INTERNATIONAL CENTRE FOR ECONOMIC RESEARCH
ICER

WORKING PAPER SERIES

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Working Paper No. 31 / 2003

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August 2003

Abstract.

Due to the high transaction cost that would be necessary for large numbers of people to negotiate with each other, even those who are usually sanguine about private markets become reserved when externalities affect large populations. The distinction between private and societal interest is well understood for pecuniary externalities, but neglect of Buchanan and Stubblebine's article Externality has left the same distinction widely unrecognized for non-pecuniary ones. If only a few parties on either side experience a relevant externality private interactions can appropriately internalize costs and benefits across the entire population. Regardless of the perceptiveness of legal and cultural institutions in placing entitlements, and regardless of the level of transaction cost among the universe of the affected, a surprising number of externalities will readily fix themselves. The desirability of corrective intervention is much too easily conceded.

* This is a generalization and extension of Haddock (20##) in PERC's 2002 Political Economy Forum conference volume on Private Land Conservation. Steven Eagle, Lynne Kiesling, Fred McChesney, Roger Meiners, Walter Thurman, and seminar participants at the Loyola University of Chicago Economics Department provided valuable commentary.

IRRELEVANT EXTERNALITY ANGST

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Let any alteration of a private action have an unavoidable indirect effect on a large population. Assume the aggregate collateral impact will be substantial while the decision maker's cost of altered behavior would be zero at the margin. Without altruism will the efficient activity level be selected, taking everyone's interest into account? Even those who are sanguine about private markets become reserved in face of the high transaction cost that would be necessary for all those people to negotiate with each other.

> *[T]he private production of collective goods, for which the cost of excluding nonpurchasers is great, does not seem to be practical (Demsetz 1970, 306).*[1]

> *[P]roperty rights will [not], in practice, always be adjusted to allow for optimal exclusion. If they are not, the "free rider" problem arises. … This suggests that one important means of reducing the costs of securing voluntary co-operative agreements is that of allowing for more flexible property arrangements and for introducing excluding devices (Buchanan 1965, 13-14).*

Substantial moderation of that pessimism is in order. If it is required that members of a large population negotiate amongst themselves comprehensively daunting transaction cost certainly seems likely. But Externality, an article coauthored by Buchanan and Stubblebine (1962), discussed how external effects can be irrelevant to efficient resource allocation. The burden here will be to show both theoretically and observationally that it is often predictable that only one or a few individuals will experience a *relevant* external affect even though large numbers experience a real (though irrelevant) externality. Given sufficient variation of interest across the population, that impact can be internalized efficiently through private negotiation though it is uneconomic to exclude those who experience irrelevant effects. The result requires that parties experiencing a relevant effect on one side of the interaction be able

[1] Collective good differentiates those public goods where exclusion is impractical (such as broadcasting) from the complementary subset of excludable public goods (such as cablecasting). The boundary is economic—using signal-scrambling devices to exclude non-payers has long been technically feasible. While early efforts to employ them over-the-air were unviable, they have recently proven economic for cable and direct-to-home satellite transmissions that employ intermediaries to consolidate interactions.

to identify those who experience a relevant effect on the other side. Often that identification problem will be minor if there are only a few actors on one side of the interaction whether or not there is a large population on the other. But even when there are many on both sides, those who experience a relevant impact will frequently be predictable—if an externality affects airlines, one might advisably approach Delta before Varig.

Much research touches Coase's (1960) The Problem of Social Cost (Social Cost henceforth), the origin of the so-called Coase Theorem.[2] But after forty years Externality, which by rights should be recognized as a major extension, enjoys barely a cult following. Social Cost noted that externalities are less cogently seen as something that one party (the perpetrator) inflicts on others (the victims) than as the unavoidable result of multiple parties' simultaneous attempts to exploit a resource when they are not induced to give (full) weight to the interests of alternative users. Forbidding Jane to do something that would disappoint Dick will disappoint Jane, but denying Dick's appeal to forbid Jane's use leaves Dick disappointed. Since one disappointment is inevitable, identifying the lesser is important. Whether to measure disappointment by willingness to pay in order to avoid it raises additional issues to be sure,[3] but ignoring some disappointments or branding them illegitimate frustrates rational decisionmaking.

Externalities can be pecuniary or non-pecuniary (technological), though aside from public choice theory economics has had little to say about pecuniary ones.[4] A non-pecuniary externality is called positive (or a public good) if it confers benefits, negative if it imposes costs. The concern with negative externalities is that people go too far; with public goods the concern is that people do not go far enough. Positive and negative externalities will be treated interchangeably here—no bystander would or should be expected to invest in aggravating an external cost, but any bystander who

[2] The Theorem was articulated by readers of Social Cost rather than Coase, and exists in several variants. Some deal solely with resource allocation when transaction cost is zero. Social Cost covers a great deal more, subtly building on Coase's (1937) student essay The Nature of the Firm, which exposed the error of neglecting positive transaction cost. Shortly before Social Cost appeared, Coase (1959) discussed the simpler low-transaction-cost/resource-allocation nexus, not as pure theory but as a real world application where transaction cost actually is minor. Social Cost breaks its most meaningful ground regarding entitlement placement precisely when it relaxes the zero transaction cost assumption across its final two-thirds, while the initial third aimed to expose severe limitations of Pigouvian taxes (Pigou 1920). Coase (1988) subsequently responded to a number of chronic confusions regarding Social Cost.

[3] For example see Calabresi and Melamed (1972) and Haddock, McChesney and Spiegel (1990)

[4] Pecuniary externalities refer to instances where costs a decision-maker imposes on some bystanders have a one-to-one offset of benefits conferred on other bystanders.

mitigates it conveys a positive externality on others who have been suffering. But will those imposing the cost impose too much while those who might mitigate it mitigate too little?

Coase noted frequent misidentification of benefits or costs as externalities though in fact they are internalized—out of self-interest Dick will take account of Jane's preferences when deciding his actions if transaction cost is modest, and vice-versa. But to mitigate deleterious external effects if transaction cost is prohibitive, Coase argued that institutions must place entitlements so that no transaction is necessary. This article argues that the need for that institutional involvement is easily overstated.

Legal and cultural institutions are sometimes unable to ascertain and enforce or unwilling to abide the placement of rights necessary to mitigate externalities directly, so externalities could be chronic where transaction cost is high. If law and culture are better at moderating chronic externalities than placing entitlements, beneficial non-market controls remain plausible. For example, economic models indicate that well-designed legal systems ameliorate the external cost of torts (Calabresi 1970; Brown 1973).[5] Other externalities such as emissions into the atmosphere or augmentation of widely valued flora and fauna might present other opportunities for useful intervention.

Even among economists there remains a widespread belief that chronic externalities are unavoidably relevant concerns for public policy. The nearly lost point of Externality is that more often they are irrelevant. If Dick is the entitlement holder and would use the resource in some different way if, counterfactually, he took account of Jane's inconsistent preferences, the externality is indeed worth pondering.[6] But if he would continue the same use even if he took full account of her preferences (though in fact he does not), the externality is real enough but simply does not matter. Externalities are everywhere but usually economically meaningless. Would you pay enough to shorten my diatribe if I hold forth too long? I suspect not (though I welcome offers). Similarly, an onlooker may admire an attractive couple though the sole target of the primping was the companion. So even observably chronic externalities may leave no useful role for intervention. Nor do more momentous ones discussed below.

