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Essays on the Cost-Benefit Administrative State

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Abstract

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Cost-benefit analysis is today a cornerstone of American administrative law. Congress has sometimes asked it of administrative agencies, the Army Corps of Engineers being an early and notable example. But it took a series of orders, issued by President Reagan and revised and reaffirmed by Presidents Clinton, Bush, and Obama, to firmly establish cost-benefit analysis as a staple of regulatory practice. Most recently, some legal scholars have suggested that a rule is presumptively "arbitrary and capricious," and hence liable to be set aside under the Administrative Procedure Act, if it cannot survive a cost-benefit test. The chapters in this dissertation examine cost-benefit analysis in its institutional context by drawing on perspectives from law, philosophy, political science, and economics.

The Supreme Court's decision in *Michigan v. EPA* (2015) contrasted formal (or quantitative) approaches to informal (or qualitative) ones. The distinction is, however, distracting, and even misleading, because monetization and aggregation, not quantification, is at the heart of cost-benefit analysis. The first chapter articulates three interpretations of monetization and aggregation, and hence, cost-benefit analysis. In its welfarist mode, cost-benefit analysis serves as an indicator of a rule's impact on overall well-being. In its replicative mode, cost-benefit analysis tries to arrive at the same destination as another mechanism, a frictionless market being the most salient example. Finally, in its rationalizing mode, cost-benefit analysis seeks to demonstrate that there is a set of numbers, satisfying certain structural and substantive conditions, that makes the regulation a rational one. These interpretations of cost-benefit analysis have implications for how monetization and aggregation are carried out. The regulatory state should therefore strive for reflective equilibrium between how cost-benefit analysis is defended and how it is practiced under a system of executive review. While the academic debate over the details of regulatory reform remains unsettled, lower court judges applying the Administrative Procedure Act's standard of arbitrary and capricious review can, under existing doctrine, at most demand of agencies cost-benefit analysis that is rationalizing.

Although cost-benefit analysis can be a mechanism for compelling agencies to reveal the information that they have to their principals, they are, for theoretical reasons and as an empirical matter, susceptible of obfuscation. The second chapter thus studies the informative-ness of cost-benefit analysis under a system of regulatory review by the Office of Information and Regulatory

Affairs (OIRA) by introducing a review technology into Crawford and Sobel (1982)'s cheap talk model. I find that depending on the cost of OIRA review, three types of communicative outcomes – no review, universal review, and selective review – may be obtained in equilibria. Moreover, communications become less informative, *ex ante*, as the ideological distance between the agency and the White House increases and, assuming a regime of selective review, as OIRA review becomes more efficacious at recovering the information that the agency has. The reason for the latter is that since the agency and the White House desire regulation that is based on actual social, economic, and political conditions, the agency has incentives to invite scrutiny from OIRA. This reduces the informative-ness of representations that the agency can credibly make. In addition, communications between the White House and the agency are more precise if they are observed by a relatively moderate body that can influence the stringency of the final rule. Conversely, the agency's communications are less precise if they are observed by a relatively extreme intervener. An agency that is perfectly aligned to the White House fudges under such circumstances because of the divergence between itself and the other member of the audience. The stylized model that is described here furnishes a theoretical basis for studying the informative-ness of cost-benefit analysis under a system of regulatory review. It hints at positive explanations of the quality of regulatory impact analyses performed by agencies and also adumbrates some of the normative considerations that should inform calls for more rigorous cost-benefit analysis in the administrative state.

Finally, the public's reaction to cost-benefit arguments is relevant to issues of institutional design. It is generally thought that policies involving "taboo" trade-offs, such as those that balance risks to life against financial costs, may be rejected by the public if their utilitarian logic becomes too apparent. The third chapter asks whether these attitudes are moderated by the type of body that is engaged in cost-benefit reasoning. This survey experiment employs a two-factor design that randomized the source of a policy and the presence of a quantified cost-benefit argument to explore this question. Analyzing responses from 1004 Amazon Mechanical Turk workers, I find no evidence that the Federal Motor Carrier Safety Administration or the fictitious National Federation of Trucking Companies have an advantage or disadvantage, vis-à-vis Congress, at persuading through cost-benefit analysis. Surprisingly, however, the presence of a cost-benefit argument did not diminish, and may even have strengthened, support for the policy. An exploratory search for heterogeneous treatment effects suggests that this contrarian result is unlikely to be due to differences in observed demographic variables between the sample and the population. As some of the treatment conditions used by prior research in the literature did not quantify the considerations on both sides, attention to the influence that a quantitative, rather than qualitative, description of costs and benefits has on opinion may improve our understanding of the how cost-benefit reasoning is received in public life.

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CHAPTER I

INTERPRETING COST BENEFIT ANALYSIS, JUDGING REGULATION

1 Introduction

"Cost-benefit analysis can take many forms. It varies from a formal analysis in which all costs and benefits are quantified in an identical unit of measurement, usually dollars, and compared, to an informal analysis where costs and benefits are identified, quantified if possible, and balanced."

Sierra Club v. Sigler, 695 F.2d 957, 976 n.15 (5th Cir. 1983)

1.1 Cost Benefit Analysis in the Administrative State

Talk of costs and benefits pervades administrative law. The most conspicuous adoption of the cost-benefit paradigm in the American administrative state is the review of regulations promulgated through informal rulemaking by the Office of Information and Regulatory Affairs (OIRA), nested within the Executive Office of the President of the United States. A series of executive orders, beginning with President Reagan's EO 12291[1] and ending, most recently, with President Obama's EO 13563[2] have entrenched a formal mechanism for the White House to delay, revise, and even reject an administrative agency's rule for its failure to pass a cost-benefit test. As articulated in President Clinton's EO 12866,[3] administrative agencies (that are not independent) must, "to the extent permitted by law," "assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs."

But administrative agencies can also be commanded to engage in some type of cost-benefit calculation by statute. Congress first introduced the language of costs and benefits into legislation in the 1930s.[4] By the mid-1940s, the Army Corps of Engineers was conducting cost

[1] 46 Fed. Reg. 13193 (Feb. 17, 1981).
[2] 76 Fed. Reg. 3821 (Jan. 18, 2011).
[3] 58 Fed. Reg. 51735 (Sept. 30, 1993).
[4] *See, e.g.*, PETER H. SCHUCK, WHY GOVERNMENT FAILS SO OFTEN: AND HOW IT CAN DO BETTER 45-46 (2014). *See also* ROBERT L. GLICKSMAN & SIDNEY A. SHAPIRO, RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH 37-45 (2003) (contrasting a cost-benefit standard with a "constrained balancing standard" in which "Congress constrains or limits the manner in which an agency is to balance the costs and benefits of risk regulation," e.g. a technology-based standard, and an "open-ended balancing" in which Congress "require[s] that agencies consider a variety of factors, including regulatory costs and benefits, before deciding how to regulate, but tend not to dictate the weight the agency must place on each factor").

benefit analysis to assess the desirability of public work projects as part of their statutory duty.[5] Congress is not, however, always explicit about whether agencies may or have to engage in the balancing costs and benefits and how they are to do so. These issues are therefore frequently litigated and resolved by the courts through statutory interpretation.

In the early case of *Whitman v. American Trucking Associations,* the Supreme Court agreed that § 109(b) of the Clean Air Act (CAA) directing the Environmental Protection Agency (EPA) to set national ambient air-quality standards (NAAQS) "requisite to protect the public health" while leaving "an adequate margin of safety" did not implicitly authorize the agency to rely on cost-benefit analysis.[6] Justice Scalia, writing for the majority, thought it "fairly clear" that the text precluded the agency from "consider[ing] costs in setting the standards" and "refused to find implicit in ambiguous sections of the CAA an authorization to consider costs that has elsewhere, and so often, been expressly granted." In contrast, the high court, in the later case of *Entergy Corp. v. Riverkeeper, Inc.*, decided that the "best technology available" standard of the Clean Water Act (CWA) did not foreclose "consideration of the technology's costs and of the relationship between those costs and the environmental benefits produced."[7] The administrative agency's reading of the statute was therefore reasonable and entitled to deference. *EPA v. EME Homer City Generation* similarly held that the ambiguity in the language of the CAA did not necessarily bar a cost-sensitive approach to regulation.[8] This is because Congress had tasked the EPA to reduce a state's upwind emissions that "significantly contribute to nonattainment" of NAAQs by another state but had not provided a formula for "allocat[ing] among multiple contributing upwind States responsibility for a downwind State's excess pollution."[9] Congress' silence "effectively delegate[d] authority to EPA to select from among reasonable options."[10]

The D.C. Circuit has occasionally gone even further, requiring (and not merely permitting) the consideration *and* quantification of costs. In *Chamber of Commerce v. SEC*, the court held that the SEC had violated the APA by failing to quantify the costs of mandating an independent chair, and more independent directors, on the board of mutual funds.[11] *Business Roundtable v. SEC* struck down a rule requiring public companies to include in their annual proxy statements information about candidates nominated by large shareholders.[12] Characterizing the studies cited by the SEC as "relatively unpersuasive," the court ruled that the Commission had "relied upon

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[5] The Flood Control Act of 1936 provided that the "Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected." *See also Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 510 (1981) (giving the act as an example of when Congress clearly intended that the agency engage in cost benefit analysis)
[6] 531 U.S. 457, 468-71 (2001)
[7] 556 U.S. 208, 218 (2009)
[8] 134 S. Ct. 1584 (2014)
[9] *Id*. at 1604.
[10] *Id.*
[11] 412 F.3d 133 (D.C. Cir. 2005).
[12] 647 F.3d 1144 (D.C. Cir. 2011).

insufficient empirical data when it concluded that [the rule would] improve board performance and increase shareholder value by facilitating the election of dissident shareholder nominees."[13] This decision has been read by many commentators as an attempt to foist quantified CBA on independent financial agencies, and assailed on grounds of efficiency and legality. Detractors assert, among other things, that the CBA of financial regulations does not clear a cost-benefit test. According to them, CBA of financial regulations is unlikely to yield returns because the effects of these regulations are exceptionally difficult to foresee.[14] Moreover, critics urge that there is no legal basis for coercing independent financial agencies into undertaking quantified CBA. Indeed, the Supreme Court in a series of cases beginning from *Vermont Yankee Nuclear Power Corp. v. NRDC* has repeatedly admonished courts not to demand of agencies procedures that have not been mandated by Congress.[15] A judicial directive for agencies to execute quantified CBA transgresses this established and venerable principle of administrative law.[16]

Most recently, the Supreme Court ruled in *Michigan v. EPA* that the EPA was not only permitted, but obliged, to take cost into account when regulating power plants under a provision that permitted such regulation if "appropriate and necessary."[17] This result has only added fuel to the debate over cost-benefit analysis. Advocates of cost-benefit analysis hailed Justice Scalia's acknowledgement that "[o]ne would not say that it is even rational, never mind 'appropriate,' to impose billions of dollars in economic costs in return for a few dollars in health or environmental benefits" as heralding the coming of age of the cost-benefit state.[18] Their adversaries, on the other hand, took the justice's clarification that the court "need not and [did] not hold that the law unambiguously required . . . a formal cost-benefit" as implying a repudiation of the suggestion that absent Congressional intent to the contrary, "quantified" cost-benefit analysis must be carried out by administrative agencies engaged in rulemaking.[19]

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[13] *Id.* at 1150-51.

[14] John C. Coates IV, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L.J. 882 (2015)

[15] 435 U.S. 519 (1978).

[16] *See, e.g.*, James D. Cox & Benjamin J.C. Baucom, *The Emperor Has No Clothes: Confronting the D.C. Circuit's Usurpation of SEC Rulemaking Authority*, 90 TEX. L. REV. 1811(2012). *See also* ADRIAN VERMEULE, LAW'S ABNEGATION: FROM LAW'S EMPIRE TO THE ADMINISTRATIVE STATE 171-72 (2016).

[17] 135 S. Ct. 2699 (2015)

[18] Cass R. Sunstein, *Thanks, Justice Scalia, for the Cost-Benefit State*, BLOOMBERG (Jul. 7, 2015), https://www.bloomberg.com/view/articles/2015-07-07/thanks-justice-scalia-for-the-cost-benefit-state.

[19] Amy Sinden, *Supreme Court Remains Skeptical of the "Cost-Benefit State"*, THE REGULATORY REVIEW (Sep. 26, 2016), https://www.theregreview.org/2016/09/26/sinden-cost-benefit-state/.

1.2 Quantified versus Non-Quantified Cost Benefit Analysis

Although it is fair to say that the state of current jurisprudence favors agencies discretion in the accounting of costs and benefits,[20] some scholars continue to contend that agencies that have failed to engage in "quantified" cost-benefit analysis have acted arbitrarily. This is because for all its shortcomings, "[quantified cost benefit analysis] is the best available method for assessing the effects of regulation on social welfare."[21] Others maintain, however, that agencies are under no legal obligation to conduct quantified cost benefit analysis. As "quantified" cost-benefit analysis is "is both disputable and widely disputed," "[t]o impose it on agencies in the name of rationality would be to squelch reasonable disagreement by sheer force."[22]

The debate has been conducted in these terms because, as Adrian Vermeule puts it, "there is a slippage in this literature between a tautology, on the one hand, and a highly sectarian decision-procedure, on the other."[23] The former is the rather mundane proposition that one should only take an action if its benefits exceed its costs. It is identified with an informal, qualitative style of cost-benefit balancing, and exemplified by Benjamin Franklin's "moral or prudential algebra":

> [M]y Way is to divide half a Sheet of Paper by a Line into two Columns; writing over the one *Pro*, and over the other *Con*[,] . . . put[ting] down under the different Heads short Hints of the different Motives . . . *for* or *against* the Measure, . . . [and] estimating their respective Weights, . . . [even] tho' the Weight of Reasons cannot be taken with the Precision of Algebraic Quantities . . . .[24]

The latter involves commitment to the normative baggage that underlies cost-benefit analysis as performed by administrative agencies for review by OIRA. It is identified with a formal, quantitative style of cost-benefit analysis, and is exemplified by the Office of Management and Budget (OMB)'s Circular A-4.[25] "By measuring incremental benefits and costs of successively more stringent regulatory alternatives," Circular A-4 states, "you can identify the alternative that maximizes net benefits."[26]

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[20] Amy Sinden, *A 'Cost-Benefit State'? Reports of Its Birth Have Been Greatly Exaggerated*, 46 ENVTL. L. REP. 10933 (2016); Adrian Vermeule, *Does Michigan v. EPA Require Cost-Benefit Analysis?*, NOTICE & COMMENT (Feb. 6, 2017), http://yalejreg.com/nc/does-michigan-v-epa-require-cost-benefit-analysis-by-adrian-vermeule/.
[21] Cass R. Sunstein, *Cost-Benefit Analysis and Arbitrariness Review* 7 (Harvard Public Law Working Paper No. 16-12 2016), https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2752068.
[22] VERMEULE, *supra* note 16, at 171.
[23] *Id.* at 170.
[24] BENJAMIN FRANKLIN, BENJAMIN FRANKLIN: REPRESENTATIVE SECTIONS, WITH INTRODUCTION, BIBLIOGRAPHY AND NOTES 348-49 (Frank Luther Mott & Chester E. Jorgenson eds,1936).
[25] OFFICE OF MGMT & BUDGET, EXEC. OFFICE OF THE PRESIDENT, CIRCULAR A-4 (2003), *available at* https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/.
[26] *Id.*

The contrast drawn between "quantified" and "unquantified" cost-benefit analysis[27] is, however, liable to engender confusion. The issue of quantification, as opposed to monetization and aggregation,[28] is a red herring because quantification should always be undertaken if feasible.[29] It is not sensible to make a decision, especially an important one, on the basis of less rather than more information. If it can be ascertained that the introduction of a vastly more stringent emissions standard reduces the risk of a severe disease by half a percentage point but increases unemployment by a full percentage point, these are numbers that a rational decision-maker should retrieve and take into account, whether or not she subscribes to qualitative balancing or quantitative analysis of costs and benefits. Regardless of her ideological commitments, it is better for the decision-maker to apprise herself of this trade-off than to wallow in the ambiguity of descriptors such as "small" and "large."[30] Some might resist this conclusion because it seems to imply an endorsement of "quantified" cost-benefit analysis (and its alleged anti-regulatory bias).[31] But the distinctive features of "quantified" cost-benefit analysis are monetization and aggregation.

[27] To presage the next section, "unquantified" cost benefit analysis is not a form of CBA on the definition that I set out later.

[28] This distinction can also be found in Circular A-4. *See* OFFICE OF MGMT & BUDGET, *supra* note 25 ("The agency should use the best reasonably obtainable scientific, technical, economic, and other information to quantify the likely benefits and costs of each regulatory alternative. Presenting benefits and costs in physical units in addition to monetary units will improve the transparency of the analysis. For example, the benefits of a regulation that reduces emissions of air pollution might be quantified in terms of the number of premature deaths avoided each year; the number of prevented nonfatal illnesses and hospitalizations; the number of prevented lost work or school days; improvements in visibility in specific regions; and improvements in ecosystem health as measured by specific indicators (e.g. lake acidification). Some costs – such as countervailing risks – may also be quantified in similar terms before they are turned into monetary equivalents.")

[29] In an essay decrying the "stupidity" of the cost-benefit standard, Henry Richardson nevertheless acknowledges "the importance of collecting information about the benefits and costs of alternative proposals," calling it "the first step in any intelligent process of deliberation." Henry S. Richardson, *The Stupidity of the Cost-Benefit Standard*, 29 J. LEGAL STUD. 973 (2000). This is not, of course, to deny the uncertainty inherent in many areas of regulation. Quantification in the face of such uncertainty is an interesting issue that is related to, but not at the crux of, cost-benefit analysis. *See, e.g.*, Daniel A. Farber, *Uncertainty*, 99 GEO. L.J. 901 (2010); David M. Driesen, *Cost-Benefit Analysis and the Precautionary Principle: Can They Be Reconciled?*, 2013 MICH. ST. L. REV. 771 (2013).

[30] Amy Sinden has "qualitative description" anchoring the informal end of the "assessment of cost and benefits" axis, and "all costs and benefits are quantified and monetized" anchoring the other, formal end. "Full (or partial) quantification but in different metrics" is closer to the informal side of the continuum. Amy Sinden, *Formality and Informality in Cost-Benefit Analysis*, 2015 UTAH L. REV. 83 (2015).

[31] *See, e.g.*, David M. Driesen, *Is Cost-Benefit Analysis Neutral?*. 77 U. COLO. L. REV. 335 (2006). *See also* Revesz and Livermore (2008) (maintaining that while cost benefit analysis has frequently been employed to defeat regulation, this is not a necessary consequence of using cost benefit analysis).

Because they are at the heart of "quantified" cost-benefit analysis, "quantified" cost-benefit analysis has to be understood and justified by reference to them (and not quantification).

One argument advanced in favor of "quantified" cost-benefit analysis is that is it can mitigate the effects of cognitive bias on decision-making.[32] Take for example the availability heuristic – the tendency to assign a higher probability to events if instances of their occurrence are more easily recalled. Although the reliance on the availability heuristic could be efficient, given our scarce mental resources, it can result in overestimation of the frequency of accidents that attract greater media attention and underestimation of the frequency of those that do not. This mis-appreciation of risk may then be manifested in calls for the regulation of relatively minor, yet salient, risks. According to Cass Sunstein,

> the effect of cost-benefit analysis is to subject a public demand for regulation to a kind of technocratic scrutiny, to ensure that the demand is not rooted in myth, and to ensure as well that government is regulating risks even when the public demand (because insufficiently informed) is low. And here too there is no democratic problem with the inquiry into consequences. If people's concern is fueled by informational forces having little reliability, and if people express concern even though they are not fearful, a governmental effort to cool popular reactions is hardly inconsistent with democratic ideals. Similarly, there is nothing undemocratic about a governmental effort to divert resources to serious problems that have not been beneficiaries of cascade effects.[33]

It is difficult to object to more informed decision-making. But it is not immediately clear that monetization and aggregation, as opposed to quantification of the actual risks, is necessary for "quantified" cost-benefit analysis to have this salutary effect.[34] There is a danger here that monetization and aggregation are being smuggled in through the Trojan horse of quantification.

Moreover, if the actual risks are unknown and/or unknowable,[35] then the argument over "quantified" as opposed to "non-quantified" cost benefit analysis is somewhat distracting. To illustrate, imagine an amusement park game defined around an urn containing 60 balls. All that is known is that 20 of these balls are red while the rest are either yellow or black.[36] Assume that one ball is to be picked from the urn and that the default lottery is a dollar if a red ball is drawn (and nothing otherwise). The visitor can, however, elect a second lottery that pays a dollar if a black ball is drawn (and nothing otherwise). Now, suppose the visitor chooses the second lottery.

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[32] Cass R. Sunstein, *Cognition and Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1059 (2000); Cass R. Sunstein, *Is Cost-Benefit Analysis a Foreign Language?*, Q. J. EXPERIMENTAL PSYCHOL. (forthcoming 2017), *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2893401.
[33] Sunstein, *supra* note 32, at 1067.
[34] Cf. STEPHEN BREYER, BREAKING THE VICIOUS CIRCLE: TOWARD EFFECTIVE RISK REGULATION 35 (1993) ("The public's 'nonexpert' reactions reflect not different values but different understandings about the underlying risk-related facts.")
[35] This is sometimes referred to in economics as Knightian uncertainty. *See* FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT (1921).
[36] This example is inspired by the Ellsberg paradox. *See* Daniel Ellsberg, *Risk, Ambiguity, and the Savage Axiom*, 75 Q.J. ECON. (1961).

Observing this, we interrupt and ask her to support her decision using "quantified" cost-benefit analysis. This can certainly be done by assigning a probability great than $\frac{1}{3}$ to the chance of drawing a black ball. Yet, it does not resolve the issue of whether the decision is wise or "arbitrary and capricious."[37] Advocates of "quantified" cost-benefit analysis in the face of uncertainty usually resort to claims about the decisionmaker's "latent knowledge and expertise."[38] But the credibility of these claims is independent of quantification.[39]

Since monetization and aggregation, not quantification, appears to me to be the normative core of cost benefit analysis, I do not believe the distinction between "quantified" and non-"quantified" cost benefit analysis to be the most relevant one for law and policy.

1.3 Defining Cost-Benefit Analysis

To reiterate, it is trite to say that in considering a course of action, one should ponder, seriously, its costs and its benefits. But to leap from this mundane proposition to the stronger conclusion that rational regulation demands cost benefit analysis[40] is too quick, because cost-benefit analysis involves more than just the contemplation of the consequences of a decision.

For ease of exposition, I henceforth use the term cost-benefit analysis to refer loosely to the consideration of costs and benefits in regulation and the abbreviation CBA to refer more precisely to a certain kind of cost-benefit analysis. Although CBA can come in many shapes and sizes, it usually takes the form of identification, quantification, monetization, aggregation, and comparison. Ideally, the conscientious cost-benefit analyst identifies the available alternatives, quantifies the different effects that each alternative could be expected on have, monetizes the quantified expressions of these effects, and then aggregates these monetized valuations, according to some formula, to arrive at a number for each alternative. These numbers may be compared to each other or they may be compared to some pre-defined baseline. By describing CBA in structural

[37] *Cf.* Sunstein, *supra* note 21.

[38] Jonathan S. Masur & Eric A. Posner, *Unquantified Benefits and the Problem of Regulation under Uncertainty*, 102 CORNELL L. REV., 87, 120 (2016).

[39] A separate argument is that even if the numbers are no more than guesses, they should be furnished on the basis of regulators' beliefs because they "provide a basis for evaluating the regulators' reliability as additional information is disclosed later on" and "for revisions in light of additional information." *See id*. I have no quarrel with this idea, but would add, in the same vein, that uncertainty may counsel an incremental rather than comprehensive rational approach to policymaking. *See* Colin S. Diver, *Policymaking Paradigms in Administrative Law*, 95 HARV. L. REV. 393 (1981); SHAPIRO & GLICKSMAN, *supra* note 4.

[40] *See, e.g.*, 50 Fed. Reg. at 52141 ("If use value is higher than the cost of restoration or replacement, then it would be more rational for society to be compensated for the cost to restore or replace the lost resource than to be compensated for the lost use. Conversely, if restoration or replacement costs are higher than the value of uses foregone, it is rational for society to compensate individuals for their lost uses rather than the cost to restore or replace the injured natural resource"); *Ohio v. U.S Dep't of the Interior*, 880 F.2d 432, 456 (D.C. Cir. 1989) (characterizing the this as "nothing more or less than cost benefit analysis.")

terms, I mean to accommodate approaches that differ as to the composition of society, the theoretical foundations of monetization, and the ethical concerns that are reflected, through the choice of a discount rate or distributional weights, in aggregation. On this definition, CBA encompasses cost-benefit analysis as it is set out in economic textbooks ("conventional CBA"),[41] and cost-benefit analysis as it is currently practiced by administrative agencies ("administrative CBA"). These mainstream versions of CBA take individual willingness-to-pay (WTP) as the basis for monetization.[42] But CBA also encompasses variants that have been espoused in the evolving academic literature such as those that adopt subjective well-being indicators over WTP.[43]

The use of CBA as a regulatory tool has many attractions. Champions tout the efficiency gains that could be achieved through rigorous CBA.[44] Furthermore, by making assumptions explicit and susceptible to challenge, CBA fosters transparency and fairness.[45] But CBA has also seen its fair share of critics.[46] According to them, CBA is founded on a mistaken theory of value[47] and is an unreliable method, even as to the dimension that it sets out to measure[48]. I do not directly adjudicate this controversy here. Rather, the chief aim of this essay is to explore the interpretations that could be attached to CBA, and the constraints that these interpretations impose on CBA methodology, and *vice versa*.

