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The \$1.75 Trillion Lie

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THE \$1.75 TRILLION LIE

*Lisa Heinzerling**

*Frank Ackerman***

A 2010 study commissioned by the Office of Advocacy of the U.S. Small Business Administration claims that federal regulations impose annual economic costs of \$1.75 trillion. This estimate has been widely circulated, in everything from op-ed pages to Congressional testimony. But the estimate is not credible. For costs of economic regulations, the estimate reflects a calculation that rests on a misunderstanding of the definition of the relevant data, flunks an elementary question on the normal distribution, pads the analysis with several years of near-identical data, and fails to recognize the difference between correlation and causation. For costs of environmental regulation, the bulk of the estimate relies on decades-old studies of decades-old rules, suggesting that voluntary unemployment is the real culprit in today's regulatory environment. The remainder of it is filled with non-existent rules and other phantoms—as is the flawed estimate of the costs of workplace safety and health rules.

It would be bad enough if this were a private study, undertaken with private funds. Even then, the viral spread of the utterly unfounded \$1.75 trillion estimate would be worrying enough. But this is a study requested, funded, reviewed, and edited by a government agency, the Small Business Administration's Office of Advocacy. The Office of Advocacy's sponsorship and official embrace of the study—including defense of the study in testimony before Congress even after it had been severely criticized—embroils this public agency in an unwholesome blend of ineptitude and bias. The Office of Advocacy should acknowledge the study's many failings and publicly disavow it.

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INTRODUCTION

Keeping regulation at bay requires hard work. Disastrous failures of regulation lie just beneath such spectacularly bad problems as the financial breakdown,¹ the oil spill in the Gulf,² the nuclear meltdown in Japan,³ the climate crisis,⁴ and more.⁵ It takes constant vigilance to prevent a public outcry for more and better regulation. It also often takes phony numbers.

The latest and biggest phony number being circulated by the anti-regulatory crowd is the figure of \$1.75 trillion—supposedly the amount we in the United States spend every year on federal regulations.⁶ This figure has been widely cited and credulously accepted. It has been wheeled out both to try to defeat new regulatory initiatives and to scale back existing ones.⁷ It has also been deployed in the service of a legislative agenda aimed

1. See, e.g., Anthony Faiola et al., *What Went Wrong*, WASH. POST, Oct. 15, 2008, at A1.

2. See, e.g., John Wyeth Griggs, *BP Gulf of Mexico Oil Spill*, 32 ENERGY L.J. 57, 66, 79 (2011).

3. See, e.g., James Glanz & Norimitsu Onishi, *Japanese Rules for Nuclear Plants Relied on Old Science*, N.Y. TIMES, Mar. 27, 2011, at A1 (discussing underestimation of tsunami risk to nuclear reactors by Japanese regulators and industry); Daniel Kaufmann & Veronika Penciakova, *Preventing Nuclear Meltdown: Assessing Regulatory Failure in Japan and the United States*, BROOKINGS (Apr. 1, 2011), http://www.brookings.edu/opinions/2011/0401_nuclear_meltdown_kaufmann.aspx.

4. See, e.g., Lisa Heinzerling, *Health Regulation and Governance: Climate Change, Human Health, and the Post-Cautionary Principle*, 96 GEO. L.J. 445, 455-58 (2008) (discussing years of missed opportunities to act on climate change).

5. SIDNEY SHAPIRO ET AL., *SAVING LIVES, PRESERVING THE ENVIRONMENT, GROWING THE ECONOMY: THE TRUTH ABOUT REGULATION* 7-9 (2011), available at http://www.progressivereform.org/articles/RegBenefits_1109.pdf (discussing the cost of various failures to regulate).

6. NICOLE V. CRAIN & W. MARK CRAIN, *THE IMPACT OF REGULATORY COSTS ON SMALL FIRMS*, at iv (2010). The study was developed under contract number SBAHQ-08-M-0466 for the Small Business Association's (SBA) Office of Advocacy.

7. As the blog for the Center for Progressive Reform has observed, one recent congressional hearing prominently featured the \$1.75 trillion figure. Ben Somberg, *Debunked SBA Regulatory Costs Study Front and Center at House Energy & Commerce Committee*

at hamstringing the regulatory agencies responsible for these purportedly massive costs.⁸ It has even become part of the rhetoric of the race for the presidency.⁹

The number comes from a report commissioned, reviewed, edited, and, despite withering criticisms of it, defended by the Office of Advocacy of the U.S. Small Business Administration (SBA). Authored by Lafayette College economists Nicole V. Crain and W. Mark Crain, the SBA-sponsored report concludes that \$1.75 trillion is the combined annual cost of complying with economic regulations, environmental regulations, the federal tax code, occupational safety and health regulations, and homeland security regulations.¹⁰

The Crain and Crain report is, as Obama regulatory czar Cass Sunstein put it in recent congressional testimony, “deeply flawed.”¹¹ Several previous

Hearing, CPRBLOG (July 15, 2011), <http://www.progressivereform.org/CPRBlog.cfm?idBlog=2E0DC7E3-B914-9703-69CC0D539EF8EC34>; see also *The Views of the Administration on Regulatory Reform: Hearing Before the H. Comm. On the Energy and Commerce, Subcomm. On Oversight and Investigation*, 112th Cong. 3 (2011) (statement of the U.S. Chamber of Commerce by William L. Kovacs, Senior Vice President, Environment, Technology and Regulatory Affairs); Thomas M. Arnold & Jerry L. Stevens, *Mixed Agendas and Government Regulation of Business: Can We Clean Up The Mess?*, 45 U. RICH. L. REV. 1059, 1073 (2011); James L. Gattuso et al., *Red Tape Rising: Obama's Torrent of New Regulation*, HERITAGE FOUND. BACKGROUNDER, Oct. 26, 2010, at 1, available at http://thf_media.s3.amazonaws.com/2010/pdf/bg2482.pdf; Phil Kerpen, Op-Ed., *Regulatory State Needs More Than a Trim*, WASH. TIMES, Jan. 24, 2011, at B3; Mark R. Warner, Op-Ed., *Red-Tape Relief for a Sluggish Recovery*, WASH. POST, Dec. 13, 2010, at A19; Glenn Kessler, *Is Obama Bad for Business?*, WASH. POST (Jan. 14, 2011, 6:00 AM), http://voices.washingtonpost.com/fact-checker/2011/01/is_obama_bad_for_business.html (quoting Thomas Donohue, President of the U.S. Chamber of Commerce, and Rep. Darrell Issa (R-Calif.), Chairman of the House Oversight Committee, who both cite Crain and Crain's study).

8. See, e.g., Wayne Crews & Ryan Young, Op-Ed., *Regulation Without Representation*, INVESTOR'S BUS. DAILY, Feb. 9, 2011, at A13; Thomas A. Hemphill, *REINING in Regulation*, AM. ENTERPRISE INST. (Nov. 22, 2010), <http://www.american.com/archive/2010/november/reining-in-regulation>.

9. See, e.g., Mitt Romney, Op-Ed., *Romney: My Plan to Turn Around the U.S. Economy*, USA TODAY, Sept. 6, 2011, at A11 (“With scant regard for the costs imposed on consumers and businesses, President Obama has vastly expanded the regulatory reach of government. The federal government has estimated the price tag for its regulations at \$1.75 trillion.”); Tim Pawlenty, Former Governor of Minnesota and Former 2012 Presidential Candidate, Economic Policy Remarks at the University of Chicago: A Better Deal (June 7, 2011) (transcript available at <http://blogs.wsj.com/washwire/2011/06/07/text-of-pawlentys-speech-on-his-economic-plan/>) (“But the fact is—federal regulations will cost our economy 1.75 trillion dollars this year alone. It’s a hidden tax on every American consumer. Built into the price of every good and service in the economy.”).

10. CRAIN & CRAIN, *supra* note 6, at iv, 5.

11. See, e.g., Jessica Randall, *OIRA Administrator Sunstein Calls Crain & Crain Report ‘Deeply Flawed,’* OMB WATCH (June 23, 2011), <http://www.ombwatch.org/node/11742> (discussing the oral testimony given by Sunstein on June 23, 2011 at the hearing before the Senate Committee on Homeland Security and Governmental Affairs).

critiques of the report have pointed out that not only does the report completely omit discussion of the benefits of regulation—thus providing an entirely one-sided picture of regulatory consequences—it also uses evidence not intended, nor suitable, for the purposes to which Crain and Crain put it.¹² It also explains away its own potential cost overestimation by asserting—contrary to existing evidence¹³—that regulatory agencies tend to underestimate regulatory costs.¹⁴ The nonpartisan Congressional Research Service (CRS) undertook its own regression analysis using almost the same data, but much sounder methods than those used by Crain and Crain, and found that, with those adjustments, a central component of Crain and Crain’s analysis (the “regulatory quality index” developed by the World Bank for a different purpose) ceased having the effect Crain and Crain claimed for it.¹⁵

Our Article takes another, even deeper plunge into Crain and Crain’s estimates of costs, and finds even more troubling problems. We focus on Crain and Crain’s estimates of the costs of economic regulation, environmental regulation, and workplace safety and health regulation. Together, these categories account for approximately \$1.6 trillion of Crain and Crain’s \$1.75 trillion estimate.¹⁶

For economic regulation, we find that Crain and Crain come up with a breathtaking \$1.24 trillion in estimated aggregate costs—seventy percent of their entire numerical picture of regulatory burden—from a single, poorly designed equation which they built on a misinterpretation of a World Bank database. They take this equation as proof that better “regulatory quality” causes higher incomes; and they read the World Bank data quite incorrectly to say that there is a well-defined maximum for regulatory quality which the United States falls far below. We will identify four serious errors in the Crain and Crain treatment of economic costs; each of these errors alone is sufficient to invalidate their analysis.

Crain and Crain’s estimates of the costs of environmental regulation are also deeply troubled. For environmental rules issued before 1988, they rely

12. See, e.g., Austin Goolsbee, *A 21st Century Regulatory System*, WHITE HOUSE BLOG (June 23, 2011, 3:08 PM), <http://www.whitehouse.gov/blog/2011/06/23/21st-century-regulatory-system>. For a detailed critique making these and other points, see SIDNEY A. SHAPIRO ET AL., *SETTING THE RECORD STRAIGHT: THE CRAIN AND CRAIN REPORT ON REGULATORY COSTS* (2011), available at http://www.progressivereform.org/articles/SBA_Regulatory_Costs_Analysis_1103.pdf.

13. See SHAPIRO ET AL., *supra* note 12, at 7–9; ISAAC SHAPIRO & JOHN IRONS, *REGULATION, EMPLOYMENT, AND THE ECONOMY: FEARS OF JOB LOSSES ARE OVERBLOWN* 21–23 (2011), available at <http://www.epi.org/files/2011/BriefingPaper305.pdf>.

