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# Irrelevant Externality Angst

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## ABSTRACT

Public goods are perplexing because insuperable transaction costs are encountered when optimization requires comprehensive negotiation among large populations of beneficiaries. Though scrutiny is certainly warranted, private internalization of public goods externalities is common. Even when many parties can freely utilize the good, if most experience a real but marginally irrelevant external effect, private interactions among the few who experience relevant impacts can suitably balance marginal costs and benefits across entire populations. It is impossible to ascertain the desirability or form of government intervention if empirical tasks are neglected on the basis of inconclusive theoretical conjectures.

Many journalists and members of the general public believe that government should spring into action whenever impacts that are nonrivalrous and nonexcludable are encountered, impacts that economists call public goods and public bads. Though a sizeable group of scholars are more circumspect (e.g., Buchanan and Stubblebine, 1962; Coase, 1959; Demsetz, 1969; Ellickson, 1991; North, 1990; Olson, 1965; Ostrom, 2000; Rose, 1986; Rubin, 2003; Spiegel, 1995), other highly

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influential economists, among them several Nobel laureates, would appear to support governmental reaction to every public good or bad (e.g., Arrow, 1962; Cooter and Ulen, 2004, 107–08; Jackson *et al.*, 2003, 361–63; Samuelson 1954; 1963). That reflex concedes resolution of intricate externality issues to special interests with much more concern for personal than public benefits. Discovering whether government intervention is apt to prove beneficial and, if so, determining its proper composition requires careful institutional analysis.

Perhaps surprisingly, public goods and public bads can be analyzed with the same theory. Something such as smog is a public bad because the misery that one person endures is neither ameliorated nor exacerbated if others are miserable as well. Any action that mitigates a public bad, however, provides a public good – the relief that a person experiences if smog-producing activities are curtailed is the same whether or not others also benefit. Conversely, erecting a billboard in front of a beautiful vista creates a public bad. Arranging for the proper amount of smog or billboards – the public bads – and for the proper amount of mitigation or vistas – the public goods – are merely two perspectives on a single task. Consequently any nonrivalrous and nonexcludable phenomenon can be addressed from the public bad perspective (smog rather than mitigation; billboards rather than vistas), or, as with the initial approach below, from the public good perspective. After the model has been developed in the context of a public good, a real world application concerning the same amenity will demonstrate the symmetry.

Those who appreciate beautiful vistas or abhor smog face a potentially crippling obstacle; optimization often requires widespread participation to finance a movement away from the status quo. If non-payers cannot be excluded from the benefits, however, many potential beneficiaries will refuse to participate – the dilemma of free riding. In consequence, a desirable public good may not materialize, or the amount may be inadequate. That is to say, we may fail to move from an undesirable status quo, or fail to move far enough.

This article develops a graphical model from a neglected idea of Buchanan and Stubblebine (1962), using it to show why an individual who acts self-interestedly and unilaterally may provide an efficient amount of a public good. The model then moves to related situations where an individual whose private incentives did not initially lead there will negotiate to a suitable outcome. Only when both unilateral and negotiated provision fail, the article's discussion of the locus and nature of government involvement becomes germane.

People are not identical, a fact that is as factually obvious as it is neglected in scholarly work. Even if everyone else could somehow overcome their free-rider problem and obtain the proper amount of a public good for their purposes, anyone with an abnormally

strong preference for it would remain dissatisfied. Such supernormal preferences cannot be met without arranging privately for the excess. When the free-rider dilemma foils contribution from others, a person with an abnormal demand for a public good may shoulder the entire burden, or share it with one or a few others with similarly strong demands. Once created, of course, everyone who wishes can enjoy the public good, provider and free rider alike.

Consider all the possible coalitions that could be formed among the members of a large population, and all the possible negotiating pairs that can be formed from those coalitions. Whenever any one of those coalitions would fail to complete a transaction with another randomly selected coalition even if the cost of transacting had been zero, then it does not matter if the transaction cost between that particular pair of coalitions is prohibitive, as it very often will be. Slightly modifying the terminology of Buchanan and Stubblebine (1962), one could say in that instance that we are dealing with an irrelevant pair of coalitions, irrelevant, that is, from the standpoint of achieving an efficient outcome. The crux is not whether the number of *imaginable* coalition pairs is large, but whether the number of *relevant* coalition pairs is large – or even positive – and whether the members of any relevant pairs can identify each other.