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[41] *See, e.g.,* ANTHONY E. BOARDMAN ET AL., COST-BENEFIT ANALYSIS: CONCEPTS AND PRACTICE (4th ed. 2010)

[42] *See generally* IAN J. BATEMAN ET AL., ECONOMIC VALUATION WITH STATED PREFERENCE TECHNIQUES: A MANUAL 24-28 (2002). *See* OFFICE OF MANAGEMENT AND BUDGET, CIRCULAR A-4 REGULATORY ANALYSIS (2003), *available at* https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/ (acknowledging that "willingness to pay is generally the preferred economic method for evaluating preferences"). *See also* CASS R. SUNSTEIN, THE COST-BENEFIT STATE 77 (2002) (stating that notwithstanding wide variations in the value of a statistical life across administrative agencies, "willingness to pay is the general basis for undertaking calculations.")

[43] This sometimes trades under the name "well-being analysis" or "WBA." *See* John Bronsteen et al., *Well-Being Analysis v. Cost-Benefit Analysis*, 62 DUKE L.J. 1603 (2013); Matthew D. Adler, *Happiness Surveys and Public Policy: What's the Use?*, 62 DUKE L. J. 1509 (2013).

[44] See e.g. Tammy O. Tengs & John D. Graham, *The Opportunity Costs of Haphazard Social Investments in Life-Saving, in* RISKS, COSTS, AND LIVES SAVED: GETTING BETTER RESULTS FROM REGULATION (Robert W. Hahn ed., 1996).

[45] *See, e.g.,* MATTHEW D. ADLER & ERIC A. POSNER, NEW FOUNDATIONS OF COST-BENEFIT ANALYSIS 123 (2006).

[46] *See, e.g.,* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004)

[47] *See* ELIZABETH ANDERSON, VALUE IN ETHICS AND ECONOMICS (1993)

[48] For a concise and careful survey of these arguments, see Charles Blackorby and David Donaldson, *A Review Article: The Case against the Use of the Sum of Compensating Variations in Cost-Benefit Analysis*, 23 CAN. J. ECON. 471 (1990).

2 Three Interpretations of CBA

2.1 Welfarist CBA

Some of the contemporary normative defenses of CBA disclaim CBA's pretension to being comprehensive and hence, conclusive. CBA does not result in an all-things-considered judgment as to the right or correct course of action to take.[49] For example, Matthew Adler and Eric Posner make the case for CBA not by embracing utilitarianism, but by arguing for overall well-being being at least one morally relevant factor among others.[50] This position is referred to as "weak welfarism."[51] According to weak welfarism, CBA, as an indicator of overall well-being, should be undertaken by decision-makers seeking to do the right thing. I shall call CBA that is so justified and interpreted welfarist CBA.

2.1.1 Theories of Well-Being

Welfarist CBA conveys information about overall well-being. Well-being refers to "how well [a life] is going for the individual whose life it is," and an individual's life is going well for her insofar as it has prudential, as opposed to aesthetic, ethical, or perfectionist, value.[52] As others have recognized, there is a lively dispute over the nature of wellbeing.[53] Although it is undeniable that there are things that always contribute to an individual's wellbeing, what it is about these things that make them prudentially valuable for the individual remains contested.[54]

Hedonic accounts locate prudential value in a state of the mind. Jeremy Bentham, for example, held that that pleasure is good for an individual and pain, bad for her, and that wellbeing supervenes on these sensations alone.[55] The value attached to a pleasure or a pain, considered in isolation is then differentiated by its "intensity," "duration," "certainty or uncertainty," and "propinquity or remoteness."[56] Bentham's contention is, however, subject to the critique that pleasures/pains do not have a uniform quality and the pleasure/pain derived from one activity

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[49] *See* Richard A. Posner, *Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers*, 29 J. LEGAL STUD. 1153, 1156 (2000) (identifying three uses of cost benefit analysis: "as pure evaluation," "as an input into decision," "or as the decision rule.")

[50] Adler & Posner, *supra* note 45, at 52-61.

[51] *Id.* at 26.

[52] L.W. SUMNER, WELFARE, HAPPINESS & ETHICS 20-25 (1996).

[53] *See, e.g.*, MATTHEW D. ADLER, WELL-BEING AND FAIR DISTRIBUTION: BEYOND COST-BENEFIT ANALYSIS 155-81 (2011).

[54] The classification of the competing accounts into "hedonic," "desire-based," and "objective list" theories is laid out in DEREK PARFIT, REASONS AND PERSONS 493 (1984). *See also* SUMNER, *supra* note 52; JAMES GRIFFIN, WELL-BEING: ITS MEANING, MEASUREMENT, AND MORAL IMPORTANCE (1986)

[55] JEREMY BENTHAM, AN INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION (J.H. Burns & H.L.A. Hart eds., 1996)

[56] *Id.* at 38.

might be different in kind from the pleasure/pain derived from another.[57] An objection – one that traces back to Socrates – is that on Bentham's terms, the faintly pleasant life of an oyster, if sufficiently enduring, can be better for an individual than the life of a human being in all its richness.[58]

James Mill and Henry Sidgwick avoided these difficulties by introducing a primitive attitude that characterizes pleasures and pains. Mill appeals to the preference for prolonging pleasure and for ending pain[59] while Sidgwick defines pleasure "as a feeling which, when experienced by intelligent beings, is at least implicitly apprehended as desirable."[60] But hedonic accounts are, as a class, vulnerable to a putatively decisive objection, namely, that as far as our well-being is concerned, we may care about things other than mental states. This is most famously illustrated by Robert Nozick's hypothetical of the experience machine.[61] Even if "[s]uperduper neurologists could stimulate your brain" so as to give you any experience you fancy, you would not choose to spend a lifetime in such a machine, enjoying the feeling of "writing a great novel, or making a friend, or reading an interesting book."[62] This is because, "we want to *do* certain things, and not just have the experience of doing them."[63]

In contrast to hedonic accounts, desire-based (or preference-satisfaction) accounts generally assert that a state of the world, *x*, is good for someone if and only if some desire (or preference) of hers is fulfilled in *x*. This assertion has to be qualified, however, for it is clear that a person can desire things that are not good, and actually bad, for her.[64] Moreover, a person can come to adapt her preferences to her station in life. As Amartya Sen vividly illustrates, "[t]he hopeless beggar, the precarious landless labourer, the dominated housewife, the hardened unemployed, or the overexhausted coolie" may come to "take pleasures in small mercies," but this does not make their condition any less deplorable.[65] Since actual desire could be tainted by errors

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[57] *See, e.g.*, PLATO, THE COLLECTED DIALOGUES OF PLATO 1088 (1963) ("Of course the mere word 'pleasure' suggests a unity, but surely the forms it assumes are of all sorts and in a sense unlike each other. For example, we say that an immoral man feels pleasure, and that a moral man feels it too just in being moral; again, we say the same of a fool whose mind is a mass of foolish opinions and hopes; or once again an intelligent man, we say, is pleased just by being intelligent. Now if anyone asserts that these several kinds of pleasure are like each other, surely he will deserve to be thought foolish?")

[58] *Id.* at 1098.

[59] 2 JAMES MILL, AN ANALYSIS OF THE PHENOMENA OF THE HUMAN MIND 184 (Alexander Bain et al. eds., 2nd ed. 1878) ("I have one sensation, and then another, and then another. The first is of such a kind, that I care not whether it is long or short; the second is of such a kind that I would put an end to it instantly if I could; the third is of such a kind, that I like it prolonged. To distinguish these feelings, I give them names. I call the first Indifferent; the second, Painful; the third, Pleasurable.")

[60] HENRY SIDGWICK, THE METHODS OF ETHICS 127 (7th ed. 1981).

[61] ROBERT NOZICK, ANARCHY, STATE, AND UTOPIA 42-45 (1974)

[62] *Id.* at 42.

[63] *Id.* at 43.

[64] GRIFFIN, *supra* note 54, at 12-13; SUMNER, *supra* note 52, at 129-130.

[65] AMARTYA SEN, ON ETHICS AND ECONOMICS 45-46 (1987).

of fact, failures in practical reasoning, and a general lack of insight, the desires that count must be confined to those that have been formed under idealized conditions.[66]

Moreover, the range of desire can extend widely, and not all such desires bear on an individual's wellbeing, especially if they are spatially and/or temporally distant.[67] For example, one may have a desire to see human beings colonize Mars. If this were to come to pass decades after one's death, it is not clear, and indeed rather doubtful, whether one's well-being has truly been enhanced by such an occurrence.

Finally, objective list accounts hold that (1) there is a plurality of goods that are prudentially valuable for a person, and (2) that at least one of those goods is prudentially valuable for her regardless of her attitudes to, or evaluation of, it. Such lists are usually constructed through reflection on the kinds of things that make an individual's life go better for her:

> We imagine two possible lives for someone that are as much alike as possible except that one of these lives contains more of some candidate good than the other. We then think about whether the life containing more of the candidate good would be more beneficial to the person living it than the other life. If the correct answer is no, then definitely the candidate good in question is not an element of well-being. On the other hand, if the correct answer is instead that the life with more of the candidate good is more beneficial, then we inquire what is the right explanation of this life's being more beneficial. One possible explanation is that the candidate good in question really is an element of well-being.[68]

Performing this exercise, Brad Hooker identified "pleasure, friendship, significant achievement, important knowledge, and autonomy, but not either the appreciation of beauty of the living of a morally good life" as constitutive of well-being.[69] Other theorists have arrived at lists such as "virtue, pleasure, the allocation of pleasure to the virtuous, and knowledge,"[70] "life, knowledge, play, aesthetic experience, friendship, practical reasonableness, and religion," [71] and "accomplishment," "the components of human existence," "understanding," "enjoyment" and "deep personal relations."[72]

Objective list theories have been dismissed as lists of things that are prudentially valuable; not a theory of prudential value.[73] But as others have argued, objective list theories also make

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[66] GRIFFIN, *supra* note 54, at 14; SUMNER, *supra* note 52, at 131.
[67] GRIFFIN, *supra* note 54, at 16-17; SUMNER, *supra* note 52, at 125.
[68] Brad Hooker, *The Elements of Well-Being*, 3 J. PRAC. ETHICS 15, 19 (2015).
[69] *Id.* at 15.
[70] DAVID ROSS, THE RIGHT AND THE GOOD 134-141(Philip Stratton-Lake ed., 2nd ed., 2003).
[71] JOHN FINNIS, NATURAL LAW AND NATURAL RIGHTS 85-92 (2nd ed., 2011)
[72] GRIFFIN, supra note 54, at 67-68.
[73] SUMNER, *supra* note 52, at 45.

"[the] claim that what it is to be intrinsically valuable for a person, to make that person's life go better for herself is to be an item on that list."[74]

For CBA to serve as an indicator of overall well-being, it is not enough to be able to identify "costs" and "benefits." We have to specify the account of well-being that is to inform CBA. There is at least an argument (the "evidential view") that such a step is unnecessary because (1) CBA only needs an enumeration of things that are good, and not an explanation of goodness,[75] and (2) preferences constitute evidence of the things that are good.[76] This second premise depends for its validity on two empirical assertions – that "[w]hen people are self-interested, their preferences will match what they believe will benefit them" and that "[people] are good judges of what will benefit them."[77] If both premises are true, then conventional CBA can identify the policies that advance well-being.

To evaluate these contentions, it is necessary to clarify the first premise. For CBA to be useful, it is not sufficient that some things be classified as good, and hence as benefits, and others as bad (or involving the loss of a good), and hence as costs. CBA has to balance the former against the latter by monetizing benefits and costs, and this requires some knowledge of the degree of good-ness or bad-ness of these things. Thus, the first premise, more precisely formulated, is that CBA only needs to assess how good or how bad outcomes are; it does not need to articulate why. So stated, the first premise is unobjectionable. But this implies that the second premise cannot be solely that "[a person's] preferences may tell others what is good for [her]."[78] It has to be that the strength of the preference also tells others how good the thing that is preferred is. Put in these terms, the second premise loses some of its plausibility. I may develop a sudden craving for fried chicken and desire it immensely, but it is not clear that the fried chicken, though perhaps good for me, is that much better for me than the salad I usually like.

This challenge to the evidential view is not merely an academic one.[79] Allegations of irrationality in regulation are frequently made on the basis of differences in costs incurred to save

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[74] Richard J. Arneson, *Human Flourishing Versus Desire Satisfaction*, 16 SOC. PHIL. & POL'Y 113, 118-19 (1999).

[75] *See, e.g.*, ROGER CRISP, REASONS AND THE GOOD 102-03 (2006) (explaining the distinction between enumerative theories of well-being and explanatory ones).

[76] DANIEL M. HAUSMAN, PREFERENCE, VALUE, CHOICE, AND WELFARE 88-103 (2012)

[77] *Id.* at 88-89.

[78] *Id.* at 88.

[79] *Contra* Gil Hersch, *The Narrowed Domain of Disagreement for Well-Being Policy*, PUB. AFF. Q. (forthcoming 2017), *available at* https://media.wix.com/ugd/eb32f5_998babe201ba478c876f7ad6f70c5163.pdf (Yet a lot of the disagreements among competing philosophical theories in general, and of well-being in particular, only emerge in such hypothetical cases. Many of the counter examples that challenge different theories of well-being only arise in hypothetical cases, such as Robert Nozick's experience machine or John Rawls' blades of grass counter. But such cases tend to be irrelevant to well-being policy. This is not to say that they are not legitimate challenges to a theory that purports to be a correct theory of well-being. Rather, many of these challenges simply do not arise when restricting the scope of the debate only to cases that have policy relevance. Well-

a statistical life. Stephen Breyer, for example, points to a 1992 study by the OMB "show[ing] variations ranging from space heater regulations that save lives at a cost of $100,000 per life saved to bans on [diethylstilbestrol] in cattle feed that require an expenditure of $125 million per statistical life," suggesting that "the nation could buy more safety by refocusing its regulatory efforts."[80] But as he himself later notes, these disparities "may reflect that the public fears certain risks more than others with the same probability of harm."[81] People appear to be willing to pay a premium to avoid . . . deaths that are especially dreaded, uncontrollable, involuntarily incurred, and inequitable distributed."[82] Welfarist CBA needs a theory of prudential value to handle these preferences, to know whether (and how) to credit them or to disregard them.[83]

To be sure, the contention need not be that preferences are a prefect proxy for well-being. The use of conventional CBA may be justified if preferences are the best proxy for well-being.[84] And examples of preferences that are inconsistent with judgements of well-being, however numerous, do not thereby establish the inferiority of conventional CBA vis-à-vis other approaches. Still, the assertion that preferences are the best proxy for well-being remains that – an assertion – unless we know the true value against which conventional CBA and its alternatives are to be measured.

Take, for instance, existence value.[85] CBAs of environmental regulations typically distinguish between use-value and non-use value. Use-value refers to the benefits that accrue from

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being policy need not be bothered by cases that go beyond the limits of practicality that public policy deals with.)

[80] BREYER, *supra* note 34, at 22.

[81] *Id.* at 33.*See also* Sunstein (2014, p. 15-16) (arguing on grounds of autonomy that the value of a statistical life should vary across mortality risks).

[82] Cass R. Sunstein, *Bad Deaths*, 14 J. RISK & UNCERTAINTY 259 (1997).

[83] *Cf. id.* at 276 ("the valuation of life should not be based on a uniform number . . . but should instead incorporate different social judgments about different kinds of death, to the extent that these judgments can survive critical scrutiny") , Richard Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 COLUM. L. REV. 941 (1999) (arguing for an upward adjustment of the value of a statistical life to account for dread); Matthew D. Adler, *Fear Assessment: Cost-Benefit Analysis and the Pricing of Fear and Anxiety*,79 CHI.-KENT L. REV. 977 (2004) (arguing that fear should be priced separately from the value of a statistical life).

[84] ADLER & POSNER, *supra* note 45, at 25 ("Cost-benefit analysis is a rough-and-ready proxy for overall well-being. It is an imperfect but practicable tool by which government decision-makers implement the criterion of overall welfare."). *See also* Richard A. Arneson, *Meaningful Work and Market Socialism Revisited*, 31 ANALYSE & KRITIK 139, 145 (2009) (recognizing one "cannot show that a proposed law or policy is unacceptable merely by pointing to an anomaly, a case in which the expectable application of the proposed law or policy would give rise to morally wrong results. You can defeat a proposed law or policy only by describing an alternative policy that would do a better job than the initial proposal at fulfilling to a higher degree the appropriately weighted goals that policy in this area ought to serve.")

[85] See the related discussions in HAUSMAN, *supra* note 76, at 91-92 and ADLER & POSNER, , *supra* note 45 at 126-27.

the actual use of an environmental resource. Non-use value refers to all other benefits and they, in turn, can be sub-divided into option value and existence value. Option value is the value of having the resource available for use at some indeterminate time in the future. Existence value is the value of having the resource, independent of any present or potential use. Although the entrance of existence value into rulemaking is relatively recent,[86] its invocation by government agencies has become increasing common.[87]

The monetization of existence value, though common in CBA, is normatively fraught, and not just for the reasons that some economists cite, *viz.* that assessments of existence value are, and can only be, founded on non-market behavior[88]. For existence value to register on a welfarist CBA, it must contribute to well-being. There have been attempts at such a claim.[89] One thought is that "[p]eople may value diverse habitats and diverse wildlife intrinsically because of moral or spiritual/religious convictions about nature and the inherent worth of non-human entities."[90] Because of that, they can be "harm[ed]" by the destruction of a natural resource, over and above any losses that they suffer from being unable to use the resource. Another thought is that people "may derive psychic satisfaction, a sense of heightened well-being, from the existence of certain natural resources even though they have no conscious moral or spiritual values regarding those resources."[91] These

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[86] ADLER & POSNER, *supra* note 45 at 126 (giving the date as 1991).

[87] Most strikingly, the Department of Justice has considered crime to have "an 'existence value' separate and apart from its impact on its victims because "it is worth something to people to know that they live in a crime-free (or crime-reduced) society" and "[i]t is also worth something to people to know that their loved ones who are incarcerated, or who might face incarceration some day, are less likely to be raped during their confinement." U.S. DEP'T OF JUSTICE, INITIAL REGULATORY IMPACT ANALYSIS FOR THE PROPOSED NATIONAL STANDARDS TO PREVENT, DETECT, AND RESPOND TO PRISON RAPE UNDER THE PRISON RAPE ELIMINATION ACT (Jan. 24, 2011), *available at* https://ojp.gov/programs/pdfs/prea_nprm_iria.pdf.

[88] *See, e.g.*, Donald H. Rosenthal & Robert H. Nelson, *Why Existence Value Should Not Be Used in Cost-Benefit Analysis*, 11 J. POL'Y ANALYSIS & MGMT. 116, 117 (1992) ("even a single existence value is very difficult to measure accurately in practice" and "[e]stimates of existence value depend heavily on the circumstances in which consumers are asked to give their evaluations.) *See also* ADLER & POSNER, *supra* note 45 at 126 ("One reason for hesitation about calculating existence values was no doubt methodological. Existence values cannot be inferred from market behavior, but must be derived from costly and controversial surveys.")

[89] *See, e.g.*, David A. Dana, *Existence Value and Federal Preservation Regulation*, 28 HARV. ENVTL. L. REV. 343, 345 (2004) ("Some, perhaps many, Americans lose some sense of well-being simply by virtue of the loss of the existence of wetlands, waterways, and other natural resources in states where they do not live").

[90] *Id.* at 348.

[91] *Id. See also* U.S. ENVTL. PROT.AGENCY, ENVIRONMENTAL AND ECONOMIC BENEFIT ANALYSIS OF PROPOSED REVISIONS TO THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM REGULATION AND THE EFFLUENT GUIDELINES FOR CONCENTRATED ANIMAL FEEDING OPERATIONS, *available at* https://www.regulations.gov/document?D=EPA-HQ-OECA-2009-0274-0166 (describing existence value as "the sense of well-being that people derive from the existence of . . . resources, even when they do not expect to see or use these resources"); John V. Krutilla, *Conservation Reconsidered*, 57 AM. ECON. REV. 777, 779 (1967) (suggesting that for some individuals, such as "the spiritual descendants of John Muir, the present members of the

arguments are relative unconvincing as arguments for CBA as it is currently performed by administrative agencies (and their consultants), and their shortcomings are instructive for our thinking about CBA.

One might ask "why the value derived by birdwatchers from bird watching, but not the value derived by non-birdwatchers from knowing that birds continue to exist, should 'count' in the determination of public policy."[92] If the satisfaction of a desire makes the desirer better off, then the accounting of existence value in CBA is simply recognition of the fact that some members of society desire the conservation of an environmental resource for its own sake. But desire-based (and objective list) accounts are embarrassed by exactly this kind of scenario. It strains our ordinary understanding of the idea of wellbeing to claim that the mere existence of an environmental resource can make an individual's life better for her. The fact that these desires stem from moral or spiritual/religious commitments does not make a difference. A moral agent acting out of conviction does not aim at making herself better off,[93] and the notion of a voluntary sacrifice is only coherent if one can desire something that does not have prudential value for oneself.

Certainly, there could be exceptional circumstances: an environmental activist who has devoted her entire life to say, protecting the ecosystem of Prince William Sound, could be said to be made worse off by the destruction wrecked by the *Exxon Valdez*. But current estimates of existence value cannot be defended on these grounds. This is because contingent valuation surveys, as fielded, generally ask respondents for their willingness-to-pay (WTP) for a stated policy; it does not ask them for their WTP for the enhancement in wellbeing brought about by that policy.[94]

Hedonic accounts might, perhaps, furnish a foundation for existence values. Insofar as one experiences pleasure at the thought that a particular environmental resource exists, existence value can be defined by the amount and intensity of this pleasure. But if this is so, then economists have been going about their task in either a confused or a clumsy fashion. Instead of asking individuals what they are willing to pay to save the environmental resource, the economist should first estimate the distribution of the number of times an individual recalls, or is reminded of, the environmental

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Sierra Club, the Wilderness Society, National Wildlife Foundation, Audubon Society and others . . . the loss of a species or the disfigurement of a scenic area causes acute distress and a sense of genuine relative impoverishment").

[92] Dana, *supra* note 89, at 349. Richard Posner makes a (superficially) similar point: "Suppose someone who does not expect to benefit from preserving the existing number of species nevertheless believes, perhaps as a matter of religious conviction, that it is wrong to allow a species to become extinct as a consequence of human activity; and he backs up his conviction with his money by making charitable contributions from which his implicit, and positive, valuation of species preservation can be inferred and even monetized with adequate objectivity to be incorporated into a cost-benefit analysis." However, since Posner believes that the justification for CBA has to be "pragmatic rather than foundational," he, unlike Dana, does not try (or have) to tie existence value to wellbeing. *See* Posner, *supra* note 49, at 1168.

[93] MARK SAGOFF, PRICE, PRINCIPLE, AND THE ENVIRONMENT 47 (2004) ("Beliefs are not benefits . . . A person who wants the Park Service to respect hallowed ground may consider that policy justified by the qualities of the battlefield itself and not by welfare consequences for her or him.")

[94] For articulations of this view, see *id.* at 46 and HAUSMAN, *supra* note 76, at 98.

resource. The economist should then seek to measure the changes in positive/negative affect occasioned by such thoughts, being careful to distinguish, if she can, between the pleasure derived from belief that the environmental resource is still in existence and pleasure that is not, such as that derived from reminiscences. So evaluated, it is difficult to believe that existence value can be anything but *de minimis* for all but a few individuals.

That leaves objective list accounts. Although objective lists are not in especially short supply, existence value is scarcely to be found in many of them. For example, it is not obvious how the Yosemite National Park, by virtue of its existence alone, enhances "pleasure, friendship, significant achievement, important knowledge, or autonomy."[95] Concededly, there are some objective lists that acknowledge the environment as an element of wellbeing. For example, Martha Nussbaum includes in the ten "central human capabilities" a head of "other species": "being able to live with concern for and in relation to animals, plants, and the world of nature."[96] This capability does not, however appear to be impaired by the despoliation of an isolated environmental resource that is far removed from a person's experiences.[97] And even if "being able to live with concern for" the environment is a central human capability that groups existence value, it is unclear if asking people for their WTP is the best metric to use for assessing the relative contributions of items contained in a single objective list.

2.1.2 Liberal Neutrality and the Preference Satisfaction State

Welfarist CBA, so I have argued, needs a theory of well-being. Yet, there is reasonable disagreement about the nature of prudential value. Some maintain that wellbeing ultimately inheres in sensations. Others hold that all said and done, wellbeing consists in having one's desires satisfied. And still others insist that wellbeing has a plurality of irreducible elements, and that some of these elements may have prudential value for the individual, even if she does not apprehend them as such. Yet CBA, as executed by agencies and defended by its most ardent supporters, seem to be largely built on a desire satisfaction account. The developments of the last decades have not only ushered in a cost-benefit state; they have also heralded a preference-satisfaction one.

The preference-satisfaction state, however, seems, at first blush, to blatantly violate one of the tenets of liberalism: neutrality. In its "canonical"[98] formulation, liberal neutrality is the principle that "government must be neutral on what might be called the question of the good life."[99]

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[95] *Cf.* Hooker, *supra* note 68, at 19.

[96] MARTHA C. NUSSBAUM, FRONTIERS OF JUSTICE: DISABILITY, NATIONALITY, SPECIES MEMBERSHIP 76-78 (2006)

[97] *Cf.* Breena Holland, *Justice and the Environment in Nussbaum's "Capability Approach,"* 61 POL. RES. Q. 319, 322-23 ("In holding that animals, plants, and particular natural places enable people to have relationships that are central to living a good human life, Nussbaum treats these components of the natural environment as instrumentally valuable to one of the central human capabilities that she designates as centrally important to living a dignified human life.")

