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Private Land Conservation and Public Policy: Land Trusts, Land Owners, and Conservation Easements

Dominic P. Parker[1,3] and Walter N. Thurman[2,3]

[1]Department of Agricultural and Applied Economics, University of Wisconsin–Madison, Madison, Wisconsin 53706, USA; email: dparker5@wisc.edu

[2]Department of Agricultural and Resource Economics, North Carolina State University, Raleigh, North Carolina 27695, USA; email: wally_thurman@ncsu.edu

[3]Property and Environment Research Center (PERC), Bozeman, Montana 59718, USA

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Abstract

We highlight the extraordinary growth in private conservation via land trusts and conservation easements and describe the problems arising from the interplay of public finance and private decisions. We offer a framework for understanding the popularity of easements and land trusts and for evaluating policy reforms aimed at improving their performance. The framework, grounded in institutional and organizational economics in the tradition of Ronald Coase, Oliver Williamson, and Yoram Barzel, focuses on the measurement and monitoring costs faced by public and private stakeholders under current and prospective policy arrangements. We illustrate how the framework can be applied to contemporary debates about the appropriate tax treatment of donated easements, requirements that they be held in perpetuity, and the extent to which government should regulate private land trusts.

1. INTRODUCTION

In this review, we explore the economics of private land conservation and how it is influenced by public policy. By private land conservation, we mean efforts to expand, preserve, or enhance the production of amenities and ecosystem services on private land. This is a broad definition and includes efforts directed toward amenities and services that can be consumed by owners of the land (and those with whom they contract) but also by others. Rather than focusing narrowly on a prescribed set of ecosystem services consumed by third parties, we include both the private goods typically contracted for in real estate markets (land as an input into agricultural production and as space on which to build) and public goods, which are costly to exclude others from enjoying (habitat for wildlife, the preservation of historic locations, on-site recreation, and scenic views).

While we are inclusive in our definition of private land conservation, public policy is, or should be, primarily concerned with benefit flows that do not accrue directly to land owners or those with whom they contract. Therefore, public policy toward private conservation is appropriately directed toward regulation, subsidy, and taxation that influences the public goods flows from private land. A separate set of issues concerns the management of publicly owned lands.[1]

Many public policies influence private land conservation both in the United States and elsewhere: local zoning and land-use ordinances and the various incentives built into tax codes that differentially tax developed and undeveloped land. Governments on every continent are now paying private landowners to voluntarily refrain from making land-use changes or to engage in particular land-use practices, through incentive-based programs sometimes described as payments for ecosystem services (see, e.g., Salzman 2005, Jack et al. 2008, Alix-Garcia & Wolff 2014).

This is true in the United States, where federal and state governments run payment programs (such as the Conservation Reserve Program), but the United States is unique in that a less centralized approach toward private land conservation has become dominant in recent years. In the United States, there is preferential tax treatment toward conservation easements held by nonprofit conservation organizations. Easements—permanent restrictions on land use—reduce land value and are often deemed charitable contributions, thus generating federal and state income tax benefits. In this system of conservation, the government's main role is to set tax policy and then let individual landowners and nonprofit organizations determine the quantity and patterns of permanent conservation under limited regulation.

Because so much US policy activity in recent years has focused on conservation easements, and because of their extraordinary popularity with nonprofit conservation organizations, our discussion is slanted toward policy that influences easements and the entities that contract over them. We begin by explaining the organizations, known as land trusts, and describe their growing use of easements. Next we provide an overview of the difficult principal-agent and contracting problems that must be mitigated for successful conservation via land trusts and especially easements. We offer a framework for analysis that is rooted in the literature on institutional and organizational economics in the tradition of Coase (1937), Williamson (1996), Barzel (1997), and Hansmann (1996). We highlight the framework's usefulness for assessing policy debates about the appropriate tax treatment of easements, requirements that they be held in perpetuity, and the extent to which government should regulate land trusts. Our goal is to promote further research on private land conservation that utilizes the framework.

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[1]For example, National Park Service land is managed in ways that affect wildlife populations; this is public land conservation. But land adjacent to national parks and elsewhere also is home to wildlife and, therefore, public policy toward such land falls under the general scope of this review.

