decisionmaking.

Third, the case for distributionally weighted CBA encounters an awkward tension between the problem it diagnoses and the solution it prescribes. The case for distributionally weighted CBA depends upon the (likely correct) assumption that the tax system doesn't do enough to redistribute from rich to poor. But for distributionally weighted CBA to become executive branch policy, it would need the support of the President. And if the President agrees with advocates for distributionally weighted CBA that the tax system doesn't do enough to redistribute from rich to poor, the President could very likely use the tax system to redistribute more. This doesn't necessarily depend upon congressional buy-in (though, as the article explains, institutional features of the tax legislative process make it much easier for the President to push her tax agenda through Congress than to enact non-tax legislation). Even without Congress, the President can shift significant amounts of money across income groups through tax regulation and tax enforcement. If we could persuade the President to accept the key predicate for distributionally weighted CBA—that the federal government should redistribute more from rich to poor—then presumably we also would want to tell her that she has much better tools at her disposal to accomplish this goal than distributionally weighted CBA. This doesn't defeat the case for distributionally weighted CBA as an nth-best redistributive mechanism, but it deprives the argument of much of its force.

This article's tentative defense of equal dollar VSLs and distribution neutrality are related though distinct. One could agree that distributionally weighted CBA ought not be used for lifesaving regulations—where it likely will require different dollar VSLs for rich and poor—but continue to believe that weighted CBA remains appropriate for the relatively small set of high-

[34] See infra notes 40-45 and accompanying text.

cost regulations that don't affect mortality and morbidity. Alternatively, one might think it is totally fine for regulators to prescribe different dollar VSLs for high-income and low-income individuals yet still conclude that executive branch agencies should practice unweighted CBA. Still, how we resolve the weighted-versus-unweighted CBA question will have important implications for how we assign VSLs (and vice versa). And working through the mechanics of unweighted and weighted CBA in a representative real-world context—with both dollars and lives hanging in the balance—will give greater clarity to the practical consequences of the different approaches and cast the status quo in new and more favorable light.

The rest of the article proceeds in five parts. Part I briefly summarizes the stakes. The argument for distributionally weighted CBA responds to the stark reality of wide wealth and income inequality. The problems that executive branch agencies address through their most expensive regulations—road deaths, air pollution, and global warming—are also clearly quite serious challenges, and the noble aspiration of CBA is to guide agencies toward the most effective methods of tackling those challenges. None of this tells us whether agencies should or shouldn't pursue distributionally weighted CBA or whether they should use the same or different VSLs for individuals at different income levels. It does serve to remind us—if such a reminder were needed—that much rides on these questions.

Part II introduces the candidates. CBA can accord the same weight to everyone's dollars or it can give greater weight to lower-income individuals' dollars. It can assign the same VSL to everyone or different VSLs to people of different incomes. A simple two-by-two matrix setting out the basic options serves to clarify the choices policymakers face. One of these approaches, distributionally weighted CBA with equal dollar VSLs, lacks any normative foundation and produces perverse results in real-world applications. The difficult decision is whether to use unweighted CBA with different VSLs for rich and poor (textbook CBA), unweighted CBA with the same VSL for everyone (status quo CBA), or distributionally weighted CBA with higher dollar VSLs for higher-income individuals (standard weighted CBA).

Part III presents the article's case study of the 2014 rear visibility rule. After laying out the agency's approach, Part III considers how the rule would have fared under other forms of CBA. It then goes on to explain why distributionally weighted CBA with different VSLs for rich and poor might be expected to pose problems for other motor vehicle safety standards and for health and safety regulations more generally.

Part IV shifts from quantitative to normative analysis. It takes up two questions: (1) should CBA continue to assign the same dollar value to everyone's life?; and (2) should CBA continue to assign the same weight to everyone's dollars? It emphasizes expressive concerns regarding income-differentiated VSLs as well as information-cost concerns that apply to all the alternatives to the status quo. Part IV also highlights institutional details of the tax legislative, regulatory, and enforcement processes that make it possible for Presidents to accomplish substantial amounts of redistribution without relying on redistributive non-tax rules. Part IV does not go far as to argue that agencies are morally or ethically required to stick with the status quo—the decision depends instead upon context-contingent grounds. But in the particular context of agency rulemaking in the US federal executive branch, the case for the status quo approach (unweighted CBA with equal dollar VSLs) makes a lot of practical sense.

Part V zooms out from the regulatory context, situating the choice between distributionally unweighted and weighted CBA and the question of income-variant VSLs within

the broader debate over the role of non-tax legal rules in redistributing income. In an influential 1994 article, Louis Kaplow and Steven Shavell argued that redistribution through non-tax legal rules is typically less efficient than redistribution through income taxes, and as a result, redistributive efforts should be channeled through the tax system.[35] That article unleashed a flood of responses proposing a range of behavioral, institutional, and political reasons why—notwithstanding Kaplow and Shavell's formal proof—policymakers nonetheless might favor redistribution through non-tax legal rules.[36] The analysis in this article does not resolve that debate—indeed, if there is any crisp takeaway, it is that the choice between non-tax legal rules and the income tax system as channels for redistribution depends upon situational details that defy one-size-fits-all summary. But the expressive, informational, and institutional considerations that arise in the rear visibility case are not sui generis, and the analysis here points to some of the challenges that arguments for redistributive legal rules will need to confront.

Before launching into that analysis, one prefatory point merits mention. To limit this article's already expansive scope, I will bracket the question of whether agencies should use different VSLs for individuals of different ages. Cass Sunstein, among others, has argued that agencies should make life-and-death decisions based on the value of a statistical life year (VSLY) rather than VSL.[37] (Several agencies within the Department of Health and Human Services already have made this shift at least in part.[38]) I think the case for VSLYs is overwhelmingly persuasive,

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[35] Louis Kaplow & Steven Shavell, Why the Legal System Is Less Efficient than the Income Tax in Redistributing Income, 23 J. Legal Studies 667 (1994).

[36] See, e.g., Christine Jolls, Behavioral Economics Analysis of Redistributive Legal Rules, 51 Vand. L. Rev. 1653, 1656 (1998) (arguing that redistributive legal rules may distort work incentives less than redistributive taxes due to the way that individuals respond to uncertainty and due to the phenomenon of mental accounting); Chris Sanchirico, Taxes versus Legal Rules as Instruments for Equity: A More Equitable View, 29 J. Legal Studies 797, 802-07 (2000) (arguing that non-tax legal rules should redistribute on dimensions other than income that are observable to legal system but not to tax system); Ronen Avraham, David Fortus & Kyle Logue, Revisiting the Role of Legal Rules and Tax Rules in Income Redistribution: A Response to Kaplow & Shavell, 89 Iowa L. Rev. 1125, 1130 (2004) (arguing that the tax-and-transfer adjustments envisioned in Kaplow and Shavell's formal proof would be "virtually impossible to implement"); Fennell & McAdams, supra note 8, at 1054-55 (arguing that redistribution through non-tax legal rules may entail lower "political action costs" than redistribution through income taxes); Zachary Liscow, Is Efficiency Biased?, 85 U. Chi. L. Rev. 1649, 1654, 1657 (2018) (arguing that economic analysis should take account of the distributive consequences of non-tax legal rules when those consequences are likely to be "sticky"); see also Louis Kaplow & Steven Shavell, Should Legal Rules Favor the Poor? Clarifying the Role of Legal Rules and the Income Tax in Redistributing Income, 29 J. Legal Studies 821, 827-32 (2000) (responding to Sanchirico's critique); David A. Weisbach, Should Legal Rules Be Used to Redistribute Income?, 70 U. Chi. L. Rev. 439 (2003) (arguing against use of redistributive non-tax legal rules).

[37] Cass R. Sunstein, Lives, Life-Years and Willingness to Pay, 104 Colum. L. Rev. 205 (2004).

[38] See Prevention of Salmonella Enteritidis in Shell Eggs During Production, Storage, and Transportation: Final Rule, 74 Fed. Reg. 33,030, 33,055 (July 9, 2009); Labeling and Effectiveness Testing; Sunscreen Drug Products for Over-the-Counter Human Use: Final Rule, 76 Fed. Reg. 35,620, 35,655 (June 17, 2011); Required Warnings for Cigarette Packages and Advertisements: Final Rule, 76 Fed. Reg. 36,628, 36.708 (June 22, 2011); Use of Materials Derived From Cattle in Human Food and Cosmetics: Final Rule, 81 Fed. Reg. 14,718, 14,729-14,730 (Mar. 18, 2016); Medicare and Medicaid Programs; Regulatory Provisions To Promote Program Efficiency, Transparency, and Burden Reduction; Fire Safety Requirements for Certain Dialysis Facilities; Hospital and Critical Access Hospital (CAH) Changes To Promote Innovation, Flexibility, and Improvement in Patient Care:

and this article's use of VSL terminology is purely for expositional ease. Importantly, the article's central arguments about redistribution and VSL all apply with equal force to VSLY. Whether agencies use VSL or VSLY, any attempt to use distributional weights will come into tension with equal dollar values for safety gains to rich and poor. And whether agencies use VSL or VSLY, a similar set of expressive, informational, and institutional arguments will favor an unweighted approach that doesn't adjust VSL or VSLY on the basis of income.

I. The Stakes of the Debate

This part summarizes the stakes of the debate. Section I.A offers a bird's-eye view of income inequality in the United States. Section I.B surveys the most expensive regulations promulgated by federal executive branch agencies in recent years and underscores the severity of the problems that they address. The purpose of this part is to clarify the challenge that subsequent segments will wrestle to resolve. We want to transfer resources from rich to poor. We also want to save lives and prevent serious illness/injury from air pollution and motor vehicle crashes. The question facing practitioners of CBA is how to balance these objectives when they come into conflict.

A. Income Inequality

Proposals for distributionally weighted CBA long preceded the late-20th century uptick in U.S. pre-tax income inequality.[39] The case for weighted CBA, however, gains greater strength given the widening gap between rich and poor. The extent of income inequality also raises the justificatory burden for defenders of unweighted (i.e., distribution-neutral) CBA.

Just how much the gap between rich and poor has widened in recent years is a subject of considerable controversy among economists. Thomas Piketty, Emmanuel Saez, and Gabriel Zucman (PSZ) estimate that the share of national income after taxes and transfers accruing to the top 1 percent rose from 9.1 percent in 1979 to 15.7 percent in 2014.[40] The Congressional Budget Office (CBO) estimates that the top 1 percent's share of income after taxes and transfers rose from 7.4 percent to 13.5 percent over the same time period.[41] Gerald Auten of the Treasury Department's Office of Tax Analysis and David Splinter of the Joint Committee on Taxation (AS) estimate that the top 1 percent's share of income after taxes and transfers rose much more

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Final Rule, 84 Fed. Reg. 51,732, 51,799-51,800 (Sept. 30, 2019) (citing Sunstein, Lives, Life-Years, and Willingness to Pay, supra note 37); Medicare and Medicaid Programs; Organ Procurement Organizations Conditions for Coverage: Revisions to the Outcome Measure Requirements for Organ Procurement Organization: Proposed Rule, 84 Fed. Reg. 70,628, 70,658 (Dec. 23, 2019); Medicare and Medicaid Programs, Clinical Laboratory Improvement Amendments (CLIA), and Patient Protection and Affordable Care Act; Additional Policy and Regulatory Revisions in Response to the COVID-19 Public Health Emergency: Interim Final Rule, 85 Fed. Reg. 54,820, 54,864 (Sept. 2, 2020).

[39] See, e.g., Arrow, supra note 10; Weisbrod, supra note 6.

[40] Thomas Piketty, Emmanuel Saez & Gabriel Zucman, Simplified Distributional National Accounts, 109 AEA Papers & Proc. 289 (2019) (see supplemental data; equal-split post-tax income shares).

[41] Congressional Budget Office, The Distribution of Household Income, 2017 (Oct. 2020) (see data underlying exhibit 20).

modestly from 7.2 percent in 1979 to 8.6 percent in 2014.[42] Other estimates—including from economists at the Federal Reserve[43] and the Commerce Department's Bureau of Economic Analysis[44]—generally fall somewhere in between AS on the low end and PSZ on the high side.

The divergence among estimates is due to a number of methodological differences discussed in the margin.[45] This methodological dispute is hugely important to the understanding of economic inequality in the United States. To identify the drivers of income inequality, we need to know how income inequality has evolved over time. The methodological dispute is, however, largely orthogonal to the policy debate over cost-benefit analysis and income redistribution. By any measure, the richest Americans have vastly more money than their compatriots. Auten and Splinter's estimates would suggest that households in the top 1 percent have, on average, more than 9 times the after-tax-and-transfer income of households in the other 99 percent—CBO's estimates place that at more than 15 times and PSZ's estimates at more than 18 times. Whether it is a ninefold difference or a fifteen-fold difference or an eighteen-fold difference, the gap is clearly very large.

The tax-and-transfer system is the primary mechanism through which the United States strives to close this gap. PSZ, the CBO, and AS all agree that taxes and transfers substantially reduce the income of the top percentile and raise the incomes of those lower down. For example, the CBO estimates that taxes and transfers in 2014 reduced average incomes of households in the top percentile by about a third and raised average incomes of households in the bottom quintile by more than 60 percent.[46] Notwithstanding high-profile examples of individuals with nine-digit incomes paying three-digit sums in federal income taxes,[47] the U.S. tax-and-transfer system does accomplish quite a bit of redistribution.

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[42] Gerald Auten & David Splinter, Top 1 Percent Income Shares: Comparing Estimates Using Tax Data, 109 AEA Papers & Proc. 307, 308 & tbls.1-2 (2019).

[43] See Jesse Bricker, Alice Henriques, Jacob Krimmel & John Sabelhaus, Measuring Income and Wealth at the Top Using Administrative and Survey Data, Brookings Papers on Econ. Activity, Spring 2016, at 261 (top 1 percent's share of pre-tax income rose from around 15 percent in 1988 to approximately 18 percent in 2012).

[44] See Dennis Fixler, Marina Gindelsky & David Johnson, Improving the Measure of the Distribution of Personal Income, 109 AEA Papers & Proc. 302 (2019) (top 1 percent's share of household income rose from 12.5 percent in 2007 to 13.3 percent in 2012).

[45] For example, unlike in PSZ, the income measure employed by the CBO and AS includes Social Security and Medicare benefits. AS additionally include employer-provided health insurance. PSZ, the CBO, and AS also take different approaches toward the allocation of business income—an issue that is particularly significant because much of the business income that would have appeared on corporate income tax returns in earlier decades now appears as passthrough income on individual returns. And they take different approaches to the allocation of underreported income. Unlike the other studies, AS allocate underreported income based on detailed IRS audit data, which has the effect of reducing the top 1 percent's share. See Gerald Auten & David Splinter, Top 1 Percent Income Shares: Comparing Estimates Using Tax Data, 109 AEA Papers & Proc. 307, 307-09 (2019).

[46] See Congressional Budget Office, The Distribution of Household Income, 2014 (Mar. 2018) (data underlying figs. 1 and 8).

[47] See Russ Buettner, Mike McIntire, Susanne Craig & Keith Collins, Trump Paid $750 in Federal Income Taxes in 2017. Here's the Math, N.Y. Times (Sept. 29, 2020), https://www.nytimes.com/2020/09/29/us/trump-750-taxes.html.

The general view in welfare economics holds that the tax system is the optimal mechanism for redistributing from rich to poor.[48] Many (probably most) economists who study the subject would say, though, that the current US income tax system does not redistribute as much as it ought to. For example, Peter Diamond and Emmanuel Saez observe that with a mid-range estimate of the elasticity of taxable income and relatively standard assumptions about individual utility functions, the optimal marginal income tax rate on the top percentile of the income distribution in the United States would be 73 percent.[49] (The current all-in top labor income tax rate is 53.3 percent in California and 52.7 percent in New York City, though substantially lower in most other states.[50])

Supporters of weighted CBA typically concede the point that the tax system is the optimal redistributive mechanism but argue that, in the absence of an optimal tax system, non-tax regulations should serve as a redistributive supplement. This is the sort of second-best argument that many of us accept in other contexts. For example, supporters of the Deferred Action for Childhood Arrivals (DACA) program concede that comprehensive legislation is the optimal mechanism for immigration reform but argue that, in the absence of legislative action, measures like DACA are appropriate. The case for weighted CBA proceeds on similar lines, and it raises the justificatory burden for defenders of the unweighted (i.e., distribution-neutral) status quo. Defenders of unweighted CBA need to show not only that redistribution via taxation is optimal, but also that—given the options actually available to the executive branch—agencies should refrain from pursuing redistribution through non-tax rules. I think defenders of distribution-neutral CBA can carry that burden, but it is a heavier lift than merely showing that the tax-and-transfer system is the optimal redistributive tool.

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[48] See, e.g., Aanund Hylland & Richard Zeckhauser, Distributional Objectives Should Affect Taxes but Not Program Choice or Design, 81 Scan. J. Econ. 264 (1979); Steven Shavell, A Note on Efficiency vs. Distributional Equity in Legal Rulemaking: Should Distributional Equity Matter Given Optimal Income Taxation?, 71 Am. Econ. Rev.: Papers & Proc. 414 (1981).

[49] See Peter Diamond & Emmanuel Saez, The Case for a Progressive Tax: From Basic Research to Policy Recommendations, 25 J. Econ. Perspectives 165, 171 (2011). Diamond and Saez also note that elasticity estimates in a different paper by one of the authors would suggest an optimal top tax rate of 54 percent given the current base, which is only slightly above the current California and New York City maximum. See id. at 173 (citing Jonathan Gruber & Emmanuel Saez, The Elasticity of Taxable Income: Evidence and Implications, 84 J. Pub. Econ. 1 (2002)).

[50] The top federal statutory income tax rate is 37 percent from 2018 through 2025 (returning to 39.6 percent starting in 2026). I.R.C. § 1(j)(2). That rate does not include an additional 3.8 percent in Medicare and Affordable Care Act-related taxes on top incomes. See I.R.C. § 1401(b) (self-employment tax); § 1411(a) (net investment income tax); § 3101(b) (hospital insurance tax on employees); § 3111(b) (hospital insurance tax on employers). The top tax rate in California is 13.3 percent; the top rate in New York State is 8.82 percent; New York City adds 3.876 percent. See Tax Foundation, Taxes in California, https://taxfoundation.org/state/california (last visited Oct. 17, 2020); New York State Department of Taxation and Finance, 2019 Tax Tables (Jan. 28, 2020), https://www.tax.ny.gov/pit/file/tax_tables.htm. This would add up to 54.1 percent in California and 53.5 percent in New York, which are the correct figures for the net investment income tax but not for taxes on labor income. The slightly lower numbers in body text reflect the fact that the employer hospital insurance tax and a portion of the self-employment tax are calculated on a tax-exclusive base.

B. Lifesaving Regulations

Debates over distributionally weighted CBA are sometimes pitched in highly abstract or stylized terms.[51] For example, one illustration of weighted CBA imagines a hypothetical policy that "produces a single outcome: fewer pet illnesses."[52] Potentially lost in translation is what weighted CBA would mean for the most important real-world regulations.[53] This section seeks to concretize the debate by way of a brief overview of the most expensive federal regulations—the ones for which distributive consequences are most likely to matter in the grand scheme of things.

Table 1 lists the 23 major rules promulgated by federal agencies subject to Executive Order 12866 from October 2001 until September 2018 for which cost ranges crossed the $1 billion threshold (in 2001 dollars).[54] A momentary glance at this list reveals that two agencies—the Environmental Protection Agency (EPA) and the Department of Transportation (DOT)—are responsible for the lion's share of high-dollar-cost regulations (19 of the 23). When we talk about redistribution through regulation—and when we focus on the highest-stakes regulations for which the distributive consequences are likely to be most profound—we are largely talking about air pollution, greenhouse gas emissions, and vehicle safety standards. As the bandit Willie Sutton said when asked why he robbed banks, that's where the money is.

[51] An important exception is Matthew D. Adler, What Should We Spend To Save Lives in a Pandemic? A Critique of the Value of a Statistical Life, 33 Covid. Econ. 1 (2020). Adler's conclusion—that weighted CBA with a utilitarian or prioritarian social welfare function will lead to substantially less investment in safety than the status quo—is consistent with the analysis in Part III. See id. tbl.10.

[52] See Williams & Broughel, supra note 12, at 3.

[53] I will note that I actually think a regulation that reduces pet illnesses is an *important* regulation because the social welfare function ought to include animal welfare too. The regulation in Williams & Broughel, supra note 52, is not an "important real-world regulation" because it is not a real-world regulation. (If it were, it might well be an important one.)

[54] See Office of Management & Budget: Reports: OIRA Reports to Congress, https://www.whitehouse.gov/omb/information-regulatory-affairs/reports (last visited Oct. 8, 2020).

