# The Impact of Regulatory Costs on Small Firms

by

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**Easton, PA**

for



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# Executive Summary

The annual cost of federal regulations in the United States increased to more than $1.75 trillion in 2008. Had every U.S. household paid an equal share of the federal regulatory burden, each would have owed $15,586 in 2008. By comparison, the federal regulatory burden exceeds by 50 percent private spending on health care, which equaled $10,500 per household in 2008. While all citizens and businesses pay some portion of these costs, the distribution of the burden of regulations is quite uneven. The portion of regulatory costs that falls initially on businesses was $8,086 per employee in 2008. Small businesses, defined as firms employing fewer than 20 employees, bear the largest burden of federal regulations. As of 2008, small businesses face an annual regulatory cost of $10,585 per employee, which is 36 percent higher than the regulatory cost facing large firms (defined as firms with 500 or more employees).

The regulatory landscape highlighted above and detailed in this report emerges from an updated analysis of the regulatory record explored in three previous studies for the Office of the Chief Counsel for Advocacy of the U.S. Small Business Administration (Hopkins, 1995; Crain and Hopkins, 2001; and Crain, 2005). Direct comparisons to the results in these prior studies should be made with caution, however. The present study introduces some new methodological techniques, which may account for some of the differences in the cost estimates for 2008 versus those for prior years.

# I. Purpose and Highlights

Government regulations pervade modern life in America and other nations with few exceptions. Regulations are needed to provide the rules and structure for societies to properly function.  This research, while mindful of this fact, does not consider the benefits of federal regulations, but looks at the overall costs imposed by them.  Little stock is taken of the cumulative effects.

Unlike most fiscal actions taken by government, the costs of regulatory actions are relatively hidden. For example, consider the activities, products, and services consumed by a typical household on a typical day. The costs of government regulations get stirred into the indistinct mixture of countless economic forces that determine prices, costs, designs, locations, profits, losses, wages, dividends, and so forth. Isolating the contribution of regulations to one's daily routine requires more than simply looking at the sales receipts, for example, as in the case of government sales taxes. A comprehensive list of regulatory influences that affect one's daily existence is indeed extensive and overwhelming to track or sum up. Yet, knowledge of the cumulative consequences of regulatory actions, and how these are changing, provides important information to assess and evaluate the performance of a political-economic social system.

This report seeks to fill some of these gaps in our knowledge by providing estimates of the costs of federal government regulations in the United States. An awareness of regulatory costs reveals much about the balance in public versus private sector responsibilities for and control over resources. Transparency about compliance costs can inform critical judgments about what society gives up in exchange for government responsibility exercised through the machinery of the regulatory process.

Policymakers long ago recognized the importance of information about U.S. taxing and spending programs; such fiscal information has been provided systematically

for nearly a century and is in fact mandated by the Constitution (Article 1, Section 9).

The annual federal budget process and the *Budget of the United States* provide

considerable detail regarding where the money comes from and how it is spent. The

quest for transparency in the nation's fiscal affairs has increased through the online

availability of and public access to detailed budget information.

Unfortunately, comparable information about the impact of federal regulatory

programs is largely absent. Federal regulations escaped any rigorous scrutiny until

limited tracking was mandated by Executive Order 11821 in 1974. The federal

Regulatory Right-to-Know Act, enacted in 2000, was a major attempt to make

information about the costs and benefits of regulations far more transparent and widely

available than before. This act requires the U.S. Office of Management and Budget

(OMB) to submit an accounting statement and report that includes an estimate of the

total annual costs and benefits of federal rules and paperwork "to the extent feasible."[1]

In the 2009 Report from OMB, the estimated annual cost of major federal

regulations ranges between $51 billion and $60 billion in 2001 dollars. Denominated in

2009 dollars (that is, adjusting for inflation), this annual cost is between $62 billion and

$73 billion. The estimated cost range provided in OMB's report differs markedly from

estimates in three prior studies commissioned by the Office of Advocacy of the U.S.

Small Business Administration (hereafter referred to as "Advocacy").[2] Thomas Hopkins

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[1] Section 624 of the Treasury and General Government Appropriations Act of 2001, Pub. L. 106-554, 31 U.S.C. § 1105 note.

[2] Thomas D. Hopkins, *Profiles of Regulatory Costs. Report to the U.S. Small Business Administration*, U.S. Department of Commerce, National Technical Information Service #PB96 128038, November 1995 (http://www.sba.gov/advo/). W. Mark Crain and Thomas D. Hopkins, *The Impact of Regulatory Costs on Small Firms*, U.S. Small Business Administration, 2001 (http://www.sba.gov/advo/). Hopkins (1995) began to fill the information vacuum regarding the federal regulatory burden, presenting a profile of the level and distribution of federal regulatory compliance costs using data through 1992, and made cost projections through 2000. The Hopkins study was updated and extended in Crain and Hopkins (2001); that study examined the actual, as distinct from projected, regulatory burden in 2000. Crain (2005) updated and provided methodological revisions to the 2001 study and estimated compliance costs for 2004.

(1995) estimated annual federal regulatory costs to be $777 billion. Mark Crain and

Thomas Hopkins (2001) estimated the annual costs to be $876 billion (both numbers are

converted here to 2001 dollars, the base year normally used by OMB in its reports).

More recently, Crain (2005) estimated the annual costs to be in excess of $1 trillion

(again in 2001 dollars). According to these three studies for Advocacy, the costs of

federal regulations are larger than the costs reported by OMB by a factor of 13 to 17.

What accounts for this large discrepancy?

OMB discusses this issue openly and candidly, stating in its 2009 *Report*:

"because these estimates exclude non major rules and rules adopted more than ten

years ago, the total benefits and costs of all Federal rules now in effect are likely to be

significantly larger than the sum of the benefits and costs reported."[3]

It is worth emphasizing at the beginning of this report the main factors that cause

OMB's estimates to differ so greatly from those in the studies for Advocacy, including the

new estimates presented here for 2008. If OMB or other government-provided estimates

were complete and comprehensive, further study would add little value. First, in

compiling its accounting statement, OMB includes only those regulations that it cleared

during the previous 10 years, which in the 2009 report included October 1, 1998, to

September 30, 2008. Limiting the analysis to this time period omits some of the most

costly federal regulations, such as the regulations stemming from the parts of the Clean

Air Act and its amendments that were enacted before 1998.

Second, the annual OMB accounting statements are based solely on cost-benefit

analyses that were performed by the separate federal agencies.[4] In other words, the

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[3] U.S. Office of Management and Budget, Office of Information and Regulatory Affairs (2005), *Draft Report to Congress on the Costs and Benefits of Federal Regulations*, p. 9.

[4] In some cases, the cost estimates are based on OMB's transparent modifications of agency-provided cost-benefit estimates. Agencies are not required to perform cost-benefit analyses on

sources for the cost and benefit estimates that OMB uses to compile its accounting

statement are the federal agencies that promulgate and enforce regulations, and those

agencies frequently declare many costs to be "inestimable." This means that while the

annual OMB accounting statements offer a trove of relevant information, the coverage in

these annual statements is limited; federal agencies have not assessed the costs (or the

benefits) for a host of regulatory activities — past and present. This is particularly

problematic in the case of economic regulations, which have not been analyzed by

federal agencies and therefore have not been included in OMB's annual accounting

total. Burdensome economic regulations such as import restrictions, antitrust policies,

telecommunications policies, product safety laws, and many other restraints on business

activities are implemented outside of the OMB regulatory review process.[5] None of these

regulatory costs are therefore included in OMB's annual estimates of total costs.

Third, the OMB annual reports to Congress include "major" regulations reviewed

by OMB. This methodological decision is understandable given the massive volume of

"non major" regulations. Nonetheless, thousands of non major regulations in the

aggregate may amount to substantial costs. Fourth, and finally, a host of regulations are

issued by independent regulatory agencies — federal government entities that fall

outside the executive branch — and, therefore, are not subject to the reporting

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regulations that are expected to have an economic impact of less than $100 million, and thus
these are omitted from OMB's cost estimate.

[5] For example, regulations implemented directly through the legislative process are outside the
OMB review process. Furthermore, the totality of rules, both existing and new, with anticipated
impacts below $100 million, and not subject to the Paperwork Reduction Act, are also outside the
OMB review process.

requirements in Executive Order 12866.[6] The costs and benefits of such regulations are not included in the aggregate costs and benefits reported by OMB.[7]

These and other differences between OMB's cost calculations and those used in this study will be described in further detail in the sections that follow. This preliminary discussion anticipates the natural question about the large difference between OMB's cost estimates and the cost estimates in Hopkins (1995), Crain and Hopkins (2001), Crain (2005), and those presented in this study. An appreciation of the limitations of OMB's regulatory accounting procedures also motivates one of the purposes of this study, which is an inclusive accounting of all federal regulations and their estimated cost. The cost estimates provided by OMB — in general, calculated by the specific executive branch agency that promulgated the regulation — are used whenever possible in this report, in particular for environmental regulations, occupational safety and health, and homeland security regulations. In the case of regulatory activities for which OMB does not offer cost estimates, the report performs independent analysis to approximate the costs and relies on other secondary sources. For example, the report specifies and estimates an econometric model and then uses the parameters to estimate the cost of economic regulations.

This report seeks to update and improve the 1995, 2001, and 2005 studies for Advocacy and advance the understanding of who bears what burdens from regulation. In particular, the report seeks to identify the federal regulatory burden on small U.S. firms, and to assess whether and to what extent this burden disadvantages small businesses

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[6]  Exec. Order No. 12,866 §1(a), 58 Fed. Reg. 51,735 (Sept. 30, 1993).

[7]  On this subject, OMB (2009, p. 23) states that "…it would be highly desirable to obtain better information on the costs and benefits of these rules." The OMB reports provide in tabular form information that is available from the Government Accountability Office (GAO) about the costs and benefits of regulations issued by independent regulatory agencies. As OMB (2009) notes, monetized costs were reported for only two rules issued by independent regulatory agencies for the period 2007-2008.

relative to their larger competitors. Underlying the significance of this assessment for the U.S. economy is the fact that 89 percent of all firms in the United States employ fewer than 20 workers. By comparison, large firms (defined as those with 500 or more employees) account for only 0.3 percent of all U.S. firms.[8] If federal regulations place a differentially large cost on small business, this potentially causes inefficiencies in the structure of American enterprises, and the relocation of production facilities to less regulated countries, and adversely affects the international competitiveness of domestically produced American products and services. All of these effects, of course, would have negative consequences for the U.S. labor market and national income.

### *Some Key Findings: The Cost of Federal Regulations in 2008*

The findings in this report indicate that in 2008, U.S. federal government regulations cost an estimated $1.75 trillion, an amount equal to 14 percent of U.S. national income. When combined with U.S. federal tax receipts, which equaled 21 percent of national income in 2008, these two costs of federal government programs in 2008 consumed 35 percent of national income.  This obviously represents a substantial burden on U.S. citizens and businesses.

It is important to stress that direct comparisons between 2008 and prior years must be made cautiously because new estimation methodologies introduced in this study were not possible previously. This means that some of the cost differences are attributable to different estimation techniques. Given this cautionary caveat, the

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[8]  Tables 7 and 8 provide snapshots of the size distribution of American businesses. It should be pointed out that large firms employ 50 percent of all workers, whereas small firms employ 18 percent of all workers in the United States. These snapshots are computed from data compiled by the U.S. Census Bureau for Advocacy (source: U.S. Small Business Administration website, http://www.sba.gov/advo/research/data.html).  For general information about the relevance of small business to the US economy, see Frequently Asked Questions on the U.S. SBA website, http://web.sba.gov/faqs/faqindex.cfm?areaID=24.

comparable cost in 2004 was an estimated $1.26 trillion (in 2009 dollars), or 11 percent of national income (Crain, 2005).[9] If regulatory costs in 2004 are recomputed using the methodologies introduced in this study, those costs rise by $445 billion to an estimated $1.7 trillion (again, converted into 2009 dollars). This apples-to-apples comparison — that is, using the same estimation methods —suggests that the cost of federal regulations increased by $43 billion (or three percent) between 2004 and 2008 after adjusting for inflation.

What is the distribution of federal regulatory costs among firms of different sizes? The findings in this report indicate that compliance costs fall disproportionately on small businesses. Table 1 summarizes the incidence of costs by firm size based on aggregate data for all sectors of the U.S. economy.

**Table 1. Distribution of Regulatory Compliance Costs by Firm Size in 2008 ***

| Type of Regulation | Cost per Employee | | | |
| --- | --- | --- | --- | --- |
| | All Firms | Firms with <20 Employees | Firms with 20-499 Employees | Firms with 500+ Employees |
| All Federal Regulations | $8,086 | $10,585 | $7,454 | $7,755 |
| Economic | $5,153 | $4,120 | $4,750 | $5,835 |
| Environmental | $1,523 | $4,101 | $1,294 | $883 |
| Tax Compliance | $800 | $1,584 | $760 | $517 |
| Occupational Safety and Health, and Homeland Security | $610 | $781 | $650 | $520 |

**\* Notes to Table 1:**

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[9] Milton Friedman put the estimated burden of government mandates and regulations at roughly 10 percent of U.S. national income in 2003. See Milton Friedman, "What Every American Wants," *Wall Street Journal,* January 15, 2003, p. A10.

Costs are denominated in 2009 dollars. The cost per employee for each firm size category uses employment shares for the respective business sectors to compute the weighted averages.

Considering all federal regulations, all sectors of the U.S. economy, and all firm sizes, federal regulations cost $8,086 per employee per year in 2008. For firms with fewer than 20 employees, the cost is $10,585 per employee per year. The cost is $7,454 in medium-sized firms, and $7,755 in large firms. Costs per employee thus appear to be at least 36 percent higher in small firms than in medium-sized and large firms. These results are roughly consistent with the findings in Hopkins (1995), Crain and Hopkins (2001), Crain (2005), as well as other studies completed during the past 25 years.[10]

The underlying force driving this differential cost burden is easy to understand. Many of the costs associated with regulatory compliance are "fixed costs," that is, a firm with five employees incurs roughly the same expense as a firm with 500 employees. In large firms, these fixed costs of compliance are spread over a large revenue, output, and employee base, which results in lower costs per unit of output as firm size increases. This is the familiar empirical phenomenon known as economies of scale, and its impact is to provide a comparative cost advantage to large firms over small firms.

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[10]   Studies on the incidence of regulatory costs among firms of different sizes include Henry B. R. Beale and King Lin, *Impacts of Federal Regulations, Paperwork, and Tax Requirements on Small Business*, SBAHQ-95-C-0023; Microeconomic Applications, Inc., prepared for the Office of Advocacy, U.S. Small Business Administration, September 1998; Roland J. Cole and Paul Sommers, *Costs of Compliance in Small and Moderate-sized Businesses*, SBA-79-2668, Battelle Human Affairs Research Centers, Seattle, WA, February 1980; *Improving Economic Analysis of Government Regulations on Small Business*, SBA-2648-OA-79, JACA Corporation, Fort Washington, PA, January 1981; Robert J. Gaston and Sidney L. Carroll, *State and Local Regulatory Restrictions as Fixed Cost Barriers to Small Business Enterprise*, SBA-7167-AER-83, Applied Economics Group, Inc., Knoxville, TN, April 1984; and, *Economies of Scale in Regulatory Compliance: Evidence of the Differential Impacts of Regulation by Firm Size*, SBA-7188-OA-83, Jack Faucett Associates, Chevy Chase, MD, December 1984. For a theoretical discussion, see William A. Brock and David S. Evans, *The Economics of Small Businesses: Their Role and Regulation in the U.S. Economy*, Holmes & Meier, New York, NY, 1986, especially chapters 4 and 5. A recent survey and extension of this literature is provided by Steven C. Bradford, "Does Size Matter? An Economic Analysis of Small Business Exemptions from Regulation," *The Journal of Small and Emerging Business Law,* 8 (1), 2004, pp. 1-37.