In virtually every situation that involves a large population, reaching an efficient outcome would require only a subset of people to transact; in some instances that would be only a modest subset; in the limiting case no imaginable coalition would be willing to pay enough to induce anyone else to alter behavior even if, counterfactually, transaction cost were zero. If every imaginable pairing of coalitions is irrelevant the level of transaction cost is also irrelevant. If, in contrast, the subset of relevant pairs is small and the members can readily identify each other, transaction cost is but an inconvenience even if the free-riders who populate irrelevant coalitions number in the millions.

In brief, many external impacts on large populations are irrelevant impacts. If the number of relevant impacts is small, those externalities should properly if counterintuitively be understood to indicate that the relevant transaction costs are low. It is well-understood that political processes present their own daunting high-transaction-cost/free-rider problems, but, as the following sections illustrate, non-political resolution of matters of especial concern to a fringe sometimes present no similar problems. That militates against public sector involvement in such situations even when millions of others benefit from the efforts of the few. Many costs and benefits that befall bystanders are subjective and thus knowable only to the bystanders. Consequently, private individuals can often better deal with a great many external impacts, even those affecting large populations, than any diligent, honest bureaucracy could even be imagined doing.

## I. A PUBLIC GOOD PRIVATELY ENJOYED

Nearly every individual's demand bears a significant relationship to the ideal quantity of a rivalrous good. If some demanders are ignored by the market there ordinarily will be a welfare loss. To see why, envision the only region where some nation's timber and cattle can be produced. For simplicity, assume each of the region's land units is worth exploiting for one or the other of those two products, but other products can be produced profitably only in other regions. All markets are competitive. Production will be assumed fixed proportions so a demand curve's horizontal axis represents both land area and the quantity of a product that amount of land can produce. 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 is measured vertically, net of the cost of all other required inputs (to avoid inessential clutter the latter costs are not shown).[1] The respective marginal net value curves for timber and cattle are shown as $MV_t$ and $MV_c$. An unfettered market will equilibrate where the marginal net value of forest equals the 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 curves consists of a rectangle below $R$ that represents the economic rent of land and two triangles above $R$ that represent consumer surplus.

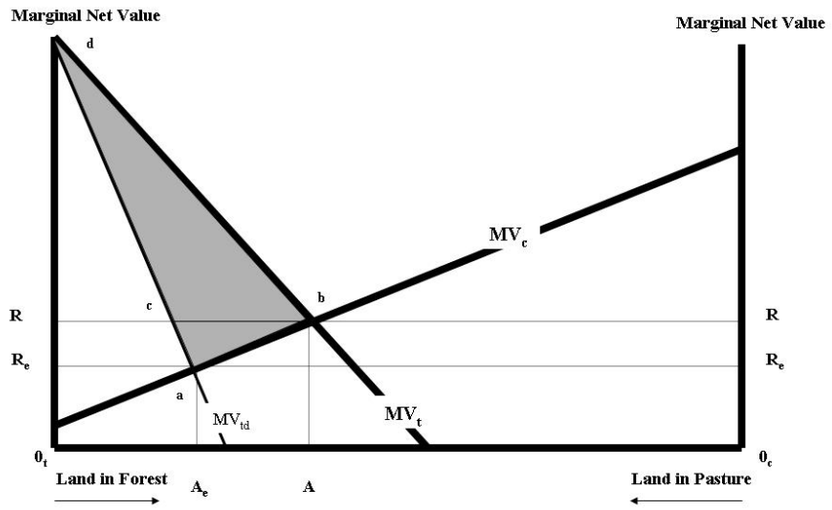


Figure 1. Welfare loss from excluding a demand for a private good

If $MV_{td}$ shows the marginal net value curve of domestically consumed timber, an embargo on timber exports alters the regions devoted to the two products to areas $0_tA_e$ and $0_cA_e$ respectively, lowering land rent to $R_e$. The reduction from $R$ to $R_e$ is predominantly a transfer from landowners to domestic consumers, though with some deadweight loss of 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 it intersected the vertical axis below $R_e$ would the welfare loss evaporate, though the embargo would then be pointless since foreigners would have been purchasing no domestic timber to begin with. That illustrates the relevance of whether individual rivalrous good demands intersect the *vertical* axis above the market *price*. The only ones that can be ignored without reducing aggregate welfare belong to individuals who would not consume the good anyway.