2. LAND TRUSTS AND CONSERVATION EASEMENTS

In this section, we describe land trusts, conservation easements, and the key tax policies that affect their activity.

2.1. Land Trusts

Land trusts are nonprofit organizations that enhance or preserve environmental amenities, such as wildlife habitat, scenic views, and recreational trails, on private land. They do so primarily by buying or encouraging donation of land and conservation easements. But land trusts are most usefully viewed as producers of service flows, not just passive holders of land title or enforcers of easement provisions, because they often attempt to coordinate landscape-level conservation.

Although a handful of large trusts, such as The Nature Conservancy, are national in scope, most operate at state or local levels. Land trusts have charitable status and are governed by an unpaid board of trustees. Trustees and organization employees cannot enrich themselves with land trusts assets, and they are supposed to manage the assets for the general public and other beneficiaries (Fairfax & Guenzler 2001). The Land Trust Alliance (LTA) identified 1,363 active land trusts in 2015, up from 535 in 1984 and 885 in 1990 (Chang 2016).

Most land trusts conserve land using a mix of private donations and public monies. Land trusts solicit cash, land, and conservation easement donations. Some cash gifts come from corporations and individuals who can claim the value of the gifts against their tax burden (as long as the land trust is a qualified public charity organization). As discussed in detail later, an array of federal, state, and local tax benefits are available to landowners who donate easements to trusts. Public monies are also channeled more directly to land trusts through local open space initiatives or through federal and state conservation programs (such as the federal Farm and Ranch Lands Protection Program).

2.2. Conservation Easements

A classic analogy is useful for describing a conservation easement. Think of land as a bundle of sticks. Each stick represents a right to use land, or exclude others from using land, in a particular manner. A conservation easement amounts to a landowner ceding some sticks from his or her bundle for a specified duration (usually for perpetuity).

A conservation easement may preclude landowners from activities such as developing, subdividing, clear cutting, grazing cattle near stream banks, strip mining, or erecting billboards. An easement may require landowners to build fences, maintain trails, or engage in organic farming. An easement may grant the holder (e.g., a land trust or government agency) rights to construct recreational structures, conduct scientific studies, and remove or plant vegetation. It may also permit public access on the land for recreation. There is an array of possibilities (see Rissman et al. 2007). Easements are negotiated on a case-by-case basis, and the terms in the over 42,000 easements held by land trusts as of 2015 vary significantly (Chang 2016).

Conservation easements are property rights, as opposed to contractual rights, because the terms conveyed in them "run with the land." This means that successor landowners (and possibly successor easement holders) are generally bound to the terms agreed upon by the original parties. In practical terms, once a landowner grants a conservation easement, all future owners are constrained in what they can do. If a granter of an easement agrees to relinquish his right to subdivide and also agrees to allow public access, all future owners of the land must abide by these provisions.

Land-trust-held easements spanned 16.8 million acres in 2015, a land area nearly the size of the US state of South Carolina (Chang 2016). **Table 1**, adapted from Parker & Thurman (2018),

Table 1 Comparison of government and land trust holdings in the United States. Adapted with permission from Parker & Thurman (2018). Copyright 2018, University of Chicago Press

Holding type	1990 acres	2010 acres	Change 1990–2010	% Change 1990–2010
Four federal land agencies				
US Bureau of Land Management	168,223,327	171,186,890	2,963,563	1.76
US Forest Service	165,790,139	167,598,134	1,807,995	1.09
US National Park Service	20,179,876	24,380,375	4,200,499	20.82
US Fish and Wildlife Service	4,697,914	4,882,153	184,239	3.92
Federal programs				
Conservation Reserve Program (CRP)	32,522,280	31,298,245	−1,224,035	−3.76
Wetlands Reserve Program (WRP)	0	2,311,702	2,311,702	NA
State parks	7,895,296	10,526,759	2,631,463	33.33
Land trusts				
Outright ownership	2,165,041	7,681,198	5,516,157	254.8
Conservation easements	793,137	13,392,500	12,599,363	1,588.6

compares the impressive growth in easements between 1990 and 2010 with more traditional approaches to land conservation. The growth in easements outpaced federal and state land conservation, and it also outpaced the acquisition of land outright (fee simple) by land trusts. Easements comprised 27% of total land trust acreage (easements plus fee simple) in 1990 compared to 67% in 2015 (Chang 2016).