The findings in Table 1 illustrate that the compliance cost disadvantage faced by small businesses is driven by environmental regulations, tax compliance, occupational safety and health, and homeland security regulations. The cost per employee of environmental regulations is more than four times higher in small firms than in large firms. With respect to tax compliance, the cost per employee is three times higher in small firms than in large firms. The particular drivers of the distribution of compliance costs among firm sizes differ across sectors of the U.S. economy. Later sections of the report lay out these patterns in further detail. It is worth highlighting the finding that not all regulations fall more heavily on small businesses than on larger firms. For example, the cost per employee of economic regulations falls most heavily on large firms. In part, this likely reflects the fact some industrial structures do not lend themselves to small firm participation (*e.g.*, utilities, telecoms, or mining) because large scale operations are a precondition to remain competitive. This simply reduces the number of small enterprises that would be affected. Another factor impacting the distribution of economic regulations is the Regulatory Flexibility Act (RFA). Under the RFA agencies are required to assess the effect of regulations on small businesses, and to mitigate undue burdens, including exemptions and relaxed phase-in schedules.[11]

This report details the distribution of regulatory costs for five major sectors of the U.S. economy: manufacturing, trade (wholesale and retail), services, health care (including social assistance), and "other" (a residual category containing all businesses not included in the other four).[12] This is the same five-sector grouping that was used in

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[11] This may be especially relevant in the cost of complying with Section 404 of the Sarbanes-Oxley Act of 2002. The impact of the exemption of small business entities has resulted in cost savings in the billions. See U.S. Small Business Administration, Office of Advocacy (annual editions), *Annual Report of the Chief Counsel for Advocacy on Implementation of the Regulatory Flexibility Act and Executive Order 13272,*

[12] The "other" category includes the following industries: forestry, fishing, hunting & agriculture; mining; utilities; construction; and transportation and warehousing.

the prior report for SBA. The sector-specific findings reveal that the disproportionate cost burden on small firms is most dramatic in the manufacturing sector; the compliance cost per employee for small manufacturers is more than double the compliance cost for medium-sized and large firms. In the health care sector and the "other" sector categories, the compliance costs also appear starkly higher in small firms compared with medium-sized and large firms. In the service and trade sectors, the distribution of regulatory costs among firm sizes is much more even overall, yet varies depending on the type of regulation.

The remainder of the report is organized into three sections and four appendices. Section II gives an overview of the regulatory accounting methodology and describes the primary sources for the cost estimates used in the report. Section III begins with a snapshot of American enterprise, showing the distribution of firms, employees, and payroll expenditures for the major sectors of the U.S. economy. It then presents the underlying assumptions and maps the methods used to allocate: (i) the regulatory burden that falls on business, (ii) the regulatory costs across business sectors, and (iii) the regulatory costs by firm size within each business sector. Section IV provides the detailed findings for the distribution of the costs across the sectors and firm sizes, and by type of regulation. The appendices contain details for the various analytical procedures used in the report, and supplemental information about the "on-budget" expenditures on federal regulatory agencies.

This report does not address the benefits of regulation, an important challenge that would be a logical next step toward achieving a rational regulatory system. The annual accounting statements compiled by OMB move toward such a system by presenting partial estimates of benefits as well as costs. This report, thus, should be seen as a building block toward a broader understanding of the costs of regulation, much of which creates important and substantial benefits. Like data on federal budgetary

outcomes, the regulatory cost estimates inform the discussion about the balance

between public and private sector control over resources.

# II. Scope of Regulatory Costs

## *Perspective on Regulatory Accounting*

The imbalance between what is known about the costs and benefits of government regulations versus government fiscal programs is hardly surprising. Regulatory accounting requires the discovery of relevant costs and benefits not reflected in any governmental cash flow, which is inherently a difficult task. Fiscal accounting is simpler in two respects: it has the luxury of using well documented monetary flows tied to tax receipts and agency expenditures, and it tracks costs but not the associated benefits. Notwithstanding the practical difficulties associated with regulatory accounting, the impact of government regulations on business and citizen activities is no less real than the impact of fiscal programs.

The total direct cost of federal regulations consists of resources employed by government agencies to promulgate, monitor, and enforce regulations, as well as the compliance activities by citizens and enterprises. This report follows the practice in the three predecessor studies for Advocacy by focusing on the latter: the resource costs over and above those that show up in the federal budget and agency personnel charts. The report provides an accounting of the nonbudgeted costs imposed on individuals and businesses to comply with regulations. A simple example illustrates this perspective on regulatory accounting. The total direct cost to the nation of, say, a pollution control regulation consists of spending by the U.S. Environmental Protection Agency for monitoring and enforcement activities, plus spending by businesses to install abatement equipment, hire environmental engineers, attorneys, accountants, and so on to comply with the regulatory rules. EPA spending shows up in the federal budget, and therefore would not be included in this report's cost accounting. Rather, this report includes estimates of the impact on those who are regulated: the spending by businesses to

install abatement equipment, hire engineers, and so forth. In this sense, the estimates presented understate the full cost of federal regulations.

Regulatory agency spending — the cost component this report excludes — amounts to less than 3 percent of the nonbudgeted regulatory compliance costs on which this report focuses. Nonetheless, spending by federal regulatory agencies on regulatory activity reached $47 billion in fiscal year 2008, so it is not trivial. Appendix 4 provides the on-budget costs of federal regulations, and shows how these budgets have grown over time. Between 1990 and 2008 regulatory agency budgets grew by 129 percent in inflation-adjusted dollars, an average annual rate of about 7 percent.[13] Total staffing of federal regulatory activity in fiscal year 2008 equaled 249,471 full-time equivalent employees. These staffing levels grew by 63 percent between 1990 and 2008, or 4 percent on an annualized basis. While these on-budget indicators of federal regulatory costs are large and growing, they represent only a tiny fraction of the nonbudgeted compliance costs on which this report focuses. To reiterate, on-budget spending on federal regulatory activity equals only 2.7 percent of the estimated compliance costs borne by U.S. citizens and businesses.

Other important regulatory costs are not captured in this report's estimates, most notably activities by state and local governments, indirect burdens, and general equilibrium effects. Regulatory agencies in the 50 American states have promulgated hundreds of thousands of regulations that are superimposed on federal regulations. Consider state-level environmental regulations as just one example. The sections of the

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[13]  These data are from Veronique de Rugy and Melinda Warren (2009), *Expansion of Regulatory' Budgets and Staffing Continues to Rise: An Analysis of the U.S. Budget for Fiscal Years 2009 and 2010,* Regulatory Report 31, Arlington, VA: Mercatus Center, George Mason University*. Appendix 4 in this report presents additional data from their study of regulatory budgets and staffing.

State Administrative Codes that regulate the environment consist of 18 million words.[14]

The costs of complying with hundreds of thousands of state regulations are not explicitly

considered here, but clearly add to the nation's total regulatory compliance burden.[15]

       The report uses various methods to determine how the costs of regulations are

distributed: between businesses and individuals, among sectors of the U.S. economy,

and among businesses of different sizes. These tend to reflect the initial or statutory

burden of the regulations, that is, based on who bears the initial compliance costs. It

needs to be acknowledged that this initial compliance burden can be shifted, and the

final incidence of regulations may differ from this initial or statutory assignment of the

regulatory costs. The difference between the initial incidence and how costs are

ultimately divided depends on the demand and supply elasticities in the respective

product and input markets. The final incidence of the federal regulatory burden is likely

to differ from the initial incidence of costs. Of course, this is exactly analogous to the

distinction between how a government collects a tax versus who ultimately pays for the

tax. Collecting 100 percent of gasoline taxes from the service station owner does not

necessarily mean that the owner bears the full burden of the gas tax. Rather, the gas tax

is passed on to consumers to the extent they are willing to pay a higher price at the

pump. While acknowledging that shifting in the cost burdens will occur, this report does

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[14] See W.M. Crain, "18 Millions Words Can Hurt You: The Cost of State Environmental Regulations," Policy Studies Working Paper, Lafayette College, 2010.

[15] A recent study of California state regulations estimated the costs of that state's regulation to be $493 billion in 2007; see Sanjay B. Varshney, and Daniel H. Tootelian, *Cost of State Regulations on California Small Businesses Study,* California State University, Sacramento, September 2009. Other researchers have ranked states in terms of their relative regulatory burden, for examples: John D. Byars, Robert E. McCormick, and T. Bruce Yandle, *Economic Freedom in America's 50 States: A 1999 Analysis*, State Policy Network, 1999; Ying Huang, Robert E. McCormick, and Lawrence McQuillen, *U.S. Economic Freedom Index: 2004 Report*, Pacific Research Institute, 2004; and Lawrence J. McQuillan, Michael T. Maloney, Eric Daniels, and Brent M. Eastwood, *U.S. Economic Freedom Index: 2008 Report,* Pacific Research Institute, 2008. A different methodology is used by Amela Karabegovic and Fred McMahon (with Christy G. Black) to rank American States and Canadian Provinces. See *Economic Freedom of North* America, The Fraser Institute, annual editions since 2002. No estimates seem to be available for the aggregate costs of state regulations for the 50 states.

not attempt to model these changes because the estimates of the relevant supply and demand elasticities for different sectors of the U.S. economy are not sufficiently consistent or reliable. This methodological issue is addressed again in Section III.

Similarly, the report does not account for a number of indirect or second-order costs of regulations. For example, environmental regulations directly affect the cost of producing electricity, and these show up as a direct cost for electric utilities. The report's cost estimates include these types of direct costs. Yet increases in the cost of electricity have ripple effects throughout the American economy in the form of higher energy costs, thus indirectly raising costs in virtually every sector. Some of these costs will be shifted even further onto consumers in the form of higher prices (directly for energy consumption, and, indirectly, for the other products purchased that now cost more because of higher energy costs). For another example, regulations that raise costs on health care providers will be shifted forward, at least partially depending on market elasticities, in the form of higher rates businesses must pay for health insurance premiums and other health care-related outlays. In turn, businesses will attempt to shift the burden of these higher health care-related outlays by increasing consumer prices or requiring employees to pay a larger share of health care costs. Some attempt is made to examine the more general impact of economic regulations, yet the distribution of these costs among sectors necessarily relies on the initial incidence.

Other general equilibrium effects include a reduction in dynamic efficiency, such as slowing innovations that would lead to productivity gains and therefore general economic expansions over time.[16] Again, the study does not measure the dynamic

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[16] The effect of regulations on dynamic efficiency is not without opposing viewpoints. Perhaps the most famous is Professor Porter's theory that environmental progress and economic competitiveness are not inconsistent but complementary, See Michael Porter, "America's Green Strategy," *Scientific American* (1991), For a critique of the Porter theory, see for examples, Oats, Wallace, "Environmental Federalism," Washington, DC: Resources for the Future, Sept. 21, 2009;

effects; omission of the indirect and general equilibrium effects means that the estimates in the report probably understate the full burden of federal regulations.[17]

As a rule, the approach used in this report to approximate the costs of regulations follows the methods used by Hopkins (1995), OMB annual reports (2000 through 2009), Crain and Hopkins (2001), and Crain (2005). This consistency helps to make the results comparable over time. As in past studies, new estimation techniques are adopted when these offer obvious improvements in the reliability and quality of the cost estimates. The introduction of new methodologies obviously means that comparisons to regulatory costs in prior years must be qualified.

## *Major Categories of Federal Regulations: Sources and Methods*

The report divides federal regulations into four categories: economic; environmental; tax compliance; and occupational safety and health, and homeland security.[18] A description of each category follows, along with an explanation of the primary sources and methods used to derive the compliance cost estimates.

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and John List and Mitch Kunce, "Environmental Protection and Economic Growth: What Do the Residuals Tell Us?, *Land Economics*, 2000, *76*(2), pp. 267-82.

[17] The effects of regulations on economic growth are recognized and discussed by OMB in its annual reports to Congress, but are not included in its cost estimates. The study by Hazilla and Kopp estimates of the indirect effects of environmental regulations as well as the dynamic consequences. Their evidence suggests that both of these costs are substantial. See Michael Hazilla and Raymond Kopp, "The Social Cost of Environmental Quality Regulations: A General Equilibrium Analysis," *Journal of Political Economy*, Vol. 98 (4), 1990. It is important to emphasize that the benefits of regulations might also be greater in a general equilibrium analysis than in partial equilibrium, and thus social welfare (benefits net of costs) might be higher in a general equilibrium than in a partial equilibrium analysis.

[18] These four categories differ slightly from those used in Crain (2005) and Crain and Hopkins (2001). They continue to conform reasonably well with the categories used by the U.S. Office of Management and Budget in its annual reports to Congress. Hopkins (1995) used slightly different categories: environmental, other social, economic, and process. Occupational health and safety regulations and homeland security regulations are combined on the rationale that both deal broadly with public safety issues.

## 1. Economic Regulations

Economic regulations include a wide range of restrictions and incentives that affect the way businesses operate — what products and services they produce, how and where they produce them, and how products and services are priced and marketed to consumers. Economic regulations affect both domestic and international business operations. For example, laws that impose quotas and tariffs on foreign imports limit competition from outside the United States, restrict production and employment, raise prices, and generally curtail U.S. economic activity.

One of the major differences between the cost estimates in this study and the estimates reported by OMB in its Annual Reports to Congress is that OMB does not include regulations issued by agencies not subject to Executive Order 12866 — the independent regulatory agencies.[19] In its 2009 report, OMB discusses and recognizes the potentially large impact of such regulatory activity (OMB, 2009, pp. 29-34). Nonetheless, OMB has not implemented estimates for a host of economic regulations, beyond those for which it has reviewed regulatory impact statements submitted by federal agencies during the past 10 years. As noted in the introduction to this report, OMB recognizes the potentially large costs associated with regulatory activities not included in its annual estimates of total regulatory costs.

A methodology was introduced in the prior report for Advocacy (Crain 2005) to expand the coverage by providing a method to assess the costs of broad-based economic regulations. Obviously, the goal is to incorporate into the analysis the impact

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[19] Under Executive Order 12866, OMB requires and reviews regulations issued by executive branch agencies. This means, for example, that the costs are not included for rules issued by such agencies as: the Securities and Exchange Commission, the Consumer Product Safety Commission, the Federal Communications Commission, the Federal Trade Commission, and the Nuclear Regulatory Commission. The U.S. Government Accountability Office (GAO) is required by statute to report to Congress on major regulatory rules, including those issued by agencies not subject to Executive Order 12866. This GAO report, however, still does not include cost estimates for most federal regulations.

of the widest possible range of economic regulations, including those that are promulgated by independent regulatory agencies. The method employs cross-country regression analysis to examine the impact of a broad index of economic regulations on the national economic output (GDP).[20] The 2005 study used an index of economic regulations developed by the Organization for Economic Cooperation and Development (OECD). The cost estimate derived from this approach was referred to as the "baseline" estimate in the 2005 study, simply because the regression procedure accounted for most of the costs of economic regulations. That baseline estimate was then supplemented in two ways: (i) by a separate estimate of the cost of international trade regulations using data from the International Trade Commission, and (ii) with estimates for specific domestic economic regulations that were either not covered by the OECD index, or were promulgated in years after that index was computed. In other words, several different approaches were used in the 2005 study to compile an inclusive measure of the cost of economic regulations.

