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Making Cost-Benefit a Political Tool

*Roger Meiners**

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INTRODUCTION

Cost-benefit analysis seems like a stodgy topic for those other than practitioners imbued in the technical aspects of such calculations. But in recent years, it has become an important tool to justify certain regulatory goals. Regulations are often suspected of dragging down economic activity. However, if it can be shown that careful analysis of a new policy shows greater wealth after its adoption, the regulation is easier to justify and more difficult for its opponents to dismiss. As reviewed in this Article, cost-benefit analysis is now actively employed to justify an array of costly regulations. Achieving this requires the adoption of assumptions that are dubious on economic grounds. The parties who developed the analysis being employed are not engaged in subterfuge; the entire process is above board. Rather, this Article argues that the process itself is deeply flawed.

This Article examines the cost-benefit analysis process as now generally employed, with a focus on environmental regulations. The Article begins with a nuts-and-bolts overview showing that cost-benefit analysis requires careful work and transparency in assumptions made so that the analysis can stand up to critical review. Then, the Article looks at how the process has been modified in the recent years to take into account values not traditionally employed, particularly by assigning a value to prevent CO₂ emissions. Finally, the Article argues that the result of the modification of the traditional analysis has given agencies the ability to set the benefits such that any rule involving reduced energy use can be easily justified, thereby making the exercise nearly meaningless. Goals that have political and social values are given a gloss of scientific legitimacy by asserting the legitimacy of contrived numbers in cost-benefit analysis.

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I. BACKGROUND

A. Executive Orders Requiring Cost-Benefit

Presidents have imposed cost-benefit analysis requirements on federal agencies for decades. For instance, President Ford required agencies to produce “inflation impact statements” for proposed major rules.¹ Similarly, President Carter ordered agencies to prepare analyses of the cost-effectiveness of alternative approaches for major rules.² However, the current framework generally traces to President Reagan who required agencies, except for independent regulatory agencies, to produce studies when benefits exceeded costs and perform these studies for all rules likely to result in an impact on the economy greater than \$100 million per year.³

In 1993, President Clinton revoked Reagan’s order, but imposed a replacement requiring quantification of costs and benefits and consideration of qualitative measures.⁴ Again, rules imposing a cost of \$100 million a year or more were subject to the requirement, as well as certain other situations, particularly where conflicts between agencies were created by new rules or where “novel legal or policy issues” arose from a mandate.⁵ For significant regulatory actions, agencies must provide the Office of Information and Regulatory Affairs (OIRA), within the Office of Management and Budget (OMB), an “assessment of the potential costs and benefits of the regulatory action.”⁶

To assist in applying the new requirement, in 1996 OIRA issued, via an interagency group, a document outlining “best practices” when preparing analyses.⁷ This document was replaced in 2003 by OMB Circular A-4 in the Bush Administration, which similarly instructed agencies on the analysis expected by OIRA under Executive Order 12866.⁸ To comply with Circular A-4, agencies must explain the problem the regulations are to address, the actions being taken, alternatives considered, and evaluations of

1. See Exec. Order No. 11,821, § 1, 39 Fed. Reg. 41,501, 41,501 (Nov. 29, 1974).

2. See Exec. Order No. 12,044, § 3, 43 Fed. Reg. 12,661, 12,663 (Mar. 24, 1978).

3. See Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (Feb. 19, 1981).

4. Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).

5. *Id.* at 51,738.

6. *Id.* at 51,741.

7. OFFICE OF MGMT. & BUDGET, ECONOMIC ANALYSIS OF FEDERAL REGULATIONS UNDER EXECUTIVE ORDER 12866 (1996).

8. OFFICE OF MGMT. & BUDGET, OFFICE OF INFORMATION AND REGULATORY AFFAIRS, OMB CIRCULAR A-4, (2003).

quantitative and qualitative costs and benefits.⁹ Finally, under the Obama administration in 2010, the OMB refined Circular A-4.¹⁰ In 2011, President Obama issued Executive Order 13563,¹¹ which is similar to earlier orders because it instructs regulators to propose and adopt rules upon a determination that the benefits justify the costs and to select approaches that maximize net benefits.¹²

B. EPA Cost-Benefit Analysis

Section 812 of the 1990 Clean Air Act Amendments (CAAA) shows the complexities involved in a cost-benefit (C-B) analysis.¹³ It requires the EPA to periodically reassess costs and benefits of the rules implemented under the Clean Air Act.¹⁴ Assessments involve a series of studies and subsequent interpretation of the results of the studies.¹⁵ The EPA is obligated to consult a review committee composed of outside experts (the Council).¹⁶ To date, the EPA has released three Section 812 reports that provide insights into the steps the EPA employs in C-B analysis preparation.¹⁷

The first report, *The Benefits and Costs of the Clean Air Act: 1970 to 1990*, commonly known as the Retrospective Study, was completed in 1997.¹⁸ The study evaluated costs and benefits of the

9. *Id.*

10. This included, in 2010, a checklist for regulatory impact analysis. OFFICE OF MGMT. & BUDGET, AGENCY CHECKLIST: REGULATORY IMPACT ANALYSIS (2010), available at http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/RIA_Checklist.pdf, archived at <http://perma.cc/G8JR-XDL6>.

11. Exec. Order 13,563, 76 Fed. Reg. 3,821 (Jan. 21, 2011). See also Exec. Order 13,579, 76 Fed. Reg. 41,587 (July 14, 2011) (supplementing Exec. Order 13,563 and encouraging independent agencies to use similar methodology). Various statutes have been enacted over time that come into play. See, e.g., National Environmental Policy Act of 1969, Pub. L. No. 91-190, 83 Stat. 852 (1970) (codified as amended at 42 U.S.C. §§ 4321–47) (imposing environmental impact studies on all major federal actions that impact the human environment and applying to independent regulatory agencies, unlike EO 13563).

12. Compare 76 Fed. Reg. at 3,821 with 76 Fed. Reg. at 41,587.

13. *Benefits and Costs of the Clean Air Act*, ENVTL. PROT. AGENCY, <http://www.epa.gov/air/sect812/>, archived at <http://perma.cc/SZ6R-2EY2> (last updated Aug. 15, 2013).

14. *Id.*

15. *Id.*

16. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT FROM 1990 TO 2020 1-14 (2011) [hereinafter BENEFITS AND COSTS 1990 TO 2020], available at http://www.epa.gov/air/sect812/feb11/fullreport_rev_a.pdf, archived at <http://perma.cc/6RTD-3JCH>.

17. *Benefits and Costs of the Clean Air Act*, supra note 13.

18. ENVTL. PROT. AGENCY, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT, 1970 TO 1990 (1997).

regulatory requirements of the 1970 Act and subsequent 1977 Amendments up to the 1990 CAAA. The report concluded that, from 1970 to 1990, the benefits of the Clean Air Act exceeded the costs by a factor ranging from 10 to 100.¹⁹ The second report, *The Benefits and Costs of the Clean Air Act: 1990 to 2010*, commonly referred to as the First Prospective Study, was published in 1999.²⁰ It estimated costs and benefits of the implementation of the 1990 CAAA through 2010 and concluded that the benefits of the Amendments exceeded costs by a factor of four.²¹ The third report, *The Benefits and Costs of the Clean Air Act from 1990 to 2020*, also known as the Second Prospective Study, was finalized in April 2011.²² In this report, the benefits of the 1990 CAAA were estimated to exceed the costs by a factor of more than 30 to 1.²³ The report also provides an overview of the timeline of the studies and the general impact on emissions, actual or presumed, under the statutes, compared to the level of emissions that would have existed in the absence of the regulatory regime.²⁴

Over the years, the EPA developed regulatory impact analyses (RIAs) to evaluate potential social costs and benefits of proposals to individual regulation, including costs and benefits that traditionally cannot be quantified and expressed in monetary terms.²⁵ The Second Prospective Study, which assesses health,

19. Benefits over the 20-year period were estimated to be between \$6 and \$50 trillion; the costs were \$523 billion. *Retrospective Study - Study Design and Summary of Results*, ENVTL. PROT. AGENCY, <http://www.epa.gov/cleanairact/benefits/design.html>, archived at <http://perma.cc/P675-TSRC> (last updated Aug. 15, 2014).

20. ENVTL. PROT. AGENCY, BENEFITS AND COSTS 1990 TO 2010 (1999), available at <http://www.epa.gov/air/sect812/1990-2010/chap1130.pdf>, archived at <http://perma.cc/7XDR-EYWK>.

21. *Id.* at iii. Benefits were estimated to be \$110 billion; costs about \$27 billion.

22. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16.

23. Later in the paper we discuss the generation of this amazing increase in benefits.

24. See BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 1-3, Figure 1-1, Clean Air Act Section 812 Scenarios: Conceptual Schematic, (The “with-CAAA” scenario tracks compliance with 1990 CAAA rules through September 2005. The “without-CAAA” scenario freezes emissions controls at the 1990 levels, allowing for changes in population and economic activity.). See also James H. Wilson et al., *Emission Projections for the Clean Air Act Second Section 812 Prospective Analysis*, 58 J. AIR & WASTE MGMT. ASSOC. 657, 663 (2008).

25. See, e.g., ENVTL. PROT. AGENCY, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED CARBON POLLUTION GUIDELINES FOR EXISTING POWER PLANTS AND EMISSION STANDARDS FOR MODIFIED AND RECONSTRUCTED POWER PLANTS 1-3 (2014), available at <http://www.epa.gov/ttn/ecas/regdata/RIAs/111dproposalRIAFinal0602.pdf>, archived at <http://perma.cc/MRC9-KGSQ>.

welfare, ecological, and economic benefits resulting from the 1990 CAAA programs alone, represents a broader C-B analytical framework.²⁶ Rather than review all three analyses, this Article focuses only on the Second Prospective Study's analysis to give an overview of the C-B process. Possible shortcomings will be noted during the discussion of the analysis, but it is used to illustrate a carefully constructed work.

