The Failure of Market Failure

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Abstract

The concept of market failure was originally presented by economists as a normative explanation of why the need for government expenditures might arise. Gradually, the concept has taken on the form of a full-scale diagnostic tool frequently employed by policy analysts to determine the exact scope and nature of government intervention. For some time, economists have known that the market failure idea is conceptually flawed. The authors of this article demonstrate why this is so, employing concepts drawn from the perspective of transaction costs. In a review of empirical studies, they further show how the market failure diagnostic leads analysts to make generalizations that are not supported by facts. Transaction cost analysis helps to explain the underlying processes involved. © 1999 by the Association for Public Policy Analysis and Management.

INTRODUCTION

The question of the proper role of government in the marketplace is an old and fundamental one. Public officials throughout the world grapple with this issue, deciding which public services to provide or how to regulate the activities of individuals and firms, a task made more urgent by recent efforts to privatize public responsibilities and "reinvent" government. In the search for objective standards by which such decisions can be made, public officials have increasingly turned to the concept of market failure. Use of the market failure concept is widespread, both in teaching curricula and in practicing government circles.

This article demonstrates the limitations of the market failure idea. The shortcomings of the market failure concept have been known for some time, but with little consequence, since its use continues to be widespread. In this article we recount the conceptual problems of the market failure idea. We further show how market failure analysis leads to conclusions about the efficiency of government intervention

that are not supported by empirical studies. An alternative economic approach, the concept of transaction costs, buttresses this criticism and provides a more well-grounded conceptual framework for understanding issues of government intervention. In general, transaction costs provide a better method for understanding the nature of collective action, although it is not a diagnostic tool in the same sense that the market failure concept purports to be.

A SHORT HISTORY OF THE MARKET FAILURE CONCEPT

The concept of market failure initially appeared as a means of explaining in economic terms why the need for government expenditures should arise. It constituted, according to its presenters, "a normative judgment about the role of government and the ability of markets to establish mutually beneficial exchanges" [Dahlman, 1979, p. 143].

Presenting the traditional approach, Arthur C. Pigou [1932] argued that the divergence between the values of marginal private and marginal social net product would not "make the national dividend a maximum; and consequently, certain specific acts of interference with normal economic processes may be expected . . . to increase the dividend"(p.173). In his classic article "The Pure Theory of Public Expenditure," Paul Samuelson [1954, p. 388] observed that no decentralized pricing mechanism could be used to determine the optimal level of goods characterized by collective consumption. In such cases, as the authors of one modern textbook agree, "the market has no choice but to fail" [Skaggs and Carlson, 1996, p. 543]. In one leading textbook on the new science of policy analysis, David Weimer and Aidan Vining [1992] reach a conclusion that appears frequently in the literature: "When is it legitimate for government to intervene in private affairs? In the United States, the normative answer to this question has usually been based on the concept of *market failure*—a circumstance where the pursuit of private interest does not lead to an efficient use of society's resources or a fair distribution of society's goods" (p. 13, emphasis in original) [see also MacRae and Wilde, 1985, p. 170]. Textbooks on microeconomics and public finance commonly present the concept of market failure as a general justification for government intervention [Browning and Browning, 1992, p. 657; Boardman et al., 1996, p. 99].

As it matured, the market failure concept took on an additional characteristic—that of a diagnostic tool by which policymakers learned how to objectively determine the exact scope and type of intervention [Weimer and Vining, 1992; Boadway and Wildasin, 1984; Hyman, 1990; Procaccia, 1996]. Expansion of this normative concept into a diagnostic tool appeared in conjunction with the growth of policy analysis as a field of study and university training. One scholar argues: "The welfare theorem lets [us] classify inefficiencies as due to monopoly externalities, and so on. This helps us to understand and perhaps to solve such inefficiencies just as a doctor's diagnosis . . . is part of treatment" [Farrell, 1987, p. 1160].

To employ the diagnostic approach, analysts attempt to identify both the precise type of problem that gives rise to the market failure, as well as the different types of bureaucratic malfunctions (nonmarket failures) likely to occur when public officials attempt a cure. Advocates of the approach present this "double market failure test" [Weimer & Vining, 1992, p. 179] as an essential part of the diagnostic process. Like doctors attempting a cure, policy analysts must render a diagnosis of the underlying disease and consider the dangers of treatment, including side effects. Accordingly, policy analysts argue that the existence of a market failure "provides a necessary, not a sufficient justification for public policy interventions" [Wolf, 1979, p. 138; see also

Weimer and Vining, 1992, p. 13]. Sufficiency is established when the gains from government intervention outweigh the dangers of government intervention.

In keeping with the diagnostic model, different treatments are favored for different afflictions. In their textbook *Public Sector Economics*, Boadway and Wildasin [1984] suggest that "while typically the remedy for market failure due to public goods is for the public sector to provide the goods, the remedy for externalities is often to provide incentives to the private sector to produce the correct amount" (p. 61). In the legal literature, Frankel [1995] echoes with the suggestion that in situations involving public goods the "government may be in a better position to operate a firm than the private sector" (p. 295). Like medical students contemplating cures, policy analysts are taught to apply the least intrusive intervention. If a market failure can be resolved by the creation of an incentive that will allow the market to correct itself, such as a tax expenditure, this is to be favored over more aggressive treatments such as the creation of a government monopoly. Full-scale government intervention should be undertaken only when it can be shown "that a less-intrusive generic policy cannot be utilized or that an effective contract for private production cannot be designed to deal with the market failure" [Weimer and Vining, 1992, p. 179].

What began as a simple attempt to provide a normative explanation for the existence of government expenditures has developed into a quasi-scientific full-scale diagnostic test with the prescription of cures. Some textbooks even present tables that allow students to identify appropriate interventions for different types of market and government failures [Weimer and Vining, 1992, p. 193; Hyman, 1990, pp. 158–159). This appears to be a powerful and attractive model. It looks scientific. It seems to provide an objective test for governmental intervention. It appears to be something than can be usefully taught in schools.

Inevitably, such concepts and teachings find their way into public policy. Recently the U.S. government issued Executive Order 12866 [1993], which requires federal officials to conduct an economic analysis as a means of determining the need for proposed regulations. Guidelines for carrying out this order require officials to make a finding of "whether the problem constitutes a significant market failure" as a prerequisite for recommending government intervention. The guidelines further provide instructions for identifying types of failures, comparing potential interventions, and guarding against "unintentional harmful effects on the efficiency of market outcomes" [Executive Office of the President, n.d., pp. 3, 5]. The resulting regulatory impact analyses make reference to a variety of market failure concepts. A controversial 1994 standard that set stricter wind resistance standards for trailer homes, for example, claimed that asymmetric information and externalities necessitated government intervention into the market for manufactured housing [De Alessi, 1996].