[5] Evolution of the economic analysis of torts can be traced in any recent law & economics text. See Cooter and Ulen (3rd ed. 2000, chs 7 & 8), Friedman (2000, ch. 14), or Posner (5th ed. 1997, ch. 6).
[6] Worth pondering hardly implies necessarily worth correcting (Demsetz 2003).

Some see an irrelevant externality as a mere implication of Social Cost's proper entitlement placement in the face of high transaction cost. But Externality focuses attention on the margin rather than on the total magnitudes that dominate Social Cost. Certainly Social Cost commits no error regarding the margin—indeed Externality cultists are invariably Coasean—but neither does Social Cost draw attention there. Dick's beautiful garden affords profound pleasure to Jane as she passes by, but she would not have noticed marginal changes had he worked even harder. For private purposes Dick invested enough effort to satisfy a cost-benefit evaluation of Jane's less comprehensive interest. That externality is real in total but inframarginal, hence irrelevant.

This article argues that regardless of the perceptiveness of legal and cultural institutions when placing entitlements, and regardless of the level of transaction cost among the universe of the affected, a surprising number of externalities will readily fix themselves. The desirability of corrective intervention is much too easily conceded.

I. The Argument In Outline

The externality literature often focuses on the masses suffering from or enjoying many externalities while despairing of the prospects for taking a careful census, much less gauging individual demands.[7] Comprehensive negotiations would impose overwhelming transaction cost even if individuals had no incentive to misrepresent interest. But if everyone else accurately reported and paid according to private interest, one's own trivial addition would cause barely a ripple; if each of the others, thinking along a similar line, conceals personal demand, one's forlorn bit would finance next to nothing. So the best strategy seems to be concealing one's individual demand, a high-transaction-cost/free-rider "market failure" that seems to imply that too little voluntary funding will materialize for adequate internalization. From that platform a frequent recommendation is for government to proxy for the governed, taxing to fund some investment and thus extract us prisoners from our dilemma. The argument undoubtedly is sound within limits, but falls far short of a general rule.

For illustration, timber registers in formal markets and, absent a jointly produced forest-amenity, an unfettered timber market would provide it efficiently. But the

[7] Boudreaux, Meiners, and Zywicki (1999) review the literature and critique frequent overreaching.

amenity registers in formal markets much less comprehensively. For instance nearly every Dakotan values Oregon's forests, and if necessary would pay a bit to have them. But high transaction cost permits that interest hardly to register. So it seems that there will be enough shoes in Dakota but too few trees in Oregon unless a government intervenes—presumably the United States because interested parties are vastly more numerous outside than inside Oregon. But wait, some Quebecois and Paraguayans also value Oregon's forests, as do uncounted Finns, Maltese, Kenyans, Punjabi, and on and on. Even the U.S. government seems too constricted, and some urge that the United Nations assume responsibility. Scoffers point to Oregon's incentive to maintain woodland for tourists, but that seems to provide scant solace to those who never visit Oregon but nonetheless value knowing that great forests survive there. Whether or not tourist demand registers fully, it seems intuitive to many observers that there will be too little forest in Oregon because existence and option values never weigh in.[8]

But consider that people are not plants or sponges that must live or die wherever their embryos happen to lodge. Not everyone living in Oregon is there due to evergreens, but someone who deeply loves forestland will more likely end up in Oregon than someone who does not much care for trees. All else equal, people move to locations that afford more of those public goods that they especially value and try to avoid locations that impose the negative externalities that they find especially noxious. A forest provides non-pecuniary income to anyone who enjoys it. Holding pecuniary returns constant a forest lover would fare better in Oregon than other people. More subtly, one who desperately loves trees will enjoy Oregon more than someone who only likes them quite a lot—it is not merely positive versus negative preference but its strength that counts.

So one who likes Oregon's forests will be somewhat more likely to accept a job there when and if it is offered, but someone who passionately loves Oregon's forests will be quite likely to accept that job, or to become self-employed in order to move to the state if no offer is forthcoming. Those enthralled by Oregon's forests should be especially common in Oregon, those who most intensely love the badlands should be concentrated in Dakota, those who most abhor coal smoke should be scarce near steel

[8] See for instance Laitos and Carr (1999); Chang (1995). But see Hausman (1993).

mills. Thus some (not all) Oregonians want more forest in their state than do most non-Oregonians.

Few evergreens are Christmas trees. Each household wants its own Christmas tree so the children can place baubles on it. In contrast—and here is the beauty of it—tree-loving Oregonians enjoy the amenity that their state's forests exude as a sense of solitude, the sights and sounds and smells of the flora and fauna, just knowing it is there. Those joys in no way interfere with simultaneous enjoyment by people from Dakota, most of them not even in Oregon and some who never will be. We can all enjoy the exact same trees at the exact same moment, but nearly every Dakotan is satiated with forest before the most intense Oregonian demands are met.

Of course several million people live in Oregon, so perhaps the problem has merely been localized rather than eradicated. Even so a federal system with states handling state-sized problems and the national government limited to nation-sized problems would have distinct advantages. Salem rather than the District of Columbia could better govern any high-transaction-cost/free-rider problem relating to Oregon's forest amenities.[9] Though people from elsewhere enjoy Oregon's forests, most of those demands are less extensive than the demands of a subset of Oregonians and thus irrelevant in the Buchanan & Stubblebine sense. Salem represents most of the relatively few relevant demands; the U.S. and the U.N. represent predominately irrelevant ones.

Point taken, but in many instances even the localized-not-eradicated viewpoint fails. Far out in the distribution's tail a few Oregonians will have atypically intense demands relative to the vast majority of their fellows. Perhaps most other state residents also enjoy Oregon's evergreens, just not nearly as much as those way out in the tail. If those in the tail achieve cost efficient forest for their purposes, other Oregonians may be satiated. Indeed, though Oregonians' forest love offered good expositional footing, with non-political internalization it does not much matter where people with marginally relevant demands reside, only that there not be too many of them. Those externalities of especial concern to a fringe present no inevitable high-

[9] Or the problem might best be delegated to specialized agencies with borders not coincident with any other political unit's, being either larger than a state—perhaps Washington and Northern California (and British Columbia?) in addition to Oregon—or smaller—Oregon's Willamette Valley might encompass a complete unit. More external effects would no doubt spill across the borders of a smaller unit, but it would simultaneously provide information and agency cost offsets while mitigating the monopoly potential of geographically large sovereigns. So the matter is cost versus benefit rather than black versus white (Haddock 1997).

transaction-cost/free-rider problem—certainly none more daunting than those attending political alternatives—and thus would be irrelevant even if millions of others benefit from the efforts of those few.

Pigou (1920, 166-68) recommended "bounties and taxes" to deal with "uncompensated services and uncharged disservices," or in modern terminology subsidies and taxes for public goods and negative externalities.[10] Economists if not the public are comfortable optimizing rather than eradicating externalities and came to see a tax that was to equal an external cost or a subsidy that was to equal an external benefit as the most direct way to go about it. Social Cost pointed out *inter alia* that such externalities would be internalized without legal intervention if transaction cost is low, and that a Pigouvian tax or subsidy then could actually induce overreaction. But since negotiation cost becomes prohibitive when too many people must participate, most economists continue to see a properly calibrated Pigouvian tax or subsidy as desirable whenever a great number of people are affected by an externality.