14. CRAIN & CRAIN, *supra* note 6, at 27, 28 n.27.

15. CURTIS W. COPELAND, CONG. RESEARCH SERV., R41763, *ANALYSIS OF AN ESTIMATE OF THE TOTAL COSTS OF FEDERAL REGULATIONS 27–28* (2011).

16. CRAIN & CRAIN, *supra* note 6, at 31 tbl.6.

on a single study published in 1991¹⁷ that uses a general equilibrium model to spin out a tortuous conjecture about a possible impact of early 1980s regulations as a whole: if regulatory costs raise prices in general, then real wages will drop; at lower real wages, textbook economics implies that workers will choose to work less, reducing output and incomes. For regulatory costs of environmental rules issued after 1988, Crain and Crain—among other mistakes—claim costs for regulations that no longer exist because the agency itself pulled them back; they include costs of rules that no longer exist because the courts overturned them; they double count by including sets of rules that all have the same regulatory end; and they include the costs of regulations issued many years, sometimes decades, ago, the current costs of which (if they still even exist) cannot be fairly attributed to regulatory programs.

In estimating the cost of workplace rules, Crain and Crain rely—indirectly, after laundering it through several more recent studies from marginally less partisan sources—on a study done in 1974 by the National Association of Manufacturers.¹⁸ Beyond reliance on an outdated and highly partisan source, Crain and Crain’s estimates of the costs of workplace rules also suffer from the same flaws embodied in their estimates of the costs of environmental rules.

Added to the numerous flaws already revealed by other commentators, the problems we have found with Crain and Crain’s estimate of regulatory costs raise a disturbing possibility: the mistakes are so many, cut in only one direction so thoroughly, and could have been discovered by the authors so easily, that one is pressed to conclude that the study was *designed* to produce a really big number. The number is a rhetorical device, a talking point, a trope; it is not the product of sound analysis.

We have been here before. Previous periods of discontent with the scope and content of regulatory activity have also featured arresting statistics that, all by themselves, appear to make the case for regulatory reform: federal regulations spend hundreds of millions, even billions, of dollars to save a single human life;¹⁹ regulation “statistically murders” 60,000 people a year by directing limited resources to very expensive life-saving measures rather

17. *Id.* at 25 (noting their reliance on Robert W. Hahn & John A. Hird, *The Costs and Benefits of Regulation: Review and Synthesis*, 8 YALE J. ON REG. 233 (1991) for cost estimates on environmental regulations).

18. *Id.* at 30 n.29 (noting that they rely on Joseph M. Johnson, *A Review and Synthesis of the Cost of Workplace Regulations*, in CROSS-BORDER HUMAN RESOURCES, LABOR AND EMPLOYMENT ISSUES 433 (Andrew P. Morriss & Samuel Estreicher eds., 2005)). Johnson’s study relies on HARVEY S. JAMES, JR., ESTIMATING OSHA COMPLIANCE COSTS (1996), a policy study conducted for the Center for the Study of American Business, which, finally, directly relies on the 1974 study by the National Association of Manufacturers.

19. John F. Morrall III, *A Review of the Record*, REG., Nov.-Dec. 1986, at 25, 30-31.

than to cheaper ones;²⁰ once a regulation costs more than a certain amount (estimates ranged from \$3 to \$50 million) to save a life, people are killed through this cost alone because it prevents spending money on other life-saving measures like health care.²¹ Just as the \$1.75 trillion figure is being served up now as Exhibit 1 in the case for regulatory reform,²² so these previous statistics were offered to prove that the regulatory system had gone badly awry.

We have challenged the empirical basis for these previous numbers at length elsewhere,²³ and we will not repeat our criticisms here. It is worth noting, though, that in our long experience with fantastical numbers offered in the service of an anti-regulatory agenda, we have not seen anything quite like Crain and Crain's number. The new high figure for regulatory costs marks a new low in anti-regulatory analysis.

I. GETTING TO NO: HOW CRAIN AND CRAIN REACH \$1.75 TRILLION

Before turning to our critique, we need to explain how Crain and Crain reached their estimates of regulatory costs.

Crain and Crain divide regulatory costs into several different categories (economic regulations, environmental regulations, the federal tax code, occupational safety and health regulations, and homeland security regulations), and use several different methodologies, depending on the category, for estimating these costs.²⁴ We assess the estimates pertaining to economic regulations, environmental regulations, and occupational safety and health regulations. Together, these categories make up over ninety percent of Crain and Crain's overall estimate of annual United States regulatory costs.²⁵

20. 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 167, 172 (Robert W. Hahn ed., 1996).

21. E.g., Randall Lutter et al., *The Cost-Per-Life-Saved Cutoff for Safety-Enhancing Regulations*, 37 ECON. INQUIRY 599 (1999); W. Kip Viscusi, *Risk-Risk Analysis*, 8 J. RISK & UNCERTAINTY (SPECIAL ISSUE) 5 (1994).

22. See *supra* note 7 and accompanying text.

23. FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING (2004); Lisa Heinzerling, *Five Hundred Life-Saving Interventions and Their Misuse in the Debate Over Regulatory Reform*, 13 RISK, SAFETY & ENV'T 151 (2002) [hereinafter *Five Hundred Life-Saving Interventions*]; Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 YALE L.J. 1981 (1998); Lisa Heinzerling & Frank Ackerman, *The Humbugs of the Anti-Regulatory Movement*, 87 CORNELL L. REV. 648 (2002).

24. CRAIN & CRAIN, *supra* note 6, at 31 tbl.6.

25. See *id.*

A. Economic Regulations

The \$1.24 trillion supposedly lost to economic regulations is described as an estimate of the costs of compliance, but no specific regulations are described in any detail, and no costs are presented for any actual compliance activities. Rather, the entire \$1.24 trillion comes from a single equation formulated by Crain and Crain, using comparative international data on per capita incomes and a World Bank “regulatory quality index” (RQI), among other variables.²⁶ The equation finds a positive relationship between income per capita and the RQI. The United States received a very good, but not perfect, score on the RQI; if it had received a perfect score, the equation seems to imply that GDP would have been \$1.24 trillion higher.

The RQI is one of six “governance indicators” calculated by World Bank researchers Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi.²⁷ They define “regulatory quality” as “capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.”²⁸ The other five indicators are voice and accountability, political stability and absence of violence, government effectiveness, rule of law, and control of corruption. Values of these six indicators are available for more than 200 countries, starting in 1996 and appearing annually since 2002.²⁹

As explained in their paper on methodology, Kaufmann, Kraay, and Mastruzzi collect information from thirty-one different data sources, including commercial business information providers, surveys, NGOs, and public sector sources.³⁰ Each individual observation is converted into a numerical score, with higher values for better outcomes.³¹ The authors then make what they call the “innocuous” assumption that the true quality of governance in each area (the quality of regulation, for the RQI) is “a normally distributed random variable with mean zero and variance one. This means that the units of our aggregate governance indicators will also be those of a standard normal random variable, i.e. with zero mean, unit standard deviation, and ranging approximately from -2.5 to 2.5.”³² The final portion of this quotation simply reflects a well-known mathematical result:

26. See *id.* at 21-22.

27. *Worldwide Governance Indicators*, WORLD BANK GRP., <http://info.worldbank.org/governance/wgi/pdf/wgidataset.xls> (last visited Nov. 19, 2011).

28. Daniel Kaufmann et al., *The Worldwide Governance Indicators: Methodology and Analytical Issues 4* (World Bank Dev. Research Grp., Policy Research Working Paper No. 5430, 2010), available at <http://siteresources.worldbank.org/INTMACRO/Resources/WPS5430.pdf>.

29. *Worldwide Governance Indicators*, *supra* note 27.

30. Kaufmann et al., *supra* note 28, at 2.

31. *Id.* at 8.

32. *Id.* at 9.

about ninety-nine percent of the time, a random variable with a normal distribution falls within 2.5 standard deviations of the mean.

Crain and Crain evidently misread this statement; they reported that the RQI “is scaled to have values that range from -2.5 to 2.5.”³³ Since they reported³⁴ that the United States had a RQI of 1.579 in 2008, it appeared to them that it would have been possible to improve our regulations up to a level that received a 2.5. Therefore, they constructed a regression analysis to estimate the economic benefit that would result from improving the U.S. RQI from 1.579 to 2.5.

The equation used in Crain and Crain’s regression analysis expresses GDP per capita as a function of the RQI and several other variables: foreign trade as a share of GDP, total population, primary school enrollment as a share of the eligible population, and broadband subscribers as a share of the population. This selection of variables is explained only by the statement that they “are drawn from the empirical literature that examines differences in economic levels across countries and over time.”³⁵ The equation is estimated using seven years of annual data, from 2002 through 2008, for twenty-five countries that belong to the Organization for Economic Cooperation and Development (OECD)—an organization whose membership is roughly, though no longer exactly, synonymous with high-income, developed countries.

The regression results show that GDP per capita is positively related to the RQI, to the share of foreign trade in GDP, and to the proportion of broadband subscribers in the population. It also shows that GDP per capita, in this data set, is significantly *negatively* related to the fraction of the population in primary education.³⁶ Thus if this regression were accurate, and if correlation always implied causation, GDP per capita could be increased by raising the RQI, the dependence on foreign trade, or the number of broadband subscribers, or by decreasing enrollment in primary education. Judging by Crain and Crain’s regression results, the relationship between broadband connections and per capita income is by far the most reliable of these links.³⁷

33. CRAIN & CRAIN, *supra* note 6, at 21.

34. The World Bank Group updates RQI data from time to time; the United States’ RQI for 2008 is now 1.550 per the data we downloaded in November 2011. *Worldwide Governance Indicators*, *supra* note 27.

35. CRAIN & CRAIN, *supra* note 6, at 21–22.

36. *Id.* at 23 tbl.2.

37. Table 2 in Crain and Crain’s report shows a *t* statistic of 8.89 for the relationship of broadband subscription rates to GDP per capita, far above any other *t* statistic in the table. *Id.* The *t* statistic is a measure of the statistical significance of a relationship: the larger the *t* statistic, the less likely it is that the observed relationship occurred by chance.

Using these regression results and holding all other data constant, Crain and Crain reported that an increase of 0.92 in the RQI (from 1.579 to 2.5) would correspond to an 8.7% increase in GDP per capita, or a \$1.236 trillion increase in total U.S. GDP in 2008, measured in 2009 dollars.³⁸

B. Environmental Regulations

Crain and Crain estimate the current annual cost of United States environmental regulation to be \$281 billion.³⁹ To reach this number, Crain and Crain add up all of the costs presented in the Office of Management and Budget's (OMB) 2001 to 2009 reports on the costs and benefits of federal regulations (and adjust them for inflation).⁴⁰ OMB's reports from 2002 through 2009 estimate the total costs and benefits of the previous year's regulations by compiling estimates—with some adjustments—from agencies' Regulatory Impact Analyses (RIA) for rules costing \$100 million or more per year.