Table 1. Annual Benefits and Costs of Major Federal Rules with Costs >$1 Billion, 2001-2018

Agency	Year	Rule	Benefits (2001$)	Costs (2001$)
EPA/DOT	2012	2017 and Later Model Year Light Duty Vehicle GHG and CAFE Standards	$21.22b-$28.82b	$5.31b-$8.83b
EPA	2012	Mercury and Air Toxics Standards	$28.14b-$76.75b	$8.19b
EPA	2007	Clean Air Fine Particle Implementation Rule	$18.83b-$167.41b	$7.32b
EPA/DOT	2010	Light-Duty Greenhouse Gas (GHG) and Corporate Average Fuel Economy (CAFE) Standards	$3.9b-$18.2b	$1.7b-$4.7b
Labor	2011	Statutory Exemption for Provision of Investment Advice	$5.79b-$15.13b	$1.57b-$4.22b
EPA	2015	Stationary-Source CO_2 Emission Guidelines	$12.74b-$22.09b	$2.48b-$2.64b
DOT	2005	Tire Pressure Monitoring Systems	$1.01b-$1.32b	$938m-$2.28b
EPA	2008	National Ambient Air Quality Standards for Lead	$455m-$5.20b	$113m-$2.24b
EPA	2010	National Ambient Air Quality Standards for Sulfur Dioxide	$2.81b-$38.63b	$334m-$2.02b
DOT	2001	Advanced Air Bags	$140m-$1.60b	$400m-$2.00b
DOT	2009	CAFE Model Year 2011	$857m-$1.91b	$650m-$1.91b
EPA	2005	Clean Air Interstate Rule	$11.95b-$151.77b	$1.72b-$1.89b
HHS	2009	Updates to Electronic Transactions	$1.11b-$3.19b	$661m-$1.45b
DOT	2011	Ejection Mitigation	$1.50b-$2.38b	$419m-$1.37b
EPA	2013	Hazardous Air Pollutants—Boilers	$21.10b-$56.56b	$1.18b-$1.35b
EPA	2004	Control of Emissions from Nonroad Diesel Engines and Fuel	$6.85b-$59.40b	$1.34b
DOT	2003	Hours of Service of Drivers	$690m	$1.32b
Energy	2011	Energy Efficiency Standards for Refrigerators/Freezers	$1.66b-$3.03b	$803m-$1.28b
DOT	2010	Positive Train Control	$34m-$37m	$519m-$1.26b
DOT	2009	Roof Crush Resistance	$374m-$1.16b	$748m-$1.19b
Energy	2010	Energy Efficiency Standards for Pool Heaters	$1.27b-$1.82b	$975m-$1.12b
EPA	2014	Tier 3 Motor Vehicle Emission and Fuel Standards	$3.20b-$10.64b	$1.06b
DOT	2007	Side Impact Protection Upgrade	$736m-$1.06b	$401m-$1.05b

Mortality and morbidity reductions generally comprise the bulk of benefits for EPA and DOT rules other than fuel economy standards. For example, EPA estimated that the 2012 Mercury and Air Toxics Standards (MATS) rule would avert 4200 to 11,000 premature air pollution-related deaths per year; these mortality benefits accounted for more than 90 percent of the estimated monetized benefits of the rule.[55] DOT estimated that its ejection mitigation rule

[55] 77 Fed. Reg. 9303, 9306 tbl.2, 9429 tbl.9 (Feb. 16, 2012). According to EPA, these mortality benefits would be attributable almost exclusively to reduced emissions of fine particulate matter rather than from a reduction in mercury and air toxics levels specifically. The Supreme Court, in Michigan v. EPA, 135 S. Ct. 2699 (2015), found the rule to be arbitrary and capricious. As a practical matter, though, the rule largely had its

would prevent about 373 fatalities and 476 serious injuries per year; these safety gains were the only benefits considered in the agency's CBA.[56] Fuel economy standards serve a wider range of purposes—including fuel savings and energy security—though reduced carbon dioxide emissions constitute an important portion of benefits[57] and, as noted above, mortality and morbidity are significant elements of the social cost of carbon.[58]

The fact that so many high-dollar-cost rules focus on air pollution and vehicle safety should not, on reflection, be terribly surprising. Reducing deaths from air pollution and motor vehicle traffic crashes are urgent policy priorities. By one estimate, nearly 200,000 excess deaths in the United States each year are attributable to just one air pollutant, fine particulate matter ($PM_{2.5}$).[59] Motor vehicle traffic crashes killed more than 36,000 Americans in 2019,[60] and cars are by far the leading cause of death among children and adolescents.[61] We incur enormous costs to address these problems because they are enormous problems.

The point here is not that air pollution and motor vehicle crashes are larger problems than income inequality or vice versa. The size of a problem is not something we can measure in diameter. The point is that tradeoffs between efficiency and distribution have real-world implications that abstract terms can occlude. Perhaps our judgments on these subjects shouldn't ultimately turn on the particulars. But when deciding whether we should adopt an inefficient rule in order to advance redistributive goals, most of us would very much like to know what the inefficiency looks like in the real world. Does it mean that cars will have inefficiently small trunks or that an inefficiently large number of passengers will die in crashes? Decisions about agency CBA procedures shouldn't be made just in order to achieve outcomes that we subjectively prefer, but the debate will be much enriched by attention to its practical consequences.

II. The Candidates

This part introduces four candidate approaches to CBA, which vary in their answers to two questions. First, should everyone's dollars count the same (unweighted CBA) or should dollars in lower-income individuals' hands count more (weighted CBA)? Second, should the dollar value of a statistical life depend on a person's income or should the dollar VSL for everyone be the same? The four approaches lend themselves to a simple two-by-two matrix (see Table 2).

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intended effect, since most affected power plants chose to comply with it while the litigation winded through court. See Coral Davenport, E.P.A. To Reconsider Obama-Era Curbs on Mercury Emissions by Power Plants, N.Y. Times (Aug. 29, 2018), https://www.nytimes.com/2018/08/29/climate/epa-mercury-emissions.html.

[56] 76 Fed. Reg. 3211, 3214 tbl.1, 3293 tbl.42 (Jan. 19, 2011).

[57] See, e.g., 77 Fed. Reg. 62,624, 62,944-45 tbl. III-105 (Oct. 15, 2012).

[58] See Carleton et al., supra note 28.

[59] Benjamin Bowe, Yan Xie & Yan Yan, Burden of Cause-Specific Mortality Associated With $PM_{2.5}$ Air Pollution in the United States, JAMA Network Open 2(11):e1915834 (2019).

[60] Press Release, National Highway Traffic Safety Administration, Early Estimates of 2019 Motor Vehicle Traffic Data Show Reduced Fatalities for Third Consecutive Year (May 5, 2020), https://www.nhtsa.gov/press-releases/early-estimates-traffic-fatalities-2019.

[61] See Rebecca M. Cunningham, Maureen A. Walton & Patrick M. Carter, The Major Causes of Death in Children and Adolescents in the United States, 379 New Eng. J. Med. 2468, 2469 tbl.1 (2018).

Table 2. Four Approaches to Cost-Benefit Analysis

	Income-Elastic Value of a Statistical Life	**Equal Dollar Value of a Statistical Life**
Unweighted (Distribution Neutral)	Unweighted CBA with income-elastic VSLs (textbook CBA)	Unweighted CBA with equal dollar VSLs (status quo CBA)
Distributional Weights	Weighted CBA with income-elastic VSLs (standard weighted CBA)	Weighted CBA with equal dollar VSLs

As will become clearer in the sections that follow, the two-by-two matrix doesn't exhaust the full range of policy choices. Within each of the bottom two boxes, there is the additional choice of whether to pursue "hard" weighted CBA (with formal distributional weights) or "soft" weighted CBA (which incorporates distribution as a qualitative variable). Moreover, while I will focus on one standard way to assign weights to different income groups, there are—in theory—an infinite number of possible sets of weights. Still, any approach to CBA for lifesaving regulations will need to answer the pair of questions that the matrix highlights. And the consequences of those two answers are likely to be far-reaching.

A. Textbook Cost-Benefit Analysis

The top left box, unweighted CBA with income-elastic VSLs, is sometimes called "textbook" CBA.[62] It is often equated with "wealth maximization,"[63] though textbook CBA and wealth maximization are *not* the same. This point is not purely a pedantic one: the difference between textbook CBA and wealth maximization is central to the debate over distributionally weighted CBA. This section seeks to clarify the distinction.

The key difference between textbook CBA and wealth maximization is that textbook CBA excludes changes in total wealth that arise purely from changes in redistribution. To illustrate the point using an example from economists Robin Boadway and Michael Keen,[64] consider a society

[62] See, e.g., Matthew D. Adler & Eric A. Posner, Rethinking Cost-Benefit Analysis, 109 Yale L.J. 165, 172, 174 (1999); David A. Hoffman & Michael P. O'Shea, Can Law and Economics Be Both Practical and Principled?, 53 Ala. L. Rev. 335, 357 (2002).

[63] See, e.g., Richard A. Posner, Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers, 29 J. Legal Stud. 1153, 1154 (2000) (equating "cost-benefit analysis" with the "Kaldor-Hicks" principle and describing the Kaldor-Hicks principle as "wealth maximization"); Lewis A. Kornhauser, Preference, Well-Being, and Morality in Social Decisions, 32 J. Legal Stud. 303, 304 (2003) (describing "cost-benefit analysis" as a "form of wealth maximization"); Lisa Heinzerling, The Accidental Environmentalist: Judge Posner on Catastrophic Thinking, 94 Geo. L.J. 833, 836 (2006) (reviewing Richard A. Posner, Catastrophe: Risk and Response) ("cost-benefit analysis incorporates both the economic method and the criterion of wealth maximization").

[64] Robin Boadway & Michael Keen, Public Goods, Self-Selection and Optimal Income Taxation, 34 Int'l Econ. Rev. 463 (1993). The Boadway-Keen article is just one of several to make a similar point. See Hylland & Zeckhauser, supra note 48; Vidar Christiansen, Evaluation of Public Projects Under Optimal Taxation, 48 Rev. Econ. Studies 447 (1981). On the lineage of this argument, see Louis Kaplow, The Theory of Taxation and Public Finance 193 (2008).

in which the government redistributes from rich to poor via income taxation. Individuals choose their jobs and hours (i.e., their labor output) so as to maximize the total value of the consumption they can afford and leisure they can enjoy. "Leisure" refers to any activity that isn't labor—including activities we might not think of as "leisure" like caring for a child or an elderly dependent.[65] Imagine that there are two levels of income-earning ability (high and low) and two levels of income (high and low). Low-ability individuals always end up in jobs that yield low income. High-ability individuals can choose between high-income jobs with less leisure or low-income jobs with more leisure. Note that "ability" here refers to income-earning ability, not innate ability. A highly capable individual may be "low ability" in Boadway and Keen's terminology—i.e., only able to take the low-paying job—for no reason other than labor market discrimination. (A world with two "ability" levels and two pay levels is obviously an oversimplification, but the same logic will hold with an infinite number of ability levels and pay levels. The oversimplification is for expositional ease, but the model's applicability is quite general.)

The income tax causes some high-ability individuals to choose low-income jobs, which means they have less money with which to purchase private goods but more time for leisure. When individuals reduce their labor supply in response to a distortionary income tax, total wealth declines. This phenomenon is the familiar "deadweight loss" of income taxation. Ideally we would tax people based on their income-earning ability rather than their actual income, but the government can't observe income-earning ability, so it is relegated to redistributing on the basis of actual income.

Now imagine that the government is deciding whether to impose a regulation that will generate more of a public good—say, clean air. The regulation will raise costs for power plants, which will push up the price of electricity, which in turn will leave individuals with less money for consumption of private goods. Textbook CBA recommends the regulation if the total benefits—calculated on the basis of individuals' willingness to pay for cleaner air—exceed the costs of compliance. Textbook CBA ignores distributive effects (i.e., whether benefits and costs accrue to high-income or low-income individuals).

Boadway and Keen (like several before them) observe that when a policy alters the value of the public good/private good bundle associated with a given amount of income, individuals may alter their labor-leisure choices.[66] For example, let's say that low-income individuals are disproportionately harmed by air pollution (e.g., because they lack air conditioners and so need to keep their windows open in the summer).[67] A regulation that results in cleaner air will thus increase the value of the public good/private good bundle for low-income individuals. A high-

[65] See Daniel J. Hemel & David A. Weisbach, The Behavioral Elasticity of Tax Revenue, 13 J. Legal Analysis (forthcoming 2021), https://ssrn.com/abstract=3462705.

[66] See Boadway & Keen, supra note 64, at 469.

[67] See Mercedes Medina-Ramón, Antonella Zanobetti & Joel Schwartz, The Effect of Ozone and PM10 on Hospital Admissions for Pneumonia and Chronic Obstructive Pulmonary Disease: A National Multicity Study, 163 Am. J. Epidemiology 579, 583 (2006) (finding that relationship between particulate matter exposure and hospital admissions is stronger in high-poverty areas but that association disappears once central air conditioning is added as a control variable); Michelle L. Bell, Keita Ebisu, Roger D. Peng & Francesca Dominici, Adverse Health Effects of Particulate Air Pollution: Modification by Air Conditioning, 20 Epidemiology 682 (2009) (finding that access to air conditioning reduces vulnerability to particulate matter).

ability person who is choosing between (a) a high-income job with less leisure and (b) a low-income job with more leisure will be somewhat more likely to choose (b) when the air is cleaner. The lower-income job leaves the person with less money to purchase private goods such as air conditioning, but living without air conditioning is somewhat more pleasant now that the air is cleaner.

When some individuals switch from labor to leisure in the presence of a distortionary tax, total wealth goes down. But textbook CBA doesn't count that decline in total wealth as a cost. Textbook CBA implicitly recognizes that we can almost always increase total wealth by redistributing less. Since textbook CBA doesn't account for changes in redistribution, it also doesn't count changes in total wealth resulting purely from changes in redistribution. In this sense, textbook CBA is *symmetrical*: it applies the same treatment to the benefits of redistribution and the costs of redistribution (which is to say, it ignores both).

But this raises the question: what exactly is textbook CBA measuring? It's not measuring the change in total wealth as a result of the regulation, because the change in total wealth would include changes in deadweight loss due to changes in redistribution. It's also not measuring the change in total welfare, because the change in total welfare would depend on distributive effects, which textbook CBA also ignores. It's often said to be measuring "efficiency,"[68] but what is efficiency if not wealth maximization or welfare maximization?[69]

Louis Kaplow, in a series of papers, has proposed a conceptual tool that clarifies what exactly textbook CBA measures.[70] Kaplow suggests the following: Imagine that, upon implementing the air pollution regulation, the government also adjusts the tax schedule so that everyone's utility is the same as it had been immediately prior to the regulation. So, for example, if the regulation yields benefits for low-income individuals, the government will raise taxes on (or reduce transfers to) low-income individuals such that they are just as well off as before. At the end of the day, after all of these benefit-offsetting tax adjustments, the value of the public good/private good bundle for low-income individuals will not have changed. Thus, labor

[68] See Aidan R. Vining & David L. Weimer, Efficiency and Cost-Benefit Analysis, in Handbook of Public Policy 417 (B. Guy Peters & Jon Pierre eds., 2006).

[69] Defining the efficiency objective of textbook CBA as "Kaldor-Hicks efficiency" still leaves the question of what Kaldor and Hicks meant. See, e.g., Liscow, Is Efficiency Biased?, supra note 36, at 1652. Nicholas Kaldor's three-page paper in the September 1939 issue of *The Economic Journal* does not address the treatment of deadweight loss from redistribution. Nicholas Kaldor, Welfare Propositions of Economics and Interpersonal Comparisons of Utility, 49 Econ. J. 549 (1939). John Hicks actually did anticipate the problem on the last page of his contribution to the same journal's December 1939 issue, but he did not propose a solution. See J. R. Hicks, The Foundations of Welfare Economics, 49 Econ. J. 696, 712 (1939) ("Since almost every conceivable kind of compensation (re-arrangement of taxation, for example) must itself be expected to have some influence on production, the task of the welfare economist is not completed until he has envisaged the total effects of both sides of the proposed reform; he should not give his blessing to the reform until he has considered these total effects and judged them to be good. If, as will often happen, the best methods of compensation feasible involve some loss in productive efficiency, this loss will have to be taken into account.").

[70] See Louis Kaplow, The Optimal Supply of Public Goods and the Distortionary Cost of Taxation, 49 Nat'l Tax J. 513 (1996); Louis Kaplow, On the (Ir)relevance of Distribution and Labor Supply Distortion to Government Policy, 18 J. Econ. Perspectives 159 (2004); Louis Kaplow, A Unified Perspective on Efficiency, Redistribution, and Public Policy, 73 Nat'l Tax J. 429 (2020).

incentives will not have changed: high-ability individuals face the same tradeoff between more income versus more leisure as before. If the rule's benefits (cleaner air) exceed its costs (more expensive electricity)—that is, if the rule generates positive net benefits overall—then the benefit-offsetting tax adjustments will leave the government with more revenue. If the rule's costs exceed benefits, then the benefit-offsetting tax adjustments will leave the government with less revenue. By looking at the change in government revenue after the hypothetical benefit-offsetting tax adjustment, we can determine whether the rule passes textbook CBA.

Importantly, no part of this analysis depends on whether benefit-offsetting tax adjustments actually occur. I will relegate to the margin a discussion of whether, when, and why we might expect them to occur or not to occur.[71] For the sake of argument, let's stipulate that they do not. The primary purpose here of the benefit-offsetting tax adjustment construct is not to predict political outcomes or to provide a normative justification for textbook CBA. It is simply to explain what counts as a "cost" or "benefit" in textbook CBA and what does not. The benefit-offsetting tax adjustment gives us a way to describe textbook CBA regardless of whether there are benefit-offsetting tax adjustments—in much the same way as, say, per capita gross domestic

[71] Much of the criticism of distribution-neutral CBA sets its target on the assumption that benefit-offsetting tax adjustments will occur. See, e.g., Avraham, Fortus & Logue, supra note 36; Lee Anne Fennell & Richard H. McAdams, Inversion Aversion, 86 U. Chi. 797, 806 (2019); Zachary Liscow, Are Court Orders Sticky? Evidence on Distributional Impacts from School Finance Litigation, 15 J. Empirical Legal Stud. 4, 37 (2018); Liscow, Is Efficiency Biased?, supra note 36, at 1654 (arguing that non-tax legal rules should diverge from Kaldor-Hicks efficiency when "distributional impacts stick"). As emphasized in text, the argument for distribution neutrality does not depend on this assumption. Still, it is interesting to consider whether benefit-offsetting tax adjustments might happen.

One reason to think that rough adjustments might occur in the aggregate and in the long run—i.e., that more redistribution through one channel might lead to less redistribution through another—is that demand for redistribution depends upon the extent of income inequality. In a perfectly egalitarian society, there would be no demand for redistribution, since there would be no inequality for redistribution to address. As we move toward (away from) egalitarianism, demand for redistribution decreases (increases). Thus, additional redistribution may reduce demand for redistribution.

A reason to think that adjustments might *not* occur is that redistribution itself affects the political system's responsiveness to changes in demand for redistribution. When the rich have a disproportionate share of resources, they are likely to wield a disproportionate share of political power, thus allowing them to push back forcefully against redistributive efforts. Under these circumstances, the political system is less likely to respond to redistributive demands. When the distribution of resources is less lopsided, then the rich may exert less political power, and demands for redistribution may be more likely to succeed. Thus, a reduction in redistribution may make it more difficult to redistribute, and an increase in redistribution may beget more redistribution.

Which of these two stories is correct? Both arguments are plausible in theory and both are likely true to some extent. But once more, nothing about the argument for distribution-neutral CBA depends upon the assumption that benefit-offsetting tax adjustments occur. Cf. Shavell, note 48, at 417 ("Now, of course, no one would really expect the income tax structure to be adjusted in response to each and every change in legal rules (much less to individual changes in other domains), for this would be impractical."). The construct of the benefit-offsetting tax adjustment serves to illustrate the important point that textbook CBA is symmetrical (i.e., textbook CBA ignores both the benefits and costs of changes in redistribution). This important point remains true as a description of textbook CBA regardless of how redistribution evolves in the real world.

product gives us a way to describe a country's wealth even though countries don't really split up their wealth on a per-capita basis.

Three other observations about textbook CBA merit mention. The first observation—and a key implication of Boadway and Keen's model—is that when the income tax system is optimal, textbook CBA gives us not only the efficiency-maximizing policy prescription but the welfare-maximizing policy prescription (subject to one caveat addressed in a moment).[72] The "optimal" tax system is one that redistributes from rich to poor up to the point that the welfare gains from additional redistribution equal the welfare losses from additional labor-leisure distortion (i.e., deadweight loss). When the tax system is optimal, society as a whole is indifferent between (a) a little bit more redistribution with a concomitant increase in deadweight loss and (b) a little bit less redistribution with a corresponding reduction in deadweight loss. If an air pollution regulation increases the value of the public good/private good bundle available to low-income individuals, then it will cause some high-ability individuals to choose to work less. But instead of trying to calculate the benefit of additional redistribution and the cost of deadweight loss, we can ignore both (because if the tax system is optimal, we're indifferent to sufficiently small changes in redistribution and deadweight loss).

Second—and this is the crucial caveat to Boadway and Keen's conclusion—this equation between textbook CBA and welfare maximization depends on the assumption that individuals with the same income assign the same value to clean air regardless of their income-earning ability. In technical terms, this assumption holds that utility is "weakly separable" between leisure and private and public goods.[73] Although this weak-separability assumption is unlikely to be correct in 100 percent of cases, deviations from weak separability don't disprove the general case for textbook CBA.

To see why, imagine that the public good in question is not cleaner air but better public transit. The government decides that since low-income individuals ride public transit more often, it will redistribute from rich to poor by using tax dollars to improve buses and subways. Say that low-ability individuals with low incomes assign greater value to public transit than high-ability individuals with low incomes (e.g., because high-ability individuals with low incomes don't work as much, so they commute less). Providing better public transit adds to the public good/private good bundle of low-ability individuals with low incomes, but it doesn't add much to the public good/private good bundle of high-ability individuals with low incomes, so it doesn't cause many high-ability individuals to reduce their labor supply. Thus, improving public transit doesn't give rise to as much deadweight loss as, say, monetary transfers to low-income individuals.

Or imagine the reverse: Say that the government decides that since high-income people are exercising on their Pelotons while low-income people are out on the bike paths, it will redistribute from rich to poor by using tax dollars to improve bike paths. Let's say that low-ability individuals with low incomes assign *less* value to bike paths than high-ability individuals with low incomes (e.g., because members of the former group have less leisure time for cycling outside). So improving bike paths doesn't do as much to reach the people to whom we want to redistribute—low-ability individuals with low incomes—but it causes some high-ability individuals to reduce their labor supply. High-ability individuals who switch to the low-income

[72] See Boadway & Keen, supra note 64, at 469.

[73] See id. at 471 & n.9.

job might not be able to afford Pelotons any longer, but they would prefer more leisure time with scenic bike paths rather than less leisure time plus Pelotons.