Such a conclusion arises from an implicit assumption that all those parties are identical. With private goods, that assumption serves merely to simplify analysis. But the assumption is critical when externalities are analyzed. Pigouvian taxes and subsidies can prove inadvisable if variance of interest is high across individuals even if a large population is affected by an externality. To make that point more rigorously the article will employ a simple graphical model of a public good. The model assumes enforceable rights over physical property, but no right to prevent passersby from viewing it. Though a reasonably malleable analogue fitting many externalities, the model is inapplicable if property rights are absent or unenforced, as with poaching or much rainforest destruction.

The model indicates that private parties will often (not always) better internalize externalities than any diligent, honest bureaucracy could even be imagined doing. One crippling bureaucratic disadvantage is that many external costs and benefits are subjective and thus knowable only to the demander or supplier, while the links from production to consumption skirt formal markets where objective proxies might be

[10] Though Pigou is best remembered for taxes and subsidies directed at private-sector externalities, the relevant discussion occurs in a chapter cumbersomely entitled Divergences Between Marginal Social Net Product and Marginal Trade Net Product that focused mainly on the distorting effects of monopoly and common if inadvisable government policies, with externalities more-or-less an afterthought.

observed (Hayek1945).[11] Though the argument would be strengthened, it rarely touches the public choice literature questioning whether a bureaucracy would even endeavor to optimize what appears to be its charge. In contrast, private initiative is capable of internalizing an unforeseen range of externalities that affect large numbers of individuals.

II. Private and Public Goods: Whose View Is Eccentric?

Imagine asking a non-economist to parse a list of assets and services into mutually exclusive and exhaustive categories called private goods and public goods. Given those constraints it seems likely that things owned by identifiable humans or companies would be placed in the private goods list, but doubtful that something owned by the government would be categorized as a private good. In addition to government property, the person might plausibly categorize what an economist would call an open access resource in the public good group. If so, a deep-sea fish would be seen as transformed from a public to a private good as it is brought aboard a fisherman's boat. Hypnotized by precedent, some drudge might note that similar answers could likely have been had well before The Wealth of Nations (Smith 1776) initiated modern economics.

The economic meanings of public and private goods are only teasingly related to that common parlance, though now perhaps too ingrained to alter. The term private good (would that it had been called a rivalous good) makes an economist think of something such as an apple for which consumption by one person forecloses consumption by anyone else—eaten apples inevitably become someone's private calories, even mess hall apples sitting on the counter while being offered to soldiers in the government's army. Private goods pose a rationing problem, solved in a market through the price mechanism (though the army more often resorts to fiat or rationing-by-waiting).[12]

Nearly every demand bears a significant relationship to the ideal quantity of a private good, so there would ordinarily be a welfare loss if the market ignored some of

[11] Thus policymakers frequently resort to survey results rather than market data. But survey respondents do not put their money where their mouths are, and often return either zero or unrealistically high valuations with little variation across a wide range of amenities, in addition to cross-amenity comparisons that are inconsistent, intransitive, or sensitive to query order and wording (Adler and Posner (2000).

[12] The substitution of queues for prices as a rationing device is discussed in Barzel (1974).

them. To see why envision the only region where a nation's timber and cattle can be produced. It is uniformly worth exploiting for one of the products while other products can be produced profitably only in other regions. All markets are competitive. Production is fixed proportions so a demand curve's horizontal axis can be redefined as the land area necessary to produce that quantity of the product. Figure 1 illustrates.

The horizontal axis between the alternative origins 0_t and 0_c shows the region's total area. Distance from the left-hand origin measures timber production, which with fixed proportions is proportional to forested area, while distance from the right-hand origin measures cattle production, or equivalently pastureland. The price of a land unit's output, net of the cost of all other required inputs, is measured vertically.[13] The respective marginal net value curves for timber and cattle are shown as MV_t and MV_c. An unfettered market will have marginal net value of forest equal to marginal net value of pasture, dividing the region into areas 0_tA of forest and 0_cA of pasture with land rent of R per unit area. The area under the two curves then consists of a rectangle below R that goes to landowners and two triangles above R that represent consumer surplus.

An embargo on foreign timber sales redivides the region into areas 0_tA_e and 0_cA_e and lowers land rent to R_e if MV_{td} shows the marginal net value curve of domestically consumed timber. The reduction from R to R_e is mainly a pecuniary transfer from landowners to domestic consumers, though with some deadweight loss of producer surplus as shown by the triangle *abc*. With the curves shown, however, the major welfare loss is of the consumer surplus of foreign timber buyers, shown by triangle *bcd*. Only if the foreign demand were so weak that (net of non-land costs) it intersected the vertical axis below R_e would the welfare loss evaporate, though an embargo then would seem pointless since foreigners would have been purchasing no domestic timber to begin with. That illustrates that it is relevant whether individual private good demands intersect the *vertical* axis above the market *price*. The only ones that can be ignored costlessly belong to individuals who would not consume the good anyway.

In contrast, in the vocabulary of economics a public good is merely non-rivalous in consumption even when it is privately owned and supplied, perhaps a television program that can be enjoyed by many viewers—the entire public even—without depreciating anyone's enjoyment. Again the economic definition makes the good's

[13] All flows should be interpreted as discounted to present value.

provider or owner irrelevant.[14] A soldier eating a mess hall apple removes it from every other opportunity set, but a soldier enjoying a CBS broadcast does not. Since each person must have his own units in order to consume private goods, the observer aggregates the interest of the entire market by adding everyone's quantity demanded at every alternative monetary price. But an indefinite number of people share consumption of the same unit of a public good, so the observer aggregates the market interest by adding everyone's monetary valuation at every alternative quantity.[15] Everyone is able to consume up to the total amount of a collective good that happens to be produced, even anyone who chances to be unrecognized by whatever process produces it. That does not assure the optimal amount will be forthcoming, but it may be—many individual demands for collective goods can be ignored while inducing no welfare loss, as shown below.

III. A Public Good Privately Enjoyed

Many different activities occupy our planet's surface, some compatible—passersby enjoy a mountain vista across a pasture while oil is pumped from beneath—but others incompatible—the pasture and its cattle preclude a shopping center on that site. While compatible uses can overlap, increased area in one use imposes a corresponding decrease on incompatible ones.

A. A Drab If Lucrative Island Life

A rancher single-handedly owns and operates an island in the region discussed earlier, regarding it solely as a tool for maximizing pecuniary profit. No one else visits or cares about the island so the production of timber and beef result solely in private goods. Government policy is neutral. The island produces too little to affect prices, so it might plausibly be specialized to produce only timber or only cattle. But suppose that the factor requirements for the alternatives have distinct time profiles so that cattle are most demanding when the forest is least so, which counters economies of specialization.

[14] "Many public goods are provided by private entities (most radio programs in the United States for example) while governments often provide private goods (such as seats in sports stadiums)" (Haddock and Kiesling 2002).
[15] Demsetz (1970).

Due to the seasonal production disjunction between cattle and timber the net value of marginal land units will be a decreasing function of the area devoted to either output.