II. C-B ANALYSIS IN THE SECOND PROSPECTIVE STUDY

The Second Prospective Study created two scenarios: one with Clean Air Act Amendments (with-CAAA) and one without Clean Air Act Amendments (without-CAAA).²⁷ The baseline scenario is with-CAAA, which assumes all federal, state, and local air pollution controls are fully implemented.²⁸ This baseline scenario is subsequently juxtaposed against the counterfactual without-CAAA scenario, in which air pollutant standards remain at 1990 levels.²⁹ Oddly, in its reliance on the population estimates provided by the Census Bureau,³⁰ the analysis assumes identical geographic population and economic activity distributions for both scenarios.³¹ A review of the steps needed to complete the C-B analysis in the Second Prospective Study are summarized in Figure 1-2 of the report.³²

A. Modeling Air Pollutant Emissions

The first step in the analytical sequence is to model emissions of the major air pollutants.³³ This model tracks the changes in the

26. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 1-5.

27. *Id.* at 1-6.

28. *Id.*

29. *See id.*

30. *Id.* at 1-7.

31. It is dubious to assume that some health-concerned residents would not leave the areas with continuously declining air quality; hence, to assume that economic activity in most polluted areas would remain constant is doubtful. Professor Revesz helped put to bed the notion that jurisdictions might fall into a race to the environmental bottom in an effort to attract industry. *See generally* Richard Revesz, *Rehabilitating Interstate Competition: Rethinking the 'Race to the Bottom' Rationale for Federal Environmental Regulations*, 67 N.Y.U. L. REV. 1210 (1992). Nevertheless, for analysts to assume some migration from more polluted areas would be a major undertaking that could also be criticized.

32. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 1-8, Figure 1-2, Analytic Sequence For The Second Prospective Analysis.

33. *Id.* at 2-1. Emissions analysis is focused on six major pollutants regulated by the 1990 CAAA: volatile organic compounds (VOCs), nitrogen

level of emissions over time in both with-CAAA and without-CAAA scenarios.³⁴ A three-step model was deemed suitable for all major source categories, except electricity-generating units (EGUs):

1. Construction of emissions inventory to serve as a base for the projections;
2. Projection of emissions for the without-CAAA scenario for three target years (2000, 2010, 2020); and
3. Construction of the with-CAAA estimates for the same three target years under the same set of economic activity projections.³⁵

Emissions for EGUs were estimated with the help of the Integrated Planning Model³⁶ via special optimization procedure.³⁷

Both scenarios, with-CAAA and without-CAAA, have distinct base years.³⁸ The year 1990 was selected as the base year for the without-CAAA scenario, based on the logic that this scenario should effectively restrict pollution controls to the 1990 level.³⁹ On the other hand, given that the with-CAAA scenario was designed to estimate the impact of compliance with the CAAA over time, the base year should allow for tracking of emissions since 1990 and take into account decisions made to comply with the CAAA; hence, the year 2000 was selected.⁴⁰

In modeling the air pollutant emissions, a general approach was adopted. Emission factors⁴¹ were multiplied by the level of the

oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM₁₀) and fine particulate matter (PM_{2.5}).

34. *Id.* at 2-2. Projections were made for five major source categories: electricity generating units (EGUs), non-EGU industrial sources, on-road motor vehicles, other non-on-road engines/vehicles, and the last, smallest category, of area sources.

35. This part assumes regulatory stringency and timing consistent with EPA's CAAA implementation plan as of late 2005. *Id.* at 1-7.

36. *Id.* at 2-3 (the process was developed by ICF Consulting for EPA).

37. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 2-3. This procedure takes into consideration additional factors such as costs of electricity generation, costs of pollution controls, external projections of electricity demand, and pollution control methods.

38. *Id.* at 2-3.

39. *Id.* at 2-3.

40. It was less problematic to apply two distinct base years instead of basing projections on recent emissions and subsequently trying to simulate effects of removing CAAA emission controls in place. *Id.*

41. Derived from base year emissions estimates.

activity⁴² generating emissions. A major challenge that required much deeper consideration was the projection of economic growth,⁴³ which entered the model in three instances:

1. Forecast of electricity demand;
 2. Forecast of fuel consumption for non-utility sectors; and
 3. Projections of economic growth serving as activity drivers.⁴⁴
- To model economic growth⁴⁵ in both scenarios, an approach⁴⁶ was adopted that took into account energy demand, fuel price projections, and other factors for each of the five source categories required by the CAAA.⁴⁷

B. Estimation of Costs

Compliance with the CAAA is expensive. The cost affects all levels of the economy, including industrial production, research and development, and capital investments.⁴⁸ Also, there are costs associated with forfeited productivity, employment, and consumption, which arise from devoting resources to comply with the regulations. Nevertheless, the main focus of the Second Prospective Study is to estimate direct (annual) compliance costs, which can be attributed specifically to the 1990 CAAA.⁴⁹ Cost analysis in the Second Prospective Study is driven by the results of the emission-reduction analysis, in which the authors modeled the

42. Emission generating activities vary by source category and generally are related to economic activity (e.g., transportation, energy consumption, industrial output, and others). THE BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 2-5.

43. *Id.* at 2-5. See *Annual Energy Review 2005*, DEP'T OF ENERGY 9 (July 27, 2006), <http://www.eia.gov/totalenergy/data/annual/archive/038405.pdf>, archived at <http://perma.cc/8HQJ-DZC9>. That data provided the basis for growth projections used by EPA.

44. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16 at 2-5.

45. *Id.* The *Annual Energy Review* applied in the analysis predates the 2008 economic downturn, so it is likely that emission estimates were innocently overstated in both scenarios.

46. For the purpose of implementing this integrated approach, a selection was made to apply the Department of Energy National Energy Modeling System (NEMS), typically used to produce the DOE's *Annual Energy Review* projections. See *The National Energy Modeling System: An Overview*, DEP'T OF ENERGY <http://www.eia.gov/oiaf/aeo/overview/index.html>, archived at <http://perma.cc/8GKN-VTBM> (last visited Oct. 3, 2014).

47. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16. Table 2-4, Base Year Emission Data Sources For The With- And Without-CAAA Scenarios (presenting a full list of CAAA programs modeled for each source category).

48. *Id.* at 3-1. A five percent discount rate was applied to annualize costs of capital expenditure over the estimated life of equipment necessary to reduce emissions. *Id.* at 3-6.

49. *Id.* at 3-2.

CAAA compliance costs for the three target years by comparing respective costs of air pollution reductions in both scenarios.⁵⁰

The Second Prospective Study identifies two cost-estimating methods:⁵¹

1. Cost Estimates Based on Unit Costs,⁵²
2. Cost Estimates Based on Optimization.⁵³

In addition to the general cost estimation methods, the EPA Project Team took into consideration supplementary cost-saving factors such as “learning by doing.”⁵⁴ Hence, when deemed plausible, the analysts applied additional cost-saving adjustments based on previous empirical evidence.⁵⁵ Finally, all cost estimates in the Second Prospective Study are expressed as the total annualized costs, meaning these costs include all of the costs of operation, maintenance, and, if applicable, capital investments.⁵⁶

C. Air Quality Modeling

Air quality modeling links changes in emissions to changes in the atmospheric concentrations of the pollutants. The focus is on what is achieved in both scenarios by estimating impact emissions on ambient concentrations of ozone, Particulate Matter, PM₁₀ and PM_{2.5}, acid deposition, and visibility for each of the target years.⁵⁷

To simulate physical and chemical processes governing the formation, transport, and deposition of gaseous and particulate species, EPA analysts relied on the Community Multi-scale Air

50. *Id.* Except for few instances in which direct costs are derived concurrently with pollutant emission reductions. *Id.* at 3-3.

51. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 3-1. *See also id.* at Table 3-1 at 3-5 (summarizing cost estimation methods applied to each source category and organized by major rules within each category).

52. *Id.* at 3-3. This method estimates costs by collecting information on the costs associated with specific control measures required by CAAA regulations.

53. *Id.* In this approach costs were estimated concurrently with emissions through a cost-minimizing algorithm with specified emissions’ reduction targets. In this approach, costs were estimated concurrently with emissions through a cost-minimizing algorithm with specified emissions’ reduction targets.

54. *Id.* at 3-4. Literature suggests that cost per unit of production, when using a given technology, declines as experience with that technology increases over time. *See* Dennis Epple et al., *Organizational Learning Curves: A Method for Investigating Intra-plant Transfer of Knowledge Acquired Through Learning by Doing*, 2 *ORG. SCI.* 58, 58–59 (1991).

55. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 3-6. The Council recommended applying a default-learning rate of five to ten percent to sectors for which no empirical data are available. *Id.* at n.22.

56. *Id.* at 3-6.

57. *Id.* at 4-2.

Quality (CMAQ) model.⁵⁸ This model allows for the determination of the magnitude, temporal variation, and spatial distribution of the ozone and particulate concentrations in the atmosphere, along with the timing and distributions to the earth's surface.⁵⁹ The CMAQ model is critical to the Prospective Study because the outputs derived from the CMAQ Model form the foundation upon which ecological and health benefits are calculated.⁶⁰

D. Economic Valuation of Human Health

In terms of the health-benefits analysis, the EPA's standard practice is to calibrate CMAQ results and not use them directly.⁶¹ Development and application of the calibration factors is done either with the use of the Modeled Attainment Test Software (MATS)⁶² or by applying an inverse distance squared weighting procedure called Enhanced Voronoi Neighbor Averaging (EVNA).⁶³

In the next step of the analytical sequence, the Second Prospective Study applies various models to estimate the expected reduction in the rates of adverse health occurrences that serve as a

58. *Id.* Emissions data are processed as input to the CMAQ using the Sparse-Matrix Operator Kernel Emissions (SMOKE) processing system. See Marc R. Houyoux et al., *EPA's New Emissions Modeling Framework*, ENVTL. PROT. AGENCY, <http://www.epa.gov/ttnchie1/conference/ei14/session11/houyoux.pdf> archived at <http://perma.cc/NN2R-KRQY> (last visited Oct. 3, 2014). For a more recent overview, see *EPA, Research in Action: Community Multi-scale Air Quality Model (CMAQ)*, ENVTL. PROT. AGENCY, <http://www.epa.gov/AMD/Research/RIA/cmaq.html>, archived at <http://perma.cc/H3J3-UPRL> (last updated June 30, 2014).

59. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 4-5.

60. *Id.* at 4-3. The CMAQ model was applied to produce twenty-one simulations with pollutants of interest including ozone and fine particulate matter (PM_{2.5}).

61. *Id.* This process is called "monitor and model relative adjustment," which is a calibration procedure sometimes applied to correct for inconsistencies in the CMAQ output. Here, the adjustment was applied to correct for inaccuracies in fine particulate matter emission estimates. *Id.* at 4-7.

62. See Abt Associates, *Modeled Attainment Test Software User's Manual* (June 2010), http://www.epa.gov/scram001/guidance/guide/MATS-2-3-1_manual.pdf, archived at <http://perma.cc/CLL6-CRQW>. To see the effect of the MATS procedure, see BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 4-9 to 4-10, Tables 4-3 and 4-4.

63. *Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-hour Ozone NAAQS*, ENVTL. PROT. AGENCY 20 (Oct. 2005), <http://purl.access.gpo.gov/GPO/LPS67873>, archived at <http://perma.cc/BB5C-WQT8>.

base for deriving the economic impact on health.⁶⁴ The Second Prospective Study focuses primarily on health benefits⁶⁵ attributed to the improved air quality.⁶⁶ The valuation analysis is comprised of a sequence of linked analytical models⁶⁷ designed to estimate health benefits. It involves three key steps:

1. Estimating exposure of individuals to air pollutants,⁶⁸
2. Estimating human response to exposure; and
3. Valuing avoided human health risk.⁶⁹

A central tool of the health-benefits analysis is the Environmental Benefits Mapping and Analysis Program (BenMAP), developed and maintained by the EPA's Office of Air and Radiation.⁷⁰ BenMAP accepts a range of air quality inputs and is widely regarded as a tool capable of performing a quality exposure analysis.⁷¹ The inputs loaded to BenMAP include:⁷²

1. Forecast changes in air quality from the without-CAAA to the with-CAAA scenarios for all three target years 2000, 2010, and 2020;

64. The analysis applies nationally representative age-specific incidence rates obtained from CDC and National Center for Health Statistics and American Lung Association. *THE BENEFITS AND COSTS 1990 TO 2020*, *supra* note 16, at 5-5.

65. *Id.* at 5-1. Health benefits are typically expressed as avoided cases of air pollution related health effects, such as premature mortality, heart disease and respiratory illness.

66. *Id.* at 5-6. Focus is on human health effects associated with reduced exposure to fine particulate matter (PM_{2.5}) and ozone, as these are the largest contributors to the overall health benefits estimates. For the summary of the Human Health Effects of ozone and PM_{2.5}. *See also id.* at Table 5-1.

67. *Id.* at 5-1. Models include forecasts of implementation activities under the 1990 CAAA, estimates of the pollutant emissions, and modeling of the air quality or both scenarios.

68. Exposure measures used in epidemiological studies used to derive human response are typically based on outdoor exposure. BenMAP (discussed immediately below) incorporates 2000 U.S. Census Bureau block-group population data to determine specific population potentially affected by ozone and PM_{2.5}.

69. Valuation is accomplished by application of estimates from the literature to characterize unit values per illness incident avoided. *BENEFITS AND COSTS 1990 TO 2020*, *supra* note 16 at 5-2.

70. *Id.* *See also BenMAP User's Manual and Appendices*, ENVTL. PROT. AGENCY (Sept. 2008), <http://www.epa.gov/air/sect812/dec09/BenMAPappendicesSept08.pdf>, archived at <http://perma.cc/KP3L-TDAD>.

71. Exposure analysis includes calibration of model results to monitor data for historical years, assessing the changes in health effects' incidence resulting from those exposures, and estimating monetized value of those avoided health effects. *BENEFITS AND COSTS 1990 TO 2020*, *supra* note 16 at 5-2.

72. *Id.* at 5-3.

2. Health impact functions that quantify the relationship between the forecasted changes in exposure and expected changes in adverse health effects;⁷³ and
3. Health valuation functions that assign a monetary value to changes in specific health effects.⁷⁴

The output from BenMAP results in central estimates, distribution of the incidence of health effects, and valuation at the national and county level for each of the three target years of analysis.⁷⁵

E. Aggregations of Results

Aggregation of the results over the entire 30-year period involved interpolating the benefit values, which would be realized in the years between the target years (2000, 2010, and 2020) by matching a trend in the emission reductions for PM precursors⁷⁶ and subsequently discounting the stream of monetized benefits to the 1990 value with a five percent discount rate.⁷⁷ Consistency in the approach applied to both scenarios (with-CAAA and without-CAAA) for all three target years allowed a direct comparison of the monetized benefits to the estimated costs in the C-B analysis.⁷⁸

73. *Id.* at 5-4. Health impact functions estimate the change in health endpoint of interest (e.g., hospital admissions) for a given change in ambient pollutant concentration. Typical function will have four components: (1) the size of potentially affected population, (2) a baseline incidence rate for health effect (obtained from a source of public health statistics such as CDC), (3) concentration-response (C-R) function (derived from epidemiological studies), and (4) estimated change in relevant pollutant concentration.

74. *Id.* at 5-16. Health valuation functions are based on assumption that a dollar required to compensate a person for exposure to an adverse effect should roughly be the same as a dollar a person is willing to pay to avoid that adverse effect.

75. *Id.* at 5-24. Estimates imply 230,000 cases of avoided deaths, which can be valued at \$1.8 trillion in 2006 dollars. For more detail related to avoided annual incidence of health effects and associated monetary valuation, *see id.* at 5-25. Table 5-6. Mean CAAA-Related Avoided Annual Incidence Of Health Effects And Associated Monetary Valuation In 2000, 2010, and 2020.

76. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 7-2. At the same time implying that a reduction in ambient PM particles is the driving force behind majority of monetized benefits.

77. *Id.* at 7-7, Table 7-3, Present Value of Monetized Benefits of the CAAA.

78. Estimates rely on particular sets of data, models and assumptions. It is likely that other models, using other sets of data and assumptions would yield different estimates of benefits and costs, but the assumptions and data used in the models here can be easily justified.

F. Uncertainty Analyses

The combination of the expected impact of the 1990 CAAA on the economy, combined with the complexity of the Second Prospective Study, requires care in addressing sources of uncertainty in the key analytic outcomes of the study.⁷⁹ With the advice of the National Research Council,⁸⁰ the Project Team developed a three-step approach to address uncertainty in its analysis:

1. Identify sources of uncertainty for each analytical step;
2. Quantify parameter and model uncertainty,⁸¹ and
3. Compare results of alternative analyses to the primary results.⁸²

To identify important sources of uncertainty, a working definition of a major uncertainty factor was developed.⁸³ To be considered major, an uncertainty factor had to meet two conditions. First, a plausible alternative assumption or approach would have to exist for this factor. Second, the factor would have to have the potential to alter the overall estimates by five percent or more.⁸⁴

Several factors could affect direct cost estimates by a significant percentage,⁸⁵ however, as the authors assert, no cost estimation uncertainty has the potential to double the current total cost estimate of \$65 billion or to reduce the cost estimate to \$0 or less,⁸⁶ constituting the required magnitude of five percent of the

79. For further discussion on the characterization of the uncertainty surrounding economic valuation, see generally *Uncertainty Analyses to Support the Second Section 812 Benefit-Cost Analysis of the Clean Air Act*, INDUS. ECON. (2010), http://www.epa.gov/cleanairactbenefits/may10/IEc_Uncertainty.pdf, archived at <http://perma.cc/P2NS-KYH3> [hereinafter, *Uncertainty Analyses*].

80. NAT'L RESEARCH COUNCIL, ESTIMATING THE PUBLIC HEALTH BENEFITS OF PROPOSED AIR POLLUTION REGULATIONS 146–48 (2002), available at http://books.nap.edu/openbook.php?record_id=10511&page=126, archived at <http://perma.cc/38NX-A5HL>.

81. Uncertainty modeling requires use of alternative assumptions and/or models to re-estimate intermediate and/or overall net benefits results.

82. See, e.g., *Uncertainty Analyses*, *supra* note 79.

83. To be considered “major,” an expected impact of uncertainty was assessed to be approximately \$100 billion to affect net benefits estimates by as much as five percent. THE BENEFITS AND COSTS 1990 TO 2020, *supra* note 16 at 11-12.

84. *Id.* at 7-12.

85. *Id.* at 7-5. A good example of uncertainty involves estimating NAAQS compliance, especially in the case when known emissions reduction measures would not be sufficient to achieve full compliance with the standard in the future.

86. *Id.* at 7-12.

net benefit estimate.⁸⁷ Conversely, there are several uncertainties with the potential to affect benefits estimates⁸⁸ that have an impact of \$100 billion or more.⁸⁹ Examination of the sources of uncertainty suggests limited ability to estimate the joint effect of these factors on the direction of potential bias for net benefits.⁹⁰ Interestingly though, 7 of 13 discussed factors listed in the analysis have an indeterminate direction of effect.⁹¹ Such a large number of factors with an indeterminate direction imply that the direction of the net effect of all factors taken together remains unclear.

III. EXPANDING C-B ANALYSIS

The steps described above indicate a carefully constructed analysis consistent with good C-B practices. As in any area of inquiry, controversy abounds and experts argue about preferred methodology.⁹² For example, putting a price on life raises ethical issues. However, in a world of limited resources, it is best that decision makers take into account alternatives to generate the best value from the resources being directed and thereby avoid costly rules that provide minimal benefit compared to more efficacious alternatives.

A. Limits of C-B Analysis

Kip Viscusi, a professor of law, economics, and management, compiled the estimated regulatory cost per life saved for assorted regulations as of 1991 and showed that the cost per life “saved” by some regulations ran into the trillions of dollars.⁹³ If the goal is efficient allocation of resources, the EPA and OSHA tend to produce the worst bang for the buck, while home and highway safety tend to be more cost-effective. Justice Breyer, prior to his

87. *Id.*

88. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 7-11. Examples of such would involve forecasting errors, especially in regard to estimating future economic and regulatory activity as well as estimating behavior under the counterfactual without-CAAA scenario.