Summing up, there may be instances in which providing low-income individuals with public goods (e.g., better public transit) leads to less deadweight loss than simply transferring cash, and there may be instances in which providing low-income individuals with public goods (e.g., public bike paths) leads to more deadweight loss than cash transfers. The advocate for textbook CBA can accept this caveat and say that, as a practical matter, textbook CBA still provides a good first cut in the benchmark case. That is, we can assume that if a regulation redistributes from high-income individuals to low-income individuals, it generates the same deadweight loss as tax-system redistribution (and, vice versa, if it redistributes from low-income individuals to high-income individuals, it yields the same *reduction* in deadweight loss as a tax cut would). Moreover, when the weak separability assumption does not apply—when public goods are like public transit (complementary to labor) or public bike paths (complementary to leisure)—the result could be that we should choose more redistributive policies than textbook CBA suggests or that we should choose less redistributive policies. And often, it will be ambiguous whether a particular public good is a complement to labor or leisure, in which case we have no reason to deviate either way from textbook CBA's prescription.[74]

A third and final observation about textbook CBA bears emphasis. Textbook CBA relies on individuals' own dollar valuations of the public good. In the example above, the public good is clean air, and the principal benefit of the public good is that breathing cleaner air reduces the probability of death from pneumonia, chronic obstructive pulmonary disease, heart attack, stroke, and other causes.[75] Individual dollar valuations of the public good will therefore be based on willingness to pay for mortality risk reduction. As discussed at greater length in Section III.C, higher-income individuals typically are willing to pay more for mortality risk reductions than lower-income individuals.[76] Textbook CBA therefore assigns higher values to mortality benefits when those benefits accrue to higher-income individuals. It uses income-elastic VSLs rather than equal dollar VSLs for everyone.

B. Status Quo Cost-Benefit Analysis

Status quo cost-benefit analysis, or real-world cost-benefit analysis, tracks textbook CBA in all respects except one. Status quo CBA also eschews the use of distributional weights, and it also is symmetrical (i.e., it ignores both the welfare benefits and deadweight loss of redistribution). But whereas textbook CBA values benefits and costs based on willingness to pay, status quo CBA assigns the same dollar VSL to everyone regardless of income.

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[74] For a suggestion that clean air is complementary to leisure, and thus that we should provide less of it than textbook CBA would prescribe, see Christos Makridis, The (Non)Separability of Air Quality: Evidence from Millions of Households Across the United States (Stanford Institute for Economic Policy Research, SIEPR Discussion Paper No. 15-020, 2015), https://siepr.stanford.edu/research/publications/elasticity-air-quality-evidence-millions-households-across-united-states.

[75] See Bowe, Xie & Yan, supra note 59, at 10.

[76] See Thomas J. Kneisner, W. Kip Viscusi & James P. Ziliak, Policy Relevant Heterogeneity in the Value of Statistical Life: New Evidence from Panel Data Quantile Regressions, 40 J. Risk & Uncertainty 15, 28 tbl.2 (2010).

Agencies typically derive VSLs from hedonic wage studies, which seek to estimate "compensating wage differentials" for jobs with different levels of fatality risk.[77] Say that a job in logging carries with it an 0.1 percent annual risk of death while an otherwise equivalent job in roofing carries an 0.05 percent annual risk of death. Let's say the job in logging will (all else equal) pay an extra $5000 per year over and above roofing.[78] The VSL is the wage differential divided by the risk differential—in this example, $5000/0.05% = $10 million. Recent agency rulemakings use VSLs slightly above $10 million.[79]

Status quo CBA's equal-VSL-for-all approach may strike many readers as sensible (subject, perhaps, to the caveat regarding lives vs. life-years at the outset[80]). And as I argue in Part IV, it *is* sensible (subject, again, to the lives vs. life-years caveat). But it creates a conceptual problem for which status quo CBA doesn't have a good solution.

The problem is this: Status quo CBA doesn't correspond to any obvious normative principle. Textbook CBA can be described as a measure of efficiency, with efficiency defined through the benefit-offsetting tax adjustment construct. But status quo CBA can't be characterized that way. Efficiency depends on income-elastic VSLs, and status quo CBA ignores the income elasticity of the VSL. Status quo CBA also can't be characterized as a welfare measure. Welfare depends upon distribution, and status quo CBA ignores distribution. To be sure, the task of federal agencies isn't to implement abstract theories of the good; it is to adopt procedures and policies that work well in the real world. So status quo CBA's lack of conceptual clarity is not necessarily a fatal flaw. But defenders of status quo CBA do start out on shaky theoretical ground, whether or not they ultimately can win an argument pitched in pragmatic terms.[81]

C. Weighted Cost-Benefit Analysis with Income-Elastic Values of a Statistical Life

A third general approach to CBA involves the use of distributional weights and income-elastic VSLs. As noted at the outset, distributional weights can be applied qualitatively ("soft" weighted CBA) or quantitatively ("hard" weighted CBA). I will focus first on the hard weighted approach and then discuss the softer iteration.

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[77] See Lisa A. Robinson, How U.S. Agencies Value Mortality Risk Reductions, 1 Rev. Envtl. Econ. & Pol'y 283, 284 (2007).

[78] The figures for logging and roofing are very close to reality. See U.S. Bureau of Labor Statistics, Civilian Occupations with High Fatal Work Injury Rates, 2018, https://www.bls.gov/charts/census-of-fatal-occupational-injuries/civilian-occupations-with-high-fatal-work-injury-rates.htm (last visited Oct. 12, 2020) (click "Show table" at bottom to see figures). Logging is remarkably dangerous.

[79] See Medicare and Medicaid Programs, Clinical Laboratory Improvement Amendments (CLIA), and Patient Protection and Affordable Care Act; Additional Policy and Regulatory Revisions in Response to the COVID-19 Public Health Emergency: Interim Final Rule (Sept. 2, 2020) ($10.1 million); The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks: Final Rule, 85 Fed. Reg. 24,174, 24,827 (Apr. 30, 2020) ($10.4 million).

[80] See supra note 37-38 and accompanying text.

[81] For a criticism of status quo CBA along these lines, see Adler, What Should We Spend To Save Lives in a Pandemic?, supra note 51, at 32-33.

Hard weighted CBA derives distributional weights from a social welfare function.[82] The social welfare function most commonly used in academic versions of hard weighted CBA is based on utilitarianism.[83] (This is also the approach recommended by the UK Treasury.[84]) With a utilitarian social welfare function, the social value of an additional dollar in a person's hands depends on that person's marginal utility of income. A utilitarian approach to weighted CBA will assign distributional weights that correspond to the marginal utility of income.

Studies of labor market behavior[85] and self-reports of personal wellbeing[86] suggest that the relationship between utility and income is roughly logarithmic (i.e., the utility of income is the natural log of income). This assumption has the virtue of arithmetic convenience as well as empirical support. The first derivative of the natural log of *y* is equal to 1/*y* (a fact that many of us learned in high school but since have banished to the recesses of our memory). Thus, if person A earns 10 times as much as person B, the marginal utility of income to person A is 1/10 the marginal utility of income to person B. If distributional weights are based on a utilitarian social welfare function with logarithmic utility of income, then an individual's weight will straightforwardly be the inverse of her income (or in some iterations, the inverse of her income multiplied by the population mean income).

To illustrate how the utilitarian version of hard weighted CBA might work, imagine that Jeff Bezos's income is 100,000 times the average American's. (This is likely an underestimate.[87]) Thus, if the average American's distributional weight is 1, Jeff Bezos's distributional weight will be 1/100,000. Now let's say that a regulation yields a benefit worth $1 to a single average American and imposes a cost of $90,000 on Jeff Bezos. The total welfare-unit effect would be 1 x $1 = 1 welfare unit for the average American and 1/100,000 x -$90,000 = -0.9 welfare units for Bezos, or (positive) 0.1 welfare units in total. The regulation would narrowly pass hard weighted CBA, though it would flunk unweighted CBA by an $89,999 margin.

Logarithmic utility of income also has important implications for the income elasticity of the VSL. If Jeff Bezos derives the same utility from his own life as the average American derives from her life, but Bezos derives only 1/100,000th as much utility from his marginal dollar as the average American derives from her marginal dollar, then—at the margin—Bezos should be willing to pay 100,000 times as much as the average American would pay for an equivalent reduction in fatality risk. More generally, if everyone values their own life equally in utility terms and the marginal utility of income is inverse to income, then VSLs will be proportional to income. A percent increase in income will lead to an equal percent increase in VSL. That is, the income elasticity of the VSL (IEVSL) will be one.

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[82] Some scholars use the term "SWF framework" to describe what I refer to as "weighted CBA" and use "CBA" to refer exclusively to unweighted CBA. See, e.g., Adler, supra note 13, at 7.

[83] See Michael W. Jones-Lee & Graham Loomes, Discounting and Safety, 47 Oxford Econ. Papers 501, 505 (1995); Christian Azar, Weight Factors in Cost-Benefit Analysis of Climate Change, 13 Envtl. & Resource Econ. 249 (1999); Adler, supra note 13, at 10.

[84] See HM Treasury, supra note 19, at 78-79 (distributional weights based on marginal utility of income).

[85] See Raj Chetty, A New Method of Estimating Risk Aversion, 96 Am. Econ. Rev. 1821, 1830 (2006).

[86] See Néstor Gandelman & Rubén Hernández-Murillo, Risk Aversion at the Country Level, 97 Fed. Reserve Bank of St. Louis Rev. no. 1, at 53 (2015).

[87] See Prachi Bhardwaj, Jeff Bezos Got So Rich in 2018 That He Now Makes More Per Minute Than You Do in a Year, Money.com (Dec. 18, 2018), https://money.com/jeff-bezos-net-worth-amazon-2018.

One convenient feature of hard weighted CBA with weights inverse to income and an IEVSL of one is that even though it assigns different dollar VSLs to different individuals' lives based on their income, it assigns the same welfare-unit weight to everyone's life regardless of income. If the average American's VSL is $10 million, and Bezos's income is 100,000 times the average American's, then Bezos's income-elastic VSL will be $1 trillion. If the average American's distributional weight is one, Bezos's weight will be 1/100,000. So hard weighted CBA would assign a value of 10 million welfare units to the average American's life and 1/100,000 x $1 trillion welfare units to Jeff Bezos's life. Not coincidentally, 1/100,000 x $1 trillion = 10 million. In welfare-unit terms, every life is valued equally.[88]

In the discussion that follows, I will refer to hard weighted CBA with weights inverse to income and an IEVSL equal to one as "standard hard weighted CBA." Standard hard weighted CBA means that when a person's income doubles, that person's VSL also doubles and the distributional weight assigned to that person declines by half. Standard hard weighted CBA reflects only one of an infinite number of assumptions we might make about distributional weights and IEVSLs,[89] though—as will become clearer below—it has particularly attractive arithmetic and normative properties.

Finally, hard weighted CBA must decide how to handle deadweight loss resulting from increases in redistribution.[90] Conceptually, the answer seems clear enough: If deadweight loss is the byproduct of redistribution, and hard weighted CBA counts an increase in redistribution as a welfare gain, then hard weighted CBA should acknowledge the corresponding increase in deadweight loss as a welfare loss. Otherwise, hard weighted CBA is having its proverbial cake and eating it too: counting the benefits of redistribution but not the costs. Somewhat surprisingly, even highly sophisticated applications of hard weighted CBA to risk analysis generally do not account for deadweight loss resulting from redistribution.[91] They are, in this sense, *asymmetrical*, including only the benefits of redistribution and not the costs.[92] This might be justifiable if one assumes that deadweight loss does not matter at all in the real world, but that assumption would

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[88] See Rachel Baker, Susan Chilton, Michael Jones-Lee & Hugh Metcalf, Valuing Lives Equally: Defensible Premise or Unwarranted Compromise?, 36 J. Risk & Uncertainty 125 (2008); Matthew D. Adler, James K. Hammitt & Nicolas Treich, The Social Value of Mortality Risk Reduction: VSL Versus the Social Welfare Function Approach, 35 J. Health Econ. 82, 90 (2014).

[89] For a comprehensive and insightful overview of potential social welfare functions, see Adler, supra note 13, ch. 3.

[90] See supra notes 64-67 and accompanying text.

[91] See HM Treasury, supra note 19, at 78-79; Adler, Measuring Social Welfare, supra note 13, at 172-192; Adler, What Should We Spend To Save Lives in a Pandemic?, supra note 51; cf. John Bronsteen, Christopher Buccafusco & Jonathan S. Masur, Well-Being Analysis vs. Cost-Benefit Analysis, 62 Duke L.J. 1603, 1639-45 (2013) (noting direct effect of regulation on involuntary employment but omitting effect on labor-leisure tradeoff in wellbeing-unit analysis of EPA regulation).

[92] Nathaniel Hendren proposes a method for distributional weights that would restore symmetry on the assumption that the existing tax system is optimal. See Nathaniel Hendren, Measuring Economic Efficiency Using Inverse-Optimum Weights, 189 J. Pub. Econ. (forthcoming 2020), https://scholar.harvard.edu/files/hendren/files/eww_jpubec_vround2_vfinal.pdf. As Hendren notes, his approach would converge to textbook CBA when weak separability applies. See id. (manuscript at 57-58). Thus the prescriptions it yields would not be redistributive in a conventional sense (i.e., would not necessarily shift resources from rich to poor and might do the reverse).

be hard to sustain. We have increasingly compelling evidence that individuals adjust their labor supply in response to redistribution (though how *much* they adjust their labor supply is a subject of fierce debate).[93] And the more explicitly that agencies seek to redistribute from rich to poor, the more likely it is that individuals will adjust their income-earning and income-reporting behavior.

Soft weighted CBA seeks to push policy in the direction of hard weighted CBA without explicit use of distributional weights. Practitioners of soft weighted CBA thus would compare net benefits and costs across the income distribution and favor policies with larger net benefits for lower-income individuals. The rationale for doing this qualitatively rather than quantitatively is, presumably, that it makes the math easier—though as illustrated below, soft weighted CBA with income-elastic VSLs may entail *greater* informational burdens in some cases than the hard weighted approach.

D. Weighted Cost-Benefit Analysis with Equal Dollar Values of a Statistical Life

The option in the bottom right box, weighted cost-benefit analysis with equal dollar values of a statistical life, is presented primarily for completeness. As noted above and explored in greater detail in Parts III and IV, the rationale for weighted CBA with equal dollar VSLs is elusive. If we thought that lower-income individuals were irrationally assigning too low a value to fatality risk reduction, then perhaps there would be a paternalistic case for weighted CBA with equal dollar VSLs. But it is entirely rational to assign a higher value to one's dollars when one has fewer dollars, and that means that lower-income individuals really should be less willing than higher-income individuals to part with their dollars in exchange for equivalent safety improvements. It is, by the same token, entirely rational for readers of this article to be unwilling to pay for fatality risk reductions that Jeff Bezos would very happily purchase, and few of us would think we are better off if compelled to follow Bezos's preferences in our own lives.

Weighted CBA with equal dollar VSLs may push policymakers toward regulations that lower-income individuals would rationally reject. Weighted CBA with equal dollar VSLs also will encounter further ethical quandaries in Part IV. For now, weighted CBA with equal dollar VSLs serves as a placeholder, but it will not be a serious candidate by the end.

III. Cost-Benefit Analysis and Redistribution: A Case Study

To see what these various approaches to CBA might mean in the real world, it will be helpful to work through a concrete example. For that purpose, I will use the National Highway Traffic Safety Administration's "rear visibility" rule, finalized in 2014. Section III.A provides an overview of that rule. Section III.B discusses NHTSA's approach. Section III.C considers the rule's distributive effects and how those distributive effects might be incorporated into CBA. Section

[93] See, e.g., Raj Chetty, Adam Guren, Day Manoli & Andrea Weber, Are Micro and Macro Labor Supply Elasticities Consistent? A Review of Evidence on the Intensive and Extensive Margins, 101 Am. Econ. Rev.: Papers & Proceedings 417, 474 (2011); Raj Chetty, Bounds on Elasticities with Optimization Frictions: A Synthesis of Micro and Macro Evidence on Labor Supply, 80 Econometrica 969 (2012). For an impressively thorough overview of the literature, see Michael P. Keane, Labor Supply and Taxes: A Survey, 49 J. Econ. Lit. 961 (2011).

III.D then imagines how NHTSA might implement the results of distributionally weighted CBA for the rear visibility rule. Section III.E assesses the generalizability of these results.

A. The Case of the Rear Visibility Rule

In 2008, Congress passed and President Bush signed the Cameron Gulbransen Kids Transportation Safety Act, which instructed NHTSA to promulgate rear visibility requirements that "reduce death and injury resulting from backing accidents, particularly incidents involving small children and disabled persons."[94] The statute did not tell the agency precisely *how* to carry out this task, but instead authorized the agency to "prescribe different requirements for different types of motor vehicles."[95] It also urged the agency to consider mirrors, sensors, and other technologies, as well as backup cameras.[96]

The statute started a lengthy rulemaking process that culminated in 2014.[97] In April of that year, NHTSA promulgated a new federal motor vehicle safety standard—the rear visibility rule—requiring motor vehicles manufactured after 2018 to be equipped with cameras allowing drivers to see behind them.[98] The rule applies to all passenger cars, trucks, multipurpose passenger vehicles, buses, and low-speed vehicles weighing less than 10,000 pounds.[99] The rule generally requires new vehicles to display a real-time image covering a 10-foot by 20-foot area behind the rear bumper.[100]

The rule provides a particularly apt example to illustrate the relationship between CBA and income redistribution for several reasons. First, the rule is broadly representative of the sorts of high-cost regulations that federal agencies impose. It generates monetary costs (here, the additional cost of equipping new motor vehicles with cameras) in exchange for health and safety benefits (here, fewer deaths and injuries from backovers). Although not above the $1 billion threshold for Table 1, it is similar to other high-cost regulations promulgated by DOT and EPA, the two agencies that account for the lion's share of total regulatory costs.[101]

Second, the rule was a close call. Although NHTSA found that monetized costs exceeded benefits, the agency said that it considered there to be "significant unquantifiable considerations" that nonetheless justified the rule—in particular, "the young age of many victims and the fact that many drivers involved in backover crashes are relatives or caretakers of the victims."[102] Those unquantifiable considerations tipped the balance in favor of the camera

[94] Cameron Gulbransen Kids Transportation Safety Act, Pub. L. No. 110-189, § 2(b), 122 Stat. 639, 639-40 (2007).
[95] Id.
[96] Id.
[97] The agency published its proposed rule at 75 Fed. Reg. 76,186 (Dec. 7, 2010).
[98] 79 Fed. Reg. 19,178 (Apr. 7, 2014). For a detailed and informative account, see Cass R. Sunstein, Rear Visibility and Some Unresolved Problems with Economic Analysis (with Notes on Experience Goods), 10 J. Benefit Cost Anal. 317 (2019).
[99] 79 Fed. Reg. at 19,243.
[100] See id. at 19,189-90, 19,195.
[101] See supra Table 1.
[102] 79 Fed. Reg. at 19,184. In theory, NHTSA could have tried to quantify those benefits too (e.g., by using a higher dollar value of a statistical life when the lives saved are children, or using the value of a statistical life-

requirement. If the agency had considered the rule's income-distributive effects, that consideration plausibly could have tipped the balance back.

Third, the costs and benefits of the rule are costs and benefits that distributive analysis is reasonably well equipped to address. Most of the people affected by the rule are alive today or will be not too long from now. The rule therefore does not raise the sorts of difficult questions regarding obligations to future generations that might be implicated by a rule regarding, say, radioactive nuclear waste storage. It actually does raise difficult questions about obligations to non-human beings—since some of the avoided backovers would have involved dogs, cats, and other domesticated and wild animals—but I will set aside that (important[103]) consideration for present purposes.

Fourth, the rule is familiar. Most of us have likely traveled in cars equipped with rearview cameras required by the rule. (Though the rule applies to all vehicles manufactured on or after May 1, 2018, carmakers were required to install cameras in a percentage of their vehicles starting in 2016.[104]) Many of us have likely read about the rule in newspapers[105]—or, perhaps, in law reviews.[106] We can comprehend, analyze, and argue about the various moving pieces without becoming experts on a totally new subject.

Fifth and finally, the rule is one that several scholars have identified as a "regressive" regulation. Economists James Bailey, Diana Thomas, and Joseph Anderson characterize the rear visibility rule as a regulation "designed to achieve an outcome higher-income households desire," while imposing costs on all income groups.[107] Thomas, in a separate piece, cites the rule as an example of a regulation that "imposes the preferences of the rich on lower-income households and forces them to share in the cost of risk reduction they are unlikely to pursue privately."[108] We can withhold judgment about the rule's regressivity for a moment, but Bailey, Thomas, and Anderson's claims suggest that the rule is—at least plausibly—one with meaningful and worrisome redistributive effects.

B. The Agency's Approach

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year to account for the age distribution of avoided deaths). See Sunstein, supra note 98, at 333. That it did not is somewhat surprising. Sunstein, who was head of OIRA at the time of the proposed rule, explains that "within the Obama Administration, there was general agreement that this approach was sufficient for a proposed rule, designed for public comment." Id.

[103] For a thoughtful discussion of CBA and nonhuman animals, see Andrew Stawasz, Why and How to Value Nonhuman Animals in Cost-Benefit Analysis (2020) (unpublished manuscript).

[104] 79 Fed. Reg. at 19,181.

[105] See, e.g., David Undercoffler, Backup Cameras To Be Required in All New Vehicles, Starting in 2018, L.A. Times (Mar. 31, 2014), https://www.latimes.com/business/autos/la-fi-hy-autos-nhtsa-backup-camera-20140331-story.html.

[106] See, e.g., Jerry L. Mashaw & David L. Harfst, From Command and Control to Collaboration and Deference: The Transformation of Auto Safety Regulation, 34 Yale J. on Reg. 167, 214-15 (2017); Eric A. Posner & Cass R. Sunstein, Moral Commitments in Cost-Benefit Analysis, 103 Va. L. Rev. 1809, 1815-16 (2017); Sunstein, supra note 98.

[107] James W. Bailey, Diana W. Thomas, Joseph R. Anderson, Regressive Effects of Regulation on Wages, 180 Pub. Choice 91, 92 (2019).

[108] Diana W. Thomas, Regressive Effects of Regulation, 180 Pub. Choice 1, 6-7 (2019).

NHTSA's analysis of the rear visibility rule was, in most respects, typical of agency CBAs—with the notable exception that NHTSA adopted the rule notwithstanding its estimate that costs exceeded benefits. The agency's analysis largely tracked the description of status quo CBA in Section II.B. One slight difference is that the clean air example in Part II involved a public good (i.e., a good that is nonrival and nonexcludable), while rearview cameras have both private-good and public-good qualities. A substantial portion of the benefits of rearview cameras accrue to members of the vehicle owner's own household: NHTSA cited data indicating that in 41 percent of backover death cases, the victim was a close relative of the person driving the car.[109] But the bulk of benefits (59 percent) accrue to others. In this respect, rearview cameras are a part public/part private good.