Analogously to figure 1, figure 2 shows forest measured from an origin 0_t and pasture measured from 0_c, with distance between indicating the island's area. [16] Putting aside land's endogenous opportunity cost, the marginal net value of timber (MV_t) begins high along the left axis—the opportunity costs of the non-land inputs are low for the first units devoted to forest because most work occurs when cattle compete for little attention. As the forest expands however, non-land inputs must be diverted from increasingly weighty cattle-tending duties, as reflected in the downward slope along the MV_t curve for movements to the right. Analogous considerations apply to the marginal net value of cattle (MV_c). Maximizing the island's value yields a product boundary at A_{max}. Assume that A_{max} has long characterized the island's comprehensively renewable production.

B. Internalities: Even Cowgirls Get the Blues

The isolated rancher notices a less lonely feeling while within her forest. Timber and cattle receipts remain objectively comparable but the rancher is both producer and consumer of the newfound forest amenity. There is thus no objective measure to contrast its marginal benefit with any pecuniary cost. Discovering all the relevant objective information would be an insuperable task; discovering all relevant subjective information would be impossible. So only the rancher can ascertain the island's optimal use pattern.

If added forest creates additional amenity value for the rancher for areas larger than A_{max} the boundary will move. Because $MV_t = MV_c$ at A_{max} the marginal cost of expanding the forest amenity is locally zero, whereas the marginal amenity value MV_{ar}, which the rancher alone can calibrate, has become positive. The rancher will move the boundary to A^* where MV_c-$MV_t = MV_{ar}$. The area *abc* represents the implicit cost of expanding the amenity while the area *abcd* shows the aggregate amenity value that

[16] Figure 2 is adapted from Dnes and Lueck (2002).

results.[17] Buchanan and Stubblebine discuss relevant versus irrelevant solely in the context of externalities, but the concept is more broadly useful—there are no externalities in figure 2 but the amenity is relevant to the rancher's decision. For brevity call the amenity boundary relevant, meaning the rancher's demand is more extensive than A_{max}, where extensiveness will be defined as the quantity where marginal amenity value reaches zero, at E_r for the rancher.

Judging from a great number of policy statements, it must come as a surprise that the amenity may have no bearing on the optimal island division. The rancher may see only part of the island at any moment, and her demand for the amenity may be inframarginal and thus irrelevant for deciding the forest-pasture division as in figure 3. The intersection of the marginal value of cattle-producing land with the pecuniary marginal value of timberland at A_{max} occurs to the right of E_r. The amenity is real but has no impact—it is boundary *IR*relevant. Like oxygen, an externality can be important but irrelevant at the margin. Perhaps the rancher cherishes few things more than her woodland, but becomes satiated before marginal amenity value has any impact on her production decisions. The rancher enjoys as much amenity as she wants while sacrificing nary a cent of market income. Those best things in life that actually are free (impose no opportunity cost) pose no economic problem and beg for no solution.

Some commentators object that the marginal value of an amenity can never fall to zero, that inevitably more is better than less. That argument confuses unconstrained preference with marginal value, and rational choice is impossible on that basis.

[17] Even if constant or increasing, marginal amenity value would be boundary relevant. As the figure has been drawn, marginal amenity value and marginal timber value reach zero at the same area, though that is mere drafting convenience. The amenity could provide utility even after marginal timber value became negative. That could induce the rancher to maintain so much forest that her accountant would lament the marginal profit being lost. Similarly, some owners of professional athletic teams subsidize from other income team accounting losses, thus involving the owner in what is to an extent a hobby. Though arguing strenuously about which sign to attach, journalists, team owners, and even the players' unions nonetheless characterize negative versus positive accounting profits as somehow dispositive regarding the desirability of proposed league reforms. And commentators accuse *economists* of failing to see past the dollar sign!

The valuable things one would give up to have a bit more measures marginal value, and there is a limited amount to give up to obtain anything.[18]

IV. Public Goods: When Does a Consumer's Demand Matter?

The model assumed away so many complications that no Kaldor-Hicks policy issues have arisen. This section corrects that by letting others enjoy the forest amenity.

A. Externalities: Public Goods With or Without a Public

Vessels begin passing. The sailors admire the forested view, thus sharing an amenity previously enjoyed solely by the rancher. As discussed above, calling the amenity a public good is perverse—a view of the island forest was already a public good according to the economic definition even when the "public" consisted solely of the rancher. Her act of viewing left the view unaltered for anyone else wanting to take a peek (which happened to be nobody until the boats came along—details, details).

The rancher is not legally entitled to a fee from offshore viewers, so the public good forest-amenity is a collective good. If no individual realizes sufficient benefit from expanding the forest an appropriate tax-expenditure scheme might offer a Kaldor-Hicks improvement.[19] But the sailors, being offshore, would see less of the island than the rancher and see it less often. Similarly she might value a finer texture to the beauty than the sailors could resolve from their greater distance. Thus the rancher might value a more extensive amenity than do the sailors and value the amenity more highly than would any sailor, perhaps more highly even than all the sailors together. The sailors might be satiated with less forest than the rancher has selected solely to maximize her

[18] A mathematician objects that a positive marginal value converging rapidly on zero permits infinite forest of finite value. A law court answers that such a marginal value quickly attains insignificance, holding the mathematician in contempt for wasting time. An economist mentions that the economics of information (Stigler 1961) holds that time-constrained people would not register trivial values, but is held in contempt for redundancy. To a tolerance finer than frogs' hair all marginal values reach the horizontal axis.

[19] Interestingly, with fewer sailors the amenity value of the island's forest would be reduced but free riding would pose less barrier to obtaining it—both rancher and a single or handful of sailors might recognize that they would each have to contribute or too little financing would be available. There would remain a transaction cost, but even that is expected to decrease with the number of negotiating parties. Paradoxically, the minor Kaldor-Hicks improvement would seem easier to achieve than the major one.

personal utility. Any additional units cultivated to satisfy the rancher beyond what satiated the sailors would comprise a public good in the economist's non-rivalous sense, but the public interest could hardly be implicated. No opportunity to free ride arises if only the rancher values additional forest, nor does transaction cost create a market failure. The sailors cannot be excluded but the size of the forest is optimal anyway.

Thus no tax-expenditure scheme may be necessary to achieve the optimal collective good, forest amenity—the rancher may select it of her own volition. A positive externality certainly exists since the sailors can view the forest while bearing none of its cost, but it is irrelevant. In fact, if the rancher *could* exclude sailors from viewing her forest but could not price discriminate among them, her profit-maximizing demand would likely leave some sailors unwilling to pay such a high price for the forest-amenity/public-good despite the positive value they would place on viewing it. But she can exclude no one if they stay offshore, so there will be the same amount of amenity value whether or not the sailors' interest is known to her. Contrary to expectation, the public goods problem could be less problematic if exclusion is infeasible.[20]

The rancher would prefer compensation for providing an amenity while taxpayers would prefer to make none. If the costless information assumption is relaxed compensation is prone to miscalculation. In part that is because so many costs and benefits are subjective, but policy initiatives pose objective hurdles as well. The cost of increased forest would depend (among many other things) on the prices of cattle and hay and transport as surely as on the price of timber. Economic costs are not dollars but the value of the multifarious opportunities foregone, which are difficult to gauge by those remote from the activities.

[20] Baumol (2002, 126-35) demonstrates that in the instance of one sort of public good—innovation—some degree of non-excludability (seemingly on the order of 80%) is both inevitable and plausibly Pareto optimal. Baumol's mechanism—complementarities between innovators and non-innovating workers—differs from the relevance/irrelevance distinction emphasized here, though where his externalities fall in the Pareto optimal range they seem also to be irrelevant in the Buchanan & Stubblebine sense. "The results … reconcile the market economies' allegedly inefficient innovation performance, which the standard theory leads us to expect, and their historically unprecedented growth record (Baumol 2002, 122)."

