Are tighter environmental regulations damaging to economic growth and prosperity?

It has long been understood that markets, although they are capable of generating large-scale growth, can also impose huge costs on society. Perhaps the best-known problem involves the business cycle, that is, the problem of how to avoid and reverse recessions and depressions.

Another problem that markets have is that they can inflict grave damage on the environment, in the form of air or water pollution, ozone destruction, greenhouse gases which lead to global warming, or other problems such as destruction of beautiful natural areas or of whole sets of species. This essay will explain why government must intervene in the economy in order to save markets from themselves. Because markets cannot adequately respond to the needs of society as a whole and in the long-term, it will be argued, the government must step in.

Before we can understand the answer to the question of the effect of environmental regulations on growth and prosperity, we have to explore what growth and prosperity are. And when inquiring as to the causes of growth, we have to ask what time frame we are talking about. That is, is prosperity a phenomenon that occurs only at one point in time, or is something we are worried about for one year, or several years, or do we ask "can we be prosperous for an indefinitely long period of time"?

The question of the time frame

When it comes to environmental regulations, this question about the time period we are considering becomes crucial. Do we want generations after us to enjoy the benefits of the environment? Or do we assert that we should maximize what economists call "utility", that is, the benefits of the output of the economic system, only in the short-term?

Conventional economics tends to have a very short-term bias, so conventional economics discussions of the environment can be weighted toward the idea of taking advantage of current opportunities, nevermind what happens in the future. Most models in economic literature assume a short-term "horizon", that is, only the short-term – say, a year – is part of what we are looking at.

But, of course, we are not mice, who only live for one year. We can live up to 100 years. Ethically, we should worry about the generations beyond us, up until the Sun swallows up the Earth several billion years from now. Most investments, such as to build a factory, take at least a year to finish, during which time the

capital used to build the factory is being "wasted", if our view of the future is restricted to, say, a quarterly report. Yet without the factories, which can last at least 20 years, civilization would collapse.

So when we start to consider the time frames that occur in an actually-functioning economy, we see that a certain group of resources are invested, for a period of time, often to make something, like a factory, that itself lasts a very long time, which is critical to creating the goods and services that the civilization uses to survive – and prosper.

What is environmental capital?

This set of things that investment is used to construct is called ***capital***. Capital is at the foundation of an economy – in fact, our current system is often referred to as capital*ism*. Often, perhaps usually, people think of *financial* capital when they use the word capital, that is, the monetary and financial reflection of the underlying wealth of an economy. But economists also recognize *physical* capital, for example, factories, and other assets such as buildings or information technology equipment that is then used to create the final goods and services that people use.

Environmental capital, like man-made physical capital, is just as important as financial capital for the proper functioning and prosperity of modern civilization. Lovins et al used the term natural capital in their book "Natural capitalism"[i]. Another kind of capital, *human* capital, is a much discussed term as well, particularly when education is the focus of a policy debate[ii].

There are therefore many kinds of capital – financial, physical, environmental, and human. Unless all of these systems are operating well, the economy cannot survive. Consider what would happen, for instance, if machine tools, machines that make parts for all other machines, were to disappear. After a certain period of time, the factory equipment that machine tools make would fall apart – and there would be no way to grow the economy either. Then, some time after the industrial capacity of the economy broke down, all other goods – such as houses and appliances and cars – would fall apart, and the civilization would collapse.

We can follow this exercise through with the other forms of capital as well. For environmental capital, we have many sources of wealth that are critical to the economy. Fresh water is required for all life on Earth, and is used mostly for agriculture and power generation (to cool down power plants), and also for drinking, cooking and cleaning for the population. The soil is a part of natural capital, and is necessary for growing food. The climate is critical for growing food, and for planning infrastructure to handle things like floods and hurricanes.

The sea level, we now know, is a critical natural resource because most of our cities are built on the assumption of a certain sea level.

Even the oxygen we breathe is the result of natural processes, expelled by trees, plankton, and other plants. The absence of pollution from the air is necessary for human health. Forests have provided the raw material, wood, that civilization was literally built on. Oceans provide much of our protein. We use the genetic wealth of the current set of existing plants and animals for our food and materials.