What explains the rapid growth in conservation easements? At their core, easements are a contracting innovation that can allow more value to be extracted from land, which is fixed in supply. The innovation—statutory amendments to property law—is due to the early pioneers of the land trust movement, acting in the 1970s and 1980s, who recognized that benefits from open space could be preserved while simultaneously allowing compatible commercial activity (Anderson & Parker 2013).[2] At least in theory, important dimensions of land can be conserved via easements, without buying land outright, allowing a farmer to specialize in commodity production and a land trust to specialize in landscape-level conservation. This is an efficiency explanation for the popularity of easements: By dividing ownership, they allow for more specialized use of land assets and facilitate gains from trade to jointly enhance the production possibilities for both farming and permanent conservation (Parker 2004). The drawback of easements is that they also create monitoring, measurement, and enforcement challenges, as discussed in more detail throughout this article.

[2]The widespread use of conservation easements required the development of specialized property law outside the scope of common law. Most conservation easements, as a primary objective, restrict landowners from engaging in certain land uses. Yet the common law on property does not generally recognize negative easements. Cases in which the benefits of negative easements accrue to owners of adjacent parcels are traditionally treated as exceptions (e.g., right of way easements), but conservation easements are intended to benefit a broad range of public beneficiaries (Boyd et al. 2000). For this reason, courts equating conservation easements to negative easements under common law are unlikely to enforce agreements on successive landowners. Because of this and more subtle common law obstacles, modern conservation easements in the United States rely on statutory law for enforcement. Each state has passed an easement enabling statute, the first in 1969 (Massachusetts) and the last and most recent in 2001 (Wyoming and Pennsylvania). Easement enabling statutes generally include basic enforcement provisions that override common law objections and delineate the acceptable purposes for easements (Dana & Ramsey 1989).

Land trust growth has been far from uniform across the United States, and research has attempted to identify some of the local demand- and supply-side drivers of relative growth. Research has tested the hypothesis that land trusts emerged as a private substitute for government-protected land (see Albers et al. 2008, Parker & Thurman 2011, Lawley & Yang 2015). In general, however, there is little indication that land trusts are systematically crowded out by government ownership. The evidence is more conclusive that demand-side drivers such as income growth have contributed positively to land trust activity across US states (Albers & Ando 2003) and across US counties within states (Parker & Thurman 2011), suggesting that permanent land conservation is something that people demand more of as income grows.[3]

2.3. Tax Incentives

Tax incentives for donors of conservation easements are a key supply-side driver of growth. The federal government has, since 1976, allowed the appraised value of an easement donation to be considered a charitable contribution and deducted from federal taxable income.[4] This incentive was enhanced in 2006 when limits on deductions as a percentage of the donor's adjusted gross income (AGI) were relaxed. Most states also allow easement deductibility from state income taxes, and since 2000 several states have created and expanded generous tax credit programs for easement donations (Suter et al. 2014, Soppelsa 2015, Parker & Thurman 2018).

Parker & Thurman (2018) develop a tax calculator to estimate the after-tax donation price for different landowner-income and donation-value scenarios. The estimated donation price is one minus the proportion of each dollar of the appraised easement value donated that is recovered through income tax savings. The estimated price incorporates federal and state income tax rates, rules about charitable deductions, and state tax credit programs. It also accounts for the dynamic effects of carryover provisions and annual income limits on easement deductions. It accounts for savings on capital gains income, but it does not account for any estate tax or property tax benefits. The calculator demonstrates that, in states with generous tax credits, such as Colorado and New Mexico, it may be possible for landowners to recoup most of the donation value through savings on income taxes.[5]

Parker & Thurman (2018) also estimate the responsiveness of easement donations to changes in tax prices. For a representative landowner, changes in federal law decreased the price by 6.6% in 2006, and the introduction of state tax credits lowered the donation price by as much as 25% in some states (e.g., Colorado and South Carolina). The estimated elasticity is −6.1, based on changes in the state-level flow of annual easement acres with respect to changes in the donation price over

[3] In economics jargon, land conservation is a normal good. Note that we consider income growth and government land ownership to be demand-side factors because each could influence the willingness-to-pay of local consumers of land trust conservation, by either augmenting private donations of cash or by increasing local government funding (Kotchen & Powers 2006).