B. Could Two Million Sailors Be Wrong?

The intuition that more users inevitably require more of a good betrays careless thinking. Given willingness to pay at least marginal production cost it is indeed efficient that all private good demands have an impact on output, as illustrated above. But weaker demands have no impact on the optimal amount of a public good. If the public good is a collective good, those with the most extensive demands will if necessary pay for so much of it that those with less extensive demands lose interest in having more.[21] Those with inframarginal demands value the good—perhaps they enjoy few things more keenly—but they are satiated before their preferences have any impact on optimal provision. They enjoy as much as they want (thus until marginal value *to them* has fallen to zero) without requiring the expenditure of a cent more than is required to satisfy marginal demands.

The arrival of boats carrying forest-loving sailors may or may not alter the optimal pasture-forest division. If not, the amenity remains important to the sailors but their demand is boundary-irrelevant. But suppose their arrival makes the ideal woodland larger (creates or strengthens boundary-relevance). Still no policy issue arises if that is reflected in the rancher's voluntary decisions. Consider those points in turn.

Boundary Relevance: To alter the optimal amenity it is necessary and sufficient that the most extensive of the sailors' demands exceed A_{max} if the rancher's amenity demand is boundary irrelevant or A^* if the rancher's demand is boundary relevant. If the rancher's demand is boundary irrelevant figures 2 and 3 suffice as illustration by substituting MV_{as}, the marginal amenity value to the most extensively interested sailor, for MV_{ar}, the marginal amenity value to the rancher.

But if the rancher's demand is boundary relevant a sailor may have an impact on the ideal amount even with a less extensive demand than the rancher's, as figure 4 illustrates. E_r shows the extensiveness of the boundary-relevant rancher demand that led to forest area A^* in figure 2. Though the most extensive sailor's demand intersects the horizontal axis at $E_s < E_r$ the ideal boundary moves from $A^*$to $A^\dagger$. If the rancher does not make that adjustment there will be a loss as shown by the area *abc*. The

[21] This was anticipated by Spiegel (1995).

frequent inclination to restrict focus to the missing amenity, area $A^{\dagger}bcA^{*}$, overstates that loss (perhaps grossly) because the opportunity cost of lost cattle production, area $A^{*}abA^{\dagger}$, is then ignored. Still, a policy that expanded the forest might plausibly represent a Kaldor-Hicks improvement that recouped part of the shaded area.[22]

The Rancher's Reaction: If transaction cost were modest the rancher would move the boundary to $A^{\dagger}$ of her own volition because she would be paid to do so by those enjoying the marginally enhanced amenity. But with a potentially large group of sailors offshore enjoying the amenity, how likely is transaction cost to be low?

The amenity being a collective good, low transaction cost is more likely than it might seem. With a private good the number of necessary consumer-producer interactions depends on the intersection of individual demand curves with the *vertical* axis in comparison with market *price*. But for a public good, including the collective good subset, the intersection of less extensive demands with the *horizontal* axis matters in comparison with the *quantity* secured by more extensive demands. Assuming no price discrimination, with private goods everyone pays the same price for different quantities (possibly zero), whereas with collective goods everyone receives the same quantity for different prices (possibly zero). Sailors will have varying demands, and sometimes the second most extensive will not reach $A^{\dagger}$ and will therefore be boundary irrelevant.

Then it hardly matters how many sailors are offshore, two or two million; only the most extensive sailor's demand is boundary relevant, and one rancher negotiating with that lone especially interested sailor compels no expectation of prohibitive transaction cost. Most people bear that level of transaction cost (and more) virtually nonstop—buying a house, buying a car, attracting a spouse, negotiating for a job, allocating fence repairs between neighbors, having a suit properly tailored, and so on. Transaction cost might be prohibitive if, for example, the rancher and sailor speak different languages, but that is not a factor that provides a distinction between public and private goods. Even if several sailors have boundary-relevant demands the cost of resorting to government might as easily dwarf the cost of a private multiparty negotiation as the converse.

[22] No policy can recoup the entire loss because the policy would entail administrative cost that must be netted out.

Negotiating with two million sailors would almost certainly be prohibitive, but in figure 4 pointless. Imagine what would be discovered if new technology reduced transaction cost to zero? That after the rancher has satisfied herself and one or a few sailors, nobody else would pay one iota to expand the forest amenity further. The level of many-party transaction cost is irrelevant if (1) no sailor has a boundary relevant demand, or (2) transaction cost between the rancher and a few relevant sailors is modest.

The rancher already is attuned to the local cattle and timber markets, to local transport, to the prices of hay and all the other inputs she uses, and thus can cheaply judge the opportunity cost of forest expansion. Bureaucrats can find objective information for some of that but collecting it is costly. Moreover, the few boundary relevant sailors are the only reliable judges of the subjective value to them of the amenity, just as the rancher is the only reliable judge of the additional amenity value to her. And that actually understates the bureaucrat's problem. Suppose that the bureaucracy hits $A^{\dagger}$ on the nose. None of the curves are likely to be static but will shift constantly with changing market prices of cattle, timber, hay, transport, and the like along with the subjective preferences of those with boundary-relevant demands. Thus even a perfectly selected area is unlikely to remain perfect. Of course, a tolerable bureaucratic estimate yesterday implies that a tolerable one is plausible tomorrow. But that requires canvassing those affected in one way or another, hence once again obtaining costly information that private participants already possess. Due in part to that greater information cost bureaucratic policy tends toward inflexibility and episodic but large changes.

Transaction cost for collective goods—even those demonstrably enjoyed by millions—are chronically overestimated in policy discussions. Only one or a few strong demands often determine both actual and ideal provision, and even two million demands are irrelevant if inframarginal.

C. But What About Yellowstone Park?

Surely there are enough marginal demanders for, say, Yellowstone National Park to frustrate optimal private provision. Perhaps. Speaking counterfactually, present congestion in Yellowstone *might* have arisen because high transaction cost frustrated private efforts; speaking factually, it *did* materialize despite a century and a third of government pre-emption of private efforts.[23] We have little evidence regarding private amenity provision in Yellowstone, though initially people were able to enjoy it solely through efforts of three private railroad companies, the Union Pacific, the Burlington, and the Milwaukee (Anderson and Hill 1994; 1996). Motivated by company, not public, benefit, the railroads then lobbied for national government (and treasury) involvement.[24]

All that is beside the point. Though Yellowstone amenities are a public good during low season they are not a collective good—non-payers are excluded at the gate. But so many members of the public (in the ordinary sense) are enjoying the park during high season that the amenity becomes a private good (in the economists' sense).[25] One cannot visit Yellowstone during summer without diminishing others' enjoyment because price is prevented from rising sufficiently to clear all manner of queues. Transaction cost for dealing with the queues would be the cost of one ranger at the entrance collecting a fee from one automobile at a time, which is borne already. It is a fraction of the transaction cost a Dakotan bears to purchase a pair of shoes.

A collective good, even one enjoyed by a large public, creates no policy issue if its marginal (not total) value is driven to zero by landowners' own utility maximizing decisions. Even if the marginal value remains positive after the landowner has completed her autonomous decisions, no policy issue arises unless transaction cost seriously burdens negotiations between the landowner and other boundary relevant interests. Interpersonal variance of demand means only a few of them are likely to be boundary relevant.