As will next be shown, the analysis changes radically with goods that are nonrivalrous in consumption, whether or not excludable. In stark contrast to rivalrous goods, many individual demands for a nonrivalrous good bear absolutely no relationship to its ideal quantity and are irrelevant to ascertaining the optimal amount.

## 1. One Drab If Lucrative Island Life

Assume a woman single-handedly owns and operates an island ranch in the region discussed above, 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 rivalrous goods. Government policy is neutral. The island produces too little to affect prices and 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. Due to the seasonal 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 $0_c$, the distance between indicating the island's area. The marginal net value of timber ($MV_t$) begins high along the left axis – the opportunity cost of the non-land inputs are low for the first units devoted to forest since most work is done while cattle compete for little attention. As the forest expands however, non-land inputs must be diverted from times of 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 pecuniary value yields a boundary at $A_{max}$ separating the land devoted to the alternative products.

## 2. Internalities: Even Cowgirls Get the Blues

Imagine now that the isolated rancher notices that she feels less forlorn when she relaxes in her forest. Timber and cattle receipts remain objectively comparable, but an objective measure contrasting the newfound forest amenity's marginal benefit with any pecuniary cost is missing; because the rancher is both its producer and its consumer, the amenity is not priced in a market. For someone other than the rancher to discover all the relevant objective information would be a very substantial task, but for that person to accurately ascertain relevant subjective information would be impossible. Only the rancher can determine the island's optimal use pattern.

The boundary will move if added forest creates additional amenity value for the rancher for areas larger than $A_{max}$. Because $MV_t = MV_c$ at $A_{max}$, the marginal cost of expanding the forest amenity is locally zero,

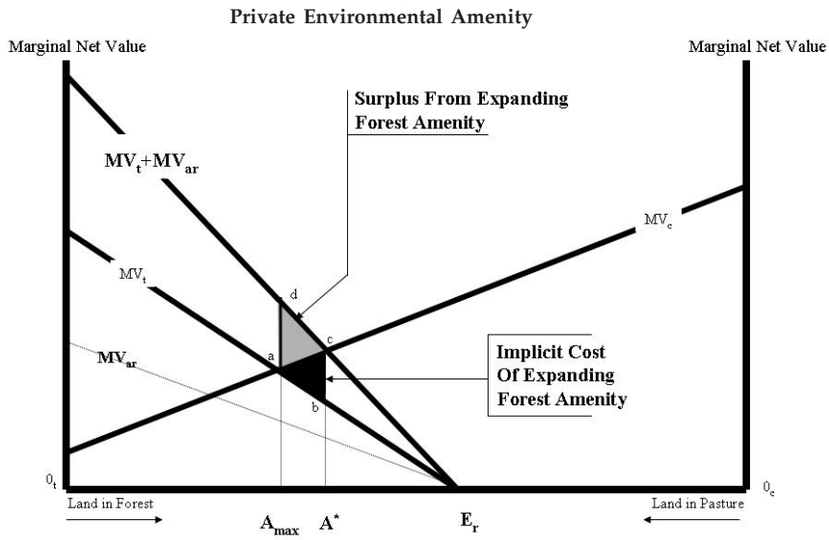


Figure 2. As the figure is drawn, marginal amenity value and marginal timber value reach zero at the same place, but that is merely drafting convenience. The amenity could provide utility even after marginal timber value fell to zero, inducing the rancher to maintain so much forest that her accountant would scold her about the marginal pecuniary profit being lost. Or, as will be discussed below, satiation with the amenity could occur where the marginal timber value remains positive.

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 $MV_c - MV_t = MV_{ar}$, in other words, where the marginal (objective) cost of the amenity equals its marginal (subjective) benefit. Buchanan and Stubblebine (1962) discuss relevance solely in the context of externalities, but the concept is more broadly useful – because there is only the decision-making rancher on the island, there are no externalities in Figure 2. Nonetheless, a previous irrelevant amenity has become relevant to the rancher's choice of boundary between the outputs. For brevity call the amenity *boundary relevant*, meaning the rancher's demand curve for the amenity extends beyond $A_{max}$. *Extensiveness* will be defined as the quantity where marginal amenity value reaches zero, at $E_r$ for the rancher.[2]

It might come as a surprise that this public good, the forest amenity, may have no relevance to the optimal island division. The rancher may see only part of the island at any moment, so her demand for the amenity may be inframarginal and thus have no influence on 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 on optimal production of cattle or timber – it is boundary *IR*relevant.