OMB's 2001 report, relied upon by Crain and Crain for the vast bulk of the costs they attribute to environmental regulation,⁴¹ took a different tack. In this report, OMB estimated costs for rules issued from the beginning of the modern environmental era all the way through the first quarter of the year 2000.⁴² For rules issued prior to 1989, OMB based its high-end estimate on a 1991 article by Robert Hahn and John Hird,⁴³ which itself relied on a 1990 study by Michael Hazilla and Raymond Kopp.⁴⁴ Almost half of Crain and Crain's estimate of the current annual costs of environmental regulation—\$132 out of \$281 billion—comes from Hahn and Hird's estimate of the costs of rules issued over twenty-five years ago.⁴⁵

38. *Id.* at 24. The actual calculation of \$1.236 trillion is not well explained. Our attempt to reproduce it, using their assumptions, yielded \$1.30 trillion.

39. *Id.* at 31 tbl.6 (reporting costs in 2009 dollars).

40. *Id.* at 26 tbl.3.

41. *Id.* (reporting high-end cost estimates of almost \$192 billion (in 2001 dollars) based on OMB's 2001 report; this is approximately \$230 billion in 2009 dollars).

42. OFFICE OF MGMT. & BUDGET, MAKING SENSE OF REGULATION: REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 10 n.7, 11 tbl.2 (2001) [hereinafter OMB 2001 REPORT]. OMB's 2001 report actually relies on OMB's 2000 report for this estimate. *Id.* at 11 tbl.2 (referring, in the source note, to OFFICE OF MGMT. & BUDGET, REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS tbls.1, 2 & 3 (2000) [hereinafter OMB 2000 REPORT]).

43. CRAIN & CRAIN, *supra* note 6, at 25; Hahn & Hird, *supra* note 17, at 256 tbl.2.

44. Michael Hazilla & Raymond Kopp, *The Social Cost of Environmental Quality Regulations: A General Equilibrium Analysis*, 98 J. POL. ECON. 853, 865 tbl.2 (1990).

45. See CRAIN & CRAIN, *supra* note 6, at 27 (utilizing the high end of the cost range provided in Hahn & Hird, *supra* note 17, at 256 tbl.2); OMB 2000 REPORT, *supra* note 42, at 20 tbl.1 (reporting a high-end cost estimate of \$99 billion (in 1996 dollars) for environmental

Hazilla and Kopp used general equilibrium analysis to estimate the costs of environmental regulation. They modeled the economy as it existed from 1958 to 1974 in order to establish a pre-regulation baseline. They then re-ran the model, this time incorporating the Environmental Protection Agency's (EPA) 1984 estimate of the costs of compliance with the Clean Air Act and the Clean Water Act, based on the regulations in place as of December 1982. In their analysis, the direct costs of regulation raise prices throughout the economy. Higher prices cause lower real wages, inducing workers to work less (in the language of economics, households choose to substitute leisure for labor). The reduction in labor decreases income, consumption, and savings, relative to the pre-regulation baseline. Lower savings means less investment, slowing the economy's rate of growth and causing decreases in production that are compounded over time. Simulating outcomes from 1981 through 1990, Hazilla and Kopp estimated that household labor supply would decrease by about 1%, and real (inflation-adjusted) gross national product would decrease by 2.4% in 1981, and 5.8% in 1990.⁴⁶

For the environmental rules issued between 1989 and 2000, OMB's 2001 report (and, by extension, Crain and Crain) relied on OMB's 2000 report, which itself relied on a report OMB issued in 1996 (estimating costs for rules issued from 1987 to 1994), along with estimates of the costs of rules from 1995 to 1999.⁴⁷

C. Workplace Regulations

Crain and Crain estimate costs of \$64.313 billion for occupational safety and health regulations issued prior to 2001, and \$471 million for such regulations issued between 2001 and 2008.⁴⁸ For the costs of rules issued before 2001, Crain and Crain rely on an analysis published in 2005 by Joseph M. Johnson.⁴⁹ Johnson estimated the costs of workplace safety and health rules by multiplying earlier estimates of these costs by 5.55, based upon findings in a 1974 study conducted by the National Association of Manufacturers.⁵⁰ For the costs of rules issued between 2001 and 2008, Crain and Crain use an aggregate estimate provided in OMB's 2009 report on the costs and benefits of federal regulation.⁵¹ OMB's estimate is based

rules as of 1988 based on Hahn and Hird, *supra* note 17; in 2009 dollars, this is \$132 billion); *infra* note 82 and accompanying text.

46. Hazilla & Kopp, *supra* note 44, at 867 tbl.3.

47. OMB 2001 REPORT, *supra* note 42, at 11 tbls.1 & 2.

48. CRAIN & CRAIN, *supra* note 6, at 30 tbl.5 (reporting costs in 2009 dollars).

49. *Id.*

50. Johnson, *supra* note 18, at 455 & n.37.

51. CRAIN & CRAIN, *supra* note 6, at 30 tbl.5.

on the RIA the Occupational Safety and Health Administration (OSHA) filed for major rules issued in the relevant years.

II. THE MANY SHORTCOMINGS OF CRAIN AND CRAIN'S ESTIMATE

Crain and Crain's study is littered with misunderstandings, mistakes, and double counting. At every step of the way, they choose data and assumptions that make the costs climb higher and higher. At every step of the way, they also make outright, objective errors that have the same effect. The result is a mix of apparent bias and ineptitude that make their estimate of \$1.75 trillion wholly unreliable.

We begin by discussing the flaws in Crain and Crain's estimate of the costs of economic regulation, and then turn to the flaws in their estimates regarding environmental and workplace regulations.

A. Economic Regulation

Crain and Crain's one-equation analysis of economic regulation has at least four fatal flaws, any one of which would be enough to destroy its prediction of a \$1.24 trillion loss. First, Crain and Crain have misunderstood the scale of the RQI and the meaning of the number they treat as a perfect score. Second, they have inappropriately lumped together seven years of extremely similar data in the same equation, creating a spurious appearance of statistical significance. Third, there is in fact no correlation between the RQI and per capita income among high-income countries. Fourth, correlation is not causation: if the RQI does show that the United States has a higher quality of regulations than some middle-income countries, this could mean either that better regulations create higher incomes, or that higher incomes allow the creation of better regulations.

1. Why Be Normal?

The normal distribution—also known as the Gaussian distribution or the bell curve—is one of the most familiar and frequently used distributions in statistics. As is well known, it has no maximum or minimum value; rather, values farther and farther away from the mean become less and less probable. Thus it is common to describe the probability of a normally distributed variable falling within a certain distance from the mean. For example, there is a ninety-five percent probability that a randomly chosen value of a normally distributed variable falls within 1.96 standard deviations of the mean. Or, in the example used by the authors of the RQI, there is a ninety-nine percent probability of such a variable falling within about 2.5 standard deviations of the mean.

Crain and Crain missed this elementary fact about normal distributions, and assumed that 2.5 standard deviations is an absolute upper limit and -2.5 is an absolute lower limit. They are wrong both in theory and in the empirical description of the RQI (which, as noted above, is defined as a normally distributed variable with a mean of zero and standard deviation of one). For the 207 countries for which the World Bank researchers reported an RQI value for 2008, the RQI ranged from -2.66 in Somalia to 1.98 in Hong Kong. The highest RQI on record is 2.23 for Singapore; since 2002, no country has received an RQI of 1.99 or higher.⁵² If, instead of the arbitrary target of 2.5, Crain and Crain had assumed that the best the United States could do was to match the best existing performance on the RQI—reaching the state of regulatory nirvana achieved by Hong Kong—then the potential improvement, and hence the estimated costs of economic regulation, would have been cut roughly in half. That is, even if one accepted the rest of their methodology, about \$600 billion of Crain and Crain's supposed costs of regulation would be eliminated, with no change in information about any United States regulations, simply by reading the international RQI data in a more measured and defensible manner.

More broadly, Crain and Crain use the RQI with little thought about its limitations. As two of the developers of the World Bank's governance indicators (including the RQI) have written, "Governance indicators can be used for regular cross-country comparisons . . . [but] they often remain blunt tools for monitoring governance and studying the causes and consequences of good governance at the country level."⁵³ They further caution users, noting:

All governance indicators include measurement error and so should be thought of as imperfect proxies for the fundamentals of good governance Whenever possible, such margins of error should be explicitly acknowledged, as they are in the WGI [the database that includes the RQI], and taken seriously when the indicators are used to monitor progress on governance.⁵⁴

The RQI estimates are published with standard errors, implying that the authors of the database believe that about two-thirds of the time, the true value will fall within one standard error of the reported value. For the United States in 2008, the RQI is 1.55 and the standard error is 0.22, implying that there is a two-thirds probability that the "true" United States

52. See *Worldwide Governance Indicators*, *supra* note 27.

53. Daniel Kaufmann & Aart Kraay, *Governance Indicators: Where Are We, Where Should We Be Going?*, 23 *WORLD BANK RES. OBSERVER* 1, 25 (2008).

54. *Id.* at 26.

RQI is between 1.33 and 1.77.⁵⁵ Of the 207 countries with RQI values for 2008 reported in the World Bank database, there were only fourteen with RQI above the United States value of 1.55, and just six with RQI above 1.77, the upper limit of the United States confidence interval: Denmark, Hong Kong, Ireland, New Zealand, Singapore, and the United Kingdom.⁵⁶ The evidence is meager that the United States lags significantly behind other countries in the quality of its regulations as measured by the World Bank's RQI. Yet the unexplained hope for a great leap forward in the RQI, well beyond all worldwide experience to date, is the fulcrum for most of Crain and Crain's estimated regulatory costs.

The RQI is just one of the World Bank's regulatory indicators; another one, the "doing business indicator," is explicitly designed to measure how easy it is to set up and run a business in 183 countries around the world.⁵⁷ The doing business indicator confirms that the United States is close to the top, ranking fifth in the world behind Singapore, Hong Kong, New Zealand, and the United Kingdom.⁵⁸ The ranking is purely ordinal, with no theoretical maximum. The United States could aspire to be number one, but there is no way to tell what economic consequences, if any, might be associated with making it easier to do business here than in all 182 other countries in the database, rather than just 178. Thus a broader look at the World Bank's regulatory indicators provides no basis for Crain and Crain's presumption that measurable increases in the United States' regulatory quality could boost our rate of economic growth.