An extensive flowering of the market failure concept has occurred in the field of law. The number of law review articles and court decisions using the concept run into the thousands, with 239 references turned up by a search of law reviews for the 12 months between June 1995 and June 1996 alone. These references occur not just in monopoly, antitrust [Kovacic, 1995, pp. 1202, 1214, 1217], and environmental issues [Baron and Dunoff, 1996, pp. 437, 441–443], but appear to span virtually the entire corpus of law. References are found, for example, in family law articles [Estin, 1995, n. 248, n. 356, n. 357], in connection with setting product standards [Abbott, 1996, p. 163], in references to the plight of refugees [Beck, 1995, p. 177], in connection with health care [Kang, 1995, pp. 513, 526; Jost, 1995, pp. 827, 851, n. 203; Jordon, 1995, p. 917, n. 18], and with regard to problems of creating markets in less developed countries [Utset, 1995, n. 7], as well as in securities law [Kitch, 1995, p. 776; Letsou, 1996, p. 150), the creation of financial derivatives [Singher, 1995, p. 1468], moral

legal theory [Baron and Dunoff, 1996], contracts [Procaccia, 1996, pp. 630, 635–636, n. 3; Blackman, 1995, p. 1368], occupational injuries [Linder, 1995, p. 94], controls on credit card interest rates [Rougeau, 1996, p. 15], intellectual property [Ginsburg, 1995, p. 1491, n. 102; Owen, 1996, n. 149], discrimination in insurance markets [Gaulding, 1995, pp. 1653, 1687], the information superhighway [Post, 1995, p. 792], and zoning [Larson, 1995, pp. 180–181].[1] Similarly, court decisions that refer to market failure and to externalities are made with great frequency.

Long before social scientists applied diagnostic skills to public affairs, doctors of medicine guessed that diseases of the body could be traced to imbalances in bodily "humors" [Thomas, 1992, pp. 8–9]. By the 18th century, this fit of deductive reasoning had been elevated to the level of a diagnostic procedure. The approach led doctors to prescribe a variety of ineffective and often dangerous remedies, such as bleeding or purging. It eventually was replaced by more scientifically valid approaches, such as the discovery of antibiotics and the theory of germs. The theory of market failures, this paper will show, is little better grounded than the outdated belief in bodily humors.

WHY MARKET FAILURE FAILS

A fundamental problem with the concept of market failure, as economists occasionally recognize, is that it describes a situation that exists everywhere [Nelson, 1987; Dahlman, 1979]. While the ubiquity of market failures seems well accepted, the consequences of this observation are not. Some people believe this dooms the concept as an analytical tool; others disagree.

Market failures are thought to occur when the market fails to produce public goods, or inadvertently produces externalities, or gives rise to natural monopolies, or disenfranchises parties through information asymmetries, or creates undesirable income distributions. All of these forms are types of externalities, since each consists of nonmonetary effects not taken into account in the decisionmaking process, which is the classic definition of externalities [Baumol and Oates, 1975]. Hence, when we charge that the market failure concept has certain shortcomings, we mean to apply this statement to all forms of externalities including nonmarket failures by governmental institutions.

The core argument against market failure analysis is derived from the study of transactions. Externalities arise when parties engage in transactions. The effect of transactions on market behavior was first analyzed in the 1930s, beginning with an examination of brokerage charges and other costs of exchange [Hicks, 1939; Allen, 1999]. This quickly expanded into an analysis of the relationship between property rights and the cost of transactions. The property rights approach began with an article by R.H. Coase [1937, 1960], now well known in the discipline of economics. Coase argued that individuals form firms because use of the price system is not costless. In other words, entrepreneurs create firms in an effort to reduce the transaction costs associated with using the price system. This approach developed mainly after Coase's 1960 article on "The Problem of Social Cost" through the work of Alchain [1965], Demsetz [1967], Barzel [1985], Ostrom [1990], Allen [1991], and others.

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[1] The legal literature gives relatively little mention to transaction costs.

The property rights approach is important because it defines the condition under which externalities entirely disappear. Transaction costs in this respect are defined as *the resources necessary to transfer, establish, and maintain property rights* [Allen, 1991, p. 4]. As property rights become more extensive and complete, transaction costs approach zero.[2] In a similar fashion, as transaction costs decline, property rights become more complete as it is cheaper to defend them or transfer property.

Only when property rights are perfect do transaction costs vanish. In a zero transaction cost world, with well-specified rights, there would be markets for everything and all markets would clear [Arrow, 1969], producing efficient outcomes for any collective problem that parties chose to resolve. This condition is expressed by the so-called "weak form" of the Coase Theorem.[3] *In a world in which property rights are fully specified and in which transaction costs are zero, the allocation of resources will be efficient* [Zerbe, 1976, 1980; Medema and Zerbe, 1999a].

No such world, of course, can ever exist. This realization is critical to understanding why the market failure model fails. Conceptually it fails for the following reasons.

Externalities Are Defined by Transaction Costs

In essence, externalities come into being because the transaction costs of resolving them are too high. In this sense, every story about externalities is also a story about transaction costs.

Transaction costs define externalities in the following manner: *the net value of the externality constitutes the lower boundary for associated transaction costs*. Stated another way, transaction costs will never be lower than the net monetary impact of the externality. By net monetary impact we mean the net benefits to be derived by eliminating the problem. An example may help clarify this point. Suppose one party suffers from the effects of pollution produced by a neighboring source. The pollution damage is $125,000 and the cost of installing devices to eliminate the pollution is $100,000. The damage done by the pollution is greater than the economically optimal amount, by definition of an externality. Pollution, in short, is being overproduced. In such a case, $25,000 represents the gain that could be made by eliminating the pollution in a situation where transaction costs equal zero. The costs of transaction (negotiations, lawsuits, contracts) will not be zero, of course. If they are less than

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[2] Such property rights may be private or public. When the government provides goods directly or supports the provision of goods and services through taxation policies, it creates a government property right with associated transaction costs.

[3] The first formal statement of the Coase Theorem did not appear until 1966, when George Stigler [1966] offered that "the Coase theorem . . . asserts that under perfect competition private and social costs will be equal" (p. 113). Since this original formulation, the theorem has been stated in numerous ways, including: "if one assumes rationality, no transaction costs, and no legal impediments to bargaining, *all* misallocations of resources would be fully cured in the market by bargains" [Calabresi, 1968, p. 68, emphasis in original] and "if transaction costs are zero the structure of the law does not matter because efficiency will result in any case" [Polinsky, 1974, p. 1665]. Paradoxically, the Coase Theorem has spawned a huge literature dealing with the artificial world of zero transaction costs, but Coase meant to emphasize real world analysis. See Medema and Zerbe [1999a, 1999b].

$25,000, efforts to eliminate the externality will ensue. If the costs are greater than $25,000, then the incentive to resolve the problem will disappear.[4]

Where externalities remain, it may be inferred that the size of the transaction costs are equal to or greater than the net value of the externality. In this sense, the net value of the externality sets the lower boundary on the transaction costs required to remove or reduce the effect. If transaction costs were less than the net value of the externality, it would pay to incur them.

Transaction Costs Are Ubiquitous

Market failures may be defined as departures from the optimum with respect to an operating price system that is costless. The existence of unpriced but nonzero transaction costs means that some trades are not created—trades that would be undertaken if the cost of the unpriced transactions were zero (or less than the net monetary impact to be gained). Failure to undertake these trades creates a market failure.

Market failures disappear only when the cost of operating the price system is zero. In the real world, however, this never occurs [Baumol, 1979]. People incur costs resolving, transferring, and maintaining property rights. This occurs wherever transactions take place. Unpriced transaction costs, as a consequence, appear everywhere [Allen, 1991]. Since unpriced transaction costs are ubiquitous, this gives rise to a situation in which externalities and hence market failures can be found wherever transactions occur.

How then does an analyst distinguish between externalities that require government attention and those that do not? The market failure approach owes much of its success to the fact that sophisticated users have focused on the provision of goods with large net benefits where government has an advantage with respect to transaction costs. For example, market failure analysts have focused on goods with high exclusion costs, such as clean air. These are goods for which the government can better exploit its advantage in coercion to effect substantial per unit reductions in transaction costs and in which the potential markets—clean air and water, police and fire services, and the like—are large. The choice of these markets, however, is essentially ad hoc (aside from their transaction cost features).