This study again uses the comparative, cross-country regression approach, in this case adopting an alternative index of economic regulations that is more comprehensive than the OECD index. This new index of economic regulations, labeled the Regulatory Quality Index, is computed by researchers at the World Bank as part of its Worldwide Governance Indicators (WGI) research project. The WGI project has estimated various measures of governance and institutional quality, including the

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[20]  It is interesting to note that in its 2000 Report to Congress, OMB used a comparable methodology and OECD data to include a more expansive estimate of the costs of economic regulations than it used in subsequent Reports to Congress. A similar regression methodology is employed by Varshney and Tootelian, *op. cit.,* to estimate the cost of state-level regulations in California. They use indices that gauge the extent of state government regulations and analyze the impact on gross state product, controlling for various factors that influence state economic performance.

Regulatory Quality Index used in this report. These indices are available from 1996 through 2008.

The Regulatory Quality Index measures perceptions of the ability of governments to formulate and implement sound policies and regulations that permit and promote private sector development. For example, the index values for 2008 are derived from 1,751 data points, representing four types of data: commercial business information providers (46 percent); public sector organizations (24 percent); nongovernmental organizations (17 percent); and surveys of firms or households (13 percent). The data from these four sources are aggregated using a statistical procedure known as the unobserved components model.[21] The elements included in the Regulatory Quality Index are listed in Appendix 1.

Three important aspects of the WGI Regulatory Quality Index — how it differs from the OECD economic regulation index used in Crain (2005) and why it enhances the accuracy of the estimated costs of economic regulation — should be described. First, a larger data series is available for the Regulatory Quality Index, covering a longer time period and more countries, and this helps to overcome the small sample size used to

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[21] A detailed description of the methodology used in its construction is provided in Daniel Kaufmann, Aart Kraay, and Massimo Mastruzzi, "Governance Matters VIII: Aggregate and Individual Governance Indicators 1996–2008," World Bank Development Research Group, Macroeconomics and Growth Team, Policy Research Working Paper 4978, June 2009. See especially Appendix D. For further discussion of applications of the governance metrics see Kaufmann, Daniel and Aart Kraay (2008). "Governance Indicators: Where Are We and Where Should We Be Going?" *World Bank Research Observer*, Spring 2008. As noted in the text, the prior study (Crain, 2005) introduced this methodological approach as a baseline estimate for economic regulations, except that it used an index of regulations compiled by researchers at the Organization for Economic Cooperation and Development. (See G. Nicoletti, Scarpetta and O. Boylaud (2000), "Summary Indicators of Product Market Regulation and Employment Protection Legislation for the Purpose of International Comparisons," *OECD Economics Department Working Paper*, No. 226.) It is noteworthy that the OECD and WGI indices are correlated over the time periods for which both indices are available. The WGI index is employed in this report because it is available annually for a longer and more recent time period, while the OECD index is only available at five-year intervals: 1998, 2003, and 2008. Prior studies by Crain and Hopkins (2001) and OMB (2000) used an estimate based on the OECD findings in *Regulatory Reform in the United States*, OECD Reviews of Regulatory Reform, Paris, 1999. One criticism of the earlier method is that it fails to account adequately for major deregulation activities in various industries in the 1980s and 1990s.

estimate the parameters in the Crain (2005) study.[22] Second, the Regulatory Quality

Index covers international as well as domestic economic regulations. This means that

unlike the 2005 study, a separate estimate of the international economic regulation

component is unnecessary. Third, the WGI Regulatory Quality Index includes rules and

mandates that affect factors markets — which obviously include the labor market — as

well as product markets. This means that the impact of economic regulations that affect

the workplace is encompassed in this measure. For this reason the four categories of

regulations are redefined from the 2005 study. In that report, "workplace regulations"

were a separate category and estimated using a different methodology. In this report,

the estimated costs of workplace regulations, such as laws affecting collective

bargaining, employee drug-testing, and the American with Disabilities Act, are now

included in the Regulatory Quality Index and merged into the general economic

regulation category. Fifth, the OECD index used in the Crain (2005) estimate of

economic regulations did not cover all business sectors.

In summary, the methodology for estimating the cost of economic regulations is

the main difference between this report and prior reports. This improvement is made

possible because of new research at the World Bank to measure economic regulations.

This Regulatory Quality Index is available for a larger number of countries and for a

longer sample period than anything available for prior studies.  More important, the

Regulatory Quality Index embodies extensive stakeholder knowledge about the

countries' regulatory practices that affect domestic and international practices that are

related to product markets and labor markets.

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[22]  The OECD Index used in Crain (2005) was based on the OECD Survey for 1998. Criticism of
the short time period is raised in Winston Harrington, "Grading Estimates of the Benefits and
Costs of Federal Regulation: A Review of Reviews," RFF Discussion Paper 06-39, Washington,
DC: Resources for the Future. September 2006.  See especially pages 14-16. Of course, a larger
sample size generally improves the reliability of statistical estimation.

***Cross-Country Regression Model.*** The cost of economic regulations is derived

from regression analysis using a panel of OECD member countries, which includes the

United States. The basic idea is to estimate empirically the impact of regulations on

aggregate economic output, or GDP. The approach uses the Regulatory Quality Index

as the main variable of interest, while controlling for other variables that affect national

economic performance. The form of the regression model is specified in Equation 1.


(Eq. 1)  GDP per Capita $_{It} = \beta$ (World Bank Index of Regulatory Quality) $_{It} + \phi$ ($\mathbf{X}$) $_{It} + \alpha_i + \varepsilon_{It}$


The sample used to estimate Equation (1) consists of 25 OECD countries for

which data on all of the relevant variables are available. The variable subscript *i* in

Equation (1) denotes an observation in a particular country *i* (= 1, ..,25)*.* The variable

subscript *t* denotes an observation in a particular year, where *t* = 2002 through 2008.[23]

The dependent variable, GDP per capita, is real GDP divided by population,

denominated in constant U.S. dollars (source: World Bank, 2010). The main explanatory

variable of interest in Equation (1) is the *World Bank Regulatory Quality Index* (source:

World Bank, 2009)*.* This *Regulatory Quality Index* is scaled to have values that range

from -2.5 to 2.5. Note that increases correspond to improvements in regulatory quality —

that is, reductions in the regulatory burden imposed on the operation of product and

factor markets.

The model also includes several economic and demographic control variables,

represented by the vector $\mathbf{X}$ in Equation (1). These control variables are drawn from the

empirical literature that examines differences in economic levels across countries and

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[23] Values for the Regulatory Quality Index are available for many OECD countries starting in 1996. The sample in the regression model includes seven years, 2002 through 2008. This is because data for some of the control variables used to estimate Equation (1) are missing for various countries before 2002. Thus, the sample of countries that may be used in the analysis increases to 25 by beginning the sample in 2002.

over time. (For useful surveys of this literature, see Hall and Jones, 1997, Barro and Sala-i-Martin, 1995, and Barro, 1997.) The set of controls included in $\mathbf{X}$ are: foreign trade as a share of GDP, country population, primary school enrollment as a share of the eligible population, and fixed broadband subscribers per 100 people (data source: World Bank, World Development Indicators, online database). The variables are entered into the regression model as natural logarithmic transformations.

Because the dataset is organized as a panel — that is, it includes observations over time for the same set of countries — the model also includes country fixed-effects variables. Fixed-effects variables are simply country-specific indicator variables that control for time-invariant factors that affect economic performance. For example, a landlocked country may be disadvantaged relative to a country with ocean access. Geographic location obviously does not change over time, and including the fixed-effects variables helps to control for the impact of such factors. Appendix Table A-2 provides summary statistics for the variables used in the analysis.

The results of estimating Equation 1 are shown in Table 2, and these parameters are used to calibrate the cost of economic regulations.

**Table 2. Impact of Economic Regulations on GDP in OECD Countries, 2002 through 2008**

| Independent Variable | ln (GDP per Capita) [a] |
|---|---|
| World Bank Regulatory Quality Index | 0.094 |
| | (2.77)** |
| ln (Country Population) | 0.089 |
| | (0.39) |
| ln (Foreign Trade as a Share of GDP) | 0.242 |
| | (4.95)** |
| ln (Primary Education as a Share of the Eligible Population) | -0.243 |
| | (-2.37)* |
| ln (Fixed broadband subscribers per 100 people) | 0.032 |
| | (8.89)** |
| Constant | 8.31 |
| | (2.19)* |
| Observations | 118 |
| Number of Countries | 25 |
| R-square Within | 0.85 |
| R-square Between | 0.03 |
| F-stat (6,87) | 85.4** |

**Notes to Table 2:**

t-statistics in parentheses where:
* indicates significance at the 5 percent confidence level.
** indicates significance at the 1 percent confidence level.
The variables are denominated in 2009 U.S. dollars. The model includes fixed-country effects and fixed-year effects when significant.

As reported in Table 2, the coefficient on the World Bank *Regulatory Quality Index* is positive and significant at the one-percent confidence level. This indicates that less stringent restrictions systematically enhance a country's aggregate economic activity, as reflected by the level of its GDP per capita. The estimated coefficient is 0.094. This means that a one-unit change in the *Regulatory Quality Index* corresponds to a 9.4 percent change in real GDP per capita (recall that the dependent variable is entered into the regression model as a logarithmic transformation and thus percentage changes).[24] The Regulatory Quality Index value for the United States is equal to 1.579 in 2008, and, as noted, the index is calibrated to range between -2.5 and 2.5. The difference between 1.579 and 2.5 (the minimal amount of regulation) would require a change equal to 0.92, which would correspond to an increase in U.S. GDP per capita of 8.7 percent (=0.094 x 0.92). The estimated cost of economic regulations as reflected in lost GDP in 2008 is thus $1.236 trillion (denominated in 2009 dollars).

This estimated cost represents a very large increase over the estimated cost of economic regulations in 2004, which equaled $671 billion after converting the estimate in Crain (2005) into 2009 dollars. As noted, some of this difference is attributable to the change in the cost accounting methodology, one that is more complete than methodologies used in the prior studies for SBA. The 2008 estimate includes labor market economic regulations that were included under the "workplace regulations" category in the 2004 estimate. The approximate value of the "economic" component of the workplace regulations category in 2004 is $56 billion (again adjusting for inflation). This means that the comparable economic regulations cost (one that includes product and labor market regulations) in 2004 is $727 billion (=$671+$56). Even after

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[24]  For comparison, when Equation (1) is estimated without the country fixed-effects variables, the estimated coefficient on the *World Bank Regulatory Quality Index* equals 0.142, which is significant at the 1 percent confidence level. In other words, the parameter estimate used in the report for the cost of economic regulations is on the low end of the range of estimates using this regression analysis.

readjustment to account for the redefined categories, this still suggests that economic regulations increased by 70 percent from 2004 to 2008, or roughly $500 billion.

How much of this large increase comes from "real" regulatory changes and how much comes from methodological changes? If the cost of economic regulations in 2004 is re-estimated using the new methodology, that value rises by $445 billion to $1.172 trillion. This recalibration of the 2004 estimate suggests that the "real" cost of economic regulations increased by $63 billion between 2004 and 2008, after adjusting for inflation and estimation methods.

## 2. Environmental Regulations

Cost estimates for environmental regulations are derived from two sources: OMB's annual reports to Congress and Hahn and Hird (1991). The report assumes that OMB's coverage of environmental regulations has been relatively complete. OMB has reviewed the regulatory impact analyses for the most costly regulations promulgated by the Environmental Protection Agency back through the late 1980s. In its reports, OMB has relied on the cost estimates in Hahn and Hird (1991) to gauge the costs of environmental regulations prior to 1988, and this study follows that procedure.[25]

Table 3 lists the sources and estimated annual costs for environmental regulations that were enacted during various time periods. It is important to stress that the costs of environmental regulations shown in Table 3 are denominated in 2001 dollars, the same base year used in the original OMB sources of these estimates. This facilitates comparisons to the OMB reports, and these costs are converted into 2009 dollars in Section IV below.

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[25]  It is worth reiterating that OMB includes only the costs of "economically significant" regulations subject to E.O. 12866 review. These are less than 1 percent of EPA's rulemaking. Moreover, as noted earlier, the OMB annual reports now encompass only regulations issued in the prior 10 years.  This was not always the case, and data on the earlier environmental regulations are summarized in OMB's past annual reports.

**Table 3. Sources and Estimated Annual Costs of Environmental Regulations**

| Years Regulations Were Issued * | Cost Estimates (Millions of 2001 $) | | Source for Estimate |
|---|---|---|---|
| | Low | High | |
| Through 2000, Q1 | 108,359 | 191,887 | OMB 2001, Table 2 |
| Apr 1999 to Sep 2001 | 11,380 | 12,812 | OMB 2002, Table 7 |
| Oct 2001 to Sep 2002 | 192 | 192 | OMB 2003, Table 1 |
| Oct 2002 to Sep 2003 | 335 | 335 | OMB 2004, Table 1 |
| Oct 2003 to Oct 2004 | 3,840 | 4,073 | OMB 2005, Table 1-1 |
| Oct 2004 to Sep 2005 | 2,609 | 3,373 | OMB 2006, Table 1-3 |
| Oct 2005 to Sep 2006 | 2,720 | 2,965 | OMB 2007, Table 1-3 |
| Oct 2006 to Sep 2007 | 7,475 | 7,584 | OMB 2008, Table 1-3 |
| Oct 2007 to Sep 2008 | 7,591 | 8,780 | OMB 2009, Table 1-3 |
| Total | 144,501 | 232,001 | |

**Note to Table 3:**

These dates follow OMB's practice by reporting the costs by fiscal years, which begin October 1 and end September 30.

OMB discusses the shortcomings in these estimates, including the basic fact that cost estimates do not exist for all environmental regulations, and the inherent difficulties in performing the regulatory impact analyses (RIAs). For example, OMB does not include an estimate for the cost of the Superfund program, which is likely to be quite large. To account for some of these shortcomings, OMB provides a range of cost estimates for most regulations, and these are reported in Table 3.

Beginning in its 2003 report, OMB began the practice of limiting its cost summaries to regulations promulgated over the preceding 10 years, which in that report covered 1992 through mid-2002.[26] For this reason, this report begins with the OMB report for 2001, which includes its earliest cost accounting and takes Hahn and Hird

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[26] U.S. Office of Management and Budget, Office of Information and Regulatory Affairs (2003), *Informing Regulatory Decisions: Report to Congress on the Costs and Benefits of Federal Regulations*, Table 2. OMB's cost estimates rely on regulatory impact analyses (RIAs) issued mainly by the U.S. Environmental Protection Agency.

(1991) as its beginning estimate of the costs prior to 1988. To account for environmental regulations promulgated since then, the costs of newly reviewed regulations are taken from OMB's annual reports for 2002 through 2009.

As shown in Table 3, this puts the cost of environmental regulations in a range between $144 billion and $232 billion (in 2001 dollars) or between $175 billion and $280 billion when converted into 2009 dollars. This report uses the high end of the cost range provided in the OMB reports and Hahn and Hird (1991). This reflects a judgment that cost estimates are absent for important environmental regulations and that government agencies tend to be conservative in estimating regulatory costs.[27] For comparison, if the midpoint of the high and low estimates were used, the cost of environmental regulations in this report would decline by roughly $50 billion, or 19 percent.