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[23] Congress reserved the area now in Yellowstone National Park in 1872, but until the National Park Service was created in 1916 such reserves were administered directly by the Department of the Interior.

[24] Similarly, a recent Public Broadcasting System series reveals that railroad companies were instrumental in opening both the south (Santa Fe) and north (Union Pacific) rims of the Grand Canyon, as well as the areas that became Zion and Bryce Canyon National Parks (Union Pacific again).

[25] Having less of a public (during low season) makes for a "public" good, whereas having more of a public (during high season) makes for a "private" good! Isn't this a great field?

D. Two Meanings of Free Range Bison

There is danger of strategic breakdown with even a few boundary-relevant demanders. To extract compensation from the sailors, perhaps the forest-loving rancher will threaten a sizeable conversion to pasture, or the sailor with the most extensive demand will refuse to negotiate with the rancher unless other sailors contribute. Prohibitive transaction cost rules out making such threats credible against two million targets because they will be unable to organize collection of the demanded funds, but the rancher might focus on one or a few sailors, or one sailor might focus on a few of his fellows. Suppose that such a threat is successful. Wealth is transferred but the amenity is not curtailed, so no efficiency loss results (Demsetz 1972).

But knowing whom to threaten and then communicating the threat is costly. If the expected cost exceeds the expected compensation no threat would materialize. When it is too costly for the rancher to identify a boundary relevant sailor the sailor must self-identify or his dissatisfaction will persist. Thus it is germane that the boundary relevant parties be able to identify each other. Transaction cost is indeed apt to be daunting if one or a few boundary relevant sailors from among two million cannot easily discern which of, say, one thousand ranchers are similarly boundary relevant.

It is possible that a sailor would bide his time hoping that some other sailor who might conceivably have a boundary relevant demand will come forward first to absorb or at least share the burden. But every period of unfulfilled waiting imposes a cost on boundary relevant parties to an externality. An ideal outcome is not guaranteed, but the outcome may be optimal, an oft neglected distinction. Ideal (or Nirvana efficient) requires perfection while optimal merely requires beating realistic alternatives. Though externality-riddled markets are imperfect so too are norms and law (Demsetz 1969, 1; Dahlman 1979). Well-informed people would prefer a chronic externality rather than bear more serious consequences attending misguided "corrective" intervention.

If the public good were excludable as in the book market, prohibitive costs of discriminating might deny those with weak demands the opportunity to enjoy the public good even though the marginal cost of serving them would be nearly zero. But that is impossible with collective goods such as existence values, views from a public way,

carbon sinks, or reductions of atmospheric pollution—whatever collective good the rancher provides for herself is available to all, so the others either accept it or negotiate for more. Those with boundary irrelevant demands will accept the outcome while anyone with a boundary relevant demand must bring that to the attention of the rancher and negotiate for an increase or risk a continuing stream of personal loss. With a collective good any negotiated increase also is available to everyone.

The cost of a breakdown will be borne solely by those with boundary-relevant demands. If there is substantial variance in demands only one or a few individuals, the ones most likely to provide the collective good voluntarily, will have boundary-relevant demands. Discovering and threatening someone who will pay less than the cost of implementing the threat makes no sense. A cartel that contemplates a price war against an "undisciplined" fringe faces an analogous problem—war could cost the cartel more than it costs the targets, so tolerating an undisciplined fringe is often profit maximizing for a cartel, which is why cartels often are unviable. Strategic breakdown is possible, but less likely with positive information cost and substantial variance in individual interest.

A valley in Montana illustrates. A small public road traverses the Flying D Ranch in southwestern Montana, wending its way between a highway in the Gallatin Valley and a Spanish Peaks campsite. Ranch owner and media mogul Ted Turner is wealthy and loves wildlife. Due in part to his willingness to invest, the ranch puts some national parkland to shame. A bison herd was established on the Flying D to produce meat. But in the meantime the bison, along with raptors, coyotes, grizzly bears, and other wildlife that find a living at the herd's margin, can be seen and photographed by drivers passing along the road. Turner can legally charge nothing for the excellent views. So what?

Turner has made all investments in the Flying D that were worth more to him personally than they cost him, and the marginal value of improvements to the rest of us has been driven to zero. Drivers free ride on his efforts but it hardly matters. The ranch will be the same either way, or at least passersby would perceive no difference.

V. Conclusion

I clean the counter of the faculty commons and a perplexed colleague calls to those round about, "Look, an economist providing a public good!"[26] Apparently the mess bothers me more than it bothers them, for I learned soon after arrival at Northwestern that all I had to do was wait long enough and—nothing would happen. If I want to enjoy a clean countertop I had better bear the cost even if slackers share the improvement. A few of them do not even notice, and the others care too little to contribute. Similar behavior is all around, but except for a few such as Anderson and Leal (2001) and Baumol (2002) economists think it aberrational—received theory does not encompass voluntary collective goods, and thus the *zeitgeist* has been unconducive to searches that would surely have revealed evidence of it (Trefil 1989, 31-42).

Economics has long been vexed by externalities, positive and negative. The distinction between private and societal interest is well understood for pecuniary externalities, but the same distinction has rarely been recognized for non-pecuniary ones, at least when they affect large populations. It is important to recognize the difference between a problem and an inconvenience.

> *"Life is inconvenient. Life is **lumpy**. You learn to know the difference between an inconvenience and a problem. You'll live longer. ... ." Problem or inconvenience? I call this the [Auschwitz survivor Sigmund] Wollman Test of Reality. Life is lumpy. But a lump in the oatmeal—a lump in the throat—and a lump in the breast—are not the same lump. We should learn to know the difference (Zulia 1999, 46)."*

Certainly ideal public policy would be sensitive to externalities—but it would only endeavor to correct those that are relevant at the margin. Externalities surround us but rarely lead to misallocation. Ill-considered efforts to regulate them will.

If Jane purchases a book for thirty but would have paid forty she has received a consumer surplus of ten. If a publisher who is freeing inventory space gives it away her surplus is forty. But if Dick receives free or pays only ten for a collective good when he would have paid forty many economists think it a market failure. The book market also embeds a public good in part. Though some books are never published because too

[26] Do we teach our students not to volunteer public goods? Are those disinclined to do so drawn to the study of economics? Or are claims that economists actually practice what most of us preach slanderous? See Rubin (2003, 168-69).

little of a substantial surplus can be captured to cover overhead, most manuscripts that languish could not cover overhead if all surplus were captured. It is easy to distinguish the two on paper but difficult in practice, and would be even more difficult if the treasury paid all publication costs so no market data was generated. With both literature and collective goods, overhead can often be covered privately. Consumers share the surplus without which it would hardly matter whether something could be produced. Why think that producers should have it all (Baumol 2002, 120-48)?

Too centralized a response can gut a process of its ability to gauge demand, to identify those who might volunteer contribution, and to mitigate bureaucratic agency cost along with the monopolistic aspects of unitary government (Haddock 1997). The ideal—perfection—is easily recognized but the optimum inevitably will lie elsewhere. At the end of the day, sufficient conditions and necessary conditions are different. Low transaction cost is sufficient to justify leaving decision-making in private hands, but it is not necessary. Much mischief arises from a misperception that transaction cost is high where it is not, or that some enjoy a free ride though they cannot (Anderson 20##). But even more mischief arises from a misperception that high transaction cost and widespread, even rampant, free riding recommend a headlong charge up the capitol steps.