89. *Id.* at 7-12.

90. *Id.* at 7-11, Table 7-6 Potentially Major Sources of Uncertainty for Estimating the Costs and Benefits of the CAAA.

91. *Id.*

92. To lay persons it may seem arcane, but, as discussed, a change of one assumption can greatly affect the outcome of the analysis.

93. W. Kip Viscusi, *Risk Equity*, 29 J. LEGAL STUD. 843, 857 (2000).

Supreme Court appointment, wrote about such waste in regulation citing Superfund as an example.⁹⁴

Other problems that occur in economic valuation have been explored. For example:

1. Measuring willingness to pay for safety measures is extraordinarily difficult, as the wording of the question about a risk will result in wide variations in value;⁹⁵
2. The values people are alleged to place on knowing of the existence of something, such as endangered species, are very difficult to believe to be meaningful;⁹⁶
3. Some real values have no logical price, such as “the freedoms that people enjoy” that would be restricted by regulation;⁹⁷
4. Pricing the possible impact of actions today on future generations is plausible,⁹⁸ but once discount rates are applied to events that may occur decades or centuries from now, the uncertainty about changes in technology are taken into account, and the likelihood of substantively criticized environmental models being accurate is recognized, policy actions today that cost more than a pittance are difficult to justify; and
5. Risk preferences and moral hazards are difficult to build into cost-benefit calculations.⁹⁹

94. STEPHEN BREYER, *BREAKING THE VICIOUS CIRCLE TOWARD EFFECTIVE RISK REGULATION* (Michael Aronson ed., 1993). Justice Breyer provided, among other examples, a Superfund site where \$9.3 million was spent “to protect non-existent dirt-eating children.” *Id.* at 12.

95. *See, e.g.*, DANIEL KAHNEMAN, *THINKING, FAST AND SLOW* (2011) (providing an overview of perception biases based on information presentation). *See also* RICHARD THALER, *PRECOMMITMENT AND THE VALUE OF A LIFE* 17–18 (1981) (providing an example in which the median value attached to avoiding a specific risk changed from \$800 to \$100,000 depending on how the question was phrased).

96. Donald J. Boudreaux et al., *Talk Is Cheap: The Existence Value Fallacy*, 29 ENVTL. L. 765, 768 (1999). *See also* Matthew D. Adler & Eric A. Posner, *Implementing Cost-Benefit Analysis When Preferences Are Distorted*, 29 J. LEGAL STUD. 1105, 1117 (2000).

97. Amartya Sen, *The Discipline of Cost-Benefit Analysis*, 29 J. LEGAL STUD. 931, 944 (2000).

98. John Broome, *Cost-Benefit Analysis and Population*, 29 J. LEGAL STUD. 953, 954 (2000). To illustrate this principle, the example of global warming is posed—what if we think there could be catastrophic events in 50 years for actions taken today. *Id.* at 955.

99. *See generally* Lewis A. Kornhauser, *On Justifying Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1037 (2000) (discussing and providing examples of these issues).

B. Benefits of C-B Analysis

Despite acknowledged limitations, C-B analysis is commonly employed. As Nobel laureate Gary Becker argues, it serves a productive role “against misleading information spread by self-interested political pressure groups” that lobby for economically destructive activities or for limits on actions that may have net benefits.¹⁰⁰ This Article argues that some novel calculations now included in C-B analysis threaten to make the analysis meaningless, as they are increasingly driven by political values.

Before serving as administrator of OIRA in the first Obama term, Professor Sunstein was enthusiastic about the use of C-B analysis. Agencies are too responsive to populist ideas about risk that may be disconnected from reality. Consequently, governments often make “misinformed judgments” that squander lives and money.¹⁰¹ He saw C-B analysis as a tool capable of going beyond mundane accounting of relatively straightforward, generally measurable costs and benefits to serving as a “spur to regulation.”¹⁰² Fully formed C-B analysis could help people overcome irrational fears and biases.

Next, a discussion on how C-B analysis has developed in recent years, in part under Sunstein’s guidance. Sunstein employs dubious measures of value to justify regulations that would be unjustifiable if analysts stuck with best-known measures of quantifiable costs and benefits based on market values and scientific evidence.

IV. COSTS AND BENEFITS OF ENVIRONMENTAL REGULATIONS IN THE OBAMA ADMINISTRATION

As noted earlier, under the guidance of OIRA, agencies are required to perform a C-B analysis of “economically significant” regulations, meaning those estimated by the issuing agency to have a cost equal to or greater than \$100 million.¹⁰³ In 2013, there were

100. Gary S. Becker, *A Comment on the Conference on Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1149, 1152 (2000). Judge Posner agrees that C-B analysis helps “to introduce market principles into government,” which he thinks is sensible. Richard A. Posner, *Cost-Benefit Analysis: Definition, Justification, and Comment on Conference Papers*, 29 J. LEGAL STUD. 1153, 1159 (2000).

101. Cass R. Sunstein, *Cognition and Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1059, 1063 (2000).

102. *Id.* at 1071.

103. *2013 Draft Report to Congress on the Benefits and Costs of Federal Regulations and Agency Compliance with the Unfunded Mandates Reform Act*,

224 such regulations in the pipeline, which constituted about five percent of all rules under consideration.¹⁰⁴

If the analysis shows a net benefit from a new rule, who can object? For example, in 2013, OIRA asserted that from 2002 to 2012 the average annual cost of compliance with major federal regulations was in the range of \$57 billion to \$84 billion. The benefits were many times greater, running somewhere from \$193 to \$800 billion a year.¹⁰⁵ That is, benefits were 3.4 to 14 times greater than costs.

Overall, direct business compliance costs for environmental regulations were estimated to be \$183 billion in 2008, plus another \$98 billion, which was passed on to the non-business sector.¹⁰⁶ Regulatory burdens typically fall hardest on manufacturing, utilities, mining, and transportation—all energy intensive sectors.¹⁰⁷ Firms in these industries have more than triple the compliance cost per worker than health sector workers.¹⁰⁸ When firms face significant burdens not faced by producers in other countries, they tend to shift their operations to foreign locations to reduce costs.

Next, this Article will review the effects of recent regulations on both a small industry with a single product and a large industry to illustrate how regulations directly impact the economy at different levels. Additionally, this Article will look at how associated costs are easily justified by asserting benefits to be unusually high by historical standards. The basis for the high benefits arises from the inclusion of non-market values.

OFFICE OF MGMT. & BUDGET 10 (2013) [hereinafter, *2013 Draft Report to Congress*], available at http://www.whitehouse.gov/sites/default/files/omb/inforeg/2013_cb/draft_2013_cost_benefit_report.pdf, archived at <http://perma.cc/8KR5-K774>.

104. CLYDE WAYNE CREWS, JR., *TEN THOUSAND COMMANDMENTS: AN ANNUAL SNAPSHOT OF THE FEDERAL REGULATORY STATE 3* (2013).

105. *2013 Draft Report to Congress*, *supra* note 103, at 3.

106. NICOLE V. CRAIN & W. MARK CRAIN, *THE IMPACT OF REGULATORY COSTS ON SMALL FIRMS 48* (2010). This estimate does not include the cost of compliance with state regulations, which could “add to the nation’s total regulatory compliance burden.” *Id.* at 14.

107. *Id.* at 40 (citing Michael Hazilla & Raymond Kopp, *The Social Cost of Environmental Quality Regulations: A General Equilibrium Analysis*, 98 J. POL. ECON. 858 (1990)).

108. *Id.* at 51–52.

A. Impact on a Small Industry: Cement

Cement manufacturing in the United States directly employs about 12,000 people, and sales of domestically produced cement were about \$6.6 billion in 2011.¹⁰⁹ Domestic cement use averages about 100 million metric tons per year.¹¹⁰ When demand runs high, imports fill the gap. The United States is a small player in the world market, accounting for about two percent of global production.¹¹¹ Not surprisingly, China dominates with more than half of global production, however, cement is made virtually everywhere as the inputs are common and transportation costs are substantial.

Hazardous emissions from Portland cement production are regulated under Subpart LLL of the National Emission Standards for Hazardous Air Pollutants (NESHAP), within the Clean Air Act.¹¹² Recently, the EPA issued a new maximum achievable control technology (MACT) standard to apply to all kilns in the country.¹¹³ The new “floor” standard for emissions is equal to the emission reduction already achieved “by the best performing 12 percent of the existing sources.”¹¹⁴ This standard applies to all existing facilities. New facilities would have to meet a more stringent New Source Performance Standard (NSPS), which is considered to be “the best system of emission reduction” the EPA identifies.¹¹⁵ New plants would cost an estimated \$600 million each, thereby driving up the cost of domestic production. As producers in China and other countries need not comply with costly regulations imposed on United States producers, buyers are likely to increasingly favor less costly imports.¹¹⁶

109. See U.S. GEOLOGICAL SURVEY, MINERAL COMMODITY SUMMARIES 2012 38 (2012), available at <http://minerals.usgs.gov/minerals/pubs/mcs/2012/mcs2012.pdf>, archived at <http://perma.cc/L4Q4-N5PY>.

110. See *id.* Consumption dropped between 2007 and 2011 to about 70 million tons due to the economic slowdown. See *id.*

111. *Id.* at 39.

112. Clean Air Act, 40 C.F.R. § 63.1340 (2014).

113. The new rule, as it affects cement, was proposed in 2009 and published in 2010 with various compliance dates through 2014. The industry sued to block the rule, while environmental groups demanded more. Essentially, the Court of Appeals for the District of Columbia upheld the EPA position. See generally *Portland Cement Ass’n. v. EPA*, 665 F.3d 177 (2011).

114. 42 U.S.C. § 7412(d)(3)(A) (2012).

115. 42 U.S.C. § 7411(a)(1).