2. Padding the Evidence

Crain and Crain use seven years of data, annually from 2002 through 2008, on the RQI, per capita incomes, and other variables. This artificially boosts the reported significance of the results; it is a violation of standard statistical practice, which makes the regression results misleading.

To see why this matters, consider the results of a coin toss. Suppose that a penny is flipped once and lands heads up. This is clearly not a statistically significant result; it is a random event, expected to occur half the time. Now suppose that a penny is flipped seven times in succession, landing heads each time. In contrast to the single toss, seven identical tosses are very significant. The chance of getting seven heads in a row is one in 128;

55. See *supra* note 34 and accompanying text.

56. See *Worldwide Governance Indicators*, *supra* note 27.

57. The "doing business indicator" is a tool developed by the Doing Business Project and is available at DOING BUSINESS, <http://www.doingbusiness.org> (last visited Nov. 4, 2011).

58. *Economy Rankings*, DOING BUSINESS, <http://www.doingbusiness.org/rankings> (last visited Sept. 19, 2011).

in other words, we are more than ninety-nine percent sure that seven successive tosses will not all be heads. Spend all day flipping pennies, and seven successive heads will probably happen at some point; but if it happens on the first seven flips, it might lead to questions about whether the penny is weighted or the experimenter is biasing the results.

Now imagine a research paper reporting seven separate observations of a single coin toss as if they were independent events. This would misleadingly convert an ordinary, random event—the single toss—into something that appears to be highly significant and unlikely to occur by chance alone.

Crain and Crain combine seven years of annual data for twenty-five OECD countries on GDP per capita, the RQI, and other variables. Both GDP per capita and the RQI, however, change very little from year to year. For the OECD countries, the correlation between GDP per capita in 2007 and 2008 has an adjusted r^2 of 0.999;⁵⁹ even for the first and last years in the Crain and Crain sample, 2002 and 2008, the correlation between GDP per capita has an adjusted r^2 of 0.982. Thus, the seven years of data on GDP per capita, treated by Crain and Crain as separate observations, contain virtually identical information about the relative affluence of OECD countries. The RQI is also highly correlated from year to year: for the OECD countries, the correlation between the 2007 and 2008 RQIs has an adjusted r^2 of 0.944, falling to 0.815 for the RQIs of 2002 versus 2008.⁶⁰

In short, the data used by Crain and Crain are much more like seven observations of the same coin toss, not seven independent observations of new information about the world. As a result, the correlation they report between RQI and GDP per capita is spuriously high.

There are econometric techniques designed for datasets like this with serial correlation between observations. Crain and Crain mention, with little explanation, that they included country fixed effect variables.⁶¹ This might be part of an appropriate methodology, but it alone is far from sufficient. Readers interested in pursuing this question should consult the CRS study, which repeats the Crain and Crain analysis with a rigorous econometric methodology—and finds no significant relationship between GDP per capita and RQI.

59. In an ordinary regression analysis, r^2 measures how much of the variation in one variable (shown on the left-hand side of the equation) can be predicted by assuming a linear relationship with the other variables in the equation. The adjusted r^2 of 0.999 reported here means that 99.9% of the variation among OECD countries in GDP per capita in 2008 can be predicted from their GDP per capita in 2007.

60. These calculations are based on GDP per capita at market exchange rates downloaded from the World Bank website in January 2011 and RQI data downloaded in November 2011 for all thirty-four OECD member nations. See *Worldwide Governance Indicators*, *supra* note 27. Adjusted r^2 , discussed *supra* note 59, is used here to adjust for a small sample size. The more familiar, unadjusted r^2 would be larger in every case.

61. CRAIN & CRAIN, *supra* note 6, at 22.

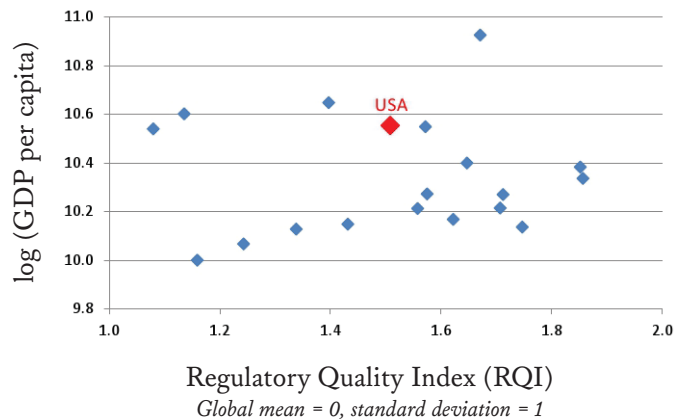
3. Inside the OECD

Crain and Crain focus on countries in the OECD, which is often taken to be synonymous with high-income, industrialized countries. The organization, however, has diversified its membership to include a number of middle-income countries, including Turkey, Mexico, Chile, and several eastern European nations. Some of the middle-income OECD members, notably Turkey and Mexico, do have much lower RQI scores. Within the high-income OECD member countries, on the other hand, there is literally no relationship between income and RQI.

If we restrict our attention to the nineteen OECD countries with per capita GDP above \$20,000 in 2008⁶²—including northern and western Europe, Australia, Canada, Israel, Japan, and the United States—then the correlation between RQI and the logarithm of per capita GDP (the form of the data used by Crain and Crain) for 2008 has an adjusted r^2 of -0.06. This puzzling result means that there is less relationship between these two data series than would be expected by chance alone; the unadjusted r^2 is 0.000003.⁶³

A graph of the data, highlighting the position of the United States, is presented in Figure 1. The absence of a trend is visible in these data.

FIGURE 1 — GDP PER CAPITA VS RQI, 2008:
HIGH-INCOME OECD COUNTRIES



62. See *GDP per Capita (Current US\$)*, WORLD BANK, <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD> (last visited Nov. 4, 2011).

63. In the regression of \log GDP per capita versus RQI for these countries, the slope has a t statistic of -0.008 and a p value of 0.99, implying there is a ninety-nine percent probability of getting a relationship at least this good by chance alone, e.g., when comparing two series of random numbers. In general, a negative value for adjusted r^2 means that there is a better than fifty percent probability of getting a relationship this good by chance alone.

4. Correlation Is Not Causation

A correlation can be found between RQI and income only by comparing countries at very different income levels;⁶⁴ we have seen that this relationship disappears within the world of countries above about half the United States' level of income.⁶⁵ Suppose, for the sake of the argument, that the RQI measures something meaningful about the quality of regulation (determining exactly what the RQI measures is an important issue which we do not address). Turkey and Mexico, two of the lowest-income members of the OECD, also have the lowest RQI scores in the OECD. This does not tell us that the quality of regulation makes a country richer or poorer; the reverse could equally well be true.

The United States is much richer than Turkey or Mexico, and, according to the RQI, has much better regulations. Does this mean that better regulation made the United States richer? Or does it mean that being richer enabled the United States to adopt better regulations? Or, since the RQI is based on the *perception* of regulatory quality by a number of observers, does the greater wealth of the United States lead to a perception that it has better regulations than Turkey or Mexico? Even if the Crain and Crain calculation was reliable and problem free (which it definitely is not, as seen above), it would founder on this shoal: their estimate of regulatory costs depends on the unstated premise that causation is all one way, from regulatory quality to income. If, instead, wealth creates better regulation, their entire argument sinks beneath the waves.

If correlation implied causation, in the manner assumed by Crain and Crain, then their curious finding of negative correlation between GDP per capita and primary school enrollment would suggest another low-cost route to wealth: throw kids out of school. We almost hesitate to mention this, given the viral spread of Crain and Crain's implausible conclusions throughout current political debates. We trust that it is self-evident that the

64. OECD membership now includes thirty-four countries at varying income levels. Crain and Crain used twenty-five of these countries in their analysis; the CRS study used thirty. See COPELAND, *supra* note 15, at 27; CRAIN & CRAIN, *supra* note 6, at 21. Neither study reported which countries they included. The previous section of this Article referred only to the nineteen highest-income OECD members—a group that corresponds, we believe, to the common (mis)understanding of OECD membership as a synonym for high income. This section discusses our exploration of the data for all thirty-four countries; it does not include the other explanatory variables used by Crain and Crain and by the CRS study, so it is not directly comparable to those results.

65. United States GDP per capita was \$38,345 in 2008, according to the World Bank. *GDP per Capita (Current US\$)*, *supra* note 62.

error lies in giving credence to Crain and Crain's calculations, not in the idea of educating children.⁶⁶

B. Environmental Regulation

Crain and Crain's estimates of the costs of environmental regulations likewise suffer from several basic flaws. First, they are based on evidence—and regulations—so old as to be unreliable, as OMB itself has acknowledged.⁶⁷ Second, they rely heavily on an outdated version of general equilibrium analysis, analysis which, even if updated to reflect the current state of the art, would nonetheless remain deeply problematic in its assumptions. Third, these estimates contain objective errors, such as double counting of the same costs and inclusion of costs for rules that do not exist.

1. Old Data on Old Rules

Crain and Crain's estimates of the costs of environmental regulations come from OMB's 2001–2009 reports on federal regulation. The earliest of these reports provide estimates of regulatory costs going back decades. In 2003, OMB stopped providing such estimates for the costs of regulations that had been issued more than ten years before, explaining that long-ago estimates were not reliable guides for current policy.⁶⁸ Several years before, OMB had explained that it was hard to justify continuing to debit such costs to the federal government's regulatory program, as it was unlikely that if the regulations were pulled, businesses would actually withdraw whatever protections they had installed in response to the relevant regulations.⁶⁹ In its 2002 report, moreover, OMB had cast a skeptical eye on aggregate cost estimates that attempted to announce an overall figure for the costs of old and new regulations, observing:

66. Crain and Crain never precisely defined their educational enrollment variable, but they reportedly told CRS that their negative coefficient on educational enrollment could reflect "aging pyramid" effects. COPELAND, *supra* note 15, at 27. If lower-income OECD nations such as Turkey and Mexico have younger populations than other OECD members, then school-age children, and hence school enrollment, may be a larger percentage of the total population in the lower-income countries. This could create a negative correlation between educational enrollment and income per capita in the Crain and Crain dataset.

67. See OFFICE OF MGMT. & BUDGET, STIMULATING SMARTER REGULATION: 2002 REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 40 (2002) [hereinafter OMB 2002 REPORT] (describing plans for subsequent reports).

68. See *id.*; see also COPELAND, *supra* note 15, at 21.

69. COPELAND, *supra* note 15, at 24–25 (citing OFFICE OF MGMT. & BUDGET, REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS (1997)).