[98] Richard J. Arneson, *Liberal Neutrality on the Good: An Autopsy*, *in* PERFECTIONISM AND NEUTRALITY: ESSAYS IN LIBERAL THEORY 191, 196 (Steven Wall & George Klosko eds.,2003).

[99] RONALD DWORKIN, A MATTER OF PRINCIPLE 191 (1985)

More explicitly, "political decisions must be, so far as is possible, independence of any particular conception of the good life, or of what gives value to life."[100]

Theorists in the liberal tradition have distinguished between neutrality of effect, neutrality of aim, and neutrality of justification.[101] The first, neutrality of effect, enjoins state action that has the consequence of making one conception of the good easier to attain than another. This interpretation of neutrality is widely rejected because of its over-inclusiveness – it seems to completely rule out any state action and, in its broader version, any state inaction.[102] The second, neutrality of aim, forbids the state from seeking to advance one conception of the good over others while the third, neutrality of justification, excludes certain types of reasons – ones based on a particular conception of the good – from the public sphere.

The correct, or best, interpretation of neutrality cannot be settled by intuitions alone, and must instead, depend on the argument for neutrality.[103] Neutrality can be based on skepticism about the possibility of knowledge. Since no conception of the good can be demonstrated to be true, the state should not step into the epistemology fray by elevating one normative vision over another.[104] The case for neutrality may also be made in terms of legitimacy. Such articulations of liberal neutrality usually start from the assertion that while individuals may order their own affairs according to their beliefs, the mobilization of the coercive resources of the state can only be justified by an appeal to impartial reasons.[105] In its most stringent form, these reasons have to be ones that all reasonable citizens can accept. Additionally, neutrality could be implied by equal respect.[106] The state fails to treat its citizens equally if, in the face of deep disagreement, it privileges the beliefs or values of the one set of citizens by making it easier for them, as compared to others, to realize their conception of the good. The argument from skepticism inclines towards

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[100] *Id.*

[101] Arneson, *supra* note 98, at 193. See also Richard J. Arneson, *Neutrality and Utility*, 20 CAN. J. PHIL. 215, 217-18 (explaining the distinction between outcome neutrality, neutrality of aim, and neutrality of procedure).

[102] *See, e.g.*, JONATHAN QUONG, LIBERALISM WITHOUT PERFECTION 18 (clarifying that "the issue . . . is not whether the actions of the state can ever have the *effect* of promoting some perfectionist ideals over others. It is both unrealistic and undesirable for the liberal state to be neutral in this way. The question instead refers to the reasons that *justify* state action.")

[103] *See* JEREMY WALDRON, LIBERAL RIGHTS: COLLECTED PAPERS 1981-1991 151-52 (1993).

[104] BRUCE A. ACKERMAN, SOCIAL JUSTICE IN THE LIBERAL STATE 11 (1980); BRIAN BARRY, 2 JUSTICE AS IMPARTIALITY 169 (1995). But this is a shaky foundation for neutrality: there is no reason for neutrality to be spared from the skepticism that afflicts moral claims. *See* WALDRON, *supra* note 103, at 152; George Klosko, *Reasonable Rejection and Neutrality of Justification, in* PERFECTIONISM AND NEUTRALITY: ESSAYS IN LIBERAL THEORY 167, 173 (Steven Wall & George Klosko eds., 2003).

[105] *See, e.g.*, CHARLES LARMORE, PATTERNS OF MORAL COMPLEXITY 45 (1987) (observing that "for the liberal, neutrality is a *political* ideal": "[t]he state's policies and decisions must be neutrally justifiable, but the liberal does not require that other institutions in society operate in the same spirit.")

[106] DWORKIN, *supra* note 99, at 203; Alan Patten, *Liberal Neutrality: A Reinterpretation and a Defense*, 20 J. POL. PHIL. 249 (2011).

neutrality as to intentions while the argument from equal respect leans towards neutrality as to outcomes.[107]

Welfarist CBA cannot, it seems, be neutral as to outcome. Although some defenders of CBA entertain reservations about it as a decision rule, preferring, instead, to cast it in the role of a decision aide, CBA nonetheless exercises influence over the policy process. If it did not, CBA would be otiose. Moreover, the choice of a particular theory of wellbeing on which to rest CBA has predictable consequences on the policies that it will recommend.[108] The use of hedonic data, as opposed to WTP, for instance, is likely to favor efforts to reduce unemployment, especially if happiness is conceived of as life satisfaction, rather than moment-by-moment affect.[109]

Neither, it seems, can welfarist CBA be neutral as to intentions. As Charles Larmore reminds us, "[l]iberals have not always grasped the degree of impartiality that the ideal of procedural neutrality requires" and "a lack of neutrality . . . may lie concealed in what appears to be a purely formal principle."[110] Classical utilitarianism's formula of maximizing pleasure for the greatest number, for example, is partial to a conception of the good that that privileges subjective experiences over, for example, genuine achievements. It "force[s] many to understand the value of what they pursue in a manner alien to what makes it of value to them."[111] The same objection has equal force, whether CBA is motivated by a hedonic account of well-being[112] or by a "restricted, preference-based"[113] one.[114]

It might be thought that the preference satisfaction state does not have to have a theory of the good. Preference satisfaction may be simply a "metric for amalgamating diverse conceptions of what is worth seeking in life on a common scale."[115] Alternatively, if the state is to advance well-being while respecting the right of individuals to arrange their own affairs, it must make their

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[107] WALDRON, *supra* note 103, at 152.

[108] The argument is not yet tight because cost-benefit analysis may have an effect on policymaking that is independent of its content. For example, the imposition of CBA on administrative agencies may be a means for having them regulate only if the costs of conducting the CBA exceed the net benefits of the regulation to the administrative agency, thereby aligning the administrative agency's incentives to the principal's interests. *See* Matthew C. Stephenson, *A Costly Signaling Theory of "Hard Look" Judicial Review*, 58 ADMIN. L. REV. 753 (2006). But if that were the only use of CBA, there would be no need to invoke weak welfarism in its defense.

[109] DIENER ET AL., WELL-BEING FOR PUBLIC POLICY 160-174 (2009); BRONSTEEN ET AL., HAPPINESS & THE LAW 19 -20, 40-44 (2015).

[110] LARMORE, *supra* note 105, at 48.

[111] *Id.* at 49.

[112] *See* BRONSTEEN ET AL., *supra* note 109.

[113] *See* ADLER & POSNER, *supra* note 45, at 35.

[114] *See also* Daniel M. Haybron & Valerie Tiberius, *Well-Being Policy: What Standard of Well-Being?*, 1 J. AM. PHIL. ASSOC. 712, 718-719 (2015) (describing as "inherently paternalistic" governmental endorsements of a particular conception of the good, "even if it does not infringe individual's pursuit of the good as they see it.")

[115] Arneson, *supra* note 101, at 232.

lives better as judged by their own standards.[116] On these views, neutrality is not violated if policy tracks the satisfaction of desires. This is because the state does not have to defend preferentism as the true account of prudential value; the deference to preferences leaves it to the individual to define her own notion of wellbeing.[117]

This reconciliation is, however, an uneasy one as people can be mistaken about what is good for them. If uncorrected, these mistakes vitiate, and may even destroy, the relationship between preference satisfaction and well-being. But undertaking to correct them necessitates a commitment to some conception of the good. Those who believe that they can have either cake and eat it as far as welfarism and neutrality are concerned are likely to downplay the prevalence and gravity of such mistakes.[118] There is, so the argument goes, no dispute about many the things that conduce to wellbeing, and this agreement relegates the difficulties that mistakes raise for a welfarist, yet neutral, justification for CBA to the status of "largely theoretical."[119] As Daniel Haybron and Valerie Tiberius state it,

> [h]owever obtuse some individuals' values might prove to be, large swaths of the public are not likely to be indifferent to whether they are healthy or unhealthy, happy or unhappy, and so forth. Policies that promote such homely values will very likely tend to promote well-being, whatever the correct theory.[120]

But once again, the challenge is to say whether a policy that trades off one of these values for another enhances well-being or not. Because such trade-offs are ubiquitous, this issue cannot simply be acknowledged before being brushed aside.

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[116] Haybron & Tiberius, *supra* note 114. *See also* CASS R. SUNSTEIN, VALUING LIFE 93 (2014) (offering an "autonomy argument" for CBA: "[i]f regulators do not use people's actual judgments, then they are insulting their dignity"). Fleurbaey derives some of the implications of such a view for a measure of wellbeing, concluding that there are approaches that are more faithful to individual preferences than the subjective indicators that have recently become fashionable in the policy arena. Marc Fleurbaey, *The importance of what people care about*, 11 POL. PHIL. & ECON. 415 (2012).

[117] Note, however, that Daniel Haybron and Valerie Tiberius endorse deference to values, not "mere" preferences. The former are "robust preferences that the agent sees as grounding reasons for her," and seem to constitute a subset of higher order preferences. Haybron & Tiberius, *supra* note 114, at 724. *See also* David Pearce, *Cost-Benefit Analysis and Environmental Policy*, 14 OXFORD REV. ECON. POL'Y 87 (1998) ("WTP and WTA are measures of human preference. That human preferences should count and be 'sovereign' is the fundamental value judgement in CBA.").

[118] *See, e.g.*, *id.* at 721 (claiming that "in general, individuals' personal welfare values probably tend not to be radically mistaken.")

[119] *Id.* at 722.

[120] *Id.*

To be clear, I do not claim to have shown either that neutrality is entailed by a commitment to liberal democracy, or that welfarist CBA cannot be rendered neutral.[121] I hope, however, to have at least highlighted some of the obstacles that proponents of welfarist CBA must confront and clear.

2.2 Two Other Interpretations of CBA

If we affirm the proposition that CBA does have a role in the administrative state, and that its function is to serve as an indicator of overall wellbeing, then we have reason to conform our practice of CBA to this belief. CBA conducted by administrative agencies should demonstrate sensitivity to heterogeneity in the marginal utility of money by, for example, weighting WTPs. Moreover, the approach taken by contingent valuation surveys to the measurement of existence value has to be revised. What individuals are willing to pay to, for example, save the snail darter from extinction is a crude measure of the prudential value that accrues to them from the continued existence of the snail darter.[122] On any plausible desire satisfaction theory of well-being, we should, instead, invite individuals to imagine the goodness of their lives in the absence of the snail darter – independent of all other uses that it might have – before articulating the amount of money that makes them indifferent between this state of affairs and the *status quo*.[123] Alternatively, if some hedonic theory of well-being is correct, we should measure the decline in life satisfaction or moment-to-moment affect that results from the permanent loss of the snail darter, once again, net of all other uses that it might have. This proposal, unlike some others, cannot be rejected on the rationale that it is too costly or impractical for administrative agencies to implement.

Yet, distributional weights have largely been eschewed by administrative agencies in the United States.[124] And contingent valuation studies continue to ask respondents what they would be willing to pay for the existence of an environmental resource, rather than what they would be willing to pay for the benefit that they derive from such existence. This suggests another possibility: to affirm CBA as it is while modifying the interpretation of CBA. What could CBA be, if not welfarist?

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[121] One could conceive of a solution where administrative agencies prepare a CBA for each reasonable, and actually held, theory of the good.

[122] *Cf. TVA v. Hill*, 437 U.S. 153 (1978)

[123] *See, e.g.*, SAGOFF, *supra* note 93, at 46 ("Since CV questionnaires in fact ask nothing about benefits, responses to them tell us nothing relevant to economic valuation."); HAUSMAN, *supra* note 76, at 98 ("If willingness to pay to protect the environment does not reflect people's expectations of the extent to which they will benefit from environmental preservation, one can ask people how much they expect to benefit rather than what they are willing to pay.")

[124] Matthew D. Adler, *Benefit-Cost Analysis and Distributional Weights: An Overview*, 10 REV. ENVTL. ECON. & POL'Y 264 (2016) (stating that such weights are "rarely if ever" used by administrative agencies in the United States.)

2.2.1 Replicative CBA

CBA can also be used as a method for replicating outcomes that would have arisen through other means, whether it is the perfectly competitive market, clean debate in an open forum, or grubby dealing behind closed doors.

Approximating free market outcomes is, perhaps, the most familiar instance of replicative CBA. This conception of CBA is normally associated with the view that governments ought to intervene in cases of market failures. When markets suffer from some imperfection, the allocation of resources that results from optimizing behavior by economic actors may not be Kaldor-Hicks efficient. That is to say, there exists another distribution of resources that is so favored by some to the existing one that they could fully compensate, in monetary units, those who disfavor it and still be, by their preferences, better off. The task of CBA, then, is to help achieve Kaldor-Hicks efficiency through regulation by comparing, and equating, marginal social cost to marginal social benefit, cost and benefit being understood in terms of WTP and/or willingness-to-accept ("WTA"). This is also called wealth maximization in the law and economics literature.[125] Since strict adherence to a standard of Kaldor-Hicks efficiency in this context does not require attention to either the marginal utility of money or distributional issues, such as fairness and equality, the use of weights in CBA is neither necessary nor advisable. Of course, the single-minded pursuit of Kaldor-Hicks efficiency has to be defended. Although a comprehensive treatment of this subject is beyond the scope of this essay, one might attempt such a defense by emphasizing the superiority of the tax system as an instrument for redistribution. Briefly, the assertion is that while redistribution through regulation or tax reduces the marginal return to labor and hence distorts the incentives to work, regulation introduces additional economic inefficiencies into those activities that it targets.[126] Moreover, the attributes of those who gain or lose from a regulation may only be tenuously related to the attributes of those who are meant to be advantaged or disadvantaged by redistribution. Thus, it is better, as a matter of institutional design, for administrative agencies (and courts) to focus solely on maximizing wealth.[127] CBA assists in that endeavor by replicating free market outcomes.

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[125] *See* RICHARD A. POSNER, THE ECONOMICS OF JUSTICE 61-62 (1981) (defining the "wealth of society" as "the aggregate satisfaction of those preferences . . . that are registered in a market, though the market "need not be an explicit one" and can be "hypothetical");Richard A. Posner, *Utilitarianism, Economics, and Legal Theory*, 8 J. LEGAL STUD. 103 (1979); Richard A. Posner, *The Ethical and Political Basis of the Efficiency Norm in Common Law Adjudication*, 8 HOFSTRA L. REV. 487 (1980) *See also* Ronald Dworkin, *Is Wealth a Value?*, 9 J. LEGAL STUD. 191 (1980); Jules L. Coleman, *Efficiency, Utility, and Wealth Maximization*, 8 HOFSTRA L. REV. 509 (1980) (making a distinction between "tests for ordering or ranking state of affairs" and "the characteristic[s] in virtue of which states of affairs are to be ranked, one that has been suppressed here).

[126] Louis Kaplow & Steven Shavell, *Why the Legal System is Less Efficient than the Income Tax in Redistributing Income*, 23 J. LEGAL STUD. 667 (1994).

[127] For a sophisticated version of this argument see David A. Weisbach, *Distributionally Weighted Cost-Benefit Analysis: Welfare Economics Meets Organizational Design*, 7 J. LEGAL

But CBA can also be used to replicate other processes. Consider, for example, regulatory choices that are the product of interest group politics. According to public choice theory, interest groups do not pursue the social good, seeking instead of advance the narrow, sectarian, interests of their members. As interest groups are generally able to overcome the coordination and free-rider problems that afflict the public, they are able to mobilize disproportionately more resources in favor of their cause, and thereby tend to exert more influence over the regulatory process. CBA, as I have defined it, can be carried out to replicate the results of such competition. For example, one could postulate a political welfare function (as opposed to a social welfare function) that "reflects not just the government's concern for the well-being of individuals but also the weight it attaches to the well-being of particular interest or pressure groups, the support of which the decision maker needs to stay in power or realize some policy proposal."[128] A decision maker's use of a political welfare function in the cadre of CBA does not have to cynical. The political welfare function may simply be a pragmatic device for obtaining a *n*-th best solution that stays within the constraints of political reality.[129] By replicating political contestation, CBA helps ensure that the policy that is eventually adopted can achieve sufficient buy-in so as to be actualized.

Consider, also, regulatory choices that have been made after democratic deliberation. The deliberative ideal is desirable because it "promote[s] the legitimacy of collective decisions," "encourage[s] public-spirited perspectives on public issues," "promote[s] mutually respectful processes of decision-making," and "help[s] correct . . . mistakes."[130] Yet, it is concededly infeasible for all citizens to deliberate about every rule that society seeks to impose. One solution is to randomly select a subset of citizens to act as deliberators for each rule.[131] Although some citizens are, by design, excluded from the deliberative arena, this defect could, perhaps, be cured by the representativeness of the deliberators of the citizenry at large.

Another solution is to have citizens deliberate about the parameters of a decision-making mechanism. Take for example, the "deliberative turn" in contingent valuation research.[132] The Contingent Valuation Method ("CVM") is a stated preference method that involves asking

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ANALYSIS 151 (2014). *But see* Lee Anne Fennell & Richard H. McAdams, *The Distributive Deficit in Law and Economics*, 100 MINN. L. REV. 1051 (2016).

[128] Giles Atkinson & Susana Mourato, *Environmental Cost-Benefit Analysis*, ANN. REV. ENV'T & RESOURCES 317, 335-336 (2008).

[129] David Pearce, *The Political Economy of an Energy Tax: The United Kingdom's Climate Change Levy*, 28 ENERGY ECON. 149 (2006).

[130] AMY GUTMANN & DENNIS THOMPSON, WHY DELIBERATIVE DEMOCRACY? 10-12 (2004). *See also* Joshua Cohen, *Deliberation and Democratic Legitimacy*, *in* THE GOOD POLITY: NORMATIVE ANALYSIS OF THE STATE 17 (Alan Hamlin & Philip Petit eds., 1989)

[131] The practical implementation of this scheme is expounded on in greater detail in Jennifer Nou, Note, *Regulating the Rulemakers: A Proposal for Deliberative Cost-Benefit Analysis*, 26 YALE L. & POL'Y REV., 601, 618-21 (2008).

[132] *See, e.g.*, Brown, et al., *The Values Jury to Aid Natural Resource Decisions*, 71 LAND ECON. 250 (1995); Matthew A. Wilson & Richard B. Howarth, *Discourse-Based Valuation of Ecosystem Services: Establishing Fair Outcomes through Group Deliberation*, 41 ECOLOGICAL ECON. 431 (2002); Clive L. Spash, *Deliberative Monetary Valuation and the Evidence for a New Value Theory*, 84 LAND ECON. 469 (2008).

individuals about their WTP for a good, and has traditionally been employed to elicit preferences for goods that are not traded on any market. Deliberation, in this setting, can be either diagnostic or constructive.[133] Deliberation can be diagnostic, in that it provokes individuals to reflect on their pre-existing inclinations and thereby articulate more informed and critical preferences. Thus understood, deliberation at the monetization stage is a curative for the cognitive deficiencies that have undermined the neo-classical model of the economic agent.[134] The conception of democracy that deliberation serves, however, remains aggregative. WTPs are taken as evidence of well-being and summed so as to identify the policy that best advances overall well-being. But of greater interest to us here is the constructive face of deliberation. Deliberation can foster "considered judgement, which may guide policy makers more as a recommendation than as a kind of evidence."[135] The WTPs that emerges from this discursive exchange of reason constitute a "[collective view] about the value society ought to place on certain resources and the extent to which society as a whole should invest in those goods rather than other public goods and services."[136] These WTPs do not have to be grounded in any one ethical theory and may, instead, represent "workable agreements"[137] or "incompletely theorized agreements."[138]

WTPs that are born out of constructive deliberation, if used to monetize costs and benefits in future CBAs, result in outcomes that replicate, in some sense to be explained, deliberated ones. Certainly, reliance on deliberated WTPs from a prior CBA in a later CBA does not imply that the conclusion of the latter is the one that should have been adopted had deliberation also occurred there. This is because there is no theoretical foundation for the claim that there are, as it were, "true" WTPs that different panels of citizen deliberators should converge on.[139] Moreover, there is an argument – sometimes called "the holism of reasons" - that reasons, and in particular, moral reasons, can vary from situation to situation. A reason for action in one circumstance can be no reason at all in another.[140] If so, then the transplantation of WTPs that have emerged from

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[133] Mark Sagoff, *Aggregation and deliberation in valuing environmenal public goods: A look beyond contingent pricing*, 24 ECOLOGICAL ECON. 213, 221-23 (1998). See also Lo and Spash (2013) (distinguishing between features of deliberative monetary valuation that address internal critiques of contingent valuation, e.g. that individuals are unfamiliar with the environmental goods they are being asked to value, and justifications of deliberative monetary valuation that address external critiques of contingent valuation, e.g. that individuals are asked to treat environmental goods as market commodities, in their capacities as consumers).

[134] *See, e.g.*, KAHNEMAN, ET AL., JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES (1982).

[135] Sagoff, *supra* note 133, at 221.

[136] *Id.* at 226.

[137] JOHN S. DRYZEK, DELIBERATIVE DEMOCRACY AND BEYOND: LIBERALS, CRITICS, CONTESTATIONS 48 (2000).

[138] Cass R. Sunstein, *Incompletely Theorized Agreements*. 108 HARV. L. REV. 1733 (1995)

[139] For some empirical evidence, see e.g. Dietz, et al. (2009) (concluding that the variance in WTPs between deliberative groups is not statistically different from the variance in WTPs between simulated groups of survey respondents).

[140] *See, e.g.*, JONATHAN DANCY, ETHICS WITHOUT PRINCIPLES (2004). An example that Jonathan Dancy credits to John Tasioulas concerns mercy: "[r]easons to be merciful with respect to the administration of punishment presuppose reasons (of justice) to punish in the first place. It makes

deliberation in a different context from the one being considered risks error, even if we assume that there are "true" WTPs and that citizen deliberators always arrive at them. Still, the use of these deliberated WTPs in CBA may be thought to confer some degree of legitimacy on the undeliberated decision, and it is in this sense that CBA replicates deliberated outcomes.

Whether it is the maximization of wealth through the market, the rough and tumble of interest group politics or the give and take of democratic deliberation that is being emulated through CBA, there is nothing inherent to replication that imposes interpretive or structural constraints on CBA.[141] For example, WTPs do not have to be susceptible of meaning, like they do in the case of welfarist CBA, and it is acceptable for benefits to be discounted one way and costs another. Since the goal is replication, the only thing that matters is accuracy and/or faithfulness. That means, in the case of interest group politics, that CBA identify, as accurately as possible, the policy that is, among other things, acceptable to important constituencies and, in the case of deliberative democracy, that CBA be faithful to the numbers that have been ratified by citizen deliberators.[142] On these views, existence value can be understood as a concession to the political clout of environmental groups or as the realization of a certain agreement on environmental values that has been reached after decades of debate inside and outside of Congress.

2.2.2 Rationalizing CBA

Finally, CBA can be used to rationalize a decision. This conception of CBA has usually been articulated as criticism rather than praise.[143] But CBA can at least confirm that the course of

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no sense to say of someone that they showed "mercy" to another, when in fact there was no reason to punish them to begin with." *Id.* at 19.

[141] There are more examples of replicative CBA. Robert Cooter and David DePianto's suggestion that the "community value" of a life be adopted as the appropriate standard for determining tort damages and for assessing regulation would transform conventional CBA from an exercise in determining the consequences of a rule on overall well-being to one that strives to reproduce a community's judgements as expressed through its norms. *See* Robert Cooter & David DePianto, *Community Versus Market Values of Life*, 57 WM & MARY L. REV. 713 (2016).

[142] One might maintain that there has to be conditions on the outcomes of deliberation for them to be attributed to a collectivity, conditions such as coherence. For instance, the discounting of benefits but not costs appears, in the absence of any further argument, to be more of an *ad hoc* compromise than the articulation of a public will. This objection has some force as applied to a particular CBA, but it does not detract from the assertion that replicative CBA is not subject to any internal constraints. Insofar as there are constraints, these constraints are external to replicative CBA.

[143] Daniel H. Cole, *Law, Politics, and Cost-Benefit Analysis*, 64 ALA. L. REV. 55, 57 (2012) (as "CBA inevitably requires value judgments that are inherently subjective," "the analyses [are] potentially manipulable for political ends"). *See also* Michael A. Livermore, *Cost-Benefit Analysis and Agency Independence*, 81 U. CHI. L. REV. 609, 619 (2014) (alluding to "fears that agencies will manipulate cost-benefit analysis to promote their agencies"); Matthew D. Adler & Eric A. Posner, *Rethinking Cost-Benefit Analysis*, 109 YALE L. J. 165, 172 (1999) ("But for all their enthusiasm for CBA, it is not clear that agencies use the textbook version. Agencies

action being taken could be justified by some set of beliefs. The notion of rationalizability is, for instance, used in game theory to relax the constraint that actors always hold factually correct beliefs about others and their actions.[144] Take the situation of a couple who have decided to go on a date but who, unfortunately, lost touch before they could agree on an activity.[145] Although their primary desire is for each other's company, the row player would rather watch the boxing match than the opera while the column player has the opposite predilection.

	Boxing	Opera
Boxing	2, 1	0, 0
Opera	0,0	1, 2

Now, it is easily observed that both of them being at the boxing match or at the opera are the better outcomes Certainly, one player has his or her preference satisfied to a greater degree than the other in either of them. But no player can do better by unilaterally leaving for the other spectacle once the two have convened. An encounter at the boxing match or at the opera are therefore the Nash equilibria of the game. As the two players cannot communicate, however, there can also be outcomes where the two do not actually meet. The row player might, for instance, dash off to the opera while the column player waits the boxing match. This state of affairs is not stable, but it is rationalizable. The row player heads for the opera because he or she could have reasonably believed that the column player is also at the opera, and the column player could have been at opera because he or she reasonably believed that the row player is on the way there.

