

An Economic Framework for Precaution

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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 detailing the limitations of the *market competition theory*, and the following three assumptions are worth highlighting.

1) Assumes 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.)

2) Assumes 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 just one 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 tax cutting and government bashing.)

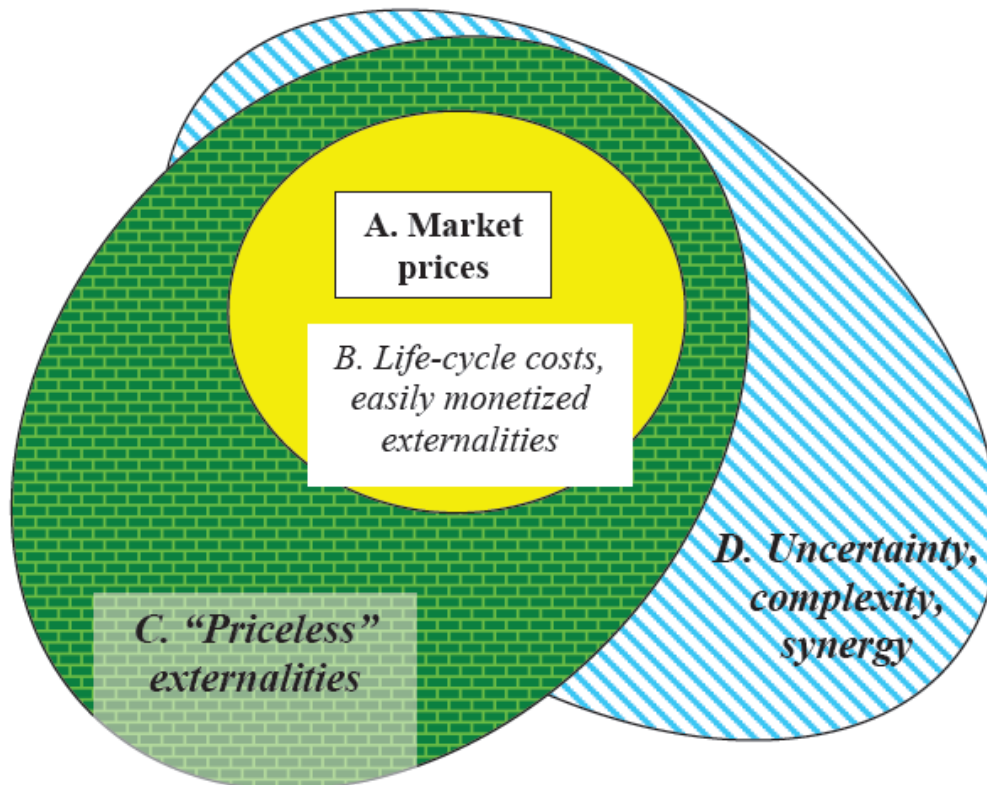
3) Assumes production and consumption of goods has no impact on anyone except the producers and consumers. Impacts on innocent bystanders, or "*externalities*," undermine the notion that the market produces just the right amount of everything, to make people as happy as possible. Externalities refer to effects outside the price system, such as illness and injury from exposure to toxic substances. This assumption ignores important externalities, such as public health and environmental costs from using technologies or products with hazardous substances.

All three of these assumptions—no large businesses, no need for government, and no externalities—clearly fail in practice. The case for precautionary

environmental policies rests on the ways in which the three assumptions fail. **The existence of negative externalities is particularly important.**

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

A Conceptual Map: Four Areas of Environmental Economics



The four areas to focus on in the economics of health and environment are represented in this diagram. The innermost area, *A. Market Prices*, 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, the high price of oil sends a useful signal about the need to conserve and to buy smaller cars. 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 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. For example, small businesses could save money by investing in more expensive, but more long-lived and energy-efficient lighting. Or if new power plants are built with public subsidies, then the total cost to society is greater than the cost to the owners as society's cost also includes the subsidies and pollution impacts.

New and imaginative work is being done to extend the scope of such calculations. For example, if toxic chemicals cause serious illnesses, then their cost to society includes the cost of health care and lost productivity when people are ill. However, these are relatively 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 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 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 externality calculations are easily performed—rarely succeed in producing meaningful numbers. Many questions of priceless values involve beliefs about rights, equity, entitlements and obligations to future generations. These are issues which are not amenable to bottom-line numerical answers. As the philosopher Immanuel Kant said, the things that matter most to us have a dignity, not a price.

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 where it is important to act on the basis of credible early warnings, rather than waiting for impossibly complete information. For example, dioxin is an extraordinarily potent carcinogen according to most scientists. Should we work to phase out substances like PVC (polyvinyl chloride) that give rise to dioxin, or wait for more scientific research? This question cannot be resolved by definitive, bottom-line

cost calculations. It calls for precautionary value judgments about protecting ourselves, our environment, and our future.