We included these aggregate estimates in the appendix rather than the text to emphasize the quality differences in the two sets of estimates. The estimates of the costs and benefits of Federal regulations over the period of April 1, 1995, to March 31, 2001, are based on agency analyses subject to public notice and comments and OMB review under E.O. 12866. The estimates . . . for earlier regulations were based on studies of varying quality. Some are first-rate studies published in peer-reviewed journals. Others are non-random surveys of questionable methodology. And some estimates are based on studies completed 20 years ago for regulations issued over 30 years ago, whose precise costs and benefits today are unknown.⁷⁰

By 2003, these older estimates had disappeared entirely from OMB's report, and they have not come back.

Despite OMB's admonition against using cost estimates that are over ten years old, Crain and Crain use OMB estimates of regulatory costs going back more than twenty years. In using Hazilla and Kopp's estimates for rules issued prior to 1988, they go back to the very beginning of United States environmental law. As OMB itself has observed, costs going back this far are unreliable.⁷¹ The great bulk of Crain and Crain's estimate of the costs of environmental regulation comes from numbers generated so long ago that OMB does not now use them in its own calculations. Crain and Crain should not have used them either. If Crain and Crain had followed OMB's cautions about the unreliability of these old estimates, and eliminated them from their estimate, the total cost of environmental regulation would have fallen from \$281 billion to \$48 billion.⁷²

As we explain below, even this much smaller figure contains large errors.

2. Is Our Real Problem Voluntary Unemployment? Really?

Crain and Crain's calculations for rules adopted before 1988 relied on the Hazilla and Kopp study⁷³—which is, strictly speaking, an estimate of potential economic consequences, from 1981 through 1990, of major environmental rules in effect in 1982. To make that estimate, Hazilla and Kopp applied a general equilibrium framework, familiar in textbook economics, in which economic changes are often governed by household responses to

70. OMB 2002 REPORT, *supra* note 67, at 39.

71. *Id.* at 40.

72. This is based on converting Crain and Crain's estimate of costs "through 2000" to 2009 dollars. *See* CRAIN & CRAIN, *supra* note 6, at 26 tbl.3.

73. Hazilla & Kopp, *supra* note 44, at 856–57.

small price differentials, including the (voluntary) choice between leisure and labor.⁷⁴

Even within the narrow field of abstract economic models of regulatory costs, Hazilla and Kopp's 1990 paper no longer represents the state of the art. Newer work has identified many subtleties in the modeling of environmental regulations, and leads to a surprisingly wide range of possible outcomes, including ones quite different from Hazilla and Kopp's estimates.⁷⁵ Nonetheless, Crain and Crain chose to rely on Hazilla and Kopp, not on newer work in this field.

Although the Hazilla and Kopp estimate of regulatory costs is driven by a decrease in employment, this is not involuntary unemployment, of the sort seen in recessions and all too well known in reality today. The general equilibrium framework used in economics typically assumes that all markets clear—that is, supply equals demand for every commodity and for factors of production such as labor.⁷⁶ Instead, the reduction in employment of interest to Hazilla and Kopp stems from a voluntary choice: looking at the higher prices, and consequently lower real wages, that result from environmental protection costs, households decide that they would prefer to reduce their aggregate hours of work by about one percent.⁷⁷ Leisure is presumably just as rewarding as ever, but labor is slightly less rewarding at the slightly lower real wages, so rational utility maximizers (the only species of human beings found in the model) choose to work slightly less. For someone working a forty-hour, fifty-week year, one percent less work is a reduction of twenty hours, or 2.5 days, per year. All the costs of pre-1989

74. Hazilla and Kopp's description of their model begins with a discussion of the importance and the challenge of modelling household preferences correctly, and cites numerous other economic models in a similar vein. *Id.* at 857–62. They observe that their model “is suitable for assessing long-run impacts of regulatory programs on neoclassical economic growth,” i.e., impacts on abstract economic models. *Id.* at 859.

75. See, e.g., Don Fullerton & Garth Heutel, *The General Equilibrium Incidence of Environmental Mandates*, AM. ECON. J.: ECON. POL'Y, Aug. 2010, at 64.

76. Hazilla and Kopp are not explicit about their labor market assumptions. The paper they cite as the source of their model includes the possibility of involuntary unemployment, but does not discuss it. It does, however, highlight the household decision about voluntary leisure time. Edward A. Hudson & Dale W. Jorgenson, *U.S. Energy Policy and Economic Growth, 1975-2000*, 5 BELL J. ECON. & MGMT. SCI. 461 (1974).

For a discussion on the limitations of general equilibrium models for policy analysis, with an emphasis on trade policy, see Frank Ackerman & Kevin Gallagher, *The Shrinking Gains from Global Trade Liberalization in Computable General Equilibrium Models: A Critical Assessment*, 37 INT'L J. POL. ECON. 50 (2008). For a discussion on the limitations of the underlying economic theory, see Frank Ackerman, *Still Dead After All These Years: Interpreting the Failure of General Equilibrium Theory*, 9 J. ECON. METHODOLOGY 119 (2002).

77. Labor supply in the environmental cost scenario is 0.84% lower than in the no-regulation baseline in 1981, and 1.18% lower in 1990. Hazilla & Kopp, *supra* note 44, at 867 tbl.3.

regulations, for Crain and Crain, are consequences of this minor, voluntary adjustment in working hours.

Since it is a voluntary choice, why complain about workers choosing more leisure? The problem, for Hazilla and Kopp, is as old as the Protestant ethic: more work means more income, some of which is saved and can be invested in capital goods, leading to faster economic growth—but more leisure just means another 2.5 days at the beach. In the folkloric tradition of kingdoms lost for a nail, it is the imposition of environmental regulations—which raised prices, which lowered real wages, which made workers choose more leisure, which lowered incomes, which lowered savings, which lowered investment, which caused slower economic growth—which imposed such burdensome costs on the economy.

What's wrong with this long and winding tale of economic causation? One might well question the real-world relevance of a model of automatic full employment. In a world with business cycles and involuntary unemployment, it is quite possible that regulatory costs could lead to increased expenditures and employment.⁷⁸ Beyond such fundamental questions about general equilibrium modeling, there are several additional problems with the Hazilla and Kopp analysis.

For one thing, there is no sign of awareness of any possible benefits of regulation—to human health, to nature, or even to the economy. Hazilla and Kopp analyzed the economic impact of the earliest regulations adopted under the Clean Air Act and the Clean Water Act—rules that save thousands of people per year from dying of lung disease, prevent rivers from catching fire, and keep lead out of gasoline. Is the main economic impact of these sweeping changes in our conditions of life really a slight increase in prices that inspires workers to do one percent less work? Even in narrowly economic terms, healthier people, with fewer respiratory diseases, are more productive workers, and children growing up free of exposure to lead have, on average, higher IQs and higher lifetime earnings prospects.⁷⁹

More broadly speaking, the benefits of clean air and clean water are immensely valuable, and widely valued. In EPA's retrospective cost-benefit analysis of the early stages of the Clean Air Act, the estimated value of the benefits is more than forty times the costs, and more than enough to

78. When, as at present, businesses are earning significant profits but not investing them due to a lack of demand for their products, regulations could force businesses to spend some of those profits on pollution controls; that spending would create an economic stimulus.

79. *E.g.*, SHAPIRO ET AL., *supra* note 5, at 11 (estimating that regulation saves \$76 billion in child healthcare costs, \$38 billion dollars in municipal charges, and thousands of lives); EPA, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT: 1990 TO 2010, at 75 (1999), available at <http://www.epa.gov/oar/sect812/1990-2010/chap1130.pdf> (estimating the benefits of Clean Air Act regulations to be \$110 billion).

outweigh Hazilla and Kopp's estimates of regulatory costs.⁸⁰ Crain and Crain, following in Hazilla and Kopp's footsteps, were happy to use calculations based on EPA's estimates of the costs of regulation, but entirely ignored EPA's much larger estimates of the benefits of the same rules.⁸¹

Another problem is that Hazilla and Kopp's projections of the costs of regulations grow rapidly over time, and should by now be vastly—but laughably—larger than Crain and Crain's estimate. The number used by Crain and Crain to represent the current costs of environmental regulations adopted before 1989 is in fact Hazilla and Kopp's estimate of costs as of 1985 (adjusted for inflation), mislabeled as the cost in 1988.⁸² There is, however, no reason to stop in 1985: the Hazilla and Kopp cost estimate is much larger for 1990, the last year in their analysis, than for 1985⁸³—and the logic of their model implies that the costs resulting from 1980s regulations should have continued to escalate, considerably faster than inflation, beyond 1990.

The rapid, ongoing escalation can be seen in a comparison of Hazilla and Kopp's social cost projections to EPA's estimates of direct compliance costs. The true social cost of early 1980s clean air and clean water rules, according to Hazilla and Kopp, was 67% of EPA's estimate of direct compliance costs in 1981, rising to 126% in 1985 and 258% in 1990.⁸⁴ Hazilla and Kopp's social costs were lower than direct compliance costs in 1981, the first year of the rules they analyzed, because they subtracted the assumed value of the increase in leisure. Yet, over time, the cumulative, dynamic effects of reduced labor become steadily more important. Every year that workers work less, thereby reducing income, savings, investment, and growth, the next year's GDP becomes smaller than it would have been. As time goes on, the reductions in income and growth are compounded, so the regulatory cost scenario falls farther and farther behind the no-regulation baseline. As a result, the social cost of regulation, defined as the gap between the baseline and regulatory cost scenarios, grows ever larger.

80. See *Retrospective Study—Study Design and Summary of Results*, EPA, <http://www.epa.gov/air/sect812/retro.html> (last visited Nov. 4, 2011).

81. The OMB reports on which Crain and Crain rely for their estimates of the costs of rules issued after 1988, CRAIN & CRAIN, *supra* note 6, at 26 tbl.3, themselves rely on EPA's estimates of costs as reflected in their RIAs for major rules. *Id.* at 25.

82. The error in dates occurs in Hahn and Hird's treatment of the Hazilla and Kopp estimate. In the appendix explaining their numbers, Hahn and Hird recognized that they were using an inflation-adjusted version of Hazilla and Kopp's estimate for 1985. Hahn & Hird, *supra* note 17, at 272 & n.224 (explaining their \$77.6 billion figure). In the body of their article, however, Hahn and Hird inserted the same number, without comment or adjustment, into a table of regulatory costs and benefits in 1988. *Id.* at 256 tbl.2.

