

An Economic Framework for Precaution

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1. What the market does, and doesn't, do well

Precaution, or any active environmental policy, calls for modifying ("interfering with") the private market economy. This flies in the face of the increasingly widespread ideological claims that the market solves all economic problems. Before talking about changing it, let's identify what the market does well, and what it does badly. Consider two economic problems:

Choosing the right mix of restaurants for an urban neighborhood -- letting the market decide is the only feasible answer; Soviet central planning (traditionally the leading alternative to the market, now deceased) was never any good at consumer-oriented problems like this. Would you rather have Thai, Chinese, Mexican, pizza, etc., available down the street? Let everyone who wants to run a restaurant try it; the ones who produce food that people want to eat, at prices they are willing to pay, will survive.

Characteristics of this problem:

- satisfying diverse consumer preferences is the only objective;
- small-scale production is possible;
- there are no major impacts on anyone other than producers and consumers.

Fighting World War II -- this is a problem which no one left up to the market; Soviet central planning was spectacularly good at it, and the US economy operated in a more centrally planned manner than at any time before or since. Would you rather spend money on winning the war, or not? Once the country has gone to war, this question has only one allowed answer.

Characteristics of this problem:

- society has adopted a collective goal which overrides individual preferences;
- total mobilization and large-scale production are essential;
- outcomes impact the entire society.

Which of our economic/environmental problems are more like getting the right mix of restaurants, and which are more like fighting World War II? The question is at least worth thinking about. One can't claim that everything belongs in the total war category (perhaps not even small discretionary wars...), but doing something about climate change, for instance, might be a critical social priority, not just a consumer choice question. Since there are *some* important things that government planning does better than the market, we have to stop and ask which decisions belong in the public sphere, and which do not.

2. Three rigid assumptions of free-market theory, and how they fail

Economic theory, we are often told, has "proved" that market competition leads to ideal results. In fact, the proof is astonishingly abstract, and rests on numerous, surprisingly restrictive and unrealistic assumptions. Books have been written (by me, among many others) detailing the limitations of this theory; three assumptions in particular are worth highlighting. Market competition, in theory, leads to ideal results only if:

There are no "economies of scale," and no large businesses. Competition satisfies consumer desires at the lowest possible cost only if all businesses are small, and always worried about actual or potential competition. It might be a fair fight between your neighborhood Thai and Chinese restaurants, but not between them and McDonald's. If larger scale production is cheaper per unit, then big businesses will get bigger and drive out smaller rivals, ending up with monopoly power. Traditionally this concern led to antitrust legislation, to break up monopolies, and to public utility regulation, to prevent price gouging on essential services.

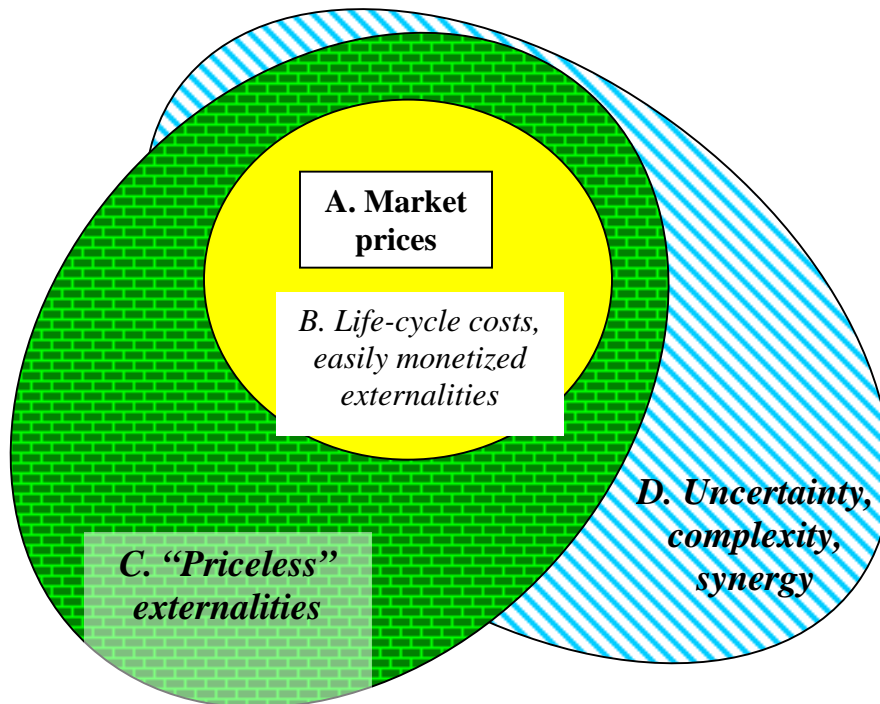
There is no need for government programs or standards. If people want things that are not private, marketed commodities, then the market is not the answer. Fighting World War II is only the extreme example of this important category. Even those competitive neighborhood restaurants are sometimes visited by the public health department to check on food safety; businesses of all varieties have to abide by child labor, minimum wage, and other labor standards. Competitive private businesses cannot efficiently produce railroads, urban mass transit, pollution controls, national parks, or countless other things that matter, for the environment and for other public objectives. Traditionally this led to active public initiatives of many varieties, before the nation was infected with the mysterious virus of endless taxcutting and government bashing.