Going beyond these obvious cases, the market failure concept can also be applied to situations that most analysts would consider trivial and not worthy of government

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[4] Of course, problems of nonconvex production sets exist. Sufficiently large nonconvexities in the production sets of victimized firms involve situations in which a victim is not better off with a marginal reduction in the size of the externality. The victim will not be willing to pay the polluter $100,000 for a change that will make him or her $25,000 better off if the first step along this path involves spending a dollar to get a zero improvement in welfare. The victim, unwilling to take this first step, will not know that better things lie over the horizon. Information about the overall value of reducing pollution will not be furnished. To consider the example in terms of transaction costs indicates that the problem here is one of information, which is a type of transaction cost: the victim will take this first, welfare-reducing step if certain that, in the end, he or she would be better off. If both victim and polluter knew of the existence of a superior position, they could also merge to achieve it. The nonconvexities argument introduces imperfect information into the model. Whether government can more efficiently supply this information or whether it can be generated through negotiations is a matter of particular circumstances and legal structure and can only be determined by a more detailed examination of the particular situation [Ostrom, 1990; Medema and Zerbe, 1999b].

attention, which analysts recognize and tend to avoid. When a neighbor fails to plant more flowers even though this would increase property values in the neighborhood by more than the cost of planting, an externality and a market failure exist. The highway driver who drives too slowly fails to consider the time costs he or she imposes on other drivers, thereby creating an externality. (Since the government owns the highway we should probably say that a nonmarket failure exists.) Wherever moral hazard or adverse selection may be found, externalities arise. Companies providing fire insurance worry that policyholders will ignore efficient fire prevention measures; flood insurance may induce people to build in flood plains; government insurance for savings and loan companies may induce investments that are too risky; and as Fischel [1996] notes, colleges granting tenure to professors may find they work too little thereafter.

Externalities exist anytime there is inefficiency in the law affecting markets. A law that encourages inefficient breach of contract produces an externality, as does a tort law that sets the penalty for reckless driving so low that too much reckless driving occurs. A person who inadvertently issues a fraudulent check may not take into account the burden he or she imposes on other users of checks. Suppose that buying a car involves title transfer fees imposed by the state. If these fees are set too high, some trades will not be made. The car manufacturer will produce too few cars, just as a monopolist would.

As these situations suggest, analysts in search of externalities and market failures can find them anywhere they look, providing a universal justification for any sort of government intervention that one might want to undertake. Supporters of the market failure concept avoid this problem by focusing on failures that are "big." In its worst form, this amounts to little more than the substitution of the ideological biases of the analyst. In its more productive forms, this leads to a comparison of the benefits of government intervention with the risk that principal-agent problems in the public sector will make the problem worse.

Definition Problems

As this discussion suggests, a close examination of the market failure concept gives rise to all sorts of definitional problems. This should not be surprising, as the authors of one leading theoretical text note, since "a fully satisfying definition of an externality has proved somewhat elusive" [Mas-Colell, Whinston, and Green, 1995, p. 351]. If the price system itself is treated as a factor of production, one could as easily say that the costs of using the price system are too high to warrant its use. In its essential form, then, the externality concept amounts to little more than the observation that the price of an input (the market system) reduces the quantity demanded.

The Search for Necessary and Sufficient Conditions Is Misleading

As noted above, analysts schooled in the market failure concept are taught that the existence of an externality is a necessary but not a sufficient condition for government intervention. Given the definitional problems inherent in the concept, it should not be surprising to learn that this statement is misleading.

Consider a standard example in which the byproduct of one profit-maximizing firm becomes part of the production costs of a second profit-maximizing firm—a classic externality. Let us assume that the combined producer and consumer surplus when firm 1 produces at the socially optimal level is greater than when it produces the externality. In this situation, "the competitive equilibrium in the presence of

externalities is Pareto suboptimal" [Just, Hueth, Schmitz, 1982, pp. 271-272]. The optimal position is the one that would be reached if a single firm that represents the merger of firms 1 and 2 maximized its profits. This position can be reached by an externality tax, by merger of the firms, or by government restriction on the output of firm 1. Analysts will recognize a market failure and governments may be encouraged to intervene.

But is government intervention optimal? Suppose that the transaction costs of a merger or the administrative costs of the tax or other devices used to internalize the externality are greater than the increase in consumer and producer surpluses to be obtained. The solution in which the externality continues to exist then becomes the optimum. Sufficiency is not attained, although not necessarily as a consequence of searching for principal-agent problems in the public sector.

Suppose, however, that the government may intervene with zero cost to the government and no principal-agent problems. To keep the example simple, assume pollution produced by firm 1 is the problem and that it may be eliminated by installing a device costing $100,000. The pollution itself causes damage of $125,000. Typically, the analyst in search of nonmarket failures would see this as a case in which government intervention is justified. Yet this may not be the case. Suppose that the government intervention imposes record-keeping costs onto the firm and that these amount to $26,000. Clearly, the intervention is not efficient.

It may be objected that the double market failure test would take all such costs into account. If this is the case, then the double market test amounts to a requirement to perform a full benefit-cost test after identifying a market failure. This supports our point exactly. Analysts are more likely to discover efficient interventions when they begin with transaction costs and net benefits [De Alessi, 1996]. Such an approach avoids the search for externalities that, as demonstrated above, can be found anywhere the analyst chooses to look and inevitably leads the analyst astray. Moreover, to begin with market failure is to assume that it is a necessary condition for efficient intervention.

Yet, it is not. Suppose that merger costs in the chosen example have fallen due to a more streamlined review process developed by the Federal Trade Commission. The two firms merge, eliminating the externality. Now suppose instead that the government devises a means of collecting the corporate income tax more efficiently. This innovation saves the firms an amount equal to the merger savings. The cheaper tax collection method is a government action unrelated to the identified externality. The cheaper method of examining mergers might be said to be a way of reducing the externality between the two firms, but it is more accurate just to say that it is a cost-saving innovation. In no sense are the two innovations different. Both should be undertaken, even though only one internalizes an externality. Hence the existence of a market failure cannot always be taken as a necessary condition for government intervention. These points are treated formally in the Appendix.

In general, anytime government can reduce private transaction costs or its own costs of provision, it should do so regardless of whether or not an externality exists. It need not wait for the appearance of an externality to effect a justification.[5]

Many policy analysts who are aware of conceptual shortcomings such as these nonetheless do not dismiss the market failure concept. Responding to a series of charges by Nelson [1987] on the inadequacies of market failure, Faulhaber [1987], for example, states:

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[5] This is not a hard and fast rule. Where government intervenes to restrain an undesirable market, such as the market for cocaine, it may be efficient to increase transaction costs.