116. *Market Intelligence*, PORTLAND CEMENT ASSOC. 6 (Apr. 29, 2013) (on file with author). For a general discussion of the impact of the NESHAP rule, see Bernard L. Weinstein, *Economic Impacts of Cement Industry Regulations: The Proposed Portland Cement NESHAP Rule*, SMU COX MAGUIRE ENERGY INST., (Feb. 2010), http://www.cox.smu.edu/c/document_library/get_file?p_1_id

In its C-B analysis, the EPA asserted that annualized compliance costs for existing facilities to meet MACT would be \$368 million (2005 dollars). Consequently, 8% of domestic cement industry jobs would be lost,¹¹⁷ average firm revenues would fall by 4%, domestic production would fall 8%, imports would increase by two million metric tons, some small plants would close, the price of domestic cement would rise 4%, and domestic industry net revenue would decline by 16%.¹¹⁸ The EPA estimated social costs to total \$605 million, about two-thirds of which would be borne by cement users as a result of higher prices (a loss of consumer surplus) and one-third would result from losses suffered by domestic producers (a loss of producer surplus).¹¹⁹

However, the EPA estimated that the total costs would be offset by the benefits which, when fully implemented, would total between \$4.4 and \$11 billion (at a three percent discount rate), yielding a net benefit between \$3.7 and \$11 billion.¹²⁰ The benefits would result from a decline in mortality and morbidity from a reduction in PM_{2.5} and SO₂.¹²¹ Why is there such a large range in estimated benefits? The lower and higher estimates are based on different models of health impacts. The lower bound estimate is derived from a nine-page 2002 study (the Pope study); the higher bound is derived from a five-page 2006 study (the Laden study).¹²²

=68463&folderId=229433&name=DLFE-3104.pdf, archived at <http://perma.cc/S2UA-8Q7Z>.

117. This estimate may be low, as employment fell more than 8% between 2009 and 2011 after having already fallen 20% the previous year when construction dropped in the recession. Payroll similarly declined. As construction was no longer in decline by 2011, the decline may be due to implementation of the rule. See *2011 Annual Survey of Manufactures*, U.S. CENSUS BUREAU, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ASM_2011_31GS101&prodType=table, archived at <http://perma.cc/PY6A-RSBQ>. See also *2009 Annual Survey of Manufacturers*, U.S. CENSUS BUREAU http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ASM_2009_31GS101&prodType=table, archived at <http://perma.cc/78RM-ZT5D>.

118. *Regulatory Impact Analysis: National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry, Final Report*, ENVTL PROT. AGENCY 1-1 (Apr. 2009), [hereinafter, *Regulatory Impact Analysis*], http://www.epa.gov/tneca1/regdata/RIAs/portlandcementria_4-20-09.pdf, archived at <http://perma.cc/U8PY-3RPZ>.

119. *Id.* at 3-13.

120. *Id.* at 1-2. Given the cost discussion, the final \$11 billion figure should probably be \$10 billion.

121. *Id.* at 5-1.

122. *Id.* (referring to Francine Laden et al., *Reduction in Fine Particulate Air Pollution and Mortality*, 173 AM. J. RESPIRATORY & CRITICAL CARE MED. 667 (2006) and C. Arden Pope, *Lung Cancer, Cardiopulmonary Mortality, and*

Even assuming these estimates represent the best available research, it is problematic for decisions of such magnitude to be based on hypothetical values derived from two limited studies.¹²³ Small changes in the assumptions could shift the benefits to be below the cost estimates or even greater than the higher bound benefit estimate reported.

One consequence of the more costly regulation of United States cement production is that foreign producers may gain a larger share of the United States market.¹²⁴ As in many other industries, the market share for imports rises as domestic capital costs are forced up by rules that do not apply to cement producers in China and other countries, which are happy to sell into the United States market.¹²⁵ Thus, one predictable result of the EPA's imposition of additional costs on United States producers is that United States consumers will purchase more foreign cement that has a greater negative impact on air quality than domestically produced cement.

The EPA's environmental analysis fails to include the environmental cost of moving production to China and other countries. This seems peculiar given the focus on the benefit of reduction in emissions. Cement delivered from China is estimated to produce 25% higher CO₂ emissions than for the same quantity of cement produced in the United States. A Department of Energy (DOE) report concurred that Chinese cement production produces more emissions than current production methods in the United States.¹²⁶ While, as discussed below, the cost of carbon is now routinely included in the cost of emissions, the fact that higher levels of emissions go into the atmosphere when production shifts from the United States to foreign sources was not taken into account.

Long-term Exposure to Fine Particulate Air Pollution, 287 J. AM. MED. ASS'N 1132 (2002)).

123. A choice must be made when using a number in such calculations, but choices of work not representative of existing research can substantially skew the final result one way or another. See generally SUSAN DUDLEY, *Perpetuating Puffery: An Analysis of the Composition of OMB's Reported Benefits of Regulation*, 45 BUS. ECON. 165 (2012) (former OIRA Administrator Susan Dudley critiquing assumptions being made in the Obama OIRA).

124. The EPA estimates importers will gain a net \$89 million. See *Regulatory Impact Analysis*, *supra* note 118, at 3-13.

125. For a discussion, see Weinstein, *supra* note 116.

126. For a discussion, see Ragnar Lofstedt, *EPA's Proposed NESHAP for Portland Cement: Ignoring the Risk-Risk Tradeoff* 11 (2010), https://cement.org/newsroom/Kings_College/Kings_College_Study.pdf, archived at <http://perma.cc/Z3LE-YUR8>.

In the EPA's view, as properly "proven" by the cost-benefit analysis required by Congress, the national economy has improved by as much as \$10 billion per year, despite shrinkage of the domestic industry in favor of increased imports and the loss of domestic producer and consumer surplus. Applying that value to the future cement industry, the EPA claims to have increased the real value of the industry from about \$10 billion a year to \$20 billion a year despite the loss of profits and production. National income accounting is not done by adding imputed or asserted values, such as dollars for tons of CO₂ emitted or not emitted; nevertheless, the EPA and other agencies apply a cost-benefit analysis by placing dollar values on things not measured in the economy, such as the imputed value of carbon not emitted.¹²⁷

B. Impact on a Common Product: Microwave Ovens

Many companies make microwave ovens. In 1967 the Amana Radarange sold for \$495.¹²⁸ Despite being condemned as unsafe by *Consumer Reports*, they were popular and sales grew rapidly.¹²⁹ Competition and technical improvements brought the price down, so a product once thought to be only for the relatively wealthy is now available to virtually everyone. While today small models can be bought for around \$60, this price will increase.

In 2014, the DOE issued the "Energy Conservation Program: Energy Conservation Standards for Standby Mode and Off Mode for Microwave Ovens."¹³⁰ The DOE asserts that over the 30-year life of the rule—2016 to 2045—it will produce benefits of up to \$3.38 billion (using a 3% discount rate).¹³¹ The corresponding cost to the microwave industry will be only \$96.6 million, which means the regulation will produce 35 times more economic benefits than costs.¹³²

The cost estimate is relatively straightforward. Microwave ovens will be more expensive when they are retooled to consume less power while not in use. DOE estimates manufacturers will lose about seven percent of their net industry value due to higher

127. See, e.g., Energy Conservation Program: Energy Conservation Standards for Standby Mode and Off Mode for Microwave Ovens, 78 Fed. Reg. 36,316 (June 17, 2013).

128. See *Amana Radar Range (1967)*, IDSA, <http://www.idsa.org/amana-radarange-1967>, archived at <http://perma.cc/TTS9-UP3Y>.

129. See STEVEN P. SCHNAARS, *MANAGING IMITATION STRATEGIES* 115 (1994).

130. 78 Fed. Reg. 36,316.

131. *Id.* at 36,317.

132. *Id.*

costs and lost sales (the \$96.6 million).¹³³ According to the DOE, however, that loss in industry value is swamped by the benefits. Over 30 years, microwave users will use less electricity, translating into 38.11 million metric tons less of CO₂ being emitted.¹³⁴ While other emissions will also drop, a decline in other emissions is not where DOE sees the primary value.

Herein lies the economic problem that impacts the validity of the C-B analysis. There is no price for CO₂. It is clear that CO₂ emissions occur, but whether they are a problem is subject to debate.¹³⁵ Assigning a price to a ton of CO₂ gives an economic fiction legal credibility, and thereby has major impact.¹³⁶ By assigning a “price” to tons of carbon, the C-B analysis assumes that the value of carbon not emitted is far greater than the cost of injury to an industry and consumers.

C. Impact on a Large Industry: Electricity

Coal produced half of the United States’ electricity in 2005, but now only produces about 40%.¹³⁷ This change is largely driven by the EPA’s decision to impose stringent regulations that will drive down coal use, largely in favor of natural gas.¹³⁸ Emissions are subject to tightening regulations, and the process seems largely

133. *Id.*

134. *Id.* at 36,317–18.

135. We express no opinion about the environmental impact of CO₂. The science on the matter is uncertain. For some research that points in another direction and illustrates the basic uncertainties about the matter, *see, e.g., Global Warming Caused by CFCs, Not Carbon Dioxide, Researcher Claims in Controversial Study*, SCIENCE DAILY (May 30, 2013), <http://www.sciencedaily.com/releases/2013/05/130530132443.htm>, archived at <http://perma.cc/NZ3W-KRYS>.

136. Even if one believes carbon loading in the atmosphere, which is occurring, is a serious matter, that does not address the issue that there is no price for carbon. Whether or not it should be subject to regulation is a policy and legal issue not addressed by the market or prices generated in the market.

137. The figure fell under 40% in 2012 but bounced back up in 2013, but the large drop in coal use is not likely to be reversed. *See Coal regains some electric generation market share from natural gas*, ENERGY INFO. ADMIN. (May 23, 2013), <http://www.eia.gov/todayinenergy/detail.cfm?id=11391>, archived at <http://perma.cc/9TC3-PHXU>.