Like oxygen, an externality can be important in aggregate but irrelevant at the margin. Perhaps the lonesome rancher cherishes few things more than her beloved woodland, but is satiated before marginal amenity value has any impact on production decisions. The rancher enjoys as much of the treasured 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 that the public sector must resolve.

## II. PUBLIC GOODS: WHEN DOES A DEMAND MATTER?

The model assumed away so many complications that no policy issues have arisen. This section corrects that by letting non-owners enjoy the forest amenity. As will be seen, sometimes that will alter the policy implications, but sometimes it will not.

### 1. Externalities: Public Goods With or Without a Public

Vessels begin passing, and sailors admire the forested view. The public trust doctrine prevents the rancher from barring offshore viewers, so the

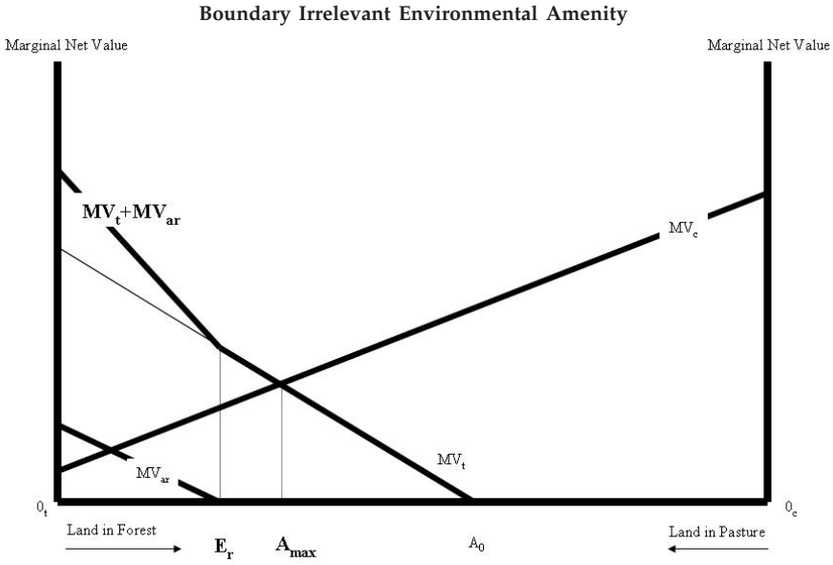


Figure 3. Interestingly, with fewer sailors the amenity value of the island's forest would be reduced since there would be fewer consumers of the amenity over which to aggregate the value. Free riding, however, would pose less of a barrier to obtaining the amenity – both rancher and a single or handful of sailors might recognize that each of them would have to contribute or too little financing would be available. Paradoxically, then, a minor Kaldor-Hicks improvement would seem easier to achieve than the major one.

forest-amenity is nonexcludable. And it is nonrivalrous in consumption; the rancher's act of viewing left the vista unaltered for anyone else wanting to take a peek. For economists to call the amenity a public good seems a bit peculiar – a view of the island forest was already a public good according to that definition even when the rancher was the entire body public.

If no sailor would anticipate sufficient benefit to justify bearing the transaction cost necessary to induce the rancher to expand the forest, an appropriate tax-expenditure scheme might offer a Kaldor-Hicks improvement, just as the common intuition would have it.[3] Being offshore, however, the sailors would see less of the island than the rancher and see it less often. Similarly, the rancher might value a finer texture to the beauty than the sailors could resolve from a distance. Thus the rancher might value a more extensive amenity than do the sailors and value the amenity more highly than would any one of them (indeed, perhaps more highly even than all the sailors aggregated together). Thus, the sailors might be satiated with less investment in

the island forest than the rancher has selected solely to maximize her own utility.

Any additional units cultivated to satisfy the rancher beyond what satiated the sailors would comprise a public good in the economist's nonrivalrous and nonexcludable sense, but the public interest could hardly be implicated. Free riding would not interfere with obtaining the efficient size of forest if only the rancher values the amenity *at the margin*, nor does transaction cost create a market failure if there is no marginally relevant demander with whom the rancher could transact. Though the sailors cannot be excluded from free riding, the size of the forest is optimal nonetheless.

