Draft Report to Congress
On The Costs and Benefits of Federal Regulations

Introduction

This is a draft for public comment of the Office of Management and Budget's third report to Congress on the costs and benefits of Federal regulations.[1] This report is required by Section 638(a) of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (the Act). The Act requires OMB to submit "an accounting statement and associated report" containing:

> "(1) an estimate of the total annual costs and benefits (including quantifiable and nonquantifiable effects) of Federal rules and paperwork, to the extent feasible:
>
> (A) in the aggregate;
>
> (B) by agency and agency program; and
>
> (C) by major rule;
>
> "(2) an analysis of impacts of Federal regulation on State, local, and tribal government, small business, wages, and economic growth; and
>
> "(3) recommendations for reform.

The Act at Section 638 (b), (c), and (d) also specifies how we are to produce the report. We must:

> "(b) ... provide public notice and an opportunity to comment on the statement and report,
>
> "(c) ... issue guidelines to agencies to standardize (1) measures of costs and benefits and (2) the format of accounting statements, and
>
> "(d) ... provide for independent and external review of the guidelines and each accounting statement and associated report under this section."

This draft report provides the public with an opportunity to comment on the "statement and report" before we submit it to Congress. We are also asking independent and external experts in the economics of Federal regulation to peer review this draft report. After taking the public comments and peer reviews into account, we will submit the final report to Congress.

In early October 1999 in accordance with the Act, we drafted guidelines for standardizing

[1] This report uses the terms "rule" and "regulation" interchangeably.

measures of costs and benefits and the format of the accounting statements. We circulated them for "independent and external review" by nine experts in the field of benefit cost analysis. In late October 1999, we sent the guidelines and format to the agencies for their use in reporting the costs and benefits of their regulations. Using this information as well as other information from the agencies and published literature on the costs, benefits, and impacts of Federal regulation, we prepared this draft report.

Chapter I presents our estimates of total annual costs and benefits of Federal regulation and paperwork in the aggregate, and by agency and agency program. It also presents an analysis of the impacts of Federal regulation on State, local, and tribal government, small business, wages, and economic growth. Finally, Chapter I presents estimates of the costs and benefits by agency of the major final regulations issued between April 1, 1995 and March 31, 1999 for which we could quantify and monetize impacts.

Chapter II uses agency regulatory impact analyses to present quantitative estimates and qualitative descriptions of the benefits and costs of the 44 major rules issued by Federal agencies for which we concluded review during the 12- month period between April 1, 1998 and March 31, 1999. This "regulatory year" is the same period we used for the first two reports.

Chapter III presents our estimates of the costs and benefits of major Federal regulations for which we concluded review during the period April 1, 1995 to March 31, 1999. We included only the regulations for which we had quantitative information on both costs and benefits. For these regulations, we applied a uniform format and standardized measures of costs and benefits to produce estimates that could be more readily compared to each other. This information is used in our aggregate and by-agency estimates of the total annual costs and benefits of Federal regulation in Chapter I.

Chapter IV presents ten recommendations for reform of specific Federal regulations.

Chapter I: Estimating the Total Annual Costs, Benefits, and Impacts of Federal Regulations and Paperwork

I. Overview

This chapter presents estimates of the total annual costs and benefits of Federal rules and paperwork in the aggregate and by agency and agency program as required by Sec 638(a)(1) (A) and (B) of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (the Act). In this chapter, we build on the information found in Chapter I of the 1998 *Report to Congress On the Costs and Benefits of Federal Regulations* (OMB 1998) by using data and information newly available during 1999. These data include information:

- On costs and benefits of regulations provided by the agencies at our request pursuant to Sec 638 (c) of the Act, which requires us to "issue guidelines to agencies to standardize measures of cost and benefits and the format of accounting statements."

- From the economic impact analyses that agencies prepare for major rules for which we completed review between April 1, 1998 and March 31, 1999.

- From other government reports and sources on the impacts of regulation and paperwork.

This chapter also analyzes the impacts of Federal regulation on State, local, and tribal government, small business, wages, and economic growth -- as required by Sec. 638 (a) (2) of the Act.

A. Estimation Problems

This is our third report estimating the total annual costs and benefits of Federal regulations. In our previous two reports (OMB 1997 and 1998), we included a detailed discussion of the methodological problems inherent in such an undertaking.[2] We recognize the importance of providing information to the public on the costs, benefits, and impacts of Federal regulations. Such information is useful for policymakers who are designing new regulations or revising existing ones to make them more cost efficient and fair. Nevertheless, any estimate of total annual costs and benefits can only be rough at best.

---

[2] The first two reports also provide background information helpful for understanding and placing in context this third report. Together, the reports contain information on the history of regulation and its reform, the Administration's regulatory review program, the basics of economic analysis of regulations, and several case studies comparing various prospective and retrospective analyses of regulations.

It is difficult, if not impossible, to estimate the actual total costs and benefits of all existing Federal regulations with accuracy. We lack good information about the complex interactions between the different regulations and the economy. A variety of estimation problems for individual and aggregate estimates distort the results in different ways. The difficulty of answering the following questions illustrate these problems:

1. What baseline should we use?

In order to estimate the impact of a regulation, we need to know what would have happened if the regulation had not been issued. In other words, what is the baseline against which costs and benefits should be measured? The baseline problem has several dimensions. First, what happens in the absence of regulation is only an educated guess (since it never happened). Moreover, the greater the regulatory change, the less sure we are of the regulatory benefits and costs. The techniques of applied welfare economics, upon which benefit-cost analysis is based, hold only for marginal changes in economic activities. The larger the changes, the less certain we are of the accuracy of these techniques. Thus, we are more confident in our estimates of the costs and benefits of a small change in the level of automobile emissions than in the costs and benefits of all Clean Air Act regulations and especially in estimates of the total costs and benefits of all regulations issued by the Federal Government since the early 1900s.

Even if we disregard the problem of modeling large changes, significant difficulties remain. It is difficult to determine the baseline for the individual regulations that must be added together to get an aggregate estimate for all regulations. Bias is always a problem when surveying firms and other regulated entities on their expected compliance costs. Both regulators and the regulated may have a stake in the survey results. The problem is potentially greater for prospective studies because they must predict both the baseline and the regulatory effects. Retrospective studies concern themselves only with the baseline. In general, the most precise estimates of the costs and benefits of regulation appear in retrospective studies done by individuals who are not interested parties, but who do seek to maintain their reputations as objective professional analysts.

2. What Costs Should We Measure?

Most of the studies of the costs of regulation produced to date measure the direct expenditures required by regulation. It is hard to do more. Yet, as Cropper and Oates (1992) point out, the cost to society of regulation is properly measured by the change in consumer and producer "surplus" [3]associated with the regulation and with any price and/or income changes that may result. At one extreme, ignoring the consumer surplus loss produced by a ban on the sale of

[3] Consumer surplus refers to the incremental value of a product, as perceived by the consumer, over and above the price paid by the consumer for that product. Producer surplus refers to the incremental revenue received by the producer of a product over and above the producer's marginal costs of production.

a product understates costs to society. Even though compliance costs are zero, consumers are less well off because they can no longer buy the product. At the other extreme, calculating compliance expenditures based on pre-regulation output overstates costs because, if the firm raises prices to cover compliance costs, consumers may shift to other products to compensate partially for the accompanying welfare losses (Cropper and Oats 1992, p. 722). Actually estimating the changes in consumer and producer "surplus" caused by regulation requires data that is usually not easily obtained and assumptions that are at best only educated guesses.

3. What Is the Effect of Technological Change?

Many of the studies on which we must rely for cost and benefit estimates are dated. Over time the dynamic nature of the economy may affect the estimation of both benefits and costs. Technological improvements are often cited as the reason that predicted costs of compliance often turn out to be less than actual costs (Office of Technology Assessment 1995). Less well noted, however, is that technological progress also alters the benefits of regulation over time. Medical progress can reduce the future benefits estimated for health, safety and environmental regulations, just as productivity improvements in manufacturing reduce the costs of compliance of some regulations. New drugs or medical procedures can reduce the benefits of regulations aimed at reducing exposure to certain harmful agents such as an infectious disease. Regulations aimed at increasing the energy efficiency of consumer products or buildings may have their expected benefits reduced by new technology that lowers the cost of producing energy.

Technological change also leads directly to higher incomes, which allow people to demand better health and more safety. Business often responds to these demands by providing safer products and workplaces, even in the absence of regulation. Individuals with rising incomes may purchase or donate land to nature conservancies to provide ecological benefits – not to mention tax writeoffs. Yet, as on the cost side, the baseline that we use is generally the *status quo*, rather than a best guess as to what is likely to happen in the future.

4. How Do We Determine Causality?

It is often difficult to attribute changes in behavior to specific Federal regulations because there can be many other causal factors. In the environmental area, there are regulations from several different Federal agencies -- the Environmental Protection Agency (EPA), the Department of Agriculture (USDA), the Department of Energy (DOE), the Department of the Interior (DOI), the Department of Commerce (DOC) and the Department of Transportation (DOT) as well as numerous State and local government entities. The tort system, voluntary standards organizations, and public pressure also may cause firms to provide a certain degree of public protection in the absence of Federal regulation. As the General Accounting Office (GAO) points out, determining how much of the costs and benefits of these activities to attribute solely to Federal regulation is a difficult undertaking (GAO 1996).

5. How Do We Assess Older Regulations?

Once regulations are implemented and compliance has begun, public attitudes about the desirability of mandated actions often change. Regulations that were widely questioned before implementation – for example, airbags and family leave -- often find wide acceptance afterwards. If the National Highway Traffic Safety Administration's (NHTSA) regulations were eliminated, the automobile companies are not likely to discontinue all the safety features that NHTSA has mandated. Consumers now expect safer cars and seem willing to pay for them. Indeed, they often demand more safety than NHTSA requires.

This same phenomenon is taking place in the environmental area. Environmentally responsible behavior can be good for the bottom line. Rising per capita income and greater acceptance of regulation encourage such behavior, although their precise impact can be hard to measure. Changes in consumer preferences can create a "rising baseline" phenomenon, which reduces the ongoing significance of health, safety, and environmental regulations. Estimates of the aggregate regulatory costs and benefits that use a pre-regulation baseline as opposed to a post-regulation baseline may thus overestimate the current costs and benefits of those regulations.

6. Is There an "Apples and Oranges" Problem?

Most attempts to summarize the total costs and benefits of Federal regulations have simply added together a diverse set of individual studies. This is an inherently flawed approach. These individual studies vary in the quality, methodology, and type of regulatory impacts they include. They use different assumptions about baselines and time periods, different discount rates, different valuations for the same attribute, and different approaches to dealing with uncertainty. They also are seldom able to analyze the interaction effects among the tens of thousands of regulations. Although we are mindful of, and tried to tried to correct for, these problems in our estimates, our numbers too should be used with caution.

7. Is It Enough To Know The Costs and Benefits?

Accurate assessment of costs and benefits does not necessarily give us information concerning the distribution of such effects. None of the analyses addressed in this report provides quantitative information on the distribution of benefits or costs by income category, geographic region, or any other equity-related factor. As a result, there is no basis for quantifying distributional or equity impacts, which often can be a key reason for regulation.