Production and consumption of goods has no impact on anyone except the producers and consumers. Impacts on innocent bystanders, or "externalities," undermine the notion that the market produces just the right amount of everything, to make people as happy as possible. If production of something is good for third parties, as in the case of public health or education, the market will produce too little of it. If production of something is bad for third parties, as in the case of polluting industries, the market will produce too much of it. The existence of these negative externalities provides the economic rationale for health and environmental protection.

All three of these assumptions -- no large businesses, no need for government, and no externalities -- clearly fail in practice. The case for precaution, and for any active environmental policy, rests on the ways in which the three assumptions fail. The existence of negative externalities is particularly important; the rest of the discussion here is organized around different ways of analyzing externalities.

Externalities refer to effects outside the price system. But there are several different categories of externalities, as suggested by the diagram on the next page.

3. A conceptual map: four areas of environmental economics



There are four areas to discuss in the economics of health and environment, as suggested by the diagram. The innermost area, A, is the formal economy based on market prices; the other three areas all represent types of externalities.

A. Market prices. A limited part of the story of environmental protection can be told in terms of the functioning of the market economy today. For example, research shows that the costs of complying with regulations are routinely exaggerated. A more important example: the high price of oil today sends a useful signal about the need to conserve, to buy smaller cars, etc. But market signals about the need to conserve resources are unplanned and inequitable; great hardship is imposed on poor people by the time that richer people get the message about conserving oil.

Most questions of environmental protection, however, involve externalities, moving into the other areas of the diagram.

B. Life-cycle costs and easily monetized externalities. Some of the factors currently left out of the market economy have prices, or are easily priced. In these cases, a more complete calculation of costs often supports a better environmental outcome. Small businesses, and households, could often save money by investing in more expensive, but more long-lived and energy-efficient lighting. Low-priced vinyl floor tiles may end up

being more expensive than more durable, less toxic alternatives, per year of useful life. If new power plants are built with public subsidies, then the total cost to society is greater than the cost to the owners; the cost to society also includes the construction subsidies, as well as the impacts of pollution.

New and imaginative work is being done in extending the scope of such calculations. For example, if toxic chemicals or other pollutants cause serious illnesses, then their cost to society includes the cost of health care, and of lost productivity when people are ill (this is the subject of a case study that will be presented soon by another speaker). However, these are still just the easy cases. Often it is hard to summarize health and environmental impacts in terms of dollars, either because the externalities are unpriced, and/or because they are uncertain. This leads to the outer regions of the diagram.

C. "Priceless" externalities. Many crucial questions of health and environmental protection, many (most?) of the high-profile, hard-fought conflicts in this area, involve values that have no meaningful prices. How much is it worth, per life saved, to prevent pollution that would otherwise kill a certain number of vulnerable people each year? How much is it worth to save endangered species and their habitats? How much should we spend now to control global warming and leave a livable world to our descendents 300 years from now? In the case of diseases caused by toxic chemicals, how much is the pain and suffering worth, above and beyond the cost of medical care and lost productivity?

Attempts to assign artificial prices to such externalities (in effect forcing them back into area B of the diagram, where calculations are easily performed) rarely succeed in producing meaningful numbers. For more on this, see my book, *Priceless* (with Lisa Heinzerling, 2004). Many questions of priceless values involve beliefs about rights, equity, entitlements, obligations to future generations -- issues which are not amenable to bottom-line numerical answers. The things that matter most to us have a dignity, not a price, as Immanuel Kant said.

D. Uncertainty, complexity, synergy. Another, overlapping group of externalities are hard to quantify because they are uncertain. We will never know as much as we would like to about the probability of new health and environmental harms. The complexity of both natural and industrial systems often makes it impossible to do exact calculation of risks. Synergy between hazards is common: the risk of lung cancer from the combination of smoking and working with asbestos is much greater than the sum of the individual risks.

This is the realm of precaution per se, where it is important to act on the basis of credible early warnings, rather than waiting for impossibly complete information. Atrazine, a widely used weed killer that produces a small increase in corn yields, makes male frogs into hermaphrodites at very low concentrations. Should we wait for proof that it has the same effect on humans, or follow the European example and ban it now? Dioxin is an extraordinarily potent carcinogen according to most (but not quite all) scientists; should we work to phase out substances like PVC that give rise to dioxin, or wait for more scientific research? These questions cannot be resolved by definitive, bottom-line cost

calculations; they call for precautionary value judgments about protecting ourselves, our environment, and our future.