Thus a tax-expenditure scheme may be unnecessary to achieve the optimal forest amenity – the rancher may select it of her own volition. A positive externality certainly exists since the sailors can and do enjoy a view of the forest while bearing none of its cost, but it is an irrelevant externality in the terminology of Buchanan and Stubblebine (1962). In fact, if the rancher *could* exclude but could not perfectly price discriminate among the sailors because their idiosyncratic interests are unascertainable by her, her profit-maximizing choice of an asking price would likely leave some sailors unwilling to pay despite the utility they could have received from viewing the forest-amenity/public-good. Excludability, in brief, would not solve a public goods problem but create a different one that would reduce the amenity's value. But because the rancher can bar none of the viewers there will be both free riders and an efficient amount of amenity.

## 2. 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 nearly all rivalrous good demands have an impact on output, as illustrated above. But relatively weak demands have no impact on the optimal amount of a public good. Those with the most extensive demands may finance so much of it that the marginal interest of the rest evaporates. The point is not that appropriate policy would discriminate against some beneficiaries of public goods, but that some interests become irrelevant once the beneficiaries have been satiated. It is, in brief, the beneficiary and not the policy who determines whether a demand is relevant or irrelevant. Those with inframarginal demands value the good, but they are satiated before their preferences have any impact on optimal provision. We use up a rivalrous good as we utilize it, but nobody uses up a public good by enjoying it. Consequently those with less extensive demands can enjoy as much as they want (thus until marginal value *to them* has fallen

to zero) without the expenditure of more than has been expended by marginal demanders.

> Blessed are they whose demands for public goods are irrelevant, for they shall be satiated while bearing none of the cost.

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. Suppose instead that 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, even less extensive demands by one or more sailors may alter the ideal amount, 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 shaded area. The frequent inclination is to restrict focus to the shortfall of the product that yields the amenity, in other words to the area under the summed marginal values of timber and amenity between $A^*$ and $A^\dagger$. That clearly overstates the loss (perhaps grossly) because the value of the additional cattle permitted by the larger pasture is then ignored. Still, a policy that expanded the forest might recoup part of the shaded area, though no policy could recoup it all because administering the bureaucracy would entail cost, whether modest or disproportionate, and that must be netted out.

*The Rancher's Reaction*: If transaction cost were modest the rancher would of her own volition move the boundary to $A^\dagger$ because she would be paid to do so by those sailors who enjoy 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 public good, low transaction cost is substantially more likely than one's intuition might suggest. With a rivalrous good the number of necessary consumer-producer interactions depends on

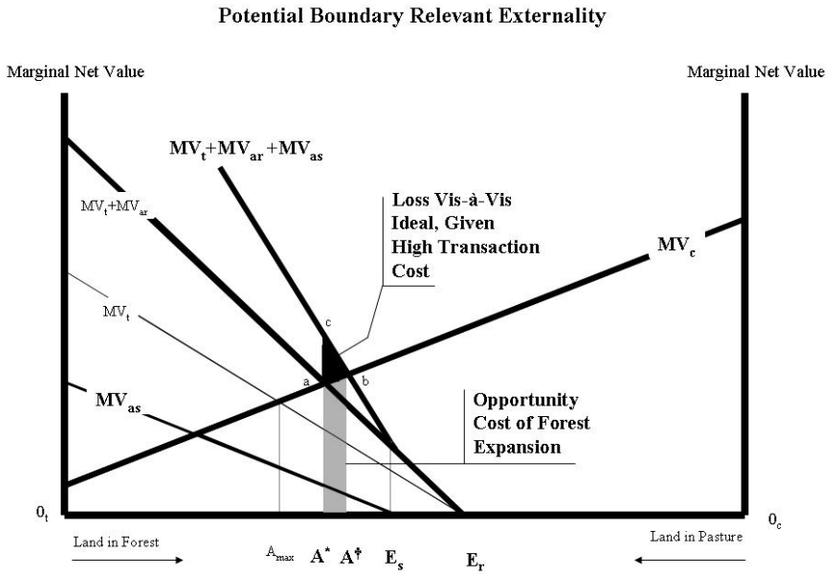


Figure 4. Public Environmental Amenity

where individual demand curves intersect the *vertical* axis, and for most viable products there will be a lot of intersections above the market *price*. But for a public good the intersection of less extensive demands with the *horizontal* axis matters in comparison with the *quantity* secured by more extensive demands. With rivalrous goods everyone pays the same price for different quantities (possibly zero) unless there is price discrimination, whereas with public goods everyone enjoys the identical quantity for different prices (possibly zero). Sailors will have varying demands, and sometimes the second most extensive of those 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 demand is boundary relevant, and the rancher must negotiate only with that single especially interested sailor. Most people bear that level of transaction cost (and more) virtually nonstop – buying a house or car, attracting and then living with a spouse, negotiating for a job, allocating fence repairs between neighbors, having a suit properly tailored, and so on. To be sure, the rancher would find it difficult to determine if there are any boundary relevant sailors. In the present example, however, any boundary relevant sailors would have no difficulty identifying the rancher and knowing that she is the counterparty who might be worth negotiating with. A boundary relevant sailor would have to self-identify if his demand was to have any influence.

