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INTRODUCTION

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Along with many other developed nations, the United States is currently experiencing economic difficulties that many feel are unprecedented. The common symptoms appear to be a substantial decline in the rate of growth of real income and productivity, increasing numbers of unemployed, and inflation rates that seem to be immune to conventional therapies. Under such bleak circumstances, it is only natural to expect that any and all possible causes of difficulties will be closely scrutinized. A currently popular candidate for scrutiny is governmental regulation in general and environmental regulation in particular.

If, in fact, environmental regulations are an important contributor to our current economic difficulties, it may be because the costs of those regulations were ignored or underestimated when the legislation was passed. There might exist, as a consequence, a bias toward too much regulation. Yet, even if environmental regulations are not a cause of our economic difficulties, the public may perceive them to be so. This perception—the feeling that there is too much regulation—and the belt-tightening that can be expected as a result of slow growth and inflation, is already beginning to spell trouble for environmental regulation.

This set of papers explores the relationship between federal environmental regulation and the performance of the U.S. economy. This subject is clearly large and encompasses many issues. We wish to emphasize at the outset that certain important issues in environmental regulation are not covered in this volume. Since the primary concern of these papers is aggregate economic activity, there is only incidental mention of the effect that environmental policies may have on specific industries, plants, firms, individuals, and geographic regions. Perhaps more important, there is very little mention of the benefits of environmental regulation. This is because these benefits generally do not show up in the national income accounts, and hence are unlikely to influence significantly the rates of inflation, unemployment, and other macroeconomic indicators that are used to judge the health of the economy. (In fact, this is the subject of one of the papers.) The lack of attention to benefits should not, therefore, be taken to imply that we or the authors of the papers consider them to be insignificant: indeed, these benefits are probably quite large.

This absence of cost-benefit comparisons, as well as any mention of the distributional implications of environmental regulation, means

that there is simply not enough material in these papers for one to draw a sweeping conclusion about the overall desirability of our environmental policies. Instead, the authors concentrate primarily on the macroeconomic impacts of regulation. Needless to say, we think this is a very significant aspect.

While the rest of the papers in this volume discuss some aspect of the effect of environmental regulation on the economy, Barry Bosworth's paper is unique: it considers the effect of future macroeconomic conditions on environmental and other regulations. He discusses three major U.S. economic concerns—the high inflation rate, the recent and substantial reduction in the rate of productivity growth, and the erosion of the international competitive position of U.S. industry. These problems, which Bosworth feels are likely to remain serious in the 1980s, will affect the way existing and proposed regulations are viewed during the period.

For example, Bosworth suggests that if anti-inflationary policies force workers to accept unemployment or falling real incomes, they may be suspicious of or hostile toward environmental policies that increase prices. Furthermore, according to Bosworth, reduced productivity growth will make it difficult to garner support for new environmental regulations if these regulations imply that some groups will gain at the expense of others. In the past, productivity increases made it possible to initiate new social programs at the same time incomes were increasing. Those groups that would have lost in a static economy were often compensated by increased growth. Finally, Bosworth identifies two industries, steel and automobiles, where wages are much higher than elsewhere in the manufacturing sector. Although he suggests that these wage concessions are responsible for much of their problems with import competition, Bosworth points out that both industries have blamed regulation for their difficulties. Future problems in these and other industries may lead to pressure for reductions in their regulatory burden.

One implication of Bosworth's observations is that it would be well for environmental regulators to hasten their search for the most cost-effective policies possible. Carefully designed policies will make fewer demands on what appears to be a limited and slowly growing stock of national economic resources. In addition, such policies will appear less intrusive and thus more politically acceptable.

Increased public awareness of the benefits of environmental policies may help alleviate some of the economic dislocations associated with these policies. As Bosworth notes, when some workers maintain real incomes in the face of price increases caused by environmental

regulations, they are actually receiving "double compensation." For, as he argues, if workers successfully negotiate wage bargains to compensate them for all price increases, not only will they have constant real wages, but also the advantages of a clean environment. Their wage increases trigger higher prices and higher wage demands from others; this perpetuates the cost-push cycle. Workers can be expected to push for wage increases even when regulation confers nonmonetary gains upon them. But a better knowledge of environmental benefits may give employers and the government something to point to in attempting to resist these demands. This may help alleviate the pressure for double compensation.

Even those who believe that environmental regulation is a major source of our economic woes recognize that many other factors influence economic performance. One way to gauge the relative contribution of each of these is to use models to mathematically describe their interactions. Since such models are an important means for obtaining a reasonably objective and comprehensive analysis of the macroeconomic effects of environmental regulations, Paul Portney discusses the better known models in some detail.

Besides describing the methodologies, limitations, and results of several studies, Portney also discusses what is known about pollution control expenditures. These are the most important data that go into the macroeconomic studies. While expenditure estimates are widely quoted and essential for the modeling studies, they are poorly understood, even by those who use them freely. As Portney points out, pollution control expenditures are not the same as the social costs of regulation, even though the terms often are used interchangeably. Moreover, the methods and sources for estimating these data differ substantially among different investigators and, yet, these methods and data sources are usually unknown to those who use the estimates.

For these reasons and several others Portney discusses, the general conclusion drawn from the macroeconomic modeling studies—that environmental regulations have a rather small effect on economic activity—should be viewed with some caution. There are weaknesses in both the data and the models that are used. Indeed, it will be some time before these models are developed to a point where they can adequately treat all the factors that affect the economy and which are affected by environmental regulation.