While I agree with both points, I do not agree that they undermine the usefulness of the concept of market failure as an analytical device. Nelson's theme that "market failure is ubiquitous" is analogous to a physicist, who, when confronted with Newton's three laws of mechanics, throws up his hands and says, "Yes, but friction is ubiquitous!" Generations of mechanical engineers and designers have made a good living from dealing with friction in all its incarnations, from machine tools to automobiles. The point is not that market failures exist, but how serious are those market failures. (p. 558)

Newton's laws of motion apply to the real world, that is, the world in which friction exists. Friction is just another force, though an important one. The social science equivalent of friction is not market failure, but the costs that slow useful transactions. An analyst who ignores transaction costs will justify incorrect interventions just as a physicist who ignores friction will make incorrect predictions. Moreover, since both transaction costs and friction are indeed everywhere, the policy analyst as well as the physicist who ignores them will be wrong everywhere.[6]

EMPIRICAL EVIDENCE AND CLASSIC EXTERNALITIES

The market failure diagnostic is a normative tool used to identify situations in which government intervention will prove efficient. The empirical test of such a tool is this: Does it justify intervention in cases where it is actually warranted? We argue that it does not. In a number of cases, the market failure concept leads to conclusions that are incorrect when compared with actual practice. The gap between what the market failure concept tells us should occur and what we actually observe grows larger as empirical studies accumulate.

Consider the cases of the lighthouse, share tenancy, apples and bees, and common property. In each case, market failure analysis predicts the wrong outcome. In each case, an understanding of transaction costs helps to explain the underlying process. While no single concept captures the rich variety of institutional arrangements developed in practice to solve collective problems, the transaction cost approach does help to explain why some of those practices arise.

The Lighthouse

Says Samuelson [1964]:

Here is a later example of government service: lighthouses. These save lives and cargoes; but lighthouse keepers cannot reach out to collect fees from skippers. So, says the advanced treatise, "we have a divergence between private advantage and money cost . . . and true social advantage and cost." Philosophers and statesmen have always recognized the necessary role of government in such cases of "external-economy divergence between private and social advantage." (p. 45).

Market failure models typically consist of theoretical discussions such as these, rather than a descriptive analysis of what in fact exists. As a result, they tend to be vague and inaccurate, permitting ideological biases to be presented as scientific fact. Samuelson notes with respect to public goods in general, and the lighthouse in particular, that "this is certainly the kind of activity that governments would naturally undertake" [1964, p. 159].

[6] We wish to thank physicist David Boulware for useful discussion on this point.

This normative judgment does not stand on firm ground. R.H. Coase [1974] has examined how lighthouses historically were provided in England and Wales. Contrary to what market failure analysis would lead us to believe, most 17th century lighthouses were not built or run by governmental bodies. The lighthouses were built by private parties for private gain. Private individuals would gain a patent from the crown upon presenting petitions from ship owners and shippers. (The granting of the patent, of course, was a form of government intervention—in this case a market-enhancing intervention that relied on the government's coercive powers to create a property right.) The patent allowed the private individual to build a lighthouse and levy tolls on ships. The toll was collected by agents or custom officials at ports and varied with the tonnage of the vessel for each lighthouse passed [Coase, 1974, p. 364]. The ship tonnage could be taken as a reasonable approximation of the level of demand for the lighthouse so that prices approximated an efficient Lindahl (discriminatory) pricing scheme.

Privately run lighthouses arose even though a government organization, Trinity House, had been established in 1566 and started to build lighthouses early in the following century. Trinity House was reluctant to invest its own funds in lighthouses, yet opposed the efforts of private individuals to construct them. By 1820, twenty-four lighthouses were operated by Trinity House and twenty-two by private individuals, although many of the former had been originally built by private individuals [Coase, 1974, p. 366]. The market failure approach would have us believe in the efficiency of government provision of lighthouses; actual experience provides a more complex conclusion.

The lighthouse case illustrates a key problem with the concept of public goods. As Mark Zupan [1996] has argued, the public provision of "public goods" may have less to do with the characteristics of the goods than the behavior of the interests providing them. Zupan argues that the providers of public goods—defense contractors, teachers, asphalt producers, and the like—join with policymakers to lobby for their overprovision because of private gain. Ironically, free-rider problems arise from the overprovision of public goods as more producers rush in to take advantage of commitments already made.

 The lighthouse has been treated as a classic example of a "public good." Public good is, in fact, an incoherent classification for public policy purposes, as Randall [1983] has noted. Public good is defined with respect to two different sorts of transaction costs: exclusion costs that are high (associated with free riding) and the costs of determining individual levels of demand, required for Lindahl pricing or taxation. Randall [1983] notes: "Nonexclusiveness and nonrivalry may be found together or separately, and the economic analysis of the two phenomena are quite different. Accordingly, a focus on questions of exclusiveness and rivalry permits precise analysis, while the term "public good" only introduces confusion" (p. 147). Neither of these types of transaction costs separately or together may justify a government intervention. Although each category of transaction cost identified with public goods is relevant, creating a class of goods that combines the two leads to errors. As the lighthouse example suggests, a variety of institutional arrangements exist, including market-enhancing government action, for handling goods characterized by high exclusion costs and nonrivalry.

Land Tenancy

Land tenancy provides another example of the way in which market failure analysis leads policymakers astray. Sharecropping and leaseholds, in which one party farms

property owned by another, are examples of land tenancy and the basis for many government land reform efforts worldwide. The standard view in the economics and tenancy literature is that tenancy leads to an inefficient allocation of resources [Cheung, 1969]. Following the classic market failure perspective, Pigou [1932] notes: "There can be no doubt that over a wide field some part of the investment designed to improve durable instruments of production is often made by persons other than their owners. Whenever this happens, some divergence between the private and the social net product of this investment is liable to occur" (p. 174). This externality is said to arise from the fact that neither the tenant nor the owner fully or correctly considers the effects of their actions on the other. Inefficiencies are said to arise particularly from the disincentive for either party to make investments in the land that will maximize its productivity.[7] The disincentive is said to account for the major externality.[8] This inefficiency was thought to be particularly large with respect to sharecropping. If this is true, one would expect to observe lower crop yields under share tenancy than under alternative cultivation arrangements. Historical studies, however, do not confirm this. An examination of share tenancy in China and Taiwan prior to the land reforms of 1949, for example, shows that a well-developed system of private property rights in land existed and that the market by and large comported with the dictates of competition. For this system Cheung [1969, p. 56–61; 1980, p. 42] did *not* observe lower ratios of labor and other inputs, a lesser degree of improvements, or lower yields on tenant farms than on owner-cultivated farms or farms employing wage labor. In addition, there is no evidence that the market value of lands under tenant cultivation were lower than the values of land under owner cultivation.

Perhaps the most frequent argument has been that under share tenancy, farm improvements would be contracted inadequately or not at all. Yet Cheung [1980] finds that these "are precisely the activities stated in every written contract that I could find" (p. 43). Charges that share tenancy is less efficient than other cultivation arrangements cannot easily be sustained.

By contrast, government intervention in land tenancy can produce inefficiencies of its own. The particular mix of tenure systems on Indian reservations is inefficient not because of market failure in the traditional sense but because the trustee arrangements mandated by the federal government are so poor. Estimates by Andersen and Lueck [1992, p. 448] show that the per acre value of agricultural land is 85 to 90 percent lower on tribal lands than on fee simple (privately owned) property.[9]

The transaction cost concept helps to explain the operation of different sorts of land tenure contracts. It has been used to explain the circumstances under which cash tenancy versus crop share tenancy are more likely to arise. Allen and Lueck [1992] argue that the tradeoff between the two types of contracts is a question of input distortion costs versus output division costs. Input distortion costs arise with cash rent because renters tend to overuse inputs supplied by land owners (e.g., too

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[7] See Cheung [1969, pp. 3–4, 7–8, and the references cited therein]. Additional problems are said to be (1) the short duration of the leases and (2) discouragement of effort on the part of the tenant, since a portion of each unit of output must be paid to the landowner as rent.