A different public policy issue arises if, though there are only a few of them, boundary relevant parties cannot easily identify each other. Suppose there are two million sailors, one or a few of whom might be willing to pay enough individually or in aggregate to obtain an expanded forest, and two thousand ranchers, one or a few of whom might be willing to expand their forest for that payment. The parties might quite plausibly find it impossible to solve the identification problem. In such an instance, however, the proper role of government would not be to determine the forest's size by fiat, but the less intrusive role of helping the boundary relevant parties identify each other so that negotiations between them can commence. The amenity value is subjective, and bureaucrats will never be able to estimate it with anything approaching the judgment the parties themselves can bring to bear.

As the common intuition has it, in summary, for the rancher to negotiate with two million sailors would indeed be prohibitively costly, 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 only a few sailors (or none) have boundary relevant demands.

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.

That actually understates the bureaucrat's problem. Suppose that the bureaucracy manages to hit $A^{\dagger}$ 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 the boundary-relevant demanders. Thus even a perfectly selected division of the island between forest and pasture is unlikely to remain perfect. Of course, a tolerable bureaucratic estimate yesterday implies that a tolerable one is plausible tomorrow. However, that will require canvassing those affected in one way or another, hence once again obtaining costly information that the rancher and sailors obtain automatically in the normal course of their activities. Due in part to that greater information cost, bureaucratic policy making tends toward inflexibility and episodic, large changes.

Transaction costs for public goods – even if enjoyed by millions – are chronically overestimated. Only one or a few strong demands often

determine both actual and ideal provision. Even two million demands are irrelevant if they are inframarginal.

## III. MITIGATING A PUBLIC BAD

I like to look at my pretty colleague. For all I know other men are admiring her at the same time, but as it is a nonrivalrous pleasure that has no impact on my enjoyment. Given her obligations within the workplace she could not evade our glances if she wanted to, so the pleasure is nonexcludable. In brief, my colleague privately provides a public good to the men around her. I suspect that most of those external benefits are irrelevant; I doubt that she spends one second of marginal effort on her appearance in order to please colleagues given the substantial effort she has already spent to please her husband. From what origin is that amenity to be measured? Even on her very best day my colleague could have looked still more attractive, while on her worst day it would have been very easy for her to look much worse. Where then is the zero?

For many nonrivalrous and nonexcludable goods it is not obvious what zero means. That is no problem in view of the symmetry between public bads and public goods. With no loss of generality zero can be taken arbitrarily as the status quo. A public good is a movement in a positive direction from the status quo and a public bad is a movement in a negative direction. Because a movement in either direction entails costs as well as benefits, the optimal amount of a public good will not be the most that is feasible; nor is the optimal amount of a public bad zero as a general transitional matter.

In the model above the issues addressed were, first, would additional forest provide amenity value at the margin, second, if so does the marginal amenity value comprise a relevant externality, and third, if it does will insuperable transaction costs prevent internalization? Taking the status quo as zero and recalling the symmetry, an equally valid perspective treats forest amenities from the public bad angle; if having more forest increases amenity, having less by logging the forest reduces it. In that event reducing the logging (though not necessarily eliminating it) would comprise a public good. Is it imaginable that some individuals have such a strong demand for the forest amenity that they will act to reduce logging to such an extent that less intense demands are satiated? Quite possibly the following example represents just such an instance.

In June, 2007 a coalition of environmentalists paid $65 million for nearly 80 square miles (205 km$^2$) of California's redwood forest that had been owned by the Hawthorn Timber Company, which had been logging the plot (Fischetti 2007). A bank loan was required by the coalition in

order to raise sufficient funds. To repay the loan, the coalition intends to operate the tract as a nonprofit business and continue logging the site, though at a reduced rate, and to sell an especially scenic coastal strip amounting to less than ½ square mile (1¼ km²), which will become a park. The coalition also hopes another environmental group will buy a conservation easement covering the remaining land, protecting it from development as vacation home sites if the nonprofit fails.