In the rear visibility case, NHTSA estimated that the rule would save 13 to 15 actual lives[110] and between 19.5 and 30.1 "equivalent lives" per year.[111] To calculate "equivalent lives" saved, DOT instructs its agencies to use the "Maximum Abbreviated Injury Scale" (MAIS), which rates nonfatal injuries from MAIS 1 (minor) to MAIS 5 (critical). An example of an MAIS 5 injury is a ruptured liver with tissue loss. MAIS injuries are then converted into VSLs based on relative disutility factors prescribed in DOT guidance. For example, at the time of the rear visibility rule, avoiding an MAIS 5 injury "counted" as saving 0.593 equivalent lives.[112]

NHTSA next multiplied its equivalent lives estimate by a VSL of $10.5 million, yielding monetized benefits of $205 million to $316 million from fatalities and injuries avoided. The agency then added $44 million to $57 million per year more in benefits from property damage avoided, and $16 million to $24 million in other societal benefits (e.g., reduced medical expenses, insurance administration expenses, productivity losses, and collision-related legal expenses). All this resulted in an estimate of approximately $265 million to $396 million in monetized benefits per year starting in 2018.[113]

On the costs side, NHTSA focused on the costs of installing rearview camera systems. It estimated that the cost per vehicle would be approximately $43 (or $45 with a slightly higher-cost installation option) for vehicles that already have display screens. For vehicles that do not have those screens, the cost would be $132 (or $142 with a slightly higher-cost installation option).[114] The agency assumed a 73 percent adoption rate for rearview cameras in the absence of the rule, with approximately 16 million new vehicles per year in total. Overall, it estimated that the cost would be $546 million to $620 million to equip all model year 2018 vehicles that did not already have rearview camera systems in place.[115]

As noted, NHTSA adopted the rear visibility rule notwithstanding the fact that monetized costs exceeded monetized benefits. This conclusion was driven by the agency's assumption that

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[109] See U.S. Department of Transportation, National Highway Traffic Safety Administration, Final Regulatory Impact Analysis: Backover Crash Avoidance Technologies FMVSS No. 111, at 20 (2014) (hereinafter Final RIA).
[110] 79 Fed. Reg. at 19,180.
[111] 79 Fed. Reg. at 19,238; Final RIA, supra note 109, at 97.
[112] Final RIA, supra note 109, at 25.
[113] 79 Fed. Reg. at 19,238; Final Regulatory Impact Analysis, supra note 109, at 97. The careful reader will note a $1 million discrepancy in the high-end benefit estimate, which is attributable to rounding along the way.
[114] 79 Fed. Reg. at 19,236; Final Regulatory Impact Analysis, supra note 109, at 83 tbl.VI-10.
[115] 79 Fed. Reg. at 19,236; Final Regulatory Impact Analysis, supra note 109, at iv.

most new vehicles without cameras would *not* already have display screens. The agency's estimate was that about 5 to 7 percent of cars and light truck vehicles without cameras would have display screens used for navigation units by model year 2018.[116] The overwhelming majority of new vehicles in the United States (98.8 percent[117]) now *do* have such screens. Of course, this does not mean NHTSA was wrong: manufacturers may have chosen to install those screens in order to comply with the rear visibility rule. But the display screens also allow cars to have on-board navigation units, and having a navigation unit in a vehicle yields additional benefits that NHTSA's CBA ignores (e.g., reducing your risk of getting lost). If the agency had used the $43 per vehicle cost figure—reflecting the minimum incremental cost of a rearview camera once a vehicle already has a display screen—then the total monetized costs would be approximately $186 million, well below the low-end estimate of monetized benefits.[118] If it had used a midpoint cost estimate (on the assumption that half of vehicles would have had display screens but for the rule), then its total cost estimate would be around $380 million, within the range of estimated benefits.[119]

Instead, the agency justified its decision to adopt the rule based on "fairness and equity" considerations.[120] The fairness and equity considerations mentioned by the agency, however, did not relate to the distribution of income. Rather, the agency emphasized the fact that the victims of backover crashes are primarily children, the elderly, and people with disabilities. "Especially in the context at issue, such people lack relevant control over the situation and are not in a good

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[116] See Final Regulatory Impact Analysis, supra note 109, at 30 tbl.IV-3. Specifically, it estimated that 39 percent of cars would not have cameras, and that 2 percent of cars would have navigation units without cameras (2%/39% ≈ 5%). It also estimated that 15 percent of light truck vehicles would not have cameras, and that 1 percent of light truck vehicles would have navigation units but not cameras (1%/15% ≈ 7%).

[117] See Keith Barry, Screen Stars: Which Infotainment System Deserves a Leading Role in Your Next Car?, Consumer Reports (Aug. 5, 2020), https://www.consumerreports.org/infotainment-systems/screen-stars-in-car-infotainment-systems.

[118] The above calculation reflects the agency's assumptions of 16 million new vehicles per year, 73 percent of which already have rearview cameras built in.

[119] Sunstein raises the intriguing possibility that the rule also might have been justifiable based on the idea that rearview cameras are an "experience good." See Sunstein, Rear Visibility and Unresolved Problems for Economic Analysis, supra note 98, at 319 (suggesting that "rearview cameras count as 'experience goods': people do not know their value until they have had experience with them"). Sunstein reports results of an Amazon MTurk experiment finding "that a lower bound of 74%" of respondents would "demand more than the high-end amount ($132 to $142, for vehicles without such displays)" in order to give up the screens today. See id. at 341. Interestingly, the 74 percent figure is close to the agency's assumption at the time of the rule that 73 percent of vehicles would have cameras by 2018. See id. at 335; Final Regulatory Impact Analysis, supra note 109, at 103.

The rule also might be justified on more conventional market-failure grounds: The 23 percent of buyers who wouldn't choose camera-equipped cars in the absence of the rule still derive some benefit from the cameras and from other functions enabled by display screens. Those private benefits on their own might not be enough to warrant the purchase, but adding the positive externality on top of the private benefits potentially could tip the balance. So either a subsidy or a mandate was plausibly necessary to align private purchases with the social objective.

[120] 79 Fed. Reg. at 129,236 (citing Exec. Order 13563).

position to protect themselves," the agency explained. "There are strong considerations, rooted in fairness and equity, to reduce these risks that they face."[121]

NHTSA's conception of fairness and equity—which seems to give priority to non-drivers because they have less "control" over the situation—is certainly open to question on both empirical and ethical grounds.[122] My focus will be not on what NHTSA included in its discussion of fairness and equity, but on what it left out. Notwithstanding hundreds of pages of analysis, NHTSA said nothing about whether the benefits of the rule would accrue primarily to high-income or low-income households, and it said nothing about who would bear the costs. The next section will consider how the agency's analysis might have changed if it did account for these effects.

C. Income-Distributive Effects

How do the costs and benefits of the rear visibility rule vary by income? This section seeks to answer that question. It explains why, at least based on data sources available to NHTSA and empirical assumptions that DOT has made in other contexts, the rear visibility rule appears to be regressive by most measures: it imposes net costs on low-income groups and generates net benefits for high-income groups. Thus, NHTSA would be likelier to reject the rule based on standard weighted CBA than based on unweighted (distribution-neutral) CBA. I then explain why the conclusions of the previous two sentences depend critically on the assumption that the value of a statistical life is income-elastic. With equal dollar VSLs for everyone, the conclusions would flip entirely. Curious readers can view and download all data and assumptions used in this article's analyses at bit.ly/rearvisibility.

Costs. Let's start on the cost side. An initial question is whether manufacturers will bear the costs of cameras or whether they will pass these costs along to consumers. Cost passthrough is likelier to occur in a competitive industry, and automobile manufacturing is a competitive industry. The Justice Department and the Federal Trade Commission consider a market with a Herfindahl-Hirschman Index (HHI) below 1500 to be unconcentrated,[123] and the automotive industry's HHI is less than half that.[124] Moreover, data on cost passthrough in the U.S. automobile

[121] 79 Fed. Reg. at 19,236.

[122] It is not immediately obvious that drivers have more control over backover crashes than pedestrians do, especially if drivers cannot see behind their cars. And even if drivers do have more control, it is not immediately obvious why this would mean that pedestrians' lives have greater social value than, e.g., the value that NHTSA assigns to drivers' lives in regulatory contexts such as the roof crush resistance standard. See 74 Fed. Reg. 22,347 (May 12, 2009).

[123] U.S. Department of Justice & Federal Trade Commission, Horizontal Merger Guidelines § 5.3 (Aug. 19, 2010), https://www.justice.gov/atr/horizontal-merger-guidelines-08192010.

[124] See Sam Korus, The Automotive Industry Is on the Threshold of Massive Consolidation, ARK Invest (Aug. 26, 2016), https://ark-invest.com/analyst-research/automotive-consolidation. That report acknowledges that current concentration is low but predicts that concentration will increase due to the incipient shift toward electric vehicles.

market indicates that cost shocks are passed through to consumers at least dollar for dollar.[125] Accordingly, assuming complete cost passthrough here appears to be appropriate.[126]

Which consumers will bear these costs? A decent first approximation is that costs will be distributed across income groups in the same proportion that vehicles are distributed across income groups. Thus, if households earning $100,000 own twice as many cars as households earning $20,000, they will bear twice the costs of the rule. This assumption may overestimate or underestimate the income elasticity of regulatory costs (i.e., the change in regulatory costs as a function of the change in income). One reason why it may overestimate the income elasticity of regulatory costs is that higher-income households may be more likely to buy cars with built-in navigation systems (which make it cheaper to comply with the rule). One reason why it may underestimate the income elasticity of regulatory costs is that higher-income households are likelier to buy new cars, whereas lower-income households are likelier to buy used cars not initially subject to the rule. Insofar as the rule raises the price of new cars, though, it may raise the price of used cars as well, since used cars are a substitute for new cars.[127] It would be miraculous if all of these factors balanced out perfectly, but all in all, using the distribution of vehicles to estimate the distribution of costs is a reasonably good guess.

Fortunately for our purposes, we know how vehicles are distributed across income groups because DOT collects data on precisely that subject. The National Household Travel Survey, conducted by the Federal Highway Administration within DOT, includes information on the number of vehicles per household in different income bands.[128] Accordingly, the analysis below allocates costs across income groups in proportion to the number of vehicles per household in those income groups. The following figures reflect scenarios in which vehicles already have display screens (Cost (low)), in which vehicles do not already have such screens (Cost (high)), and in which 50 percent of vehicles have screens (Cost (medium)).[129]

Benefits. Now turn to the benefits, which are primarily attributable to lives and injuries avoided. NHTSA's regulatory impact analysis indicates that approximately 41 percent of backover

[125] See, e.g., Anne Gron & Deborah L. Swenson, Cost Pass-Through in the U.S. Automobile Market, 82 Rev. Econ. & Statistics 316, 321 (2000) (noting that in response to exchange-rate shocks affecting input prices, "U.S. manufacturers actually increased dollar prices more rapidly than their underlying increase in costs"). Gron and Swenson reject the hypothesis of full cost passthrough for *non*-U.S. automakers. See id. at 321. However, the cost increases contemplated here—mandates announced well in advance, with ample time for manufacturers to adjust prices and quantities—are probably even more likely to be passed through to consumers than the sudden cost swings studied in Gron and Swenson (who focused on cost changes arising from exchange rate fluctuations). I thank Matthew Stephenson for this observation.

[126] As emphasized in Section IV.C, cost passthrough assumptions—like IEVSL assumptions—will be critical to distributive analysis. For practical implications of this observation, see infra note 210 and accompanying text.

[127] See Thomas, supra note 108, at 6 & n.16.

[128] See U.S. Department of Transportation, Federal Highway Administration, 2017 National Household Travel Survey, https://nhts.ornl.gov (last visited Oct. 9, 2020) (choose "Households" as analysis variable and HHFAMINC and HHVEHCNT as additional variables).

[129] I use cost figures from the Final RIA: $131.60 per vehicle where an entire camera system is required and $42.82 where a navigation unit already is present so only camera and wires are needed. See Final RIA, supra note 109, at 83 tbl.VI-10.

crash victims are close relatives of drivers.[130] For those crashes, I assume that equivalent lives saved are distributed across income groups in the same proportion that vehicles are distributed across income groups. For the remaining 59 percent of equivalent lives saved, I assume an equal distribution across the population.

This equal-distribution assumption for remaining equivalent lives may overestimate or underestimate the income elasticity of regulatory benefits (i.e., the change in benefits as a function of the change in income). One reason why it might overestimate is that high-socioeconomic-status individuals are generally less likely to be car-crash victims.[131] We do not know, however, whether the relationship between income and motor vehicle injury risk holds true for backover crashes. (It may be a function of the fact that lower-income individuals *ride* in more dangerous vehicles, whereas backover crash victims almost always are outside the relevant vehicle.) One reason why the equal-distribution assumption may underestimate the income elasticity of regulatory benefits is that nonfamily-member backover crash victims are likely to be neighbors and acquaintances of the drivers, as these crashes generally happen either at the beginning or the end of vehicle trips. If higher-income households are more likely to own vehicles covered by the rule, and their neighbors and acquaintances are also high-income, then benefits to nonfamily members still may accrue disproportionately to high-income individuals.

Importantly, the income distribution of equivalent lives saved matters only for purposes of textbook CBA, *soft* weighted CBA with income-elastic VSLs, and weighted CBA approaches that use equal dollar VSLs for all. Under status quo CBA, there is no need to know the income distribution of equivalent lives saved, because all lives count the same in dollar terms regardless of income. In hard weighted CBA with the standard assumptions—weights inverse to income and an IEVSL of one—there is no need to know the income distribution of equivalent lives saved because all lives count the same in welfare-unit terms regardless of income. Soft weighted CBA is, perhaps ironically, harder than hard weighted CBA with the standard assumptions in this case, because soft weighted CBA requires us to know where saved lives lie on the income distribution and hard weighted CBA doesn't.[132]

As noted above, the rear visibility rule also generates two more types of benefits: benefits from avoiding property damage-only crashes and "societal" benefits."[133] The analysis below splits benefits from property damage-only crashes 50/50 between drivers and the rest of society. Societal benefits are allocated across the population on a per capita basis. Since by far the bulk of benefits (more than three quarters) are attributable to equivalent lives saved, the distributive analysis will be largely robust to different assumptions about the allocation of property damage avoidance and societal benefits.

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[130] See Final RIA, supra note 109, at 20.

[131] See, e.g., Sam Harper, Thomas J. Charters & Erin C. Strumpf, Trends in Socioeconomic Inequalities in Motor Vehicle Accident Deaths in the United States, 1995–2010, 182 Am. J. Epidemiology 606, 610 tbl.3 (2015); Robert B. Noland, Nicholas J. Klein & Nicholas K. Tulach, Do Lower Income Areas Have More Pedestrian Casualties?, 59 Accident Analysis & Prevention 337 (2013).

[132] In this particular case, the fraction of equivalent lives saved that are within the driver's household turns out not to be a particularly influential parameter in the distributive analysis. The topline regressivity and progressivity results remain the same whether we assume that 0 percent of equivalent lives saved are in the driver's household or that 100 percent are.

[133] See supra note 113 and accompanying text.

Income Elasticity of the Value of a Statistical Life. The final element of the distributive analysis entails transforming equivalent lives saved into dollar terms for different income groups. This transformation, again, depends on the income elasticity of the value of a statistical life, the percent change in an individual's private VSL for every percent change in her income. As noted above, logarithmic utility of income implies an IEVSL of one if all individuals value their own lives equally in utility terms.

Empirical estimates of the IEVSL vary considerably. In a 2003 meta-analysis, Kip Viscusi and Joseph Aldy reviewed dozens of wage-risk studies across ten countries and arrived at a point estimate of 0.5 to 0.6 for the IEVSL.[134] This implies that when income goes up by 1 percent, willingness to pay for fatality risk reduction goes up by 0.5 to 0.6 percent. Consistent with those estimates, DOT in 2008 adopted an IEVSL equal to 0.55.[135] As noted above, DOT applies the same VSL to everyone regardless of income, but it adjusts the VSL year-to-year in light of real income growth. DOT's IEVSL assumption guides these year-to-year adjustments.

After Viscusi and Aldy published their IEVSL meta-analysis, Louis Kaplow observed that IEVSLs substantially below one are difficult to reconcile with other widely accepted propositions of utility theory. Kaplow conjectured that, given logarithmic utility of income, the IEVSL would be above one at lower incomes and would fall toward one as income rises.[136] Viscusi, along with Thomas Kneisner and James P. Ziliak, then reanalyzed data on wage and fatality risks across industry-occupation groups in the United States using a different empirical approach (quantile regression). IEVSL estimates generated through this method largely bear out Kaplow's conjecture.[137] For workers in the 10th percentile by real family income, the estimated IEVSL is 2.24; for workers in the 90th percentile, it is 1.23.[138] The authors note that their results are

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[134] See W. Kip Viscusi & Joseph E. Aldy, The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World, 27 J. Risk & Uncertainty 5 (2003).

[135] For a review of changes to DOT guidance, see Peter Rogoff, Acting Under Secretary for Policy, & Kathryn Thomson, General Counsel, U.S. Department of Transportation, Guidance on Treatment of the Economic Value of a Statistical Life (VSL) in U.S. Department of Transportation Analyses—2014 Adjustment (June 13, 2014), https://www.dot.gov/sites/dot.gov/files/docs/VSL_Guidance_2014.pdf.

[136] Louis Kaplow, The Value of a Statistical Life and the Coefficient of Relative Risk Aversion, 31 J. Risk & Uncertainty 23 (2005). According to Kaplow, the reason why we would expect the income elasticity of the VSL to exceed one at lower income levels is that higher income yields greater utility (i.e., having more money likely makes life more pleasant). Given declining marginal utility of income, this effect fades as the marginal utility of income approaches zero, in which case the income elasticity of the VSL should converge to one.

Kaplow's theoretical analysis appropriately focuses on mortality risk, but DOT's application of the VSL applies to equivalent lives saved (i.e., combining mortality and morbidity). This distinction matters for our purposes because it is not obvious that the income elasticity of the value of a statistical *equivalent* life has the same properties as the IEVSL. For example, one reason why I value my hands is that they allow me to type. But if I had a very large amount of money, my utility loss from a serious hand injury might be lower because I could hire someone else to take dictation for me. It may be that higher income yields greater utility from being alive but less utility from health attributes for which there are privately purchasable substitutes. In any event, the assumption that everyone derives the same utility from their lives and their health regardless of income is useful as a starting point, and with logarithmic utility of income, that equal-utility assumption translates to an income elasticity of the value of a statistical life of one.

[137] Kneisner, Viscusi & Ziliak, supra note 76.

[138] Id. at 28 tbl.2.

broadly consistent with Kaplow's model.[139] Another study by Dora Costa and Matthew Kahn based on changes in wage-risk tradeoffs in the U.S. labor market from 1940 to 1980 similarly finds an IEVSL well above one (in the range of 1.5 to 1.7).[140]

Citing these studies as well as Kaplow's theoretical work, the Department of Transportation updated its VSL guidance in 2013 to use an IEVSL of 1.0 going forward.[141] Since DOT uses the same VSL for everyone regardless of income, the policy effect of this update is not that DOT favors rich people's lives more than poorer people's lives, but that DOT values everyone's lives more as overall income rises. DOT's estimate of the IEVSL nonetheless allows us to project how the agency *would* calculate the benefits of the rear visibility rule for different income groups if it applied the same income-elasticity assumption to its distributive analysis as it uses for its annual updating.

Results. Figure 1 illustrates benefits and costs of the rear visibility rule across the income distribution, with the above assumptions and an IEVSL equal to one. To make interpretation easier (given different household sizes across the income distribution), all figures reflect costs and benefits in *per capita* terms. The three cost curves reflect alternative assumptions regarding the installation cost of cameras. Vertical lines reflect quintile bounds calculated by the Census Bureau ($20,000 for the bottom quintile; $38,000 for the second quintile, $61,500 for the third quintile, and $100,029 for the fourth quintile). All figures are in 2010 dollars.[142]

Two observations emerge from Figure 1. First, while costs and benefits both rise with income, the benefits curve (in blue) is much steeper than the cost curves (red). Second, under all three cost assumptions, individuals at the bottom (left side) of the income distribution are made worse off by the rule and individuals at the top (right side) of the income distribution are made better off. The rear visibility rule thus appears to be a "regressive" regulation insofar as it redistributes from the very poor to the very rich—with households in the middle experiencing either positive or negative net benefits depending upon installation-cost assumptions.

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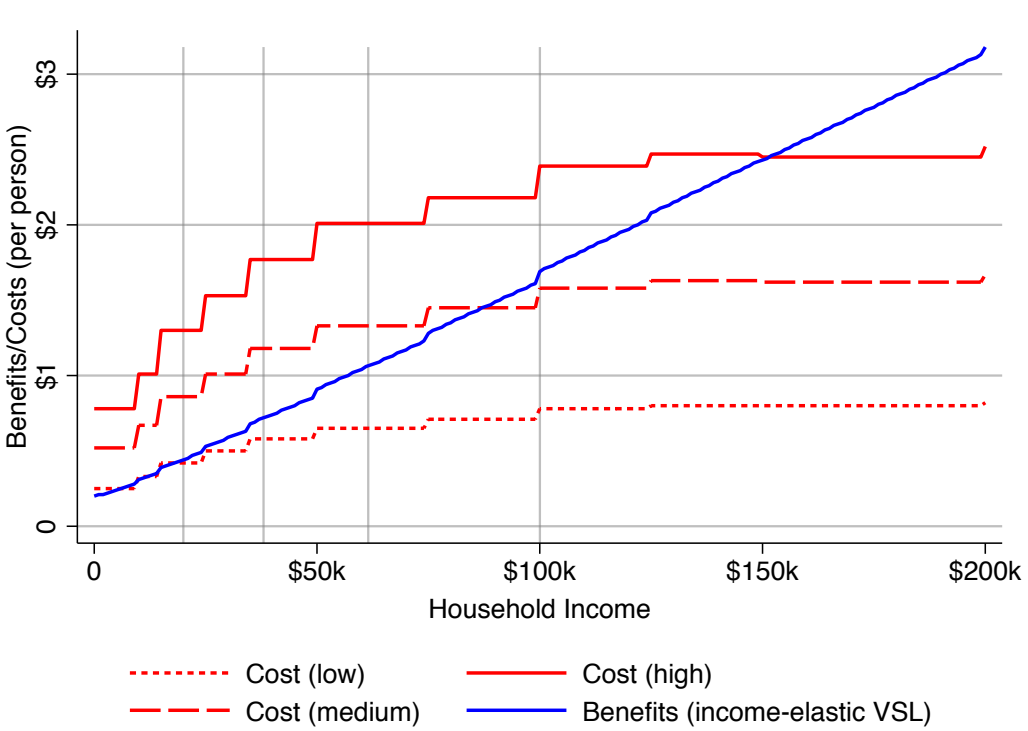
[139] Id. at 19.