[4] Easements are appraised as the difference between the land's unencumbered (fair market) value and its encumbered (current use) value (Boykin 2000). In order to be eligible for deductions, donated easements are supposed to meet at least one of a wide range of conservation purposes and they must be held in perpetuity. Eligible purposes include outdoor recreation, fish and wildlife habitat, open space scenery, and historic preservation.

[5] Because an easement lowers property values, landowners may realize property tax reductions after encumbering their land and may also reduce their estate tax and capital gains tax exposure. Under certain circumstances, the combined tax benefits to a landowner can be large. This occurs when landowners have sufficient income to offset the entire deduction, hold land that is otherwise ineligible for an estate tax exemption, and live in a state offering attractive tax credit programs. In some of the tax credit states such as Colorado and Virginia, it may be possible for landowners to recoup more than the entire value of their easement donations.

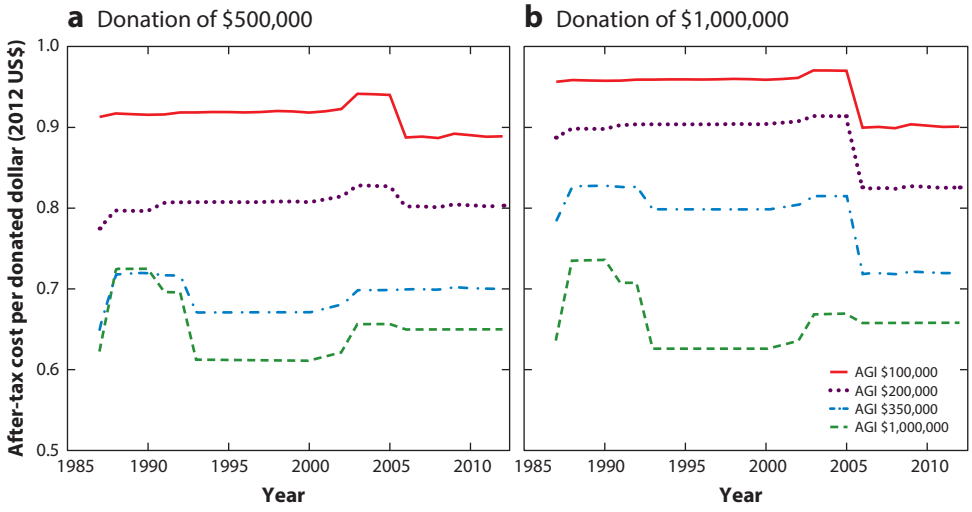

Figure 1

After-tax price of donating a conservation easement (one minus the proportion of easement value recovered through federal income tax savings). We assume that the adjusted gross income (AGI) $100,000 and AGI $200,000 donors are qualified farmers and the higher AGI donors are not. All scenarios assume that none of the donation's value would otherwise be subjected to capital gains.

1992 to 2012. This implies that the 2006 changes in federal law induced a 40% increase in the annual flow of easement acres, and the introduction of state tax credits in Colorado and South Carolina induced an almost 200% increase in the annual flow of easement acreage.

The tax calculator also quantifies the dependence of the tax incentive to donate on the easement value relative to landowner income. **Figure 1** shows the price over time for an easement donated in the seven states lacking a state income tax (e.g., Florida, Washington, and five others). Focusing on these states isolates and highlights the role of federal income tax policy. Each panel plots the price for four different taxpayers: those with adjusted gross incomes of $100,000, $200,000, $350,000, and $1 million. **Figure 1** shows calculator output for easements appraised at $500,000 (**Figure 1*a***) and $1 million (**Figure 1*b***).[6]

The prices demonstrate the combined effects of differences in marginal tax rates and of AGI limitations on deductions and carry-forward limits. Notably, **Figure 1** shows that prior to 2006, the price of conservation increased with donation size, primarily because of a 5-year carry-forward limit on charitable deductions.[7] The price of conservation can be seen to fall for lower income donors in 2006 because the carry-forward period was extended from 5 to 15 years. Also in 2006, the restriction that a deduction could not exceed 30% of AGI was relaxed to allow deductions up to 100% of AGI for qualifying farmers and ranchers.[8]

[6]The actual average easement donation was $475,416 over 2003–2012, which dwarfs in value every other form of charitable giving on a per-donation basis: art, real estate, and money (Parker & Thurman 2018).