## 3. Tax Compliance

Prior studies of federal regulations stress the substantial burden of paperwork costs on the American public and businesses. In the modern era in which electronic

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[27] Several regulatory experts draw a similar conclusion about the OMB environmental cost estimates, but considerable debate continues. For example, Johnson concludes that "the costs of water quality regulation totaled $93.1 billion in 2001. While this figure is based on conservative estimates of regulatory costs, it is significantly larger than the cost and benefit estimates produced by EPA." (Joseph Johnson, *The Cost of Regulations Implementing the Clean Water Act,* Arlington, VA: Mercatus Center, Regulatory Studies Program Working Paper, April 2004.) In contrast, in 1999, EPA estimated the costs of the 1972 Clean Water Act at $15.8 billion per year. ("A Retrospective Assessment of the Costs of the Clean Water Act: 1972 to 1997," U.S. Environmental Protection Agency, October 2000.) The discussion in Robert W. Hahn, "Regulatory Reform: What Do the Government's Numbers Tell Us?" in Robert W. Hahn (ed.) *Risks, Costs, and Lives Saved: Getting Better Results from Regulation*, New York: Oxford University Press and AEI Press, 1996, pp. 208-253, is also informative. Hahn makes a strong case that government agencies overestimate benefits and underestimate costs systematically. In addition, the review article by Jaffe, *et al.*, "Environmental Regulation and the Competitiveness of U.S. Manufacturing," *Journal of Economic Literature*, Vol. 33 (1), 1995, suggests that environmental costs in the long run have exceeded compliance cost estimates. Finally, the study by Winston Harrington, *et al.* "On the Accuracy of Regulatory Cost Estimates," *Journal of Policy Analysis and Management*, vol. 19 (2), 2000, examines the estimates for 28 particular rules promulgated by EPA and OSHA and finds, in contrast, that overestimation of unit costs occurs about as often as underestimation.

submissions are displacing paper, the term *"paperwork burden"* has become merely a metaphor for the time and resources required for monitoring, recordkeeping, reporting, and compliance with statutes and regulations. Of this burden, the time required to comply with the federal tax code accounts for the lion's share. Of course, the federal government requires a host of additional forms that also impose recordkeeping and reporting burdens. However, these non-tax-related reporting and compliance requirements are largely tied to specific economic, environmental, or occupational safety and health and homeland security regulations. This means that the cost estimates for the other regulations will account for most of the non-tax-related compliance and reporting burden. In that sense, a separate estimate would be double-counting recordkeeping and form filing costs.

The estimates of the cost of federal tax compliance in prior studies for Advocacy relied mostly on annual studies of tax compliance produced by the Tax Foundation. These studies provided extensive details about the time required to file federal income tax forms and the number of specific forms filed. The estimates in this report rely mostly on data directly available from the U.S. Internal Revenue Service, simply because the Tax Foundation's latest report was for 2005. For certain forms, the Tax Foundation's estimates of the time required to file in 2005 are used.

The estimate of tax compliance costs in 2008 is consistent with past reports for Advocacy and is easy to describe. The first step compiles data from the Internal Revenue Service and in some cases from the Tax Foundation on the amount of time required to complete each type of tax form, and the number of filings for each type of form. The number of compliance hours is shown in the first row of Table 4 broken down by businesses and by individual and nonprofits, with a total for these two categories. The total number of hours required for compliance is nearly 4.3 billion per year, with

businesses devoting about 2.3 billion hours and individuals and nonprofits devoting

about 2.0 billion hours.

**Table 4. Sources and Estimated Costs of Compliance with the Federal Tax Code**

|  | Businesses | Individuals & Nonprofits | Total |
|---|---|---|---|
| # Hours Required to Comply | 2,280,966,382 | 2,018,119,637 | 4,299,086,018 |
| Compliance Cost per Hour (in 2009 $) | $ 49.77 | $ 31.53 | |
| Total Compliance Cost (in 2009 $) | $95,984,291,402 | $ 63,635,262,186 | $ 159,619,553,588 |
| Share of Total Compliance Cost | 60% | 40% | |

The second step is to multiply the hours spent on compliance by an hourly wage

rate that reflects either the value of the preparer's time (the average hourly wage rate for

accountant and auditors in the case of individuals and nonprofits) or the hourly

compensation rate for Human Resources professionals (in the case of businesses).[28]

The estimated cost of federal tax compliance is nearly $160 billion (in 2009 dollars). To

be clear, this $160 billion estimate includes the combined costs on individual filers,

nonprofit organizations, and business filers. The estimated cost of compliance for

businesses is about $96 billion, accounting for 60 percent of the total cost.

## 4. Occupational Safety and Health and Homeland Security Regulations

Prior studies for Advocacy used "workplace regulations" as one of the four

categories for analysis. This category covered a wide array of regulations dealing with

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[28] The source of the hourly rate data is the U.S. Bureau of Labor Statistics website.

wages, benefits, safety and health, and civil rights, among other things.[29] Because the

economic cost component of workplace regulations is now reclassified and scored under

the "economic" regulations category, this report modifies the workplace category to

include only workplace regulations that deal with safety and health. These are primarily

issued by the Occupational Safety and Health Administration, a division of the U.S.

Department of Labor. It is noteworthy that occupational safety and health regulations

alone accounted for 53 percent of the compliance costs of all workplace regulations in

the 2005 study (Crain 2005).  These were by far the largest element within the

workplace regulations category.

This report relies on three sources to estimate the costs of occupational safety

and health and homeland security regulations. These costs and sources are

summarized in Table 5.


**Table 5. Sources and Estimated Costs of Occupational Safety and Health and Homeland Security Regulations**

| Type of Workplace Regulation | Cost Estimate (Millions of 2009 $) | Source |
|---|---|---|
| Occupational Safety and Health (for those issued pre-2001) | 64,313 | Johnson (2005) |
| Occupational Safety and Health (for those issued 2001-2008) | 471 | OMB (2009), Table 1-2 |
| Homeland Security (all through 2008) | 10,416 | OMB (2009), p. 18 |
| Total | 75,200 | |

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[29]  The source for the cost estimate for workplace regulations is the 2005 study by Joseph Johnson. The Johnson study offers a synthesis and evaluation of available estimates of the cost of regulations directed at the workplace, and from these different studies, generates an estimate of the total cost of workplace regulation. It provides the most comprehensive analysis to date, covering the 25 statutory acts and executive orders that encompass all significant workplace regulations promulgated by the federal government through 2001. Joseph M. Johnson, "A Review and Synthesis of the Cost of Workplace Regulations," in *Cross-Border Human Resources, Labor and Employment Issues.* Andrew P. Morriss and Samuel Estreicher (eds.), Kluwer Law International: Netherlands, 2005, pp. 433-67.

The cost calculations from the Johnson (2005) study are used where possible, that is, until 2001, and adjusted for inflation as shown in Table 5. The costs provided by OMB on OSHA regulations are used for those regulations issued subsequent to the Johnson study. All 17 of the homeland security regulations included in this report have been implemented since the 2005 report for Advocacy, and these cost estimates are all taken from OMB (2009). As examples, these are regulations concerned with transportation facilities security, chemical plant security, electronic availability of passenger manifest lists, cargo security, notice of imported food and registration of food facilities that might be vulnerable to bioterrorism, and air cargo security. The cost of these 17 homeland security regulations is $10.4 billion, and the total cost for this category — Occupational Safety and Health plus Homeland Security — is $75.2 billion.

### *Summary of Total Regulatory Costs*

Table 6 summarizes the cost estimates described in this section by regulatory category, and notes the basic sources and procedures behind the estimates.

**Table 6. Summary of Regulatory Compliance Costs in 2008**
         **(Billions of 2009 dollars)**

| Type of Regulation | Cost Estimate | Sources |
|---|---|---|
| All Federal Regulations | 1,752 | Summation of Costs by Type |
| Economic | 1,236 | Original regression analysis using World Bank Regulatory Quality Index |
| Environmental | 281 | Hahn and Hird (1991); Crain (2005); OMB (2004, 2005, 2006, 2007, 2008, 2009) |
| Tax Compliance | 160 | IRS website, Bureau of Labor Statistics; Tax Foundation (2005) |
| Occupational Safety and Health, and Homeland Security | 75 | Johnson (2005); OMB (2009) |

# III. Incidence of Regulatory Costs

This section describes how the burden of federal regulations is distributed among major business sectors of the American economy, and, within sectors, how this burden is distributed among firms of different sizes. It begins with a brief quantitative summary of the composition of American enterprise: how the number of firms and the work force are distributed among firms of different sizes and among the major categories of business activities. This underlying composition of economic activity in America is a key element in the study, because it provides the basis for determining the incidence of regulatory costs.

## *A Snapshot of American Enterprise*

The report uses a three-part firm size classification, relying on data available from Advocacy on employees per firm:

- Small firms                      fewer than 20 employees
- Medium-sized firms         20 to 499 employees
- Large firms                      500 or more employees.

The North American Industry Classification System (NAICS) devised by the U.S. Census Bureau divides American businesses into 2,000 distinct industry types. In order to make the results tractable, this report distills these classifications down to five broad categories:

- Manufacturing,
- Trade (wholesale and retail trade),
- Services,
- Health care, and
- Other (a residual containing almost all other nonfarm employers).[30]

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[30] The U.S. Census Bureau provides Advocacy with these data. The Statistics of U.S. Business covers almost all nonfarm employer businesses. It omits farms, railroads, and most government-owned establishments, the U.S. Postal Service, and large pension, health, and welfare funds

Four of these five categories are adopted from the original Hopkins (1995) study for Advocacy. The health care category was added in the Crain (2005) study for Advocacy to reflect the growing scale and importance of this sector within the U.S. economy. The rationale for a small number of large categories, here and in previous reports for Advocacy, is to gain insight into the distribution of the regulatory burden across various types of economic activity — "manufacturing" versus "services" provides an obvious and distinct boundary. The "other" category includes: forestry, fishing, hunting & agriculture, mining, utilities, construction, and transportation and warehousing. To be sure, "other" bundles a diverse set of economic activities into a single category. However, in creating additional sector categories the analysis becomes less tractable.

Table 7 shows the distribution of American industry by sector and firm size using the most recently available data (for 2006) from Advocacy.[31] Table 7 presents three relevant size indicators: the number of firms, the number of employees, and payroll expenditures.[32] For example, the data indicate some six million firms in the United States and roughly 5.4 million of these are small businesses (less than 20 employees).

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(100 + employees) and nonincorporated firms with no paid employees. According to the Census Bureau, nonemployers account for roughly 3 percent of all business activity (see U.S. Census Bureau, "Nonemployer Statistics," http://www.census.gov/epcd/nonemployer).

[31]  American industry is obviously not static and these 2006 data on the distribution of business activity do not match up exactly with the years for the regulatory cost data. However, changes in the basic structure of American industry generally occur only incrementally. These data provide a reasonable approximation for the relevant years of the proportions of firms, employees, and payroll across the three firm size categories and the five sector classifications.

[32]  The Office of Advocacy of the U.S. Small Business Administration contracts with the U.S. Census Bureau to collect the employer firm size data (see http://www.sba.gov/advo/stats/data.html). When the Census Bureau compiles its *Statistics of U.S. Businesses*, it relies on survey questionnaires filled out by firms. Occasionally, firms classify themselves under more than one industry type (or NAICS classification). This means that when summed by sector, the number of firms is greater than the actual number of firms. The data used in this report are corrected for this over count using a technique explained in Appendix 4. In brief, the correction relies on the fact that the number of employees in each industry is accurately reported to the Census Bureau, and the share of employees by sector is used to eliminate the redundancy and scale back over counts of firms.

**Table 7. Size Distribution of American Business in 2006***

| Sector | Size Measure | All Firms [a] | Firm Size: | | |
|---|---|---|---|---|---|
| | | | <20 Employees | 20-499 Employees | 500+ Employees |
| All Sectors [a] | Firms | 6,022,127 | 5,377,631 | 626,425 | 18,071 |
| | Employment | 119,917,165 | 21,609,520 | 38,614,220 | 59,693,425 |
| | Payroll ($000) | 5,099,088,373 | 772,519,440 | 1,492,491,072 | 2,834,077,860 |
| | | | | | |
| Manufacturing | Firms | 278,703 | 210,220 | 66,890 | 1,593 |
| | Employment | 13,631,683 | 1,180,832 | 4,875,389 | 7,575,462 |
| | Payroll ($000) | 659,910,538 | 44,023,629 | 205,977,710 | 409,909,200 |
| | | | | | |
| Trade | Firms | 1,048,443 | 941,506 | 105,527 | 1,410 |
| | Employment | 21,798,513 | 4,060,460 | 5,939,480 | 11,798,573 |
| | Payroll ($000) | 35,798,406 | 128,105,755 | 238,874,376 | 368,818,276 |
| | | | | | |
| Services | Firms | 3,064,433 | 2,755,361 | 296,335 | 12,738 |
| | Employment | 55,026,464 | 10,386,251 | 17,413,803 | 27,346,941 |
| | Payroll ($000) | 2,420,355,343 | 354,457,788 | 627,515,860 | 1,427,510,876 |
| | | | | | |
| Health Care | Firms | 596,992 | 526,261 | 69,895 | 835 |
| | Employment | 16,451,361 | 2,544,976 | 5,401,418 | 8,504,967 |
| | Payroll ($000) | 666,681,058 | 112,830,630 | 186,810,745 | 367,039,682 |
| | | | | | |
| Other | Firms | 1,033,556 | 944,284 | 87,778 | 1,494 |
| | Employment | 13,009,144 | 3,430,737 | 4,982,216 | 4,634,181 |
| | Payroll ($000) | 616,343,027 | 132,247,939 | 231,835,480 | 250,237,452 |

**Notes to Table 7:**

* Source: U.S. Small Business Administration, Office of Advocacy, "Statistics of U.S. Businesses: Firm Size Data," website: http://www.sba.gov/advo/stats/data.html.  Payroll data are converted into 2009 dollars. The Office of Advocacy contracts with the U.S. Census Bureau to provide employer firm size data. These data for 2006 are the most recently available from the SBA.

[a] These Statistics of U.S. Businesses data cover almost all nonfarm employer businesses. Omitted are farms, railroads, and most government-owned establishments, the U.S. Postal Service, and large pension, health, and welfare funds (100 + employees) and nonincorporated firms with no paid employees.

Table 8 reports these business size indicators in a slightly different format, as

shares of all U.S. industry, which are used to allocate compliance costs. Table 8 simply

converts the raw data shown in Table 7 into percentage terms.  For example, consider

the data in Table 8 that describe the manufacturing sector. Manufacturing accounts for 5 percent of all U.S. firms, 11 percent of all U.S. employment, and 13 percent of all U.S. business payroll expenditures. Within the manufacturing sector, 75 percent of the firms are classified as small businesses (fewer than 20 employees), 24 percent have between 20 and 499 employees, and only one percent has 500 or more employees. Nine percent of manufacturing employees work in small firms, 36 percent in mid-sized firms, and 56 percent in large firms. Finally, regarding the distribution of payroll expenditures, small firms account for 7 percent, mid-sized firms account for 31 percent, and large firms account for 62 percent.

**Table 8. Size Distribution of American Business (As a Percentage of Private Industry Employment)**

| | Sector Share of All U.S. Industry | | | | | |
|---|---|---|---|---|---|---|
| Size Measure | Manufacturing | Trade | Services | Health Care | Other | |
| No. of Firms | 5 | 17 | 51 | 10 | 17 | |
| Employees | 11 | 18 | 46 | 14 | 11 | |
| Annual Payroll | 13 | 14 | 47 | 13 | 12 | |
| | | | | | | |
| | Percent of Firms, by Sector | | | | | |
| | Manufacturing | Trade | Services | Health Care | Other | All Sectors |
| <20 employees | 75 | 90 | 90 | 88 | 91 | 89 |
| 20-499 employees | 24 | 10 | 10 | 12 | 9 | 10 |
| 500+ employees | 1 | 0.1 | 0.4 | 0.1 | 0.1 | 0.3 |
| | | | | | | |
| | Percent of Employees, by Sector | | | | | |
| | Manufacturing | Trade | Services | Health Care | Other | All Sectors |
| <20 employees | 9 | 19 | 19 | 15 | 26 | 18 |
| 20-499 employees | 36 | 27 | 32 | 33 | 38 | 32 |
| 500+ employees | 56 | 54 | 50 | 52 | 36 | 50 |
| | | | | | | |
| | Percent of Payroll, by Sector | | | | | |
| | Manufacturing | Trade | Services | Health Care | Other | All Sectors |
| <20 employees | 7 | 17 | 15 | 17 | 21 | 15 |
| 20-499 employees | 31 | 32 | 26 | 28 | 38 | 29 |
| 500+ employees | 62 | 50 | 59 | 55 | 41 | 56 |

**Source**: See Table 7.

The percentages displayed in Table 8 provide a snapshot of the distribution of productive activity and resources among broad sectors of American industry. It is against this descriptive backdrop that the report charts the incidence of regulatory compliance costs. These costs are allocated across the sectors and firm sizes shown in Table 8 using the procedures described in the remainder of this section.