[140] Dora L. Costa & Matthew E. Kahn, Changes in the Value of Life, 1940-1980, 29 J. Risk & Uncertainty 159 (2004); see also Ted R. Miller, Variations Between Countries in Values of a Statistical Life, 34 J. Transport Econ. & Pol'y 169 (2000) (income elasticity of the VSL between 0.85 and 1.00).

[141] Moran & Monje, Guidance on the Treatment of the Economic Value of a Statistical Life (VSL) in U.S. Department of Transportation Analyses—2016 Adjustment, supra note 31, at at 8-9. As of 2016, EPA was reconsidering its own estimates of the income elasticity of the VSL. See Staff of the EPA Office of Air & Radiation & Office of Policy, Recommended Income Elasticity and Income Growth Estimates: Technical Memorandum (Feb. 25, 2016), https://yosemite.epa.gov/sab/sabproduct.nsf/36a1ca3f683ae57a85256ce9006a32d0/0CA9E925C9A702F285257F380050C842/$File/Income+Elasticity+Technical+Memorandum_final_2_5_16_docx.pdf (articulating one approach that would yield a central-estimate IEVSL of 0.7 and another approach that would yield a central-estimate IEVSL of 1.1). As of this writing, the review process does not appear to have culminated.

[142] U.S. Census Bureau, Table H-1: Income Limits for Each Fifth and Top 5 Percent of All Households: 1967 to 2019 (last visited Oct. 10, 2020), https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-income-households/h01ar.xlsx.

Figure 1. Benefits and Costs of Rear Visibility Rule, by Household Income (2010$); Income Elasticity of the Value of a Statistical Life = 1

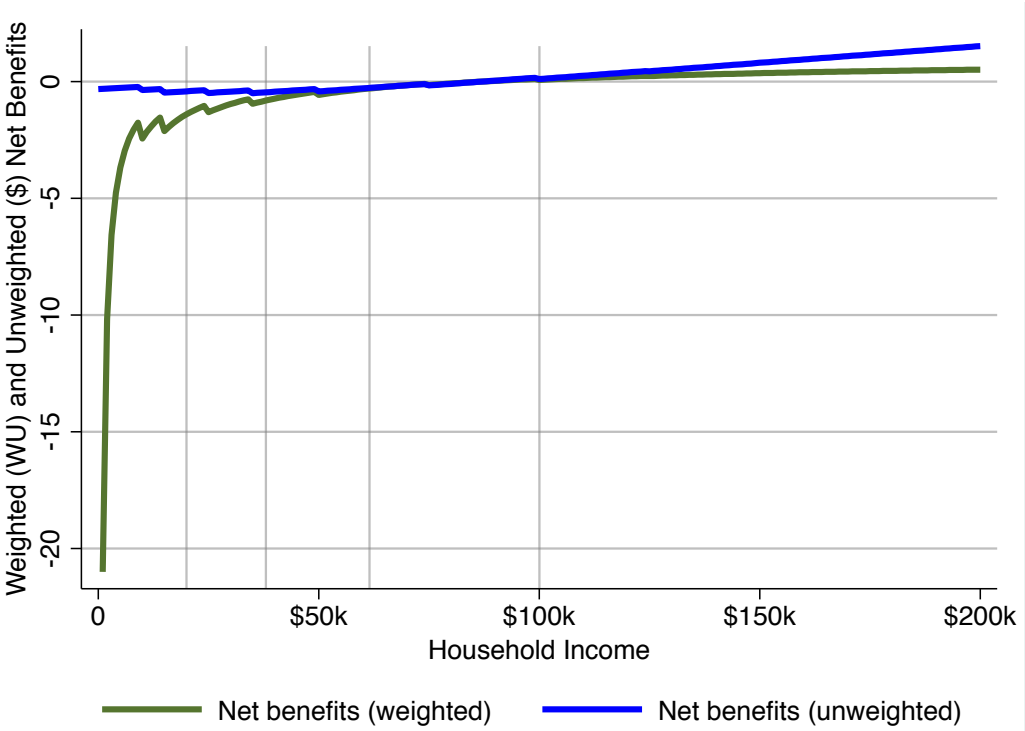


As noted above, the hard weighted approach to CBA would evaluate the rear visibility rule not based on an impressionistic assessment of its progressivity or regressivity, but based on a more formal weighted-welfare-unit analysis. To make results more easily interpretable, I will use welfare weights that are the ratio of mean household income to actual income (rather than one over actual income, which would yield an inordinate number of decimal points.) According to the Census Bureau, mean household income in 2010 was approximately $67,000.[143] So, for example, a household with income of $10,000 would have a weight of 6.7, and a $1 gain to that household would count for 6.7 weighted welfare units. Likewise, a household with income of $100,000 would have a weight of 0.67, and a $1 gain to that household would count for 0.67 weighted welfare units.

To illustrate the difference between the hard weighted approach and status quo CBA, Figure 2 shows weighted net benefits and unweighted net benefits for households across the income distribution, using an IEVSL of one to calculate benefits, and based on the midpoint estimate of costs (i.e., 50 percent of vehicles are already equipped with display screens). Vertical lines again delineate quintile boundaries. Figure 2 graphically emphasizes the fact that under a weighted approach, net costs to lower-income households count for much more in the aggregate analysis than net benefits to higher-income households.

[143] U.S. Census Bureau, Table H-5: Race and Hispanic Origin of Householder--Households by Median and Mean Income: 1967 to 2019 (last visited Oct. 10, 2020), https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-income-households/h05.xlsx (data for all races).

Figure 2. Weighted (welfare unit) and Unweighted ($) Net Benefits of Rear Visibility Rule, by Household Income; Midpoint Cost Assumption; Income Elasticity of the Value of a Statistical Life = 1

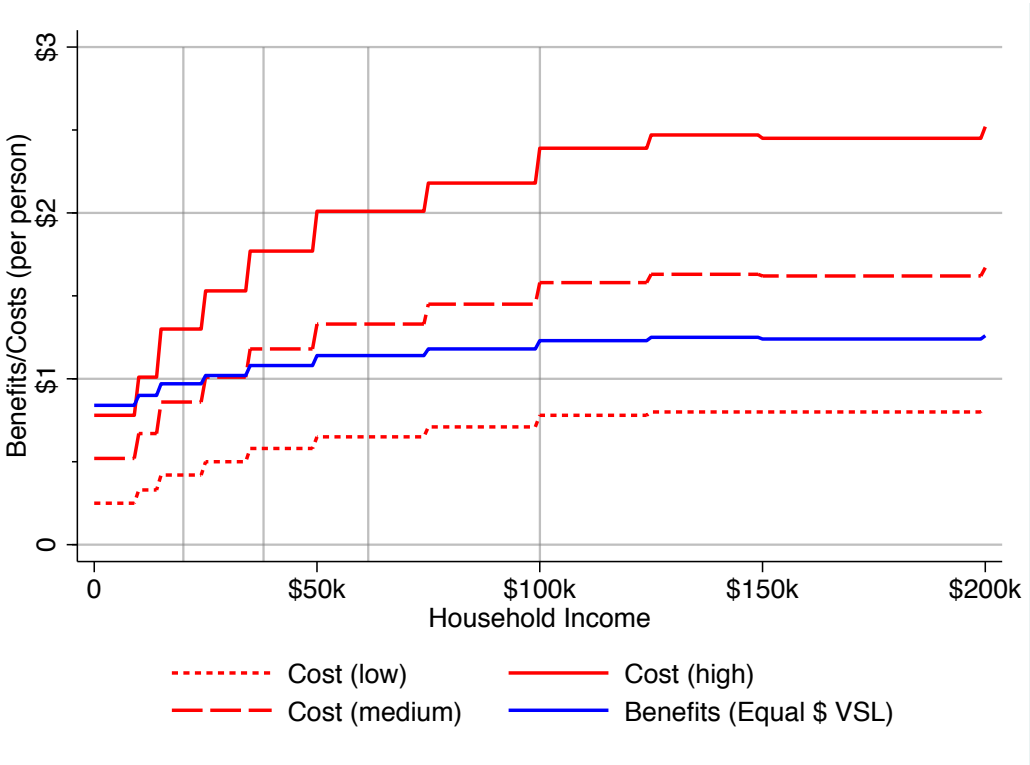


To assess whether weighted and unweighted CBA would ultimately recommend the rule, one more piece of information is needed: how income is distributed across the population. Based on income data from the 2010 Census,[144] the verdict under weighted CBA is reasonably clear: the net effect of the rule, in weighted welfare unit terms, is negative (-204 million weighted welfare units across the population). Textbook CBA yields the quantitative equivalent of a hung jury (-$9 million, which—given the imprecision of estimates—amounts to a finding that costs and benefits roughly balance out).

How would this analysis change if DOT used weighted CBA with equal dollar VSLs rather than income-elastic VSLs? In other words, what if we assigned a $10.5 million VSL to everyone but still performed a distributive analysis? The short answer is that everything would change. Indeed, key conclusions would reverse 180 degrees. Costs and benefits still would increase with income, but now, costs would increase more quickly than benefits. The upshot would be that the rule generates net *benefits* at the low end of the income distribution under all cost assumptions and net *costs* for the highest-income groups under all but the most optimistic cost assumptions.

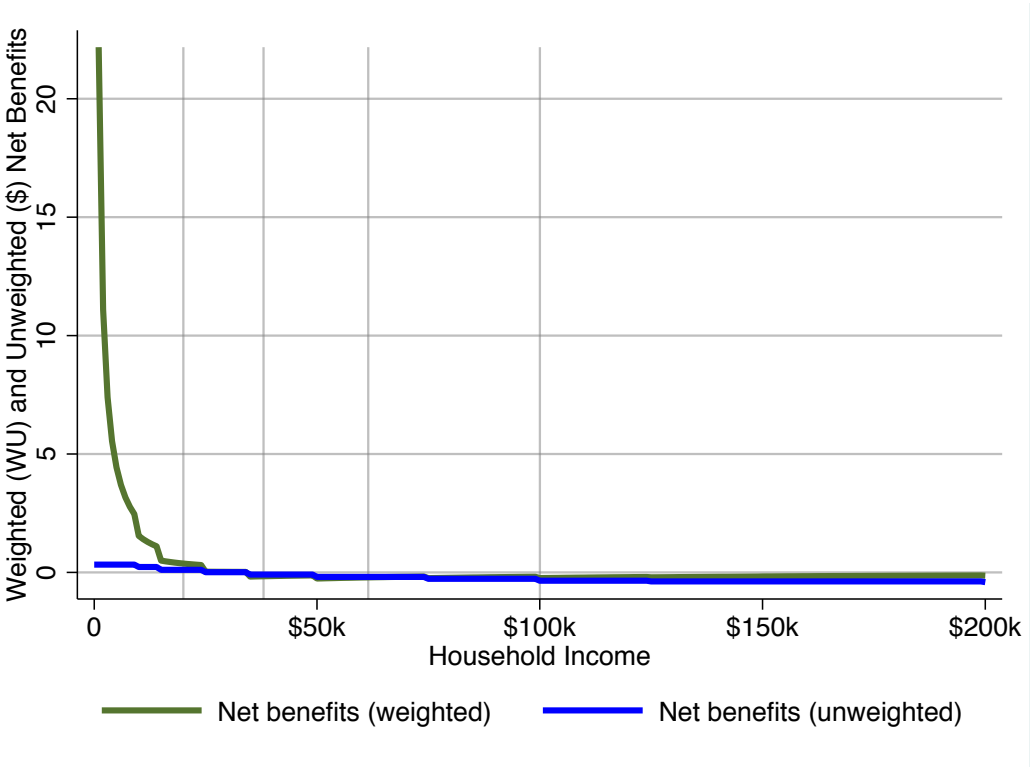
[144] U.S. Census Bureau, Table H-3: Mean Household Income Received by Each Fifth and Top 5 Percent: 1967 to 2019 (last visited Oct. 10, 2020), https://www2.census.gov/programs-surveys/cps/tables/time-series/historical-income-households/h03ar.xlsx.

Figure 3. Benefits and Costs of Rear Visibility Rule, by Household Income (2010$); Equal Dollar (Population Average) Values of a Statistical Life



The effects of using equal dollar (population average) VSLs appear even more dramatic when costs and benefits are calculated in weighted welfare units (Figure 4). The gains to households in the bottom two quintiles swamp losses in welfare-unit terms elsewhere in the distribution. Using the midpoint cost assumption, the net welfare effect of the rule is a *gain* of 56 million weighted welfare units across the population. Weighted CBA with equal dollar VSLs provides the exact opposite recommendation from the one we reached above.

Figure 4. Weighted (welfare unit) and Unweighted ($) Net Benefits of Rear Visibility Rule, by Household Income; Midpoint Cost Assumption; Equal Dollar (Population Average) Values of a Statistical Life



In sum, based on NHTSA and DOT's own data and assumptions (including the assumption that the IEVSL equals one), the rear visibility rule appears to fare worse under a soft or hard weighted analysis than under an unweighted analysis. Importantly, though, this verdict hinges entirely on the income elasticity of the VSL. Distributive analysis with equal dollar VSLs for everyone (i.e., an IEVSL equal to zero) will lead to diametrically opposite results. How to calculate VSLs across income groups will have enormously important implications for the weighted-CBA enterprise.

D. Practical Implications

How would NHTSA's decision have changed if the agency incorporated distributive objectives into its CBA—either through hard weighted CBA or through consideration of distributive effects as a soft variable—while maintaining its assumption that the IEVSL equals one? Here we are in the land of speculation, but we can imagine at least three possible agency responses.

First, and least likely, NHTSA might have adopted an explicitly *income-differentiated regulation*. For example, NHTSA might have said that the rearview camera requirement applies only to cars purchased by consumers with incomes over a certain threshold. It is rather doubtful, though, that the agency would have had statutory authority to draw such a distinction. The enabling statute, the Caremon Gulbransen Kids Transportation Safety Act, authorized NHTSA to

"prescribe different rules for different types of motor vehicles;"[145] it did not authorize NHTSA to prescribe different rules for different types of drivers. Beyond the statutory authority question, an income-differentiated rule would be enormously difficult to enforce (would automobile dealers be required to check the Form 1040 individual income tax returns of their customers to verify income?). And a secondary market in camera-free cars would undermine any effort to limit those vehicles to low-income buyers.

Second, and somewhat more likely, NHTSA might have issued an *income-correlated regulation*—one that draws distinctions based on attributes associated with income rather than distinctions based directly on income. For example, 50 percent of SUV buyers have household incomes above $75,000, versus only 43 percent of sedan and truck buyers.[146] In an attempt to exempt lower-income individuals from regulatory burdens, NHTSA might have issued a rear visibility regulation that applies to SUVs but not to sedans and trucks. Shifting from explicit income differentiation to income-correlated rules will substantially reduce the redistributive potential of regulations (the income profiles of SUV, sedan, and truck buyers are different, but not *that* different). Income-correlated regulations will, however, address some of the enforceability challenges arising from explicit income differentiation.

Third and finally, NHTSA might have adopted a generally applicable policy informed by redistributive considerations. For example, if NHTSA concluded that the rear visibility rule would impose inordinate costs on lower-income individuals, NHTSA might have decided not to issue any rearview camera requirement. This approach would mitigate some of the statutory and practical challenges arising from income-differentiated and income-correlated rules. But it would even further reduce the potential for meaningful redistribution.[147]

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[145] Pub. L. No. 110-189, § 2(c), 122 Stat. at 640.

[146] See New Buyer Demographics 2020 (Updated), Hedges & Co., https://hedgescompany.com/blog/2019/01/new-car-buyer-demographics-2019 (last visited Oct. 16, 2020).

[147] An interesting question for administrative law scholars is whether even the third approach would survive judicial review. Could NHTSA get away with saying that it was adopting or not adopting a rule primarily because of distributive concerns?

NHTSA motor vehicle safety standards—like other agency rules—are subject to the criteria set forth in the Supreme Court's decision in *Motor Vehicle Manufacturers Association of the United States v. State Farm Mutual Automobile Insurance Co.*, 463 U.S. 29 (1983), which provides a gloss on the Administrative Procedure Act's "arbitrary and capricious" standard. 5 U.S.C. 706(2)(A) (court shall hold unlawful and set aside agency action found to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law"). The Court in *State Farm* emphasized that "[t]he scope of review under the 'arbitrary and capricious' standard is narrow and a court is not to substitute its judgment for that of the agency." 463 U.S. at 43. The Court noted, though, that "[n]ormally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider" or "entirely failed to consider an important aspect of the problem." Id.

One can imagine arguments based on *State Farm* going in both directions. Advocates of distributionally weighted CBA might argue that agencies, when *not* accounting for distributive effects, "entirely fail[] to consider an important aspect of the problem." Or the argument could go in reverse: that Congress sets redistributive policy through the tax-and-transfer system and thus that an agency regulating on the basis of its own distributive judgments "has relied on factors which Congress has not intended it to consider." My own view is that, just as "[t]he Fourteenth Amendment does not enact Mr. Herbert Spencer's Social Statics," the Administrative Procedure Act does not enact Professor Paul Samuelson's Pure Theory of Public Expenditure. Cf. Lochner v. New York, 198 U.S. 45, 75 (Holmes, J., dissenting); Paul A. Samuelson, The

Weighted CBA with equal dollar VSLs, by contrast, would encourage adoption of the rule with no exemptions or carveouts. That is, it would offer exactly the opposite recommendation of weighted CBA with income-elastic VSLs. While it may seem superficially attractive to maintain equal dollar VSLs for all income groups, note that the prescription generated by weighted CBA with equal dollar VSLs leaves lower-income individuals worse off under standard economic reasoning (and, indeed, commonsense intuition).

Textbook CBA (i.e., unweighted CBA with income-elastic VSLs) would potentially favor the first or the second approach. Textbook CBA typically favors rules that require lower-income individuals to purchase less safety. But once one decides to issue a generally applicable rule, textbook CBA does not provide a reason for prioritizing lower-income individuals' interests over higher-income individuals' interests. For rules that apply on a population-wide basis, like the rear visibility rule, textbook CBA and status quo CBA largely align (though they may diverge if, for example, a disproportionate number of lives saved by a regulation are in higher-income or lower-income groups).[148]

In sum, the practical implications of distributionally weighted CBA for the rear visibility rule would be significant. Weighted CBA with income-elastic VSLs would make it much harder for NHTSA to justify the rule. (Weighted CBA with equal dollar VSLs would make it much easier.) The next section considers whether weighted CBA would have similarly profound effects on other lifesaving regulations.

E. Generalizability

To what extent are the conclusions of the rear visibility rule case study generalizable to other important environmental, health, and safety regulations? This section seeks to shed light on that question. It suggests that the rear visibility rule is not a one-off, though determining just how many major federal regulations would flunk weighted CBA with income-elastic VSLs will require a case-by-case analysis beyond a single study's scope.

Before diving into the details, a crucial caveat is in order. Distributive analysis is difficult. One cannot glance casually at a rule and guesstimate its distributive effects very accurately. This is so for at least three reasons.

The first and most obvious reason is lack of data. Because agencies generally don't analyze the effects of their regulations across income groups, they usually don't collect the sort of information we would need for a comprehensive distributive analysis. For example, in the rear visibility case, NHTSA's Special Crash Investigations (SCI) program probed 50 backover crash cases, gathering information that later helped the agency assess whether the crash could have been avoided by rearview cameras.[149] The agency's summation of its SCI findings, though,

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Pure Theory of Public Expenditure, 36 Rev. Econ. Studies 387 (1954) (intellectual foundation for textbook CBA). So even though I ultimately don't think agencies should apply hard or soft distributional weights, I don't think the APA and *State Farm* categorically preclude those approaches.

[148] Here, there is actually a slight difference between textbook CBA and status quo CBA. With midpoint cost assumptions, the rule generates net costs of $9 million under textbook CBA and net costs of $37 million under status quo CBA. The gap—which is quite small within the scheme of a rule this size—emerges because equivalent lives saved skew modestly toward the higher end of the income distribution.

[149] See Final RIA, supra note 109, at 34-43.

included no information on the income of the driver or victim. After-the-fact distributive analyses of other rules are likely to encounter similar data limitations.

Second, the ultimate incidence of regulatory costs will not always be apparent even when the immediate incidence is clear. Motor vehicle safety standards are somewhat special in this respect because we have theoretical and empirical reasons to believe that manufacturers will pass costs through to consumers.[150] In other cases, though, it will be much harder to determine whether costs will be passed through and if so, to whom. For example, who bears the cost of DOT's 2003 rule limiting the number of consecutive hours that commercial motor vehicle drivers can work without a break?[151] Do owners of transportation companies pass on those costs to drivers in the form of lower total wages, or do they pass on the costs to customers in the form of higher prices, or do they bear the costs themselves in the form of narrower profit margins? The answer is not obvious, and the results of any distributive analysis will almost certainly depend on whether costs are borne by working-class truck drivers[152] or by shareholders of United Parcel Service and Federal Express.