B. Types of Regulation

Since there are so many different types of Federal regulations, it is useful to break this heterogeneous body up into categories. Three main categories are widely used: social, economic, and process.

- *Social Regulation* seeks to benefit the public interest in one of two ways. It prohibits

firms from producing products in certain ways or with certain characteristics that are harmful to public interests such as health, safety, and the environment. Examples would be OSHA's rule prohibiting firms from allowing in the workplace more than one part per million of Benzene averaged over an eight hour day and the Department of Energy's rule prohibiting firms from selling refrigerators that do not meet certain energy efficiency standards. It also requires firms to produce products in certain ways or with certain characteristics that are beneficial to these public interests. Examples are FDA's requirement that firms selling food products must provide a label with specified information on its package and DOT's requirement that automobiles be equipped with certain kinds of airbags.

- *Economic Regulation* prohibits firms from charging prices or entering or exiting lines of business that might cause harm to the economic interests of other firms or economic groups. Such regulations usually apply on an industry-wide basis (for example, agriculture, trucking, or communications). In the United States, this type of regulation at the Federal level has often been administered by "independent" commissions such as the Federal Communications Commission (FCC), the Securities and Exchange Commission (SEC), or the Federal Energy Regulatory Commission (FERC). This type of regulation can cause economic loss from the higher prices and inefficient operations that often occur when competition is restrained.

- *Process Regulations* impose administrative or paperwork requirements such as income tax, immigration, social security, food stamps, or procurement forms. Most process costs result from program administration, government procurement, and tax compliance efforts. Social and economic regulation may also impose paperwork costs due to disclosure requirements and enforcement needs. These costs generally appear in the cost for such rules. Procurement costs generally show up in the Federal budget as greater fiscal expenditures.

1. Measuring the Impacts of the Different Types of Regulation

The impacts of regulation have several dimensions. Regulation either increases or decreases the total welfare or well being of society, or redistributes it among different groups. Usually it does both, but the relative degree varies significantly by type of regulation. The public purpose for a regulation usually takes one of two forms: to maximize society's welfare or to redistribute costs and benefits from one group to another.

Social Regulation often seeks to improve the efficiency of the market by correcting what economists call "market failures" -- for example, pollution or public health risks or other unintended consequences on third parties and unequal information between buyers and sellers. Such regulation affects the value of goods and services or welfare enjoyed by society. We measure the impact of a social regulation on society's welfare by estimating its net benefits: social costs subtracted from social benefits.

Redistributive effects or " income transfers" should also be measured, noted, and presented to policymakers to help in forming their decision. OMB has issued recommended procedures or "Best Practices," which are particularly useful for estimating the benefits and costs of social regulations. We have described and discussed these procedures in the two previous Reports to Congress on the Costs and Benefits Of Federal Regulation. As mentioned above in the introduction, we have provided additional guidance for the agencies for standardizing the measures of costs and benefits sent us for this and next year's report.

We can divide social regulation into several categories:

Environmental. The true social cost of regulations aimed at improving the quality of the environment is represented by the total value that society places on the goods and services foregone as a result of resources being diverted to environmental protection. (EPA's *Cost of a Clean Environment,* pp. 1-2, 1-3.) These social costs include the direct compliance costs of the capital equipment and labor needed to meet the standard. They also include the more indirect consumer and producer surplus losses from lost or delayed consumption and production opportunities that result from the higher prices and reduced output needed to pay for the direct compliance costs. In the case of a product ban or prohibitive compliance costs, almost all of the costs represent consumer and producer surplus losses. Most of the cost estimates used in this report do not include consumer and producer surplus losses because it is difficult and often impractical to estimate the demand and supply curves needed to do this type of analysis.

Further indirect effects on productivity and efficiency result from price and output changes that spread through other sectors of the economy. Estimates of compliance costs may understate substantially the true long-term costs of pollution control.[4] The estimates used in this report do not include these indirect and general equilibrium effects.

The benefits of environmental protection are represented by the value that society places on improved health, recreational opportunities, quality of life, visibility, preservation of ecosystems, biodiversity, and other attributes of protecting or enhancing our environment. This value is best measured by society's willingness-to-pay (WTP) for these attributes. Since most types of improvement in environmental quality are not traded in markets, benefits must be estimated by indirect means using sophisticated statistical techniques or "contingent valuation" survey methods. Such methods often have more difficulty with benefit estimation than cost estimation.

Other Social. This category of regulation includes rules designed to advance the health and safety of consumers and workers, as well as regulations aimed at promoting social goals such as equal opportunity, equal access to facilities, and protection from fraud and deception. These kinds of regulation, as well as environmental regulation, are concerned with controlling or reducing the harmful or unintended consequences of market transactions. Such consequences as

[4] See Jaffe, Peterson, Portney, and Stavins' survey (1995), p. 153.

air pollution, occupationally induced illness, or automobile accidents are commonly called "negative externalities." Regulations designed to deal with such externalities are said to "internalize" the externalities.

This can be done by regulating the amount of the externality, for example, banning a pollutant or limiting it to a "safe" level, or regulating how a product is produced or used. Social regulation may also require the disclosure of information about a product, service, or manufacturing process where inadequate or asymmetric access to information may place consumers, citizens, or workers at a disadvantage. The techniques and methodological concerns involved in the estimation of the social costs and benefits generated by these rules are similar to those involved in the estimation of costs and benefits of environmental regulation discussed above. In the results reported below, we further break "Other Social" into three categories: transportation, labor and other regulations. The third category includes food and drug safety, energy efficiency, and quality of medical care regulations.

Economic regulation, especially in the past, often served to transfer income among economic groups. In certain circumstances, however, such as when used to regulate natural monopolies, economic regulation can produce net social benefits. In the last twenty years, deregulation and improvements in technology have reduced entry barriers in a variety of sectors, including transportation, communications, energy, and financial services. To a large degree, economic regulation now serves more and more to promote competition, rather than to protect firms from it. The costs of economic regulation are usually measured by modeling or comparing specific regulated sectors with less regulated sectors, estimating the consumer and producer surplus losses that result from higher prices and lack of service, and estimating the excess costs that may result from the lack of competition. These costs are made up of efficiency losses, or costs to society, and income transfers that one group gains at the expense of another. The Hopkins (92) and Hahn and Hird (91) surveys of regulatory costs found that transfer costs were generally about two to three times the social costs of economic regulation.

Economic regulation may produce net social benefits when natural monopolies are regulated to simulate competition. Although Hahn and Hird (1991) argue that the dollar amounts of such efficiency benefits are small and short lasting in a dynamic and technologically vibrant economy, this is a judgment that is not the result of an empirical study. It is, however, based on the increasingly accepted view that the U.S. economy is becoming more competitive over time, with fewer long-lasting natural monopolies, and on evidence that much economic regulation seeks primarily to enhance one group at the expense of another. Even though monopoly power may not be as long lasting in the "new economy" as it was in the old, it can still be important at a given point in time.[5]

---

[5] Note that our definition of economic regulation does not include antitrust activities such as preventing the formation of monopolies through mergers or anticompetitive behavior.

Process Regulation mainly serves to collect funds, allocate them among groups of recipients, and establish the conditions under which the government purchases or provides goods and services from and to the public. Although allocating and collecting funds can serve to transfer income between economic groups, the fiscal budget already accounts for these transfers and we do not provide separate estimates below. We do, however, provide estimates of the administrative costs to the public of providing the information needed by the government to collect these funds and provide these services because these estimates are not included in the fiscal budget. These costs are also real burdens to society, not transfers. Government can reduce them streamlining paperwork and red tape.

2. Other Types of Regulatory Impacts

As discussed above, analysts often use estimates of benefits and costs to measure the net impact of regulation on society as a whole. Executive Order No. 12866, Regulatory Planning and Review, issued by President Clinton on September 30, 1993, requires the agencies to measure such impacts (Sect. 1(b)(6)). It also requires that the agencies analyze the effect of a proposed regulation on State, local, and tribal governments and on businesses of differing sizes (Sect.1. (b)((9) and (11)). As mentioned, Sect. 638 (a)(2) of the Act asks for information on these impacts as well as on wages and economic growth.

Clearly, the impacts of regulation on these sectors are of special interest to policymakers and should be examined in a full analysis of regulatory impacts. The impacts on State, local, and tribal governments, small businesses, and workers can be measured by distributional analysis, which looks at the transfers of income among groups caused by regulations. Generally the analysis does not make value judgments about the merits of these transfers, leaving that up to policymakers. This approach is in contrast to Benefit Costs Analysis, which generally ignores income transfers and focuses on whether social benefits exceed social costs. Since distributional effects and net benefits are both important, both analyses should be presented to policymakers. Reflecting this philosophy, Executive Order 12866 states that agencies should select regulatory approaches that "maximize net benefits" taking into account distributional impacts and equity.

As required by the Act, we present estimates in section II of the costs and benefits of regulation and paperwork, and in section III present what we know about its distributional impacts.

II. The Costs and Benefits of Regulation and Paperwork

Our estimate of the total annual costs and benefits of Federal rules and paperwork starts with our estimates in last year's report. It then adds new information received from the agencies about previous regulations and about new regulations issued during the last year.

A. Social Regulation

1. Total Annual Costs and Benefits

Tables 1, 2, and 3 document how we estimate the total annual monetized costs and benefits of social regulation as of April 1, 1999.[6]

Table 1 relies on estimates from Hahn and Hird (1991) and EPA's *Cost of a Clean Environment* (1990) and Section 812 Retrospective Report (1997) to present a range of estimates for costs and benefits as of 1988.[7] The estimates of costs range between $84 billion and $140 billion and the benefits between $56 billion and $1.51 trillion annually. The $1.51 trillion upper-range estimate is dominated by EPA's Section 812 Retrospective, which estimates the benefits of the Clean Air Act from 1970 to 1990.

In last year's report we used EPA's upper range estimate for benefits of $3.2 trillion. This estimate engendered considerable public criticism. For example, a panel of regulatory experts convened by GAO expressed considerable scepticism about the magnitude of the estimate (GAO, 1999). EPA points out, however, that this criticism was somewhat misdirected because the $3.2 trillion estimate was the upper bound, 95th percentile estimate generated by the 812 Retrospective Study for the year 1990, a value which EPA itself believes has a very small probability of being the correct estimate (that is, the probability that benefits are equal to or greater than $3.2 trillion is 5%). EPA's expected value for the benefits of 1970 to 1990 programs in the year 1990 is $1.45 trillion (in 1997 dollars). We have amended our report this year to incorporate EPA's expected-value estimate.

GAO (1999) also reported that many of the experts identified specific concerns about some of the assumptions in the Retrospective Report, including: (1) the assumption that air quality would have deteriorated significantly between 1970 and 1990 in the absence of the Clean Air Act, (2) the assumed health effects from limiting exposure to particulate matter, and (3) the methods used to estimate the value that individuals would place on reducing health and mortality risks.[8]

Table 2 provides estimates of the total annual monetized costs and benefits of social regulations issued between 1987 and the first quarter of 1998. As explained in last year's report,

---

[6] Our general approach follows the procedures we used in last year's report which discusses them in more detail. (See OMB 1999, pp 13-18).