They do not.

Figures.

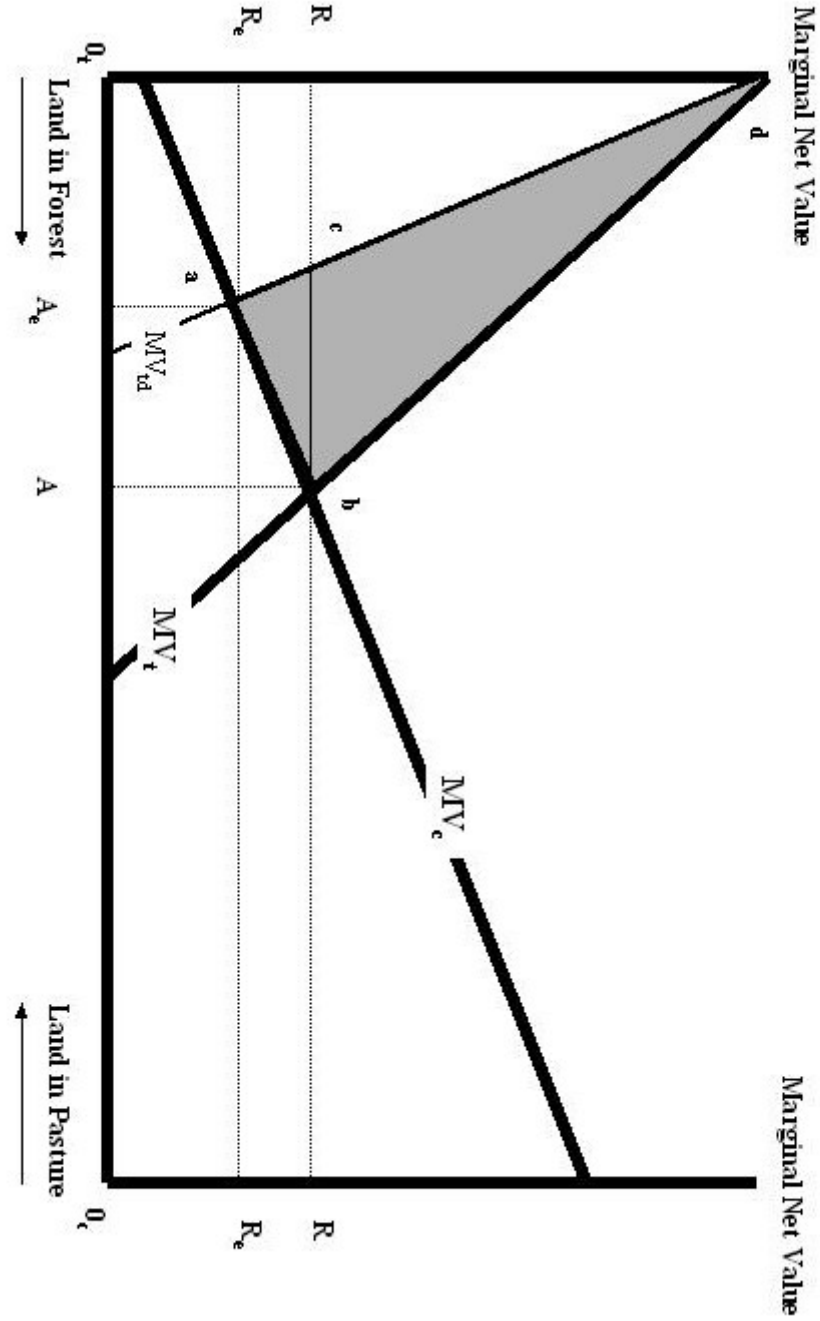

Figure 1

Boundary Relevance

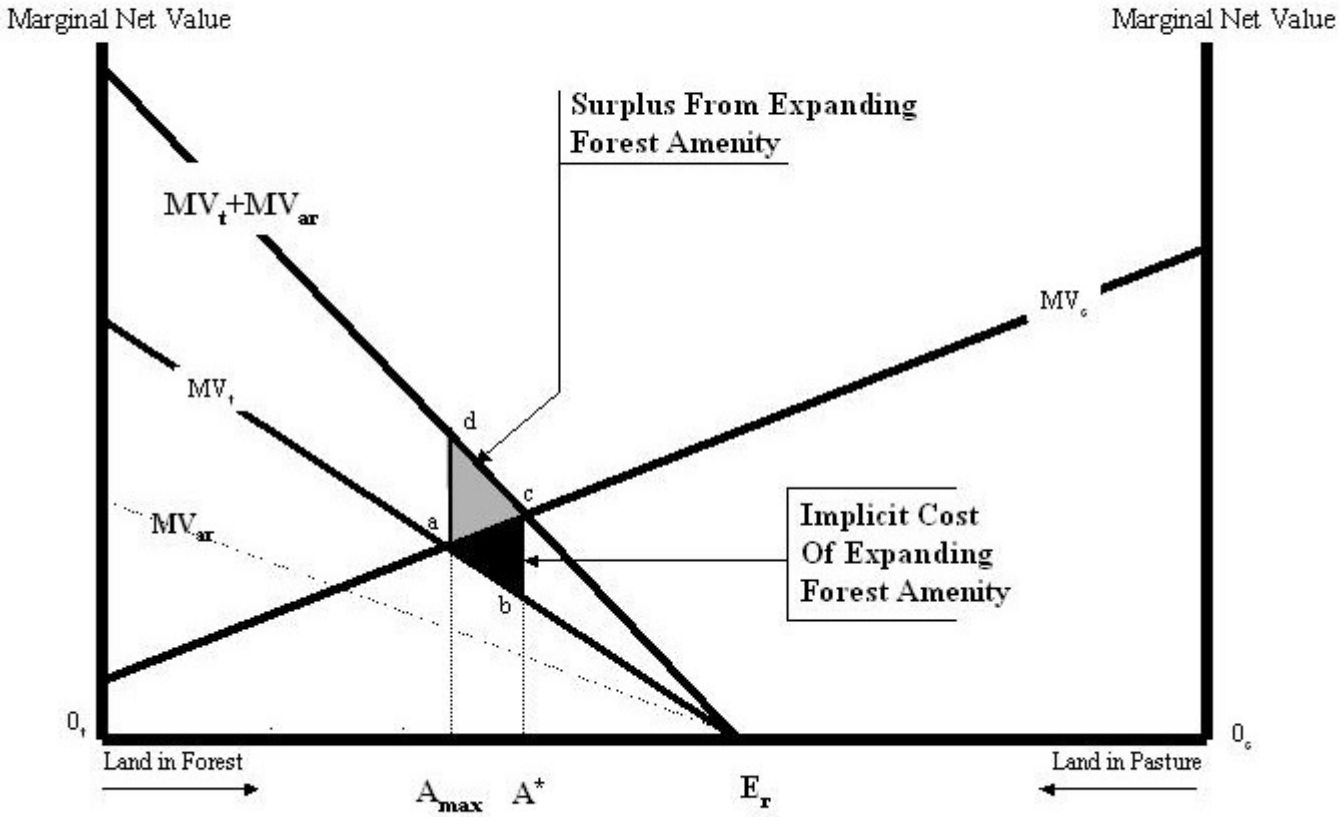

Figure 2

Boundary Irrelevance