To take a starker example, consider the game of "Hawk-Dove"[146]

	Dove	Hawk
Dove	3, 3	1, 4
Hawk	4, 1	0, 0

where the row and column players can choose to be either dovish or hawkish (and cannot randomize between these two actions). If both players are dovish, they each receive a payoff of 3. If one player is dovish while the other is hawkish, the former receives a payoff of 1 while the latter

sometimes appear to use CBA to rationalize decisions made on other grounds. At other times, agencies may be sincere, but depart from CBA without explaining their departure.")

[144] For a formal definition, *see* MARTIN J. OSBORNE & ARIEL RUBINSTEIN, A COURSE IN GAME THEORY 54-56 (1994).

[145] *See, e.g., id*. at 15-16 (calling the game "Bach or Stravinsky").

[146] *See, e.g., id* at 16-17. This game is sometimes called "chicken."

receives a payoff of 4. If both players are hawkish, they each receive a payoff of 0.[147] One can easily observe that for two pair of actions, no player has an incentive to deviate to a different action. To illustrate, if the row player selects 'Dove' while the column player selects 'Hawk', the former cannot increase his playoff by emulating the latter. This is therefore a Nash equilibrium of the game.[148] But suppose it turns out that both players decided to be hawkish. This is not a Nash equilibrium, in that either player can do better by switching to 'Dove.' Furthermore, this result gives them both the lowest payoff. Still, we can rationalize their action by assigning certain beliefs to them, *viz.* that their opponents are going to be dovish, and that their opponents are going to be so based on the belief that they themselves are going to be hawkish.

Consider, on the other hand, the prisoner's dilemma

	Don't Confess	Confess
Don't Confess	3, 3	0, 4
Confess	4, 0	1, 1

where the row and column players can choose to confess or not confess (and cannot randomize between these two actions). The outcome in which both confess is strictly worse for the players than the outcome in which both do not confess. The former, however, is a Nash equilibrium while the latter is not. Moreover, a player refusal to confess is not rationalizable – no matter what the other player does, she herself is better off confessing. Rationalization does not, therefore, have to have pejorative overtones. Although a decision can be rationalizable without being, in some sense, optimal, a decision that is rationalizable is at least not clearly irrational.[149]

But we may want more out of rationalizing CBA than numbers that add up. Rationalizing CBA should normally be complete, in that all factors contrary to its ultimate conclusion should have been quantified, monetized, and aggregated. For CBA to demonstrate that the adopted policy is, under one set of assumptions, superior to the others, it should usually have considered all of the costs of the former and all of the benefits of the latter. One exception to this requirement is if Congress has explicitly barred the administrative agency from considering certain types of cost and/or benefits.[150] A second condition is consistency. Consistency concerns the relation of the

[147] We can assume that these preferences are held over an outcome space where states are defined capaciously to include descriptions that encompass, among other things, a violation of social norms. *See* Amartya Sen, *Well-Being, Agency, and Freedom*, 82 J. PHIL. 169, 185 (1984).
[148] The other is where the roles are reversed. The row players selects 'Hawk' while the column player selects 'Dove.'
[149] As it turns out, the set of each player's rationalizable actions in a game can be derived through the iterated elimination of dominated strategies. MARTIN J. OSBORNE & ARIEL RUBINSTEIN, *supra* note 144, at 61-62.
[150] See *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Life Ins. Co.*., 463 U.S. 29, 43 (1983) ("an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider . . . .")

parameters to each other. An example of consistency is symmetric treatment of costs and benefits. If costs are discounted, benefits should be too. And if unintended costs are included, then, as a general matter, unintended benefits should be too.[151] Unless there is a reason for deviating from this general rule – and, again, a statutory instruction might constitute such a reason – a policy cannot be rationalized by a CBA that does not respect symmetric treatment of costs and benefits.

Finally, the CBA should be plausible. Plausibility has both procedural and substantive elements, in that it can apply to theory, method, or results. For example, it is not clear what principle could inform the monetization of as abstract a value as human dignity. But substantively, "it would seem extravagant to assign a value [of human dignity] in excess of the value of human life."[152] Plausibility is also a matter of degree. There are more and less convincing techniques for eliciting the recreational value of a natural resource. One technique is the travel cost method: if a consumer is willing to incur *x* dollars to travel to a nature reserve, the analyst concludes that the recreational value of the natural reserve to her, as revealed through her choice, exceeds *x* dollars.[153] Another technique is the contingent valuation method discussed earlier: the analyst apprises survey respondents of various facets of the natural resource being valued before asking them for their WTP to enjoy the natural resource. Both techniques are regularly used in environmental CBAs, but the latter is more controversial than the former because of doubts over the reliability of hypothetical data.[154]

Plausibility is admittedly an elastic test. First, there is no bright line demarcating plausible theories, methods, or results, from implausible ones. Second, it is unclear if in evaluating the plausibility of a CBA, one should assess theory, method, or results on their own merits or whether there is a sliding scale, such that a more plausible showing in one aspect compensates for a less plausible showing in another. Despite these uncertainties, plausibility retains some bite. Sunstein suggests, for instance, that "[i]f . . . the value of a statistical life is $9 million, then injuries and illnesses that fall short of death cannot plausibly be valued in excess of $9 million, and a wide variety of other harms must be assigned a lower value as well." If true,[155] a policy cannot be

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[151] *Cf.* RICHARD L. REVESZ & MICHAEL A. LIVERMORE, RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH (2008); Christopher DeMuth & Douglas H. Ginsburg, *Rationalism in Regulation*, 108 MICH. L. REV. 877 (2010) (book review).

[152] Cass R. Sunstein, *The Limits of Quantification*, 102 CALIF. L. REV. 1369, 1396 (2014).

[153] *See, e.g.*, George Parsons, *The Travel Cost Model*, *in* A PRIMER ON NONMARKET VALUATION 269 (Patricia A. Champ et al. eds., 2003)

[154] The exchange in *The Journal of Economic Perspectives* lays out the arguments on both sides. See Michael W. Hanemann , *Valuing the Environment Through Contingent Valuation*, 8 J. ECON. PERSP. 19 (1994), Peter A. Diamond & Jerry A. Hausman, *Contingent Valuation: Is Some Number Better than no Number?*, 8 J. ECON. PERSP. 45 (1994); Catherine L. Kling et al., *From Exxon to BP: Has Some Number Become Better than No Number?*, 26 J. ECON. PERSP. 3 (2012); Richard T. Carson, *Contingent Valuation: A Practical Alternative when Prices Aren't Available*, 26 J. ECON. PERSP. 27 (2012); Jerry A. Hausman, *Contingent Valuation: From Dubious to Hopeless*, 26 J. ECON.PERSP. 43 (2012).

[155] I doubt this (unqualified) claim because the value of a statistical life estimates the value of a small reduction in the risk of death and not the value of life itself.

rationalized by CBA if, for all values of injuries and illness that do not surpass the value of a statistical life, the monetized benefits of the regulation falls short of its monetized costs.

What are we to make then, of the allegation that allowing administrative agencies to conjure numbers for CBA amounts to a "misuse[]"[156] or "blatant abuse"[157] of CBA? These charges stick only if CBA is represented as something as it is not. Rationalizing CBA does not prove that a policy is the best one; only that it could be. It therefore imposes on the administrative agency only a thin notion of rationality.[158] Once rationalizing CBA is recognized for what it is, its formality is no more false than the informality of qualitative cost-benefit reasoning.[159]

3 Implications

3.1 Reflective Equilibrium in Administrative CBA

CBA seems poised to become an enduring fixture in American administrative law, so much so that one scholar has urged those resisting its spell to "stop wasting their energy tilting at windmills and put their extraordinary talents to use in more promising endeavors."[160] Yet, although Presidents since Ronald Reagan have steadfastly embraced OIRA review of regulations, CBA practice has continued to evolve and be shaped by actors like the administrative agencies themselves.[161] As headlined at the outset, the aim of this essay is not to prescribe or promote one interpretation of CBA over the others, but to clarify what it means for administrative agencies to do CBA. According to Jonathan Masur and Eric Posner:

> Cost-benefit analysis is a decision procedure that requires the decision-maker to estimate both the benefits and the costs of a regulation in monetary terms. If a regulator chooses not to monetize all the benefits or all the costs, it is not doing cost-benefit analysis. If it is not doing cost-benefit analysis, what is it doing?[162]

If we decline to settle the debate over CBA by definitional fiat, the question, though asked rhetorically, admits of a serious response. If nothing matters to regulation except overall well-being, then welfarist CBA could be determinative, and all gains and losses of prudential value must be registered. This means, however, that the costs and benefits entering into the analysis

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[156] Sinden, *supra* note 30, at 172.
[157] Cole, *supra* note 143, at 82.
[158] *Cf.* Jacob Gerson & Adrian Vermeule, *Thin Rationality Review*, 114 MICH. L. REV. 355 (2016).
[159] *Cf.* Sinden, *supra* note 30. *See also* Coates, *supra* note 14 at 902 (One form of camouflage that seems likely to recur is the presentation of guesstimated CBA as quantified CBA – which potentially misleads the public by omitting significant information about the uncertainty, judgment, and sensitivity of particular numerical results in a CBA.").
[160] Richard J. Pierce, *The Regulatory Budget Debate*, 19 N.Y.U. J. LEGIS. & PUB. POL'Y 249, 250 (2016).
[161] Livermore, *supra* note 143.
[162] Masur & Posner, supra note 38, at 125.

have to be those that make the individual's life worse or better *for her*. Thus, one should ignore an individual's disinterested desires,[163] although these desires may still be relevant on a hedonic account of well-being if knowledge of their satisfaction induces in her a "warm glow." So one answer to Masur and Posner is that the regulator could be maximizing aggregate welfare on a theory that does not treat every cost and benefit as necessarily affecting the goodness of lives for the people living them. The regulator could also be trying to replicate the result of a process or procedure. Replicative CBA can ignore certain costs and benefits so long as doing it makes it more accurate or faithful to the thing that it is replicating. Values that do not find expression in consumer behavior may, for example, be safely excluded from CBA that seeks to recreate free market outcomes. What the regulator is most likely *not* doing is rationalization because for that, CBA has to arrive at an all-things-considered conclusion. That is, CBA has to include all relevant considerations, including those not usually thought to be susceptible of reduction to numbers. But even then, as noted before, the regulator may (and perhaps, should) disregard costs and benefits if Congress has so commanded. Such a CBA can still rationalize so long as sense can be made of the regulator's decision in light of the constraints that she operates under.

If we insist that regulators must monetize every conceivable cost and benefit, we should embrace an interpretation of CBA that coheres with such a conviction. And if it turns out that such interpretations of CBA are unacceptable to us, we should surrender the idea that all things can and should be monetized. By reasoning in such a fashion for this and other features of CBA, we can achieve a sort of reflective equilibrium that clarifies the role (and hence, defenses) of CBA in the administrative state.[164]

While one of my concerns in this essay is to bring the interpretation and the methodology of CBA into harmony, the reader may be interested in an argument for the type of CBA that ought to govern in a regulatory democracy. I am, unfortunately, unable to provide a complete answer to that question here. I can, however, proffer some general remarks that might inform such an answer. First, there is a distinction between the interpretation of CBA that administrative agencies are asked to conduct and the review of CBA by courts. The former might conduct, say, welfarist CBAs that are then incorporated into the administrative record and examined by the latter only for, say, consistency. This arrangement could be desirable for reasons of institutional capacity, including the greater expertise that administrative agencies have vis-à-vis the courts. Second, there does not have to be a single interpretation of CBA that all administrative agencies should imbibe and implement. This heterogeneity in CBA could arise between agencies because of the nature of the task assigned to them. For example, CBA that replicates free market outcomes may only be useful for regulation that seeks to remedy market failure.[165] It may not be as appropriate for the question of whether a religious group should be able to deny education to

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[163] *See* ADLER & POSNER, *supra* note 45, at 126-27.

[164] *See generally* JOHN RAWLS, A THEORY OF JUSTICE 18-19 (rev. ed., 1999)

[165] *See, e.g.*, *Int'l Union, UAW v. OSHA*, 938 F.2d 1310, 1319 (D.C. Cir. 1991) (holding that Section 3(8) of the Occupational and Health Safety Act permitted cost-benefit analysis because "while the legislative history is almost blank on the subject, it suggests concern with market failures . . . and properly conducted cost-benefit analysis should yield a solution approximating that of a market undistorted by market failures.")

its children.[166] It could also occur within agencies as great uncertainty in the quantification and monetization of changes in social welfare may make it such that the only interpretation that an attempt at welfarist CBA can bear is the rationalizing one.[167] Finally, CBA can be layered such that one component is built on top of another. An administrative agency could perform welfarist CBA before monetizing and adding non-welfarist costs and benefits to arrive at an augmented, rationalizing, CBA. The interpretation and justification for each of these steps are related but distinct.

3.2 CBA and Judicial Review

All said and done, judges still have to discharge their obligation to decide whether regulations are properly promulgated, and therefore legally enforceable, even as academics vex themselves over the theoretical subtleties of CBA. As they do this, those serving on the federal district courts and on the federal court of appeals have to take reference from the law, as illuminated by precedent, even as they are colored by their own understanding of the values served by judicial review.[168] For example, supposing it were true that administrative law is animated by the need to rein in the prerogative of unaccountable bureaucrats who may be acting from political beliefs rather than scientific expertise, a lower court judge is nevertheless not free to depart from the strictures of *Vermont Yankee* and demand of administrative agencies procedures that go above and beyond those prescribed by Congress. As recently re-emphasized, "the Administrative Procedure Act ("APA") sets forth the full extent of judicial authority to review executive agency action for procedural correctness," and a court may not compel administrative agencies to undertake additional steps deemed to be conducive to "some vague, undefined public good."[169] *Vermont Yankee* has buried "the notion that the courts have a continuing 'common-law' authority to impose procedures not required by the Constitution in the areas covered by the APA."[170] Insofar as cost-benefit analysis is a decision procedure,[171] it cannot be grafted into administrative agencies by judicial decree.[172]

Anticipating this hurdle, Sunstein has discerned in the APA a textual hook for CBA.[173] As he has it, a regulation is *prima facie* "arbitrary and capricious," and therefore liable to be set aside under Section 706 of the APA,[174] if the administrative agency neither demonstrates,

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[166] See Martha C. Nussbaum, *The Costs of Tragedy: Some Moral Limits of Cost Benefit Analysis*, 29 J. LEGAL STUD. 1005, 1025 (2000); Weisbach, *supra* note 127, at 169.
[167] Sunstein (2014)'s breakeven analysis bears this flavor. Daniel Farber's objections assume break even analysis to be a "decision-making technique," but this is, I suggest, not the only use to which breakeven analysis might be put. Sunstein, *supra* note 152; Daniel A. Farber, *Breaking Bad? The Uneasy Case for Regulatory Breakeven Analysis*, 102 CALIF. L. REV. 1469 (2014).
[168] *See generally* RONALD DWORKIN, LAW'S EMPIRE (1986).
[169] 135 S. Ct. 1199, 1207 (2015).
[170] Antonin Scalia, *Vermont Yankee: The APA, the D.C. Circuit, and the Supreme Court*, 1978 SUP. CT. REV. 345, 395-96 (1978).
[171] *See* ADLER & POSNER, *supra* note 45, at 62-199.
[172] *See* Vermeule, *supra* note 20. This conclusion is presaged in or at least, not dispelled by, *Michigan v. EPA*. *See* 153 S. Ct. at 2711.
[173] Sunstein, *supra* note 21, at 12.
[174] 5 U.S.C. § 706 (2017).

through a quantified cost-benefit analysis, that its benefits exceeds its costs, nor excuses the absence of such a demonstration. Yet, there seems to be, under the APA, "no general obligation on [administrative] agencies to produce empirical evidence."[175] All that is necessary is for an administrative agency "to justify its rule with a reasoned explanation."[176] Sunstein's approach is therefore viable only if the CBA that is offered in support of the regulation is treated as a kind of rationalization. As glossed by the Supreme Court, a decision is "arbitrary and capricious" if not "based on a consideration of the relevant factors" or if "there has been a clear error of judgment."[177] The standard of review is "a narrow one" and "[t]he court is not empowered to substitute its judgment for that of the agency."[178] Judicial interpretation of this language after *Vermont Yankee* has imposed on administrative agencies the obligation to, among other things, make the scientific data underpinning their policy conclusions available for public comment so as to ensure that "all relevant factors" have been surfaced and therefore considered.[179] Asking agencies to generate a rationalizing CBA (and place it on the administrative record)[180] is therefore not necessarily foreclosed by current jurisprudence if it sounds in the APA. Indeed, such an accounting may facilitate and, perhaps, even be imperative to, an assessment of whether there is a "rational connection between facts and judgment" that is sufficient to survive arbitrary and capricious review.[181]

Someone whose preferences over outcomes are accurately represented by the payoff matrix in the prisoner's dilemma acts irrationally if she confesses. There is no belief attributable to her that renders her choice comprehensible. Likewise, an administrative agency acts arbitrarily and capriciously if it cannot articulate a set of numbers satisfying the rather minimal conditions adumbrated above that sustains its regulation.[182] By asking for rationalization, courts do not thereby convert bureaucrats into the instruments of judicial sensibilities. This is not to say that the judicial role in these circumstances is entirely mechanical, akin to that of an automaton whose task is to confirm that the sums do indeed tally. If this were all that the courts demanded,

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[175] *Stilwell v. Office of Thrift Supervision*, 569 F.3d 514, 519 (D.C. Cir. 2009).
[176] *Id.*
[177] *Preserve Overton Park Inc. v. Volpe* , 401 U.S. 402, 416 (1971).
[178] *Id.*
[179] *See U.S. v. Nova Scotia Food Prods. Corp.*, 568 F.2d 240, 251-52 (2d Cir. 1977). Some have maintained that *Nova Scotia*, and its progenitor, *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 393 (D.C.Cir.1973), sit uneasily with the lesson of *Vermont Yankee*. *See, e.g.*, Jack M. Beermann & Gary Lawson, *Reprocessing Vermont Yankee*, 75 GEO. WASH. L. REV. 856, 894 (2007). Be that as it may, *Nova Scotia*'s continuing vitality has been recognized in, for instance, *Am. Radio Relay League , Inc. v. FCC*, 524 F.3d 227 (D.C. Cir. 2008). *See also* Gillian E. Metzger, *Embracing Administrative Common Law*, 80 GEO. WASH. L. REV. 1293, 1305 (2012) ("The [Supreme] Court appears to have sanctioned these developments, or, at minimum, has made no effort to rebuff them.").
[180] *See SEC v. Chenery Corp.*, 318 U.S. 80, 95 (1943) (holding "that an administrative order cannot be upheld unless the grounds upon which the agency acted in exercising its powers were those upon which its action can be sustained.").
[181] *See Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 56 (1983).
[182] *See infra* ???.

then regulations can pass muster merely on the *ipse dixit* of administrative agencies.[183] To fulfill its statutory duty under the APA, a court has to assume the posture of an auditor, checking the statement of costs and benefits for completeness, consistency, and plausibility. Some of these conditions, like plausibility, are more plastic than others, and the threshold that separates adequate (rationalizing) CBAs from deficient ones must, ineluctably, be the subject of elaboration and contestation.

Judges are, to some extent, already engaged in this enterprise for CBAs that are adduced in the administrative record.[184] Administrative agencies have to explain the methodology employed in any CBA tendered in defense of their regulations, and these explanations are probed for rationality and not (ostensibly) wisdom.[185] Thus, the D.C. Circuit rebuffed a Federal Motor Carrier Safety Administration CBA for revisions to the hours of service regulations covering truck drivers because it found "dubious" the assumption that "that time spent driving is equally fatiguing as time spent resting - that is, that a driver who drives for ten hours has the same risk of crashing as a driver who has been resting for ten hours, then begins to drive."[186] More notoriously, the Fifth Circuit, in *Corrosion Proof Fittings v. EPA*, vacated an asbestos ban, faulting the EPA's analysis for, *inter alia*, failing to consider policy alternatives less drastic than a blanket prohibition and overlooking the health risks posed by the substitutes products, lapses that speak to completeness. [187] While one might argue about whether the scrutiny that the regulation received was overly stringent,[188] a plausibility argument is evident in the court's reasoning that

> [e]ven taking all of the EPA's figures as true, and evaluating them in the light most favorable to the agency's decision (non-discounted benefits, discounted costs, analogous exposure estimates included), the agency's analysis results in figures as high as $74 million per life saved . . . The EPA would have this court believe that Congress, when it enacted its requirement that the EPA consider the economic impacts of its regulations, thought that spending $200-300 million to save approximately seven lives (approximately

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[183] *See* Masur & Posner, *supra* note 38, at 136 ("Agencies regularly promulgate regulations for which they do not fully quantify costs and benefits . . . In many cases, these regulations involved significant, measurable costs in excess of $100 million and no quantified benefits. Nonetheless the agencies proceeded with the regulations based upon little more than conclusory statements that, in the agencies' judgments, the benefits justified the cost. This is not sound practice.")

[184] *See* Caroline Cecot & W. Kip Viscusi, *Judicial Review of Agency Benefit-Cost Analysis*, 22 GEO. MASON L. REV. 575, 590-603 (2015).

[185] *See Owner-Operator Indep. Drivers Ass'n v. Fed. Motor Carrier Safety Admin.*, 494 F.3d 188, 203 (D.C. Cir. 2007); *Pub. Citizen v. Fed. Motor Carrier Safety Admin.*, 374 F.3d 1209, 1219 (D.C. Cir. 2004).

[186] *Pub. Citizen*, 374 F.3d at 1218.

[187] 947 F.2d 1201 (5th Cir. 1991). *See also* Daniel A. Farber, *Rethinking the Role of Cost-benefit Analysis*, 76 U. CHI. L. REV. 1355, 1380 (book review) ("CBA has clearly contributed to the dysfunctionality of US toxics regulation. *Corrosion Proof Fittings v. EPA* is a *bête noire* among environmentalists for this reason.")

[188] The court adopted the substantial evidence standard of the Toxic Substances Control Act, "generally considered to be more rigorous than the arbitrary and capricious standard normally applied to informal rulemaking." 947 F.2d at 1214.

> $30-40 million per life) over thirteen years is reasonable . . . The EPA's willingness to argue that spending $23.7 million to save less than one-third of a life reveals that its economic review of its regulations, as required by TSCA, was meaningless.[189]

But there is still some distance between these attitudes and that taken in *Business Roundtable*. Recall that there, the court controversially dismissed two studies relied upon by the SEC in its rulemaking, one of them published in a reputable peer-reviewed journal,[190] as "relatively unpersuasive" before proceeding to conclude that the SEC had not produced anything more than "admittedly (and at best) 'mixed' empirical evidence" for the proposition that proxy access for certain qualified shareholders to nominate candidates to the board is likely to increase shareholder value.[191] This holding seems to evince a standard that transcends that of plausibility and risks offending the principle that agencies have broad discretion in exercising their professional and expert knowledge to navigate uncertainty.[192] As the cases adumbrate, however, judicial review of rationalizing CBA can be calibrated and, if appropriately administered, could instill good governance while respecting the fundamental doctrines of American administrative law.

4 Conclusion

Recent treatments of the legal and normative status of cost-benefit analysis in the American administrative state have been dominated by a contrast between "quantified" and "non-quantified" approaches. I have argued that a debate conducted on such terms risks eliding the divisions between five phases of CBA, *viz.* identification, quantification, monetization, aggregation, and comparison, and occluding inquiry into the free-standing justification for each of them. Unless sufficient analytic caution is exercised, an argument in favor of quantification, for example, may be inadvertently accepted as an argument for "quantified" cost-benefit analysis. Moreover, I have suggested that monetization and aggregation are the defining elements of CBA and that interpretations of CBA should be, in the main, interpretations of these two steps. This essay therefore elucidated three interpretations of CBA: welfarist, replicative, and rationalizing. Distinguishing between these interpretations of CBA could, it is hoped, bring clarity to what it is that is being recommended or resisted under the label of cost-benefit analysis, whether it be in the realm of executive review or in the domain of judicial review.

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[189] *Id.* at 1223.

[190] The article is J. Harold Mulherin & Annette B. Poulsen, *Proxy Contests & Corporate Change: Implications for Shareholder Wealth*, 47 J. FIN. ECON. 279 (1998).

[191] 647 F.3d at 266.

[192] *See, e.g.*, *Nat'l Wildlife Fed'n v. EPA*, 286 F.3d 554, 563 (D.C. Cir. 2002) ("[W]e do not review EPA's cost figuring *de novo*, but accord EPA discretion to arrive at a cost figure within a broad zone of reasonable estimate ").

CHAPTER II

THE INFORMATIVE-NESS OF COST-BENEFIT ANALYSIS UNDER A SYSTEM OF REGULATORY REVIEW

1 Introduction

According to the doctrine of the unitary executive, the constitution vests executive power in the Chief Executive who has the ultimate duty "to take Care that the Laws be faithfully executed." But the bureaucracy is vast and the President's resources, limited, so influence over the bureaucracy is usually exercised, as a practical matter, through "politicization" and "centralization" (Moe & Wilson, 1994). The former occurs as political appointees seek to impose their agendas on the agencies that they manage while the latter involves the reallocation or duplication of some of the agencies' functions and decision-making authority to the White House.

Centralization gives rise to a "counter-bureaucracy" within the Executive Office of the President (Nathan, 1983). An "obscure but powerful" (Cf. Arbuckle, 2011) element of this counter-bureaucracy is the Office of Information and Regulatory Affairs (OIRA), nested in the Office of Management of Budget (OMB). Although OIRA is a creature of the Paperwork Reduction Act of 1980, its role in the oversight of federal regulation has been defined, and entrenched, by a series of executive orders. In 1981, President Reagan issued Executive Order 12291, declaring that "[a]dministrative decisions shall be based on adequate information concerning the need for and consequences of proposed government action" and demanding that "[r]egulatory objectives . . . be chosen to maximize the net benefits to society. The executive order also classified as "major" any rule likely to (1) have "[a]n annual effect on the economy of $100 million or more," (2) entail "[a] major increase in costs or prices for consumers, individual industries, . . . government agencies, or geographic regions," or (3) have "[s]ignificant adverse effects on competition, employment, investment, productivity, innovation," or the competitiveness of domestic industries. All major rules, draft or final, had to be supported by Regulatory Impact Analyses (RIAs) and cleared by the OIRA.