[7] We discussed in detail the problems and uncertainties associated with these estimates in the two previous reports. We refer the reader to them for more specific information. The estimation problems discussed earlier in this report explain the general estimation problems with these types of aggregate estimates.

[8] GAO also points out that these are similar to the concerns expressed by OMB in last year's report. (See OMB 1999, pp. 25-35).

the cost estimates are based on the Regulatory Impact Analyses (RIAs) for major rules that agencies submitted to OMB under Executive Order 12866 and its predecessor, Executive Order 12291. To estimate benefits, we used a combination of sources. For the years 1987 to 1995, we assumed that benefits bore the same ratio to our cost estimates for the four categories of regulations shown in Table 2 as they did in a study by Robert Hahn (1996) of major regulations issued between 1990 and mid-1995. We did this because we do not have our own systematic estimates of the benefits for major rules issued before 1995.[9] For the benefit estimates for 1995 through the first quarter of 1999, we used the information from agency-supplied RIAs modified for consistency with *Best Practices* as appropriate and extended to provide more monetized estimates of benefits and costs using consensus value estimates used by the agencies or found in the literature. These estimates are explained in detail in Chapter III.

Table 3 combines the results from Tables 1 and 2 to present our estimates for the existing costs of social regulation as of the first quarter in 1999. It shows that health, safety and environmental regulation produces between $32 billion and $1,621 billion of net benefits per year.

Insert Tables 1,2, and 3 about here.

2. New Estimates for the Clean Air Act Amendments

EPA has also called to our attention its new study, *The Benefits and Costs of the Clean Air Act 1990 to 2010*, (EPA 1999) to supplement the set of studies that served as the basis for the monetized estimates of benefits and costs in last year's report. This study presents estimates of the benefits and costs of the regulatory program mandated by the 1990 Clean Air Act Amendments (CAAA). It does not, however, cover the benefits and costs of many of EPA's recent major regulations, such as the 1997 final rule setting new Ozone and Particulate Matter National Ambient Air Quality Standards and the recent regional haze final rule. Nor does it include the costs and benefits of the regulations EPA issued during this period pursuant to its Acts other than the CAAA.

EPA's new study estimates total annual costs for the CAAA of about $19 billion and total annual benefits of $71 billion in the year 2000. We note that the adoption of a value for the projected reduction in the risk of premature mortality is the subject of continuing discussion within the economic and public policy analysis community within and outside the

[9] Admittedly this is a crude estimation procedure because Hahn's inventory of rules begins in 1990 and ours extends back to 1987. Consequently, we are assuming that the relationship between costs and benefits that Hahn found for the later period extends back three years. Still, we know of no other approach to fill this gap in the data until RIAs for these years are re-examined. For further details see last year's report (OMB, 1999).

Administration. In response to the sensitivity of this issue, we provide estimates reflecting two alternative approaches. The first approach -- supported by some and preferred by EPA -- uses a Value of a Statistical Life (VSL) approach developed for the Clean Air Act Section 812 benefit-cost studies. This VSL estimate of $5.9 million (1997$) was derived from a set of 26 studies identified by EPA using criteria established in Viscusi (1992), as those most appropriate for environmental policy analysis applications.

An alternative, age-adjusted approach is preferred by a number of others both within and outside the Administration. This approach was also developed for the Section 812 studies and addresses concerns with applying the VSL estimate – reflecting a valuation derived mostly from labor market studies involving healthy working-age manual laborers – to PM-related mortality risks that are primarily associated with older populations and those with impaired health status. This alternative approach leads to an estimate of the value of a statistical life year (VSLY), which is derived directly from the VSL estimate. It differs only in incorporating an explicit assumption about the number of life years saved and an implicit assumption that the valuation of each life year is not affected by age.[10] Under this alternative approach, the estimated mean VSLY is $360,000 (1997$); combining this number with a mean life expectancy of 14 years would yield an age-adjusted VSL of $3.6 million (1997$).

Both approaches are imperfect, and raise difficult methodological issues which are discussed in depth in the recently published Section 812 Prospective Study, draft EPA Economic Guidelines, and the peer-review commentaries prepared in support of each of these documents. For example, both methodologies embed assumptions (explicit or implicit) about which there is little or no definitive scientific guidance. In particular, both methods adopt the assumption that the risk versus dollars trade-offs revealed by available labor market studies are applicable to the risk versus dollar trade-offs in the air pollution context.

EPA currently prefers the VSL approach because, essentially, the method reflects the direct application of what EPA considers to be the most reliable estimates for valuation of premature mortality available in the current economic literature. While there are several differences between the labor market studies EPA uses to derive a VSL estimate and the particulate matter air pollution context addressed here, those differences in the affected populations and the nature of the risks imply both upward and downward adjustments. For example, adjusting for age differences may imply the need to adjust the $5.9 million VSL downward, as would adjusting for health differences; but the involuntary nature of air pollution-related risks and the lower level of risk-aversion of the manual laborers in the labor market

[10]Specifically, the VSLY estimate can be calculated by amortizing the $5.9 million mean VSL estimate over the 35 years of life expectancy associated with subjects in the labor market studies. The resulting estimate, using a 5 percent discount rate, would be $360,000 per life-year saved in 1997 dollars. This annual average value of a life-year can then be multiplied times the number of years of remaining life expectancy for the affected population.

studies may imply the need for upward adjustments. In the absence of a comprehensive and balanced set of adjustment factors, EPA believes it is reasonable to continue to use the $5.9 million value while acknowledging the significant limitations and uncertainties in the available literature. Furthermore, EPA prefers not to draw distinctions in the monetary value assigned to the lives saved even if they differ in age, health status, socioeconomic status, gender or other characteristics of the adult population.

Those who favor the alternative, age-adjusted approach emphasize that the value of a statistical life is not a single number relevant for all situations. Indeed, the VSL estimate of $5.9 million (1997$) is itself the central tendency of a number of estimates of the VSL for some rather narrowly defined populations. When there are significant differences between the population affected by a particular health risk and the populations used in the labor market studies – as is the case here – they prefer to adjust the VSL estimate to reflect those differences. While acknowledging that the VSLY approach provides an admittedly crude adjustment (for age though not for other possible differences between the populations), they point out that it has the advantage of yielding an estimate that is not presumptively biased. Proponents of adjusting for age differences using the VSLY approach fully concur that enormous uncertainty remains on both sides of this estimate – upwards as well as downwards – and that the populations differ in ways other than age (and therefore life expectancy). But rather than waiting for all relevant questions to be answered, they prefer a process of refining estimates by incorporating new information and evidence as it becomes available.

Our estimates of the costs and benefits of environmental regulations in Table 2 above include estimates for CAAA regulations as well as other EPA regulations based on the RIAs EPA prepared at the time. The new CAAA report estimates cannot simply be added to our estimates in Table 2 without adjustments to correct for the overlapping regulations. The CAAA report estimates cannot replace our estimates because they do not include all the regulations EPA issued between 1987 and the first quarter of 1999.

3. Costs And Benefits Of Major Rules By Agencies

Table 4 lists the costs and benefits by agency and agency program for major regulations issued over the last four years (April 1, 1995 to March 31, 1999) as estimated by us in Chapter III. During this period, only seven agencies issued major rules. Of these, rules by EPA and HHS had the greatest impact. Those issued by EPA are expected to provide between $17 billion and $84 billion in annual benefits for society at an annual cost of about $28 billion. Those issued by HHS are expected to provide $12 billion to $14 billion in annual benefits at an annual cost of about $800 million.

Table 4 here

B. Economic Regulation

In our 1997 and 1998 reports, we presented an estimate that the efficiency costs of

economic regulation amounted to $71 billion. This is based on an estimate by Hopkins (1992) of $81 billion, which we adjusted downward by $10 billion to account for the deregulation and increase in competition that has occurred in the financial and telecommunications sectors since Hopkins' estimates were made in 1992. In a recent comprehensive report on regulatory reform in the United States by a panel of experts from around world, the OECD estimated that additional reforms in the transportation, energy, and telecommunications sectors would lead to an increase in GDP of 1 percent (OECD, 1999). One percent of the revised first quarter 1999 GDP of $9,073 billion is about $90 billion.

This estimate does not include the costs of international trade protection, which Hopkins included in his estimate of the cost of economic regulation. According to a recent study, the static gains from removing trade barriers existing in 1990 suggested potential gains of about 1.3 percent of GDP (Council of Economic Advisers 1998) or $120 billion for the first quarter of 1999, assuming trade barriers have not changed.[11] These estimates taken together suggest that Hopkins' estimate may be too low.

As we discuss above, economic regulation also results in income transfers from one group to another. In our previous two reports, we used an approach used by Hahn and Hird, and Hopkins, to estimate transfers as a multiple of the efficiency losses. Based on the OECD estimate of efficiency losses, Hopkins' multiple of two (1992) gives rise to an estimate of transfer costs for economic regulation (not counting trade protection) of $180 billion.

C. Process Regulation

The main costs of process regulation consist of the paperwork costs imposed on the public. Sec. 638(a)(1)(A) of the Act calls on OMB to examine the costs and benefits of paperwork. Currently OMB is in the process of revising its guidance on how the agencies should evaluate paperwork burden. OMB issued a notice in the *Federal Register* on October 14, 1999 (64 FR 55788) inviting comments on how best to improve the uniformity, accuracy, and comprehensiveness of agency burden measurement. In this notice, we raise the issue of expanding the reporting of burden to include a monetized value of time, and specifically seek comment on the idea of converting "burden hours" into a dollar measure of burden. If a dollar-equivalent value is calculated for burden hours, agencies and OMB could report a single estimate – in dollar terms – of paperwork burden that would combine monetized burden hours with the "cost burden" calculation. This would estimate out-of-pocket expenses that are not captured by the time-based measure of burden. While this approach has analytical appeal, it does

[11] The CEA report also went on to state that studies of this type only capture static costs, fail to capture value of foregone varieties of products, quality improvements, and productivity enhancements that would take place in the absence of trade barriers, and thus understate the benefits from trade (CEA 1998, p. 238).

pose significant methodological challenges.

In addition, IRS has begun work on a new model that will estimate the amount of burden incurred by wage and investment taxpayers as a result of complying with the tax system. IRS has undertaken this study to improve our understanding of taxpayer burdens, to enable us to measure both current and future levels of burden, and to help us isolate the burden of particular tax provisions, regulations, or procedures. To help provide input into our consideration of methods to expand the reporting of burden to include monetized burden hours, the IRS paperwork burden study will include the development of a White Paper on the Monetization of Taxpayer Time. This White Paper will examine the issues surrounding monetization, review existing research, identify lessons learned, and discuss the implications for efforts to monetize taxpayer time.

In our *Information Collection Budgets*, published annually, we calculate paperwork burden imposed on the public using information agencies give us with their requests for information collection approvals.[12] We present below in Table 5 estimates of paperwork burden in terms of the hours the public devotes annually to gathering and providing information for the Federal government. At a future point in time, we hope to be able to provide information on the dollar costs of paperwork. At present we do not know how to estimate the value of the total annual benefits to society of the information the government collects from the public.