Third, and symmetrically, just as the incidence of regulatory costs may be opaque, the incidence of regulatory benefits may be difficult to discern. For example, local environmental improvements are likely to raise property values in affected areas, benefiting homeowners but potentially pushing up rents.[153] Nearly half of households with below-median family incomes are renters,[154] and the rate of renting is much higher (above 80 percent) among households in poverty who receive public assistance.[155] The interaction with rents poses the possibility that pollution control and hazard remediation will lead to "environmental gentrification," displacing poorer residents of neighborhoods where environmental quality has improved.[156]

All this is to say that without careful case-by-case analysis, broad generalizations about the distributive effects of environmental, health, and safety regulations are highly hazardous. With that caveat in mind, though, we can make three limited observations.

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[150] See supra notes 123-125 and accompanying text.

[151] See 68 Fed. Reg. 22,456, 22,456-57 (Apr. 28, 2003) (limiting drivers to 11 hours of driving in their first 14 hours on a shift, after which they must take at least 10 hours off before driving again). For subsequent history, see Public Citizen v. Fed. Motor Carrier Safety Admin., 374 F.3d 1209 (D.C. Cir. 2004) (vacating rule); . Transportation Extension Act of 2004, Part V, Pub. L. No. 108-310, § 7(f), 118 Stat. 1144, 1154 (temporarily reinstating rule); 70 Fed. Reg. 49,978, 49,980 (Aug. 25, 2005) (readopting rule).

[152] According to the Bureau of Labor Statistics, median pay for heavy and tractor-trailer truck drivers in 2019 was $45,260 per year. For delivery truck drivers, it was $32,020. See U.S. Bureau of Labor Statistics, Occupational Outlook Handbook, https://www.bls.gov/ooh (last updated Sept. 1, 2020).

[153] See Jacob L. Vigdor, Does Environmental Remediation Benefit the Poor?, in The Political Economy of Environmental Justice 52, 53 (Spencer Banzhaf ed., 2012).

[154] U.S. Census Bureau, Quarterly Residential Vacancies and Homeownership 10 tbl.8 (July 28, 2020), https://www.census.gov/housing/hvs/files/currenthvspress.pdf.

[155] See H. Spencer Banzhaf & Eleanor McCormick, Moving Beyond Cleanup: Identifying the Crucibles of Environmental Gentrification, in The Political Economy of Environmental Justice 23, 23 (Spencer Banzhaf ed., 2012).

[156] See id. at 24; National Environmental Justice Advisory Council, Unintended Impacts of Redevelopment and Revitalization Efforts in Five Environmental Justice Communities: Final Report (Aug. 2006), http://www.epa.gov/compliance/ej/resources/publications/nejac/redev-revital-recomm-9-27-06.pdf.

First, as Dustin Chambers, Courtney Collins, and Alan Krause document, lower-income households spend larger shares of their incomes on goods and services in sectors subject to more intensive federal regulation.[157] This should not be terribly surprising. Food, healthcare, transportation, and utilities all are highly regulated industries. A household earning $200,000 will likely spend more on (for example) food than a household earning $20,000, but not 10 times more. Thus, the income elasticity of regulatory costs will generally be less than one (i.e., a 1 percent increase in household income will lead to less than a 1 percent increase in regulatory costs). Chambers, Collins, and Krause infer from this finding that regulations therefore have a "regressive" impact.[158] But of course, regulations generate benefits as well as costs, and we cannot reach definitive conclusions about the effects of regulations on different income groups without knowing something more about the distribution of benefits.

Second, with respect to motor vehicle safety standards specifically, there are strong reasons to believe that these regulations will fare worse under weighted CBA with income-elastic VSLs than under status quo or textbook CBA. Consider, for example, NHTSA's 2009 roof crush resistance rule, which the agency estimated would prevent 135 deaths and 1065 nonfatal injuries per year.[159] NHTSA projected that the cost per equivalent life saved would be between $6.1 million and $9.8 million,[160] which rendered the rule roughly breakeven according to the agency's then-current VSL estimate.[161] If a motor vehicle safety standard is breakeven overall, then it is very likely net negative for lower-income groups with below-average VSLs and net positive for higher-income groups with above-average VSLs. And with distributional weights inverse to income, the net costs to lower-income households would count for much more in the aggregate analysis. Similar observations apply to other close-call NHTSA rules, like the 2001 advanced air bags standard[162] and the 2007 side impact protection update.[163] Regulations that impose relatively constant costs across income groups in exchange for largely uniform lifesaving benefits will struggle to survive under weighted CBA with income-elastic VSLs.

Third, there is one area of regulation for which the literature on distributive effects is large: air pollution control. This literature yields two clear lessons with ambiguous implications. One robust funding is that the costs of air pollution control are larger as a proportion of income for lower-income households than for higher-income households.[164] In this sense, pollution

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[157] See Dustin Chambers, Courtney A. Collins & Alan Krause, How Do Federal Regulations Affect Consumer Prices? An Analysis of the Regressive Effects of Regulation, 180 Pub. Choice 57 (2019).

[158] See id. at 81.

[159] 74 Fed. Reg. 22,348, 22,377 (May 12, 2009).

[160] Id. at 22,378 tbl.2.

[161] At the time, DOT guidance specified a VSL of $5.8 million. See id. at 22,377.

[162] 66 Fed. Reg. 65,376 (Dec. 18, 2001). Net benefits ranged from $140 million to $1.6 billion and net costs from $400 million to $2 billion. See supra Table 1.

[163] 72 Fed. Reg. 51,907 (Sept. 11, 2007). Net benefits ranged from $736 million to $1.06 billion in 2001 dollars and net costs from$401 million to $1.05 billion. See supra Table 1. The rear visibility rule likely fares *better* in distributive analysis than other NHTSA motor vehicle safety standards because lower-income individuals—who might not buy cars subject to the standards—nonetheless capture a share of external benefits. Many other NHTSA rules, like the roof crush resistance and side impact protection standards, generate benefits primarily for the driver and her passengers, not for other motorists, cyclists, and pedestrians.

[164] See, e.g., Sarah E. West, Distributional Effects of Alternative Vehicle Pollution Control Policies, 88 J. Pub. Econ. 735, 753-54 (2004) (modeling CAFE standards as a tax on new vehicles that are large and finding that

controls are "regressive."[165] A second finding is that lower-income groups suffer more from air pollution than higher-income groups.[166] Although evidence regarding the relationship between income and *exposure* to air pollution is mixed,[167] the effect of exposure on mortality and morbidity appears to be larger among lower-income groups.[168] Possible explanations include that lower-income individuals are more likely to suffer from underlying medical conditions, are less likely to have healthcare access,[169] and are less likely to have air conditioning.[170]

Only a few studies combine costs and benefits to assess the overall effect of air pollution control across income groups, with mixed results.[171] Most recently, Akshaya Jha, Peter

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lower-income households would pay a larger proportion of their income than higher-income households); Sarah E. West & Roberton C. Williams III, Estimates from a Consumer Demand System: Implications for the Incidence of Environmental Taxes, 47 Envtl. Econ. & Mgmt. 535, 551 tbl.1 (2004) (finding that burden of gas tax as a proportion of income is higher for lower- and middle-income households than for households in the top quintile under a variety of demand-response scenarios); Sebastian Rausch, Gilbert E. Metcalf & John M. Reily, Distributional Impacts of Carbon Pricing: A General Equilibrium Approach with Micro-Data for Households, 33 Energy Econ. S20, S25 (2011) (noting that lower-income groups spend a larger fraction of their income on energy-intensive goods).

[165] See Richard J. Lazarus, Pursuing Environmental Justice: The Distributional Effects of Environmental Protection, 87 Nw. U. L. Rev. 787, 800 (1993) (summarizing literature up to that date).

[166] See Nicholas Z. Muller, Peter Hans Matthews & Virginia Wiltshire-Gordon, The Distribution of Income Is Worse Than You Think: Including Pollution Impacts Into Measures of Income Inequality, 13 PLoS ONE e019246 (2018) (finding that lower-income groups suffer larger health-related damages from air pollution, even though differences in exposure across income groups are relatively small).

[167] Compare Paul J. Brochu et al., Particulate Air Pollution and Socioeconomic Position in Rural and Urban Areas of the Northeastern United States, 101 Am. J. Pub. Health S224 (2011) (household income negatively associated with particulate matter levels in Northeast), with Zhengyan Li, David M. Konisky & Nikolaos Zirogiannis, Racial, Ethnic, and Income Disparities in Air Pollution: A Study of Excess Emissions in Texas, 14 PLoS One e0220696 (2019) (household income positively associated with particulate matter levels in Texas).

[168] See Matthew J. Neidell, Air Pollution, Health, and Socio-Economic Status: The Effect of Outdoor Air Quality on Childhood Asthma, 23 J. Health Econ. 1209 (2004) (finding that the effect of air pollution on childhood hospitalizations for asthma is larger for children in lower-income households); Yan Wang et al., Long-Term Exposure to $PM_{2.5}$ and Mortality Among Older Adults in the Southeastern United States, 28 Epidemiology 207 (2017) (finding stronger effect of particulate matter exposure on mortality among lower-income adults).

[169] See Wang et al., supra note 168 (proposing lower baseline health and less access to health care services as explanations); Sabit Cakmaka, Robert E. Dales, Maria Angelica Rubio & Claudia Blanco Vidal, The Risk of Dying on Days of Higher Air Pollution Among the Socially Disadvantaged Elderly, 111 Envtl. Research 388 (2011) (suggesting that healthcare access, smoking rates, and exposure to co-pollutants such as occupational dust and fumes as explanations).

[170] See supra note 67 and accompanying text.

[171] Compare David Harrison, Jr., Who Pays for Clean Air?: The Cost and Benefit Distribution of Federal Automobile Emission Controls 128-131 (1975) (finding that cost of automobile emission controls as a proportion of income is larger for lower-income households than for higher-income households, while distribution of benefits by income is less clear); Robert Dorfman, Incidence of the Benefits and Costs of Environmental Programs, 67 Am. Econ. Rev.: Papers & Proceedings 333, 337 tbl.2 (1977) (estimating benefits of pollution control based on self-reported willingness to pay and finding that pollution control imposes net costs on lower-income households and yields net benefits for higher-income households); and F. Reed Johnson, Income Distributional Effects of Air Pollution Abatement: A General Equilibrium Approach, 8 Atlantic Econ. J. 10 (1980) (finding that sulfur abatement policy in Sweden imposes net costs on low-income groups and yields net benefits for high-income groups), with Leonard P. Gianessi, Henry M. Peskin & Edward Wolff,

Matthews, and Nicholas Muller examine the overall distributive effects of EPA's 2006 national ambient air quality standard for fine particulate matter[172] and its 2008 standard for ozone.[173] After adjusting income to account for pollution-related damages, the authors conclude that the two rules led to an increase in income inequality.[174] They explain that benefits "accrue disproportionately to cities, which tend to have higher income on average than rural areas."[175]

These findings do not mean that EPA air quality standards will necessarily flunk distributionally weighted CBA. At least for the highest-cost EPA regulations,[176] benefits so overwhelmingly exceed costs that these regulations might survive CBA even under the most unfavorable approach.[177] Statutory limits on the consideration of costs in the setting of national ambient air quality standards also might ensure that the rules survive intact even if weighted CBA recommends that they be modified.[178] Benefits and costs for motor vehicle safety standards tend to be somewhat less lopsided, though, and so the potential for distributive analysis to tip the balance is greater there. Moreover, NHTSA is not prohibited from considering costs in setting federal motor vehicle safety standards, so it would have more leeway to adjust those standards in light of redistributive objectives.

In sum, there are strong reasons to believe that the rear visibility rule is not a one-off instance of a regulation that would fare worse under standard weighted CBA than under status quo CBA. At the same time, not every major federal environmental, health, or safety rule will share the same distributive properties. Thus the claim here is not that weighted CBA with income-elastic VSLs will doom every lifesaving rule in Table 1: each regulation requires its own analysis.

The Distributional Effects of Uniform Air Pollution Policy in the United States, 93 Q. J. Econ. 281, 294-95 tbl.VI (1979) (finding that industrial air pollution controls impose net costs on higher-income households and generate net benefits for lower-income households, while automobile emissions controls impose net costs on all income groups); Matthew E. Kahn, The Beneficiaries of Clean Air Act Regulation, 24 Regulation 34, 38 (2001) ("[I]t appears that regulation under the Clean Air Act has helped, and not economically harmed, the 'have nots.'").

[172] 71 Fed. Reg. 61,144 (Oct. 17, 2006).

[173] 73 Fed. Reg. 16,436 (Mar. 27, 2008).

[174] Akshaya Jha, Peter H. Matthews, and Nicholas Z. Muller, Does Environmental Policy Affect Income Inequality? Evidence from the Clean Air Act, 109 AEA Papers and Proceedings 271, 273 tbl.1 (2019).

[175] See id. at 274-75.

[176] See supra Table 1.

[177] With the one exception of the NAAQS for lead, the low end of the benefits range exceeds the high end of the cost range for all the rules issued by the EPA alone in Table 1.

[178] The Clean Air Act requires EPA to set primary NAAQS at levels that, "allowing an adequate margin for safety, are requisite to protect public health." 42 U.S.C. § 7409(b)(1). The Supreme Court, in the 2001 case *Whitman v. American Trucking Associations*, interpreted that language to prohibit EPA from considering "implementation costs" in setting NAAQS. 531 U.S. 457, 486 (2001). In theory, EPA might argue that poverty and income inequality generate negative health effects, and so income redistribution—by reducing poverty and inequality—thereby serves to "protect public health." See, e.g., Eric Neumayer & Thomas Plümper, Inequalities of Income and Inequalities of Longevity: A Cross-Country Study, 106 Am. J. Pub. Health 160, 160 & nn.5-8 (2016) (compiling sources); Beth C. Truesdale & Christopher Jencks, The Health Effects of Income Inequality: Averages and Disparities, 37 Annual Rev. Pub. Health 413 (2016). But it is somewhat doubtful that the courts would effectively allow EPA to undo *Whitman* by reframing cost considerations as poverty reduction.

Weighted CBA with income-elastic VSLs likely would, though, swing the scales in a number of cases—particularly in motor vehicle and other product safety contexts.

IV. Normative Implications

This part shifts from a descriptive register to a normative one. It takes up two questions: first, whether CBA should retain its commitment to equal dollar VSLs at all income levels, and second, whether CBA should continue to be unweighted (i.e., distribution neutral). The analysis in this part operates as a sort of meta-cost-benefit analysis—cost-benefit analysis about how we should do cost-benefit analysis. Meta-CBA, like first-order CBA, entails difficult choices among imperfect options. I ultimately come down on the side of the status quo—unweighted CBA with equal dollar VSLs—though reasonable minds may differ. While I hope to convince readers of the bottom-line result, the primary purpose of this part is not to win converts but to make tradeoffs transparent.

The meta-cost-benefit analysis proceeds in four parts. Section IV.A considers whether the choice among the various approaches to CBA can be resolved on ethical grounds. For the most part, the answer appears to be no. Even if we take it as a given that the government must accord equal value to all lives, alternatives to status quo CBA still vindicate the equal-value-for-all-lives principle—they just define value in welfare-unit rather than dollar terms. Section IV.B examines expressivist arguments for the various approaches. It considers whether the use of income-elastic VSLs in an unweighted or weighted analysis might communicate disrespect for low-income individuals—either through the procedures employed or the policies prescribed. This is, I think, a real cause for concern, though I will suggest some ways that practitioners of CBA might be able to use income-elastic VSLs while mitigating expressive harms. Section IV.C examines the different informational burdens imposed by various approaches to CBA. An advantage of the status quo approach—unweighted CBA with equal dollar VSLs—is that it significantly economizes on information costs. Section IV.C also considers how the informational burdens of alternative approaches would interact with other agency and executive-branch policy priorities. Section IV.D looks to the tax system. It argues that the executive branch has a number of options apart from distributionally weighted CBA that would allow a President to achieve distributive objectives much more effectively.

A. "Equal Value for All Lives"?

For some readers, the question of whether we should assign equal values to the lives of rich people and poor people may seem straightforward. As Deborah Hellman writes (though not in the CBA context), the "equal moral worth of all persons" is a "bedrock moral principle."[179] There is, to be sure, a distinction between assigning different VSLs to different people and ascribing different moral worth to different people.[180] But even assuming that "equal value for

[179] Deborah Hellman, When Is Discrimination Wrong? 6 (2008).

[180] See Benjamin Eidelson, Comment, Kidney Allocation and the Limits of the Age Discrimination Act, 122 Yale L.J. 1635, 1647 (2013).

all lives" (or "equal value for all life-years") is a moral or ethical mandate, that won't resolve the debate here (except perhaps to further rule out one already-unattractive option).

A modification of philosopher Philippa Foot's famous trolley problem will serve to motivate the discussion.[181] Imagine that the driver of a runaway trolley can only steer from one track to another. On one track are 99,999 average Americans and on the other track is the CEO of the world's most valuable company, with an income 100,000 times the average American's. Let's say that the trolley company is state-owned, the driver is a government employee, and (notwithstanding the fact that she is steering a runaway trolley) the driver has the wherewithal amidst all of this to realize that the lone man is the world's richest person. Should the driver direct the trolley so that it hits the 99,999 average Americans (whose combined income-elastic VSLs are $999.99 billion) and avoids the CEO (whose income-elastic VSL is $10 million x 100,000 = $1 trillion)?

The question seems to be self-answering. One virtue of status quo CBA is that it gets the modified trolley problem "right," in the sense that it saves the 99,999 average Americans. But status quo CBA is not the only approach that yields this outcome. Distributionally weighted CBA with the standard assumptions (i.e., weights inverse to income and an IEVSL equal to one) does too. The average American's distributional weight is one and her VSL is $10 million, so the value of saving 99,999 average Americans is 999.99 billion welfare units. The CEO with an income 100,000 times the average American's receives a distributional weight of 1/100,000; with an income-elastic VSL of $1 trillion, the value of saving his life is 10 million welfare units. Distributionally weighted CBA with the standard assumptions easily chooses the 99,999 average Americans over the CEO. It just does so with an extra arithmetic step.

On first glance, textbook CBA would appear to yield a different result. The CEO's income-elastic VSL of $1 trillion trumps the 99,999 average Americans' aggregate VSLs of $999.99 billion. The hypothetical is concededly contrived, but textbook CBA's answer to the hypothetical still seems startling.

On further inspection, though, it is not so clear that textbook CBA really would favor the CEO over the 99,999 others. To see why, let's posit that utilitarianism is the correct approach to normative analysis. When utility is logarithmic in income, weighted CBA with the standard assumptions is an implementation of utilitarianism. And recall that weighted CBA with the standard assumptions yields equal values for all lives in welfare-unit terms.

Now return to the Boadway-Keen model introduced in Section II.A. When the tax system is optimal and weak separability applies, textbook CBA gives us the same prescriptions that weighted CBA would if weighted CBA were symmetrical. That is, with weights inverse to income, an IEVSL equal to one, and consideration of both the welfare benefits of redistribution and the concomitant deadweight loss, textbook CBA just spits out the answer that weighted CBA would give us (provided that the tax system is optimal).

Bringing this all back to the billionaire on the tracks, the practitioner of textbook CBA can offer the following response to the modified trolley problem: *Look, I'm really a utilitarian at heart who thinks the tax system is optimal, and so I apply textbook CBA because it serves as a short cut*

[181] See Philippa Foot, The Problem of Abortion and the Doctrine of Double Effect, in Virtues and Vices and Other Essays in Moral Philosophy 19 (1978); Judith Jarvis Thompson, The Trolley Problem, 94 Yale L.J. 1395 (1985).

to the utilitarian solution. Since I think the tax system is optimal, I think the welfare gain from additional redistribution generally equals the welfare loss from additional labor/leisure distortions, so I ignore distributive effects and focus on efficiency effects in CBA. But if we stipulate that I can save 99,999 average Americans' lives at the cost of one multibillionaire's life without any effect on deadweight loss, then of course I will choose the 99,999 over the one. After all, I'm really a utilitarian at heart. In more realistic scenarios, there may be deadweight loss to worry about, but if we stipulate that there isn't here, then this case is as easy for me as for the adherent to status quo CBA or standard weighted CBA.

Somewhat surprisingly, the approach that is most difficult to reconcile with the equal-value-for-all-lives principle is weighted CBA with equal dollar VSLs. To flip the modified trolley problem, if there were a single average American on one track and 99,999 CEOs on the other, the practitioner of weighted CBA with weights inverse to income and equal dollar VSLs for everyone would favor the average American. The benefit of saving the average American would be 10 million welfare units, and the benefit of saving 99,999 CEOs would be 99,999 x (1/100,000) x $10 million = 9.9999 million welfare units. The notion that we should sacrifice tens of thousands of average Americans to save a single billionaire is horrific, but the notion that we would sacrifice tens of thousands of billionaires (if there were tens of thousands of billionaires) to save an average American is no more palatable. Moreover, unlike in the case of textbook CBA, we can't reverse-engineer a defensible moral theory from weighted CBA with equal dollar VSLs.

In sum, the ethical principle that all lives have equal value potentially helps us to further rule out weighted CBA with equal dollar VSLs, but it fails to resolve the debate among textbook CBA, status quo CBA, and weighted CBA with the standard assumptions. The choice among those approaches will have to be made on other grounds.

B. Expressive Harms

A second approach to the choice between equal dollar VSLs and income-elastic VSLs emphasizes expressive consequences. As Richard McAdams notes, claims about the content of expression can refer to the meaning intended by the speaker (first party), the meaning perceived by the audience (second party), or the meaning as interpreted by a hypothetical reasonable person (third party).[182] Like McAdams, my focus is on the *consequences* of expression and so emphasizes the second-party perspective: how will individuals—and in particular, lower-income individuals—perceive the results of CBA with income-elastic VSLs? What message will they glean from a procedure that assigns a lower dollar value to their lives and/or from the policies that such a procedure prescribes? And most importantly, what welfare effects will follow from those interpretations?

While scholars sometimes distinguish between "expressivist" and "consequentialist" claims,[183] the concern here about expressive harms remains entirely consequentialist. Individuals

[182] See Richard H. McAdams, The Expressive Powers of Law 240-46 (2015) (presenting a typology of expressive claims about law).