138. *See, e.g., Aaron Larson, The Coal to Gas Exodus Continues*, POWER (Jan. 23, 2014) http://www.powermag.com/the-coal-to-gas-exodus-continues/?hq_e=el&hq_m=2819287&hq_l=3&hq_v=87613213e8, archived at <http://perma.cc/Y266-ZPYS>.

driven by concerns over coal's contributions to greenhouse gas emissions that may relate to climate change.¹³⁹

A recent major rule in this regard is the Utility MACT Rule, also known as the Mercury and Air Toxics Standards (MATS), which was finalized by the EPA at the end of 2011 and updated in 2013.¹⁴⁰ This rule applies mainly to plants burning coal to generate electricity (very little oil is burned to generate electricity, but the rule applies to such facilities also). Coal-fuel electric generating units must meet the new control standard by 2015.

What are the costs and benefits of the Utility MACT Rule? The EPA estimates the annual compliance cost, in 2007 dollars, to be \$9.6 billion by 2015.¹⁴¹ Using the EPA and the Energy Information Administration's (EIA) assumptions, National Economic Research Associates (NERA), a consulting firm employed by the coal industry, estimates annual compliance costs of \$10.4 billion in 2010 dollars, or about \$9.9 billion in 2007 dollars, and total compliance costs of \$94.8 billion.¹⁴² The difference in the cost estimates is relatively small, which is an indication that the EPA did quality work on that side of the equation, as it is not much contested by industry. The costs are significant, but there is little dispute about how large the costs are. To put into perspective what this \$10 billion per year rule means in practice, it will result in coal plant closings affecting 23,000 MegaWatts (MWs) of electricity production and job losses of 180,000 to 215,000 by 2015.¹⁴³

While the cost to implement the rule is about \$10 billion per year, the EPA reports that the "annual monetized benefits (in 2007\$ [sic]) [will be] between \$37 to \$90 billion using a 3%

139. Again, we are not qualified to make a pronouncement on climate change, but note the substantial skepticism about the presumed mechanism and threat posed by greenhouse gas emissions. *See, e.g.*, Justin Gillis, *What to Make of a Warming Plateau*, N.Y. TIMES, June 11, 2013, at D3; Matt Ridley, *Mind & Matter: Science Is About Evidence, Not Consensus*, WALL ST. J., July 6, 2013, at C2.

140. Reconsideration of Certain New Sources Issues, 78 Fed. Reg. 24,073 (2013).

141. ENVTL PROT. AGENCY, REGULATORY IMPACT ANALYSIS FOR THE FINAL MERCURY AND AIR TOXICS STANDARDS ES-1 (2011) [hereinafter MERCURY AND AIR TOXICS STANDARDS], available at <http://permanent.access.gpo.gov/gpo/38996/20111221MATSfinalRIA.pdf>, archived at <http://perma.cc/VLP7-Q42C>.

142. *Major EPA Regulations Affecting Coal-Fueled Electricity*, AM. COAL. FOR CLEAN COAL ELEC. 1 (Aug. 2012), <http://americaspower.org/sites/default/files/may-issues-policies/EPA-Regulations-August-2012.pdf>, archived at <http://perma.cc/6YF7-E75E>.

143. Anne E. Smith et al., *An Economic Impact Analysis of EPA's Mercury and Air Toxics Standards Rule*, NAT'L ECON. RESEARCH ASSOC. 5 (Mar. 1, 2012), http://www.nera.com/content/dam/nera/publications/archive2/PUB_MATS_Rule_0312.pdf, archived at <http://perma.cc/CT2F-J39W>.

discount rate”¹⁴⁴ The EPA asserts that the benefits are not theoretical, rather, the agency asserts that the benefits are “monetized,” meaning that they will show up in measured higher GDP. Since GDP is about \$16 trillion, the impact of this one rule is asserted to add about a half a percent of GDP.¹⁴⁵ The benefit will not go directly to the utility companies—they will incur higher costs and lower profits—but the economy at large will benefit. Outside of Ponzi schemes, one cannot find investments promising to deliver a rate of return of between 370% and 900%, year after year.

Compounding the difficulty of doing standard cost and benefit estimation is the impact of the EPA’s “environmental justice” program.¹⁴⁶ The EPA wants emission impacts estimated for various minority populations.¹⁴⁷ In 2011, the Utility MACT Rule looked at the impact of reductions in mercury emissions on Laotian fishermen and Chippewa Indians, among other racial and ethnic groups, for the year 2016.¹⁴⁸ While such group-specific studies raise the cost of analysis, they need not skew the gross value of the benefits of a particular rule, however, this is not the case with the presumption of monetization of carbon emissions.

D. Carbon Pricing and the War on Coal via Cost-Benefit Analysis

The Utility MACT Rule is only one of a number of rules in place or under development that are primarily aimed at coal-fueled utilities. Looking at seven rules implemented or under consideration by the EPA, and using the EPA and EIA’s assumptions, analysts for the coal industry estimate that over 20 years, the total implementation cost in the electricity industry will be about \$200 billion.¹⁴⁹ Depending on the specific assumptions, the estimated number of jobs lost will be between 544,000 and

144. MERCURY AND AIR TOXICS STANDARDS, *supra* note 141, at ES-1.

145. *Id.*

146. For an overview of various elements, see ENVTL. PROT. AGENCY, PLAN EJ 2014 (Sept. 2011), available at <http://www.epa.gov/compliance/ej/resources/policy/plan-ej-2014/plan-ej-2011-09.pdf>, archived at <http://perma.cc/QGT4-KHNP>.

147. For a general discussion of how such measures will become a routine part of C-B analysis, see *Draft Technical Guidance for Assessing Environmental Justice in Regulatory Analysis*, ENVTL. PROT. AGENCY (2013), [http://Yosemite.epa.gov/sab/sabproduct.nsf/0/0F7D1A0D7D15001B8525783000673AC3/\\$File/EPA-HQ-OA-2013-0320-0002\[1\].pdf](http://Yosemite.epa.gov/sab/sabproduct.nsf/0/0F7D1A0D7D15001B8525783000673AC3/$File/EPA-HQ-OA-2013-0320-0002[1].pdf), archived at <http://perma.cc/CX7F-M5DP>.

148. *Id.* at 7-48 and 7-49 respectively.

149. For a summary, see *Impacts of Seven EPA Rules*, AM. COAL. FOR CLEAN COAL ELEC. (2012), <http://www.americaspower.org/sites/default/files/NERA-3.0-Impacts-Oct26.pdf>, archived at <http://perma.cc/K57H-J829>.

887,000, and much of that will be in the upper Midwest and Mississippi valley where the use of coal-fired power plants is common.¹⁵⁰ Total loss of existing electricity facilities will be between 54,000 and 69,000 MWs—about 1.5% of total United States capacity.¹⁵¹

Some existing facilities will be decommissioned, a costly process in itself, and capital investments must be made that will result in higher operating costs for existing facilities. For example, new natural-gas-fueled facilities will be built to replace functional coal-fueled plants. Crucially, these are not capital expenditures by firms that have independently determined that the investments are worthwhile based on economic considerations of rates of return, but instead, the expenditures are forced by regulators. Capital is consumed, meaning less is available for other economic uses. The net result is continued supply of electricity at higher cost to utility operators and electricity users.

The NSPS proposed by the EPA in 2012 will likely ensure that new coal-fueled plants will not be built. The standards are intended to control CO₂ emissions from new fossil-fuel-fired power plants by forcing a preference for natural gas.¹⁵² The industry has reported that the new standards mean no new coal-fired plants can be built. At this time, the only feasible way to meet the standards is to use carbon capture technology.¹⁵³ This technology is being tested at a plant in Mississippi.¹⁵⁴ However, as often happens with new technology, there have been cost overruns and multiple problems, so it is uncertain when the technology could be cost effective or even capable of being put into practice.¹⁵⁵ In early 2014, the DOE announced the reinvigoration of a stalled carbon

150. *Id.*

151. *Id.*

152. Withdrawal of Proposed Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, 79 Fed. Reg. 1,352, 1,352–53 (Jan. 8, 2014). EPA stalled implementation, perhaps in due to pressure from unhappy members of Congress. See Justin Martino, *EPA delays finalizing New Source Performance Standard regulations*, POWER ENGR. (Apr. 15, 2013), <http://www.power-eng.com/articles/2013/04/epa-delays-finalizing-new-source-performance-standard-regulation.html>, archived at <http://perma.cc/E2YW-2BAG>.

153. The rule is expected to be finalized. See *Major EPA Regulations Affecting Coal-Fueled Electricity*, *supra* note 142, at 4–5.

154. For an ongoing review of the multi-billion dollar project, see *Kemper County IGCC Fact Sheet: Carbon Dioxide Capture and Storage Project*, CARBON CAPTURE & SEQUESTRATION TECHNOLOGIES @ MIT, <https://sequestration.mit.edu/tools/projects/kemper.html>, archived at <http://perma.cc/KX42-GMVU> (last updated Sept. 15, 2015).

155. Rebecca Smith, *Southern Co. to Take \$540 Million Charge For Kemper Plant*, WALL ST. J., Apr. 24, 2013, at B4.

capture project in Illinois.¹⁵⁶ While carbon capture technology may become cost effective, the industry literature does not indicate that this is expected any time soon.

The EPA asserts the NSPS rule will have no net economic impact because the cost advantage of natural gas means that it is likely to replace coal even without the rule. Substituting natural gas for coal is environmentally beneficial¹⁵⁷ because natural gas emits only a tiny fraction of the SO₂ and NO_x emitted by coal, and only about half the CO₂ emitted by coal, to generate the same power.¹⁵⁸ Hence, the major justification for the rule is reduction of greenhouse gas emissions. A variety of prices are attached to each ton of emissions, but the benefit of damage prevented by burning natural gas rather than coal is presumed to be about \$50 per MW hour.¹⁵⁹ However, in making this presumption the EPA failed to take the final step of estimating the value of the benefit of phasing out coal in favor of natural gas, which is the purpose of the NSPS rule. Assuming electricity use remains at about 3.75 billion MWs, and 40% of that number is generated from coal, then 1.5 billion MWs will be converted. Because the EPA calculation provides that the benefit of burning natural gas instead of coal is roughly \$50 per MW, the total value of the 1.5 billion MWs converted from coal is \$75 billion. This sum adds about a half percent to GDP and, best of all, allegedly costs nothing.