Although President Clinton revoked Executive Order 12291, he embraced the adoption of a cost-benefit approach to regulation in Executive Order 12866. Executive Order 12866 applied to all "significant regulatory action[s]," including those likely to "likely to result in a rule that may:

> (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in [Executive Order 12866]."

For significant regulatory action falling in the first category (also labelled "economically significant rules"), the agency has to furnish an RIA that details the "underlying analys[e]s," including the costs and benefits of all reasonably feasible alternatives. For all other significant regulatory action, the agency only has to provide a summary of the costs and benefits of the rule under consideration. President Obama's Executive Order 13563 "reaffirmed the principles, structures, and definitions governing contemporary regulatory review that were established in Executive Order 12866."

As Gailmard and Patty (2012) observes, "[a]lmost all of the recent formal literature on bureaucratic policy making in political science starts with some kind of information asymmetry and presumes some kind of principal–agent relationship between a bureaucratic agent and a principal who is either at a higher level in the bureaucracy or in some political position." The RIAs prepared by agencies have, in particular, been conceived as enabling information revelation by agents to their principals. Cost-benefit analysis is, on this understanding, a device for relieving the informational asymmetry between the agency and the White House. Without cost-benefit analysis, the agency is sometimes unable to convince the White House not to veto a regulation, even if the regulation furthers both their agendas (Posner E. A., 2001). These welfare losses are avoided if the White House can order the agency to conduct a cost-benefit analysis that perfectly reveals the agency's information.

In addition, it is reasonable to suppose that OIRA has to invest effort into examining an agency's cost-benefit analysis before it can be apprised of the information, if any, contained therein (Acs & Cameron, Regulatory Auditing at the Office of Information and Regulatory Affairs, 2014). As auditing agencies is costly, the mission of OIRA is to rein in agency slack by selecting targets for more exacting screening. OIRA accordingly concentrates its attention on adversaries, rather than allies (Acs & Cameron, Does White House Regulatory Review Produce a Chilling Effect and "OIRA Avoidance" in the Agencies?, 2013; Nou, Agency Self-Insulation Under Presidential Review, 2013). To avoid such scrutiny, agencies may attempt to circumvent audit by, *inter alia*, resorting to policy instruments other than informal rulemaking, such as adjudication or guidance documents, or by splitting a significant rule into several insignificant ones (Acs & Cameron, Does

White House Regulatory Review Produce a Chilling Effect and "OIRA Avoidance" in the Agencies?, 2013; Nou, Agency Self-Insulation Under Presidential Review, 2013).[1]

These models tend to assume that the preparation of a cost-benefit analysis necessarily compels the agency to yield all the information at its disposal. While this assumption might be useful for isolating and hence illuminating certain principal-agent interactions, RIAs are, in actuality, rather malleable. For instance, uncertainty, that is, the inability to even measure the likelihood of an event occurring, could mean that some of the probabilities being fed into cost-benefit analysis are little more than educated guesses whose *bona fides* are difficult, if not impossible, to verify. Furthermore, even if the risks to be addressed through regulation are susceptible of quantification, the monetary valuation of costs and benefits can vary, sometimes wildly, between accepted methods and across reliable studies.

Although these remarks have only hinted at the amount of discretion that is embedded in cost-benefit analysis, they suffice to demonstrate that despite the formality of cost-benefit analysis, agencies still have broad latitude to obfuscate. Agencies could, for example, furnish a range rather than divulge its best estimate of net benefits so as to hide the fact that the latter is negative.[2] Agencies could also quantify some costs or benefits while not quantifying others that they deem are ultimately resistant to monetization, such as human dignity. Indeed, the empirical research on the quality of cost-benefit analyses submitted by agencies indicates that they frequently fail to conform to Executive Order 12866 and the guidelines formulated by the OMB (Hahn, Burnett, Chan, & Mader, 2000; Hahn & Dudley, 2007; Shapiro & Morrall, 2012). Several reasons have been suggested for this neglect: a lack of agency resources (Hahn & Dudley, How Well Does the U.S. Government Do Benefit-Cost Analysis?, 2007), a deliberate decision by the agency to hide the fact that some of its regulations do not pass a cost-benefit test (Hahn & Dudley, How Well Does the U.S. Government Do Benefit-Cost Analysis?, 2007; Shapiro & Morrall, 2012, p. 198), the low organizational capacity of OIRA (Bolton, Potter, & Thrower, 2016), and the political capital expended through enforcement being relative high vis-à-vis the political payoffs (Hahn & Dudley, How Well Does the U.S. Government Do Benefit-Cost Analysis?, 2007).

This article presents a strategic model of the informative-ness of RIAs under a system of OIRA review. Following a dominant theme in the literature (Acs & Cameron, Does White House Regulatory Review Produce a Chilling Effect and "OIRA Avoidance" in the Agencies?, 2013; Nou, Agency Self-Insulation Under Presidential Review, 2013), the relationship between agencies and OIRA is characterized as one of conflict, in that agencies may have preferences over regulation that systematically deviate from those of the White House. But a shared interest in regulation that is based on actual social, economic, and political conditions also means that

[1] Raso (2010) and Acs and Cameron (2013) find little evidence of these effects. Moreover, Rezaee (2015) reports that Presidents Clinton and Obama were disproportionately likely to review significant policies by more liberal agencies, whereas President George W. Bush was disproportionately likely to review significant policies by more conservative agencies."

[2] Without ascribing any such motive to the EPA, one notes that the EPA's RIA for its 1997 revision of the ozone NAAQS estimated net annual partial attainment benefits to "range from -$0.7 billion to positive $1.0 billion, depending on whether the estimates are based on the low or high end assumptions." Available at https://archive.epa.gov/ttn/naaqsimp/web/pdf/riach-13.pdf

agencies sometimes seek to transmit information to their overseer (See Posner, 2001).[3] For reasons briefly rehearsed above, credible revelation of such information is not necessarily achievable through cost-benefit analysis because an RIA can be muddied or otherwise manipulated.

The function of OIRA review is to unveil or retrieve information for the Chief Executive. Acs and Cameron (2014) see OIRA as a "generalist agency" that cannot discover anything about the policy environment except through a close look at the responsible agency's cost-benefit analysis. Although this label is not far off the mark, OIRA might learn of issues not broached in the agency's RIA after consulting the views of other governmental entities or hearing the opinions of members of the public (Sunstein, The Office of Information and Regulatory Affairs: Myths and Realities, 2013). OIRA review could therefore gather data that is not communicated, or communicated only vaguely or imprecisely, by the agency's cost-benefit analysis. The agency's rule might be returned, or re-calibrated, on the basis of these representations. To illustrate, President George H.W. Bush was

> directly involved in a few regulatory decisions, including a dispute over the Food and Drug Administration (FDA) regulations to implement the Nutrition Labelling and Education Act of 1990. David Kessler, the commissioner of the FDA, has described how OMB (with the support of the Department of Agriculture) tried to require the FDA to modify its proposed food labelling regulations to mollify the meat industry, which wanted to obscure information about the fat content of foods . . . Kessler reports that he and [Health and Human Services Secretary Louis Sullivan] were prepared to resign if the White House ordered the FDA to issue the rules sought by the meat industry. Instead, to their surprise, the president directed that the regulations preferred by the FDA be promulgated, though he did not accept the FDA's proposal to apply them to restaurants (Percival, 2001, pp. 994-995).

The White House can thus reverse or revise the agency's rule to accommodate its own interests, even if it does not possess any expertise in the relevant policy domain.

Section II therefore describes the standard cheap talk model through an application to the regulatory setting. Section III lays out the basic model of OIRA review. Section IV examines an extension of the basic model that imposes a cost on the agency for OIRA review. Section V studies another extension of the basic model that features two decision-makers. Section VI concludes.

2 The Standard Cheap Talk Model

Suppose that the Environmental Protection Agency (EPA) has the ability to make a proposal consisting of a rule supplemented by a RIA that the President can then modify.[4] The

[3] For an argument that OIRA review can be used not only to discipline unaligned agencies but also to render assistance to aligned ones, see Rezaee (2015).

[4] The President is also frequently modelled as a veto player that can accept or reject, but not change, the regulation that is being advanced by the agency (Posner E. A., 2001; Acs & Cameron, Regulatory Auditing at the Office of Information and Regulatory Affairs, 2014). But the idea that the White House can alter a proposed rule is not entirely foreign to the literature.

agency's submission and the final regulation that the President directs the agency to promulgate are denoted m and r respectively.

The state of the environment is encapsulated by the variable θ. Although it is common knowledge that θ is a random variable distributed uniformly in $[0, 1]$, the realized value of θ is known to the agency but not the President.[5] Both the Environmental Protection Agency and the President desire that the regulation correspond to the state of the environment. The agency, however, cares more about the environment than the President does. Let the agency's utility function be represented by

$$U_A = -(\theta + \beta - r)^2$$

and the President's utility function be represented by

$$U_P = -(\theta - r)^2$$

where $\beta \geq 0$ represents the divergence between the agency and the President ("bias"). For any θ, the agency's ideal regulation is $r = \theta + \beta$ while the President's ideal regulation is $r = \theta$. In the absence of any further information on θ, the President's best course of action is to maximize

$$\int_0^1 -(\theta - r)^2 d\theta$$

by setting $r = 0.5$.

But sometimes, there is an alternative to $r = 0.5$ that is favored by both the EPA and the President. The task is for the agency to convince the President of this. If the President and the agency are perfectly aligned, i.e. $\beta = 0$, the agency is able to credibly reveal θ by submitting $m = \theta$. The President believes the agency and approves $r = m$, and the agency has no incentive to mischaracterize θ (by submitting $m \neq \theta$). If the President and the agency are not perfectly aligned, i.e. $\beta > 0$, then the President is rightfully suspicious of the agency's proposals. If the agency naively submits $m = \theta + \beta$ for all θ, the President could ensure that his or her ideal regulation is implemented by setting $r = m - \beta$. But the agency should soon figure out that it could induce the President to realize *its* ideal regulation by submitting $m = \theta + 2\beta$. The implication of these machinations is that the agency may not be able to have the President agree to a regulation that is more satisfactory to the both of them.

The preceding analysis assumed that the only possibilities are full revelation of θ or no revelation of θ at all. A fundamental result, established by Crawford and Sobel (1982), demonstrates, however, that if β is not too large, then partial revelation of θ can be sustained. As the EPA and the President subscribe to the idea that regulation ought to be responsive to the state

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For example, Bubb and Warren (2014)'s OIRA is allowed to set the stringency level of regulation once a regulatory opportunity has been identified by the agency.

[5] The agency's incentives to acquire expertise are elided in the model. This and related issues are discussed at length in e.g. Gailmard and Patty (2013).

of the environment, the agency can meaningfully specify ranges for θ. These disclosures are trusted by the president who then acts on his or her updated beliefs.

More technically, the agency partitions $[0,1]$ into intervals $\left[\theta_j, \theta_{j+1}\right], j = 0, \ldots, K-1$, and conveys a submission that credibly reveals the interval that θ is in. The number of intervals in the partition, K, is bounded above by

$$N(\beta) = \left\lceil -\frac{1}{2} + \frac{1}{2}\sqrt{1 + \frac{2}{\beta}} \right\rceil$$

where $\lceil x \rceil$ denotes the smallest integer greater than or equal to x. This implies, among other things, that no information is transmitted by the agency to the President if $\beta \geq \frac{1}{4}$. Crawford and Sobel (1982) also proved that in the Pareto-efficient outcome, the agency partitions $[0,1]$ into $K = N(\beta)$ intervals,

$$\theta_j = \frac{j}{N(\beta)} + 2\beta j(j - N(\beta))$$

for $j = 1 \ldots K$, and makes the submission corresponding to $[\theta_i, \theta_{i+1}]$ if and only if $\theta \in [\theta_i, \theta_{i+1}]$. The President then maximizes his utility function by setting $r = \frac{\theta_i + \theta_{i+1}}{2}$. Defining informative-ness as the sum of the variances of the uniform distribution over each of these intervals, i.e.

$$\sum_{i=0}^{N(\beta)} \frac{1}{12}(\theta_{i+1} - \theta_i)^2$$

, such that an equilibrium that generates a lower sum is more informative than an equilibrium that generates a higher sum, it can be shown that the Pareto-efficient outcome is also the most informative outcome.[6]

3 A Basic Model of OIRA Review

As long as final authority to regulate is vested in the President, the agency has a reason to communicate information to him or her, even in the absence of OIRA review. I build on the Crawford and Sobel (1982) model ("C-S model") by introducing a review technology. OIRA can, at cost k, review the submission that it has received from the agency. This review reveals the value of θ with probability p, $p \in (0,1)$, and extracts no further information with probability $1 - p$. p therefore represents the efficacy of review.

[6] Informative-ness and Pareto efficiency are referred to here in the *ex ante* sense.

Assume that OIRA is a faithful agent of the President that takes on the President's utility function and suppose, to simplify matters, that β is such that $N(\beta) = 2$, that is $\frac{1}{12} \leq \beta < \frac{1}{4}$. Then, the communicative equilibrium in the C-S model involves a partition of $[0, 1]$ into $\left[0, \frac{1}{2} - 2\beta\right]$ ("low") and $\left[\frac{1}{2} - 2\beta, 1\right]$ ("high"). Although there is also the babbling equilibrium where no meaning is ascribed to the agency's communications, such equilibria are ignored throughout.

Proposition 1: If $k \geq p\frac{1}{6}\left(\frac{1}{2} + 2\beta\right)^3$, OIRA never reviews the agency's ("no review") while if $k \leq p\frac{1}{6}\left(\frac{1}{2} - 2\beta\right)^3$, OIRA will always choose to review the agency's submissions before acting ("universal review"). The agency communicates as in the C-S model.

Proof: Note that it remains incentive compatible for the agency to adhere to its equilibrium strategy in the C-S model under a no review or universal review regime. That is, if it turns out that $\theta = \frac{1}{2} - 2\beta$, the agency is indifferent between a low submission that corresponds to $\theta \in \left[0, \frac{1}{2} - 2\beta\right]$ and a high submission that corresponds to $\theta \in \left[0, \frac{1}{2} - 2\beta\right]$. Since the President's expected gain from knowing the realized value of θ for any interval $[\theta_i, \theta_{i+1}]$ is $\frac{1}{6}(\theta_{i+1} - \theta_i)^3$, OIRA engages in no review if the expected gain from reviewing the larger of the two intervals is smaller than k, and engages in universal review if the expected gain from reviewing the smaller of the two intervals is larger than k. ■

This leaves the scenario where submissions in one of the intervals are reviewed, but not those in the other. Suppose then that OIRA reviews if $\theta \in [\theta_c, 1]$ but not if $\theta \in [0, \theta_c]$ ("selective review") for some θ_c.[7] Then it must be the case that $p\frac{1}{6}{\theta_c}^3 \leq k \leq p\frac{1}{6}(1 - \theta_c)^3$. Moreover, incentive compatibility requires that

$$-\left(\theta_c + \beta - \frac{\theta_c}{2}\right)^2 = -(1 - p)\left(\theta_c + \beta - \frac{1 + \theta_c}{2}\right)^2 - p\beta^2$$

, and hence, that

$$\frac{p}{4}{\theta_c}^2 + \left(p\beta + \frac{1 - p}{2}\right)\theta_c - (1 - p)\left(\frac{1}{4} - \beta\right) = 0.$$

Since $0 < \theta_c$, applying the general solution for a quadratic equation gives

$$\theta_c = \frac{-\left(p\beta + \frac{1 - p}{2}\right) + \sqrt{\left(p\beta + \frac{1 - p}{2}\right)^2 + p(1 - p)\left(\frac{1}{4} - \beta\right)}}{\frac{p}{2}}.$$

[7] In fact, there does not exist, in the basic model, $0 < \theta_C < 1$ such that the OIRA reviews if $\theta \in [0, \theta_C]$ but not if $\theta \in [\theta_C, 1]$. The details are given in Appendix A.

The following propositions flow from the discussion so far.

Proposition 2a: When $\frac{p}{6}{\theta_c}^3 \leq k \leq \frac{p}{6}\left(\frac{1}{2}-2\beta\right)^3$, there are two equilibria: one in which the sender partitions $[0,1]$ into $\left[0,\frac{1}{2}-2\beta\right]$ and $\left[\frac{1}{2}-2\beta,1\right]$ and the sender always reviews, and one in which the sender partitions $[0,1]$ into $[0,\theta_c\,]$ and $[\theta_c,1]$ and the receiver reviews if and only if $\theta \in [\theta_c,1]$.

Proposition 2b: When $\frac{p}{6}\left(\frac{1}{2}+2\beta\right)^3 \leq k \leq \frac{p}{6}(1-\theta_c)^3$, there are two equilibria: one in which the sender partitions $[0,1]$ into $\left[0,\frac{1}{2}-2\beta\right]$ and $\left[\frac{1}{2}-2\beta,1\right]$ and the sender never reviews, and one in which the sender partitions $[0,1]$ into $[0,\theta_c\,]$ and $[\theta_c,1]$ and the receiver reviews if and only if $\theta \in [\theta_c,1]$.

Proposition 3: $\theta_c \leq \frac{1}{2}-2\beta$.

Proposition 4: θ_c is decreasing in β and p.

Proof: The partial derivatives of θ_C with respect to p and β are

$$= \frac{1}{p^2}\left(1+\frac{1-\frac{2}{p}}{2\sqrt{\left(2\beta+\frac{1-p}{p}\right)^2+\frac{1-p}{p}(1-4\beta)}}\right)$$

and

$$= -2+\frac{4\left(2\beta+\frac{1-p}{p}\right)-4\frac{1-p}{p}}{2\sqrt{\left(2\beta+\frac{1-p}{p}\right)^2+\frac{1-p}{p}(1-4\beta)}}$$

respectively, and less than or equal to 0 for $p \in (0,1)$ and $\beta \in \left[\frac{1}{12},\frac{1}{4}\right)$,[8]. ■

An immediate corollary of Proposition 3 is that the agency's submissions are less informative under selective review than under no review, universal review, or the standard cheap talk model. Moreover, by Proposition 4, the agency's submissions under a regime of selective review also become less informative as bias or the efficacy of review increases. The latter occurs because the agency, too, benefits from regulation that is tethered to θ, and its incentive to invite review therefore becomes stronger as review becomes more efficacious.

[8] See Appendix A for a three dimensional plot of θ_C as a function of p and β.

The equilibrium outcomes for the basic model can therefore be described as a function of k, keeping in mind that θ_c is, here, a function of p and β.

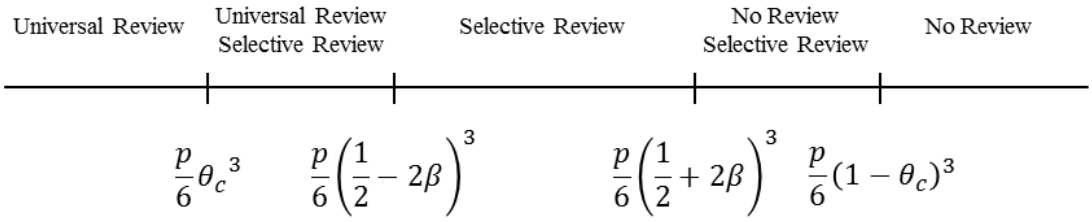

Figure 1: Equilibrium Outcomes in the Basic Model as a Function of k

The White House's expected payoff is

$$\begin{cases} -\frac{1}{48}-\beta^2, & \text{if no review} \\ -\frac{1}{12}{\theta_c}^3-\frac{1}{12}(1-p)(1-\theta_c)^3-(1-\theta_c)k, & \text{if selective review} \\ (1-p)\left(-\frac{1}{48}-\beta^2\right)-k, & \text{if universal review} \end{cases}$$

while the agency's expected payoff is

$$\begin{cases} -\frac{1}{48}-2\beta^2, & \text{if no review} \\ -\frac{1}{12}{\theta_c}^3-\frac{1}{12}(1-p)(1-\theta_c)^3-\beta^2, & \text{if selective review} \\ (1-p)\left(-\frac{1}{48}-2\beta^2\right)-p\beta^2, & \text{if universal review} \end{cases}$$

. Where there are multiple equilibria, Pareto efficiency is determined by, among other things, the cost of review relative to the efficacy of review. Thus, OIRA prefers no review to selective review if and only if

$$\frac{1}{1-\theta_C}\left(\frac{1}{48}+\beta^2-\frac{{\theta_c}^3}{12}-\frac{(1-p)(1-\theta_c)^3}{12}\right)<k$$

and universal review to selective review if and only if

$$\frac{1}{\theta_c}\left(-(1-p)\left(\frac{1}{48}+\beta^2\right)+\frac{{\theta_c}^3}{12}+\frac{(1-p)(1-\theta_c)^3}{12}\right)>k.$$

On the other hand, the agency prefers no review to selective review if and only if

$$\frac{1}{48}+\beta^2-\frac{{\theta_c}^3}{12}-\frac{(1-p)(1-\theta_c)^3}{12}<0$$

and universal review to selective review if and only if

$$-(1-p)\left(\frac{1}{48}+\beta^2\right)+\frac{{\theta_c}^3}{12}+\frac{(1-p)(1-\theta_c)^3}{12}>0$$

These inequalities imply that OIRA prefers no review to selective review if the agency does, and the agency prefers universal review to selective review if OIRA does.

Since review is costly, however, the agency, but not OIRA, may prefer more review to less review. The reason for this is that while the agency and OIRA both stand to benefit from more informed action, the agency, in the basic model, does not bear the cost of review; only OIRA does. For instance, when $\beta = 0.1$, and $p = 0.75$ is large, the agency, but not OIRA, favors selective review over no review (Figure 2).

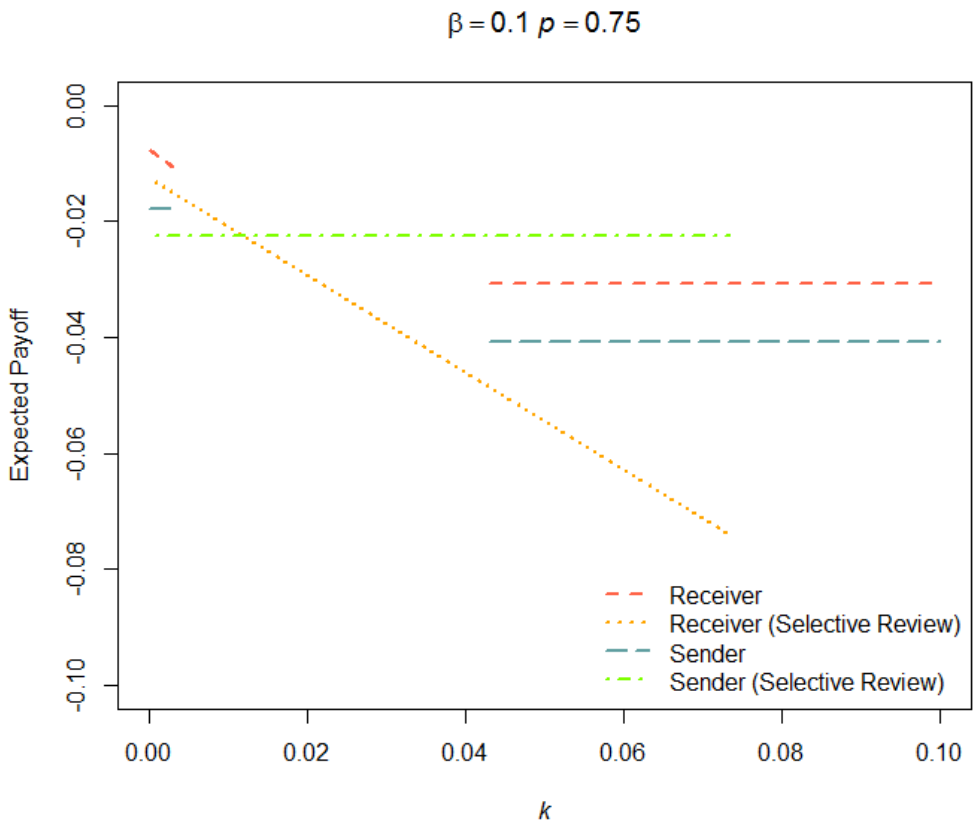

Figure 2: Expected Payoffs for Sender and Receiver as a Function of k if $\beta = 0.1$ and $p = 0.75$

4 Extensions

4.1 Agency Cost of Review

The basic model is unrealistic in that the agency typically incurs a cost for OIRA review, both in terms of time and in terms of resources: let this cost be $z \geq 0$. As before, let β be such

that $N(\beta) = 2$, that is $\frac{1}{12} \leq \beta < \frac{1}{4}$. It is still the case that if $k \geq p\frac{1}{6}\left(\frac{1}{2} + 2\beta\right)^3$, OIRA conducts universal review while if $k \leq p\frac{1}{6}\left(\frac{1}{2} - 2\beta\right)^3$, OIRA conducts no review.

Suppose that OIRA selectively reviews if $\theta \in [\theta_c, 1]$ but not if $\theta \in [0, \theta_c]$.[9] Then, it must be that $p\frac{1}{6}{\theta_c}^3 \leq k \leq p\frac{1}{6}(1-\theta_c)^3$.[10] Moreover, by the incentive compatibility condition,

$$\theta_c = \frac{-\left(p\beta + \frac{1-p}{2}\right) + \sqrt{\left(p\beta + \frac{1-p}{2}\right)^2 + p\left((1-p)\left(\frac{1}{4} - \beta\right) + z\right)}}{\frac{p}{2}}.$$

It is evident, on inspection, that θ_c is increasing in z. Having the agency bear a cost for OIRA review could therefore have the effect of increasing the informative-ness of submissions under a selective review regime.