### *Assumptions and Procedures Underlying the Cost Allocations*

### *Business Portion of the Regulatory Burden*

Before costs can be allocated across these five business sectors, a more general cost allocation is necessary, specifically how much of the regulatory burden falls in the aggregate on businesses. This task requires a delineation of the regulatory burden that falls initially on business from the burden that falls initially on individuals and state and local governments. As discussed in Section II, the report does not attempt to map out the subsequent shifting of this burden from businesses to individuals (*e.g.*, in the form of higher retail prices) or from one business sector to another (*e.g.*, in the form of higher energy prices or health insurance premiums). It is worth emphasizing that all regulatory costs are — and can only be — borne by individuals, as consumers, as workers, as stockholders, as owners, or as taxpayers. In other words, the distinction between "business" and "individual" is one that focuses on the compliance responsibility, fully recognizing that ultimately all costs must fall on individuals. Moreover, the degree to which businesses are able to shift compliance costs forward onto consumers can only be determined with highly specific information about the market elasticities. For example, without the price elasticity of demand, we cannot determine with any level of certainty

what percentage of the regulatory cost will be shifted forward beyond the statutory incidence.

A second rationale for attempting to apportion costs between businesses and individuals is that the incidence of costs across different sectors of the economy is potentially quite important from a policy perspective, and the consumer costs cannot be allocated to the different classes of businesses. As a final introductory comment, some of the costs of federal regulations fall on state and local governments. Homeland security regulations are a good example of such costs. These costs borne by state and local governments are bundled with those borne by individuals to keep a relatively tractable division in business versus non business costs.

The cost allocations for each type of regulation are shown in Table 9.

**Table 9. Allocation of Compliance Cost Incidence to Business**

| Type of Regulation | Business Incidence (% of Category Costs) | Other Incidence (% of Category Costs) |
|---|---|---|
| Economic | 50 | 50 |
| Environmental | 65 | 35 |
| Tax Compliance | 60 | 40 |
| Occupational Safety and Health, and Homeland Security | 97 | 3 |

The allocations shown in Table 9 generally employ the same methodology used in Hopkins (1995), and Crain and Hopkins (2001), and Crain (2005). The allocation of environmental regulations is based on the compliance data reported by the

Environmental Protection Agency.[33]  In the absence of allocation data for economic

regulation, a default judgment of 50-50 is applied. The allocation for federal tax

compliance uses the apportionment data from the IRS as shown in Table 4.

Occupational Safety and Health, and Homeland Security are allocated 97 percent to

businesses and 3 percent to other. This assumption is consistent with the empirical

evidence that the labor supply function is relatively inelastic, and therefore safety and

health costs are not immediately shifted onto consumers.[34] The assumption is that a

small share (3 percent) of estimated homeland security costs is borne by state and local

governments and individuals.


### *Allocation of Regulatory Costs Across Business Sectors*

The second task is to allocate the business portion of regulatory costs among the

five major sectors. These five sectors generally follow those in Hopkins (1995), Crain

and Hopkins (2001), and Crain (2005) to facilitate comparisons over time. The sectors

are based on the Census Bureau's North American Industry Classification System

(NAICS), in some cases aggregating categories.[35] For example, the NAICS separates

wholesale trade and retail trade, and these are combined in this report. Table 10 lists

these allocations by sector and the sources and methods used. A more complete

description of the allocation basis for each type of regulation is described in turn.

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[33]  Environmental Protection Agency, "Environmental Investments: The Cost of a Clean
Environment," EPA 230-11-90-083, November 1990, pp. 2-5.

[34]  Moreover, this assumption is similar to that used by the Congressional Budget Office that
payroll taxes are borne fully by workers (and therefore not shifted forward onto consumers
through price increases). See the discussion in Jonathon Gruber, *Public Finance and Public
Policy*, New York: Worth Publishers, 2004, pp. 539-540.

[35]  The NAICS data are from the U.S. Census Bureau website:
http://www.census.gov/epcd/naics02/naicod02.htm

**Table 10. Allocation of Business Regulatory Costs to Sectors (Percentages)**

| Type of Regulation | Sectoral Allocations | | | | | Sources and Summary of Methods |
|---|---|---|---|---|---|---|
| | Manufacturing | Trade | Services | Health Care | Other | |
| Economic | 12 | 18 | 46 | 13 | 11 | BEA (Value added share of private GDP); SBA (Employment share of private workforce) |
| Environmental | 54 | 0 | 0.3 | 1 | 45 | Hazilla and Kopp, 1991 (Compliance Costs by Sector) |
| Tax Compliance | 3 | 14 | 58 | 7 | 17 | IRS, Statistics of Income (Sector share of total returns filed, weighted by cost of filings) |
| Occupational Safety and Health, and Homeland Security | 14 | 18 | 49 | 12 | 8 | SBA (Employment share of private workforce); BEA (Value added share of private GDP) |

*Economic Regulations.* Regarding economic regulations, the cost allocations are

based on a weighted average of two components: (i) the sector's value added to GDP

divided by total private sector GDP, and (ii) the number of employees on the sector

divided by total private sector employment. [36] The average for each sector is weighted by

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[36] The source of the value added to GDP by sector and the private sector GDP data is the Industry Economics Division, Bureau of Economic Analysis (BEA), U.S. Department of Commerce. The data used were released on April 28, 2009. The source for the employment data is U.S. Small Business Administration, Office of Advocacy, "Statistics of U.S. Businesses: Firm Size Data," website: http://www.sba.gov/advo/stats/data.html.

the share of non-OSHA workplace regulations on the sector. That is, a sector's

employment share gets a slightly higher weight where regulations such as "labor

standards" or "labor management relations" are likely to have a larger impact.

***Environmental Regulations.*** The sector allocations for environmental regulations are

taken from Hazilla and Kopp.[37] Almost all of these costs fall on the manufacturing sector

(54 percent) and the "other" sector (45 percent). The "other" sector includes such

businesses as coal mining, ore mining, oil and gas extraction, coal gasification, and

electric utilities, all of which are heavily affected by regulations promulgated under the

Clean Air Act and the Clean Water Act. The remaining one percent of environmental

costs falls on the health care and service sectors.

***Federal Tax Compliance.*** The allocation of federal tax compliance costs is derived from

IRS Statistics of Income data that indicate the number of returns and forms filed by each

type of business by sector, sole proprietorships, partnerships, and corporations. These

data are summarized in Table 11.

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[37] Michael Hazilla and Raymond Kopp (1990), "The Social Cost of Environmental Quality Regulations: A General Equilibrium Analysis," *Journal of Political Economy*, Vol. 98 (4), p. 858.

**Table 11. Cost Allocation for Federal Tax Compliance**

| | Sole Proprietorships | Partnerships | Corporations | All Businesses | |
|---|---|---|---|---|---|
| **Total Number of Returns / Forms Filed** | 39,503,733 | 3,445,433 | 6,922,433 | 49,871,600 | |
| **Share of Forms:** | | | | | |
| Manufacturing | 2% | 2% | 5% | | |
| Trade | 12% | 8% | 18% | | |
| Services | 56% | 80% | 52% | | |
| Health Care | 9% | 2% | 8% | | |
| Other | 22% | 9% | 18% | | |
| **Compliance Costs (in Millions of 2009 $):** | | | | | **Cost Share** |
| Manufacturing | 475 | 289 | 2,417 | 3,181 | 3% |
| Trade | 3,642 | 1,335 | 8,451 | 13,429 | 14% |
| Services | 16,943 | 13,991 | 24,871 | 55,805 | 58% |
| Health Care | 2,645 | 409 | 3,819 | 6,874 | 7% |
| Other | 6,626 | 1,520 | 8,549 | 16,695 | 17% |

***Occupational Safety and Health, and Homeland Security Regulations.*** The costs of homeland security regulations are allocated based on each sector's share of value added to private sector GDP. The costs of occupational safety and health regulations are allocated based on each sector's share of private sector employment. The sum of these two sector costs then determines the overall sector share.

### *Allocation of Regulatory Costs by Firm Size*

The third task of this study involves allocating the costs of regulations by firm size. As noted above, this study adopts a three-division scheme: firms with fewer than 20 employees ("small"), firms with 20 to 499 employees ("medium," or "mid-sized"), and firms with 500 or more employees ("large"). The specific allocation procedure differs for each type of regulation, and the procedures are described below.

Starting with economic regulations, the cost allocation among the three firm size groups uses a two-step procedure. Step one seeks to separate the total regulatory costs for the sector into two components, those that apply to all firms and those that explicitly exempt small firms (those with fewer than 20 employees). In step two, for the nonexempt regulations, the procedure follows Crain and Hopkins (2001) and Crain (2005) and allocates these costs based on the share of payroll expenditure within each firm size category (shown in Table 8 above). For example, in the manufacturing sector, small firms generate 7 percent of payroll within the sector, medium-sized firms generate 31 percent, and large firms generate 62 percent. This procedure is used because payroll expenditures are the best available proxy for the economic activity by firm size. The portion of economic regulations from which small firms are exempt is approximated using the share of costs that were exempt in the Johnson 2005 study. This historical share is then multiplied by the currently estimated cost of economic regulations to estimate exempted costs. These exempted costs are then reallocated to the medium-sized and large firms based on their respective employment shares. In other words, the aggregate costs of economic regulations include some regulations that exempt small firms and these exempted costs are reapportioned to mid-sized and large firms. The costs reapportioned to mid-sized and large firms are sector-specific, and based on the relative employment shares by firm size in each sector.

The methodology used to allocate the cost of environmental regulations by firm size is described in detail in Appendix 5 and is relatively easy to summarize. The procedure uses multiple regression analysis to estimate the relationship between pollution abatement costs (PAC) per employee and firm size, measured by the number of employees per firm. The model regresses firm compliance costs per employee against the number of employees, controlling for other factors. The regression results indicate that a 1 percent increase in firm size (measured in terms of the number of employees) corresponds to a 0.43 percent decrease in pollution abatement costs per employee. In essence, this parameter estimates the degree of economies of scale in compliance costs.

This "economies of scale" parameter value is used to solve for the median cost per employee within each firm size category for each business sector. To state the problem differently, given the economies of scale parameter and the share of employees within each size class, what per-employee cost for the three firm size classes would yield the overall sector average cost? Other studies are consistent with this finding of economies of scale in environmental regulatory compliance, although Becker (2005) finds that economies of scale differ depending on the type of pollutant.[38]

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[38] See, for examples, Thomas J. Dean, <u>Pollution Regulations as a Barrier to the Formation of Small Manufacturing Establishments: A Longitudinal Analysis</u>, Office of Advocacy, U.S. Small Business Administration: Washington, D.C., 1994; and Thomas J. Dean, *et al.*, "Environmental Regulation as a Barrier to the Formation of Small Manufacturing Establishments: A Longitudinal Analysis," *Journal of Environmental Economics and Management* 40, 2000, pp. 56-75. These two studies suggest that regulatory costs lower the startup rate for new firms, especially in the manufacturing sector, because of its higher capital requirements from environmental and other types of regulations. They also indicate that environmental regulations increase the minimum efficient scale of production. See also the related study by Samuel Staley, *et al.*, *Giving A Leg Up to Bootstrap Entrepreneurship: Expanding Economic Opportunity in America's Urban Centers*, Los Angeles: Reason Public Policy Institute, 2001. As noted in the text, a recent student finds that relative costs of pollution abatement by firm size vary depending on the type of regulated pollutant.  See Randy A. Becker, "Air Pollution Abatement Costs under the Clean Air Act: Evidence from the PACE Survey," *Journal of Environmental Economics and Management*, (5) 2005, pp. 144-169.

The allocation of tax compliance costs across the firm sizes starts with the information reported in Table 11, the compliance costs by sector and by type on business (sole proprietorships, partnerships, and corporations). Within each sector, the following apportionment strategy is used. All of the costs for sole proprietorships are allocated to small businesses. The costs for partnerships are distributed between small and mid-sized businesses based on their shares of payroll expenditures. For example, consider the manufacturing sector. Of total payroll spending by small firms and mid-sized firms, small firms account for 17 percent and mid-sized firms account for 83 percent. Thus, 17 percent of the compliance costs for manufacturing partnerships are allocated to small businesses and 83 percent to mid-sized businesses. Similarly, the compliance costs for corporations are distributed between mid-sized and large businesses based on their shares of payroll expenditures. Again using the example of the manufacturing sector, of total payroll spending by mid-sized firms and large firms, mid-sized firms account for 31 percent and large firms account for 69 percent. Thus, 31 percent of the compliance costs for manufacturing corporations are allocated to mid-sized businesses and 69 percent to large businesses.

The costs of occupational safety and health, and homeland security regulations are distributed among the three firm size categories such that the cost per employee in small firms is 20 percent higher than in medium-sized firms, and the cost per employee in large firms is 20 percent lower than in medium-sized firms. For the regulations that exempt small firms, the costs are allocated solely between the medium-sized and large firms using the same ratio as above (20 percent lower per employee in large firms than in medium-sized firms). The final allocation then sums the nonexempt and exempt cost components for each firm size category.[39]

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[39] The category of workplace regulations is the one area that applies this judgmental cost allocation used in Hopkins (1995), Crain and Hopkins (2001), and Crain (2005). That is, the 20

# IV. Principal Findings

This section presents the report's principal findings regarding the total cost of federal regulations and the distribution of this cost across major sectors of the economy, and across firms of different sizes.

## *A Preliminary Benchmark: Total Federal Regulatory Costs per Household*

One way to illustrate the magnitude of the total cost of federal regulations is in relation to the number of U.S. households. Table 12 presents this cost per household data as a benchmark for comparing how the regulatory burden has changed over time based on the previous studies for Advocacy. However, it is important to caution the reader that this particular benchmark includes the total cost of regulations and makes no effort to distinguish between how much of this cost falls on individuals compared with businesses. It simply assumes that households (as consumers, workers, small business owners, shareholders, and so on) ultimately bear the entire burden of regulations. Further, as noted throughout this report, the estimation methodologies have evolved since the initial study in 1995, and, obviously, this accounts for some of the differences in costs. Table 12 also shows the total federal government burden, encompassing federal tax receipts, and how this total burden per household changed during this time period. The data in Table 12 are adjusted for inflation and expressed in 2009 dollars.

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percent assumption is applied solely to a relatively small segment of all regulations, and therefore the overall results are not very sensitive to this assumption.

**Table 12. Federal Regulatory Costs and Federal Receipts per Household (HH), Compared to Prior Studies for the Office of Advocacy [a]**

| Year | Households (Millions) | Total Regulatory Costs per HH | Federal Receipts per HH [b] | Combined Federal Burden per HH |
|---|---|---|---|---|
| 2008 | 112 | $ 15,586 | $ 22,375 | $ 37,962 |
| 2004 | 109 | $ 11,550 [c] | $ 19,516 | $ 27,359 |
| 2000 | 106 | $ 10,362 [d] | $ 23,903 | $ 30,176 |
| 1995 | 98 | $ 9,580 [e] | $ 19,309 | $ 25,441 |
| Avg. Annual Growth Rate: 1995 to 2008 | 1.1% | 4.8% | 1.2% | 2.4% |

**Notes to Table 12**:

[a] All dollar amounts are adjusted for inflation and denominated in 2009 dollars.