V. WE ARE THE WORLD?

Carbon cost is calculated in regulatory analysis not just for its assumed future impact on the United States, but also for its future impact on the world. Consider the DOE's energy conservation

156. See Mark Drajem, *Stalled Carbon-Capture Project Nears Construction with U.S. Aid*, BLOOMBERG BUSINESSWEEK (Jan. 16, 2014), <http://www.businessweek.com/news/2014-01-16/stalled-carbon-capture-project-nears-construction-with-u-dot-s-dot-aid>, archived at <http://perma.cc/KV3R-UTTV>.

157. AMANDA CURRY BROWN, REGULATORY IMPACT ANALYSIS FOR THE PROPOSED STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FOR NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS ES-3 (Mar. 2012), available at <http://permanent.access.gpo.gov/gpo23756/20120327proposalRIA.pdf>, archived at <http://perma.cc/JC32-T4EC>.

158. *Id.* at 5-21, Table 5-5 Illustrative Emissions Profiles, New Coal and Natural Gas-Fired Generating Units.

159. *Id.* at 5-30, Table 5-7 Pollution Damages (\$/MWh) from Illustrative New Coal Unit Relative to New Natural Gas Combined Cycle Unit. This is at a three percent discount rate and does not include possible benefits by reductions in pollutants such as mercury and arsenic, so it could be a conservative estimate.

standards for residential furnace fans.¹⁶⁰ The DOE estimates that the industry net present value (INPV) of the market for residential furnace fans is a quarter-billion dollars and “manufacturers may lose up to 21.6% of their INPV, which is approximately \$54.4 million.”¹⁶¹ In exchange, consumers will, assuming a similar discount rate, save \$11.6 billion in exchange for \$3.1 billion in higher costs at the time of installation.¹⁶² The rule meets a standard C-B test, however, the benefit is asserted to be even better. At a discount rate of seven percent, the economic value of the environmental benefit from reduced CO₂ and NO_x is asserted to be \$20.1 billion.¹⁶³ That number can be much smaller or larger depending on the discount rate chosen as well as the per-ton value placed on the emissions.

The social cost of carbon (SCC) “is an estimate of the monetized damages associated with an incremental increase in carbon emissions in a given year. It is intended to include . . . changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services.”¹⁶⁴ This measure includes both a domestic value and a global value. The global value is the one employed in C-B analyses. The residential heating fan rule discussion notes that the Department of Transportation (DOT) used a domestic SCC value of \$2 per metric ton of CO₂ and a global SCC value of \$33 per ton in the 2011 Corporate Average Fuel Economy (CAFE) rule.¹⁶⁵ What value to use depends on many assumptions, including how far out in time and what discount rate.

In its microwave oven rule, the DOE relied on an interagency agreement from 2010 in which the SCC was calculated. As the DOE notes, a ton of carbon is valued at \$15.7 in 2050 if using a 5% discount rate, at \$65 if using a 2.5% discount rate, and at \$136.2 if using a 3% discount rate, but this assumes the 95th percentile worst-case projection of climate change under assorted models from the IPCC.¹⁶⁶ The vague authority to adopt such

160. Energy Conservation Program for Consumer Products: Standards for Residential Furnace Fans, 78 Fed. Reg. 64,068 (Oct. 25, 2013).

161. *Id.* at 64,070.

162. *Id.* at 64,071. That calculation assumes a seven percent discount rate. At a three percent discount rate the cost rises to \$5.8 billion but the savings rise to \$32 billion. *See* Table 1.3.

163. *Id.* At a discount rate of three percent the benefit would be \$38 billion.

164. *Id.* at 64,106.

165. 78 Fed. Reg. at 64,107.

166. INTERAGENCY WORKING GRP. ON SOCIAL COST OF CARBON, TECHNICAL SUPPORT DOCUMENT: SOCIAL COST OF CARBON FOR REGULATORY IMPACT ANALYSIS UNDER EXECUTIVE ORDER 12866 1 (2010) [hereinafter, INTERAGENCY WORKING GRP.], *available at* <http://www.whitehouse.gov>

numbers is drawn from Executive Order 12866 of 1993, which uses the “best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.”¹⁶⁷ Hence, the IPCC estimates are drawn upon for scientific expertise. Assertions of the IPCC are then used as the basis for a panel of experts to divine a price to be assigned today to carbon emissions that may have an impact decades in the future. Climate change is asserted to be a “global externality”¹⁶⁸ so the cost of emissions should be estimated globally.¹⁶⁹ The United States contains only a tiny fraction of the world population, so the domestic value of reduced emissions is much smaller than the global value.¹⁷⁰

The SCC is the source of benefits from reduced CO₂ emissions. According to the DOE’s calculations concerning microwave ovens, this is worth as much as \$3.615 billion, and at a minimum it is worth \$255 million, which is much higher than the regulation’s cost under the most conservative assumption. However, the large number attributed to the SCC almost entirely drives this result. The benefit of a ton of CO₂ not emitted is predicted to be somewhere between \$12.6 and \$119.1 per ton, up substantially from the 2010 SCC values of only \$6.2 to \$78.4 per ton. In particular, the DOE doubled the lower bound of the estimate, which placed more regulations in the black.

The “value” of CO₂ non-emissions is based on nothing other than the imagination of bureaucrats and advocates of carbon pricing. There is no real market for such emissions. The price,

/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf, archived at <http://perma.cc/9DG8-LJKW>. In general, those who think climate change a serious threat wish to use low discount rates. The value in 100 years of \$1,000 spent today assuming a 1% discount rate is \$367; using a 7% discount rate yields less than \$1 in benefits a century from now. See Maureen Cropper, *How Should Benefits & Costs Be Discounted in an Intergenerational Context?* 183 RESOURCES 2013, <http://www.rff.org/Publications/Resources/Pages/183-Benefits-and-Costs-in-Intergenerational-Context.aspx>, archived at <http://perma.cc/T724-CGWX>.

167. Exec. Order No. 12,866, 3 C.F.R. 569 (1994).

168. INTERAGENCY WORKING GRP., *supra* note 166, at 10.

169. Recall that, curiously, there was no consideration given to the increased carbon emission from increased cement production outside of the United States for cement likely to be sold to the United States after domestic production falls due to the rule.

170. The report notes that, rather than population, one could base the distribution of benefits as a share of world GDP, in which case the United States would capture about 23% of the benefit of reduced emissions rather than 7%-10%. INTERAGENCY WORKING GRP., *supra* note 166, at 11.

whether \$12.6 or \$119.1 per ton, exists only in the minds of those “interagency process” participants who speculate about the matter. The only place a so-called “market” for carbon exists is in the European Union, where carbon emissions are traded due to regulatory fiat. The carbon price has gyrated; it was \$13 a ton in early 2013,¹⁷¹ but fell to less than half that by early 2014.¹⁷²

Asserting a definitive price for carbon as the basis for detailed federal policy-making that imposes hundred of billions in cost is akin to the Pentagon, the NSA, and Homeland Security announcing that the value to every American to be free of terrorists and foreign invasion is \$2,000 to \$20,000 per year per American, and then employing this value in determining military budget and planning. Pick your number. While Americans wish to be free of terrorist threats, it is traditionally not up to agency bureaucrats to determine the economic value of services, including national defense, which will be paid for by the private sector.

A. Social Planning through Cost-Benefit

In Executive Order 13563, Improving Regulation and Regulatory Review, President Obama instructed agencies to take into account nearly every imaginable value when doing C-B analysis. Agencies must include “values that are difficult or impossible to quantify, including equity, human dignity, fairness, and distributive impacts.”¹⁷³ This has opened the barn door to throwing in any value, real or imagined, that may be asserted by any advocacy group in the calculation of benefits from regulations.

171. The price had been higher in Europe, but has been falling as the carbon-trading program in the EU appears to be failing. See Mathew Carr, *EU Carbon Price Expectations Plunge 47% in a Year, IETA Says*, BLOOMBERG (May 28, 2013, 6:01 PM), <http://www.bloomberg.com/news/2013-05-28/eu-carbon-price-expectations-plunge-47-in-a-year-ieta-says.html>, archived at <http://perma.cc/UZU7-NDFJ>. The State of California has run some carbon auctions for limited purposes and the price is similar to that in Europe. See *Additional Auction 1 and 2 Summary Statistics*, CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/cc/capandtrade/auction/additionalauction1and2summarystatistics.pdf>, archived at <http://perma.cc/QHX9-4PXP> (last visited Oct. 13, 2014).

172. The price was 3.71 Euros in late March 2014, which was about \$5. See James Murray, *EU Carbon Price Rides the “Rollercoaster” as Emissions Fall*, BUSINESSGREEN (Apr. 2, 2014), <http://www.businessgreen.com/bg/analysis/2337543/eu-carbon-price-rides-the-rollercoaster-as-emissions-fall>, archived at <http://perma.cc/P8JT-4JTZ>.

173. Improving Regulation and Regulatory Review, Exec. Order 13563, 76 Fed. Reg. 3,821, 3,821 (Jan. 21, 2011).

Human dignity has real value but no price, and fairness and equity are elusive concepts subject to endless exploitation.¹⁷⁴

Despite the fact that these values allow for endless speculation and exploitation, Cass Sunstein celebrates their inclusion in C-B analysis.¹⁷⁵ He gives examples such as a ban on discrimination on the basis of sexual orientation, and easier bathroom access for employees in wheelchairs.¹⁷⁶ Logically, would such rules be based on fairness, human dignity, or equity? Sunstein says the former is an example of fairness and the latter is an example of dignity. For the same examples, call the former an example of dignity and the latter an example of fairness. Does it change the value of either? Philosophers may have thoughts about such matters, and such rules may strike us generally as the right thing to do, but that does not mean they have a logical part in a C-B analysis.