83. Hazilla and Kopp, *supra* note 44, at 865 tbl.2.

84. Calculated from *id.*

From 1981 to 1985, Hazilla and Kopp's social cost estimate, measured in constant (inflation-adjusted) dollars, grows by an average of 20.5% per year. From 1985 to 1990, the growth rate is only slightly slower, at 18.8% per year.⁸⁵ Nothing is said in the article (or in the subsequent articles citing it) about what growth rates to expect beyond 1990; two hypothetical examples, however, demonstrate the importance of this question. First, if the post-1985 rate of growth, 18.8% annually, continued into the future, then by 2009 the social cost of early-1980s environmental regulation would have reached \$8.8 trillion, well over half of the GDP. Second, if the rate of growth continued to decline by 1.7 percentage points every five years, as it did from the early- to late-1980s in Hazilla and Kopp's analysis, then the social cost of early-1980s regulations would have been "only" \$4.5 trillion by 2009, nearly one-third of the GDP.⁸⁶ Surely these numbers are large enough to fail the laugh test: they are humorously, absurdly wrong on their face. In order to make sensible, contemporary use of the Hazilla and Kopp estimates, it would be necessary to explain why their growth decelerates or stops—an explanation which is not present in Hazilla and Kopp, or in Crain and Crain.

Within the (limited, as we have seen) logic of this model, what prevents the costs of a fixed set of regulations from growing without limit? Hazilla and Kopp are not alone in having missed an obvious answer: high initial costs of regulatory compliance create an incentive for innovation, which lowers future costs. General equilibrium analyses frequently focus on the implications of consumers' and workers' responses to small price changes, such as the one percent reduction in working hours modeled by Hazilla and Kopp. Yet they typically omit the comparable response of engineers and entrepreneurs to regulations: if compliance costs are high enough, there are profits to be made by inventing cheaper alternative technologies. Why should entrepreneurs, who are in the business of seeking out new opportunities for profits, be less sensitive to price incentives than households? Innovation may seem less predictable than changes in consumer purchases or workers' desire to work—but the assumption that regulation creates an incentive for innovation makes sense out of the repeated empirical finding that regulatory costs turn out to be lower than predicted in advance.⁸⁷

The argument that regulations create important incentives for innovation exists in economics literature. The "Porter hypothesis" claims that

85. Calculated from the "Social Cost" estimates, *id.*, converted to constant dollars.

86. Calculated by applying the indicated growth rates to the Hazilla and Kopp estimate of social costs in 1990, *id.*, converted to 2009 dollars.

87. See e.g., SHAPIRO ET AL., *supra* note 5, at 2; Frank Ackerman, *The Unbearable Lightness of Regulatory Costs*, 33 FORDHAM URB. L.J. 1071, 1083 (2006); Thomas O. McGarity & Ruth Ruttenberg, *Counting the Cost of Health, Safety, and Environmental Regulation*, 80 TEX. L. REV. 1997, 1998 (2002).

well-designed regulations can prompt enough innovation to increase the competitiveness of regulated firms.⁸⁸ This idea has been controversial among economists, since it implies that, prior to regulation, the firms were not maximizing profits. There is, however, extensive empirical evidence to support the hypothesis. At a macro level, Germany's large, longstanding trade surplus suggests that the country's famously strict regulations do not destroy competitiveness.⁸⁹

The article introducing the Porter hypothesis cites Hazilla and Kopp as an example of a study that is biased against regulation by its failure to consider the incentives it creates (as well as the failure to evaluate any benefits of regulation).⁹⁰ A more empirically-grounded account of the economic impact of 1980s regulations, the subject of Hazilla and Kopp's analysis, would include, for example, the unexpectedly low cost to society of removing lead from gasoline, since the catalytic converters introduced by automobile manufacturers at about that time required unleaded gasoline.⁹¹ By the 1990s, unleaded gasoline had become the universal standard, and it was no longer meaningful to say that its costs were higher than the baseline (as assumed in the Hazilla and Kopp cost estimates). Once there was no longer any leaded fuel option available on the market, no one could save money by going back to it; the only baseline worth talking about was the new, healthier world of unleaded gasoline.⁹²

88. Michael E. Porter & Claas van der Linde, *Toward a New Conception of the Environment-Competitiveness Relationship*, 9 J. ECON. PERSP. 97, 97-98 (1995).

89. For a historical analysis of Germany's institutional framework and its positive relationship to economic growth, see Wendy Carlin, *West German Growth and Institutions*, in *ECONOMIC GROWTH IN EUROPE SINCE 1945*, at 455 (Nicholas Crats & Gianni Toniolo eds., 1996). For an attempt at quantitative analysis of the effects of German regulations on economic growth, finding a positive effect on growth from environmental regulations and a negative effect from capital market regulations, see Helge Berger, *Regulation in Germany: Some Stylized Facts About its Time Path, Causes, and Consequences*, 118 ZEITSCHRIFT FÜR WIRTSCHAFTS- UND SOZIALWISSENSCHAFTEN [J. APPLIED SOC. SCI. STUD.] 185 (1998) (Ger.).

Germany's trade surplus is documented in the numerous statistical reports available from the WORLD TRADE ORG., <http://www.wto.org> (last visited Nov. 19, 2011). For example, in 2009, Germany had a merchandise trade surplus of \$188 billion, second only to China's \$196 billion. See WORLD TRADE ORG., *INTERNATIONAL TRADE STATISTICS 2010*, at 13 tbl.I.8 (2010), available at http://www.wto.org/english/res_e/statis_e/its2010_e/its2010_e.pdf.

90. Porter & van der Linde, *supra* note 88, at 108.

91. See e.g., Frank Ackerman et al., *Applying Cost-Benefit Analysis to Past Decisions: Was Environmental Protection Ever a Good Idea?*, 57 ADMIN. L. REV. 155, 164-65 (2005); Jamie Lincoln Kitman, *The Secret History of Lead*, NATION, Mar. 20, 2000, at 11.

92. The Clean Air Act banned the sale of leaded gasoline as of 1996, and other countries around the world took similar actions. As of June 2011, the only countries relying exclusively on leaded gasoline were Myanmar (Burma) and Afghanistan; the only other countries still selling any leaded gasoline for road use were Algeria, Iraq, North Korea, and Yemen. Robert Taylor & Zac Gethin-Damon, *Countries Where Leaded Petrol is Possibly Still*

Yet phony numbers have a life of their own; repetition of Hazilla and Kopp's estimate, passed from Hahn and Hird to OMB to Crain and Crain, continued even as the innovative processes of the real-world economy eliminated the costs that were estimated, so long ago, in such a biased manner.

3. Piling On: Crain and Crain's Use of OMB Reports on the Costs of Environmental Rules

In their tallies of total costs, Crain and Crain always use the high end of the range of OMB's cost estimates. They explain that agencies underestimate costs and that this justifies use of high-end estimates.⁹³ But the empirical evidence that exists on actual regulatory costs—limited though it may be—does not support Crain and Crain's assertion that agencies underestimate regulatory costs. Indeed, the evidence that exists tends to point in the opposite direction.⁹⁴ Although the refrain that agencies have an incentive to underestimate costs pervades discourse on the costs of regulation,⁹⁵ in fact at least EPA often has exactly the opposite incentive. Much environmental regulation stems from laws directing EPA to set limits based on the best available technology for pollution control.⁹⁶ A primary consideration in determining which technology is available is economic affordability.⁹⁷ In anticipating the inevitable legal challenge to a rule generated within this legal framework, EPA has an incentive to overestimate rather than underestimate the costs of the technology. If the technology is affordable even based on an overly-high cost estimate, then it should survive legal attack.⁹⁸ Whether EPA does more harm than good to itself when it deliberately highballs its estimates of costs, the fact remains that it does so, and this belies the claims that the agency aims at the low end in estimating costs.

Sold for Road Use as at 17th June 2011 [sic], THE LEAD GRP. (June 17, 2011), <http://www.lead.org.au/fs/fst27.html>.

California banned the sale of leaded gasoline in 1992, four years earlier than the federal government, and found that the initiative had no statistically significant effect on the price of gasoline in California. Hayley H. Chouinard & Jeffrey M. Perloff, *Gasoline Price Differences: Taxes, Pollution Regulations, Mergers, Market Power, and Market Conditions*, 7 B.E. J. ECON. ANALYSIS & POL'Y 1, 12, 20 tbl.5 (2007).

93. CRAIN & CRAIN, *supra* note 6, at 27.

94. See, e.g., SHAPIRO ET AL., *supra* note 5, at 7; Ackerman, *supra* note 87, at 1083.

95. See, e.g., Morrall, *supra* note 19, at 29.

96. See, e.g., Cass R. Sunstein, *Administrative Substance*, 1991 DUKE L.J. 607, 627-31.

97. See, e.g., Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category, 74 Fed. Reg. 62,996, 63,002 (Dec. 1, 2009) (to be codified at 40 C.F.R. pt. 450); Effluent Limitations Guidelines and New Source Performance Standards for the Airport Deicing Category, 74 Fed. Reg. 44,676, 44,678 (Aug. 28, 2009) (to be codified at 40 C.F.R. pt. 449).

98. SHAPIRO ET AL., *supra* note 12, at 7 (citing McGarity & Ruttenberg, *supra* note 87, at 2011, 2044-45).

It must be remembered, moreover, that the cost estimates in EPA's RIAs always go through OMB review.⁹⁹ OMB has no incentive to allow EPA to underestimate costs, and, indeed, OMB stands ready to direct the agency to change cost estimates in the RIAs that accompany major rules sent to OMB for review. OMB staff members are not shy about insisting on significant changes to RIAs as a condition of OMB clearance.¹⁰⁰ Thus, although the cost estimates in OMB's recent reports all come from the agency's own RIAs, those RIAs reflect OMB's prior input; they are not the work product of the agency alone.

Crain and Crain also justify the use of high-end estimates by emphasizing that OMB's annual reports count the costs only of major rules that cost \$100 million or more per year, and exclude regulatory programs (like Superfund) that do not rely on rules as their predominant regulatory mechanism.¹⁰¹ Crain and Crain are correct in saying that OMB's reports do not cover the regulatory waterfront. Insofar as OMB estimates only the costs and benefits of major rules, it does not capture the costs and benefits either of rules costing less than this or of regulatory programs that are not primarily implemented through rulemaking.

But OMB itself has concluded that major rules account for the "vast majority" of the total costs of federal rules.¹⁰² And Crain and Crain themselves tell only a tiny part of the story. As others have observed, they completely omit regulatory benefits, as if federal regulatory programs cost money but give us nothing in return.¹⁰³ More subtly, they completely ignore the fact that many federal programs in fact provide money to, rather than just taking money from, the very industries covered by the regulatory programs they criticize. Direct and indirect subsidies cost taxpayers billions of dollars every year, yet these costs do not figure at all in Crain and Crain's report.¹⁰⁴

Then there are outright errors that further inflate Crain and Crain's figures on regulatory costs. Table 3 of the study reports the costs of rules

99. By definition, RIAs are done for economically significant rules, and OMB reviews economically significant rules.

100. For a particularly dramatic example of changes made to an RIA during OMB review, see Sidney Shapiro, *Back to the Future: OMB Intervention in Coal Ash Rule Replicates the Bush Administration's Way of Doing Business*, CPRBLOG (Jan. 1, 2010), <http://www.progressivereform.org/CPRBlog.cfm?idBlog=1DDEA50F-E885-B550-C04BDE576F2C0B6E>.