Insert Table 5 Here

Table 5 shows our estimates of the expected paperwork burden hours for FY 1999 by agency. The total burden of 7,202 million hours is made up of 5,912 million hours for the Treasury Department (82%) and 1,290 million hours for the rest of the Federal government (18%). Using the estimate of the average value of time for the individuals and entities that provide information to the government of $26.50 per hour, which we used in the last two reports, we can get an idea of the dollar burden of paperwork on the public: $190 billion. Note, however, that (1) this is a rough average and should not be applied to individual agencies or agency collections, and (2) this estimate should not be added to our estimates of the costs of regulation because it would result in some double counting. Our estimates of regulatory costs already include paperwork costs. Many paperwork costs arise from regulations, often for enforcement and disclosure purposes.

III. The Other Impacts of Federal Regulation

Sec. 638 (a)(2) of the Act calls on OMB to present an analysis of the impacts of Federal

[12] The Paperwork Reduction Act of 1995 requires Federal agencies to seek approval from OMB for each information collection sought from ten or more individuals or entities. As part of that request agencies must estimate the burdens that their individual collection requests impose on the public.

regulation on State, local, and tribal government, small business, wages, and economic growth.

A. Impact on State, Local, and Tribal Government

Over the past four years, four rules have imposed costs of more than $100 million on State, local, and Tribal governments (and thus have been classified as public sector mandates under the Unfunded Mandates Act of 1995).[13] All four of these rules were issued by the Environmental Protection Agency. These four rules are described in greater detail below.

1. *EPA's Rule on Standards of Performance for Municipal Waste Combustors and Emissions Guidelines* (1995): This rule set standards of performance for new municipal waste combustor (MWC) units and emission guidelines for existing MWCs under sections 111 and 129 of the Clean Air Act [42 U.S.C. 7411, 42 U.S.C. 7429]. The standards and guidelines apply to MWC units at plants with aggregate capacities to combust greater than 35 megagrams per day (Mg/day) (approximately 40 tons per day) of municipal solid waste (MSW). The standards require sources to achieve emission levels reflecting the maximum degree of reduction in emissions of air pollutants that the Administrator determined is achievable, taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements.

   EPA estimated the national total annualized cost for the emissions standards and guidelines to be $320 million per year (in constant 1990 dollars) over existing regulations. EPA estimated the cost of the emissions standards for new sources to be $43 million per year. EPA estimated the cost of the emissions guidelines for existing sources to be $277 million per year. The annual emissions reductions achieved through this regulatory actions include, for example, 21,000 Mg. of SO2; 2,800 Mg. of particulate matter (PM); 19,200 Mg of NOX; 54 Mg. of mercury; and 41 Kg. of dioxin/furans.

2. *EPA's Standards of Performance for New Stationary Sources and Guidelines for Control*

---

[13] EPA's proposed rules setting air quality standards for ozone and particulate matter may ultimately lead to expenditures by State, local or tribal governments of $100 million or more. However, Title II of the Unfunded Mandates Reform Act provides that agency statements on compliance with Section 202 must be conducted "unless otherwise prohibited by law". The Conference report to this legislation indicates that this language means that the section "does not require the preparation of any estimate or analysis if the agency is prohibited by law from considering the estimate or analysis in adopting the rule." EPA has stated, and the courts have affirmed, that under the Clean Air Act, the air quality standards are health-based and EPA is not to consider costs.

of Existing Sources: Municipal Solid Waste Landfills (1996): This rule set performance standards for new municipal solid waste landfills and emission guidelines for existing municipal solid waste landfills to implement section 111 of the Clean Air Act. The rule addressed non-methane organic compounds (NMOC) and methane emissions. NMOC include volatile organic compounds (VOC), hazardous air pollutants (HAPs), and odorous compounds. Of the landfills required to install controls, about 30 percent of the existing landfills and 20 percent of the new landfills are privately owned. The remainder are publicly owned. The total nationwide annualized costs for collection and control of air emissions from new and existing MSW landfills are estimated to be $94 million per year annualized over 5 years, and $110 million per year annualized over 15 years.

3. *National Primary Drinking Water Regulations: Disinfectants and Disinfection Byproducts* (1998): This rule promulgates health based maximum contaminant level goals (MCLGs) and enforceable maximum contaminant levels (MCLs) for about a dozen disinfectants and byproducts that result from the interaction of these disinfectants with organic compounds in drinking water. The rule will require additional treatment at about 14,000 of the estimated 75,000 residential water systems nationwide. The costs of the rule are estimated at $700 million annually. The quantified benefits estimates range from zero to 9,300 avoided bladder cancer cases annually, with an estimated monetized value of $0 to $4 billion. Possible reductions in rectal and colon cancer and adverse reproductive and developmental effects were not quantified.

4. *National Primary Drinking Water Regulations: Interim Enhanced Surface Water Treatment* (1998): This rule establishes new treatment and monitoring requirements (primarily related to filtration) for drinking water systems that use surface water as their source and serve more than 10,000 people. The purpose of the rule is to enhance protection against potentially harmful microbial contaminants. The rule is expected to require treatment changes at about half of the 1,400 large surface water systems, at an annual cost of $300 million. All systems will also have to perform enhanced monitoring of filter performance. The estimated benefits include mean reductions of from 110,000 to 338,000 cases of cryptosporidiosis annually, with an estimated monetized value of $0.5 to $1.5 billion, and possible reductions in the incidence of other waterborne diseases.

While these four EPA rules were the only ones over the past four years to require expenditures by State, local and Tribal governments exceeding $100 million, they were not the only rules with impacts on other levels of governments. For example, 18% of rules listed in the April 1999 Unified Regulatory Agenda cited some impact on State, local or Tribal governments. In general, OMB works with the agencies to ensure that the selection of the regulatory option for all final rules fully complies with the Unfunded Mandates Reform Act. For proposed rules, OMB works with the agencies to ensure that they also solicited comment on alternatives that would reduce costs to all regulated parties, including State, local and Tribal governments.

Agencies have also significantly increased their consultation with State, local, and Tribal

governments on all regulatory actions that impact them. For example, EPA and the Department of Health and Human Services engaged in particularly extensive consultation efforts over a wide variety of programs, on both formal unfunded mandates as defined by the Unfunded Mandates Reform Act and other rules with intergovernmental impacts. Agencies also made real progress in improving their internal systems to manage consultations better. This has helped them analyze specific rules in ways that reduce costs and increase flexibility for all levels of government and for the private sector, while implementing important national priorities.

This trend toward increased consultation is expected to continue. On August 5, 1999, President Clinton issued Executive Order 13132 entitled "Federalism." This Executive Order emphasizes consultation with State and local governments and greater sensitivity to their concerns. It also establishes specific requirements that Federal agencies must follow as they develop and carry out policies that affect State and local governments.

B. Impact on Small Business

The President explicitly recognized the need to be sensitive to the impact of regulations and paperwork on small business in his Executive Order 12866, "Regulatory Planning and Review," issued September 30, 1993. The Executive Order called on the agencies to tailor their regulations by business size in order to impose the least burden on society, consistent with obtaining the regulatory objectives. It also called for the development of short forms and other streamlined regulatory approaches for small businesses and other entities. The President also supported and signed into law the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). In the findings section of SBREFA, Congress stated that "... small businesses bear a disproportionate share of regulatory costs and burdens." This is largely attributable to fixed costs -- costs that all firms must bear regardless of size. Each firm has to determine whether a regulation applies, how to comply, and whether it is in compliance. As firms increase in size, fixed costs are spread over a larger revenue and employee base resulting in lower unit costs.

This observation is supported by empirical information from a study by the Office of Advocacy of the Small Business Administration (1995). That study found that regulatory costs per employee decline as firm size -- as measured by the number of employees per firm -- increases. Using data from Hopkins (1995), SBA estimates that the total cost of regulation (environmental, other social, the efficiency costs of economic, the transfer costs of economic, and process regulation) was 50 percent greater per employee for firms with under 20 employees compared to firms with over 500 employees.[14]

[14] SBA estimated that average per employee regulatory costs were $5,106 for firms with under 20 employees compared to $3,404 for firms with over 500 employees. These estimates are based on 1992 conditions using 1995 dollars. Hopkins's own estimates found a 86 percent differential (See SBA 1995, pp 39-46).

These results do not necessarily indicate, however, the extent to which reducing regulatory requirements on small firms would produce more benefits for society at lower costs. That depends in part on the contribution of small firms to the risks being addressed and the benefits produced per dollar of compliance costs by regulating small firms.

C. Impact on Wages

The impact of Federal regulations on wages depends upon how "wages" is defined and on the types of regulations involved. If we define "wages" narrowly as workers' take-home pay, social regulation may have decreased average wage rates, while economic regulation may have increased them, especially for specific groups. If we define "wages" more broadly as the real value or utility of workers' income, the directions of the effects of the two types of regulation are probably reversed.

1. Social Regulation

By a broad measure of welfare, social regulation, regulation directed at improving health, safety, and the environment, can create benefits for workers that outweigh the costs. This is true even if take-home pay does not increase. Compliance costs must be paid for by some combination of workers, business owners, and/or consumers through adjustments in wages, profits, and/or prices. This effect is most clearly recognized for occupational health and safety standards. As one leading text book in labor economics suggests: "Thus, whether in the form of smaller wage increases, more difficult working conditions, or inability to obtain or retain one's first choice in a job, the costs of compliance with health standards will fall on employees."[15]

Viewed in terms of overall welfare, the regulatory benefits of improved health, safety, and environment improvements for workers can outweigh the costs. In the occupational health standards case where the benefits of regulation accrue mostly to workers, workers are likely to be better off if health benefits exceed compliance costs.[16] Although wages may reflect the cost of compliance with health and safety rules, the job safety and other benefits of such regulation can more than compensate for any monetary loss. Workers as consumers benefitting from safer products and cleaner environment may also come out ahead if regulation produces significant net benefits for society.

2. Economic Regulation

For economic regulation, designed to set prices or conditions of entry for specific sectors,

---

[15] From Ehrenberg and Smith's *Modern Labor Economics*, p 279.

[16] Based on a cost benefit analysis of OSHA's 1972 Asbestos regulation by Settle (1975), which found large net benefits, Ehrenberg and Smith cite this regulation as a case where workers' wages were reduced, but they were made better off because of improved health (p 281).

these effects may at times be reversed to some degree. Economic regulation can result in increases in income narrowly defined, but decreases in broader measures of income based on utility or overall welfare. Economic regulation is often used to protect industries and their workers from outside competition. Examples include the airline and trucking industries in the 1970's. These wage gains come at a cost in inefficiency from reduced competition, however, which consumers must bear. Moreover, real wages, which depend upon productivity, do not grow as fast without the stimulation of outside competition.[17]

These statements are generalizations for the impact of regulation in the aggregate or by broad categories. Specific regulations can increase or decrease the overall level of benefits accruing to workers depending upon the actual circumstances.