Similarly, Sunstein asserts that a value can be calculated for a regulation that may help reduce the likelihood of rape, and the fact of human dignity should be put into the calculation.¹⁷⁷ Do the mental exercise: what amount of money would you pay to prevent your daughter from being raped? Thugs in another room will rape her unless you pay. Most people would empty their bank accounts to prevent such a thing. These are not market transactions susceptible of being priced. Criminal laws, and to a lesser extent, tort laws, are how civilized societies deal with such matters; there are no relevant market prices. Thus, to assign prices makes all of policy a utilitarian exercise.

The war in Iraq may have cost a trillion dollars. Was it worth it? Such things are public policy decisions largely based on non-market values.¹⁷⁸ Political struggles ensue; costs and benefits can be asserted but cannot be scientifically calculated for policy matters that evolve as events proceed. Suppose Hitler had offered to sign an enforceable non-aggression treaty with the United States, so long as the United States allowed the Third Reich to continue its domination of Europe. It would not be hard to construct a C-B analysis to justify such a peace, especially if only

174. A century ago, the Federal Trade Commission was ordered to attack “unfair” business practices. The agency generally ignored that part of the statute, preferring to focus on deceptive acts, as it is easier to agree on a legally operational meaning of that term compared to the vague “unfair.”

175. See CASS R. SUNSTEIN, SIMPLER: THE FUTURE OF GOVERNMENT (2013).

176. See *id.*

177. *Id.* at 10.

178. Market *considerations* no doubt matter. Iraq may have been of special concern due to its oil, as was the case with Kuwait previously. Government instability and slaughters in Rwanda, the Congo, and other places result in little more than head shaking.

the values of residents of the United States mattered. Adding Holocaust victim values into the mix changes the calculus.

Unlike war and rape, there are other serious matters, such as starvation, that are well addressed by markets. How much would you pay not to starve or, less selfishly, not let your child starve? We address that problem through the market. Refusal to buy any food may result in voluntarily starvation, but food markets ordinarily work quite well, so the prices are relied on to help sort out the issue with little thought. Unfortunate people in barbarous countries *do* face starvation at various times, but such events are often caused by disastrous government policies that spur food shortages. Even if it is understood that bad government policies caused the food shortage, the “solution” of the moment is often to hand over food to thugs who control a country and hope for a better government.¹⁷⁹

Even if they can be recognized as noble goals, adding values such as dignity and equity into C-B analysis cannot be justified as good economics. Economists are not that smart. They cannot predict stock prices tomorrow, let alone values of fairness.¹⁸⁰ Taking C-B analysis to the level endorsed by Sunstein and increasingly employed by the Obama administration is central planning in new, more scientific-appearing clothes.¹⁸¹ Some prominent economists hail Sunstein’s declarations, which is not

179. There has been much debate about the wisdom of giving food to North Korea, which we know is a source of revenue for the dreadful regime there, but it still strikes many as the best alternative. Costs and benefits can be argued but not sensibly calculated. Even democratic regimes, such as India, can engage in food policies that provide more food for corrupt bureaucrats than for the poor who are supposed to be helped. *See, e.g.*, Raymond Zhong & Vibhuti Agarwal, *Modi’s U.S. Visit Fails to Resolve Food Subsidy Dispute*, WALL ST. J. INDIA (Oct. 2, 2014, 10:26 AM) <http://blogs.wsj.com/indiarealtime/2014/10/02/modi-u-s-visit-fails-to-resolve-food-subsidy-dispute/>, archived at <http://perma.cc/A2UK-A2XQ>.

180. Economists did not foresee the forthcoming financial collapse in 2008. Even those who gained fame from “predicting” the forthcoming problem may have simply been lucky. Ask enough experts about tomorrow and some will randomly be right. Similarly, efforts to predict inflation are similarly flawed despite the intellectual and computer firepower devoted to such efforts. *See* James H. Stock & Mark W. Watson, *Inflation Forecasting*, 12 NBER REPORTER 13 (2012).

181. Until the collapse of the Soviet Union, there were serious debates for decades about the wisdom on having central authorities control production, wages and prices. Even those who disdained the brutality of Stalinism argued that well-informed authorities, especially economists, could guide an economy to prosperity. Some argued for near-total controls, others advocated a more limited degree of central control. *See, e.g.*, Stanislaw Wellisz & Ronald Findlay, *Central Planning and the ‘Second Economy’ in Soviet-Type Systems*, 96 ECON. J. 646, 646 (1986).

surprising.¹⁸² Personal, intellectual, and financial self-interest drives members of a profession to be more highly valued and is part of the process that guides society.¹⁸³

The rule of law has traditionally been sensible about such matters. Carelessly running a red light, plowing into another car, and killing a person results in a tort suit if solvent, possible criminal charges aside. Compensatory damages will equal the value of the life taken. The damages are largely based on the expected economic value of the life lost; a smart young doctor of 30 is worth a lot more than a smart retired doctor of 85. Sums will be added in for other values, it is the best society can do. Such proceedings are rather cruelly technical as experts argue over the value of the life lost. The fact that the taking of the life was unfair does not change the matter. The family members who have suffered the loss would refuse to put a price tag on it, however, they will see a price tag assigned. Such matters can be addressed with rough justice through use of market values.

To assert that regulators should assign values to fairness and dignity is fundamentally flawed if one believes that markets work under a rule of law. Thomas Sowell summarizes this in his book *A Conflict of Visions*.¹⁸⁴ There are two fundamental tribes of thinkers.¹⁸⁵ One tribe has what Sowell calls a constrained vision that relies on limited government and markets. The other tribe has an unconstrained vision of a world in which there can be rational planning to promote human perfectibility. No doubt Sunstein belongs to the latter tribe and is genuine in his pursuit of carefully crafted regulations that account for a multiplicity of values. James M. Buchanan, a Nobel laureate in economics, viewed the power of economics and the role of economists from the other side, as the title of his autobiography, *Better than Plowing*, attests.¹⁸⁶ Economists and other analysts are no smarter than farmers; they just do not work as hard.

182. According to the quotes that appear on the book jacket.

183. Difficult issues such as hedonic values continue to undergo refinement and, no doubt, improve, the problems are rife in in such generally accepted methodology. For mention of recent work, see V. Kerry Smith, *Is Environmental Quality Worth the Cost?*, 11 NBER REPORTER 14, 14 (2011).

184. See THOMAS SOWELL, *A CONFLICT OF VISIONS: IDEOLOGICAL ORIGINS OF POLITICAL STRUGGLES* (2007).

185. In economics this is an ever-present issue that goes back many decades. Can economic planners do better than a market economy under a rule of law? See, e.g., Daniel Shapiro, *Reviving the Socialist Calculation Debate: A Defense of Hayek Against Lange*, 6 SOC. PHILOSOPHY & POLICY 139 (1989).

186. See JAMES M. BUCHANAN, *BETTER THAN PLOWING AND OTHER PERSONAL ESSAYS* (1992).

CONCLUSION

In *Simpler: The Future of Government*¹⁸⁷ Professor Sunstein reflects on his years in the Obama Administration as Administrator of the OIRA. He explains how an application of behavioral economics to regulation allows the development of more sophisticated, effective regulation, which avoids the pitfalls of brute regulations that may have good intentions but are often poorly executed.¹⁸⁸ The resulting rules can produce greater benefits at lower cost.

Some examples seem curious. He discusses the ban of Primatene Mist in 2011. It was “the only over-the-counter asthma medicine” available,¹⁸⁹ but its propellant was a CFC banned under the Montreal Protocol.¹⁹⁰ When the forthcoming ban was announced in 2008, it was presumed that a substitute propellant would be available by 2011, however, no new propellant came into existence. Thus, it had to be decided whether Primatene Mist would still be marketed despite the ban called for by the Protocol.

Sunstein explains that Food and Drug Administration (FDA) regulators had to wrestle with the tradeoff between environmental damage from the CFCs emitted by Primatene Mist and the health benefits to those who used the product.¹⁹¹ It was the only over-the-counter product and was much cheaper than alternatives requiring prescriptions.¹⁹² As some asthma sufferers did not have regular health care, access to alternatives was even more difficult and costly.¹⁹³ The FDA wrestled with these costs and benefits, it knew that banning the product would result in more hospitalizations and could result in significant costs.¹⁹⁴ Ultimately, the FDA decided not to extend the life of the product because “asthma sufferers would do better to find doctors and to use the prescription medicine that really was right for them.”¹⁹⁵ How this differs from old-style brute regulation is unclear, but Sunstein asserts that being

187. SUNSTEIN, *supra* note 175.

188. *See id.* at Ch. 2.

189. *Id.* at 154.

190. *Id.*

191. *Id.* at 155.

192. *Id.* at 155.

193. SUNSTEIN, *supra* note 175, at 155.

194. Cass R. Sunstein, *The Ozone Treaty that Banned Your Asthma Inhaler*, BLOOMBERG (Oct. 22, 2013), <http://www.bloomberg.com/news/print/2013-10-22/the-ozone-treaty-that-banned-your-asthma-inhaler.html>, archived at <http://perma.cc/RRC7-N3RY>.

195. SUNSTEIN, *supra* note 175, at 155.

more scientific about C-B analysis is “a little like a plea for sense rather than nonsense.”¹⁹⁶

The key point is that by adding a fictional “market” value for CO₂ non-emissions to the benefits of assorted environmental regulations, the total alleged benefits of the regulations are pushed to astronomical levels. As discussed previously, in 2011, the EPA published a summary of the benefits of the Clean Air Act of 1990.¹⁹⁷ By 2010, the Act was asserted to impose annual costs of about \$50 billion, but yield benefits of about \$1.3 trillion per year—a wonderful 26-1 benefit to cost ratio.¹⁹⁸ Hence, about nine percent of the GDP is attributed to one statute and its attendant regulations. Those alleged benefits do not include CO₂ reductions, which, as just discussed, drive benefits to even higher levels. If regulatory control by agencies continues to march forward using the advanced cost-benefit process that Sunstein helped enshrine at the OIRA, many claim that GDP will rise significantly. This remains to be seen, and there will be a market test of the beneficence of the latest variation of scientific central planning.

196. *Id.* at 5.

197. *See supra* Part II. A.

198. BENEFITS AND COSTS 1990 TO 2020, *supra* note 16, at 3-9.