101. CRAIN & CRAIN, *supra* note 6, at 4, 26.

102. OMB 2002 REPORT, *supra* note 67, at 38.

103. COPELAND, *supra* note 15, at 12–13; SHAPIRO ET AL., *supra* note 12, at 1–2, 6.

104. See, e.g., AUTUMN HANNA ET AL., GREEN SCISSORS 2011: CUTTING WASTEFUL AND ENVIRONMENTALLY HARMFUL GOVERNMENT SPENDING (2011), available at [http://heartland.org/sites/default/files/_Green_Scissors_2011_Web_\(2\)_pdf](http://heartland.org/sites/default/files/_Green_Scissors_2011_Web_(2)_pdf); Lisa Heinzerling, *New Directions in Environmental Law: A Climate of Possibility*, 35 HARV. ENVTL. L. REV. 263, 268–69 (2011).

issued “[t]hrough 2000, Q1” and the costs of rules issued from April 1999 to September 2001. This double counts the costs of rules issued between April 1, 1999 and March 31, 2000. It is difficult to know exactly how large a difference this double counting makes in Crain and Crain’s estimates because the OMB reports from which Crain and Crain draw do not provide annualized costs for all of the rules issued in the period of overlap.¹⁰⁵ But we do know the difference is large. Just considering the costs of the rules for which OMB does provide annualized cost estimates, we can see that the costs Crain and Crain double count amount to over \$3 billion (in 2009 dollars).¹⁰⁶ And this does not include two rules that together, several years out, were estimated to cost almost \$10 billion.¹⁰⁷ For the period October 2003 to October 2004, Crain and Crain report the costs of *all* federal rules and not just EPA rules.¹⁰⁸ The cost of this mistake is just over \$1 billion.¹⁰⁹ These errors together account for well over \$4 billion of the annual costs Crain and Crain attribute to environmental rules for the ten-year period from 1999 through 2008.

Crain and Crain also include the costs of many rules that no longer exist. Some of these rules were never put into effect because EPA chose to reconsider them. These include air toxics rules on boilers¹¹⁰ and plywood,¹¹¹ a New Source Performance Standard for petroleum refineries,¹¹² and the

105. OMB 2001 REPORT, *supra* note 42, at 22–28 tbl.4 (reporting costs of rules issued between April 1, 1999 and March 31, 2000, some annualized and some single-year).

106. *See id.* (providing the costs of storm water discharges (phase II), handheld engines, and section 126 petitions for purposes of reducing interstate ozone transport). All of our subsequent estimates of the effect, in dollars, of double counting and other errors on Crain and Crain’s total estimates are stated in 2009 dollars.

107. *See id.* (noting the Tier 2/new motor vehicle emissions standards at a cost estimate of \$5.3 billion per year (1997 dollars) in 2030 and the regional haze rule at a high-cost estimate of \$4.4 billion per year (1990 dollars) in 2015).

108. Crain and Crain report a high-cost estimate of just over \$4 billion for this period. CRAIN & CRAIN, *supra* note 6, at 26 tbl.3. This is the same as OMB’s estimate for the costs of all federal regulations for this same period. OFFICE OF MGMT. AND BUDGET, VALIDATING REGULATORY ANALYSIS: 2005 REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 12 tbl.1-3 (2005) [hereinafter OMB 2005 REPORT].

109. \$862 million in 2001 dollars.

110. *See* National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters, 69 Fed. Reg. 55,218 (Sept. 13, 2004) (to be codified at 40 C.F.R. pt. 63); OMB 2005 REPORT, *supra* note 108, at 13 tbl.1–4 (noting a high-end cost estimate of \$876 million in 2001 dollars).

111. *See* National Emission Standards for Hazardous Air Pollutants: Plywood and Composite Wood Products; List of Hazardous Air Pollutants, Lesser Quantity Designations, Source Category List; Reconsideration, 70 Fed. Reg. 43,820 (July 29, 2005) (to be codified at 40 C.F.R. pt. 63); OMB 2005 REPORT, *supra* note 108, at 13 tbl.1–4 (noting a high-end cost estimate of \$291 million in 2001 dollars).

112. *See* Standards of Performance for Petroleum Refineries, 73 Fed. Reg. 55,751 (Sept. 26, 2008) (granting reconsideration and stay of the effective date); OFFICE OF MGMT. AND

National Ambient Air Quality Standard (NAAQS) for ozone set in 2008.¹¹³ In including rules that the agency itself has pulled, Crain and Crain overstate actual regulatory costs for the relevant period by almost \$11 billion.

Similarly, Crain and Crain also include rules that no longer exist because the courts have overturned them. Rules invalidated by the courts, yet embraced within Crain and Crain's estimates of today's regulatory costs, include the Bush administration's Clean Air Act rule governing mercury from power plants,¹¹⁴ its Clean Water Act rules on concentrated animal feeding operations,¹¹⁵ and rules on cooling water intake structures at power plants and other facilities.¹¹⁶ The cost of including these rules in Crain and Crain's cost estimates is almost \$6 billion. It is also worth noting that two of the rules most cited in industry complaints about the aggressiveness of the Obama EPA are do-overs of these two invalidated rules—the proposed new rules on air toxics from power plants and on cooling water intake structures.¹¹⁷ Crain and Crain use defunct cost estimates associated with past, invalidated incarnations of these rules, and many observers have then taken Crain and Crain's flawed cost estimates as a reason to caution against the new rules in this administration—which include new versions of these very same rules.¹¹⁸ If ever there was double counting, this surely is it.

Crain and Crain also double count by including rules that together aim at the same regulatory end point. They include the 2006 NAAQS for

BUDGET, 2009 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 16 tbl.1-4 (2010) [hereinafter OMB 2009 REPORT] (noting a cost estimate of \$7 million in 2001 dollars).

113. See OMB 2009 REPORT, *supra* note 112, at 16 tbl.1-4 (noting a high-end cost estimate of \$7.73 billion in 2001 dollars).

114. See OFFICE OF MGMT. & BUDGET, 2006 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL AND TRIBAL ENTITIES 9 tbl.1-4 (2007) [hereinafter OMB 2006 REPORT] (noting a high-end cost estimate of \$500 million).

115. See OFFICE OF MGMT. & BUDGET, PROGRESS IN REGULATORY REFORM: 2004 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL AND TRIBAL ENTITIES 18 tbl.4 (2004) (noting a cost estimate of \$360 million).

116. See *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2d Cir. 2009) (vacating rule); National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576 (July 9, 2004) (to be codified at 40 C.F.R. pts. 9, 122-125); OMB 2005 REPORT, *supra* note 108, at 13 tbl.1-4 (noting a high-end cost estimate of \$383 million).

117. See, e.g., AM. LEGISLATIVE EXCH. COUNCIL, EPA'S REGULATORY TRAIN WRECK: STRATEGIES FOR STATE LEGISLATORS 12-13, 15 (2011), available at <http://timeopinions.files.wordpress.com/2011/10/epa-train-wreck-2011-final-full-printres.pdf>.

118. See *supra* text accompanying notes 7-9.

particulate matter¹¹⁹ and the implementation plans for meeting these standards,¹²⁰ while at the same time including other rules that also target the same emissions of particulate matter.¹²¹ Likewise, Crain and Crain include both the estimated costs of the 1997 ozone NAAQS¹²² and rules designed to meet those very standards.¹²³ OMB, for its part, eschews this kind of double counting.¹²⁴ The cost of Crain and Crain's double counting here is well over \$10 billion.

All told, these mistakes add up to over \$30 billion out of the \$48 billion Crain and Crain report for the costs of environmental regulation from 1999 to 2008.¹²⁵ And this only accounts for Crain and Crain's double counting and their inclusion of nonexistent rules, not for the likely overestimation of regulatory costs in RIAs¹²⁶ or for any other contestable part of their analysis. No one, we hope, would argue that it is acceptable to count the costs of the same rule more than once in estimating actual regulatory costs. Nor, we hope, would anyone argue that the costs of nonexistent rules should figure in estimates of actual regulatory costs. Taking out these phantom costs cuts Crain and Crain's estimate of the costs of environmental regulation post-2000 by two-thirds.

We have not toted up every single possible instance of double counting or of counting the costs of rules that are not in force. Once we discovered the magnitude of the errors in Crain and Crain's analysis, it seemed like

119. See National Ambient Air Quality Standards for Particulate Matter, 71 Fed. Reg. 61,144 (Oct. 17, 2006) (to be codified at 40 C.F.R. pt. 50); OFFICE OF MGMT. & BUDGET, 2007 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 9 tbl.1-4 (2008) [hereinafter OMB 2007 REPORT] (noting a high-end cost estimate of \$2.83 billion in 2001 dollars, equivalent to \$3.42 billion in 2009 dollars).

120. See OFFICE OF MGMT. & BUDGET, 2008 REPORT TO CONGRESS ON THE BENEFITS AND COSTS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 11 tbl.1-4 (2009) (noting a high-end cost estimate of \$7.32 billion in 2001 dollars).

121. Rules on regional haze, boilers, petroleum refineries, automobile emissions, and more: all share particulate matter emissions as one of their regulatory targets.

122. See OFFICE OF MGMT. & BUDGET, REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS 79 tbl.15 (1998) (noting a cost estimate of \$4.5 billion in 1996 dollars, equivalent to over \$6.1 billion in 2009 dollars).

123. See OMB 2006 REPORT, *supra* note 114, at 8 tbl.1-4 (noting a cost estimate of \$1.89 billion in 2001 dollars for the Clean Air Interstate Rule Formerly Titled: Interstate Air Quality Rule); OMB 2000 REPORT, *supra* note 42, at 38, 39 (noting a cost estimate of \$1.7 billion in 1990 dollars for the NO_x SIP Call).

124. See OMB 2007 REPORT, *supra* note 119, at 36.

125. The figures are converted from CRAIN & CRAIN, *supra* note 6, at 26 tbl.3, which were reported in 2001 dollars, to 2009 dollars based on the figures reported in CRAIN & CRAIN, *supra* note 6, at 31 tbl.6, which were reported in 2009 dollars.

126. See *supra* text accompanying notes 94-100.

overdoing it to chase after more double counted or miscounted millions when we had found so many double counted and miscounted billions.