Analogous to the basic model, the White House's expected payoffs under no review, selective review, and universal review are

$$\begin{cases} -\frac{1}{48} - \beta^2, & \text{if no review} \\ -\frac{1}{12}{\theta_c}^3 - \frac{1}{12}(1-p)(1-\theta_c)^3 - (1-\theta_c)k, & \text{if selective review} \\ -(1-p)\left(\frac{1}{48} + \beta^2\right) - k, & \text{if universal review} \end{cases}$$

The agency's expected payoffs, on the other hand, are

$$\begin{cases} -\frac{1}{48} - 2\beta^2, & \text{if no review} \\ -\frac{1}{12}{\theta_c}^3 - \frac{1}{12}(1-p)(1-\theta_c)^3 - \beta^2 - (1-\theta_c)z, & \text{if selective review} \\ (1-p)\left(-\frac{1}{48} - 2\beta^2\right) - p\beta^2 - z, & \text{if universal review} \end{cases}$$

. While the closed form expressions for some of the expected payoffs under each of these equilibria are unchanged, they nevertheless depend on z through θ_c. Moreover, a change in z could alter the set of communications that can be sustained in equilibrium. For example, if $\theta_c < \frac{1}{2} - 2\beta$, a marginal increase in the cost of review to the agency does not change the region for k where a selective review regime is the only communicative equilibrium. It does, however,

[9] The other case does not exist. The details are given in Appendix A.

[10] This implies, *a fortiori*, that $z < \frac{1}{16}p + \beta - \frac{1}{2}p\beta$.

result in the no review and universal review being the sole communicative equilibrium for a larger range of values for k (See Figure 1).

The following propositions serve to clarify some of these ideas.

Proposition 5a: As compared to the basic model, and assuming a selective review equilibrium is maintained, the agency's expected payoff is always decreased by the imposition of an arbitrarily small cost of review.

Proof: The partial derivative of the agency's expected payoff under selective review, taken with respect to z is

$$\frac{1-p(1-4z)-\sqrt{1-p(1-4z)+4p^2\beta^2}}{p\sqrt{1-p(1-4z)+4p^2\beta^2}}$$

and, evaluated at $z=0$,[11] is negative for $\frac{1}{12} \leq \beta < \frac{1}{4}$ and $0 < p < 1$. ■

Proposition 5b: As compared to the basic model, and assuming a selective review equilibrium is maintained, the White House's expected payoff is always increased by the imposition of an arbitrarily small cost of review.

Proof: The partial derivative of the White House's expected payoff under selective review, taken with respect to z is

$$\frac{2\left(k-z-\beta\left(2p\beta-\sqrt{(2p\beta)^2+1-p(1-4z)}\right)\right)}{\sqrt{(2p\beta)^2+1-p(1-4z)}}$$

and evaluated at $z=0$, is positive for $\frac{1}{12} \leq \beta < \frac{1}{4}$ and $0 < p < 1$. ■

Proposition 5c: As compared to the basic model, and assuming a selective review equilibrium is maintained, social welfare, defined as the sum of the agency and the White House's expected payoffs, is increased by the imposition of an arbitrarily small cost of review if and only if OIRA's cost of review, k, is larger than the threshold $\frac{-(1-p-4p\beta^2)+\sqrt{(1-p+4p\beta^2)(1-2p\beta)^2}}{2p}$.[12]

Proof: This inequality is arrived at by evaluating the sum of the partial derivatives of the agency and White House's expected payoffs under selective review with respect to z at $z=0$, and solving for the conditions under which it is positive for $\frac{1}{12} \leq \beta < \frac{1}{4}$ and $0 < p < 1$. ■

[11] The expressions for the partial derivatives are reproduced in Appendix A.

[12] This condition is satisfied by k that also supports a selective review equilibrium only for higher values of β and/or p.

As an illustration, consider

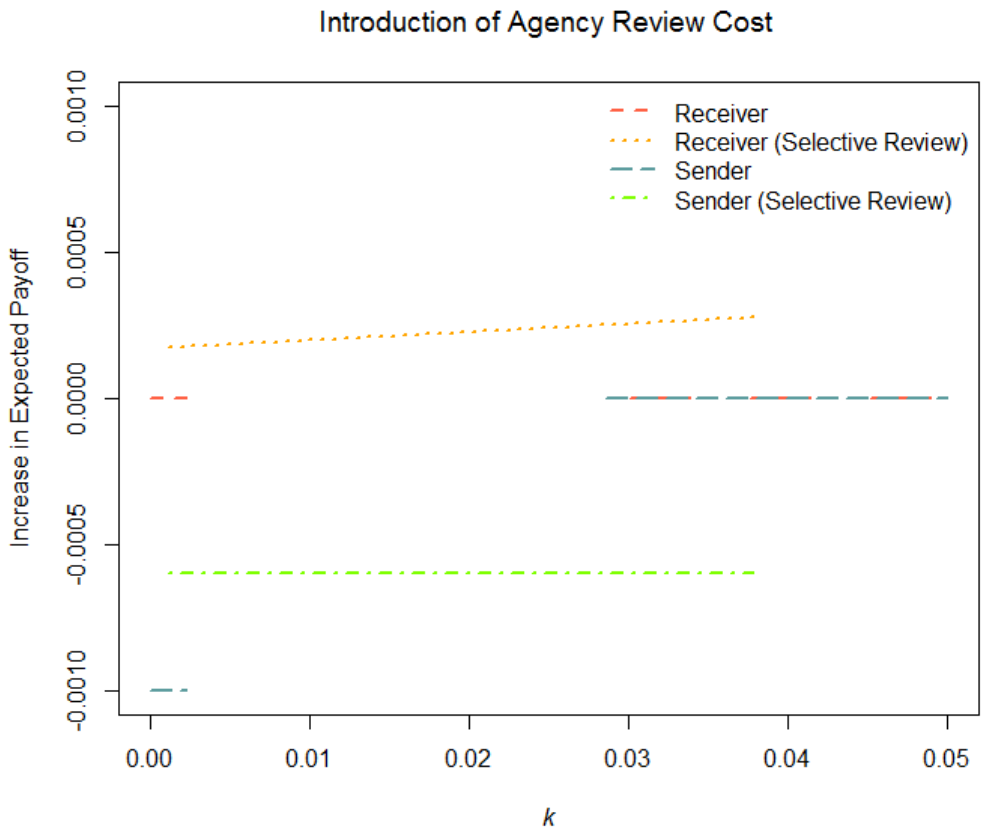

Figure 3a: Increase in Sender and Receiver's Expected Payoffs as a Function of p for $\beta = 0.1$ and p=0.5 as z Increase from 0.000 to 0.001

The conclusion of this extension is that under certain circumstances, the White House may be made better off by having the agency bear a cost for review. The intuition is that the President might, in a selective review regime, prefer more informative submissions *ex ante* to more extensive review *ex post*. But such an adjustment cannot be implemented, even if the agency – for some reason – concurs in it, because of credibility issues. The agency may, after learning θ, be tempted to invite review by making the high submission rather than the low one.

Costly review (for the agency) dampens this incentive and thereby enables the sender to communicate more informatively.

4.2. Extension: Second Decision-Maker

The rational choice of actors may be influenced by the observability of their conduct or speech by others. The tax code, for example, safeguards the confidentiality of returns so as to facilitate the collection of revenue.[13] Taxpayers who run illegal businesses would have even more incentive to hide their income from the Inland Revenue Service if their returns could be obtained by a law enforcement agency. Another example is filings with the Securities and Exchange Commission. A company that is keen to shield its business schemes from its rivals may nevertheless find it advantageous to announce its commercial strategy so as to find favor in the capital markets.

A key element of American administrative law is disclosure. Information transmitted by the agency to OIRA (and *vice versa*) is subject to a host of disclosure rules. The first source of rules derives from the Administrative Procedure Act. Section 553, in particular, requires agencies to "give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation." The federal courts have read the strictures of Section 553 as laying on agencies a duty to make publicly available for notice and comment the data and methodology used to inform the regulation.[14] The second source of rules is statutes other than the Administrative Procedure Act, such as an agency's enabling statute. For example, the Clean Air Act, as amended by Congress in 1977, explicitly states that "[t]he drafts of proposed rules submitted by the Administrator [of the Environmental Protection Agency] to the Office of Management and Budget for any interagency review process prior to proposal of any such rule, all documents accompanying such drafts, and all written comments thereon by other agencies and all written responses to such written comments by the Administrator shall be placed in the docket no later than the date of proposal of the rule."[15] The third source of rules comes from Executive Orders. Pursuant to Executive Order 12866, OIRA has to release, after publication of the contemplated regulation in the Federal Register "all documents exchanged between [itself] and the agency during the review."

It is therefore natural to ask if information revelation is enhanced or diminished if another entity, such as an industry group, a legislative committee, or a court, has access to the content of the communications between the agency and the OIRA, and may intervene based on the content of those communications. Some related issues have been explored theoretically by, among others, Farrell and Gibbons (1989), Koessler (2007), and Goltsman and Pavlov (2011). Farrell and Gibbons (1989) sketch a stylized model involving one sender and two receivers, demonstrating that full information revelation is achievable in public but not in private. This is

[13] 26 U.S.C.A. § 6103 (West).
[14] See e.g. *United States v. Nova Scotia*, 568 F.2d 240, 252 (2d Cir. 1977) ("To suppress meaningful comment by failure to disclose the basic data relied upon is akin to rejecting comment altogether"); *Connecticut Light and Power Co. v. Nuclear Regulatory Commission*, 673 F.2d 525, 531-32 (D.C. Cir. 1982) (describing this failure as a "serious procedural error").
[15] 42 U.S.C.A. § 7607 (West).

referred to as "mutual discipline." "Mutual subversion," that is, full information revelation in private but not in public, is ruled out. Koessler (2007), on the other hand, suggests that if a sender's messages are "certifiable," that is, if the messages available to a sender are (exogenously) restricted by his type, then the conclusions of Farrell and Gibbons (1989) are reversed. Goltsman and Pavlov (2011) take these insights into the Crawford and Sobel (1982) framework, showing that the sender does better by communicating in private when the average bias of the two receivers is high, and by communicating in public if the average bias of the two receivers is low and the two receivers are sufficiently polarized.

Here, I let the Sender's utility function be,

$$U_S = -(\theta - r)^2$$

Receiver 1's utility function be

$$U_{R_1} = -(\theta - \beta_1 - r)^2$$

and Receiver 2's utility function be

$$U_{R_2} = -(\theta - \beta_2 - r)^2$$

where β_1 and β_2 are assumed to be positive. I simplify the strategic interaction between the receivers by introducing a parameter $q \in (0,1)$. Receiver 1 is able to set r with probability q while Receiver 2 is able to set r with probability $1 - q$.[16] Receiver 1, but not Receiver 2, may review the Sender's submissions. Receiver 2, however, fully observes all communications from the Sender to Receiver 1 and the fruits of Receiver's 1 review, if any. One can therefore imagine Receiver 1 to be the White House and Receiver 2 to be the industry group, the legislative committee, or the court.

Proposition 6: If the review technology did not exist, the Sender acts as though there is a single receiver that has the utility function $U_R = -(\theta + q\beta_1 + (1-q)\beta_2 - r)^2$.

Proof: By incentive compatibility, partial revelation is sustained if and only if

$$-q\left(\theta_{j+1} - \frac{\theta_j + \theta_{j+1}}{2} + \beta_1\right)^2 - (1-q)\left(\theta_{j+1} - \frac{\theta_j + \theta_{j+1}}{2} + \beta_2\right)^2$$
$$= -q\left(\theta_{j+1} - \frac{\theta_{j+1} + \theta_{j+2}}{2} + \beta_1\right)^2 - (1-q)\left(\theta_{j+1} - \frac{\theta_{j+1} + \theta_{j+2}}{2} + \beta_2\right)^2$$

and therefore that

[16] Although this device may seem somewhat *ad hoc*, it is possible to demonstrate models where in equilibria, the sender communicates as though the two receivers were one receiver that has a bias that is a convex combination of β_1 and β_2.

$$\frac{\theta_{j+1}\left(\theta_{j+2}-\theta_j\right)}{2}+(q\beta_1+(1-q)\beta_2)\left(\theta_{j+2}-\theta_j\right)+\frac{{\theta_j}^2-{\theta_{j+2}}^2}{4}=0.\ \blacksquare$$

In the absence of the review technology, the partitions are as in the C-S model for a sender having a bias $\bar{\beta}=q\beta_1+(1-q)\beta_2$. In particular, if $\frac{1}{12}\leq\beta_1,\beta_2<\frac{1}{4}$, then $\frac{1}{12}\leq\bar{\beta}<\frac{1}{4}$ and the most informative equilibrium consists of a partition of $[0,1]$ into $\left[0,\frac{1}{2}-2\bar{\beta}\right]$ and $\left[\frac{1}{2}-2\bar{\beta},1\right]$.

The review technology is deployed by Receiver 1 if and only if its cost, k, is justified by its expected gain from revealing the value of θ. For any partition $[\theta_i,\theta_{i+1}]$, this expected gain is

$$p\left[\frac{1}{6}(\theta_{i+1}-\theta_i)^3-(1-q)(\beta_2-\beta_1)^2(\theta_{i+1}-\theta_i)\right].$$

Thus, Receiver 1 never reviews the Sender's submissions if

$$k\geq p\left[\frac{1}{6}\left(\frac{1}{2}+2\bar{\beta}\right)^3-(1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}+2\bar{\beta}\right)\right]$$

and always reviews the Sender's submissions if

$$k\leq p\left[\frac{1}{6}\left(\frac{1}{2}-2\bar{\beta}\right)^3-(1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}-2\bar{\beta}\right)\right].^{17}$$

It is easily verified that in both of these cases, the Sender communicates with Receivers 1 and 2 as though the review technology did not exist. The Sender's expected payoffs are therefore

$$\begin{cases}-\frac{1}{48}-\bar{\beta}^2-(1-q){\beta_2}^2-q{\beta_1}^2, \text{if no review}\\ -(1-p)\left[(1-q)\left(\frac{1}{48}+\bar{\beta}^2+q{\beta_1}^2+(1-q){\beta_2}^2\right)\right]-p\left[q{\beta_1}^2+(1-q){\beta_2}^2\right], \text{if universal review}\end{cases}$$

Receiver 1's expected payoffs are

$$\begin{cases}-\frac{1}{48}-\bar{\beta}^2-(1-q)(\beta_1-\beta_2)^2, & \text{if no review}\\ -(1-p)\left(\frac{1}{48}+\bar{\beta}^2\right)-(1-q)(\beta_1-\beta_2)^2-k, & \text{if universal review}\end{cases}$$

while Receiver 2's payoffs are

[17] The expected gain from reviewing a "high" submissions always exceeds the expected gain from reviewing a "low" submission. Calculations are reproduced in appendix A.

$$\begin{cases} -\frac{1}{48} - \bar{\beta}^2 - q(\beta_1 - \beta_2)^2, & \text{if no review} \\ -(1-p)\left(\frac{1}{48} + \bar{\beta}^2\right) - q(\beta_1 - \beta_2)^2, & \text{if universal review} \end{cases}.$$

There are two corollaries of these results. First, by Proposition 6, Receiver 2 induces more informative communication in the no review and universal review regimes if $\bar{\beta} < \beta_1$ or, equivalently, if $\beta_2 < \beta_1$. The converse is true if $\bar{\beta} > \beta_1$ or, equivalently, if $\beta_2 > \beta_1$. One implication of this corollary is that agencies may engage in obfuscatory behavior despite alignment between themselves and the White House if their RIAs are observed by hostile outsiders who may interpose themselves into the rulemaking process.

Second, the informational benefits to Receiver 1 of having another receiver observe, and act on, the sender's submissions could dominate the costs of having the final decision influenced by an entity that has mildly divergent interests. Assume k to be large such that no review occurs across all models. Then, the introduction of Receiver 2 actually improves the expected payoff of Receiver 1 if $\beta_2 < \beta_1$. On the other hand, if k is arbitrarily small such that universal review is always assured, then Receiver 1 fares better by having Receiver 2 around if the twin conditions

$$\beta_2 < \beta_1$$

and

$$p < \frac{q(\beta_1 - \beta_2) + 2\beta_2}{(1+q)\beta_1 + (1-q)\beta_2}$$

are satisfied. This second condition becomes more restrictive as q decreases.

There is also the selective review equilibrium where Receiver 1 reviews if the Sender makes a high submission and does not review if the Sender makes a low submission. This is rational for Receiver 1 if and only if $p\left[\frac{1}{6}{\theta_c}^3 - (1-q)(\beta_2 - \beta_1)^2\theta_c\right] \leq k \leq p\left[\frac{1}{6}(1-\theta_c)^3 - (1-q)(\beta_2 - \beta_1)^2(1-\theta_c)\right]$ where, by the incentive compatibility condition,

$$\theta_c = \frac{-\left(p\bar{\beta} + \frac{1-p}{2}\right) + \sqrt{\left(p\bar{\beta} + \frac{1-p}{2}\right)^2 + p(1-p)\left(\frac{1}{4} - \bar{\beta}\right)}}{\frac{p}{2}}.$$

By Proposition 3, $\theta_c \leq \frac{1}{2} - 2\bar{\beta}$. Furthermore, Since θ_c is decreasing in $\bar{\beta}$, it is also the case that the existence of Receiver 2 leads to more informative communication if $\bar{\beta} < \beta_1$ or, equivalently, if $\beta_2 < \beta_1$. Under a selective review regime, the Sender's expected payoff is

$$-\frac{1}{12}[\theta_c^3 + (1-p)(1-\theta_c)^3] - (1-q)\beta_2^2 - q(1 + 2p\theta_c - 2p)\beta_1^2,$$

Receiver 1's expected payoff is

$$-\frac{1}{12}[\theta_c^3 + (1-p)(1-\theta_c)^3] - (1-q)(\beta_1-\beta_2)^2 - (1-\theta_c)k,$$

and Receiver 2's expected payoff is

$$-\frac{1}{12}[\theta_c^3 + (1-p)\theta_c^3] - q(\beta_1-\beta_2)^2.$$

Proposition 7: For $\beta_2 < \beta_1$ there exists k such that the selective review regime obtains and Receiver 1 does better by having Receiver 2 makes the call some of the time ($q = \epsilon, \epsilon > 0$) than not at all ($q = 0$).

Proof: Note that since $\frac{\partial \theta_c}{\partial \overline{\beta}} < 0$ and since $\frac{d\overline{\beta}}{dq} = \beta_1 - \beta_2 > 0$, $\frac{\partial \theta_c}{\partial q} < 0$. Recall that Receiver 1's expected payoff under a selective review equilibrium is given by $-\frac{1}{12}[\theta_c^3 + (1-p)\theta_c^3] - (1-q)(1+p\theta_c)(\beta_1-\beta_2)^2 - (1-\theta_c)k$. The partial derivative of this expression, taken with respect to q, is

$$\left(-\frac{1}{4}\theta_c^2 - \frac{1}{4}(1-p)\theta_c^2 - p(1-q)(\beta_1-\beta_2)^2 + k\right)\frac{\partial \theta_c}{\partial q}$$

. Evaluated at $q = 1$, this is

$$\left(-\frac{1}{4}(2-p)\theta_{c,q=1}^2 + k\right)\frac{\partial \theta_c}{\partial q}\Big|_{q=1}$$

. Recall also that in general, it is rational for Receiver 1 to review the higher submission, but not the lower one, if and only if $p\left[\frac{1}{6}{\theta_c}^3 - (1-q)(\beta_2-\beta_1)^2\theta_C\right] \le k \le p\left[\frac{1}{6}(1-\theta_c)^3 - (1-q)(\beta_2-\beta_1)^2(1-\theta_c)\right]$. Let $k = p\frac{1}{6}{\theta_{c,q=1}}^3 + \epsilon$ for $\epsilon > 0$. Such an ϵ exists because $\theta_{c,q=1} \le \frac{1}{2} - 2\beta_1$. Then

$$\left(-\frac{1}{4}(2-p)\theta_{c,q=1}^2 + p\frac{1}{6}{\theta_{c,q=1}}^3 + \epsilon\right)\frac{\partial \theta_c}{\partial q}\Big|_{q=1} < 0$$

, the last inequality being true by the fact that $\theta_{c,q=1} \le \frac{1}{2} - 2\beta_1$ and $\frac{\partial \theta_c}{\partial q}\Big|_{q=1} < 0$. In addition, $p\left[\frac{1}{6}{\theta_{c,q=1-\delta}}^3 - \delta\theta_C\right] \le k \le p\left[\frac{1}{6}\left(1-\theta_{c,q=1-\delta}\right)^3 - \delta(\beta_2-\beta_1)^2\left(1-\theta_{c,q=1-\delta}\right)\right]$ for $\delta > 0$. Hence, there exists, for $\beta_2 < \beta_1$, k such that Receiver 1's payoff is increased by an arbitrarily small decrease in q at $q = 1$. ■

To illustrate, Figure 4 plots the increase in expected payoff for the Sender and Receiver 1 for $\beta_1 = 0.12$, $\beta_1 = 0.10$, and $p = 0.1$ as Receiver 2's chance of being decisive goes from 0 to 0.01.

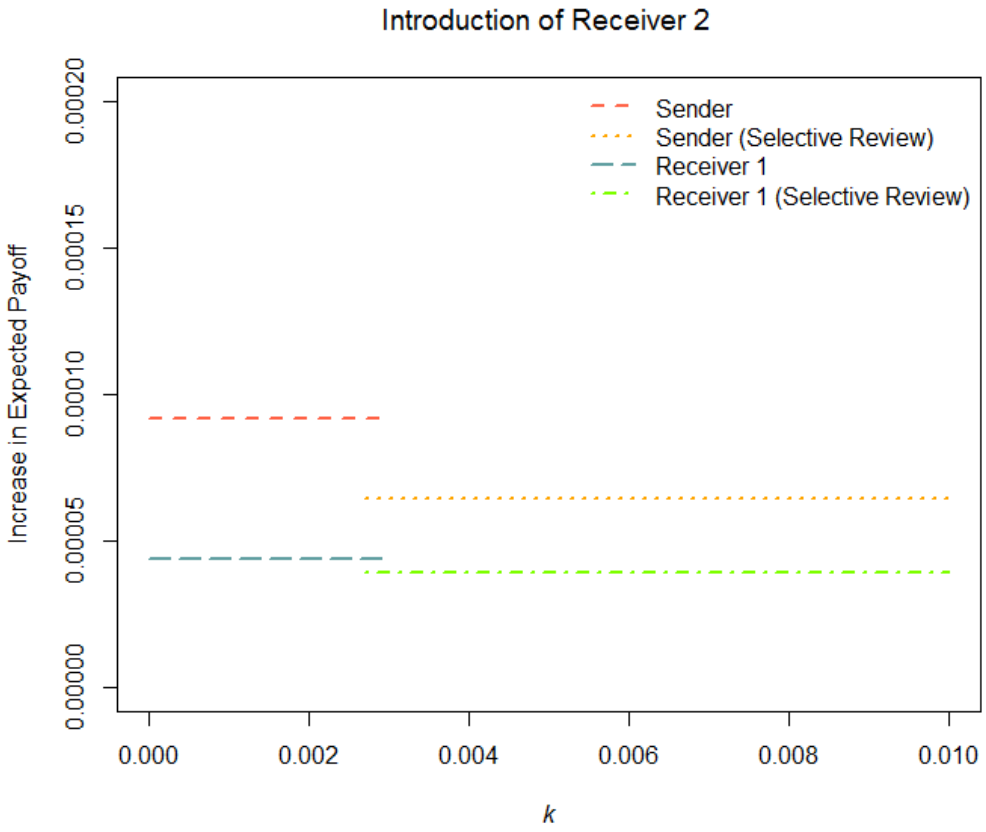

Figure 4: Increase in Sender and Receiver 1's Expected Payoffs as a Function of k for $\beta_1 = 0.12$, $\beta_2 = 0.10$, and $p = 0.1$ as q Decreases from 1 to 0.99

Finally, it is also important to note, for completeness, that the review regimes obtainable in equilibrium depend on β_1, β_2, p, and q. In particular, while it is true here that $p\left[\frac{1}{6}{\theta_c}^3 - (1-q)(\beta_2-\beta_1)^2\theta_c\right] \geq p\left[\frac{1}{6}\left(\frac{1}{2}-2\bar{\beta}\right)^3 - (1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}-2\bar{\beta}\right)\right]$ if and only if $p\left[\frac{1}{6}\left(\frac{1}{2}+2\bar{\beta}\right)^3 - (1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}+2\bar{\beta}\right)\right] \geq p\left[\frac{1}{6}(1-\theta_c)^3 - (1-q)(\beta_2-\beta_1)^2(1-\theta_c)\right]$, neither inequality is guaranteed to be satisfied.[18] Thus, there could be multiple equilibria, or no equilibrium (except for the babbling one), for certain values of k.

5 Conclusion

As an emerging body of literature has it, cost-benefit analysis under a regime of regulatory review eliminates the informational asymmetry between agencies and the Chief Executive. An agency that is ideologically opposed to the White House may therefore seek to

[18] The solutions for these inequalities in terms of p, q, β_1, and $\beta_2$are lengthy and of secondary interest, and have therefore been omitted from the manuscript. They are, however, available on request.

avoid such review by resorting to forms of regulatory activity that are not covered by Executive Order 12866.