[b] Federal receipts by fiscal years, including Social Security. Source: CBO Web Site: http://www.cbo.gov/showdoc.cfm?index=1821&sequence=0

[c] Source: Crain (2005).

[d] Source: Crain and Hopkins (2001). As described in Crain (2005) this estimate for 2000 adjusts the cost originally reported in Crain and Hopkins (2001) upward by $37 billion to be consistent and comparable with the calculation methods and sources introduced in the Crain (2005) report.

[e] Source: Hopkins (1995)

As shown in Table 12, the total cost of federal regulations per household reached $15,586 in 2008, an increase of more than $4,000 per household since 2004 after adjusting for inflation. (A substantial portion of the 2004-2008 increase shown in Table 12 is the result of the change in methodology in the calculation of the costs estimate for economic regulation). The combined federal burden — federal receipts plus regulatory costs — reached $37,962 per household in 2008, an increase since 2004 of nearly $6,900 per household.  The combined federal burden is growing at a real annual rate of 5.5 percent. An interesting observation in Table 12 is the sharp increase in growth rates

in comparison to the 2000 to 2004 period. In that four-year period, the combined federal

burden per household fell at annual rate of 2.3 percent.

### *Distribution of Federal Regulatory Costs: Businesses and Others*

Table 13 shows the estimated costs of all federal regulations, broken down by

type, and the distribution of the burden between businesses and others (*i.e.*, individuals

and state and local governments).

**Table 13. Total Cost of Federal Regulations in 2008 by Type and Business Share (Billions of 2009 Dollars)**

| | Total Costs (Billions of $) | Business Portion | | Others | |
|---|---|---|---|---|---|
| | | Share (Percent) | Amount (Billions of $) | Share (Percent) | Amount (Billions of $) |
| All Federal Regulations | 1,752 | 55% | 970 | 45% | 782 |
| Economic | 1,236 | 50% | 618 | 50% | 618 |
| Environmental | 281 | 65% | 183 | 35% | 98 |
| Tax Compliance | 160 | 60% | 96 | 40% | 64 |
| Occupational Safety and Health, and Homeland Security | 75 | 97% | 73 | 3% | 2 |

These estimates in Table 13 indicate that the annual total cost of all federal regulations in 2008 was $1.752 trillion. Of this amount, the annual direct burden on business is $970 billion. Economic regulations represent the most costly category, with a total cost of $1.236 trillion, and with $618 billion falling initially on business. Environmental regulations represent the second most costly category in terms of total cost ($281 billion), and the cost apportioned to business is $183 billion. Compliance with the federal tax code is the third most costly category ($160 billion), and the cost of occupational safety and health, and homeland security regulations ranks last ($75 billion).

### Distribution of the Regulatory Burden across Business Sectors: Three Metrics

Table 14 further deconstructs the business portion of regulatory costs by sector and by the four categories of regulations. Three measures of the regulatory burden are

employed to assess the cost distribution among business sectors: cost per firm, cost per

employee, and cost as a share of payroll expenses.

**Table 14. Average Sectoral Regulatory Costs, 2008** (In 2009 Dollars)

| | Total Costs (Billions of Dollars) | Cost per Firm (Dollars) | Cost per Employee (Dollars) | Cost as a Share of Payroll (Percent) |
|---|---|---|---|---|
| **Manufacturing** | | | | |
| Total | 193 | 688,194 | 14,070 | 29 |
| Economic | 82 | 293,660 | 6,004 | 12 |
| Environmental | 98 | 352,689 | 7,211 | 15 |
| Tax Compliance | 3 | 11,415 | 233 | 0.5 |
| OSHHS * | 8 | 30,431 | 622 | 2 |
| **Trade** | | | | |
| Total | 115 | 109,970 | 5,289 | 16 |
| Economic | 89 | 84,811 | 4,079 | 12 |
| Environmental | - | - | - | - |
| Tax Compliance | 13 | 12,808 | 616 | 2 |
| OSHHS * | 13 | 12,351 | 594 | 2 |
| **Services** | | | | |
| Total | 400 | 129,912 | 7,235 | 15 |
| Economic | 308 | 100,460 | 5,595 | 13 |
| Environmental | 1 | 177 | 10 | 0 |
| Tax Compliance | 56 | 18,211 | 1,014 | 2 |
| OSHHS * | 35 | 11,065 | 616 | 1 |
| **Health Care** | | | | |
| Total | 69 | 116,326 | 4,221 | 10 |
| Economic | 52 | 86,760 | 3,148 | 8 |
| Environmental | 1 | 2,056 | 75 | 0.2 |
| Tax Compliance | 7 | 11,514 | 418 | 1 |
| OSHHS * | 9 | 15,995 | 580 | 1 |
| **Other** | | | | |
| Total | 191 | 188,704 | 14,992 | 31 |
| Economic | 88 | 84,687 | 6,728 | 14 |
| Environmental | 83 | 79,900 | 6,348 | 13 |
| Tax Compliance | 17 | 16,153 | 1,283 | 3 |
| OSHHS * | 6 | 7,964 | 633 | 1 |
| **U.S.Totals (All U.S. Businesses)** | | | | |
| Total | 907 | 161,021 | 8,086 | 19 |
| Economic | 618 | 102,612 | 5,153 | 12 |
| Environmental | 183 | 30,329 | 1,523 | 4 |
| Tax Compliance | 96 | 15,939 | 800 | 2 |
| OSHHS * | 73 | 12,141 | 610 | 1 |

**Note to Table 14:**

* OSHHS stands for Occupational Safety and Health, and Homeland Security Regulations

As shown in Table 14, considering all U.S. businesses and all federal regulations, the

cost burden on the typical U.S. firm is about $161,000. The cost per employee for the

typical U.S. firm tops $8,000. This cost of federal regulation in the typical U.S. firm

equals 19 percent of payroll expenditures. To place this amount in perspective, it

exceeds the employer contribution to the payroll tax for Social Security (OASDHI) and

Medicare, which is 7.65 percent of wages. Indeed, 19 percent of payroll expenditures

exceeds the combined payroll taxes for OASHDI and Medicare paid by employers and

employees, or self-employed individuals, which equals 15.3 percent.

The three cost metrics described and shown in Table 14 reveal several

noteworthy patterns in how the cost burden of regulations is distributed among the

business sectors. Table 15 shows these patterns a bit more clearly by ranking the five

sectors in terms of the relative cost burden.

**Table 15. Sector Rankings Based on Three Metrics of the Regulatory Burden**
     **(In 2009 Dollars. 1=highest burden; 5=lowest burden)**

| Business Sector | Cost Per Firm (Dollars) | Cost Per Firm (Rank) | Cost Per Employee (Dollars) | Cost Per Employee (Rank) | Cost / Payroll (Percent) | Cost / Payroll (Rank) |
|---|---|---|---|---|---|---|
| Manufacturing | 688,944 | 1 | 14,070 | 2 | 29 | 2 |
| Other | 188,704 | 2 | 14,992 | 1 | 31 | 1 |
| Services | 129,912 | 3 | 7,235 | 3 | 15 | 4 |
| Health Care | 116,326 | 4 | 4,221 | 5 | 10 | 5 |
| Trade | 109,970 | 5 | 5,289 | 4 | 16 | 3 |

As illustrated by the rankings in Table 15, the manufacturing sector and the

"other" sector bear the largest regulatory burden by all three metrics. For example, using

the "cost per firm" metric as a gauge, the distribution of the regulatory burden is heavily

skewed toward these two sectors. The manufacturing sector in particular bears the

51

highest total regulatory burden in terms of the average cost per firm. The burden on the manufacturing sector ($688,944 per manufacturing firm) exceeds the burden on the second most costly sector (the "other" category at $188,704 per firm) by a factor of 3.6. However, by the other two metrics — cost per employee and cost as a percent of payroll — the "other" category bears the highest burden. The cost per employee for firms in the "other" category is $14,992 as compared with the second highest sector (manufacturing), where the cost per employee is $14,070.

The difference between the rankings based on "cost per firm" versus "cost per employee" is likely explained by the fact that enterprises within these two sectors operate with different mixes of capital and labor. For example, predominant among the "other" category are utilities, mining (including coal and oil and gas extraction), and transportation and warehousing concerns, all of which require huge capital investments relative to the number of employees. This means that the regulatory cost per worker rises in this sector relative to manufacturing establishments that typically have more employees per unit of capital investment than establishments such as public utilities, airlines, and railroads. It is worth emphasis, however, that costs per employee in both of these sectors are double the cost per employee in the next highest-cost sector, services, where costs equal $7,235 per employee.

The second conclusion from the metrics in Table 15 is that regulatory costs are distributed much more evenly among the three remaining sectors: health care, services, and trade. For example, in terms of the cost per firm, the burden on the services sector is 12 percent higher than the health care sector and 18 percent higher than the trade sector. As a final observation, when the regulatory burden is gauged by "cost as a percent of payroll," the health care sector fares far better than any of the other sectors (equal to 10 percent). For example, the difference is large even compared to the second

lowest cost industry, services, which equals 15 percent of payroll expenditures. Health care compliance costs as a share of payroll is one-third the level in the "other" sector.

In summary, some conclusions about the distribution of the regulatory burden among sectors depend on which metric one favors. However, the metrics uniformly indicate that the manufacturing sector and the "other" sector bear substantially higher regulatory costs compared with the services, health care, and trade sectors of the economy.

### The Distribution of Regulatory Costs by Firm Size

The distribution of regulatory costs among different firm size categories is presented in Table 16.

**Table 16. Regulatory Costs in Small, Medium-sized and Large Firms, 2008**
            **(Cost per Employee in 2009 Dollars)**

| Type of Regulation | All Firms | Firm Size | | |
|---|---|---|---|---|
| | | <20 | 20-499 | 500+ |
| **Manufacturing** | | | | |
| Total | 14,070 | 28,316 | 13,504 | 12,586 |
| Economic | 6,004 | 4,454 | 5,481 | 6,952 |
| Environmental | 7,211 | 22,594 | 7,131 | 4,865 |
| Tax Compliance | 233 | 444 | 205 | 219 |
| OSHHS * | 622 | 824 | 687 | 550 |
| **Trade** | | | | |
| Total | 5,289 | 5,453 | 6,242 | 4,753 |
| Economic | 4,079 | 3,673 | 4,866 | 3,823 |
| Environmental | - | - | - | - |
| Tax Compliance | 616 | 1,013 | 737 | 418 |
| OSHHS * | 594 | 767 | 639 | 511 |
| **Services** | | | | |
| Total | 7,235 | 7,106 | 6,274 | 7,815 |
| Economic | 5,595 | 4,181 | 4,668 | 6,648 |
| Environmental | 10 | 25 | 8 | 5 |
| Tax Compliance | 1,014 | 2,113 | 944 | 637 |
| OSHHS * | 616 | 786 | 655 | 524 |
| **Health Care** | | | | |
| Total | 4,221 | 5,375 | 3,707 | 4,204 |
| Economic | 3,148 | 3,318 | 2,725 | 3,366 |
| Environmental | 75 | 203 | 64 | 44 |
| Tax Compliance | 418 | 1,103 | 292 | 293 |
| OSHHS * | 633 | 772 | 643 | 514 |
| **Other** | | | | |
| Total | 14,992 | 21,906 | 12,878 | 11,964 |
| Economic | 6,728 | 5,273 | 6,700 | 7,721 |
| Environmental | 6,348 | 13,760 | 4,343 | 2,963 |
| Tax Compliance | 1,283 | 2,101 | 1,192 | 765 |
| OSHHS * | 633 | 772 | 643 | 514 |
| **Total, All U.S. Businesses \*\*** | | | | |
| Total | 8,086 | 10,585 | 7,454 | 7,755 |
| Economic | 5,153 | 4,120 | 4,750 | 5,835 |
| Environmental | 1,523 | 4,101 | 1,294 | 883 |
| Tax Compliance | 800 | 1,584 | 760 | 517 |
| OSHHS * | 610 | 781 | 650 | 520 |

**Notes for Table 16:**

\* OSHHS stands for Occupational Safety and Health, and Homeland Security Regulations

\*\* The costs per employee for all U.S. Businesses are computed using the employment shares to weight the costs in each of the five respective sectors.

Considering first the aggregate costs for all federal regulations and all business sectors (displayed as the last category in Table 16), regulations cost small firms an estimated $10,585 per employee.[40] Regulations cost medium-sized firms $7,454 per employee, and large firms $7,755 per employee. Overall, the cost per employee is 42 percent higher in small compared with mid-sized firms, and 36 percent higher in small firms than in large firms. It is noteworthy that the distribution of costs across the three categories of firms in 2008 is similar to the findings in the prior study for Advocacy (Crain, 2005). In 2004 the cost differential between small and mid-sized firms was 41 percent; thus, the cost disadvantage to small businesses has remained nearly constant. In 2004 the cost differential between small and large firms was 45 percent, which is even greater than the gap estimated in 2008. This suggests that since 2004, costs per employee have increased for large businesses relative to small and mid-sized businesses.[41] Indeed, considering the costs of all regulations and all business sectors, mid-sized firms appear to have a slight advantage over large firms, and a wide advantage over small firm.

This pattern, however, is not uniform across sectors or types of regulations. As the results in Table 16 reveal, the distribution of compliance costs with respect to firm size classes differs across the five major business sectors. Indeed, even within sectors, the distribution of the burden varies with the type of regulation. Table 17 reports the percentage difference in the cost per employee in small firms versus larger firms by

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[40]   The U.S. total figures are based on a weighted average of the costs in the five business categories. The weights for each average use the share for the respective category. For example, for the "cost per firm" value, the cost per firm in each sector is weighted by the share of all U.S. firms in that sector. For the "cost as a percent of payroll" value, the sector values are weighted by the share of all U.S. payroll expenditures in that sector, and so on.

[41] The caution about comparing the 2008 estimates with prior years again should be noted because of the newly introduced methodology for estimating economic regulations.

sector. That is, Table 17 restates the numbers in Table 16 in terms of the cost burden on small firms relative to mid-sized and large firms.

**Table 17. Regulatory Costs in Small Firms Relative to Medium-sized and Large Firms in 2008 ***

| Business Sector | Small Firms Relative to Medium-Sized Firms | Small Firms Relative to Large Firms |
|---|---|---|
| Manufacturing | 110 | 125 |
| Trade | -13 | 15 |
| Services | 13 | -9 |
| Health Care | 45 | 28 |
| Other | 70 | 83 |
| All Sectors | 42 | 36 |

**\* Note to Table 17:**

The numbers reflect the percentage difference between regulatory costs per employee in a small firm versus a medium-sized firm or large firm using the data reported in Table 16.

The disproportionate cost burden on small firms is dramatic for the manufacturing sector. In that sector the estimated cost per employee for small firms is 110 percent higher than in medium-sized firms ($28,316 versus $13,504), and 125 percent higher than in large firms ($28,316 versus $12,586). To drive home the importance of this result, in the U.S. manufacturing sector, small firms face a regulation burden that is more than double the burden faced by their larger rivals. This cost disadvantage faced by small manufacturing firms appears in three of the four types of regulations (see the detailed breakdown by type of regulation in Table 16). The burden falls disproportionately on large manufacturing firms only in the case of economic

regulations.[42] However, while some types of regulations disadvantage large firms

relative to small, the combined impact of all regulations in the manufacturing sector puts

small firms at a substantial competitive disadvantage.