But be assured: there are more millions, and even billions, to be found, and excised from Crain and Crain's estimates. For example: OMB's 1998 report estimates an annual cost of \$17 billion in 1996 dollars for the 1997 particulate matter NAAQS (\$23.28 billion in 2009 dollars). This estimate is carried over into Crain and Crain's estimates through their use of OMB's 2001 report. Yet Crain and Crain also include the costs of many rules that reduce particulate matter and are aimed in large part at attaining that 1997 standard. If the 1997 NAAQS rule is removed from Crain and Crain's aggregate cost estimate, that estimate declines by over \$23 billion. And another example of many millions left on our cutting room floor: Crain and Crain's estimates surely include the costs of EPA's 1989 ban on asbestos—overturned in court almost twenty years ago.¹²⁷

C. Workplace Safety and Health

Crain and Crain estimate costs of \$64.3 billion for occupational safety and health regulations issued prior to 2001, and \$471 million for such regulations issued between 2001 and 2008.¹²⁸ For the costs of rules issued before 2001, Crain and Crain rely on a book chapter published in 2005 by Joseph M. Johnson.¹²⁹ As Sidney Shapiro and his co-authors from the Center for Progressive Reform have tellingly observed, Johnson's figure has an exceptionally dubious provenance: Johnson aggregates cost estimates for occupational safety and health rules through 2001, then multiplies them by 5.55 based on a 1996 study¹³⁰ which itself relied on a 1974—yes, 1974—estimate of compliance costs (“unpublished and otherwise unavailable,” Shapiro et al. point out) by the National Association of Manufacturers.¹³¹ Despite these awkward origins, Crain and Crain apparently think so highly of the Johnson estimate that they report they used the Johnson calculations

127. These costs are included in OMB's 2001 report (incorporated by Crain and Crain) through use of estimates compiled in 1996 for major rules issued between 1987 and 1994. The asbestos ban was issued in 1989, Asbestos Ban and Phaseout Rule, 40 C.F.R. § 763 (1989), and estimated (on the high end, which is what Crain and Crain used) to cost approximately \$62 million per year. If Crain and Crain's analysis is to be believed, we are still paying over \$100 million a year (based on adjusting the \$62 million figure for inflation, as Crain and Crain do) for this ban, which was overturned by the courts in 1991. See *Corrosion Proof Fittings v. Env'tl. Prot. Agency*, 947 F.2d 1201 (5th Cir. 1991). For the anti-regulatory crowd, this defunct ban is certainly the gift that keeps on giving. See *Five Hundred Life-Saving Interventions*, *supra* note 23, at 156 (criticizing the invalidated asbestos ban in one-third of the environmental measures discussed).

128. CRAIN & CRAIN, *supra* note 6, at 30 tbl.5 (reporting cost in 2009 dollars).

129. *Id.* (citing Johnson, *supra* note 18).

130. JAMES, *supra* note 18.

131. SHAPIRO ET AL., *supra* note 12, at 9.

“where possible, that is, until 2001.”¹³² Apart from showing a strange preference for calculations of dubious quality, Crain and Crain’s suggestion that it was not possible to use the Johnson estimate for rules after 2001 betrays a lack of understanding of how that estimate was derived. All Crain and Crain had to do, if they really believed in the Johnson estimate as much as they appeared to, was to multiply the cost estimates for rules issued after 2001 by 5.55!¹³³

One of us has previously criticized this multiplier, which comes from a study by Harvey James:¹³⁴

Harvey James estimates the costs of compliance with 25 OSHA regulations as of 1993. But he also observes that the cost per firm was 5.5 times higher in a 1974 study of OSHA compliance costs done by the National Association of Manufacturers. James then simply asserts that the costs per firm could not be lower today than in 1974. On that basis, he multiplies his 1993 numbers by 5.5—thereby eliminating all empirical content in his study of 1993 costs, and simply recycling a 1974 estimate by an anti-regulatory industry group.¹³⁵

It is worth noting that James himself had more modest claims for his own study, cautioning that his cost calculations were “estimates only . . . and not measures of actual expenditures.”¹³⁶ He emphasized that the rules he studied had been issued in “different time periods” and that “estimates of the compliance costs of OSHA do not take into account new rules, changes in existing regulations, or old rules no longer aggressively enforced by the agency.”¹³⁷ None of these cautions reappears in Crain and Crain’s wholesale adoption of James’s estimates.¹³⁸

Crain and Crain’s estimate for the costs of rules on workplace safety and health regulation issued from 2001 to 2008 has the same basic flaw as many of their estimates of environmental regulatory costs: the estimate

132. CRAIN & CRAIN, *supra* note 6, at 31.

133. Crain and Crain also are mistaken to say that the figure they report for OMB’s estimates of the costs of OSHA rules run from 2001 to 2008. CRAIN & CRAIN, *supra* note 6, at 30 tbl.5. Actually, the OMB source they cite covers rules from 1998 to 2008. OMB 2009 REPORT, *supra* note 112, at 10-11 tbl.1-2.

134. JAMES, *supra* note 18.

135. Ackerman, *supra* note 87, at 1085-86; *see also* SHAPIRO ET AL., *supra* note 12, at 9.

136. JAMES, *supra* note 18, at 10.

137. *Id.* at 5.

138. Nonexistent rules make an appearance here, too: Johnson (based on James) includes over \$1 billion (in 2009 dollars) in costs for OSHA’s air contaminants rule. Johnson, *supra* note 18, at 34 tbl.10. The rule was overturned almost twenty years ago in *AFL-CIO v. Occupational Safety & Health Admin.*, 965 F.2d 962 (11th Cir. 1992).

includes costs that do not exist.¹³⁹ To take one example, a good portion—\$327 million out of \$470 million—of the costs Crain and Crain report for workplace rules from 2001 to 2008 comes from just one rule: OSHA's rule setting limits for hexavalent chromium.¹⁴⁰ After this rule was issued, the parties challenging the rule agreed to significant changes in the rule to make it more flexible and less costly.¹⁴¹ But Crain and Crain use the previous version of the rule in their analysis.¹⁴² Here, too, Crain and Crain report the costs of a rule that does not exist in the form they assume.

CONCLUSION

If statistical analysis required a driver's license, Crain and Crain could have theirs revoked for reckless and dangerous driving. On economic regulation, their one-equation calculation, worth \$1.24 trillion in their fantasy of regulatory costs, rests on misunderstanding the definition of their data, flunking an elementary question on the normal distribution, padding the analysis with seven years of near-identical data, and failing to recognize the difference between correlation and causation. Their methods could just as easily be read as claiming that economic benefits would result from cutbacks in education as from cutbacks in regulation—yet, no one has argued that is a credible position.

On environmental regulation, Crain and Crain wheel out decades-old studies of decades-old rules. The bulk of their estimate rests on the idea that *voluntary* unemployment is the real culprit in today's regulatory environment. The remainder of it is filled to the brim with nonexistent rules and other phantoms—as is their flawed estimate of the costs of workplace safety and health rules.

139. Crain and Crain also repeat here the error of double counting the costs of some years' regulatory output. Crain and Crain report that their estimates from OMB's annual reports cover the years 2001 to 2008. CRAIN & CRAIN, *supra* note 6, at 30 tbl.5. In fact, those reports cover the years 1998 to 2008 and thus overlap for three years with the period covered in the James study. OMB 2009 REPORT, *supra* note 112, at 10 tbl.1–2.

140. See OMB 2007 REPORT, *supra* note 119, at 9 tbl.1–4 (reporting a high-end cost estimate of \$271 million in 2001 dollars for this rule, which works out to approximately \$327 million after adjusting for inflation).

141. See Settlement Agreement, Surface Finishing Indus. Council v. Occupational Safety & Health Admin., No. 06-2272 and Pub. Citizen Health Research Grp. v. Occupational Safety & Health Admin., No. 06-1818 (3d Cir. Oct. 25, 2006), available at http://www.osha.gov/SLTC/hexavalentchromium/elect_sign_steelworkers.html.

142. Crain and Crain rely on OMB's 2007 estimate of the cost of this rule, which itself used OSHA's estimate of the cost of the original rule and not the rule as changed after settlement. See Occupational Exposure to Hexavalent Chromium, 71 Fed. Reg. 10,100, 10,263 (Feb. 28, 2006) (reporting a cost estimate of \$288 million per year in 2003 dollars, which works out to OMB's cost of \$271 million when 2001 dollars are used); OMB 2007 REPORT, *supra* note 119, at 9 tbl.1–4 (reporting a cost estimate of \$271 million).

It would be bad enough if this were a private study, undertaken with private funds, lacking any official imprimatur. Even then, the viral spread of the utterly unfounded \$1.75 trillion estimate through the public sphere would be worrying enough. But this is a study requested, funded, reviewed, and edited by a government agency, the SBA's Office of Advocacy.¹⁴³ Taxpayers shelled out almost \$100,000 for this nonsense.¹⁴⁴ More fundamentally, the Office of Advocacy's sponsorship and official embrace of the study—running all the way from initially conceiving the study, funding it, reviewing it, and editing it, to officially defending the study in testimony before Congress even after it had been severely criticized¹⁴⁵—embroils this public agency in an unwholesome blend of ineptitude and bias. Before funding any more anti-regulatory research that threatens to repeat the same sad story,¹⁴⁶ the Office of Advocacy should officially, emphatically, and loudly disown the methodology and findings of Crain and Crain's problematic report. "Advocacy" is not an excuse for phony numbers.

143. CRAIN & CRAIN, *supra* note 6, at cover page (stating that report was "reviewed and edited by officials of the Office of Advocacy," though hedging as to whether the "final conclusions" of the report reflected the views of that office).

144. \$99,500, to be exact. *See, e.g.*, Contract between U.S. Small Bus. Administration, Office of Procurement & Grants Mgmt., & Mark Crain for the *Impact of Regulatory Costs on Small Firms* (Sept. 24, 2008), http://www.progressivereform.org/articles/Crain%20and%20Crain_20Contract.pdf.

145. *See Assessing The Impact Of Greenhouse Gas Regulations On Small Business (Part 2 of 2)* (House Oversight Committee broadcast Apr. 6, 2011, 1:03:33), *available at* <http://www.archive.org/details/gov.house.ogr.ra.20110406.2> (oral testimony by Claudia R. Rodgers, Deputy Chief Counsel for Advocacy, SBA Office of Advocacy). Rodgers defends the Office of Advocacy's failure to ask Crain and Crain to report on benefits of regulation, stating that the Office of Advocacy is "not required to ask for [the underlying] data" when it sponsors studies, defends the peer review process for the study, and defends the study as having the "exact same methodologies" as previous studies sponsored by the Office of Advocacy. *Id.*

146. James Goodwin, *On Heels of Debunked Report, SBA's Office of Advocacy Solicits More Anti-Regulatory Research*, CPRBLOG (Aug. 16, 2011), <http://www.progressivereform.org/CPRBlog.cfm?idBlog=CF8517C8-C94D-590E-C7AD9962D431FB0A>.