D. Economic Growth

The conventional measurement of GDP does not take into account the market value of improvements in health, safety, and the environment. It does incorporate the direct compliance costs of social regulation. Accordingly, conventional measurement of GDP can suggest that regulation reduces economic growth.[18] In fact, sensible regulation and economic growth are not inconsistent once all benefits are taken into account.

The OECD (1999) estimates that the economic deregulation that occurred in the US over the last 20 years permanently increased GDP by 2 percent. The OECD also estimates that further deregulation of the transportation, energy, and telecommunication sectors would increase US GDP by another 1 percent. Jaffe, Peterson, Portney, and Stavins (1995) summarize their findings after surveying the evidence of the effects of environmental regulation on economic growth as follows: "Empirical analysis of the productivity effects have found modest adverse impacts of environmental regulation." Based on the studies that tried to explain the decline in productivity that occurred in the US during the 1970's, they placed the range attributable to environmental regulation from 8 percent to 16 percent (p. 151). The recent increase in productivity growth in the US coinciding with continued health, safety, and environmental regulation supports the notion that the negative growth effects of social regulation have been relatively small.[19]

---

[17] Winston (1998) estimates that real operating costs declined between 25 and 75 percent in the sectors that were deregulated over the last 20 years -- transportation, energy, and telecommunications.

[18] Social regulation reduces growth by diverting resources from the production of goods and services that are counted in GDP to the production or enhancement of "goods and services" such as longevity, health, and environmental quality that generally are not counted in GDP.

[19] For the last three years, output per hour in nonfarm business has been growing as rapidly as it did on average during productivity's golden years from 1948 though 1973.

As indicated above, conventionally measured GDP growth does not take into account the market value of the improvements in health, safety, and the environment that social regulation has brought us. If even our lower range estimate of the benefits of social regulation ($266 billion) were added to GDP, then the more comprehensive measure of GDP, one that includes the value of nonmarket goods and services provided by regulation, would be about 3 percent greater.[20] Focusing on the effect of social regulation on economic growth is misleading if it does not take into account the full benefits of regulation.

More important than knowing the impact of regulation in general on growth is the impact of specific regulations and alternative regulatory designs on economic growth. As Jaffe *et al* put it: "Any discussion of the productivity impacts of environmental protection efforts should recognize that not all environmental regulations are created equal in terms of their costs or their benefits." (p 152).

In this regard, market-based or economic-incentive regulations will tend to be more cost-effective than those requiring specific technologies or engineering solutions. Under market-based regulation, profit-maximizing firms have strong incentives to find the cheapest way to produce the social benefits called for by regulation. How you regulate can go a long way toward reducing any negative impacts on economic growth and increasing the overall long run benefits to society.

[20] Including the value of increasing life expectancy in the GDP accounts to come up with a more comprehensive measure of the full output of the economy is not as far fetched as it sounds. It was first proposed and estimated in 1973 by D. Usher in "An Imputation to the Measure of Economic Growth for Changes in Life Expectancy" *NBER Conference on Research in Income and Wealth.*

Chapter II: Estimates of Benefits and Costs of This Year's "Major" Rules

In this chapter, we examine the benefits and costs of each "major rule," as required by section 638(a)(1)(C). We have included in our review those final regulations on which OMB concluded review during the 12-month period April 1, 1998, through March 31, 1999. This "regulatory year" is the same calendar period we used for last year's report. It ensures that we cover a full year's regulatory actions as close as practicable to the date our report is due, given the need to compile and analyze data and publish the report for public comment.

The statutory language categorizing the rules we consider for this report differs from the definition of "economically significant" in Executive Order 12866 (section 3(f)(1)). It also differs from similar statutory definitions in the Unfunded Mandates Reform Act and subtitle E of the Small Business Regulatory Enforcement Fairness Act of 1996 -- Congressional Review of Agency Rulemaking. Given these varying definitions, we interpreted section 638(a)(1)(C) broadly to include all final rules promulgated by an Executive branch agency that meet any one of the following three measures:

- rules designated as "economically significant" under section 3(f)(1) of Executive Order 12866
- rules designated as "major" under 5 U.S.C. 804(2) (Congressional Review Act)
- rules designated as meeting the threshold under Title II of the Unfunded Mandates Reform Act (2 U.S.C. 1531 - 1538)

We also include a discussion of major rules issued by independent regulatory agencies, although OMB does not review these rules under Executive Order 12866. This discussion is based on data provided by these agencies to the General Accounting Office (GAO) under the Congressional Review Act.

During the regulatory year selected, OMB reviewed 44 final rules that met the criteria noted above. Of these final rules, HHS submitted 15; EPA eight; DOT six; USDA four; DOI two; and DOL, DOC, SBA, DOJ, PBGC, and Education, one each. Two were Federal Acquisition Regulations rules. In addition, three agencies -- DOL, HHS, and Treasury -- worked together to issue one common rule. These 44 rules represent about 18 percent of the 255 final rules reviewed by OMB between April 1, 1998, and March 31, 1999, and less than one percent of the 4,752 final rule documents published in the *Federal Register* during this period. Nevertheless, because of their scale and scope, we believe that they represent the vast majority of the costs and benefits of new Federal regulations during this period.

I. Overview

As noted in Chapter II of last year's report, Executive Order 12866 "reaffirms the primacy of Federal agencies in the regulatory decisionmaking process" because agencies are given the legal authority and responsibility for rulemaking under both their organic statutes and certain process-oriented statutes, such as the Administrative Procedure Act, the Unfunded Mandates Reform Act, and the Small Business Regulatory Enforcement Fairness Act. The Executive order also reaffirms the legitimacy of centralized review generally and, in particular, review of the agencies' benefit cost analyses that are to accompany their proposals. The Executive Order recognizes that in some instances the consideration of benefits or costs is precluded by law. Nevertheless, the Executive Order requires agencies to prepare and submit benefit cost analyses even if those considerations are not a factor in the decisionmaking process. Again, it is the agencies that have the responsibility to prepare these analyses, and it is expected that OMB will review (but not redo) this work. In some cases where the agency has substantial discretion, the costs and benefits identified may be attributable to the regulation. In other cases, where the agency has limited discretion, they may be attributable primarily to the statute.

We found that the benefit cost analyses accompanying the 44 final rules listed in Table 6 vary substantially in type, form, and format of the estimates the agencies generated and presented. For example, agencies developed estimates of benefits, costs, and transfers that were sometimes monetized, sometimes quantified but not monetized, sometimes qualitative, and, most often, some combination of the three.

II. Benefits and Costs of Economically Significant/Major Final Rules (April 1998 to March 1999)

A. Social Regulation

Of the 44 rules reviewed by OMB, 22 are regulations requiring substantial additional private expenditures and/or providing new social benefits,[21] as described in Table 6.[22] EPA issued eight of these rules; HHS and DOT, three each; USDA and DOI, two each; DOC, DOL and Education, one each; and HHS/DOL/Treasury jointly issued one rule. Agency estimates and discussion are presented in a variety of ways, ranging from a purely qualitative discussion,for example, the benefits of the joint HHS/DOL/Treasury rule establishing minimum length-of-stay requirements for mothers and newborns, to a more complete benefit-cost analysis,for example, EPA's surface water treatment rule.

[insert table 6 here]

---

[21] The other 22 are "transfer" rules.

[22] Note that all dollar figures Table 6 are in 1996 dollars unless otherwise noted.

1. Benefits Analysis.

Agencies monetized at least some benefit estimates in a number of cases including: (1) FDA's $5.7 billion over 5 years from the additional transplants resulting from its transplant-related data rule; (2) EPA's estimate of $1.1 to $4.2 billion per year in terms of better air quality from its ozone transport (NOx SIP Call) rule; and (3) DOT's $360 million over 10 years in highway safety improvements from its reflector rule for trailers.

Of the 22 (non-transfer) rules listed in Table 6, agencies monetized all the benefit estimates that they were able to quantify in 10 cases. In two cases, agencies provided some of the benefit estimates in monetized and quantified form, but did not monetize other, important quantified components of benefits. DOL's analysis of its powered industrial truck operator training rule monetized the property damage reductions and out-of-pocket savings associated with injury reductions. DOL, however, did not monetize the other aspects of those injuries (such as pain and suffering) nor the fatalities avoided. EPA's analysis of its non-handheld engines rule monetized the projected fuel savings, but not the estimated hydrocarbon and nitrogen oxide emission reductions.

In four cases, agencies provided quantified benefit estimates but did not provide monetized estimates. These included: (1) DOT's 36 to 50 fatalities and 1,231 to 2,229 injuries prevented per year as a result of child seat rule; (2) EPA's 113,500 tons of volatile organic compound emission reductions per year from its architectural coatings rule; and (3) EPA's annualized emission reductions of 786,000 tons of nitrogen oxides, 110,000 tons of hydrocarbons and 87,000 tons of particulate matter from its nonroad diesel engines rule.

Finally, in six cases, agencies did not report any quantified (or monetized) benefit estimates. In many of these cases, the agency provided a qualitative description of benefits. For example, USDA's wood packing material rule discusses the potential benefits of avoiding the loss of forest products, commercial fruit, maple syrup, and tourism associated with a massive beetle infestation, but does not estimate the probability of such an episode. HHS's analysis of its length-of-stay rule for mothers and newborns includes a qualitative discussion of the rule's positive impact on the overall health and well-being of those affected.

2. Cost Analysis.

In 16 of the 22 cases, agencies provided monetized cost estimates. These include such items as HHS's estimate of $1.4 billion over 5 years in direct medical costs for its transplant-related data rule; DOT's estimate of $152 million per year for its child restraint rule; and EPA's estimate of $1.7 billion per year for its ozone transport rule.

For the remaining six rules, the agencies did not estimate costs. These rules included both USDA rules, DOI's two migratory bird hunting rules, DOC's endangered species listing rule and NHTSA's light truck fuel economy rule.

3. Net Monetized Benefits.

Ten of the 22 rules provided at least some monetized estimates of both benefits and costs. Of those, eight have positive net monetized benefits, that is, estimated monetized benefits that unambiguously exceed the estimated monetized costs of the rules. For example, DOT's reflector rule will generate an estimated net benefit of about $140 million (present value) over 10 years. EPA's surface water treatment rule will result in an estimated net benefit of between $41 million and $1.3 billion per year. In the case of certain health, safety, and environmental rules, the epidemiologic evidence may indicate, but not establish with certainty, that a causal link exists between the regulated substance and the occurrence of serious illness. Despite the lack of certainty, an agency may decide that regulation is appropriate. In calculating the benefits of such a rule, it is necessary to describe more than one possible outcome, reflecting the current state of knowledge referred to above. Thus, for example, two EPA rules resulted in monetized benefit estimates that included the possibility of both positive or negative net benefits. For example, EPA's disinfection byproducts rule was estimated to generate between $3.18 billion in net benefits and $701 million in net costs. This reflected the lack of certainty as to whether the rule would definitely prevent bladder cancer.