[8] The strong version of the Coase Theorem includes an invariance claim and predicts that, if transaction costs are zero (low) and there are well-defined private property rights in land, the allocation of resources will be "the same whether the landowner cultivates the land himself, hires farm hands to do the tilling, leases his holdings on a fixed rent basis, or shares the actual yield with his tenant." In other words, "different [observed] contractual arrangements do not imply different efficiencies of resource use" [Cheung, 1969, p. 4].

[9] Of course, there may be benefits not captured in the land conferred by the trustee arrangements, though it is difficult to imagine they are so great as to justify this enormous cost.

much fertilizer), a consequence of the fact that the renter pays a fixed rent and gets all the proceeds from the crop (obviously a bigger problem with short-term leases than long-term leases). So when input distortion costs are high, for example, in a situation involving fragile soil, crop sharing is favored. Crop sharing contracts lead to high measurement and division costs, but fewer input distortion costs.

Bees and Crops

The U.S. beekeeping subsidy has been presented in the popular literature as one of the best examples of a federal intervention that would not die. In his classic discussion of the positive reciprocal externalities that exist between beekeepers and the owners of apple orchards, J.E. Meade [1952] argues that a system of taxes and subsidies can, and must, be imposed in order to achieve efficiency. Apple farmers provide valuable services to beekeepers, since bees feed on the blossoms of fruit trees, while at the same time the bees provide valuable pollination services to apple growers.

   S.N. Cheung [1973] examined the relationship of bees to pollination as it actually exists. He found first that no externality exists and instead that contractual arrangements between farmers and beekeepers have long been routine in the U.S. The existence of a market for nectar and pollination services can readily be observed in Washington State, the location of Cheung's study, in some cases simply by consulting the yellow pages of the telephone directory [Cheung, 1973, p. 19].

   How is it possible that the market avoids the externality predicted by Meade? To begin with, transaction costs are very low here. Since the value of resources devoted to pollination and nectar extraction is insignificant and farmers could easily and cheaply keep bees themselves (and sometimes do), the gains from contracting with beekeepers are extremely small. This, in turn, suggests that contracting costs are minimal [Cheung, 1980, pp. 46–48]. There is also a well-developed system of contractual relations between beekeepers and farmers, so well developed, in fact, that while written contracts (sometimes so simple as to be recorded on postcards) are used to secure an initial arrangement among the parties, oral agreements are standard for subsequent relations. Furthermore, these oral contracts are rarely breached, owing to the presence of "extra-legal constraints" in the form of sanctions against those who do not honor their pledges [Cheung, 1973, p. 29]. Thus, the presence of strong cultural norms serves to lower private transaction costs. In spite of the informality of these contracts, they tend to be quite comprehensive, specifying "the number and strength of the [bee] colonies, the rental fee per hive, the terms of delivery and removal of hives, the protection of bees from pesticide sprays, and the strategic placing of hives." And where hives are placed merely for honey-generating purposes (i.e., no pollination is involved), prices (often paid in honey) are not necessarily fixed, but are allowed to vary with the honey yield [Cheung, 1973, p. 29].[10] All of these various pieces of evidence lead Cheung to conclude, contrary to Meade's story, that "the allocation of hives and nectar flows approximates that of a smoothly functioning market" wherein resources are efficiently allocated [Cheung, 1980, p. 50]. These cases

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[10] Cheung notes the existence of two factors that could potentially complicate these arrangements (relative to standard lease contracts), both of which relate to other levels of external effects. First, there are potential spillovers from one farmer contracting for pollination services, which could potentially lead neighbors to take strategic advantage by employing fewer hives themselves. Second, the use of pesticide sprays by one farmer may result in damage to the bees kept on nearby farms. But both of these issues are dealt with through either custom or explicit contracting (such as the payment of risk premiums for potential exposure to pesticides), depending on the circumstances. The reliance on custom here is an interesting parallel to Ellickson [1991], discussed above.

offer important evidence that markets can successfully (if not fully efficiently) deal with potential externality problems under appropriate conditions.

The market failure model, ungrounded as it is in fact, ignores subtleties such as these. The existence of cultural norms defining acceptable behavior and the size of monitoring and enforcement costs affect voluntary arrangements. As Elinor Ostrom notes in her study of common property arrangements, models that make unrealistic assumptions about norms of acceptable behavior, monitoring and enforcement costs, and the availability of information do little to help analysts derive predictions that are precise or even correct [Ostrom, 1990, pp. 190–191].

Common Property

One of the most famous market failure stories is that of the tragedy of the commons [Gordon, 1954; Scott, 1955; Hardin, 1968]. According to this story, community resources held in common such as grazing land inevitably suffer exploitation and degradation. Suggested remedies include transfer of the resources to a single government agency or privatization [Hardin, 1978]. Yet, as Feeny, Hanna, and McEvoy [1996] note, the assumptions of this approach "appear to lack both descriptive accuracy and predictive power" (p. 198). Empirical inspection of common property phenomena from the property rights–transaction cost perspective has uncovered a rich array of arrangements previously unexamined and a good deal of evidence contrary to the prediction of overexploitation. Overexploitation has occurred, but its incidence is not exclusive to situations of common property; it also has been found under state and private property regimes. At the same time, successful management has occurred under a variety of regimes, including communal [Feeny, Hanna, and McEvoy, 1996, p. 187; Ostrom, 1990].

Anderson and Swimmer [1997], in a study of Native American land use, provide empirical support for the assertion that tribal choice among private, shared, or open access land can be explained by changes in the relative costs imposed by different constraints, a matter of transaction costs. In her extensive study of common property arrangements, Ostrom [1990] has revealed a variety of institutional arrangements for resolving disputes in areas such as meadows and forests, irrigation, groundwater, and fisheries. Ostrom and also North [1981] show that institutional arrangements are quite sensitive to transaction costs, including those imposed by litigation and the ease of creating government institutions.

In the area of fisheries, officials in New Zealand and Canada have found that the costs of creating property rights to fish stocks are often less than the costs of imposing government restrictions on fishing. In the United States, where the government has attempted to prevent overfishing through a variety of regulations, boat owners have evaded these regulations by inefficiently changing fishing practices and technology [Lesser, Dodds, and Zerbe, 1997, pp. 132–37].

ASSESSING GOVERNMENT INTERVENTION

At this point we return to the original question raised by this article: How is it possible to determine the proper role of government in the marketplace? We have argued thus far that the market failure idea, with its conceptual and empirical shortcomings, does not provide a reliable guide to this process. The correct normative theory rests on transaction costs, and implementing this theory is largely a matter of significant empirical inquiry.

The issue of government intervention is largely an empirical and not a theoretical one. As Nelson [1987] says, "there is no satisfactory normative theory regarding the appropriate roles of government in a mixed economy" (p. 556). No theory captures the variety of institutional arrangements that people have developed to resolve collective problems. The market failure concept is not inherently empirical and as such cannot provide answers to empirical questions.

The most important empirical question is this: What are the net benefits (if any) of any particular institutional arrangement? The only general statement that can be made about government intervention on Kaldor-Hicks efficiency grounds is that government should intervene where the costs of intervention are less than the benefits. No simple diagnostic scheme can indicate whether the costs of intervention will be less than the benefits for any general class of cases. Empirical analysis invites the analyst to consider the particular costs that govern each case.