Yet, RIAs are, for theoretical reasons and as an empirical matter, susceptible of obfuscation. This article therefore studied the informative-ness of communications from agencies to the White House by introducing a review technology into the C-S model, finding that depending on the cost of OIRA review, three types of communicative equilibria – no review, universal review, and selective review – are possible. Moreover, the informative-ness of communications diminishes as the bias between the agency and the President increases and, under a regime of selective review, as OIRA review becomes more efficacious at recovering the information that the agency has. Since both the agency and the President hope regulation to be responsive to actual social, economic, and political conditions, selective review that is costless to the agency gives it incentives to invite review, reducing the informative-ness of submissions that can credibly be made. OIRA review that is costly for the agency blunts these incentives, and can therefore sustain equilibrium outcomes that are better for the President than those obtained under the basic model.

Moreover, communications between the White House and the agency are less noisy if they have to be disclosed to a relatively moderate body that can determine, to some extent, the stringency of the final rule. This could increase the expected payoffs for the President as the benefits of more informative submissions overcome the costs incurred from ceding influence to another entity. Conversely, the agency's communications are noisier if they are observed by a relatively extreme intervenor. A perfectly aligned agency fudges under such circumstances because of the divergence between itself and the other member of the audience.

Although the framework adopted here is rather stylized, it furnishes a theoretical basis for studying the informative-ness of cost-benefit analysis under a system of regulatory review, hinting at positive accounts for the documented quality of cost-benefit analyses and elucidating some of the normative considerations that should inform calls for more rigorous RIAs.

CHAPTER III

CAN COST-BENEFIT REASONING PERSUADE?

1 Introduction

According to some theorists, the universe of values is irreducibly plural and cannot be ranged along a single dimension like utility. Hence, it is asserted that approaches to policymaking that attempt to do so, e.g. cost-benefit analysis, are misguided because the things to be compared are, in a sense, non-commensurable. By treating them as though they were, we misunderstand them. Worse, by monetizing non-market goods, we commodify and, thereby degrade, them (Anderson, 1993).

The standard reply to these objections is to observe the ubiquity of trade-offs in our daily lives, and the necessity of them in public decision-making. Thus, the fundamental assumption underlying cost-benefit analysis is implicitly endorsed by the choices that we make as individuals and as a society. Furthermore, cost-benefit analysis is an instrument that is used for calibrating regulation; it does not claim to furnish a comprehensive account of value. The case for cost-benefit analysis is therefore an "intensely pragmatic" one that steers clear of deep metaphysical claims (Sunstein, Valuing Life: Humanizing the Regulatory State, 2014, p. 70).

Abstracting from that exchange, however, there is still an issue of whether cost-benefit analysis can be used to convince members of the public of the correctness of a decision. A body of literature consistently demonstrates that it is unlikely to have that effect. The mere thought of attaching a price to "sacred" values (Tetlock, Peterson, & Lener, Revising the Value Pluralism Model: Incorporating Social Content and Context Postulates, 1996) can give rise to feelings of moral contamination and the corresponding urge to cleanse oneself of the taint (Tetlock, Kristel, Elson, Green, & Lerner, 2000).

Consider the debate over the value of a statistical life (VSL). VSL is taken in cost-benefit analysis to represent the amount of money that people are willing to pay to avoid a small risk of death. For instance, consumers weighing additional security features to a car against their cost may exhibit indifference between $50 and a 1 in 100,000 reduction in the chance of a fatal accident. The VSL derived from this example is therefore $50×100,000=$5,000,000. Standard law and economics recommends, under the prescription of social efficiency, that precaution should be taken until its marginal benefit is equal to its marginal cost. And some advocates of cost-benefit analysis in the public domain argue that social efficiency aside, satisfying preferences as revealed through market behavior constitutes a form of respect for personal autonomy. Cass Sunstein, for one, argues that

> [g]overnment should respect people's choice about their how to use limited resources . . . When people decline to devote more than $90 to the elimination of a 1/100,000 risk, it is because they would prefer to spend the money in a way that seems to them more desirable. If regulators do not use people's actual judgments, then they are insulting their dignity (Sunstein, Valuing Life: Humanizing the Regulatory State, 2014, p. 93).

People, however, tend to respond to the assignment of a monetary value to a statistical life by expressing moral outrage. They reaffirm the sanctity of human life by refusing to entertain any limit on the resources to be spent preserving it and by sanctioning those who even contemplate such a trade-off (Tetlock, Coping with Trade-Offs: Psychological Constraints and Political Implications, 2000). Corporations are punished by jurors for having explicitly performed a cost-benefit calculus, even though this is the conduct that modern tort law seeks to encourage (Viscusi, 2000, pp. 586-587). And in the field of law and policy, critics of the cost-benefit approach to regulating health and the environment strenuously condemn its inappositeness to "the realm of the priceless, where market values tell us little about the social values at stake" (Ackerman & Heinzerling, 2004, p. 10).

Yet research indicates that these responses can be quelled to some degree by recasting the choice as one between two "secular" values ("routine trade-off") or two "sacred" ones ("tragic trade-off"), or by obfuscating the logic underlying the choice (Tetlock, Thinking the unthinkable: sacred values and taboo cognitions, 2003). More interestingly for the present inquiry, citizen's evaluations of politicians who engage in talk of trade-offs can vary depending on the stereotypes that are most accessible to them at the time. Tetlock (2003) finds that respondents who have been exposed to a "thoughtful statesman" script "became increasingly positive toward complex trade-off arguments" and "increasingly negative toward simple arguments that denied or minimized trade-offs" (Tetlock, Coping with Trade-Offs: Psychological Constraints and Political Implications, 2000, p. 261). Those exposed to a "principled leader" script, on the other hand, displayed opposite reactions. Whereas the outcome measures involve evaluations of the speaker than rather his message, one suspects that those who rated him "as balanced, thoughtful, and even wise" were more likely to have supported his policy position (which was maintained invariant across all conditions) than those who rated him as "confused, uncertain, and indecisive."

These findings raise a question that is germane to the organization of the administrative state, namely, whether Congress or the federal agencies fare better at invoking cost-benefit trade-offs in the policy arena. While transparency may be a virtue in a democracy, it can also have a negative impact on public acceptance of a decision that is made on cost-benefit grounds (de Fine Licht, 2014). If surrendering the ideal of transparency is not a normatively attractive option, then

the choice of an executory and/or communicative body for cost-benefit analysis becomes an interesting one from the perspective of institutional design.[1]

2 Literature Review and Hypotheses

Some have explained persuasion and framing by distinguishing between an alteration in the content of issue-relevant beliefs and an alteration in the importance of these beliefs (Nelson & Oxley, 1999). Persuasion could be conceptualized as opinion change induced by the former and framing, as opinion change that occurs as a result of the latter. But others resist this attempt to draw a definitional line between the two phenomena. This is because frames do not merely suggest how we should understand an issue but also, how we should resolve it. Since frames can "carry evaluative content", they could also produce opinion change via persuasion (Slothuus, 2008, p. 3). This essay does not take a substantive stance on the dispute because persuasion and framing are often commingled in practice. For example, presidential incumbents campaigning for reelection on the back of their economic performance "must accomplish two things: They must get across the message that their administration has done a good job on the economy, and they must convince voters that the economy should be the basis of their evaluation" (Chong & Druckman, Framing Theory, 2007, p. 116). Similarly, a cost-benefit argument reaches its audience through two channels. It introduces considerations that may not have been known or salient to the listener while simultaneously offering, and recommending, a consequentialist formula for public decision-making.

Conventional wisdom has it that elites exercise great influence over the policy attitudes of the citizenry who rely on heuristics to figure out how they should stand on an issue.[2] Such influence, however, has its limits. Sources that are viewed as credible are more efficacious at persuading (See e.g. Petty, 1994; Petty & Wegener, 1998) and at framing (Druckman, 2001). Yet efforts to persuade or frame may themselves affect the audience's perceptions of the source's credibility (Lachapelle, Montpetit, & Gauvin, 2014). As applied to political institutions in the United States, a growing body of experimental, and observational, evidence demonstrates that the United States Supreme Court can, by virtue of the high regard that it is held in by the public, bolster agreement for the policies that it endorses (Hoekstra, 1995; Clawson, Kegler, & Waltenburg, 2001; Bartels & Mutz, 2009; Linos & Twist, 2016).[3] At the same time, the high

[1] For example, Stiglitz (2017) contends that trust, not expertise, is the reason why legislators find it in their interest to delegate rulemaking authority to legislative agencies.
[2] For a strong statement of this proposition, see Zaller (1992, p. 45) (arguing that citizens "react mechanically to political ideas on the basis of external cues about their partisan implications.")
[3] For findings to the contrary, see e.g. Baas and Thomas (1984), and Egan and Citrin (2011) (concluding that "even among the Court's strongest supporters … its power to shift mass opinion towards accepting its rulings [is] essentially nil."). In general, studies on the United States Supreme Court usually take Congress to be the main reference for comparison, although the foils

court's interventions in political debates could come at the expense of its legitimacy, particularly among those who do not share its ideological orientation (Mondak J. J., 1992; Egan & Citrin, 2011; Bartels & Johnston, 2013; Christenson & Glick, 2015).[4]

The sustained interest in the ability of the United States Supreme Court to change minds is unsurprising given the juxtaposition of its status as the authoritative interpreter of the Constitution and its institutional frailty.[5] At the same time, an analogous inquiry into the bureaucracy should not be neglected because Congress can delegate certain tasks to administrative agencies that it cannot foist onto the judiciary[6]. A study that contrasts them is therefore one of practical relevance. In addition, despite the emergence of the "cost-benefit state" (Sunstein, The Cost-Benefit State, 2002), the relative acceptability for governmental entities to reason in cost-benefit terms has not hitherto been broached. Compared to the rationales proffered in the survey experiments focusing on the United States Supreme Court, such as those grounded in "past discrimination" or "freedom of expression," (Bartels & Mutz, 2009) receptivity to the balancing of costs and benefits seems to depend not just on credibility, understood as a mélange of trust and expertise (Pornpitakpan, 2004), but also other factors such as whether the audience expects a principled stance from the source or an all-things-considered one (Cf. Tetlock, 2000).

I do not propose, at first pass, to tease out the comparative importance of each of these factors. As an initial matter, federal agencies are conceived of in administrative law (and lore) as repositories of specialized knowledge that are insulated, in varying degrees, from politics. The empirical evidence that is available also confirms the intuition that federal agencies enjoy higher levels of public approval than Congress. The worst-rated federal agency (out of seventeen) in the Pew Research Center's 2015 wave,[7] the Department of Veteran Affairs, was regarded favorably by 39% of respondents and unfavorably by 52% of respondents. The corresponding figures for Congress stood at 27% and 69% respectively.

Three hypotheses can be formulated from the preceding discussion. First, a policy that openly balances lives and financial costs is likely to encounter more resistance than one that does not explicitly announce such a trade-off. Second, federal agencies can – more so than Congress

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in Clawson, et al. (2001) were the Department of Education in one scenario and the Federal Communications Commission in the other.

[4] For a recent argument to the contrary, see Gibson and Nelson (2016).

[5] In the immortal words of Hamilton, "[t]he judiciary . . . has no influence over either the sword or the purse; no direction either of the strength or of the wealth of the society; and can take no active resolution whatever. It may truly be said to have neither FORCE nor WILL, but merely judgment; and must ultimately depend upon the aid of the executive arm even for the efficacy of its judgments."

[6] That said, Congress could move some issues into a judicial forum by being deliberating vague in its statutes. See e.g. Farhang (2010).

[7] http://www.people-press.org/2015/11/23/4-ratings-of-federal-agencies-congress-and-the-supreme-court/

(or industry groups) – move public opinion in favor of policies by simply endorsing them. Third, federal agencies are better communicators of cost-benefit reasoning than Congress (or industry groups). This could be manifested in, first, support for the policy that is being justified in cost-benefit terms and, second, the perceived credibility of body after it has appealed to cost-benefit analysis.

3 The Experimental Design

The experiment is structured around a proposal to suspend one element of the hours for service (HOS) rules for truck drivers.[8] The existing regulations require, among other things, that truck drivers who have driven more than 70 hours in a week rest for 34 consecutive hours before driving again. In addition, there is a stipulation for these 34 hours to include at least two 1 a.m. to 5 a.m. periods. The suggestion, described in a newspaper story, is to retain the former while relaxing the latter. This idea is randomly attributed to one of three entities, Congress, Federal Motor Carrier Safety Association (FMCSA), or a fictitious industry group, the National Federation of Truck Companies (NFTC). The source of the policy change is mentioned in the headline and again in several passages of the story.

The main body of the story contains, in addition to a brief description of the HOS rules and the contemplated suspension, two dominant frames. The first frame emphasizes public safety and is reinforced by a quote from the chairperson of a citizen's group. The second frame, articulated by an interviewed trucker driver, invokes the right of autonomous agents to order their own affairs. These frames are included out of concern for verisimilitude. Moreover, this design provides a more stringent test of influence as the presence of competing frames is likely to attenuate any effect that its endorsement might have on policy attitudes (Sniderman & Theriault, 2004; Chong & Druckman, Framing Theory, 2007).

Finally, the story concludes in one of two ways: a justification of the proposal by the source that relies explicitly on monetized costs and benefits or a sentence informing the reader that the paper has reached out to the source for comment. In order to reduce, as far as possible, effects that arise solely from doubts about the credibility of the numbers cited by the source, the cost-benefit analysis is described as an "independent study conducted by researchers at Amherst University."

[8] This policy issue has been selected because it can plausibly be attributed to an administrative agency that has almost no public visibility or ideological valence (the Federal Motor Carrier Safety Association), thus compelling respondents to draw on their stereotypes of a federal administrative agency. Although Clinton and Lewis (2008) and Chen and Johnson (2014) have constructed measures of bureaucratic ideology, the Federal Motor Carrier Safety Association does not appear in either list.

After reading the story, the respondent is invited to indicate, on a branching scale of 1 to 7, whether he or she supports or opposes the proposal. The respondent is then queried for his or her opinion of the source and one of the other two entities that had not been used in the story he or she read.[9] For example, if the story ascribes the proposal to Congress, the respondent would be asked for his or her opinion of Congress and either the FMCSA or the NFTC. The four questions in this block tap different dimensions of credibility. Specifically, respondents are asked whether they agree that the source "can be trusted to get the facts right," "can be trusted to tell us the facts," "is likely to take advantage of circumstances to advance its own interest," and "is likely to consider all factors in making a decision." Demographic information is also collected at the end of the survey.[10]

The survey was fielded in February 2017 to respondents recruited through Amazon's Mechanical Turk. The participants do not, therefore, constitute a random draw of the adult residents of the United States. However, such samples tend, as a general matter, to be more representative of the population (Buhrmester, Kwang, & Gosling, 2011; Berinsky, Huber, & Lenz, 2012; Kees, Berry, Burton, & Sheehan, 2017) than (other) convenience samples. Moreover, Amazon Mechanical Turk workers appear to be more attentive than college students (Hauser & Schwarz, 2016; Kees, Berry, Burton, & Sheehan, 2017),[11] and data collected from them, through the internet, appear to be no less reliable than those obtained through other traditional survey modes (Buhrmester, Kwang, & Gosling, 2011; Simons & Chabris, 2012; Ansolabehere & Schaffner, 2014). Most importantly, results obtained on Amazon's Mechanical Turk have hitherto been similar to those established in population-based settings (Paolacci, Chandler, & Ipeirotis, 2010; Goodman, Cryder, & Cheema, 2012; Berinsky, Huber, & Lenz, 2012; Weinberg, Freese, & McElhattan, 2014; Krupnikov & Levine, 2014; Mullinix, Leeper, Druckman, & Freese, 2015; Kees, Berry, Burton, & Sheehan, 2017).

4 Data Analysis

4.1 Sample

As some participants did not enter their completion codes into Amazon Mechanical Turk, a total of 1004 surveys (instead of the 1000 originally intended) were completed and returned. Since exploratory factor analysis revealed that one factor is responsible for almost all of the variation in the answers to the fours questions on credibility, predicted values generated by a unidimensional model are used throughout the essay as the measure of perceived credibility.

[9] Random selection of one of the two un-encountered sources, rather than asking respondents about both of them, mitigates survey fatigue.
[10] The survey instrument is reproduced in Appendix B.
[11] But see Goodman, et al. (2012) (finding that "MTurk participants are less likely to pay attention to experimental materials, reducing statistical power".)

4.2 Treatment Effect of Cost-Benefit Reasoning

The effect of treatment on individual *i* is defined in the Neyman-Rubin potential outcomes framework as

$$\tau_i = Y_i(1) - Y_i(0)$$

where $Y_i(1)$ is the individual *i*'s outcome under treatment and $Y_i(0)$ is individual *i*'s outcome of under control (Holland, 1986). Although $Y_i(1)$ and $Y_i(0)$ are not simultaneously observed for every *i*, random assignment to treatment justifies the assumption of exchangeability and hence, inference on, among other things, the sample average treatment effect (SATE),

$$\frac{\sum_{i=1}^{N} \tau_i}{N}.$$

Treatment in this section refers to the spokesperson's use of cost-benefit reasoning to justify a suspension of 1 a.m. to 5 a.m. early morning rest requirement. To assess covariate balance between treatment and control groups, *p*-values from the Wilcox rank sum test and the Kolmogorov-Smirnov test are computed (See Figure 1 and Table 6 in Appendix C). At first glance, randomization has succeeded in achieving balance across most of the covariates except, perhaps, education.

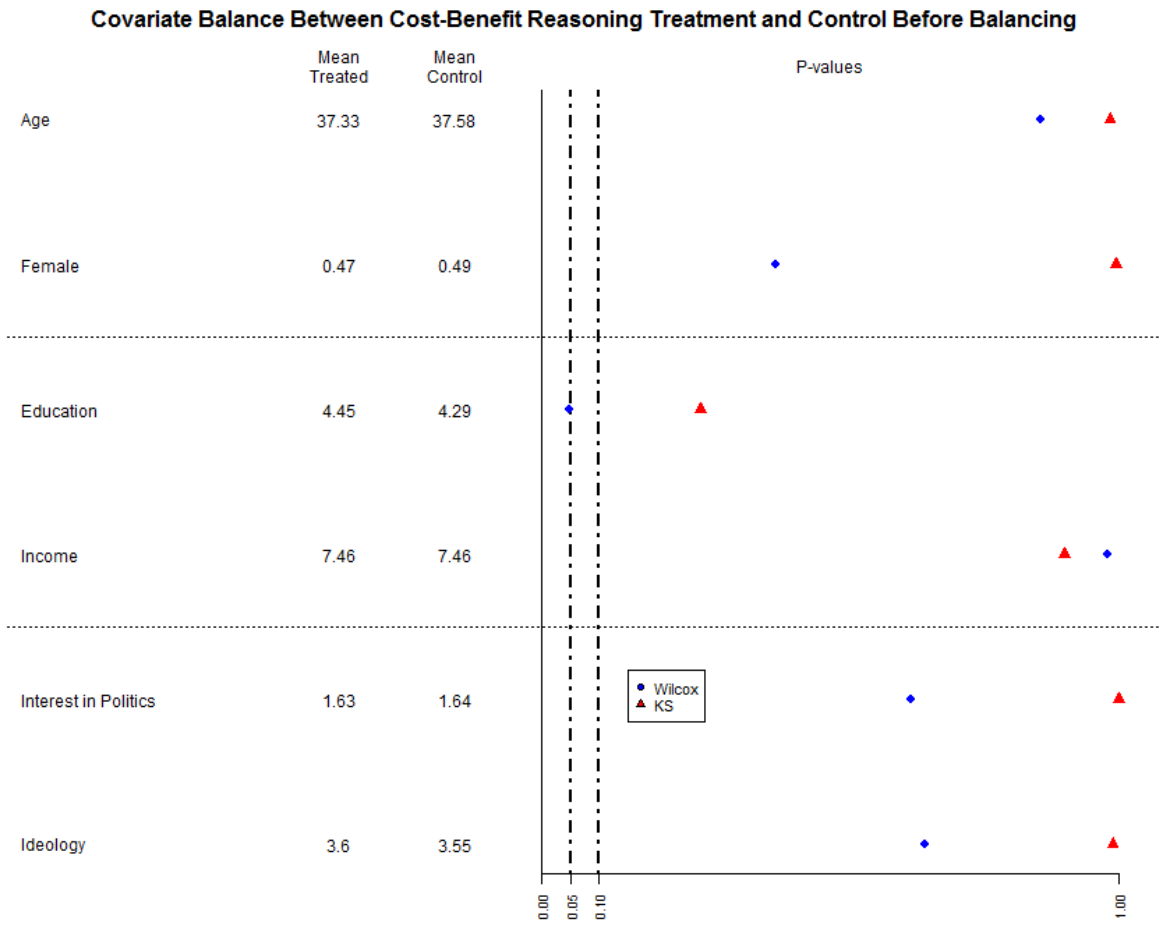

Figure 1: *p*-values from Wilcox rank sum and Kolmogorov-Smirnov (K-S) tests on the distribution of demographic variables between treatment and control groups before balancing. Further details on these variables are given in Appendix C.

The difference in means between the treatment and control groups is used as the estimator for the SATEs while the conservative Neyman estimator is used to estimate sampling variances (Imbens & Rubin, 2015).

	Outcome Variables	
	Support/Opposition to Policy Change	Perception of Source Credibility
SATE	0.1963 (0.1249)	-0.0224 (0.0609)

Table 1: SATE of cost-benefit reasoning on support/opposition to policy change and perception of source credibility.

The average effect of treatment on support/opposition to the policy change is indistinguishable from zero at conventional levels of significance (p=0.117, two-sided t-test). The analysis also indicates that conditional on making the policy recommendation, treatment has, on average, no effect on perceptions of source credibility (p=0.713, two-sided t-test).

Since the treatment group is slightly more educated than the control group, genetic matching is employed to improve covariate balance as measured by Mahalanobis distance (Diamond & Sekhon, 2013; Sekhon & Grieve, 2012).[12] Covariate balance after matching, done using an R package (Sekhon J. S., 2011), is represented in Figure 2 and in Table 6 in Appendix C.

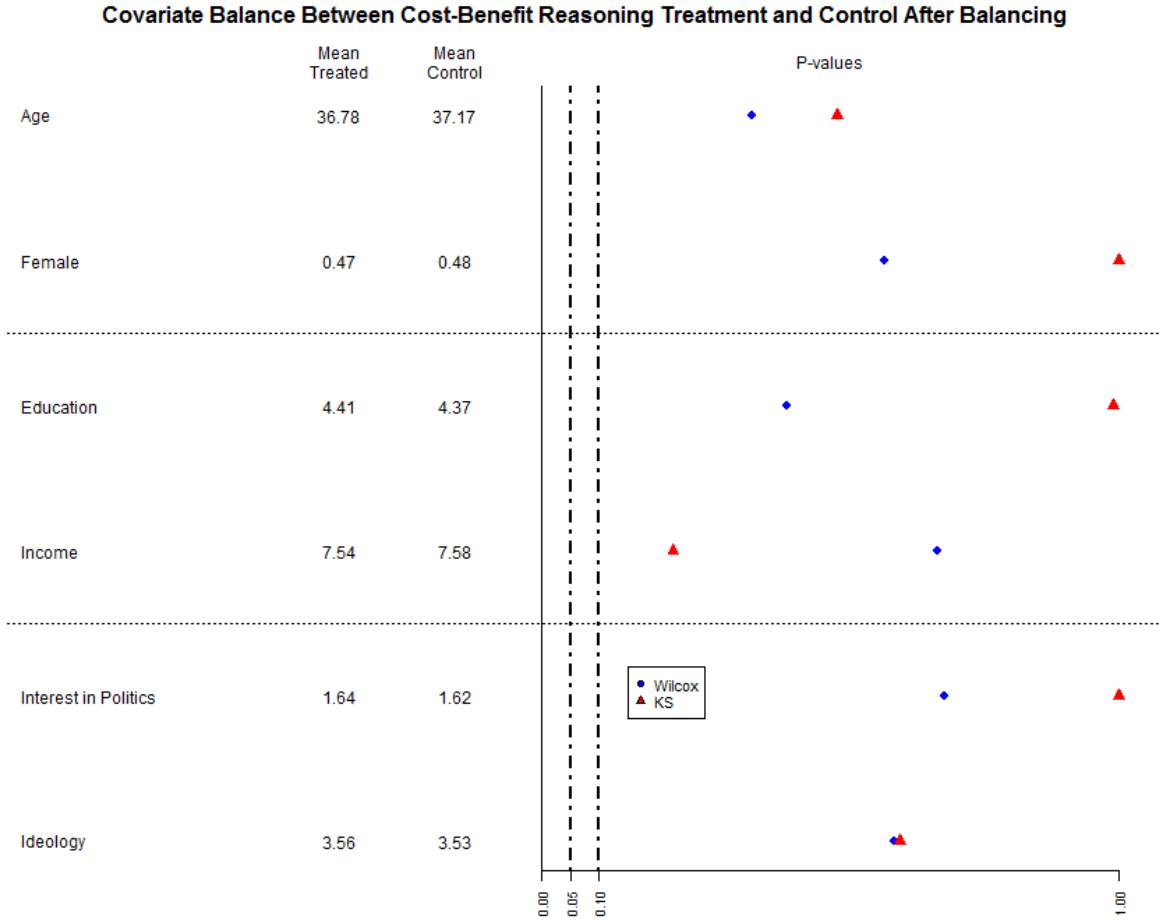

Figure 2: *p*-values from Wilcox rank sum and Kolmogorov-Smirnov (K-S) tests on the distribution of demographic variables between treatment and control groups after balancing.