While Portney's paper discusses large models that describe many indicators of economic activity, the next two papers concentrate on two of these indicators: productivity and the gross national product. Robert Haveman and Gregory Christainsen explore recent declines in

the growth rate of U.S. productivity, which is of special concern for two reasons: first, because of its implications for economic growth and inflation; and second because the public associates this decline with a general decline in America's perceived leadership in economic production, product quality, workmanship, and innovation. As a result, for perhaps the first time in U.S. history, polls indicate that many Americans feel that their children may end up worse off than themselves.

Haveman and Christainsen discuss the possible links between regulation and productivity. They point out that there are many other factors—the energy crisis, changes in the age-sex composition of the labor force, and shifts in the composition of production from manufacturing to services, to name just a few—that also could contribute to productivity declines. Indeed, after reviewing the available estimates of the relationship between regulation and productivity, they conclude that only a small fraction, perhaps 8 to 12 percent, of the recent decline should be attributed to environmental regulation.

They caution, however, that empirical analyses are unable to account for certain possibly adverse effects that may be associated with regulatory delay, paper work, and uncertainty about future requirements.

On the other hand, the productivity measures Haveman and Christainsen consider are limited in an important respect: the "output" upon which their calculation is based includes only those items measured in the national income accounts. Since these accounts in general do *not* include changes in environmental quality, productivity may fall even if very little in the way of conventional output has been traded for substantial increases in environmental output.

The best-known measure of conventional economic output is the gross national product (GNP). For this reason, Henry Peskin's paper looks closely at this indicator. In particular, Peskin investigates to what extent conventional GNP already appropriately measures changes in the quality of the environment; whether it is feasible to modify GNP to more accurately reflect environmental change; and, if feasible, whether such modifications are desirable.

In spite of its wide use as an indicator of economic output, GNP is nevertheless a very limited measure of economic well-being. It ignores altogether the composition of output and its distribution among the population. Furthermore, even though national income accounting focuses on production, productive activity that takes place outside of the marketplace—in the household, for example—is also ignored. It is not surprising that GNP is a poor indicator of changes in environmental quality.

Peskin also discusses U.S. and Japanese proposals to modify the GNP to make it a better indicator of well-being. While none of the proposed measures is free of deficiencies, and although all pose problems to those wishing to implement changes, Peskin recommends that these efforts be explored further. He suggests, however, that they proceed parallel to, but not as a substitute for, the existing effort to measure conventional GNP. A governmental attempt to measure alternative versions of GNP would signal the public that although conventional GNP is a useful measure, the government recognizes its deficiencies as a measure of well-being.

While there may be some question about their quantitative importance, several of the papers suggest that environmental regulations will have adverse effects on at least some measures of economic activity. Yet, as Winston Harrington and Alan Krupnick point out in their paper, many of these adverse effects can be moderated by changes in the way the country goes about regulating.

Currently, environmental policy relies to a large extent on the promulgation of technology-based regulations. Harrington and Krupnick briefly review the legislation supporting this approach, with special emphasis on the 1977 amendments to the Clean Air and Clean Water acts. Because of complexities and uncertainties associated with their implementation, these amendments have the potential for generating more severe economic effects than have been observed in the past.

Harrington and Krupnick consider several possible alterations in regulatory procedures. Some of these, referred to as "procedural reforms," could be implemented with little or no change in existing legislation. These reforms, some of which are already under way, include a number of technical changes in rulemaking procedures (for example, using EPA contractors differently and classifying industries differently), changed permit procedures (for example, longer permit life), use of standards based on cost-effectiveness, and permission for waivers for those firms which will develop innovative, less costly pollution control methods.

Other approaches, referred to as "substantive reforms," represent more of a break with the current regulatory approach. These approaches include EPA's new bubble policy and related offset policies, the use of marketable pollution permits, and effluent charges.

Such economic incentives have long been advocated by economists because of the cost savings they might make possible. In addition to the cost-saving properties of incentive-based regulation, Harrington and Krupnick point to another reason for using this approach. Not only does it have desirable efficiency properties, it also appears to

interfere less with the functioning of the economy than the present regulatory approach.

Up to and including Peskin's paper, all the authors take a rather short-term view of the relationship between environmental regulation and economic activity. Their concern is with existing regulations and recent economic conditions. However, it is also important to understand as best we can the long-run relationship between environmental policy and economic conditions.

In their paper Ronald Ridker and William Watson provide a methodology for taking the longer view. Using an input-output model, some illustrative data, and some assumptions about population growth and technological change, they simulate the effects of several hypothetical environmental policies well into the next century. Their model attempts to account for the pressures that increased population and economic growth exert on fixed amounts of available environmental resources, as well as the effects of technological progress. Economic and population growth tends to increase the benefits that may obtain from environmental regulation, while technological progress tends to decrease the costs of these regulations.

Thus, the Ridker–Watson paper shows that conclusions drawn from the near term may change once one takes a longer view. In particular, environmental policies that may appear too costly from today's perspective *may* appear socially and economically desirable once their long-term consequences are accounted for. However, as the authors are quick to point out, one must treat the conclusions from such a long-run analysis even more carefully than those obtained from short-term models.

The 1970s have aptly been called "the environmental decade" because of the large body of environmental legislation that was put in place during that time by the Congress. But the implementation of that legislation is still going on and will last well into the 1980s. The legislation will undergo its full test during a decade that threatens to present us with many economic difficulties. It is therefore more important than ever before to try to understand the forces that bear on macroeconomic performance. The papers in this volume should add to an understanding of the influence of environmental regulation.