Obviously, the completion of empirical studies is more difficult and time-consuming than the general search for externalities. Being ubiquitous, externalities are easy to find. Empirical studies, especially those that employ benefit-cost analysis, are hard to complete. Analysts may use the wrong formula to calculate the proportion of cost increases that fall on consumers; they may confuse expenditures with costs; they may misestimate costs or omit unintended consequences [De Alessi, 1996]. Policy analysts have long recognized the difficulty of completing accurate empirical studies as a guide to intervention decisions, which helps to explain why the simple diagnostic scheme offered by the market failure concept—even though ill conceived—has proved so popular.

For thinking about intervention decisions, the transaction cost concept provides analysts with insights into the relationship between government and the marketplace not otherwise apparent. It provides insights into the accumulation of institutional arrangements that exist in practice and it avoids the endless quest for "failures" either in the private or public sector that provide a basis for government intervention. The transaction cost concept is correct in principle, we believe, although not all of its facets have been worked out.

The transaction cost concept invites the analysis to answer a key question: What are the transaction costs that affect the search for collective solutions, and in each case how are those costs affected by government laws and actions?

The transaction cost approach does tend to restore law to a more central role in the study of government [Lowi, 1992]. The strengthening of private property rights often lowers transaction costs and thereby permits private parties to achieve collective solutions in situations where the costs of litigation and bargaining would otherwise be prohibitive. In such cases, government intervention through the strengthening of private property rights may improve the market. Such markets are inefficient not because of any inherent "failures," but because the government has neglected to provide the appropriate institutional framework.

The transaction cost approach has been used to explain much of the structure of law [Cooter and Ulen, 1997; Posner, 1992]. For example, the approach has been used to explain why injunctive relief is superior where bargaining is possible, but compensatory damages are more appropriate where bargaining costs are high [Calabresi and Melamed, 1972]. It also explains a good deal of contract behavior and contract law [Salanie, 1997] and has been used effectively to explain government utility regulation [Goldberg, 1979].

Transaction cost analysis calls attention to the characteristics of government that give it an advantage relative to other institutions in its ability to lower transaction

costs. There is one such advantage: the power of coercion. A classic definition of government is that of an institution that monopolizes the use of force or coercive powers over a given territory [Weber, 1958, p. 78]. The government may change laws and use force to compel compliance with them; it may force payment for goods through taxation and it may use police powers to forbid or compel actions. The most general statement about government intervention is that it should perform those functions for which its powers of coercion give it an absolute advantage. This is also a positive prediction about what government will do, since in failing to perform these functions government sacrifices both wealth and power. What are the important market failures to which its advocates refer? They are simply instances in which government action can lower transaction costs sufficiently to produce significant welfare gains.

Chief among the market-enhancing measures that government undertakes are the creation of institutions that strengthen private property rights. As North and Thomas [1973] note, "governments take over the protection and enforcement of property rights because they can do it at lower cost than private volunteer groups" (p. 8). Property law, dealing with fraud, extortion, contract, and torts, is perhaps the best example of goods in which the costs of provision by an entity with coercive powers are less than the costs without such powers. Changes in the law of contract or fraud are among the most important measures that government provides. These do not fit well into the market failure concept, but are easily analyzed through the transaction cost approach [Zerbe and Urban, 1988].

Similarly, disagreements about measurements, a type of transaction cost, may invite regulation by the state [Eggertsson, 1990, p. 27]. Measurement costs are those that arise in determining the quality of a good that has many characteristics. Government efforts to supply uniform weights and measures have sharply lowered measurement costs, as have private organizations such as the Chicago Board of Trade and the New York Stock Exchange, institutions to which government has in part transferred its coercive powers. Various trade associations also provide uniform standards. Zerbe and Urban [1988] argued some time ago that licensing of day care by state government may be justified as a way of lowering the costs of quality determination. Licensing of professions such as medicine at least in part represents an attempt to lower measurement costs [Leffler, 1978]. We would not, however, call these stories of market failure. We would say simply that in many situations the government possesses advantages in obtaining consent for the use of uniform standards.

Culture can act as a substitute for government action [Ellickson, 1991; Ostrom, 1990]. A culture in which honesty is widely practiced, for example, will reduce transactions costs devoted to preventing fraud. Similarly, private technological innovations that reduce transaction costs may allow the production of some goods that formerly were not feasible.

Better empirical analysis, more attention to net benefits, and a deeper understanding of transaction costs would all help to improve the process of policy analysis. Continued reliance on the market failure concept will not.

The market failure model ultimately fails, like other deductive models, because it is not sufficiently derived from an empirical base [Zerbe and Medema,1997]. It is not sufficiently inductive, and instead relies on methods of understanding that derive specific propositions from general principles without much attention to observed facts. As Coase has pointed out, little can be learned from the study of theoretical

optimal systems [Coase, 1964, p. 195].[11] Analysts who become enamored of "blackboard economics," where equations are substituted for underpinnings, produce concepts that bear little correspondence to the actual social system. The world portrayed is one that exists only on the blackboard: "the analysis is carried out with great ingenuity, but it floats in the air" [Coase, 1988, p. 10].

APPENDIX

The following constitutes a formal treatment of the remarks offered regarding our claim that the search for necessary and sufficient conditions in market failure analysis is misleading. Consider a standard example of an externality such as that constructed by Just, Hueth, and Schmitz [1982, pp. 270–271]. The production of firm 1 is a function of input x_1 and is given by $q_i = x_1^{1/2}$, and the production function of a second firm is $q_2 = x_2^{1/2} - x_0$, where x_0 is considered as a constant by the second firm. The externality arises because x_0 is produced as a by-product of the first firm such that $x_0 = x_1^{1/2}$. Both firms are profit maximizers with prices for q_1, q_2, x_1, x_2 given respectively by p_1, p_2, w_1, w_2. The first firm's profits will be $p_1 q_1 - w_1 x_1$. These are at a maximum when price equals marginal cost, or when $p_1 = 2 w_1 q_1$ at output $p_1 / 2 w_1$. The second firm will maximize its profits where $p_2 = 2 w_2 (q_2 + w_1^{1/2})$ given the amount of X_1 used by firm 1. Firm 2's output will be $q_2 = p_2 - 2 w_2 x_1^{1/2})/2w_2$. The significance of this point is that firm 2's output depends on firm one's use of the input x_1—that is, there is an externality.

Were firm 1 to consider the harm done to firm 2 by its use of output x_1, it would maximize its total revenue minus its costs for x_1 and also minus the harm it causes to firm 2. This damage is indicated by the price for q_2 times the reduction in the output of q_2 or $p_2 x_1^{1/2}$. Thus the social cost function for firm 1 is $[w_1 x_1 + p_2 x_1^{1/2}]$. This is the sum of private costs $w_1 x_1$ and external costs. It gives an optimal output for firm 1 of $q_1 = (p_1 - p_2)/2 w_1$. In the output decision where firm 1 considers its harm to firm 2, the former takes into account the value of producing both q_1 and q_2. This is exactly the output that occurs when a single firm that represents a merger of firm 1 and firm 2 maximizes its private profits. The standard conclusion points out that the combined producer and consumer surplus when firm 1 produces at the socially optimal level are greater than when there is a failure to internalize the externality and the finding of suboptimality follows.

For simplicity, assume that both firms face flat demand curves so that the internalization of the externality through merger of the two firms generates only an increase in producer surplus. This will equal the increase of profits from merger. The profits of the two firms in the presence of the externality will be $p_1^2/4w_i$ for the first firm and $p_2^2/4 w_2 - p_1 p_2/(2 w_1)$ for the second firm. Joint profits for the single merged firm will, however, be $(p_1 - p_2)^2/(4 w_1) + p_2^2/(4 w_2)$. Profits are thus larger for the merged firm by $p_2^2/(4 w_1)$, and it is said that the merger is desirable in the presence of externalities.