4. Rules With Quantified Effects Of Less Than $100 Million Per Year.

Seven of the rules in Table 6 are classified as economically significant even though their quantified effects do not exceed $100 million in any one year:

USDA - Solid Wood Packing Material from China: Because of a lack of data, the USDA was not able to estimate the benefits and costs associated with regulating solid wood packing materials from China to prevent the importation of wood pests. USDA stated, however, that in the absence of regulatory action, the wood pests could significantly affect the forest products, commercial fruit, maple syrup, nursery, and tourist industries, which have a value of $41 billion.

USDA - Pseudorabies in Swine: In 1999, USDA began implementing a policy to accelerate the Federal eradication program for pseudorabies. Although USDA authorizes a $80 million fund for indemnity payments, the producers of the swine incur other costs such as the cost of cleaning and disinfection. USDA did not estimate these costs because it did not have sufficient information to determine the effect of its actions on the market. USDA believed it was important to act immediately because the severely depressed values of market swine presented a unique opportunity to accelerate significantly pseudorabies eradication in a cost-effective way through depopulation.

DOC - Endangered and Threatened Species of Salmonids: Based upon publicly available information, OMB determined that rules covering these species were major. Citing the Conference Report on the 1982 amendments to the Endangered Species Act, however, the agency did not perform a benefit-cost analysis of the final rules. This report specifically provides that economic impacts cannot be considered in assessing the status of a species.

HHS - Safety and Effectiveness of New Drugs in Pediatric Patients: FDA estimated that this rule will generate benefits of about $76 million per year. FDA also noted, however, that this should be interpreted as a lower bound, since the analysis covered only five illnesses and did not include any estimate for avoided pain and suffering. FDA expressed the belief that the benefits of the rule could easily exceed $100 million.

HHS - Over-The-Counter Drug Labeling: FDA estimated the benefits of this rule at $61 to $80 million/yr. In addition, the agency was unable to quantify several components of benefits that it believes are significant. These include increased consumer satisfaction and a reduction in less-severe adverse health outcomes.

DOT - Light Truck CAFE: For each model year, DOT must establish a corporate average fuel economy (CAFE) standard for light trucks, including sport-utility vehicles and minivans. (DOT also sets a separate standard for passenger cars, but is not required to revisit the standard each year.) For the past four years, however, appropriations language has prohibited NHTSA from spending any funds to change the standards. In effect, it has frozen the light truck standard at its existing level of 20.7 miles per gallon (mpg) and has prohibited NHTSA from analyzing effects at either 20.7 mpg or alternative levels. Although DOT did not estimate the benefits and costs of the standards, the agency's experience in previous years indicates that they may be substantial. Over 5 million new light trucks are subject to these standards each year, and the standard, at 20.7 mpg, is binding on several manufacturers. In view of these likely, substantial effects, we designated the rule as economically significant even though analysis of the effects was prohibited by law.

EPA - Petroleum Refining Process Waste - EPA estimated the cost of the rule at $20 to $40 million/yr. with an expected value of $30 million/yr. Based on new cost information submitted to EPA after the close of the comment period, OMB determined that the rule as written could impose costs in excess of $100 million/yr. EPA subsequently determined that the higher cost estimates are attributable to waste leachates not intended to be covered by the petroleum listing, and EPA published in the Federal Register another rule clarifying that leachates are excluded from this petroleum listing and other listings, and are deferred to Clean Water Act discharge standards. This deferral was in effect when the petroleum rule became effective; consequently, the impacts for the petroleum listing are correctly estimated to be $30 million.

B. Transfer Regulations

Of the 44 rules listed in Table 6, 22 were necessary to implement Federal budgetary programs. The budget outlays associated with these rules are "transfers" to program beneficiaries. Of the 22, two are USDA rules that implement Federal appropriations language regarding disaster aid for farmers; eleven are HHS rules that implement Medicare and Medicaid policy; one is an HHS rule providing assistance to needy families; three are DOT rules regarding grants to states to increase seatbelt usage and reduce intoxicated driving; one is an SBA rule regarding contracting; two are Federal Acquisition Regulation rules; one is a DOJ rule regarding immigration policy; and one is a Pension Benefit Guaranty Corporation (PBGC) rule regarding

payment of premiums.

1. Major Rules for Independent Agencies

The Congressional review provisions of the Small Business Regulatory Enforcement Fairness Act (SBREFA) require the General Accounting Office (GAO) to submit reports on major rules to the Committees of jurisdiction in both Houses of Congress, including rules issued by agencies not subject to Executive Order 12866 (the "independent" agencies). We reviewed the information on the costs and benefits of major rules contained in GAO reports for the period of April 1, 1998 to March 31, 1999. GAO reported that four independent agencies issued twenty-four major rules during this period. We list the agencies and the type of information provided by them (as summarized by GAO) in Table 7.

In comparison to the agencies subject to E.O. 12866, the independent agencies provided relatively little quantitative information on the costs and benefits of the major rules As Table 7 indicates, six of the twenty-four rules included some discussion of benefits and costs. Only two of the twenty-four regulations had any monetized cost information; only one regulation monetized the benefits associated with the regulation.

The one rule that estimated both benefits and costs was "Registration Form Used by Open-Ended Management Investment Companies and New Disclosure Option for Open-Ended Management Investment Companies" by the Securities and Exchange Commission (SEC). This regulation updated the Form N-1A that is used by mutual funds to register under the Investment Company Act of 1940 and to offer their shares under the Securities Act of 1933 [63 FR 13916]. SEC estimated the cost associated with the regulation to be approximately $175 million. The estimated benefits for the small funds was $1.8 million. This was the only rule in which the monetized cost exceeded $100 million.

SEC also estimated the cost associated with a regulation amending Rule 17a-5 to require broker-dealers to report their processes for preparing for the Year 2000. The cost was about $66 million. With respect to the remaining regulations, the twenty-two GAO reports contain no information useful for estimating the aggregate costs and benefits.

[insert table 7 here]

Chapter III: Estimates of Benefits and Costs of "Economically Significant" Rules, April 1995 - March 1999

This chapter presents the available benefit and cost estimates for individual rules from April 1, 1995 through March 31, 1999. The summary of agency estimates for final rules from the current year (April 1, 1998 to March 31, 1999) is presented in Chapter II, Table 6. The summary of agency estimates for final rules from the preceding three years (April 1, 1995 to March 31, 1998) is presented in Tables 15 through 17 in the Appendix. In this chapter, we also aggregate benefit and cost estimates for those Federal rules with significant quantified benefit and cost estimates.

In assembling agency estimates of benefits and costs, we have:

(1) applied a uniform format for the presentation of benefit and cost estimates in order to make agency estimates more closely comparable with each other (for example, providing the benefit and cost streams over time and annualizing benefit and cost estimates); and

(2) monetized quantitative estimates where the agency has not done so (for example, converting tons of pollutant per year to dollars).

Adopting a format that presents agency estimates so that they are more closely comparable also allows, at least for purposes of illustration, the aggregation of benefit and cost estimates across rules. While we have attempted to be faithful to the respective agency approaches, we caution the reader that agencies have used different methodologies and valuations in quantifying and monetizing effects.

As noted in Chapters I and II, the substantial limitations of available data on the benefits and costs for this set of rules raise significant obstacles to the development of a meaningful aggregate estimate of benefits and costs for even a single year's regulations. For example in many cases, agencies identified important benefits of their rules that were not quantifiable. In such cases, we necessarily excluded them from the monetized estimates we develop in this Chapter. To the extent that these benefits are substantial, the monetized estimates will understate the total value of the benefits. The discussion below addresses other limitations in the data and outlines the steps we have taken in an effort to overcome some of them.

I. Monetized Benefit and Cost Estimates for Individual Rules

We have included in this Chapter only those major rules with quantified estimates of both benefits and costs. These include six rules from the 1995/96 period, 15 rules from the 1996/97 period, 13 rules from 1997/98 period, and 14 from 1998/99. We have excluded 17 rules without quantified estimates of either benefits or costs. (See Table 8.) Ten additional rules listed in Table 9 have also been excluded from further discussion because only quantified cost estimates were available and/or there were only relatively small benefit and cost estimates.

[insert tables 8 and 9 here]

For some of the remaining rules, agencies quantified estimates of significant effects, but did not assign a monetized value to these effects. Some of the quantified effects -- for example, small changes in the risk of premature death or serious injury -- are identified as outcomes for a variety of rules. In a number of instances, agencies did assign monetized estimates to these outcomes.

Differences in valuation across rules are often critical, particularly in comparisons of individual rules or programs. The different approaches in the quantification and monetization of these effects across agencies can also result in an "apples and oranges" problem in aggregating estimates. Indeed, where effects have been quantified, but not monetized, the different quantitative effects cannot be aggregated because they are not expressed in common units. In order to address this problem, this section takes the additional step of assigning a monetized value in order to provide a more consistent set of estimates in those cases where agencies only quantified significant effects. We have not, however, attempted to quantify or monetize any qualitative effects identified by agencies where the agency did not at least quantify them.

As in the past, agencies continue to take different approaches toward rules that affect small risks of premature death. In some cases, such as FDA's tobacco rule, agencies have quantified and monetized these effects in terms of "quality-adjusted statistical life years." In other cases, such as FRA's roadway worker protection rule, agencies have quantified and monetized these effects in terms of statistical lives. In still other cases, such as DOL's industrial truck operator rule and NHTSA's child restraint rule, agencies have quantified risks of death in terms of life-years or lives, but have not monetized them. Finally, in some cases, such as FDA's animal feed rule, the agency did not develop any quantified estimate of the rule's mortality effects.

Estimates for the value of a statistical life varied across agencies. For the tobacco rule, FDA estimated benefits based on a value of $2.5 million per statistical life. For the roadway worker rule, FRA used $2.7 million per statistical life. For the upper-bound estimates of EPA's ozone and PM NAAQS rules, the agency used $4.8 million per statistical life. For its mammography rule, FDA used $5 million per statistical life.[23] Similarly, agency estimates for the value of a statistical life-year have also varied. FDA used $116,500 per life-year for its tobacco rule. EPA used $120,000 per life-year to produce its lower-bound estimates of benefits in its ozone and PM NAAQS rules. FDA used $368,000 per life-year in its mammography rule. As a general matter, we have deferred to the individual agencies' judgment in this area. In cases

[23] There is a relatively rich body of academic literature on this subject. The methodologies used and the resulting estimates vary substantially across the academic studies. Based on this literature, agencies have each developed estimates they believe are appropriate for their particular regulatory circumstances.

where the agency both quantified and monetized fatality risks, we have made no adjustments to the agency's estimate.

In cases where the agency provided only a quantified estimate of fatality risk, but did not monetize it, we have monetized these estimates in order to convert these effects into a common unit. For example, in the case of HHS's organ donor rule, the agency estimated, but did not monetize, statistical life-years saved (although it discussed its use of $116,500 per life-year in other contexts). We valued those life-years at $116,500 each. For NHTSA's child restraint rule, we used a value of $2.7 million per statistical life.