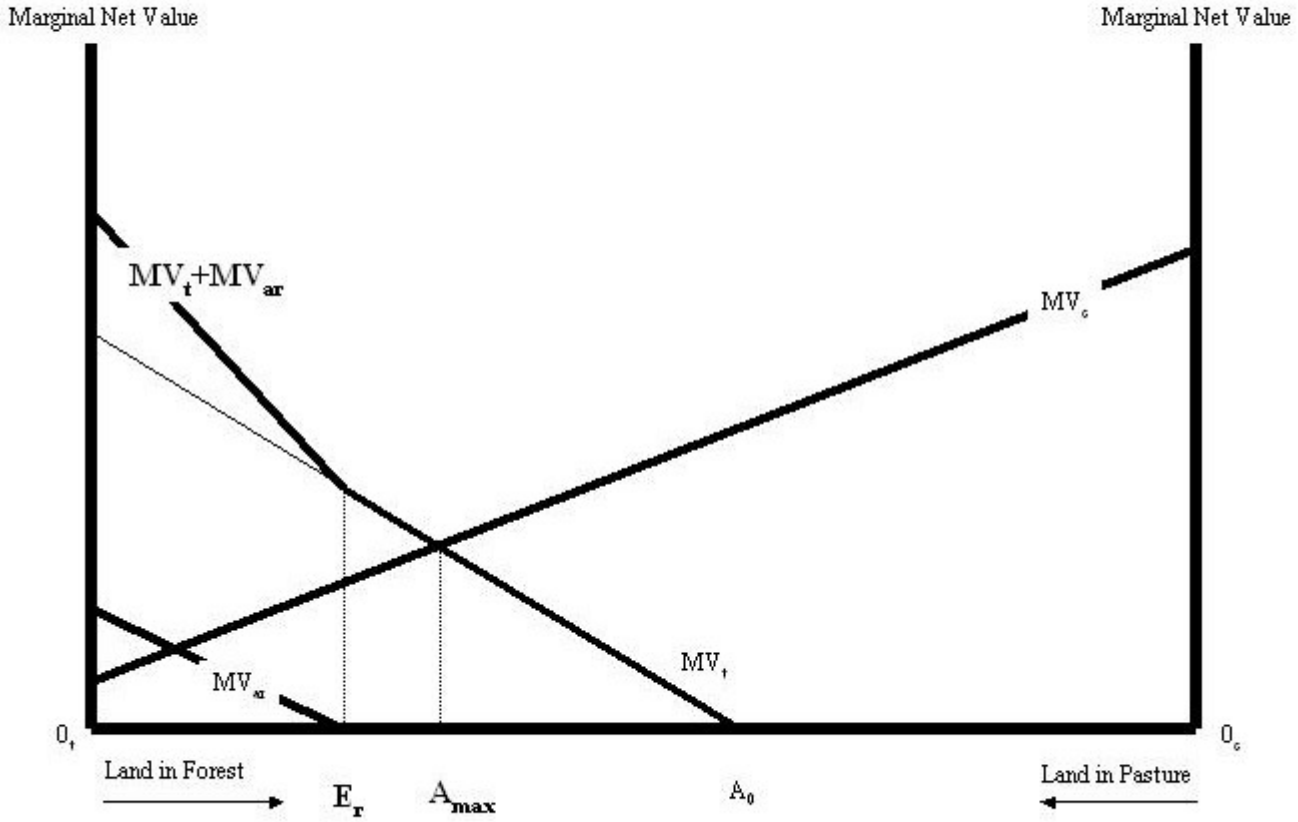

Figure 3

Potential Boundary Relevant Externality

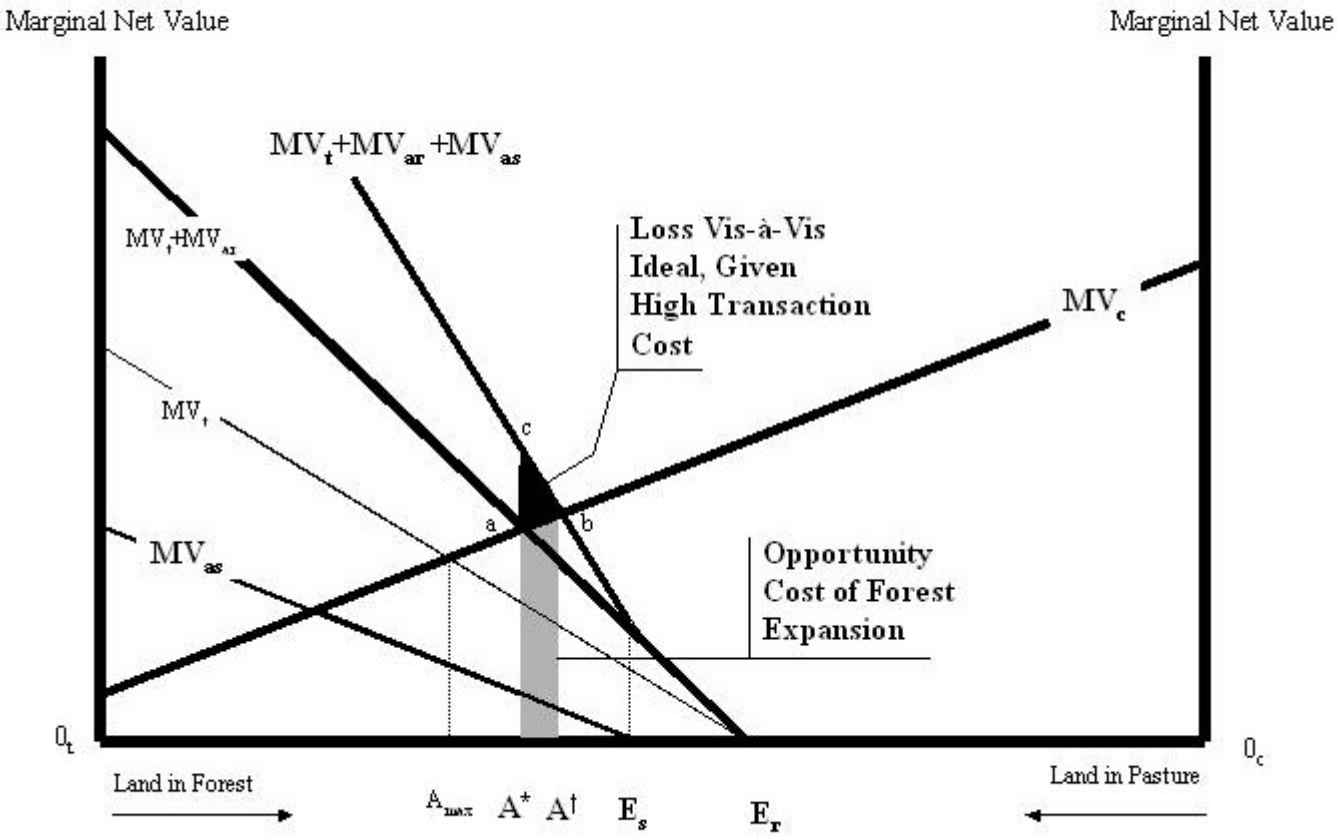

Figure 4

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