There are other, less obvious "services", as they are called, that natural systems provide[iii]. Forests bind the soil to the ground, clean the fresh water that we use, and soak up large amounts of carbon dioxide[iv]. Marshes and swamps prevent storms and storm surges from engulfing whole regions[v], as we found out to our regret in the aftermath of Hurricane Katrina. Glaciers and mountain snows provide a supply of fresh water when they partially melt in spring and summer[vi]. Many species of plants and animals have provided valuable compounds used for fighting diseases[vii]. We don't even know all of the services that our biosphere provides, even though we are currently destroying the genetic capital of the biosphere by causing the extinction of thousands of species.[viii]

Then there are the less tangible mental health and entertainment services that natural systems provide. It has been established that mental health can be improved by contact with natural systems such as forests[ix]. The recreation industry is based on the use of rivers, lakes, beaches, deserts, and other areas for leisure enjoyment. People move into particular areas just to enjoy the natural beauty of a particular area; the first conservation movements were founded to save the natural beauty of areas like Yosemite and Yellowstone. Indeed, many people have written of a spiritual element to saving the environment[x].

The importance of ecosystems

However, simply listing the elements of the environment that provide services does not help us understand everything that needs to be protected, because the natural world is divided into *ecosystems*, that is, systems of plants, animals, fungi, and nonliving elements such as rivers and rocks. It is these ecosystems that need to be protected, along with the components. Trees cannot survive without soil and water, and soil cannot survive with trees or other plants to bind soil to the ground. The "web of life" of ecosystems is predicated on the existence of various species and material sources, such as water, which often cannot exist without the specific creatures that have evolved within that particular ecosystem.

What this means is that not only must a particular part of an ecosystem be maintained, such as for instance the purity of fresh water in a river, the *entire ecosystem* must be maintained as a complete whole. If it not maintained as a

whole, if pieces of it are destroyed, even without destroying the entire ecosystem, the ecosystem collapses (the same applies to the biosphere as a whole)[xi]. Thus if trees are clear-cut from a forest, that is, they are all cut down at the same time, the entire ecosystem collapses.

Mainstream economics is incapable of explaining systems that are composed of critical subsystems. Economics is based on the idea of a system, but a system that is not relevant to a system such as ecosystem. In an ecosystem, the various pieces serve a particular *function*, such as providing water or plant material for plant-eaters or predation to keep down the population of plant-eaters. In an economics-based system, on the other hand, there is no use of the concept of *function*. Each firm is assumed to be pretty much like every other firm – the question is how a large set of firms behaves together when a certain phenomenon, such as the increase in price, occurs. Each industry is also pretty much like other industries. Capital flows to those industries that have a higher return on investment, no matter what the industry is, and this capital flow, so goes the story, leads to an optimum outcome. It doesn't matter if the flow of capital moves from manufacturing to tourism or from education to finance, the market does the right thing.

The book *Manufacturing Green Prosperity* shows that the problem with this story is that it is wrong[xii]. Industries in an economic system perform certain functions, and it matters where capital flows, whether or not the market acts as if a certain industry, such as manufacturing or education, is not important. The same applies to an ecosystem – if you extract one piece of the ecosystem, the entire ecosystem may collapse. For example, when wolves are taken out of an ecosystem, plant life suffers because plant-eaters have free reign. Or if you take sea otters out of an aquatic ecosystem, the sea urchins that the otters eat experience a population explosion, and destroy much of the kelp that is the foundation of the ecosystem[xiii]. The effect of the component of the ecosystem far outweighs its absolute size.

An economy is also an ecosystem. When manufacturing is removed from a wealthy society, its prosperity level declines[xiv]. Within manufacturing when, say, machine tools are removed, then the other parts of the manufacturing "ecosystem" suffer. Thus the U.S. auto industry has declined, not just from the mistakes of management, but also from a decline in the critical machinery industries that it uses.