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[11] In a similar vein, Coase [1974] argues that "generalizations are not likely to be helpful unless they are derived from studies of how such activities are actually carried out within different institutional frameworks. Such studies would enable us to discover which factors are important and which are not in determining the outcome and would lead to generalizations which have a solid base. They are also likely to serve another purpose, by showing us the richness of the social alternatives between which we can choose" (p. 375).

Suppose that the costs of the merger or of government intervention are $p_2^3/(4w_1)$. The net social cost of government intervention is higher than the gain—it will be $p_2^2 (p_2 - 1)/(4w_1)$—so that there is a loss from merger or from government intervention. The solution in which the externality continues to exist becomes an optimum.

In regard to the claim that market failure is a necessary condition for efficient intervention, consider the following. Suppose the costs of merger have fallen to $p_2/(4w_1)$ due to a more streamlined and less expensive method developed by the Federal Trade Commission for examining mergers. This is the first innovation. The net gains from the merger are now $p_2^2/(4w_1)$. The two firms merge, eliminating the externality. Now suppose instead that the government devises at low cost an innovative means of collecting the corporate income tax more cheaply. This innovation saves the firms an amount, say, equal to the merger savings or $p_2^2/(4w_1)$, but the firms continue to exist independently. The tax-collecting innovation does not eliminate an externality, but as an innovation it is equally worthwhile.

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REFERENCES

Abbott, F.M. (1996, January). Book review: Product standards for internationally integrated goods markets. American Journal of International Law, 90, 162–165.

Alchain, A. (1965). Some economics of property rights. Il Politico, 30, 816–829.

Allen, D.W. (1991). What are transaction costs? In R.O. Zerbe and V.P. Goldberg (Eds.), Research in law and economics (Volume 14, pp. 1–8). Greenwich, CN: JAI Press.

Allen, D. (1999). Transactions costs. In S. Medema, G. Bouckaert, & G. DeGeest (Eds.), Encyclopedia of law and economics. Aldershot, UK: Edward Elgar.

Allen, D., & Lueck, D. (1992, October). Contract choice in modern agriculture: Cash rent versus cropshare. Journal of Law and Economics, 35, 397–426.

Andersen, T.L., & Lueck, D. (1992, October). Land tenure and agriculture productivity on Indian reservations. Journal of Law and Economics, 35, 427–455.

Anderson, L.C., & Swimmer, E. (1997, May). Some empirical evidence on property rights of first peoples. Journal of Economic Behavior and Organization, 33(1), 1–22.

Arrow, K.J. (1969). The organization of economic activity: Issues pertinent to the choice of market versus nonmarket allocation. In Joint Economic Committee, The analysis and evaluation of public expenditures: The PPB system, 91st Congress, 1st session.

Baron, J., & Dunoff, J. (1996, January). Against market rationality: Moral critiques of economic analysis in legal theory. Cardozo Law Review, 17, 431–496

Barzel, Y. (1985, March). Transactions costs: Are they just costs? Journal of Institutional and Theoretical Economics, 141, 4–16.

Baumol, W.J. (1979, June). Quasi optimality: The price we must pay for a price system. Journal of Political Economy, 87, 578–599.

Baumol, W.J., & Oates, W.E. (1975). The theory of environmental policy. Englewood Cliffs, NJ: Prentice Hall.

Beck, R.J. (1995). Refugees in inter-war Europe: The emergence of a regime. Oxford: Clarendon Press.

Blackman, S.G. (1995, Summer). An analysis of aider and abettor liability under section 10 (b) of the Securities Exchange Act of 1934: Central Bank of Denver v. First Interstate Bank of Denver. Connecticut Law Review, 27, 1323–1376.

Boardman, A.E., Greenberg, D.H., Vining, A.R., & Weimer, D.L. (1996). Cost-benefit analysis: Concepts and practice. Upper Saddle River, NJ: Prentice Hall.

Boadway, R.W., & Wildasin, D.W. (1984). Public sector economics (2nd ed.). Toronto: Little Brown and Company.

Browning, E.K., & Browning, J.M. (1992). Microeconomic theory and applications (4th ed.). New York: Harper Collins.

Calabresi, G. (1968). Transaction costs, resource allocation and liability rules: A comment. Journal of Law and Economics, 11, 67–73.

Calabresi, G., & Melamed, D. (1972, April). Property rules, liability rules, and inalienability: One view of the cathedral. Harvard Law Review, 85, 1089–1128.

Cheung, S.N.S. (1969). The theory of share tenancy. Chicago: University of Chicago Press.

Cheung, S.N.S. (1973, April). The fable of the bees: An economic investigation. Journal of Law and Economics, 16, 11–33.

Cheung, S.N.S. (1980). The myth of social cost. San Francisco: Cato Institute.

Coase, R.H. (1937). The nature of the firm. Reprinted in R. Coase, The firm, the market, and the law. Chicago: University of Chicago Press, 1988.

Coase, R.H. (1960, October). The problem of social cost. Journal of Law and Economics, 3, 1–44.

Coase, R.H. (1964, May). Discussion of direct regulation and market performance in the American economy, by Richard E. Caves, and The effectiveness of economic regulation: A legal view, by Roger C. Cramton, papers and proceedings from American Economic Association annual meeting. American Economic Review, 54, 194–97.

Coase, R.H. (1974, October). The lighthouse in economics. Journal of Law and Economics, 17, 357–376.

Coase, R.H. (1988). The firm, the market, and the law. Chicago: University of Chicago Press.

Cooter, R., & Ulen, T. (1997). Law and economics. Boston: Addison Wesley.

Dahlman, C.J. (1979, April). The problem of externality. Journal of Law and Economics, 22, 141–162.

De Alessi, L. (1996, Spring/Summer). Error and bias in benefit-cost analysis: HUD's case for the wind rule. Cato Journal, 16, 129–147.

Demsetz, H. (1967, May). Toward a theory of property rights. American Economic Review, 62, 347–339.

Eggertsson, T. (1990). Economic behavior and institutions. Cambridge: Cambridge University Press.

Ellickson, R. (1991). Order without law: How neighbors settle disputes. Cambridge, MA: Harvard University Press.

Estin, A.L. (1995). Economics and the problem of divorce. University of Chicago Law School Roundtable, 2, 517–597.

Executive Office of the President (n.d.). Economic analysis of federal regulations under executive order 12866, Executive Office of the President, Office of Management and Budget, Washington, DC.

Executive Order 12866 (1993, October 4). From William J. Clinton, Executive order 12866—Regulatory planning and review, September 30, 1993. In Weekly Compilation of Presidential Documents, 39, 1925–1933.

Farrell, J. (1987, Fall). Information and the Coase theorem. Journal of Economic Perspectives, 1, 113–129.

Faulhaber, G.R. (1987, Summer). Comment. The role of government in a mixed economy: Reprise. Journal of Policy Analysis and Management, 6, 557–561.

Feeny, D., Hanna, S., & McEvoy, A.F. (1996, May). Questioning the assumptions of the tragedy of the commons: Model of fisheries. Land Economics, 72, 187–205.

Fischel, W. (1996). Regulatory takings: Law, economics and politics. Cambridge, MA: Harvard University Press.