[183] See Elizabeth S. Anderson & Richard H. Pildes, Expressive Theories of Law: A General Restatement, 148 U. Pa. L. Rev. 1503, 1556 (2000) (arguing that constitutional law "is pervasively oriented to expressivist, rather than to consequentialist, welfare-maximizing, or functional concerns").

experience real harms from what they perceive to be expressions of disrespect. A law student suffers harm when a professor calls him by the wrong first name. The student may be less likely to seek out the professor for an independent study or a letter of recommendation down the road, and even apart from that, he may experience disutility in the moment. Whether the student suffers harm does not depend on whether the professor meant any disrespect (though the fact that the professor failed to predict and avert the expressive harm may justify us in saying that the professor, consciously or not, *did* disrespect the student).[184] Assigning a precise number of dollars or welfare units to the harm may be hard, though we could at least settle on a broad range (it's not $1 but it's also probably not $10,000).

The argument here about income-elastic VSLs focuses on harms of a similar sort. Let's stipulate that practitioners of textbook CBA and weighted CBA with income-elastic VSLs do not mean to communicate disrespect for low-income individuals by assigning their lives a lower dollar value. Indeed, the practitioners' motivation may be to *improve* the lot of low-income individuals. What matters to the welfarist, though, is not only what practitioners intend but also how the practice is perceived and what consequences follow from those perceptions. And it is not hard to imagine circumstances in which individuals would perceive the use of income-elastic VSLs to be an indication of disrespect regardless of the practitioners' intent.

Relevant expressive harms could arise through several channels. First, the very fact that agency officials assign lower dollar VSLs to lower-income individuals might itself give rise to expressive harms. Agencies publicly release their "regulatory impact analyses" (the documents that detail their CBAs), and they typically summarize key elements of the CBA in the preambles to proposed and final rules published in the Federal Register. Although it is unlikely that large numbers of Americans will read regulatory impact analyses and Federal Register notices in their original form, reporters likely will read these documents. Before deciding to use lower dollar VSLs for lower-income individuals, practitioners of CBA need to think about the consequences of news headlines declaring, for example, that EPA and DOT are discounting poorer people's lives.

The concern is not purely about public relations. It is, virtually all will agree, a bad thing if millions of Americans think that the federal government values their interests less than the interests of other citizens—and bad for reasons beyond the fact that agency officials may endure a few difficult news cycles. We derive utility from believing that federal officials are looking out for our interests and disutility from believing that they are not. Public confidence in government is a difficult-to-quantify value, but it is not a trivial value. One consideration in the decision to (or not to) use income-elastic VSLs should be whether the practice will be interpreted as communicating a lack of concern for lower-income individuals' interests.

Although this concern is serious, it is also partly mitigable—at least in the hard weighted CBA context. Insofar as the concern arises solely from the use of different dollar VSLs for

[184] As Benjamin Eidelson notes, the fact that an action "will predictably appear disrespectful" in light of social conventions may mean that it *is* disrespectful in a nonconsequentialist sense. Benjamin Eidelson, Respect, Individualism, and Colorblindness, 129 Yale L.J. 1600, 1621 (2020). Treating other people "in a way consistent with their value" requires one to take into account their predictable reactions. See id. at 1619-21. The argument in body text does not depend, though, on the idea that disrespect has "any moral importance apart from its effects." See id. at 1621 n.63. The argument depends only on the claim that policymakers should be concerned about the harms they inflict through their policies and through the procedures they use to select their policies.

individuals of different incomes, the most straightforward solution is just not to use dollar VSLs. The typical approach to hard weighted CBA is to calculate net benefits in dollar terms for all individuals or income groups and then to convert those dollar terms into welfare units via multiplication by distributional weights. But practitioners of hard weighted CBA could take a different approach. They could (1) calculate net *non-mortality* benefits for all individuals or income groups, (2) convert those dollar terms into welfare units via multiplication by distributional weights, and then (3) add net mortality benefits in welfare-unit terms without ever assigning dollar VSLs to anyone. Recall again that hard weighted CBA with the standard assumptions—distributional weights inverse to income and an IEVSL equal to one—assigns the same number of welfare units to all lives. So the practitioner of hard weighted CBA with the standard assumptions simply needs to know the standardized welfare-unit value of a life or equivalent life and can proceed from there.[185]

This workaround to avoid the use of different dollar VSLs for individuals of different incomes won't, though, fully address a second potential channel for expressive harms. The *policies* prescribed by the procedure presented in the previous paragraph will be the same policies prescribed by hard weighted CBA with income-elastic VSLs. This should come as no surprise, because the procedure presented in the previous paragraph is arithmetically identical to hard weighted CBA with income-elastic VSLs. And it may be the policies prescribed rather than the procedures employed that give rise to expressive harms.

Whether expressive harms manifest through this second channel will depend critically on what types of policies result from the use of income-elastic VSLs. As noted in Section III.D, policies based on income-elastic VSLs can be explicitly income-differentiated (e.g., lower safety standards for cars purchased by lower-income individuals), income-correlated (e.g., lower safety standards for sedans and trucks than for SUVs because sedans and trucks are likelier to be purchased by lower-income individuals), or simply redistribution-informed (e.g., lower safety standards across the board to take into account the interests of lower-income individuals). The risk of expressive harm is likely decreasing from the first to the third. If NHTSA explicitly said that lower-income individuals can drive more dangerous cars because their lives are less valuable in dollar terms, then it is not hard to imagine expressive harms manifesting. On the other hand, very few people would have interpreted a failure to adopt the rear visibility rule *for all vehicles* as a suggestion that lower-income individuals' lives have less value. The less narrowly tailored a rule is on the basis of income, the less likely it is to generate expressive harms. At the same time, the less narrowly tailored a rule is on the basis of income, the less likely it is to significantly advance the efficiency and welfare goals that underlie the use of income-elastic VSLs in the first place.

EPA's unhappy experience with dollar VSL differentiation may shed light on some of these expressive-harm concerns, though it also may muddle the picture. The story begins in the late Clinton years, when EPA—in a series of rulemakings—reported benefit estimates based on both VSLs and VSLYs.[186] In each instance EPA noted that it preferred the VSL approach. In none of

[185] For a proposal along these lines, see E. Somanathan, Valuing Lives Equally: Distributional Weights for Welfare Analysis, 90 Econ. Letters 122 (2006).

[186] See Findings of Significant Contribution and Rulemaking on Section 126 Petitions for Purposes of Reducing Interstate Ozone Transport: Final Rule, 65 Fed. Reg. 2,674 2721-22 (Jan. 18, 2000); Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements: Final Rule, 65 Fed. Reg. 6,698, 6,785 &

these rulemakings did EPA explicitly say that it was assigning a lower dollar value to mortality gains accruing to older Americans under the VSLY approach, though that is (usually[187]) the effect of using VSLYs. In all three instances, EPA's rulemaking resulted in more stringent air quality standards. The agency's use of VSLYs in its alternative estimates elicited no public outcry (nor even any apparent mention in the press).

Then in 2002, the Bush administration unveiled a "Clear Skies" proposal that would have amended the Clean Air Act to allow broader use of cap-and-trade programs.[188] In a technical analysis of benefits associated with the Clear Skies plan, EPA reported an alternative estimate based on age-adjusted VSLs. The agency explicitly said that its alternative estimate was based on a VSL of $3.7 million for the general population and a mean VSL of $2.3 million for seniors (all figures in 1999 dollars).[189]

The Natural Resources Defense Council and other environmental groups seized upon EPA's use of age-adjusted VSLs to rally opposition to the Clear Skies plan.[190] Ads in local newspapers showed images of grandmothers with price tags stating, "Senior Discount: 37 percent."[191] EPA officials encountered protests at hearings in Tampa, Pittsburgh, Iowa City, San Antonio, and Los Angeles.[192] Bowing to public pressure, EPA administrator Christine Todd Whitman disavowed the use of age-adjusted VSLs in May 2003.[193]

Lost amid the "senior death discount" controversy was the fact that EPA's 2002 technical analysis actually assigned a *higher* value to avoided deaths for seniors than to avoided deaths for younger Americans. EPA surmised that 40-year-olds have approximately 35 years of life remaining while the average senior has 10 years of life remaining. Translating age-adjusted VSLs into VSLYs (assuming a 3 percent discount rate), the agency estimated that 40-year-olds have a VSLY of $163,000 and seniors have a VSLY of $258,000. The agency then assumed that individuals who die prematurely as a result of particulate matter exposure likely would have had around five

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tbl.IV.D-7 (Feb. 10, 2000); Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements: Final Rule, 66 Fed. Reg. 5002, 5107 & tbl.VI.F-3 (Jan. 18, 2001).

[187] Usually, but as we will soon see, not always.

[188] See Christopher Marquis, Bush Energy Proposal Seeks To 'Clear Skies' by 2018, N.Y. Times (July 30, 2002), https://www.nytimes.com/2002/07/30/us/bush-energy-proposal-seeks-to-clear-skies-by-2018.html. The administration embraced the Clear Skies proposal over an alternative EPA plan that would have led to faster air quality improvements. See Katharine Q. Seelye, White House Rejected a Stricter E.P.A. Alternative to the President's Clear Skies Plan, N.Y. Times (Apr. 28, 2002), https://www.nytimes.com/2002/04/28/us/white-house-rejected-stricter-epa-alternative-president-s-clear-skies-plan.html.

[189] U.S. Environmental Protection Agency, Technical Addendum: Methodologies for the Benefit Analysis of the Clear Skies Initiative 35-36 (Sept. 2002), https://archive.epa.gov/clearskies/web/pdf/tech_adden.pdf.

[190] See Environmentalists Use 'Senior Discount' Issue to Buoy Alliances, Risk Policy Report (June 24, 2003); Press Release, Natural Resources Defense Council, Cheapening the Value of Life: The Bush Administration's Death Discount (Apr. 1, 2003), https://www.nrdc.org/media/2003/030401-0.

[191] Id.

[192] See Cindy Skrzycki, Under Fire, EPA Drops the 'Senior Death Discount,' Wash. Post (May 13, 2003), https://www.washingtonpost.com/archive/business/2003/05/13/under-fire-epa-drops-the-senior-death-discount/e14279ed-9109-40e5-998b-fd3a1620799c; Bush Administration Changes the Way It Calculates the Value of a Human Life in Dollars, NPR Morning Edition (May 5, 2003).

[193] See Katharine Q. Seelye & John Tierney, E.P.A. Drops Age-Based Cost Studies, N.Y. Times (May 8, 2003), https://www.nytimes.com/2003/05/08/us/epa-drops-age-based-cost-studies.html.

years of life remaining, regardless of age. This yielded values of approximately $880,000 per avoided death for under-65s in 2010 and $1.4 million per avoided death for over-65s in 2010.[194] (The agency assigned lower figures to individuals with chronic obstructive pulmonary disease on the assumption that they have even shorter lifespans.) Startlingly, the agency was applying an approximately 59 percent *premium* for seniors, not a 37 percent discount. As the agency explained, "The implied VSL for younger populations is less than that for older populations because the value per life year is higher for older populations. Since we assume that there is a 5-year loss in life years for a PM related mortality, regardless of the age of person dying, this necessarily leads to a lower VSL for younger populations."[195]

One possible interpretation of the senior death discount episode is that the second-party expressive consequences of differentiated dollar VSLs lie beyond an agency's control. If EPA's application of a senior death premium could be misconstrued as a senior death discount, then there is no predicting how activists will recast agency CBAs. This, though, is not the only possible interpretation. As Benjamin Eidelson notes, the reaction to EPA's analysis was not totally unpredictable: "the suggestion that some people's lives were less worth saving was understandably heard to say that the people themselves were worth less."[196] Perhaps if seniors had carefully read the agency's analysis, they would have realized that EPA actually was assigning a higher value to mortality benefits for older Americans, but we cannot expect ordinary citizens to carefully parse CBAs. Activists and journalists told seniors that EPA was valuing their lives at $2.3 million and valuing younger people's lives at $3.7 million—and while that was an oversimplification, it was not entirely wrong. This is not to say that the content of agency CBAs should be dictated wholly by worries about misinterpretation or spin. It is to say, though, that a pragmatic approach to CBA should take into account the risk that assigning different dollar VSLs to different individuals will cause people to perceive that their government counts them for less.

The analysis so far has focused on second-party consequences (i.e., consequences for the "audience" of CBA, broadly construed), but the use of income-elastic VSLs also may have first-party consequences too (i.e., consequences for agency officials). One might worry that when agency officials regularly assign lower dollar VSLs to lower-income individuals, this may routinize them into *thinking* that lower income individuals' lives and health "matter" less. Defenders of weighted CBA (and, by extension, textbook CBA) may respond that this is all an illusion arising from the focus on dollars: after all, in welfare-unit terms, everyone's life has the same value when distributional weights are inverse to income and the IEVSL equals one. But most of us are not used to thinking about the world in welfare-unit terms; we are much more accustomed to thinking in dollars. It is not crazy to worry that the practice of assigning lower dollar VSLs to lower-income individuals will have a corrosive effect on agency officials' attitudes toward the poor even though that is not at all the underlying motivation.

There is a further dimension to the expressive-harm concern that intersects with the discussion in the next section. Assigning different dollar VSLs to individuals of different income levels may affect not only perceptions of government writ large but of CBA specifically. One

[194] See Technical Addendum, supra note 189, at 35-37.

[195] Id. at 37.

[196] Benjamin Eidelson, Comment, Kidney Allocation and the Limits of the Age Discrimination Act, 122 Yale L.J. 1635, 1648 (2013).

outcome of the senior death discount episode was to provide CBA critics with a predictably effective avenue of attack against the practice of assigning dollar figures to benefits and costs.[197] One might argue on principled grounds that we should not yield to the heckler's veto (especially if the heckler misunderstands or misconstrues the reason for income-differentiated VSLs). At the same time, a committed welfarist should account for all the likely consequences of a policy—including the consequences arising from predictable hecklers. The PR concern on its own is probably not weighty enough to resolve the income-differentiated VSL debate (though the expressive harms highlighted in this section go well beyond PR). But EPA's age-adjusted VSL experience—as well as the anticipated backlash from using income-elastic VSLs in the future—should at least prompt second thought about whether the potential gains from using different dollar VSLs justify the risk to the entire CBA enterprise.

C. Informational Burdens and Their Institutional Consequences

A further cause for concern regarding the use of income-differentiated VSLs and distributional weights emphasizes informational burdens and their institutional consequences. Each of the alternatives to status quo CBA considered in Part II entails significantly heavier informational burdens than the current approach. Textbook CBA requires us to determine not only how many fatalities a regulation will prevent but also the distribution of those avoided fatalities across income groups. Hard weighted CBA with the standard assumptions requires us to determine not only how many dollars will be gained or lost by a regulation but also the distribution of those dollar gains and losses. Soft weighted CBA and versions of weighted CBA that use equal dollar VSLs present the worst of all worlds: they require us to know both the distribution of avoided fatalities and the distribution of non-mortality net benefits, thus effectively doubling the informational burden on agencies.

Some of these informational burdens are manageable. As illustrated in Part III, it is possible in the case of the rear visibility rule to generate a decent estimate of the distribution of mortality and non-mortality effects based on existing DOT data and a number of not-implausible assumptions. But in other cases, distributional analysis will not be so straightforward. As noted above, estimating the economic incidence of occupational safety and air quality standards is difficult.[198] Without careful attention to subtleties, there is a real risk of making adjustments that not only fail to achieve—but actually set back—redistributive goals.

The concern here is not solely a concern that CBA with distributional weights and/or income-elastic VSLs might be more difficult for agencies. Costs borne by agencies are social costs too, and the additional informational burden of more complex CBA may divert agency officials from other important policymaking or enforcement priorities. But the increase in the costs of CBA may have farther-reaching effects on federal administration.

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[197] See, e.g., Christian Bourge, Analysis: Is Cost-Benefit Policy Flawed?, United Press Int'l (July 3, 2003) ("An uproar in recent months over the Environmental Protection Agency's application of the economic valuation technique to Bush administration clean air regulations has focused attention on the issue amid questions of [CBA's] appropriateness as a policy tool.").

[198] See supra notes 150-156 and accompanying text.

For one thing, raising the cost of CBA may deter some agencies from engaging in the practice. As Jennifer Nou illustrates, agencies have considerable leeway as to whether they conduct CBAs at all.[199] Agencies can, for example, seek to implement policies via adjudication rather than regulation, thus escaping Executive Order 12866's mandate that costs and benefits be assessed and that proposed regulations be submitted to OIRA.[200] Or they may split a single regulation into several pieces so as to evade the requirement of formal CBA for actions with annual effects on the economy of $100 million or more.[201] Nou observes that agency leaders sometimes pursue strategies of "self-insulation" because their preferences diverge from the preferences of the President and/or White House officials.[202] In other cases, though, self-insulation may result not from preference divergence but from resource constraints. CBA can be burdensome, and agencies' capacities are limited.[203]

A mandate for agencies to estimate the distribution of mortality and/or non-mortality effects across the income distribution would raise the "price" to agencies of conducting CBAs. Even if OIRA provides top-down guidance regarding relevant parameters (e.g., distributional weights and an executive branch-wide IEVSL), data collection and analysis will fall to the agencies. This increase in the price of CBA may in turn give the agency stronger incentives to self-insulate from centralized review (or perhaps to refrain from regulating at all). In other words, the harder it is for agencies to perform CBA, the less likely they are to do it.

The worry about deterring agencies from engaging in CBA is greater if the benefits of CBA are large. And CBA does more than simply implement a particular notion of efficiency. As Cass Sunstein argues, one important function of CBA is to impose a check on cognitive biases.[204] The practice of CBA "reduces people's reliance on intuitive judgments that sometimes go wrong, especially in highly technical areas."[205] Richard Revesz and Michael Livermore add that CBA "can be used to ensure that [agencies'] decisions are based on reasoned analysis and not, for instance, on the unaccountable whim of an official or a bargain-hunting special interest."[206] CBA also can enhance the political accountability of agencies by requiring them to justify their regulations in light of the President's priorities.[207] And CBA may serve what could be described as an "Elysian" function—representation-reinforcing regulatory review[208]—by forcing agency officials to explicitly account for all members of society and their interests in the evaluation of proposed rules.

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[199] See Jennifer Nou, Agency Self-Insulation Under Presidential Review, 126 Harv. L. Rev. 1755 (2013).
[200] See id. at 1783-84.
[201] See id. at 1792.
[202] See id. at 1774.
[203] See id. at 1775.
[204] See Cass R. Sunstein, Cognition and Cost-Benefit Analysis, 29 J. Legal Studies 1059, 1072-73 (2000).
[205] Cass R. Sunstein, Is Cost-Benefit Analysis a Foreign Language?, 72 Q.J. Experimental Psychology 3, 5 (2019).
[206] Richard L. Revesz & Michael A. Livermore, Retaking Rationality: How Cost-Benefit Analysis Can Better Protect the Environment and Our Health 13 (2008).
[207] See Eric A. Posner, Controlling Agencies with Cost-Benefit Analysis: A Positive Political Theory Perspective, 68 U. Chi. L. Rev. 1137 (2001).
[208] See John Hart Ely, Democracy and Distrust: A Theory of Judicial Review (1980); Kathleen M. Sullivan & Pamela S. Karlan, The Elysian Fields of the Law, 57 Stan. L. Rev. 695 (2004).

An increase in the price of CBA will potentially mean less of all these things. The price increase might be an expense worth bearing if the use of different dollar VSLs or distributional weights substantially improved the quality of the output. But there are reasons to worry that it would have the opposite effect. These concerns apply primarily to distributionally weighted CBA (rather than textbook CBA with income-elastic VSLs), though some will apply to both.

First, for distributionally weighted CBA to improve welfare, it not only needs to get its distributive analysis right on average; it needs to be right substantially more often than not. When we adjust legal rules away from efficiency, we bear a cost regardless of whether any distributive benefit follows. If we only redistribute a bit on average but incur significant inefficiencies along the way, the net welfare effect will be substantially negative.

In many cases, the direction of the optimal redistributive adjustment will be uncertain.[209] For example, the analysis of the rear visibility rule in Part III depends entirely on the assumption that car manufacturers pass costs along to customers. If cost passthrough does not occur, and shareholders of car manufacturers bear the costs, then the rule is likely to be highly progressive because households in the top income decile own more than 90 percent of US equities.[210] If assumptions about cost passthrough turn out to be wrong, agencies may end up rejecting, on redistributive grounds, regulations that not only would be efficient but also would be redistributive.

Second, the sensitivity of distributive analysis to subtle modeling changes makes it more difficult for weighted CBA to serve as a check on bias, whim, and interest-group capture. Agency officials who want to justify a particular policy often will be able to justify that policy with the additional degrees of freedom that weighting brings. Cost passthrough is one parameter that motivated agency officials can modify in order to achieve their preferred results, but it is not the only one. For example, in the context of air quality standards, changes to assumptions about the effect of air quality on rents will have important implications for distributive findings.[211] These concerns apply to some extent to textbook CBA with income-elastic VSLs as well. For example, a regulator who wants to justify an air quality standard under textbook CBA will do well to aggregate mortality data at the county level, because mortality gains are likely to be greatest in high-income urban counties (though likely among the lowest income residents of those counties).[212]

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[209] This point is an extension of Kaplow and Shavell's observation that redistributive legal rules "may well overshoot the optimum." Kaplow & Shavell, Should Legal Rules Favor the Poor?, supra note 36, at 832. The concern highlighted in text is a concern not just about overshooting but about shooting in the wrong direction.

[210] See Robin Wigglesworth, How America's 1% Came To Dominate Equity Ownership, Financial Times (Feb. 10, 2020), https://www.ft.com/content/2501e154-4789-11ea-aeb3-955839e06441; Heidi Chung, The Richest 1% Own 50% of Stocks Held by Americans, Yahoo! Finance (Jan. 17, 2019), https://finance.yahoo.com/news/the-richest-1-own-50-of-stocks-held-by-american-households-150758595.html.

[211] See supra notes 153-156 and accompanying text.

[212] County-level aggregation potentially explains the result in Jha, Matthews & Muller, supra note 174, which finds that national ambient air quality standards increase inequality. From a textbook CBA perspective, income-regressive distribution of mortality gains will make total gains look greater.