Since the market cannot act to protect the system integrity of an economy or ecosystem, the government has to step in. This is the high-level reason for government intervention into the economy – the market is not capable of managing a system that is composed of functional elements. A corollary of this idea is that the market cannot manage systems such as economies and

ecosystems *over the long-term* – an economy or ecosystem that is subjected to a purely market system will eventually collapse, because there is no way for a market to correct itself when there is no profitable reason to do so in the short-term[xv].

Governments need to intervene

Thus, when environmental regulations are tightened, it often is the case that the *long-term* growth prospects and prosperity on an economy are *increased*, not decreased. Again, it depends on the time frame that is being investigated. But in the very short-term, even *investments* look economically unjustifiable. Indeed, since returns on financial investments can take place in nanoseconds, instead of the years required to see a return on an investment in a factory, the United States economy has become more and more directed toward financial speculation instead of the creation of wealth.

If all the trees in a forest are "harvested", that is, cut down, then in the short-term the society will be richer because it has increased its wealth by the value of the trees. But if the forest, which is now effectively destroyed, was preventing erosion of soil and preventing flooding, and value of the damage of the soil erosion and flooding *over the long-term* is much greater, in economic terms, than the value of the trees, then the government should step in and use environmental regulations to prohibit the destruction of the forest.

In this scenario, the corporation that is destroying the forest is doing what it does best, maximizing its profits. In a free market system, with competition between firms, we cannot expect a firm to decide to "do the right thing" for future generations when its competitors don't. If its competitors do the wrong thing and make more profits than the "good" firm, then the good firm will eventually go out of business because the profits of the "bad" firms will allow them to squeeze out the good firm with more marketing, financial manipulation, price decreases, etc.

Therefore, the government needs to use regulations to "level the playing field", that is, to insure that all corporations in an industry "do the right thing", not because the corporations choose to improve ethically, but because they have no choice. So, for example, if pollution of a particular chemical, say sulfur, is banned, then no company will be punished for "doing the right thing" – they all have to do it.

In other words, in a free-market system in which it is claimed, loudly and regularly, that corporations have to maximize profits for their shareholders, then it is absolutely essential that the government issues regulations that all corporations have to follow if the economy is not going to collapse.

Responses to Regulatory Capture

However, historically there has been a problem with regulation – the agencies which are created to regulate an industry are captured by that industry[xvi]. The corporations in the industry, such as rail, energy, or food, have enormous resources, and can use those resources to lobby and contribute campaign funds to legislators, who then pass regulations designed to help these corporations, and direct the regulating agencies to help the industry instead of regulating them. The corporations influence the hiring of the staff of the agencies, and the policies the agencies promulgate may also be subject to intense pressure from industry.

We saw a stark example of "regulatory capture" in the case of the Gulf Oil blowout. An entire agency which had been set up to oversee the environmental and safety requirements of the offshore oil platform industry had been thoroughly captured[xvii].

In the case of the petroleum industry, almost every oil-producing nation besides the United States has pursued the logical solution – they have nationalized the oil industry, so that the national government directly controls the oil companies that pump the oil. This doesn't mean that the nationalized oil companies are perfect, but in the case of the United States it would be much easier to insure environmental safety than by relying regulation alone – and the Federal Treasury would capture the profits from oil extraction, which is the common inheritance of all citizens.

Therefore one way to overcome the disadvantages of regulation is to actually nationalize an industry. Even according to mainstream economic theory, monopoly of an industry, that is, the capture of an entire industry by one company, can be converted to government ownership without loss of efficiency. There are many examples of "natural" monopolies, such as a national rail system, or an electric utility in a particular region[xviii]. In most countries outside the U.S., rail, electric utilities, and other natural monopolies such as telephone and internet systems, are controlled by the national government.

Since the United States developed its energy industry long ago, when the central government was relatively weak, electric utilities and energy companies are private, and will probably continue to be private for the foreseeable future. So the government has to resort to regulation instead of outright control.

Another way of getting around the problem of regulation capture is to prohibit certain materials or processes, instead of regulating by specifying conditions under which a process take place or a material can be created. Barry Commoner argued for prohibition, whenever possible, over regulation, mostly because of the

problem of regulatory capture[xix]. Thus, for instance, CFCs that destroy the life-supporting ozone layer where simply banned, instead of being subject to an elaborate set of rules that the captured regulatory agency would then have to manage.