[7]Because of the AGI limits and carry-forward constraints, the taxpayer with an AGI of $100,000 could deduct only 0.30 × $100,000 = $30,000 each year for six years, leading to a total deduction of $180,000. Moreover, deductions in later years yield declining financial benefits due to the 5% annual discount rate we apply to the calculations.

[8]Hence, a qualifying landowner with an AGI of $100,000 would fully exploit the $500,000 donation in five years, which lowers the price of conservation from 0.94 to 0.89.

In broad summary, there are large gaps in the donation price across taxpayers, which increase with taxpayer income, holding constant donation size. Equivalently, the gaps increase with donation size, holding constant taxpayer income. This is in part because high-income donors pay higher marginal tax rates and in part because land-rich but cash-poor donors have not been able to deduct the full value of their donation, especially prior to 2006. The gaps grow further if we account for savings from state income taxation, which can be large in states with high marginal tax rates (e.g., California) and in states with generous tax credits for easement donors (e.g., Colorado).[9] The gaps would grow further if one were to consider the potentially large savings in property taxes and inheritance taxes for easement donors (see Sundberg & Dye 2006, Sundberg 2014).

The fact that donation prices are decreasing landowner income helps explain why easements tend to be donated by wealthy people. Internal Revenue Service (IRS) summary data spanning 2003–2012 show that although 2% of easements came from taxpayers with annual incomes greater than $10 million, these donors accounted for 23% of the monetary value. Taxpayers with incomes exceeding $500,000—roughly the top 1%—accounted for 17% of donation quantity but 75% of monetary value.

Important conclusions regarding the conservation incentives embedded in the tax code are: (*a*) Tax incentives have induced significant growth in the quantity of easement donations, and (*b*) donation prices are decreasing landowner income but invariant to easement quality. We will return to these points below, where we emphasize how monitoring and measurement problems of easement value can lead to questionable easement appraisals, and also to the donation (and acceptance) of low-quality easements with limited conservation value.

3. EMERGING QUESTIONS FOR FUTURE RESEARCH

As the use of conservation easements has grown, academics, stakeholders, and critics have begun to raise legitimate questions about their on-the-ground effectiveness. Although we know that 16.8 million acres are under easements, surprisingly little is known about their conservation value. Do easements actually provide additional conservation, or do they simply displace development and reward landowners for actions they would take regardless of whether or not the land is under easement? Are tax policies effective conservation tools, and is there a better way to incentivize conservation? Are land trusts positioned to monitor and enforce easements into perpetuity? How much oversight and regulation should governments engage in with respect to easement appraisals and land trust practices? Below we describe some of the salient issues and review relevant research.

3.1. Syndicated Easements and the Appraisal Challenge

The most recent wave of public scrutiny over conservation easements concerns the rising use of so-called syndicated easements since 2012 (Elkind 2017, Looney 2017). These deals involve groups of investors forming partnerships that buy land with the intent of donating easements for financial gain. The partnerships seek land they believe will be eligible for easement donation tax benefits, seek appraisers to place a high value on the easement restrictions, and seek land trusts willing to hold the syndicated easements. In 2016, syndicated easements comprised approximately

[9]The tax credits in some states, such as Colorado and New Mexico, are tradable. Making credits tradable shrinks the gap in donation price between high and low income donors because cash-poor but land-rich owners can sell tax credits to higher-income taxpayers who can fully exploit the tax benefits.

$6 billion in claimed deductions,[10] which exceeds claimed deductions from traditional (nonsyndicated) easements.

The use of syndicated easements is controversial. Some critics argue that the profit motive driving syndication is fundamentally in discord with effective conservation. Others take a more agnostic stance on motivation but argue that syndication results in the public overpaying for easements held by a small number of land trusts, appearing to have little to do with legitimate conservation (Looney 2017). Land trusts holding syndicated easements defend their use, pointing to the large amount of land permanently protected from development. Meanwhile, the US Congress is contemplating regulations that would render syndicates less attractive (discussed below).