In many similar situations a state government might have purchased the plot for a preserve or park. A spokesman for the coalition articulated several disadvantages of state purchase. Employing the vocabulary of this article, several of the disadvantages of state ownership would have arisen from costs and benefits (including preservation of jobs) that are local and subjective. Given so many local and subjective costs and benefits, local decision making will almost surely result in a better stream of decisions over the years than any diligent, honest bureaucracy could achieve. The plot will continue to provide timber, employment, and recreation, and of course existence value even for those of us who are never able to visit the forest.

## IV. CONCLUSION

This article disputes the notion that the optimal amounts of public goods can be inferred from a theory that was derived to analyze rivalrous goods. Because a public good is not used up as an individual enjoys it, the appropriate amount cannot be determined from the population of users, but instead depends on the relatively strong preferences of the most avid user(s). Surveys that attempt to aggregate amenity value over the entire population miss the mark entirely, even were they capable of eliciting accurate responses. Moreover, the article contradicts the notion that free-rider problems inevitably become more severe as the number of users consuming a public good grows; free riding becomes worrisome only when *boundary relevant* users become numerous. Finally, it argues that private parties are able to arrange for an efficient amount of many public goods (including the mitigation of public bads) because so many externalities are irrelevant.[4]

A public good, even one enjoyed by a very large public, creates no policy issue if other people are satiated by the most avid demander's voluntary decisions. Even if others are not satiated in that way, no policy issue arises unless transaction cost seriously burdens negotiations between that person and the others whose interests are similarly strong. Given enough interpersonal variance among preferences, the other parties with relevantly strong interests will sometimes consist of only one or a few people, so relative to transaction cost in the political sphere little cost would be incurred through negotiation.

Where some government involvement might prove beneficial, ownership and production of the public good would often be better done privately. If the main barrier to an optimization is that the few relevant pairs within a large population cannot identify each other, then public sector involvement could be limited to providing that information, the specific arrangements being left to the now mutually-known parties.

That any scholar would fail to notice the substantial voluntary provision of public goods by individuals is especially peculiar given that the provision of public goods is arguably the most important component of what scholars do. Many U.S. academics are employed by universities such as Harvard (founded 1636), Yale (1701), Dartmouth (1769), and Northwestern (1851) that predate substantial government involvement in higher education, which began with the Morrill Act (1862). Even with today's much larger government involvement, a substantial portion of the academic budget comes from the private sector. Though much research yields private benefits such as salary increments and prestige, once developed, an idea's use by one person rarely destroys its usefulness to another. A government/public-goods nexus is a special case, not a general rule.

How then is one to choose between government and private provision of a public good? Theory can tell us what screwdrivers and saws can do, but one can never know whether to employ a saw or a screwdriver without first determining whether the task requires cutting wood or fastening it together. Theory often exists on a pedestal to the exclusion of serious institutional analysis. Theory is a tool, however; it should never be considered to preempt careful observation.

Much mischief arises from a misapprehension that a large pool of public good beneficiaries inevitably creates prohibitive transaction cost. That will be true only if comprehensive negotiation among them is necessary, but comprehensive negotiation will be unnecessary when there is a large variance across beneficiaries in the strength of interest in the good.

For public goods, there can be such a thing as a free lunch.

## NOTES

1 All flows should be interpreted as discounted to present value.

2 As the figure is drawn, marginal amenity value and marginal timber value reach zero at the same place, but that is merely drafting convenience. The amenity could provide utility even after marginal timber value fell to zero, inducing the rancher to maintain so much forest that her accountant would scold her about the marginal pecuniary profit being lost. Or, as will be discussed below, satiation with the amenity could occur where the marginal timber value remains positive.

3 Interestingly, with fewer sailors the amenity value of the island's forest would be reduced since there would be fewer consumers of the amenity over which to

aggregate the value. Free riding, however, would pose less of a barrier to obtaining the amenity—both rancher and a single or handful of sailors might recognize that each of them would have to contribute or too little financing would be available. Paradoxically, then, a minor Kaldor-Hicks improvement would seem easier to achieve than the major one.

4 The theory elaborated here formalizes institutional findings that have been discussed elsewhere (Haddock 2004; 2008).

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