In cases where agencies have not adopted estimates of the value of reducing these risks, we used estimates supported by the relevant academic literature. For DOL's industrial truck operator rule, for example, we used $5 million per statistical life.[24] We did not attempt to quantify or monetize fatality risk reductions in cases where the agency did not at least quantify them. As a practical matter, the aggregate benefit and cost estimates are relatively insensitive to the values we have assigned for these rules because the aggregate estimates are dominated by the FDA tobacco rule and EPA's rules revising the ozone and PM primary NAAQS.

II. Valuation Estimates for Other Regulatory Effects

The following is a brief discussion of our valuation estimates for other types of effects which agencies identified and quantified, but did not monetize.

- *Injury*. For the child restraint rule, we adopted the Department of Transportation approach of converting injuries to "equivalent fatalities." These ratios are based on DOT's estimates of the value individuals place on reducing the risk of injury of varying severity relative to that of reducing risk of death. For the OSHA industrial truck operator rule, we did not monetize injury benefits beyond OSHA's estimate of the direct cost of lost workday injuries.

- *Change in Gasoline Fuel Consumption.* We valued reduced gasoline consumption at $.80 per gallon pre-tax.

- *Reduction in Barrels of Crude Oil Spilled.* We valued each barrel prevented from being spilled at $2,000. This reflects double the sum of the most likely estimates of environmental damages plus cleanup costs contained in a recent published journal article (Brown and Savage, 1996).

---

[24] As a result of OSHA's interpretation of the Supreme Court's decision in the "Cotton Dust" case, *American Textile Manufacturers Institute v. Donovan,* 452 U.S. 491 (1981), OSHA does not conduct cost-benefit analysis or assign monetary values to human lives and suffering.

- *Change in Emissions of Air Pollutants.* We used estimates of the benefits per ton for reductions in hydrocarbon, nitrogen oxide (NO_x), sulfur dioxide (SO_2), and fine particulate matter (PM) derived from EPA's Pulp and Paper cluster rule (October, 1997). These estimates were obtained from the RIA prepared for EPA's July, 1997 rules revising the primary NAAQS for ozone and fine PM. We note that in this area, as in others, the academic literature offers a number of methodologies and underlying studies to quantify the benefits. There remain considerable uncertainties with each of these approaches. In particular, the derivation and application of per-ton coefficients to value reductions in these pollutants requires significant simplifying assumptions. This is particularly true with respect to the relationship between changes in emitted precursors pollutants and changes in the ambient pollutant concentrations which yield actual benefits. As a result of these simplifying assumptions, the monetary benefit estimates obtained by multiplying tons reduced by benefit estimates per-ton, which we derive from analyses of other rules, should be considered highly uncertain. For each of these pollutants, we used the following values (all in 1996$) for changes in emissions[25]:

Hydrocarbons:	$519 to $2,360/ton;
Nitrogen Oxides:	$519 to $2,360/ton;
Particulate Matter:	$11,539/ton; and
Sulfur Dioxide:	$3,768 to $11,539/ton.

EPA has recently recommended that we use an average value of $7,999/ton for nitrogen oxides. EPA based this estimate on the benefits estimate associated with its recent "Tier 2/gasoline sulfur" final rule **(FR cite, when available)**. We will be considering whether we should use this or some other value instead of the range we currently use and would welcome comment on the subject.

In order to make agency estimates more consistent, we developed benefit and cost time streams for each estimates of benefits and costs, we used these estimates in developing streams of benefits and costs over time. W years, we used a linear interpolation to represent benefits and costs in the intervening years.[26]

Agency estimates of benefits and costs cover widely varying time periods. While HHS analyzed the effe agencies generally examined the effects of their regulations over longer time periods. HHS used a 10-year perio for its truck operator training rule. EPA's analyses on disinfection and enhanced water treatment rules evaluate used for the various rules evaluated generally reflect the specific characteristics of individual rules such as expec

In order for comparisons or aggregation to be meaningful, benefit and cost estimates

[25] Where applicable, the lower (higher) end of the value ranges in all of the tables throughout this report reflect the lower (higher) values in these ranges.

[26] In other words, if hypothetically we had costs of $200 million in 2000 and $400 million in 2020, we would assume costs would be $250 million in 2005, $300 million in 2010, and so forth.

should correctly account for all substantial effects of regulatory actions, including potentially offsetting effects, which may or may not be reflected in the available data. We have not made any changes to agency monetized estimates. To the extent that agencies have adopted different monetized values for effects, for example, different values for a statistical life, or different discounting methods, these differences remain embedded in Tables 10 through 14. Any comparison or aggregation across rules should also consider a number of factors which the presentation in tables 10 through 14 does not address. For example, these rules may use baselines in regulations and controls already in place. In addition, these rules may well treat uncertainty in different ways. In some cases, agencies may have developed alternative estimates reflecting upper- and lower- bound estimates. In other cases, the agencies may offer a midpoint estimate of benefits and costs. In still other cases the agency estimates may reflect only upper-bound estimates of the likely benefits and costs.

III. Aggregation of Benefit and Cost Estimates Across Rules

In Table 14, we aggregated the estimates for individual rules from Tables 10 through 13 by year. This approach yields prospective estimates of the benefits and costs that Federal agencies expected before they issued major rules over the last three years.

[insert tables 10 through 14 here]

We have several important observations to offer on these aggregate estimates. First, the 1996 HHS rule placing restrictions on the sale of tobacco and EPA's 1997 rules revising the NAAQS for ozone and particulate matter dominate the annualized and present value aggregates presented in Table 13. Changes in estimation methodology for these rules, as reflected by the "plausible range" adopted by the analysis for the EPA NAAQS rules for ozone and particulate matter, will have a marked effect on the aggregated benefit and cost estimates for the rules published over the period from April 1, 1995 to March 31, 1998. By the same token, the aggregate estimates are not very sensitive to different approaches for the remaining rules.

The presentation of these aggregates as annualized benefit and cost streams or as net present value estimates may obscure the actual timing of benefits and costs. In the case of the tobacco rule, for example, the annualized benefit estimates were estimated to be $9 to $10 billion per year. The health benefits associated with successfully reducing the number of young tobacco users, however, will not begin to be realized until after 2015 because of the lag in the noticeable, adverse effects associated with tobacco use. In the case of OSHA's methylene chloride standard, our estimate assumes that the reduction in cancer deaths among exposed workers will not occur until the year 2017, based on an average 20 year lag from exposure to death from cancer.[27]

[27] OSHA believes that this assumption is unrealistic and that many workers will avoid incurring cancer before 2017 as a result of the reduction in their methylene exposures brought about by the standard.

Similarly, the benefits and costs of the revised ozone and particulate matter NAAQS will only be recognized in the years after 2005. These estimates of "out-year" benefits and costs are not certain. EPA will complete its next periodic review of the particulate matter NAAQS, scheduled for 2002, before it begins implementation of the revised particulate matter NAAQS. If this review yields a "mid-course" change in the standard, the estimates of benefits and costs could change. EPA has also expressed a continuing concern with the uncertainty of the full attainment cost estimates because EPA believes technological change over the next decade will yield lower-cost approaches that will achieve the revised NAAQS.

As noted above, there are significant methodological issues that need to be confronted when aggregating estimates from a set of individual rules (as presented in tables 10 through 13) in an effort to obtain an estimate of the total benefits and costs of Federal regulation. These issues include:

(1) Adoption of a reasonable, consistent baseline (it is difficult to patch together a sensible baseline from the differing baseline scenarios adopted across rules).

(2) The use of prospective estimates (versus retrospective estimates) of the benefits and costs of regulation, for example, the reliance on prospective estimates may well fail to reflect important changes in taste, innovation by the private sector, or changes in Federal/State/local regulation.

(3) The "apples and oranges" problem associated with combining estimates from different studies, including different measures of benefits and costs, double-counting of benefits and costs across related rules, differing approaches to uncertainty such as the use of upper- and lower-bound estimates versus the use of an upper-bound only estimate, and different discount rates.

A final reason that any regulatory accounting effort has limits is the lack of information on the effects of regulations on distribution or equity. None of the analyses addressed in this report provides quantitative information on the distribution of benefits or costs by income category, geographic region, or any other equity-related factor. As a result, there is no basis for quantifying distributional or equity impacts.

Chapter IV: Ten Recommendations For Reform

Sec. 638(a)(3) of the Act requires OMB to submit with its report on the costs and benefits and impacts of Federal regulation "recommendations for reform." In seeking to reform and make more efficient the regulatory process, OMB provides guidance to the agencies in regulatory planning and reviews individual regulations as provided by Executive Order 12866. In so doing, we coordinate policy concerns among the agencies and make numerous recommendations to the agencies to ensure that regulations are consistent with applicable law, the President's priorities, and the regulatory reform principles of Executive Order 12866. The results of those recommendations and their consideration by the agencies during the regulatory decisionmaking process are reflected in final regulations and represent the Administration's regulatory reform efforts.

The most comprehensive accounting of the recommendations and regulations that agencies currently have under consideration is published annually in the Administration's Regulatory Plan. The Regulatory Plan contains a description of the most significant regulatory and deregulatory actions that the agencies plan to issue in either proposed or final form during the next fiscal year. The latest Regulatory Plan was published in the *Federal Register* on November 22, 1999 (64 FR 63883). This year, the Regulatory Plan contains 164 entries from 28 agencies.

The 164 regulations under development in the Regulatory Plan may be viewed as specific recommendations for regulatory improvement or reform based on statutory mandates and the Administration's priorities. Four agencies -- USDA, HHS, DOL, and EPA -- account for 100 of the 164 initiatives. The following is a sample of the Administration's specific regulatory reform efforts that either increase the regulated entities' flexibility, reduce paperwork burden, clarify the regulated entities' responsibilities with plain language, or substitute performance standards for command-and-control:

- The Food Safety and Inspection Service (FSIS) of USDA is reforming its regulations on imported livestock and poultry products by replacing command-and-control regulations with performance standards, which should benefit consumers and producers and expand international trade.

- FSIS also is reforming its egg product inspection regulations to move from a command-and-control and prior approval systems to a performance standard approach based on the Hazard Analysis and Critical Control Point (HACCP) system and pathogen reduction goals.

- The Food and Drug Administration of HHS is also developing a performance-based HACCP program and a labeling system rather than specifying good manufacturing practices to reduce food-borne pathogens in fruit and vegetable juices.

- HUD is developing four year performance goals for Fannie Mae and Freddie Mac requiring them to purchase mortgages for low and moderate-income housing, special affordable housing, and housing in under served areas. This will increase the number of affordable housing units without significantly crowding out traditional portfolio lending.

- The Bureau of Land Management of the Department of the Interior is revising its Federal oil and gas leasing operations regulations. It will use plain language to improve understanding of the rule. The rule will rely on performance standards, rather than prescriptive requirements, to allow greater flexibility to deal with unique geological or engineering circumstances.

- The Office of Federal Contract Compliance Programs of DOL is reforming its nondiscrimination and affirmative action obligations for government contractors under Executive Order 11246. It plans to reduce paperwork burdens, eliminate unnecessary regulations, and simplify and clarify regulations while improving the efficiency and effectiveness of the contract compliance program.

- The Occupational Safety and Health Administration of DOL is revising its injury and illness reporting and recordkeeping requirements to improve the quality and utility of the data, clarify and simplify guidance, and exempt small businesses in low hazard industries.