The foundation of growth and prosperity is capital. Environmental capital occurs in the form of ecosystems, which are composed of functionally critical components, all of which must thrive for the ecosystem to survive. Corporations, and the market which they comprise, are only able to pursue the maximization of short-term profit, not the long-term health of ecosystems. Therefore, government must step in and manage the market in order to protect the essential capital that underlies prosperity. Sometimes the most efficient policy is to nationalize an entire industry, but if that is not possible or more efficient, then regulation is the logical direction to take.

Thus, we see that far from hurting economic growth and prosperity, environmental regulations are a necessary cause of long-term prosperity in a modern economy.

[i] *Natural Capitalism: Creating the next industrial revolution*, L. Hunter Lovins, Amory Lovins, Paul Hawken, Back Bay Books, 2008

[ii] *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, 3rd edition, Gary Becker, University of Chicago Press, 1994

[iii] *Capitalizing on Nature: Ecosystems as Natural Assets*, Edward B. Barbier, Cambridge University Press, 2011

[iv] Economic Value of Forest Ecosystem Services: A review, Douglas J. Krieger, The Wilderness Society, 2001

[v] *Ecosystems and Human Well-being: Wetlands and Water: Synthesis*, World Resources Institute, 2005, available at http://www.maweb.org/documents/document.358.aspx.pdf

[vi] World on the Edge: How to prevent environmental and economic collapse, Lester R. Brown, W.W. Norton, 2011, Chapter 4

[vii] Hawkins, B., 2008. *Plants for life: Medicinal plant conservation and botanic gardens*. Botanic Gardens Conservation International, Richmond, U.K.

[viii] *The Sixth Extinction: Patterns of life and the future of mankind*, Richard E. Leakey and Roger Lewin, Anchor Books, 1996 ; see also Elizabeth Kolbert, "The Sixth Extinction?", May 25, 2009, *The New Yorker*

[ix] "Being near nature improves physical, mental health", USA Today, 10/15/2009, available at http://usatoday30.usatoday.com/news/health/2009-10-15-nature-anxiety-exercise_N.htm

[x] E.O. Wilson, *The Creation: An Appeal to Save Life on Earth*, W. W. Norton, 2007

[xi] "Are we nearing a planetary boundary?", Justin Gillis, New York Times, June 6, 2012; see also "Approaching a state shift in Earth's biosphere." By Anthony D. Barnosky, Elizabeth A. Hadly, Jordi Bascompte, Eric L. Berlow, James H. Brown, Mikael Fortelius, Wayne M. Getz, John Harte, Alan Hastings, Pablo A. Marquet,, Neo D. Martinez, Arne Mooers, Peter Roopnarine, Geerat Vermeij, John W. Williams, Rosemary Gillespie, Justin Kitzes, Charles Marshall, Nicholas Matzke, David P. Mindell, Eloy Revilla & Adam B. Smith. Nature, Vol. 486, No. 7402, June 6, 2012

[xii] Jon Rynn, "Manufacturing Green Prosperity: The power to rebuild the American Middle Class", Praeger Books, 2010, Chapter 7

[xiii] "Why the Beaver Should Thank the Wolf", Mary Ellen Hannibal, 9/28/2012, *New York Times*

[xiv] *Manufacturing Green Prosperity*, Chapter 2

[xv] The classic explanation of this view is in Karl Polanyi, *The Great Transformation: The Political and Economic Origins of Our Time*, Beacon Press, 2001 [1944]

[xvi] The classic statement is Gabriel Kolko, *The Triumph of Conservatism: A Reinterpretation of American History, 1900-1916*, Free Press, 1977

[xvii] By Mark Jaffe and David Olinger, *Tracking down Minerals Management Service's dysfunctional history of drilling oversight*, Denver Post, 6/6/2010

[xviii] George Irvin, “When Privatisation Doesn’t Work”, The Guardian, March 27, 2012

[xix] Barry Commoner, *Making Peace with the Planet*, Free Press, 1992