What is the correct perspective on syndicates, and what can economic theory offer to explain their emergence? We view these as important questions for future research because they lie at the heart of inquiry into the merits of unregulated, private conservation. Here we offer some initial thoughts.

One perspective is that syndicates exist to fully and legally exploit income tax benefits. This they do through their organizational form, which spreads deductions and credits over a large number of partners with high marginal tax rates. Spreading out deductions ensures that each partner (*a*) can deduct against their highest marginal rate, (*b*) is not constrained by the 50% AGI limitation discussed above, and (*c*) is not constrained by individual limits on how many state tax credits can be claimed. In the context of the Parker & Thurman (2018) tax calculator, syndicates help maximize the income-to-donation ratio, which minimizes the after-tax price of each easement donation.

This logic takes as given the donated easement value. Recent publicity over easement appraisals claimed by syndicates, however, suggests that they may specialize in acquiring exaggerated appraisals. In one widely publicized case a syndicate bought a defunct golf course in 2016 in South Carolina for $5.4 million. The property had sat vacant for a decade. Investors bought the land at market price and, "with the help of a private appraiser, declared it to be worth $41 million, nearly eight times the purchase price" (Elkind 2017). This allowed the investors to claim a large easement deduction and to recoup significant tax savings.

Although the land's appraiser defends the appraisal as legitimate, the example highlights the general problem that appraising easements—valuing the difference between full market price and the price of land constrained by the easement—can resemble more art than science. When calculating the land's value without an easement, appraisers should account for zoning regulations and provide realistic estimates of development pressures. But these factors often are difficult to assess, and appraisers working on behalf of landowners wanting tax breaks have incentives to overestimate full market value. When calculating the encumbered value, appraisers should take into account the fact that buyers of land value scenery and open space and are often willing to pay extra for these amenities, so the value of the land may remain high even with the easement. Here, too, appraisers working for landowners wanting tax breaks have incentives to underestimate the encumbered value.

Appraisal challenges are exacerbated by the fact that land trusts have not been held liable by the IRS for erroneous or fraudulent valuations (McLaughlin 2016). Freedom from liability may be appropriate policy, but it weakens trusts' incentives to encourage truthful appraisals. The response to news about syndicates has been twofold. First, there have been legislative calls for federal and state governments to place more rules on how land trusts operate and on how appraisals are conducted. In some cases, lawmakers have threatened to disallow federal tax deductions. Second, the LTA—a trade organization for land trusts—launched a voluntary accreditation program that

[10]The source is a June 2018 letter from Commissioner of the Treasury to the US Senate Committee on Finance, on file with the authors.

began operations in 2008. Through this program, almost 400 land trusts have become certified as adhering to high standards for prudent, high-quality, and cost-effective conservation. We discuss these responses in greater detail below.

3.2. Conservation Value Versus Development Value

Even if one ignores the problem of incentives to inflate appraisals, there remains an incentive misalignment between land trusts and the general public. This is because easements are appraised by foregone development values rather than by the value of public-good amenity flows generated from undeveloped land, which we refer to here as conservation value. This means that the tax incentive to donate easements is just that—an incentive to donate easements—and not necessarily to donate ecologically or aesthetically valuable open-space amenities. Just as in the incentive contracting literature (e.g., Baker 2002) the agent (a landowner in our case) is paid to contribute toward an output that can be measured (the acreage of easements), which is not exactly what the principal (the public) is seeking. It is, perhaps, the folly of rewarding A while hoping for B.

The incentive misalignment will, in theory, limit the social surplus generated from donated easements. Using a game-theoretic model of private monetary incentives and experimental evidence, Anderson & King (2004, p. 355) conclude that, "unless land trusts are discriminating, conservation easements need not lead to optimal conservation, and may even reduce social welfare." Vercammen (2019) develops a theoretical model incorporating the option value of undeveloped land. It shows conditions under which the failure of a land trust to internalize the land's development value can result in a land trust accepting a welfare-reducing donated easement. The basic intuition is that organizations accepting tax-incentivized easement donations do not pay the implicit costs to US taxpayers and might therefore accept donated easements for which the (appraisable) development value exceeds the (unappraisable) conservation value (Parker 2004).