- The Federal Railroad Administration of DOT is developing a rule using careful analysis weighing the benefits of reduced collision probabilities with the costs imposed on society to determine when and how train whistles must be sounded at grade crossings.

- EPA is streamlining its requirements for revising operating permits issued by State and local permitting authorities for major sources of air pollution under the Clean Air Act. It will simplify the process for minor new source review actions that have little or no environmental impact.

- EPA is streamlining its public notification regulations for violations of drinking water regulations by public water systems. It will seek to give consumers better and more timely notification of the potential health risks from drinking water when violations occur.

These reforms, as well as many other efforts underway, are significantly improving the lives, health, and well-being of the American public.

Bibliography

Brown, R. Scott and Ian Savage, "The Economics of Double-Hulled Tankers" *Maritime Policy and Management*, Vol. 23, No. 2 (1996).

Crandall, Robert W**.,** *et al. An Agenda For Federal Regulatory Reform* (Washington D.C.: American Enterprise Institute and the Brookings Institution, 1997).

Crandall, Robert W., Howard Gruenspecht, Ted Keeler and Lester Lave. *Regulating the Automobile* (Washington D.C.: Brookings Institution, 1986).

Crandall, Robert W. "What Ever Happened to Deregulation?" in David Boaz (ed.) *Assessing the Reagan Years* (Washington D.C.: Cato Institution, 1988).

Cropper, Maureen L. and Wallace E. Oates. "Environmental Economics: A Survey," *Journal of Economic Literature*, Vol. 30, No. 2 (June 1992).

Denison, Edward F. *Accounting for Slower Economic Growth: The U.S. in the 1970s* (Washington D.C.: Brookings Institution, 1979).

Dudley, Susan E. and Angela Antonelli, "Congress and the Clinton OMB: Unwilling Partners in Regulatory Oversight," *Regulation* (Fall 1997).

Eads, George C. and Michael Fix. *Relief or Reform? Reagan's Regulatory Dilemma* (Washington, D.C.: The Urban Institute Press, 1984).

Ehrenberg, Ronald G. and Robert S. Smith. *Modern Labor Economics; Theory and Public Policy* (New York: Harper Collins, 1991).

Elliehausen, Gregory. *The Cost of Bank Regulation: A Review of the Evidence* (Washington D.C.: Federal Reserve Board Staff Study, 1997).

Gardner, Bruce L. *Protection of U.S. Agriculture: Why, How, and Who Loses?* (University of Maryland Dept. Agriculture and Resource Economics Working Paper No. 87-15).

Grant Thorton. *Regulatory Burden: The Cost to Community Banks*, A study prepared by the Independent Bankers Association of America, (1993).

Gray, W. B. "The Cost of Regulation: OSHA, EPA, and the Productivity Slowdown," *American Economic Review*, (December 1987).

Hahn, Robert W. and John A. Hird. "The Costs and Benefits of Regulation: Review and Synthesis," *Yale Journal on Regulation*, (Vol. 8, No. 1, Winter 1991).

Hahn, Robert W. and Robert E. Litan. *Improving Regulatory Accountability* (Washington D.C.: American Enterprise Institute and the Brooks Institution, 1997).

Hahn, Robert W. "Regulatory Reform: Assessing the Government's Numbers" in *Reviving Regulatory Reform: A Global Perspective*, (Cambridge University Press and A.I. Press, Forthcoming).

Hahn, Robert W. "Regulatory Reform: What do the Numbers Tell Us?" in Hahn, Robert W., ed., *Risks, Costs, and Lives Saved: Getting Better Results From Regulation*, (New York: Oxford University Press and A.I. Press, 1996).

Hazilla, Michael and Raymond Kopp. "Social Cost of Environmental Quality Regulations: A General Equilibrium Analysis," *Journal of Political Economy*, (Vol. 98, No. 4, 1990).

Himmelstein, David U. And Steffie Woolhandler. "Cost Without Benefit: Administrative Waste in U.S. Health Care," *The New England Journal of Medicine*, (Vol.314, No. 7, February, 13, 1986).

Hopkins, Thomas D. "Cost of Regulation," Report Prepared for the Regulatory Information Service Center, Washington, D.C., (August 1991).
Hopkins, Thomas D. "Cost of Regulation: Filling the Gaps," Report Prepared for the Regulatory Information Service Center, Washington D.C., (August 1992).
Hopkins, Thomas D. "Profiles of Regulatory Costs," Report to U.S. Small Business Administration, (November 1995).
Hopkins, Thomas D. "OMB's Regulatory Accounting Report Falls Short of the Mark," Center for the Study of American Business (October 1997).
Hopkins, Thomas D. "Regulatory Costs in Profile," Policy Study No. 132, Center for the Study of American Business, (August 1996).
Hufbauer, Gary C., Diane T. Berliner and Kimberly Ann Elliot. *Trade Protection in the United States* (Washington, D.C.: Institute for International Economics, 1986).
Jaffe, Adam B., Steven R. Peterson, Paul R. Portney and Robert Stavins. "Environmental Regulation and the Competitiveness of U.S. Manufacturing," *Journal of Economic Literature*, Vol. 33, No. 1 (March 1995).
James Jr., Harvey S. *Estimating OSHA Compliance Costs*, Center for the Study of American Business (October 1996).
Jorgenson, Dale W. and Peter J. Wilcoxen. "Environmental Regulation and U.S. Economic Growth," *Rand Journal of Economics* (Vol. 21, No. 2, Summer 1990).
Kahane, Charles J., The Effectiveness of Center High-Mounted Stop Lamps: A Preliminary Evaluation. Technical Report No. DOT HS 807 076. Washington, DC: National Highway Traffic Safety Administration, (1987).
Kahane, Charles J., An Evaluation of Center High-Mounted Stop Lamps Based on 1987 Data. Technical Report No. DOT HS 807 442. Washington, DC: National Highway Traffic Safety Administration, (1989).
Kahane, Charles J., and Ellen Hertz. Long-Term Effectiveness of Center High-Mounted Stop Lamps in Passenger Cars and Light Trucks. Technical Report No. DOT HS 808 696. Washington, DC: National Highway Traffic Safety Administration, (1998).
Litan, Robert E. and William D. Nordhaus. *Reforming Federal Regulation* (New Haven, Ct.: Yale University Press, 1983).
Morrison, Steven A. and Clifford Winston. *The Economic Effects of Airline Deregulation* (Washington, D.C.: Brookings Institution, 1986).
Morrison, Steven A. and Clifford Winston. "Enhancing Performance of the Deregulated Air Transportation System, "*Brookings Papers on Economic Activity: Microeconomics*, 1989.
Organization for Economic Cooperation and Development. *The OECD Report on Regulatory Reform Volume I: Sectoral Studies* (Paris: 1997).
Organization for Economic Cooperation and Development. *Regulatory Reform in the United States*, OECD Reviews of Regulatory Reform (Paris: 1999).
U.S., Council of Economic Advisers. *Economic Report of the President* (February 1997).
U.S., Council of Economic Advisers. *Economic Report of the President* (February 1998).
U.S., Council of Economic Advisers. *Economic Report of the President* (February 1999).
U.S., Environmental Protection Agency. *Environmental Investments: The Cost of a Clean*

Environment (December 1990).
U.S., Environmental Protection Agency. *Technical and Economic Capacity of States and Public Water Systems to Implement Drinking Water Regulations -- Report to Congress* (1993).
U.S., Environmental Protection Agency. *1972-1992 Retrospective Analysis: Impacts of Municipal Treatment Improvement for Inland Waterways* (1995).
U.S., Environmental Protection Agency. *The Benefits and Costs of the Clean Air Act, 1970-1990* (October 1997).
U.S., Environmental Protection Agency. *The Benefits and Costs of the Clean Air Act, 1990-2100* (November 1999).
U.S., General Accounting Office. *Regulatory Accounting: Analysis of OMB's Report on the Costs and Benefits of Federal Regulation* (April 1999).
U.S., General Accounting Office. *Regulatory Burden: Measurement Challenges Raised by Selected Companies* (November 1996).
U.S., General Accounting Office. *Regulatory Reform: Agencies Could Improve Develoment, Documentation, and Clarity of Regulatory Analyses* (May 1998).
U.S., General Accounting Office. *Regulatory Reform: Information on Costs, Cost-Effectiveness, and Mandated Deadlines for Regulations* (March 1995).
U.S., General Accounting Office. *Regulatory Reform:* Major Rules Submitted for Congressional Review During the First 2 Years (April 1998).
U.S., National Highway Traffic Safety Administration. [Preliminary] Regulatory Impact Analysis, Federal Motor Vehicle Safety Standard 108, Center High-Mounted Stoplamps, Washington, DC (1980).
U.S., National Highway Traffic Safety Administration. Final Regulatory Impact Analysis, Federal Motor Vehicle Safety Standard 108, Center High-Mounted Stoplamps. Washington, DC (1983).
U.S., Office of Management and Budget. *Agency Compliance with Title II of the Unfunded Mandates Reform Act of 1995* (1996, 1997, 1998, 1999).
U.S., Office of Management and Budget. *More Benefits Fewer Burdens: Creating a Regulatory System that Works for the American People* (December 1996).
U.S., Office of Management and Budget, *Report to Congress On the Costs and Benefits of Federal Regulations* (September 30, 1997).
U.S., Office of Management and Budget, *Report to Congress On the Costs and Benefits of Federal Regulations 1998* (1998).
U.S., Office of Management and Budget, *Reports to Congress Under the Paperwork Reduction Act of 1995* (September 1997).
U.S., Office of Management and Budget. *Information Collection Budget of The United States Government* (Various Years).
U.S., Office of Technology Assessment. *Gauging Control Technology and Regulatory Impacts in Occupational Safety and Health* (September 1995).
U.S. Small Business Administration. *Annual Report of the Chief Counsel for Advocacy on Implementation of the Regulatory Flexibility Act, Calendar Year 1998* (June 1999).
U.S. Small Business Administration. *The Changing Burden of Regulation, Paperwork, and Tax Compliance on Small Business: A Report to Congress* (October 1995).

Usher, D. "An Imputation to the Measure of Economic Growth for Changes in Life Expectancy" in *NBER Conference on Research in Income and Wealth* (1973)

Viscusi, W. Kip. *Fatal Tradeoffs: Public and Private Responsibilities for Risk* (New York: Oxford University Press, 1992).

Viscusi, W. Kip. *Risk by Choice: Regulating Health and Safety in the Workplace* (Cambridge Mass.: Harvard University Press, 1983).

Weidenbaum, Murray L. and Robert DeFina. "The Cost of Federal Regulation of Economic Activity," (Washington D.C.: American Enterprise Institute, 1978).

Wenders, J. *The Economics of Telecommunications: Theory and Practice,* 83 (1987).

White, Lawrence J. *The S&L Debacle: Public Policy Lessons for Bank and Thrift Regulation* (New York: Oxford University Press, 1991).

Winston, Clifford. "U.S. Industry Adjustment to Economic Deregulation", *Journal of Economic Perspectives* (1998).