The distribution of the regulatory burden among firms of different sizes in the

"other" category is similar to that in the manufacturing sector, although the overall cost

differentials are less extreme than in the manufacturing sector. The cost per employee is

70 percent higher in small firms than in medium-sized firms, and 83 percent higher in

small firms than in large firms. The health care sector exhibits a similar disproportionate

distribution. In that sector, the cost per employee is 45 percent higher in small firms than

in medium-sized firms, and 28 percent higher in small firms than in large firms.

The regulatory burden is distributed most evenly with respect to firm size in the

services sector, as summarized in Table 17 and displayed in detail in Table 16. In the

services sector the total cost per employee for small firms is only 13 percent larger than

the cost in medium-sized firms, and 9 percent less than the cost in large firms. In the

trade sector, small firms face a 15 percent heavier cost burden than large firms, but have

a 13 percent cost advantage over medium-sized firms. In other words, within the trade

sector, the heaviest cost burden falls on mid-sized firms.


### Summary Comments

Overall and on almost every regulatory frontier, compliance costs place small

businesses at a competitive disadvantage. The cost disadvantage confronting small

business is driven by environmental regulations, tax compliance, and occupational

safety and health and homeland security regulations. The particular cost drivers differ

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[42]  The relatively large impact of economic regulations on large firms has been noted by a number of scholars. See the literature review in Steven C. Bradford, "Does Size Matter? An Economic Analysis of Small Business Exemptions from Regulation," *The Journal of Small and Emerging Business Law,* 8 (1), 2004, pp. 1-37.

somewhat across the five business sectors, as the details of this report point out. Moreover, not all regulations fall more heavily on small firms than on their larger counterparts. For example, the cost of economic regulations falls most heavily on large firms in every sector except health care. The most disadvantaged of all by federal regulations are small manufacturing firms.

This study provides a broad sense of the costs of federal government regulations in the United States and how they affect the balance in public versus private sector responsibilities. In 2008 federal regulatory compliance absorbed about 14 percent of U.S. national income, a clear indication of what citizens give up in exchange for this government function.

# Bibliography

Anderson, P.M. & Meyer, B.D. (1997). The effects of firm specific taxes and government mandates with an application to the U.S. unemployment insurance program. *Journal of Public Economics,* 65, 119-45.

Antonelli, Angela. (1995). *The U.S. Paperwork Reduction Act after fifteen years.* (PUMA/REG(95)4).Paris: Organisation for Economic Cooperation and Development.

Arnold, F. (1995). *Economic analysis of environmental policy and regulation.* New York: John Wiley and Sons.

Barro, Robert J. (1997). *Determinants of economic growth: A cross-country empirical study.* Cambridge, MA: MIT Press.

Barro, Robert J. & Sala-i-Martin, X. (1995). *Economic growth.* New York: McGraw-Hill.

Becker, Randy A. (2005). Air pollution abatement costs under the Clean Air Act: Evidence from the PACE survey. *Journal of Environmental Economics and Management,* 5, 144-169.

Bradford, Steven C. (2004). Does size matter? An economic analysis of small business exemptions from regulation. *The Journal of Small and Emerging Business Law,* 8 (1), 1-37.

Byars, John D., McCormick, Robert E., & Yandle, T. Bruce. (1999). *Economic freedom in America's 50 states: A 1999 analysis.* Clemson, SC: Clemson University, State Policy Network.

Cole, Roland J. & Sommers, Paul. (1980). *Costs of compliance in small and moderate-sized businesse*s. (SBA-79-2668). Seattle, WA: Battelle Human Affairs Research Centers.

Crain, W. Mark.(2005). *The impact of regulatory costs on small firms*, Washington, DC: U.S. Small Business Administration, Office of Advocacy. (http://www.sba.gov/advo/).

Crain, W. Mark & Hopkins, Thomas D. (2001). *The impact of regulatory costs on small firms.* Washington, DC: U.S. Small Business Administration, Office of Advocacy. (http://www.sba.gov/advo/).

Crain, W. Mark & Johnson, Joseph. (2001). *Compliance costs of federal workplace regulations: Survey results for U.S. manufacturers. (*Working paper). Arlington, VA: George Mason University, Mercatus Center.

Crain, W. Mark. (2010). *18 million words can hurt you: The cost of state environmental regulations.* (Policy Studies Working Paper). Easton, PA: Lafayette College.

Crews, Jr., Clyde Wayne. (2004). *Ten thousand commandments: An annual snapshot of the federal regulatory state.* Washington, DC: Cato Institute.

de Rugy, Veronique & Warren, Melinda. (2009). *Expansion of regulatory budgets and staffing continues to rise: An analysis of the U.S. budget for fiscal years 2009 and 2010. (*Regulatory Report 31). Arlington, VA: George Mason University, Mercatus Center*.*

Dean, Thomas J. (1994). *Pollution regulations as a barrier to the formation of small manufacturing establishments: A longitudinal analysis.* Washington, DC: U.S. Small Business Administration, Office of Advocacy.

Dean, T. J., Brown, R.L., & Stango, V. (2000). Environmental regulation as a barrier to the formation of small manufacturing establishments: A longitudinal analysis. *Journal of Environmental Economics and Management,* 40, 56-75.

Donez, F. (1997). *Environmental regulations and small manufacturing plants: Evidence from three industries.* (Unpublished manuscript). Washington, DC: U.S. Environmental Protection Agency, Office of Policy.

Dudley, Susan E. & Antonelli, Angela. (1997). Congress and the Clinton OMB: Unwilling partners in regulatory oversight. *Regulation.*

Evans, Donald S. (1985). *An analysis of the differential impact of EPA and OSHA regulations across firm and establishment size in the manufacturing industries.* Washington, DC: U.S. Small Business Administration, Office of Advocacy.

Executive Order 12866 (1993). Regulatory Planning and Review. *Federal Register*, 58 FR 51735. (http://www.epa.gov/fedrgstr/eo/eo12866.htm).

Friedman, Milton. (2009, January 15). What every American wants. *Wall Street Journal*, A10.

Gruber, Jonathon. (2004). *Public finance and public policy.* New York: Worth Publishers.

Hahn, Robert W. & Hird, John A. (1991). The costs and benefits of regulation: Review and synthesis. *Yale Journal of Regulation,* 8(1), 233-278.

Hahn, Robert W. (1996). Regulatory reform: What do the government's numbers tell us? In Robert W. Hahn (Ed.), *Risks, costs, and lives saved: Getting better results from regulation* (pp. 208-253). New York: Oxford University Press and AEI Press.

Hahn, Robert W. (1998). Government analysis of the benefits and costs of regulation. *Journal of Economic Perspectives*, 12 (4), 201-210.

Hahn, Robert W. (2001). Regulatory reform: Assessing the government's numbers. In *Reviving regulatory reform: A global perspective.* New York: Cambridge University Press and AEI Press.

Hall, J. V. (1997). The theoretical and empirical basis for assessing economic impacts of environmental regulation. In D. C. Hall (Ed.), *Advances in the economics of environmental resource*s (pp. 13-37). New York: JAI Press, Inc.

Hall, Robert E. & Jones, Charles I. (1997). Levels of economic activity across countries. *American Economic Review*, 87 (2), 173-177.

Harrington, Winston, Morgenstern, Richard D., & Nelson, Peter. (2000). On the accuracy of regulatory cost estimates. *Journal of Policy Analysis and Management*, 19 (2), 297-322.

Hazilla, Michael & Kopp, Raymond. (1990). The social cost of environmental quality regulations: A general equilibrium analysis. *Journal of Political Economy*, 98 (4), 853-873.

Hopkins, T. D. (1995). *A survey of regulatory burdens.* (Report no.SBA-8029-OA-93). Washington, DC: U.S. Small Business Administration, Office of Advocacy. (http://www.sba.gov/advo/research/rs163.html).

Hopkins, Thomas. (1995). *Profiles of regulatory costs. Report to the U.S. Small Business Administration.* (NTIS No.PB96 128038). Washington, DC: U. S. Small Business Administration, Office of Advocacy. (http://www.sba.gov/advo/).

Huang, Ying, McCormick, Robert E., & McQuillen, Lawrence. (2004). *U.S. Economic Freedom Index: 2004 report.* San Francisco: Pacific Research Institute.

Jaffe, Adam B., Peterson, Steven R., Portney, Paul R., & Stavins, Robert. (1995). Environmental regulation and the competitiveness of U.S. manufacturing. *Journal of Economic Literature*, 33 (1), 132-163.

James, Jr., Harvey S. (1996). Estimating OSHA compliance costs. (Policy Study no. 135). St. Louis: Washington University, Center for the Study of American Business.

Johnson, Joseph M. (2004). *The cost of regulations implementing the Clean Water Act.* (Regulatory Studies Program working paper). Arlington, VA: George Mason University, Mercatus Center.

Johnson, Joseph M. (2005) A review and synthesis of the cost of workplace regulations. In Andrew P. Morriss and Samuel Estreicher (Eds.), *Cross-border human resources, labor and employment issues* (pp. 433-467). Netherlands: Kluwer Law International.

Jorgenson, Dale W. & Wilcoxen, Peter J. (1990). Environmental regulation and U.S. economic growth. *Rand Journal of Economics,* 21 (2), 314-340.

Julien, P.A. (1993). Small businesses as a research subject: Some reflections on knowledge of small businesses and its effects on economic theory. *Small Business Economics,* 5, 157-166.

Karabegovic, Amela & McMahon, Fred, with Black, Christy G. (Annual editions, 2002-2009). *Economic freedom of North America.* Canada: The Fraser Institute.

Kaufmann, Daniel & Kraay, Aart. (2008, spring). Governance indicators: Where are we and where should we be going? *World Bank Research Observer.*

Kaufmann, Daniel, Kraay, Aart, & Mastruzzi, Massimo. (2009, June). Governance matters VIII: Aggregate and individual governance indicators 1996–2008. (Policy Research Working Paper 4978). Washington, DC: World Bank Development Research Group, Macroeconomics and Growth Team.

Kirchhoff, B. A. & Greene, P.G. (1996). Understanding the theoretical and empirical content of critiques of U.S. job creation. *Small Business Economics,* 10, 153-169.

Kohn, R. E. (1988). Efficient scale of the pollution-abating firm. *Land Economics,* 64(1), 53-61.

List, John & Kunce, Mitch. (2000). Environmental protection and economic growth: What do the residuals tell us? *Land Economics*, *76*(2), 267-282.

McQuillan, Lawrence J., Maloney, Michael T., Daniels, Eric, & Eastwood, Brent M. (2008). *U.S. Economic Freedom Index: 2008 report.* San Francisco: Pacific Research Institute.

Madrian, B. C. (1998, winter). Health insurance portability: The consequences of COBRA. *Regulation,* 27-33.

Martin, S. (1993). *Advanced industrial economics.* Cambridge, MA: Blackwell.

Moody, J. Scott. (2000). *The cost of complying with the U.S. federal income tax.* Washington, DC: The Tax Foundation.

Moody, J. Scott. (2002). *The cost of complying with the U.S. federal income tax* Washington, DC: The Tax Foundation.

Morrison, Todd A. (1984). *Economies of scale in regulatory compliance: Evidence of the differential impacts of regulation by firm size.* (Jack Faucett Associates.) Washington, DC: U.S. Small Business Administration, Office of Advocacy. (NTIS no. PB85-178861),

Organisation for Economic Cooperation and Development. (1997). *The OECD report on regulatory reform. Volume I: Sectoral studies.* Paris: Author.

Organisation for Economic Cooperation and Development. (1999a). *Regulatory reform in the United State*s. (OECD Reviews of Regulatory Reform). Paris: Author.

Organisation for Economic Cooperation and Development. (1999b). Cross-country patterns of product market regulation. *Economic outlook,*Chapter VII (pp. 179-189). Paris: Author.

Organisation for Economic Cooperation and Development. (2000). *Summary indicators of product market regulation with an extension to employment protection legislation.* (Economics Department Working Paper No. 226). Paris: Author.

National Federation of Independent Business Education Foundation. (2000). William J. Dennis, Jr. (Ed.), *NFIB small business policy guide.* Washington, DC: Author. (http://www.nfib.com/PDFs/NFIBPolicyGuide.pdf).

Nicoletti, G., Scarpetta, S., & Boylaud, O. (1999). *Summary indicators of product market regulation and employment protection legislation for the purpose of international comparisons.* (OECD Economics Department Working Paper No. 226).Paris: Organisation for Economic Cooperation and Development.

Oats, Wallace. (2009, September 21). *Environmental federalism.* Washington, DC: Resources for the Future.

Pashigian, B. P. (1984). The effect of environmental regulation on optimal plant size and factor shares. *Journal of Law and Economics*, 27, 1-28.

Pashigian, B. P. (1986). Reply to Evans. *Journal of Law and Economics,* 29, 201-209.

Phillips, Bruce D. & Dennis, Jr., William J. (2001, May 21). *Better measures of regulatory costs as support for entrepreneurship.* (Mimeograph). Washington. DC: National Federation of Independent Business Educational Foundation.

Pittman, R. W. (1981). Issue in pollution control: Interplant cost differences and economies of scale. *Land Economics,* 57(1), 1-14.

Porter, Michael. (1991). America's green strategy. *Scientific American.*

Posner, Richard A. (1975). The social costs of monopoly and regulation. *Journal of Political Economy*, 83(4), 807-828.

Potter, E. E. & Reesman, A.E. (1990). An assessment of remedies: The impact of compensatory and punitive damages on Title VII. (Policy paper). Washington, DC: Employment Policy Foundation.

Regulatory Flexibility Act. (1980). 5 U.S.C. Section 605.

Sargentich, T. O. (1997). The Small Business Regulatory Enforcement Fairness Act. *Administrative Law Review,* 49 (1), 123-138.

Schmalensee, Richard. (1994). The costs of environmental protection. In M.B. Kotowski (Ed.), *Balancing economic growth and environmental goals* (pp. 57-61). Washington, DC: American Council for Capital Formation.

Siegfried, J. J. & Evans, I.B. (1994). Empirical studies of entry and exit: A survey of the evidence. *Review of Industrial Organization,* 9, 121-155.

Staley, Samuel R., Husock, Howard, Bobb, David J., Burnett, Sterling, Crasy, Laura, and Hudson, Wade. (2001). *Giving a leg up to bootstrap entrepreneurship: Expanding*

*economic opportunity In America's urban centers.* Los Angeles, CA: Reason Public Policy Institute.

Storey, D. J. (1994). *Understanding the small business sector.* London: Routledge.

Thieblot, A.J. (1996). A new evaluation of impacts of prevailing wage law repeal. *Journal of Labor Research,* 17(2), 297-322.

U.S. Bureau of the Census. (1992). Economic Census (http://govinfo.kerr.orst.edu/econ-stateis.html).

U.S. Bureau of the Census, Bureau of Economic Analysis. (1996). Pollution abatement and control expenditures, 1972–94. *Survey of Current Business*, 76.

U.S. Bureau of Labor Statistics. (2001). Labor force statistics from the Current Population Survey. (http://stats.bls.gov/news.release/union2.t03.htm).

U.S. Department of Health and Human Services. (2009). *National health expenditure accounts.* Washington, DC: Author. (http://www.cms.hhs.gov/NationalHealthExpendData/02_NationalHealthAccounts Historical.asp#TopOfPage).

U.S. Environmental Protection Agency. (1990). *Environmental investments: The cost of a clean environment.* (EPA 230-11-90-083). Washington, DC: Author.

U.S. Environmental Protection Agency. (1999a). *Economic analysis of the proposed boat manufacturing NESHAP.* (EPA-452/R). Washington, DC: Author.