Using the treatment and control groups that have been constructed through matching, one finds that treatment increased support for the policy (p=0.0146, two-sided t-test) but did not change perceptions of the source's credibility (p=0.6422, two-sided t-test).[13]

[12] All demographic variables recorded in the survey are used for matching. Specifically, age is treated as a continuous variable, education, income, interest in politics, and ideology enter as ordinal variables, while gender, race, and party identification are introduced through indicator variables.

[13] The standard errors are as calculated in Abadie and Imbens (2006) and implemented in Sekhon (2011).

Although the final conclusion therefore seems to turn on whether matching is performed, the sign and magnitude of the estimated SATE on policy attitudes are manifestly contrary to the tenor of the existing literature and should be further probed.

4.3 Treatment Effect of Source Attribution

One could also define the treatment to be the attribution of the proposal to a particular source. As a preliminary matter, respondents' impressions of Congress, the FMCSA, and the NFTC, *conditional on them not being the source of the policy at issue*, differ. Surprisingly, Congress is held in higher regard than the NFTC (p=0.0000, two-sided t test) and the FMCSA (p=0.0000, two-sided t test). Moreover, the NFTC is viewed as more credible than the FMCSA (p=0.0005, two-sided t test). This implies that the original hypothesis has to be reformulated. If the ability to persuade stems from credibility, then one should expect an endorsement by Congress to be more effective in garnering support for the policy than an endorsement by the NFTC or the FMCSA.

The disparity in respondents' perception of the credibility of these sources did not, however, translate into a detectable influence on support for or opposition to the policy change. Although casting the NFTC, rather than Congress, as the originator of the proposal did seem to have a negative effect on attitudes towards it, this difference is not statistically significant (p=0.3595, two sided t-test). The same is true if the proposal came from the FMCSA, rather than Congress. (p=0.4275, two sided t-test).

	Treatment	
	NFTC	FMCSA
SATE	-0.1198 (0.1509)	-0.1409 (0.1536)

Table 2: SATE of source on support/opposition to policy change before matching. The baseline for comparison is Congress.

While covariate balance between the groups being compared is reasonable (Tables 7 and 8 in Appendix C), the income levels of those who were assigned to the condition that has Congress as the source seem to be higher than those who were assigned to the other conditions. This minor imbalance may be remedied through the matching procedure described earlier (Tables 7 and 8 in Appendix C). Doing so does not, however, alter the qualitative conclusions reached above. (Table 3).

	Treatment	
	NFTC	FMCSA

SATE	-0.0180 (0.1734)	-0.1180 (0.1725)

Table 3: SATE of source on support/opposition to policy change after matching. The baseline for comparison is Congress.

4.4 Interactions

Finally, the cost-benefit reasoning treatment and the source treatments may interact. This possibility is tested by estimating the linear regression model

$$Y_i = \alpha + \beta_1 I_{CBA=1} + \beta_2 I_{S=A} + \beta_3 I_{S=G} + \beta_4 I_{CBA=1} \times I_{S=A} + \beta_5 I_{CBA=1} \times I_{S=G}$$

where Y_i, the dependent variable, is support or opposition to the policy change or perception of source credibility, and $I_{CBA=1}$, $I_{S=C}$, $I_{S=A}$, and $I_{S=G}$ are indicators for the presence of a cost-benefit argument and attributions to Congress, the FMCSA, and the NFTC respectively. The coefficients on the interaction terms can be interpreted as average interaction effects. For example, consider the treatment combination of $CBA = 1$ and $S = A$ relative to the baseline of $CBA = 0$ and $S = C$. Then,

$$\beta_4 = \left(\bar{Y}_{CBA=1,S=A} - \bar{Y}_{CBA=0,S=A}\right) - \left(\bar{Y}_{CBA=1,S=C} - \bar{Y}_{CBA=0,S=C}\right)$$

. The estimates for the coefficients and their Huber-White standard errors are reported in Table 4. In sum, no significant interaction effects are found, although this is probably due to an insufficiently large number of observations in each of the 3×2 cells.

Dependent Variable	Support/Opposition to Policy Change	Perception of Source Credibility
Constant	3.839***	-0.345
	(0.156)	(0.389)
CBA	0.125	0.160
	(0.211)	(0.542)
FMCSA	-0.231	-0.263
	(0.225)	(0.547)
NFTC	-0.136	-0.288
	(0.220)	(0.547)
CBA : FMCSA	0.181	0.351
	(0.307)	(0.768)
CBA : NFTC	0.034	-0.047
	(0.302)	(0.762)
N	1004	1004
R^2	0.227	0.002

$*\ p \leq 0.05 \quad **\ p \leq 0.01 \quad ***\ p \leq 0.001$

Table 4: Regression of support/opposition to policy change and perception of source credibility on both factors, and interaction. The baseline for comparison is Congress and no cost-benefit reasoning.

5 Discussion and Conclusion

As it turns out, the experiment did not adduce any confirmatory evidence for the three hypotheses articulated at the beginning. Interestingly, reasoning in cost-benefit terms (referred to as the treatment for this section) seemed to strengthen, rather than diminish, support for a policy that trades off statistical lives for cost savings. This conclusion is in stark contrast to the tenor of the existing literature and calls for further investigation.

To gain some traction on this question, I undertake an exploratory search for heterogeneous treatment effects using a support vector regression (L2 SVR) that imposes separate LASSO constraints on covariates (and all two-way interactions between them) and interactions between treatment and the covariates (and all two-way interactions between them) (Imai & Ratkovic, 2013). The model penalizes non-zero coefficients on any of the dependent variables, and the estimation algorithm therefore selects for the most predictive covariates and treatment-covariate interactions. The fruits of this inquiry, implemented by the R package FindIt, are presented in Table 5.

Selected Dependent Variable	Coefficient
Constant	3.750
Covariates	
Ideology	0.115
Education : Party, Independent	-0.096
Female	0.060
Republican	0.016
Age : Party, Other	0.013
Ideology^2	-0.011
Age : Female	0.009
Treatment	
CBA	0.198
CBA: Income : Party, Independent	-0.062

Table 5: Variables selected by a L2 SVR, the predicted outcome variable being support/opposition to the policy change. Lasso constraints are set by generalized cross validation.

As might be anticipated, respondents who leaned conservative tended to support the deregulatory measure, and this is substantively the most important factor after treatment. Also notable is the negative association between more educated independents and support for the policy. The main interest lies, however, in the interactions between treatment and covariates, and there is little to remark on in that respect, except that cost-benefit reasoning appears to be slightly less persuasive for high income independents. Overall, these results make it unlikely that the sign of the treatment effect in this experiment is due to deviations between the sample and the population, as evaluated through these covariates. They do not rule out the possibility that recruitment through

Amazon Mechanical Turk selects for unobserved characteristics that render individuals more amenable to cost-benefit arguments.

Alternatively, one could try to reconcile the experimental finding here to previously reported ones. For instance, Swedish citizens (*n*=1032) expressed greater opposition to a decision not to fund safety road dividers if they learnt that the traffic committee had taken into account *unquantified* considerations such as financial cost and the number of commuters using the road than if they had not (de Fine Licht, 2014). On the other hand, Americans respondents (undisclosed *n*) were more favorably disposed towards a recommendation to cut the budget for a clean-up program than a recommendation to maintain it if the former recited a deontic rationale while the latter cited a high VSL (Tetlock, Coping with Trade-Offs: Psychological Constraints and Political Implications, 2000, pp. 255-256). But an allusion to "all the relevant costs and benefits" had the same influence on attitudes as Kantian arguments, leading Tetlock (2000) to infer that it is the "explicit spelling-out of the trade-off," and not utilitarian logic, that is being objected to. It might hence be that *relative to the absence of an explanation for the policy decision*, a justification that explicitly trades "sacred" benefits for "secular" costs

(1) reduces support for a policy if the values at stake are described, but the magnitude of the benefits and costs are not;

(2) reduces support for a policy if the stated costs are modest;

(3) does not reduce support for a policy if the stated costs are sufficiently large.

Cultural differences may also furnish an additional reason for the discrepancy.

Further research along these lines is likely to contribute to a more nuanced understanding of the public's reactions to cost-benefit arguments, a phenomenon that has practical implications for the introduction of economic logic into the public sphere.

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Appendix A

The Partial Derivatives of θ_C in the Basic Model

Figure 5 plots θ_C as a function of p and β.

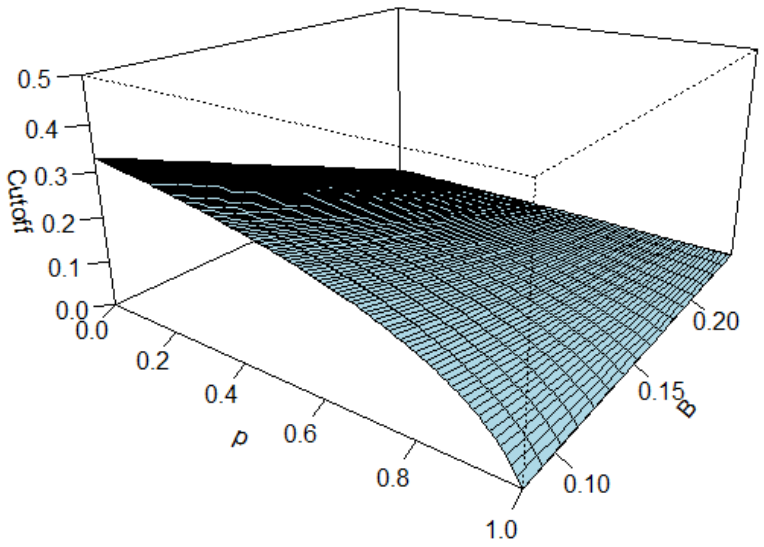

Figure 5

Selective Review in the Basic Model and Extensions: Exclusion of Other Case

Suppose that OIRA selectively reviews if $\theta \in [0, \theta_c]$ but not if $\theta \in [\theta_c, 1]$. Then $\frac{1}{6}(1-\theta_C)^3 \leq k \leq p\frac{1}{6}{\theta_c}^3$. By incentive compatibility

$$-(1-p)\left(\theta_C + \beta - \frac{\theta_c}{2}\right)^2 - p\beta^2 - z = -\left(\theta_C + \beta - \frac{1+\theta_c}{2}\right)^2$$

and since $0 < \theta_c < 1$,

$$\theta_c = \frac{-\left(p\beta - \frac{1}{2}\right) + \sqrt{\left(p\beta - \frac{1}{2}\right)^2 + p\left(\beta + z - \frac{1}{4}\right)}}{\frac{p}{2}}$$

But $\theta_c > 1$ for $\beta \in \left[\frac{1}{12}, \frac{1}{4}\right)$, $p \in (0,1)$, $k \in (0, \infty)$ and , $z \in [0, \infty)$.

Selective Review in Extension: Second Decision-Maker

The expected gain from reviewing the high interval always exceed the expected gain from reviewing the low interval. This difference is given by

$$p\left[\frac{1}{6}\left(\frac{1}{2}+2\bar{\beta}\right)^3-(1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}+2\bar{\beta}\right)\right]$$
$$-p\left[\frac{1}{6}\left(\frac{1}{2}-2\bar{\beta}\right)^3-(1-q)(\beta_2-\beta_1)^2\left(\frac{1}{2}-2\bar{\beta}\right)\right]$$

$$=p\left[\frac{1}{6}\left(3\bar{\beta}+16\bar{\beta}^3\right)-4(1-q)(\beta_2-\beta_1)^2\bar{\beta}\right]>0$$

iff

$$\frac{1}{2}+\frac{8}{3}\bar{\beta}^2-4(1-q)(\beta_2-\beta_1)^2>0$$

, true since $\beta_2-\beta_1<\frac{1}{6}$.

Appendix B

Stimulus: Congress and No Cost-Benefit Argument

Congress Ponders Revisions to Safety Regulations for Truck Drivers

WASHINGTON – The House Committee on Transportation and Infrastructure is proposing the suspension of one element of the existing hours-of-service rules for truck drivers.

The rules currently limit the average work week for truck drivers to 70 hours although it allows truck drivers who reach the maximum 70 hours of driving within a week to resume if they rest for 34 consecutive hours, including at least two nights from 1 a.m. to 5 a.m.. The suggested relaxation of the 1 a.m. to 5 a.m. requirement means that trucker drivers can hit the road again during those hours so long as they have had a 34-hour break.

According to scientists, undisturbed rest during those early morning hours is critical for alertness, and many have already come out to condemn the idea.

"This action is reckless. It spells danger not only for truck drivers, but also motorists who share our nation's roads with them," said Jill Clarke, 65, who is chair of Citizens for Safer Highways.

Photo by Thomas R. Machnitzki

The truck drivers themselves, however, have differing opinions. Bill Kallam, 62, of Richmond, Virginia supports the early morning rest requirement because it ensures that drivers are well-rested. But Alex Sims, 58, of Springfield, Illinois, said the rule should be repealed entirely.

"The law should not be able to dictate your sleeping and working hours," Sims said during a truck-stop interview along Interstate 81 after dropping off a load of yeast at a livestock-feed plant. "Only a driver knows when he's tired. And if you're tired, take a nap."

This paper has reached out to members of the House Committee for comment.

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In response to an inquiry from this paper, a member of the House Committee explained that policymaking involves difficult trade-offs between traffic safety and increased transportation costs, costs that would eventually be passed on to American consumers. An independent study conducted by researchers at Amherst University had found the early morning rest requirement to be highly disruptive, adding approximately two hundred million dollars to costs and lost wages each year while only saving an estimated eight lives annually. It is a tough call to make, the congressman said, but the committee is confident that the proposal strikes the right balance between the legitimate interests of competing stakeholders.

Stimulus: FMCSA and No Cost-Benefit Argument

FMCSA Ponders Revisions to Safety Regulations for Truck Drivers

WASHINGTON – The U.S. Department of Transportation's Federal Motor Carrier Safety Administration (FMCSA) is proposing the suspension of one element of the existing hours-of-service rules for truck drivers.

The rules currently limit the average work week for truck drivers to 70 hours although it allows truck drivers who reach the maximum 70 hours of driving within a week to resume if they rest for 34 consecutive hours, including at least two nights from 1 a.m. to 5 a.m.. The suggested relaxation of the 1 a.m. to 5 a.m. requirement means that trucker drivers can hit the road again during those hours so long as they have had a 34-hour break.

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This paper has reached out to the FMCSA for comment.

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Stimulus: NFTC and No Cost-Benefit Argument

NFTC Ponders Revisions to Safety Regulations for Truck Drivers

WASHINGTON – The National Federation of Trucking Companies (NFTC) is proposing the suspension of one element of the existing hours-of-service rules for truck drivers.

The rules currently limit the average work week for truck drivers to 70 hours although it allows truck drivers who reach the maximum 70 hours of driving within a week to resume if they rest for 34 consecutive hours, including at least two nights from 1 a.m. to 5 a.m.. The suggested relaxation of the 1 a.m. to 5 a.m. requirement means that trucker drivers can hit the road again during those hours so long as they have had a 34-hour break.

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This paper has reached out to the NFTC for comment.

Stimulus: NFTC and Cost-Benefit Argument

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Outcome Questions

Outcome1A

Do you support or oppose the proposal to suspend the 1 a.m. to 5 a.m. early morning rest requirement?

Support	Neither support nor oppose	Oppose
○	○	○

Outcome1B

To what extent do you oppose the proposal?

Slightly oppose	Moderately oppose	Strongly oppose
○	○	○

To what extent do you support the proposal?

Slightly support	Moderately support	Strongly support
○	○	○

Outcome2

How likely are you to write in to the paper to support this proposal?

Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely
○	○	○	○	○	○	○

How likely are you to write in to the paper to oppose this proposal?

Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely
○	○	○	○	○	○	○

Perception

Do you agree or disagree with the following statements about Congress?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Congress can be trusted to get the facts right.	○	○	○	○	○	○	○
Congress can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
Congress is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
Congress is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Do you agree or disagree with the following statements about the Federal Motor Carrier Safety Administration?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
FMSCA can be trusted to get the facts right.	○	○	○	○	○	○	○
FMSCA can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
FMSCA is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
FMSCA is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Do you agree or disagree with the following statements about the National Federation of Truck Companies?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
NFTC can be trusted to get the facts right.	○	○	○	○	○	○	○
NFTC can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
NFTC is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
NFTC is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Now, we are going to ask you for your opinion on an entity that is not involved in the story.

PerceptionOther

Do you agree or disagree with the following statements about Congress?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
Congress can be trusted to get the facts right.	○	○	○	○	○	○	○
Congress can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
Congress is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
Congress is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Do you agree or disagree with the following statements about the Federal Motor Carrier Safety Administration?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
FMSCA can be trusted to get the facts right.	○	○	○	○	○	○	○
FMSCA can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
FMSCA is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
FMSCA is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Do you agree or disagree with the following statements about the National Federation of Truck Companies?

	Strongly agree	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree	Strongly disagree
NFTC can be trusted to get the facts right.	○	○	○	○	○	○	○
NFTC can be trusted to tell us the facts that it has.	○	○	○	○	○	○	○
NFTC is likely to take advantage of circumstances to advance its own interest.	○	○	○	○	○	○	○
NFTC is likely to consider all relevant factors in making a decision.	○	○	○	○	○	○	○

Demographic Questions

Thank you. Finally, we will ask you some questions about yourself.

Age

What is the year of your birth? Please respond in YYYY format.

Gender

What is your gender?

- ◯ Male
- ◯ Female

Educ

What is the highest level of school you have completed or the highest degree you have received?

- ◯ Less than high school diploma
- ◯ High school graduate (high school diploma or equivalent including GED)
- ◯ Some college but no degree
- ◯ Associate degree in college (2-year)
- ◯ Bachelor's degree in college (4-year)
- ◯ Master's degree
- ◯ Doctoral degree
- ◯ Professional degree (JD, MD)

Income

Please give the best estimate of your family's income in 2015, before taxes.

- ◯ Less than $10,000
- ◯ $10,000 to $14,999
- ◯ $15,000 to $19,999
- ◯ $20,000 to $24,999
- ◯ $25,000 to $29,999
- ◯ $30,000 to $39,999
- ◯ $40,000 to $49,999
- ◯ $50,000 to $59,999
- ◯ $60,000 to $69,999
- ◯ $70,000 to $79,999
- ◯ $80,000 to $99,999
- ◯ $100,000 to $119,999
- ◯ $120,000 to $149,999
- ◯ $150,000 or more

Race

What racial or ethnic group best describes you?

- ◯ White
- ◯ Black
- ◯ Hispanic
- ◯ Asian
- ◯ Native American
- ◯ _____ Other

Interest

How interested are you in politics and current events?

Very interested	Somewhat interested	Not at all interested
◯	◯	◯

Ideology

How liberal or conservative would you consider yourself to be?

Extremely liberal	Liberal	Slightly liberal	Moderate	Slightly conservative	Conservative	Extremely conservative
◯	◯	◯	◯	◯	◯	◯

PartyA

Lastly, which political party do you most closely identify with?

- ◯ Democratic Party
- ◯ Republican Party
- ◯ Independent
- ◯ _____ Other

PartyB

Would you call yourself a strong Democrat or not a very strong Democrat?

- ◯ Strong
- ◯ Not very strong

Would you call yourself a strong Republican or not a very strong Republican?

- ◯ Strong
- ◯ Not very strong

Do you think of yourself as closer to the Democratic party, closer to the Republican party, or equally close to both parties?

- ◯ Closer to the Democratic party
- ◯ Closer to the Republican party
- ◯ Equally close to both parties

Appendix C

Coding of Ordinal Covariates

Education

1 - Less than high school diploma; 2 - High school graduate (high school diploma or equivalent including GED); 3 - Some college but no degree; 4 - Associate degree in college (2-year); 5 - Bachelor's degree in college (4-year); 6 - Master's degree; 7 - Professional degree (JD, MD); 8 Doctoral degree

Income

1 - Less than $10,000; 2 - $10,000 to $14,999; 3 - $15,000 to $19,999; 4 - $20,000 to $24,999; 5 - $25,000 to $29,999; 6 - $30,000 to $39,999; 7 - $40,000 to $49,999; 8 - $50,000 to $59,999; 9 - $60,000 to $69,999; 10 - $70,000 to $79,999; 11 - $80,000 to $99,999; 12 - $100,000 to $119,999; 13 - $120,000 to $149,999; 14 - $150,000 or more

Interest in Politics

1 – Very interested; 2 – Somewhat interested; 3 – Not at all interested

Ideology

1 – Extremely liberal; 2 – Liberal; 3 – Slightly liberal; 4 – Moderate; 5 – Slightly conservative; 6 – Conservative; 7 – Extremely Conservative

Covariate Balance Between Cost Benefit Reasoning Treatment and Control Groups

Before Matching	Mean Treated	Mean Control	Wilcox Test
Race			
White	0.7831	0.7747	0.7497
Black	0.0803	0.0672	0.4264
Hispanic	0.0424	0.0553	0.3333
Asian	0.0723	0.0810	0.6032
Native American	0.0100	0.0040	0.2470
Other	0.0120	0.0178	0.4542
Party Identification			
Democrat	0.5542	0.5395	0.6404
Republican	0.3394	0.3241	0.6082
Independent	0.0843	0.0988	0.4270
Other	0.0221	0.0375	0.1506

After Matching	Mean Treated	Mean Control	Wilcox Test
Race			
White	0.7839	0.7809	0.8721
Black	0.0727	0.0727	1.0000
Hispanic	0.0452	0.0481	0.7527
Asian	0.0766	0.0766	1.0000
Native American	0.0069	0.0069	1.0000
Other	0.0147	0.0147	1.0000
Party Identification			
Democrat	0.5511	0.5511	1.0000
Republican	0.3291	0.3291	1.0000
Independent	0.0904	0.0904	1.0000
Other	0.0295	0.0295	1.0000

Table 6: Covariate balance between cost benefit reasoning treatment and control groups before and after matching.

Covariate Balance Between FMCSA Treatment and Control (Congress)

Before Matching	Mean Treated	Mean Control	Wilcox Test	K-S Test
Age	37.3182	37.6299	0.5544	0.8095
Female	0.5091	0.4746	0.3746	
Education	4.3242	4.4746	0.2422	0.6853
Income	7.3242	7.8090	0.0591	0.2292
Interest in Politics	1.6667	1.6239	0.3595	0.9940
Ideology	3.5909	3.6627	0.5774	0.9894
Race				
White	0.7697	0.7881	0.5688	
Black	0.0848	0.0746	0.6271	
Hispanic	0.0485	0.0388	0.5418	
Asian	0.0758	0.0687	0.7240	
Native American	0.0091	0.0060	0.6426	
Other	0.0121	0.0239	0.2554	
Party Identification				
Democrat	0.5697	0.5343	0.3596	
Republican	0.3061	0.3313	0.4847	
Independent	0.1000	0.0985	0.9490	
Other	0.0242	0.0358	0.3828	

After Matching	Mean Treated	Mean Control	Wilcox Test	K-S Test
Age	36.8891	37.4018	0.3593	0.2563
Female	0.4873	0.4948	0.7844	
Education	4.4033	4.4528	0.7274	0.9819
Income	7.5457	7.6327	0.6126	0.8227
Interest in Politics	1.6462	1.6297	0.6848	1.0000
Ideology	3.5652	3.5877	0.8214	0.9683
Race				
White	0.7796	0.7811	0.9474	
Black	0.0795	0.0795	1.0000	
Hispanic	0.0435	0.0420	0.8925	
Asian	0.0720	0.0720	1.0000	
Native American	0.0075	0.0075	1.0000	
Other	0.0180	0.0180	1.0000	
Party Identification				
Democrat	0.5577	0.5577	1.0000	
Republican	0.3163	0.3148	0.9531	
Independent	0.0960	0.0975	0.9263	
Other	0.0300	0.0300	1.0000	

Table 7: Covariate balance between FMCSA treatment and control (Congress) groups before and after matching.

Covariate Balance Between NFTC Treatment and Control (Congress)

Before Matching	Mean Treated	Mean Control	Wilcox Test	K-S Test
Age	37.4159	37.6299	0.8367	0.9721
Female	0.4602	0.4746	0.7073	
Education	4.3097	4.4746	0.1014	0.5406
Income	7.2537	7.8090	0.0383	0.1505
Interest in Politics	1.6195	1.6239	0.9442	1.0000
Ideology	3.4808	3.6627	0.1848	0.7515
Race				
White	0.7788	0.7881	0.7699	
Black	0.0619	0.0746	0.5146	
Hispanic	0.0590	0.0388	0.2251	
Asian	0.0855	0.0687	0.4119	
Native American	0.0059	0.0060	0.9917	
Other	0.0088	0.0239	0.1241	
Party Identification				
Democrat	0.5369	0.5343	0.9474	
Republican	0.3569	0.3313	0.4850	
Independent	0.0767	0.0985	0.3170	
Other	0.0295	0.0358	0.6449	

After Matching	Mean Treated	Mean Control	Wilcox Test	K-S Test
Age	37.0236	37.1654	0.8715	0.7452
Female	0.4682	0.4727	0.8704	
Education	4.3959	4.4165	0.9520	1.0000
Income	7.4653	7.5908	0.4797	0.9705
Interest in Politics	1.6160	1.6086	0.7834	1.0000
Ideology	3.5288	3.6041	0.4757	0.9525
Race				
White	0.7843	0.7873	0.8947	
Black	0.0679	0.0679	1.0000	
Hispanic	0.0487	0.0458	0.7981	
Asian	0.0768	0.0768	1.0000	
Native American	0.0059	0.0059	1.0000	
Other	0.0162	0.0162	1.0000	
Party Identification				
Democrat	0.5377	0.5406	0.9133	
Republican	0.3486	0.3412	0.7751	
Independent	0.0857	0.0857	1.0000	
Other	0.0281	0.0325	0.6345	

Table 8: Covariate balance between NFTC treatment and control (Congress) groups before and after matching.