To be sure, some of these same concerns apply to status quo CBA. In the rear visibility case, if NHTSA had wanted to show that its rule was cost-justified, it could have made the most favorable cost assumption (i.e., that cars by 2018 would come equipped with display screens). But the fact that there is already play in the joints of CBA is not a good reason to generate more. At the very least, the additional opportunities for shading that come with weighted CBA should prompt thought about whether and how to limit analytical flexibility.

Finally, a President could address some of the concerns related to the resource costs and deterrent effects of textbook CBA or weighted CBA by giving agencies the *option* to use income-elastic VSLs and/or distributional weights, rather than making their use mandatory. Optionality, though, is not a panacea. Under an optional system, agencies could incorporate IEVSLs or distributional weights into CBA when it would make their favored regulations look better and omit discussion those factors when it would make their favored regulations look worse. This would potentially undermine one of CBA's chief goals: aligning agency policies with presidential priorities.[213]

Whether the President and OIRA are comfortable with this optionality may vary from agency to agency and from administration to administration. Republican Presidents will generally have more reason to be concerned about agencies with liberal staffs (e.g., the EPA) straying from the administration's agenda, and Democratic Presidents will generally have more reason to be concerned about agencies with more conservative careerists (e.g., the Pentagon).[214] A particular President may decide that her control over her administration is sufficiently secure that she can afford to give agencies more slack. The judgment is difficult to assess in the abstract. The key point for present purposes is that the use of income-elastic VSLs and distributional weights can create tension with CBA's diverse objectives. These concerns may not be decision-determinative, but they certainly merit consideration as part of a holistic evaluation of the various approaches.

D. Alternative Mechanisms for Redistribution

The expressive and informational concerns emphasized in the previous two sections relate both to textbook CBA and to weighted CBA with income-elastic VSLs. A further argument for the status quo emphasizes the availability of alternative policy channels that are superior to non-tax regulations as mechanisms for redistribution. This argument specifically addresses the choice between distributionally weighted and unweighted approaches rather than the choice between textbook CBA and status quo CBA (both of which are unweighted).

Recall that the case for distributionally weighted CBA depends critically on the assumption that the existing tax-and-transfer system fails to accomplish the "optimal" amount of redistribution.[215] (Optimality means that the welfare gains from additional redistribution equal the welfare losses; it does *not* mean that taxes must be nondistortionary.) Thus, if the same decisionmaker were to have control over the tax system and over agency CBA procedures, there

[213] See Posner, supra note 207.

[214] See, e.g., Joshua D. Clinton et al., Separated Powers in the United States: The Ideology of Agencies, Presidents, and Congress, 56 Am. J. Pol. Sci. 341 (2012); Mark D. Richardson, Joshua D. Clinton & David E. Lewis, Elite Perceptions of Agency Ideology and Workforce Skill, 89 J. Pol. 303 (2018).

[215] See supra notes 64-73 and accompanying text.

would be little reason to use distributionally weighted CBA. And the decisionmaker with control over agency CBA procedures across the executive branch is, ultimately, the President, whose power over the tax system is vast.

At initial glance, the notion that the President has control over the tax system may seem strange. After all, in the United States, Congress—not the President—holds the power to tax.[216] On further inspection, though, this "Schoolhouse Rock!"[217] vision of the US federal tax system becomes quite a bit more nuanced—for several reasons.

First, the President wields enormous influence over tax legislation. To some extent, this influence arises through the same channels that allow the President to influence non-tax legislation (e.g., the bully pulpit and the veto pen).[218] But for reasons rooted in congressional procedure, recent Presidents have been more successful in pushing tax-and-transfer changes than other changes through Congress. This is primarily because tax-and-transfer changes can go through the fast-track, filibuster-proof budget reconciliation process.[219] Presidents Clinton,[220] George W. Bush,[221] Obama,[222] and Trump[223] all achieved major elements of their distributive agendas via budget reconciliation. Sometimes, they did so with the slimmest of majorities. For example, President George W. Bush's second round of tax cuts in 2003 and President Trump's 2017 tax cuts both passed the Senate through the budget reconciliation procedure on a 51-49 vote. Clinton's 1993 tax hike was an even closer call—splitting the Senate 50-50, with Vice President Al Gore breaking the tie. (As of this writing, Senate Democrats had initiated a process to enact President Biden's COVID-19 relief package via reconciliation, but the results of the effort remain to be seen.[224])

The upshot has been that the past four Presidents all have succeeded in transforming the federal tax system. Using the budget reconciliation process, President Clinton pushed through Congress a 10.9 percentage-point increase in the top marginal tax rate.[225] President George W. Bush then cut the top marginal rate on ordinary income by 5.8 percentage points and cut the top rate on qualified dividends and long-term capital gains by a remarkable 25.8 percentage

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[216] U.S. Const. art. I, § 8, cl. 1.

[217] See Schoolhouse Rock!: I'm Just a Bill (1976).

[218] No tax legislation has passed via veto override in 231 years of U.S. history. See Vetoes, 1789 to Present, U.S. Senate, https://www.senate.gov/legislative/vetoes/vetoCounts.htm (last visited Sept. 19, 2020). The closest Congress ever came to a veto override of a tax bill was the Death Tax Elimination Act of 2000, where the House fell 14 votes short of overriding President Clinton's veto. H.R. 8, 106th Cong., 2d Sess. (2000). For the override vote, see Roll Call No. 458 (Sept. 7, 2000), https://clerk.house.gov/Votes/2000458.

[219] See Ellen P. Aprill & Daniel J. Hemel, The Tax Legislative Process: A Byrd's Eye View, 81 Law & Contemp. Probs. 99 (2018).

[220] See Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103–66 (1993).

[221] See Economic Growth and Tax Relief Reconciliation Act of 2001, Pub. L. No. 107–16 (2001); Jobs and Growth Tax Relief Reconciliation Act of 2003, Pub. L. No. 108–27 (2003)

[222] See Health Care and Education Reconciliation Act of 2010, Pub. L. No. 111–152, 124 Stat. 1029.

[223] See An Act to Provide for Reconciliation Pursuant to Titles II and V of the Concurrent Resolution on the Budget for Fiscal Year 2018, Pub. L. No. 115–97, 131 Stat. 2054 (2017).

[224] See Luke Broadwater & Jim Tankersley, Democrats Speed Ahead on Economic Aid Package, N.Y. Times (Feb. 2, 2021), https://www.nytimes.com/2021/02/02/business/stimulus.html.

[225] Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312.

points.[226] President Obama's signature legislative accomplishment—the Affordable Care Act—is not typically characterized as a tax law (except by Chief Justice John Roberts), but its companion budget reconciliation bill raised the top tax rate by 3.8 percentage points.[227] All in all, the top marginal rate rose by a total of 9.6 percentage points in President Obama's first term.[228] President Trump then succeeded in slashing the top marginal rate by 3.8 percentage points and the top marginal rate on passthrough income by 11.2 percentage points.[229]

Of course, the fact that these four Presidents transformed the federal income tax system does not mean that they ended up with exactly the amount of redistribution they wanted. President Obama, for example, sought further tax increases for the rich and tax cuts for the middle class at the end of his presidency but was unable to win support from a Republican-controlled Congress.[230] Moreover, past performance is no guarantee of future results. Future Presidents might have less success pushing a reconciliation package through the House and Senate. But even when their tax legislative reforms fail in Congress, Presidents have other tools that they can use to influence the amount of redistribution that occurs through the tax system.

First, the President controls the Treasury Department, and the Treasury Department writes tax regulations. The President's power to effect more (or less) redistribution via tax regulation is far-reaching.[231] For example, one of the most important questions in corporate income taxation is whether an instrument will be considered debt or equity (i.e., stock). Interest on debt is deductible to the corporation whereas dividends and distributions to stockholders are not. Non-tax lawyers might assume that a question this central to the tax system would be resolved by Congress, but Congress has punted the question to Treasury. The Treasury Secretary is authorized by statute to "prescribe such regulations as may be necessary or appropriate to determine whether an interest in a corporation is to be treated . . . as stock or indebtedness."[232] The Obama administration invoked this broad grant of authority in 2016 to substantially limit the ability of corporations to deduct interest paid to foreign affiliates.[233] With authority to define debt versus equity, a President (through her Treasury Secretary) has significant influence over the effective corporate income tax rate.

Or to use another example: Probably the primary mechanism of estate and gift tax avoidance today is the grantor retained annuity trust, or "GRAT." The statute that authorizes

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[226] Economic Growth and Tax Relief Reconciliation Act of 2001, Pub. L. No. 107-16, 115 Stat. 38; Jobs and Growth Tax Relief Reconciliation Act of 2003, Pub. L. No. 108-27, 117 Stat. 752.

[227] Health Care and Education Reconciliation Act of 2010, Pub. L. No. 111-152, 124 Stat. 1029.

[228] The 9.6 percentage points include the 4.6 percentage-point statutory rate increase, the restoration of the Pease provision (which had effectively added 1.2 percentage points to the marginal tax rate of top earners), and the 3.8 percent net investment income tax added by the Affordable Care Act. I.R.C. §§ 1(a); 68(a)-(b), 1411.

[229] The December 2017 tax law reduced the top statutory rate by 2.6 percentage points, but it also suspended the Pease provision. See I.R.C. § 68(f). The additional rate cut for passthrough income occurs via the qualified business income deduction. See I.R.C. § 199A.

[230] See Julie Hirschfeld Davis, Obama Will Seek to Raise Taxes on Wealthy to Finance Cuts for Middle Class, N.Y. Times (Jan. 17, 2015), https://www.nytimes.com/2015/01/18/us/president-obama-will-seek-to-reduce-taxes-for-middle-class.html.

[231] See Daniel J. Hemel, The President's Power To Tax, 102 Cornell L. Rev. 633 (2017).

[232] I.R.C. § 385(a).

[233] See Treas. Dec. 9790, 81 Fed. Reg. 72,858 (Oct. 21, 2016).

GRATs also allows the Treasury Secretary to limit uses of GRATs that are "inconsistent with the purposes of this section."[234] The particular provision authorizing the valuation method that makes it possible for taxpayers to pay no gift tax on their use of GRATs also enables the Treasury Secretary to effectively turn off that valuation method.[235] A President who wanted to increase redistribution from rich to poor could instruct her Treasury Secretary to promulgate regulations substantially limiting the use and abuse of GRATs.[236] President Obama's last budget proposal included a modification to the grantor trust rules that would have raised revenue by $19 billion over a decade,[237] with virtually all of that revenue coming from taxpayers in the top percentile. A motivated Treasury Department likely could have implemented most if not all elements of that proposal via regulation.[238] Few changes to, say, EPA or DOT regulations would have as large an impact on income distribution as this one.

Beyond the President's control over tax regulation, the President also can direct the IRS's allocation of enforcement resources. Natasha Sarin and Larry Summers have estimated that the IRS, by redirecting audit resources toward high-income taxpayers, could raise roughly $500 billion over the next decade from taxpayers earning more than $1 million.[239] Even if that estimate is optimistic by an order of magnitude, it likely exceeds the potential redistributive gains from refashioning all the rules in Table 1 with redistributive goals in mind.

What I have described as "the President's power to tax"[240] places arguments for distributionally weighted CBA in an awkward position, at least insofar as they apply to the US context. The case for distributionally weighted CBA derives force from the fact that we do not do enough to redistribute through the tax system. But the actor with authority to implement distributionally weighted CBA across the executive branch—the President—also has substantial authority over the tax system. If we could persuade the President that the federal government should do more to redistribute resources from rich to poor, the logical next step of the argument would not be to tell her to adopt distributionally weighted CBA for non-tax regulations. It would be to tell her to pursue substantially more redistribution through the tax system—and if legislative avenues were blocked, to do so through tax regulation and tax enforcement.

To be sure, it may be that even after the President pursues redistribution vigorously through tax channels, she remains unsatisfied with the amount of redistribution that she has accomplished and is unable to persuade Congress to take further action either. So the argument about the availability of alternative redistributive mechanisms does not logically defeat the case for distributionally weighted CBA when tax regulatory and enforcement routes are exhausted and legislative reform is politically impossible. In that case, though, a President would need to compare whatever additional redistributive benefits she thinks she can achieve via weighted CBA against the expressive, informational, and institutional costs emphasized above. The upshot is

[234] I.R.C. § 2702(a)(3)(iii).
[235] I.R.C. § 7520(b).
[236] See Hemel, supra note 231, at 669-771.
[237] U.S. Department of the Treasury, General Explanations of the Administration's Fiscal Year 2017 Revenue Proposals 269 (Feb. 2016), https://home.treasury.gov/system/files/131/General-Explanations-FY2017.pdf.
[238] See Hemel, supra note 231, at 670.
[239] See Natasha Sarin & Lawrence H. Summers, Shrinking the Tax Gap: Approaches and Revenue Potential tbl.4 (Nov. 8, 2019).
[240] See Hemel, supra note 231, at 716 (internal quotation marks omitted).

not, then, that weighted CBA is never justifiable as an nth-best response to the challenge of income and wealth inequality. But it is at best a last resort—one that is dominated by other approaches (including approaches that do not depend on congressional buy-in).

V. Conclusion: Beyond Cost-Benefit Analysis

The discussion so far has focused on agency CBA—and, specifically, agency CBA in the US federal executive branch. The article's central observation is that redistribution through lifesaving regulations will likely require policymakers implicitly or explicitly to assign lower dollar values to lower-income individuals' lives. The normative implications are less clear. A moral or ethical commitment to the equal-value-for-all-lives principle won't resolve the debate: the three most viable approaches—textbook CBA, status quo CBA, and standard distributionally weighted CBA with income-elastic values of a statistical life—all adhere to the equal-value-for-all-lives principle, albeit in their own ways. Concerns about expressive harms favor the status quo approach, though this factor on its own might not be enough to tip the balance. Concerns about informational burdens provide an additional argument for status quo CBA. The case for adding distributional weights to CBA loses even more steam once one accounts for the other redistributive options available to the executive branch. Distributionally weighted CBA still might be a way to shift resources from rich to poor when all other avenues are exhausted, but the analysis here should cause advocates to rethink whether the comparatively small upside is worth the considerable costs.

On first glance, the debate over distributionally weighted CBA and income-elastic VSLs might seem like it is of interest primarily to scholars and practitioners of federal administrative law—and perhaps to those impacted by the lifesaving regulations to which weighted CBA would potentially apply. The latter category is, to be sure, not a small universe: virtually all of us breathe air, drink water, and drive or ride in vehicles affected by EPA and DOT CBAs. ("Virtually all" rather than "all" to accommodate non-US readers, though even they are impacted by agency CBAs that affect US carbon emissions levels.) But the implications go further. The case for distributionally weighted CBA is simply one element of a broader argument over redistributive non-tax legal rules—an argument with implications well beyond the federal executive branch and well beyond the United States.[241] What, if anything, does the debate over CBA and income-elastic VSLs tell us about that question?

Quite a bit, it turns out. Much of law involves tragic tradeoffs between dollars and lives.[242] The COVID-19 pandemic has put this point in the spotlight: large swaths of society are now governed by laws and rules that seek to strike a balance between economic interests and lifesaving objectives. Since long before the pandemic, these sorts of tradeoffs have been particularly salient in tort law. Tort law also happens to be the area in which the academic debate about redistributive legal rules has been most robust.[243]

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[241] See supra notes 35-36 and accompanying text.

[242] See Guido Calabresi & Philip Bobbitt, Tragic Choices

[243] See, e.g., Thomas J. Miceli & Kathleen Segerson, Defining Efficient Care: The Role of Income Distribution, 24 J. Legal Studies 189 (1995); Kaplow & Shavell, supra note 35, at 669 (modification to strict liability rule as motivating example); Jolls, supra note 36, at 1657 (explaining that tort law focus "tracks much of the existing

Tort law's approach to dollars-for-lives tradeoffs contrasts with CBA in some respects but aligns in others. As Eric Posner and Cass Sunstein observe, the lodestar of economic damages in wrongful death cases—future income minus expenses—is very different from the emphasis in administrative law on VSLs derived from wage-risk tradeoffs.[244] Moreover, tort law's focus on lost earnings means that economic damages—like VSLs in textbook CBA but unlike VSLs in status quo CBA—are income-elastic. On the other hand, as Ariel Porat notes, courts do *not* adjust the standard of care at the liability stage on the basis of income.[245] In this last respect, tort law's approach shares similarities with status quo CBA's income invariance. And in tort law, as in textbook CBA and status quo CBA, the interests of lower-income individuals do not receive greater weight formally or informally.[246]

Some scholars argue that tort law should be modified to incorporate income-redistributive concerns. As Christine Jolls notes, these arguments typically focus on "tort rules that operate between strangers," as opposed to "parties in a contractual relationship."[247] The rationale for focusing on stranger cases is that the distributive consequences are likelier to stick. By contrast, a rule that—say—favored lower-income litigants in contract cases might make others less likely to enter into contracts with lower-income parties.

The stranger tort setting is not all that dissimilar to the fact pattern underlying Part III's case study. Backover crashes have been a frequent subject of tort litigation in recent years.[248] In *Wright v. Ford Motor Co.*, for example, a three-year-old boy was crushed and killed when a woman driving a Ford 2001 XLT Expedition failed to see the boy as she reversed out of a parking spot.[249] The boy's parents then sued Ford—presumably because they could not show negligence on the part of the Expedition driver. The parents argued that Ford should have equipped the

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literature on redistributive legal rules."); Sanchirico, supra note 36, at 806 ("Tort rules were chosen here because they are what are examined in the existing literature on the question."); Avraham et al., supra note 36, at 1132 (focusing on tort regime as guiding example).

[244] See Posner & Sunstein, supra note 22, at 544.

[245] See Ariel Porat, Misalignments in Tort Law, 121 Yale L.J. 82, 86 (2011). If one were to justify tort law's chimerical stance—income neutrality at the liability stage, income elasticity at the damages stage—presumably it would be for reasons related to moral hazard: we do not want to create situations in which individuals can earn far more in death than in life. See id. at 102 n.53; Arthur Miller, Death of a Salesman: Certain Private Conversations in Two Acts and a Requiem 109 (Penguin Books 1998) (1949).

[246] Indeed, this income-neutrality principle is one of the first propositions about tort law that students may encounter as 1Ls. See Vosburg v. Putney, 47 N.W. 99, 100 (Wis. 1890) (holding that it was improper to introduce evidence of the Vosburg family's financial condition and stating that "[t]he plaintiff, if he recovered, was entitled to full compensation for his injury, no less and no more, whatever his pecuniary circumstances or those of his father"), subsequent proceedings at 50 N.W. 403 (Wis. 1981).

[247] See Jolls, supra note 36, at 1657; see also Avraham et al., supra note 36, at 1127 (emphasizing centrality of the stranger tort setting to the redistributive legal rules debate); Kyle Logue & Ronen Avraham, Redistribution Optimally: Of Tax Rules, Legal Rules, and Insurance, 56 Tax L. Rev. 157, 177 (2003) (same).

[248] See, e.g., Clemens v. Nissan Motor Co., Civil Action No. 3:04-CV-2584-N, 2006 U.S. Dist. LEXIS 116258 (N.D. Tex. Oct. 20, 2006) (entering judgment for manufacturer after jury found that lack of backup camera did not render SUV defective and that plaintiff was contributorily negligence); Messerly v. Nissan N. Am., Inc., 2011 Ky. App. LEXIS 234, at *11-15 (Ky. App. 2011) (reversing trial court's grant of summary judgment for manufacturer and holding that whether lack of a backup camera renders an SUV unreasonably dangerous is question for jury).

[249] Wright v. Ford Motor Co., 508 F.3d 263, 266-68 (5th Cir. 2007).

Expedition with features, such as a sensor or a camera, that would have allowed the driver to detect pedestrians behind her.[250] This was a tort action among parties not in privity: the Wrights and the manufacturer of a car that was not theirs. In this respect, it seems to be the paradigm case for the redistributive-legal-rules argument.

Wright is an unusually heart-rending case. But it is also, in many ways, representative of the caseloads of US courts. Motor vehicle crash cases account for 35 percent of all trials in state courts, 58 percent of tort trials in state courts, [251] and an even larger percentage of stranger tort cases. Very often these are cases in which a fatality or serious injury has occurred. Redistribution through tort rules—as through federal agency regulations—will often operate in contexts where death looms in the background. We typically abstract away from that fact when we argue about redistributive tort rules. The discussion above shows why it ought to be at the fore.

For one thing, until we specify the relationship between income and the value of fatality risk reduction, it is very difficult to know even what a redistributive tort rule is. For example, the redistributive rule in *Wright* might seem like it would reallocate from Ford to the plaintiffs, on the theory that Ford's shareholders are probably much richer than the plaintiffs. But if Ford responds by installing rearview cameras in more of its vehicles and passing on costs to consumers, then the distributive consequences look more like those in Part III (i.e., heavily dependent on assumptions about the income elasticity of the value of a statistical life). The discussion in Part III further shows that—even when we know the income elasticity of the value of a statistical life—we still cannot easily guesstimate the direction of distributive effects. These inquiries often will depend on costly data gathering and expert analysis. The litigants who will be best positioned to perform those tasks and show that the redistributive rule favors their side will likely be the ones who already have more resources at the start. The very process of determining distributive effects in tort law will potentially have perverse distributive consequences of its own.

The debate over redistributive tort rules remains highly theoretical. No one expects courts to flip a switch tomorrow and suddenly resolve tort cases with a view to the parties' relative incomes. But in the agency context, the question of redistribution via regulation becomes immediate. Practitioners of CBA need to decide whether to apply equal dollar VSLs or income-elastic VSLs, and whether to apply distributional weights or not. This article has suggested reasons why the agencies' current approach may be the right one. But whatever approach agencies choose, they should do so with a clear understanding of what exactly it might mean to pursue income-redistributive objectives through lifesaving policies. Hopefully this article has helped to highlight some of the implications of the various approaches in real-world settings. At the very least, it serves to show just how much hangs in the balance.

[250] See id. at 275-77. The jury ultimately found for Ford on the plaintiffs' design defect claim, and the Fifth Circuit affirmed.

[251] See Lynn Langton & Thomas H. Cohen, Bureau of Justice Statistics, U.S. Department of Justice, Civil Bench and Jury Trials in State Courts, 2005, at 2 tbl.1 (rev'd Apr. 4, 2009).