U.S. Environmental Protection Agency. (1999b). *Revised interim guidance for rulewriters: Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act.* Washington, DC: Author. (www.EPA.Gov/SBREFA).

U.S. Environmental Protection Agency. (2000). *A retrospective assessment of the costs of the Clean Water Act: 1972 to 1997.* Washington, DC: Author.

U.S. General Accounting Office. (1994). *Workplace regulation.*Vol. 1 *(*GAO/HEHS-94-138). Washington, DC: Author.

U.S. International Trade Commission. (2004). *The economic effects of significant U.S. import restraints.* Fourth update. (Investigation No. 332-325). Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2000). *Report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2001). *Report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2002). *Informing regulatory decisions*: *Report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2003). *Informing regulatory decisions: Report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2004). *Informing regulatory decisions: 2004 draft report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Office of Management and Budget, Office of Information and Regulatory Affairs. (2005). *Draft report to Congress on the costs and benefits of federal regulations.* Washington, DC: Author.

U.S. Small Business Administration. (1998a). Impacts of federal regulations, paperwork, and tax requirements on small business. (SBAHQ-95-C-0023) Washington, DC: Author. (http://www.sba.gov/ADVO/research/#regulation).

U.S. Small Business Administration. (1998b). Small business answer card. Washington, DC: Author. (http://www.sba.gov/advo/stats/ec_anscd.html).

U.S. Small Business Administration, Office of Advocacy. (2001). Statistics of businesses: Firm size data. Washington, DC: Author. (http://www.sba.gov/advo/stats/data.html).

U.S. Small Business Administration, Office of Advocacy. (Annual editions). *Annual report of the chief counsel for advocacy on implementation of the Regulatory Flexibility Act and Executive Order 13272.* Washington, DC: Author. (http://www.sba.gov/advo/laws/flex/).

Varshney, Sanjay B. & Tootelian, Daniel H. (2009). *Cost of state regulations on California small businesses study.* Sacramento, CA: California State University.

Verkuil, P. R. (1982). A critical guide to the Regulatory Flexibility Act. *Duke Law Journal,* 213-275.

Walker, Deborah. (1988). Mandatory family-leave legislation: The hidden costs. *Policy Analysis*, No. 108.

Warren, Melinda. (2000, June). *Federal regulatory spending reaches a new height: An analysis of the budget of the U.S. government for the year 2001.* (Regulatory Report No. 23). St. Louis: Washington University, Center for the Study of American Business. (http://csab.wustl.edu/New%20WC%20Site/CSAB%20publications/CSAB%20pubs-pdf%20files/RBR/RBR%2023.pdf)

Winston, Clifford. (1998). U.S. industry adjustment to economic deregulation. *Journal of Economic Perspectives,* 12(3), 89-110.

Wittenberg, A. & Arnold, F. (1999). *Review of small entity economic impact analysis*. (Unpublished manuscript prepared by ICF Consulting for U.S. Environmental Protection Agency, Contract 68-W6-0056).

# Appendix 1.  Elements Included in the World Bank Index of Regulatory Quality and Data Summary for Estimating the Costs of Domestic Economic Regulations

**Table A-1: List of Concepts Included in the Regulatory Quality Index**

Export and Import Regulations
Restrictions on ownership of business by non-residents
Restrictions on ownership of equity by non-residents
Unfair competitive practices
Price controls
Discriminatory tariffs
Excessive protections
Stock Exchange / Capital Markets
Foreign investment restrictions
Administrative regulations
Tax system is distortionary
Competition in local market is limited
Anti-monopoly policy is lax and ineffective
Complexity of tax system
Easy to start a company
Banking / finance restrictions
Wage and prices controls
Administrative business start-up formalities
Ease of market entry for new firms
Tax Effectiveness (How efficient the country's tax collection system is.)
An assessment of whether the necessary business laws are in place.
Labor Market Policies
Enabling Environment for Private Sector Development
How problematic are labor regulations for the growth of your business?
How problematic are tax regulations for the growth of your business?
How problematic are custom and trade regulations for the growth of your business?
Trade & foreign exchange system
Enabling conditions for rural financial services development
Investment climate for rural businesses
Access to agricultural input and produce markets
Banking regulation does not hinder competitiveness
Competition legislation in your country does not prevent unfair competition
Customs' authorities do not facilitate the efficient transit of goods
Financial institutions' transparency is not widely developed in your country
Labor regulations hinder business activities
Subsidies impair economic development

**Source for Table A-1: Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzzi (2009), Table B-4**

**Table A-2. Summary Statistics for OECD Cross-Country Data Set**

|  | mean | median | sd |
|---|---|---|---|
| GDP per Capita (in 2009 US $) | 22,654 | 24,306 | 12,201 |
| World Bank Index of Regulatory Quality | 1.317 | 1.441 | 0.441 |
| Population (in 1000s) | 38,900 | 10,800 | 57,900 |
| Fixed Broadband Subscribers per 100 people | 14.2 | 13.3 | 10.1 |
| Primary Education as a Share of the Eligible Population (times 100) | 98 | 99 | 5 |
| Foreign Trade as a Share of GDP (times 100) | 98 | 81 | 57 |

## Appendix 2. Methodology Used to Correct Overcount of Firms in the SBA Data

When the Census Bureau compiles its Statistics of U.S. Businesses, it relies on survey questionnaires filled out by firms. Occasionally the firms classify themselves under more than one industry. Because some firms are redundantly classified, the sum of the firms within each category is actually greater than the entire number of firms.

To correct for this over count, the number of redundantly counted firms is calculated by summing the number of firms by industry and subtracting the total number of firms from this across-industry sum.

The next task is to assign a certain fraction of over counted firms to each industry to be used as a reduction factor. This is accomplished using the fact that the number of employees within each industry is accurately measured. Each industry's share of the total work force is calculated; these shares are then used to allocate the over counted firms to each industry. From there, it is a simple matter of subtracting the over count within each industry from the reported count in each industry. This ensures that the total number of firms is equal to the number of firms summed across the five industry categories.

# Appendix 3. Methodology for Estimating Economies of Scale in Environmental Compliance Costs

## Introduction

In 2008, environmental regulations cost an estimated $281 billion (16 percent of total federal regulatory costs), and the cost falling on businesses was an estimated $183 billion (19 percent of total business regulatory costs). This appendix describes the methodology used to estimate the relationship between firm size and compliance costs for environmental regulations. This methodology is adopted from Crain and Hopkins (2001) and Crain (2005), and the objective is to provide a basis for allocating the cost of environmental regulations among the three firm size categories.

The relationship between compliance costs and firm size is estimated using pollution abatement expenditures by manufacturing firms. For reasons described below the data used in the analysis are for 1992. Among environmental regulations, pollution abatement expenditures account for about one-fourth of the costs. Thus, a reliable estimate of scale economies in pollution abatement provides a reasonable approximation for the general distribution of all environmental regulatory costs.

## Estimation Procedure and Results

The general approach is to estimate the relationship between pollution abatement cost (PAC) per employee and firm size, here measured by the number of employees per firm. Equation (2) specifies the estimation equation, which is estimated in log form:

(Eq. 2)  $\ln(\text{PAC} / \text{employee})_{i,s} = \beta \ln(\text{Firm Size}_{i,s}) + \phi \ln(\text{Value of Sales}_{i,s}) + \gamma_i + \varepsilon_{i,s}$ ,

where subscript *i* stands for a specific industry type and subscript *s* stands for a specific American state. Industry types are defined by two-digit SIC codes covering all industries in the manufacturing sector; see Table A-8 below for a description of the 20 industries included. Each continuous variable is entered into Equation (2) as a natural logarithmic transformation (ln).

In Equation (2) the dependent variable, (PAC / employee) $_{i,s}$, measures the average pollution abatement expenditure per employee in industry *i* in state *s* in 1994 (source: Bureau of the Census, 1996). These are the most recently available data, as Census no longer collects this series. These expenditure data include capital expenses and operating expenditures. The main independent variable of interest, firm size $_{i,s}$, measures the average number of employees per firm in industry *i* in state *s* (source: Bureau of the Census, *1992 Economic Census*). The estimated coefficient on firm size, $\beta$, thus provides the measure of economies of scale. Specifically, how does pollution abatement expenditure per employee respond to changes in firm size? Equation (2) also includes a control variable for the average value of sales, and a fixed-effects variable, $\gamma_i$, which seeks to control for other factors that cause pollution abatement costs to differ among the 20 industries. For example, the chemical industry may simply be subject to different environmental standards than, say, the leather products industry. Including the fixed-effects dummy variables in the model allows the cost function to shift for each specific industry. $\varepsilon_{i,s}$ is the regression error term, which is assumed to be normally distributed.

Equation (2) is estimated across states using data for 1992. While the Census Bureau continued to survey pollution abatement expenditures through 1994, 1992 is used because the Census of Manufacturing (the source of the state-level data on firm

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sizes, employment, and sales) also occurred in that year (the Census of Manufacturing is conducted only every five years).

### *Results*

Table A-3 presents the regression results. Overall, the regression model demonstrates considerable explanatory power. The F-statistic is significant at the one-percent confidence level, and the model explains 83 percent of the variation in pollution abatement expenditures per employee. The estimate of $\beta$, $-0.431$, is significant at the 0.07 confidence level. This parameter value indicates that a 1 percent increase in firm size (the number of employees) corresponds to a 0.431 percent decrease in abatement costs per employee. (Recall that the variables are entered as log transformations, so the estimated coefficient indicates the elasticity.) The control variable for the value of sales is significant at the 0.01 level. Finally, the F-statistic allows us to reject the hypothesis that the coefficients on the industry-specific dummy variables are jointly equal to zero. In other words, not surprisingly, the fixed-effects variables pick up significant differences in costs among the various industries.

**Table A-3. Regression Results: Economies of Scale in Compliance Costs: Environmental Regulations**

Dependent variable: Pollution Abatement Expenditure per Employee

| Independent Variable | Coefficient | Std. Err. | t-stat | P>|t| |
|---|---|---|---|---|
| ln (Number of Employees) | -0.431 | 0.243 | -1.78 | 0.07 |
| ln (Value of Shipments) | 0.698 | 0.186 | 3.75 | 0.00 |
| Constant | -2.494 | 2.28 | -1.10 | 0.28 |

**Notes to Table A-3:**

Number of observations = 208
Adjusted R-squared = 0.83
Regression F-stat (2, 188) = 10.84
Fixed Industry Effects, F-stat (17, 188) = 18.43

Following the firm classification scheme used throughout this study, the predicted costs per employee are computed for three broad categories of firm sizes: firms with fewer than 20 employees ("small firms"), firms with 20 to 499 employees ("medium-sized firms"), and firms with 500 or more employees ("large firms"). These costs are also shown in Table A-4, converted into 2009 dollars. The relative costs across these three firm size categories for the earlier time period establish the basis for allocating the cost of environmental regulations in 2008.

**Table A-4. Results on Environmental Compliance Costs by Firm Size**
**(2009 Dollars)**

| | Cost per Employee, Manufacturing Sector Firms with: | | |
|---|---|---|---|
| | <20 Employees | 20 to 499 Employees | 500+ Employees |
| **Values Using Eq. 2** | 22,594 | 7,131 | 4,865 |

## *Concluding Comments*

The earliest studies for Advocacy (Hopkins, 1995) provided the most comprehensive assessment to date on the incidence of regulatory costs by sector and firm size. However, Hopkins pointed out, he was forced to rely on a judgmental approach to the cost allocations across firm sizes in the absence of specific empirical estimates. This appendix provides the basis used in this report (and two prior reports for Advocacy) to allocate the costs of environmental regulations among the different firm size classes.

**Table A-5. Sectors Included in the Regression Analysis of Environmental Compliance Costs**

| SIC Code | Industry Description |
|----------|---------------------|
| 20 | Food and kindred products |
| 21 | Tobacco products |
| 22 | Textile mill products |
| 23 | Apparel and other textile products |
| 24 | Lumber and wood Products |
| 25 | Furniture and fixtures |
| 26 | Paper and allied products |
| 27 | Printing and publishing |
| 28 | Chemicals and allied products |
| 29 | Petroleum and coal products |
| 30 | Rubber and miscellaneous plastic products |
| 31 | Leather and leather products |
| 32 | Stone, clay and glass products |
| 33 | Primary metal industries |
| 34 | Fabricated metal products |
| 35 | Industrial machinery and equipment |
| 36 | Electronic and other electric equipment |
| 37 | Transportation equipment |
| 38 | Instruments and related products |
| 39 | Miscellaneous manufacturing industries |

## Appendix 4. Spending and Staffing by Federal Regulatory Agencies

**Table A-6. Total Spending by Federal Regulatory Agencies on Regulatory Activity, Fiscal Years (Millions of 2009 Dollars)**

| Fiscal Year | Social Regulations | Economic Regulations | Total |
|---|---|---|---|
| 1990 | 17,020 | 3,883 | 20,903 |
| 1991 | 18,588 | 3,736 | 22,323 |
| 1992 | 20,320 | 4,098 | 24,418 |
| 1993 | 20,442 | 4,687 | 25,130 |
| 1994 | 20,745 | 4,366 | 25,111 |
| 1995 | 21,243 | 5,076 | 26,319 |
| 1996 | 21,041 | 4,685 | 25,726 |
| 1997 | 22,103 | 5,057 | 27,160 |
| 1998 | 24,123 | 4,948 | 29,071 |
| 1999 | 25,034 | 5,197 | 30,231 |
| 2000 | 26,247 | 5,460 | 31,707 |
| 2001 | 27,305 | 5,588 | 32,892 |
| 2002 | 32,296 | 6,002 | 38,297 |
| 2003 | 41,683 | 5,926 | 47,609 |
| 2004 | 36,658 | 6,418 | 43,076 |
| 2005 | 36,778 | 6,508 | 43,286 |
| 2006 | 37,888 | 6,751 | 44,639 |
| 2007 | 38,267 | 6,988 | 45,256 |
| 2008 | 40,518 | 7,352 | 47,870 |

**Notes to Table A-6:**

*Source*: de Rugy and Warren (2009), Table A-5, p. 28. Their figures were derived from the *Budget of the United States Government* and related documents, various fiscal years.

**Table A-7. Total Staffing of Federal Regulatory Activity,
Fiscal Years, Full-Time Equivalent Employment**

| Fiscal Year | Social Regulations | Economic Regulations | Total |
|---|---|---|---|
| 1990 | 119,459 | 33,155 | 152,614 |
| 1991 | 123,247 | 34,284 | 157,531 |
| 1992 | 130,747 | 36,971 | 167,718 |
| 1993 | 135,804 | 37,957 | 173,761 |
| 1994 | 133,487 | 37,499 | 170,986 |
| 1995 | 136,016 | 37,594 | 173,610 |
| 1996 | 136,926 | 33,611 | 170,537 |
| 1997 | 133,153 | 32,313 | 165,466 |
| 1998 | 139,794 | 31,848 | 171,642 |
| 1999 | 139,799 | 32,384 | 172,183 |
| 2000 | 143,052 | 32,548 | 175,600 |
| 2001 | 140,523 | 32,270 | 172,793 |
| 2002 | 152,585 | 32,436 | 185,021 |
| 2003 | 210,316 | 31,981 | 242,297 |
| 2004 | 202,195 | 32,559 | 234,754 |
| 2005 | 203,417 | 32,312 | 235,729 |
| 2006 | 201,961 | 32,567 | 234,528 |
| 2007 | 204,893 | 33,440 | 238,333 |
| 2008 | 215,147 | 34,324 | 249,471 |

**Notes to Table A-7:**

*Source*: de Rugy and Warren (2009), Table A-6, p. 29.  Their figures
were derived from the *Budget of the United States Government*
and related documents, various fiscal years.