Frankel, T. (1995, Fall). Foreword. Symposium: A recipe for effecting institutional changes to achieve privatization. Boston University International Law Journal, 13, 295–311.

Gaulding, J. (1995, September). Race, sex, and genetic discrimination in insurance markets: What's fair? Cornell Law Review, 80, 1646–1694.

Ginsburg, J.C. (1995, October). Putting cars on the "information superhighway": Authors, exploiters, and copyright in cyberspace. Columbia Law Review, 95,1466–1499.

Goldberg, V. (1979). Protecting the right to be served by public utilities. Research in Law and Economics, 1, 145–156.

Gordon, H.S. (1954, April). The economic theory of a common property resource: The fishery. Journal of Political Economy, 62, 124–142.

Hardin, G. (1968, December 13) The tragedy of the commons. Science, 162, 1243–1248.

Hardin, G. (1978). Political requirements for preserving our common heritage. In H.P. Bokow (Ed.), Wildlife and America (pp. 310–317). Washington, DC: Council on Environmental Quality.

Hicks, J.R. (1939). The foundations of welfare economics. Economic Journal, 49(4), 696–712.

Hyman, D.N. (1990). Public finance: A contemporary application of theory to policy. Chicago: Dryden Press.

Jordon, K. (1995, Fall). Managed competition and limited choice of providers. Arizona State Law Journal, 27, 875–952.

Jost, T.S. (1995, Fall). Oversight of the quality of medical care: Regulation, management, or the market. Arizona Law Review, 37, 825–868.

Just, R., Hueth, D., & Schmitz, A. (1982). Applied welfare economics and public policy. Englewood Cliffs, NJ: Prentice Hall.

Kang, J. (1995, Fall). Perpetuating market misallocations in health care through employer health insurance mandates. American Journal of Tax Policy, 12, 513–547.

Kitch, E.W. (1995, Fall). The theory and practice of securities disclosure. Brooklyn Law Review, 61, 763–888.

Kovacic, W. (1995, Summer). Designing and implementing competition and consumer protection reforms in transitional economics. DePaul Law Review, 44,1197–1224.

Larson, J.E. (1995, December). Free markets deep in the heart of Texas. Georgetown Law Journal, 84,179–260.

Leffler, K. (1978, April). Physician licensure: Competition and monopoly in American medicine. Journal of Law and Economics, 21,165–186.

Lesser, J., Dodds, D., & Zerbe, R. (1997). Environmental economics and policy. Reading, MA: Addison-Wesley.

Letsou, P. (1996). The scope of section 12 (2, Winter) of the securities act of 1933: A legal and economic analysis. Emory Law Journal, 45, 95–152.

Linder, M. (1995, Fall). I gave my employer a chicken that had no bone: Joint firm-state responsibility for line-speed-related occupational injuries. Case Western Reserve Law Review, 46, 33–143.

Lowi, T.J. (1992, March). The state in political science: How we become what we study. American Political Science Review, 86, 1–7.

Mas-Colell, A., Whinston, M., & Green, J. (1995). Microeconomic theory. New York: Oxford University Press.

MacRae, D., & Wilde, J.A. (1985). Policy analysis for public decisions. Lanham, MD: University Press of America.

Meade, J.E. (1952). External economies and diseconomies in a competitive situation. Economic Journal, 62(1), 54–67.

Medema, S.G., & Zerbe, R.O. Jr. (1999a). The Coase theorem. In S. Medema, G. Bouckaert, & G. DeGeest (Eds.), Encyclopedia of law and economics. Aldershot, UK: Edward Elgar.

Medema, S.G., & Zerbe, R.O. Jr. (1999b). Educating Alice: Lessons from the Coase theorem. Working paper, Department of Economics, University of Colorado, Denver, Colorado.

Nelson, R. (1987, Summer). Roles of government in a mixed economy. Journal of Policy Analysis and Management, 6, 541–557.

North, D.C., & Thomas, R.P. (1973). The rise of the western world: A new economic history. Cambridge: Cambridge University Press.

North, D. (1981). Structure and change in economic history. New York: W. W. Norton & Co.

Ostrom, E. (1990). Governing the commons. Cambridge, MA: Cambridge University Press.

Owen, D. (1996, April). Interfaces and interoperability in Lotis v. Borland: A market-oriented approach to the fair use doctrine. Fordham Law Review, 64, 2381–2423.

Pigou, A.G. (1932). The economics of welfare (4th ed.). London: Macmillan.

Polinsky, A.M. (1974, June). Economic analysis as a potentially defective product: A buyer's guide to Posner's economic analysis of law. Harvard Law Review, 87, 1655–1681.

Posner, R.A. (1992). Economic analysis of law. Boston: Little, Brown and Company.

Post, J. (1995, December). A lawyer's ramble down the information superhighway. Fordham Law Review, 64, 782–793.

Procaccia, U. (1996, January). Crafting a corporate code from scratch. Cardozo Law Review, 17, 629–645.

Randall, A. (1983, January). The problem of market failure. Natural Resources Journal, 23, 131–148.

Rougeau, V.D. (1996, Winter). Rediscovering usury: An argument for legal controls on credit card interest rates. University of Colorado Law Review, 67, 1–46.

Salanie, B. (1997). The economics of contract. Cambridge, MA: MIT Press.

Samuelson, P.A. (1954, November). The pure theory of public expenditure. Review of Economics and Statistics, 36, 386–389.

Samuelson, P.A. (1964). Economics: An introductory analysis (6th ed.). New York: McGraw Hill.

Scott, A. (1955, April). The fishery: The objectives of sole ownership. Journal of Political Economy, 63, 116–124.

Skaggs, N.T., & Carlson, J.L. (1996). Microeconomics: Individual choice and its consequences (2nd ed.). Cambridge, MA: Blackwell Publishers.

Singher, T.C. (1995, April). Regulatory derivatives: Does transnational regulatory cooperation offer a viable alternative to congressional action? Fordham International Law Journal, 18, 1397–1474.

Stigler, G.J. (1966). The theory of price (3rd ed.). New York: Macmillan.

Thomas, L. (1992). The fragile species, New York: Charles Scribner's Sons.

Utset, M. (1995, Fall). Emerging markets in the age of mechanical reproduction. Boston University International Law Journal, 13, 351–365.

Weimer, D.L., & Vining, A.R. (1992). Policy analysis: Concepts and practice (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

Weber, M. (1958). From Max Weber: Essays in sociology (C.W. Mills, Ed.). New York: Oxford University Press.

Wolf, C. (1979, April). A theory of nonmarket failure: Framework for implementation analysis. Journal of Law and Economics, 22, 107–139.

Zerbe, R.O. Jr. (1976). The problem of social cost: Fifteen years later. In A.Y. Lin (Ed.), Theory and measurement of externalities (pp. 29–36). New York: Academic Press.

Zerbe, R.O. Jr. (1980). The problem of social cost in retrospect. Research in Law and Economics, 2, 83–102.

Zerbe, R.O. Jr., & Medema, S.G. (1997). Ronald Coase, the British tradition, and the future of economic method. In S.G. Medema (Ed.), Coasean economics: Law and economics and the new institutional economics (pp. 209–238). Boston: Kluwer Academic Publishers.

Zerbe, R.O. Jr., & Urban, N. (1988). Towards a public interest theory of regulation. Research in Law and Economics, 11, 1–23.

Zupan, M.A. (1996). Are public goods good for the public? Working paper, University of Southern California Business School, Los Angeles, California.