What is the effect of tax incentives on the average conservation value of easements acquired by land trusts? Will generous tax incentives actually lead to lower conservation quality of land trust acquisitions? The answer depends on how much land trusts are willing and able to discriminate on conservation quality. Parker & Thurman (2018) explore the possibility that more generous tax incentives could decrease the flow of low-quality easements by allowing trusts to choose quality offerings from a larger set of prospective donors. We offer a coarse empirical assessment of this issue and find no evidence of a systematic relationship between generous incentives and easement quality.[11]

To summarize, more research is needed to assess the quality of land trust conservation and the contribution of tax policy to average quality. There is a need for research on the social benefits of easement conservation relative to the social costs and, ideally, research that identifies policies that will best align the incentives of land trusts with socially welfare-enhancing conservation.

3.3. Perpetuity and Long-Term Stewardship

Conservation easements are unique not only in their division of land ownership but also in their duration: forever. Federal tax rules require that donated conservation easements be held in perpetuity. On the one hand, this requirement is useful in that it allows land trusts to operate with some assurance that the network of currently conserved parcels will remain undeveloped in the long run (see, e.g., Elmendorf 2004, Thompson 2004). On the other hand, the requirement is

[11]In the Parker & Thurman (2018) assessment, quality is measured by the percentage of easement acres acquired within a land trust's self-defined priority areas.

inconsistent with centuries of common law, which discourages perpetual constraints on land use (Mahoney 2002). The rationale is a concern over "dead hand control": Restrictions that freeze land use may become antiquated and inefficient over time. As economic and ecological conditions change, the benefits and costs of conserving particular parcels will change, especially in light of population growth and migration, changing demands on agricultural land, climate change, and changes in preferences toward the preservation of different wildlife species. Perpetuity simultaneously enables and frustrates effective conservation.

Perpetuity is also key in landowner motivations and the costs of IRS oversight. With respect to landowner motivation, Parker & Thurman (2018) model the commitment to perpetual conservation as an argument in a landowner's utility function. This is supported anecdotally by advisor reports of the importance of perpetuity in landowners' bequest motives. Whereas temporary conservation leaves open the option value to develop (see Vercammen 2019), perpetual conservation does not and hence fixes a transfer to future generations in the form of land use and not fungible wealth. Further, because the tax code favors only perpetual easement restrictions, it favors the production of a privately consumed characteristic (perpetuity) that is only imperfectly correlated with public and more fungible benefits.

With respect to tax authorities, value reductions due to perpetual commitments are arguably easier to appraise than would be value reductions due to terminal easements with expiration dates. With easements of finite duration, developers may temporarily put land under easement while waiting for the optimal time to develop, rendering easements of no added value in terms of their marginal contribution to open space protection. Similar behavior may occur with the Conservation Reserve Program, which is a temporary (typically 10 years) commitment (Jacobs et al. 2014, Jacobson 2014).

Finally, perpetuity raises issues related to land trust capacity. Land trusts understand the appeal of perpetuity to donors, who might be reluctant to donate if easement properties were viewed as fungible and transferable assets that could later be developed and reinvested in broader goals of conservation. As practical matters, and whatever the conceptual merits of perpetuity, the arrangement puts long-term stress on land trusts to monitor and enforce easements. This is especially relevant considering that many land trusts are small operations that may have limited capacity to monitor and enforce perpetual agreements.

4. A FRAMEWORK TO ORGANIZE FUTURE RESEARCH

This section sketches an analytical framework that gives insight into land trusts and coordination among various groups affected by private land-use decisions. It draws on the extensive literature on property rights, transaction costs, and contracting. Important issues that can be illuminated by the analytical framework include the quality of privately conserved land, the role played by perpetuity, the economic scope and desirability of easement syndicates, and the appropriate roles of public oversight and private certification of land trusts.

4.1. Property Rights to Value and Liability Streams

Private land conservation takes many forms, from fee simple private ownership to private land owners receiving payments for ecosystem services to land managed jointly by private owners and land trusts. In each instance, multiple parties take actions and are influenced by the actions taken by others. The benefits and costs are variable—depending on the actions taken by economic agents—and are often difficult to measure and verify. Costly-to-measure value flows give rise to contracting costs that vary with organizational form.

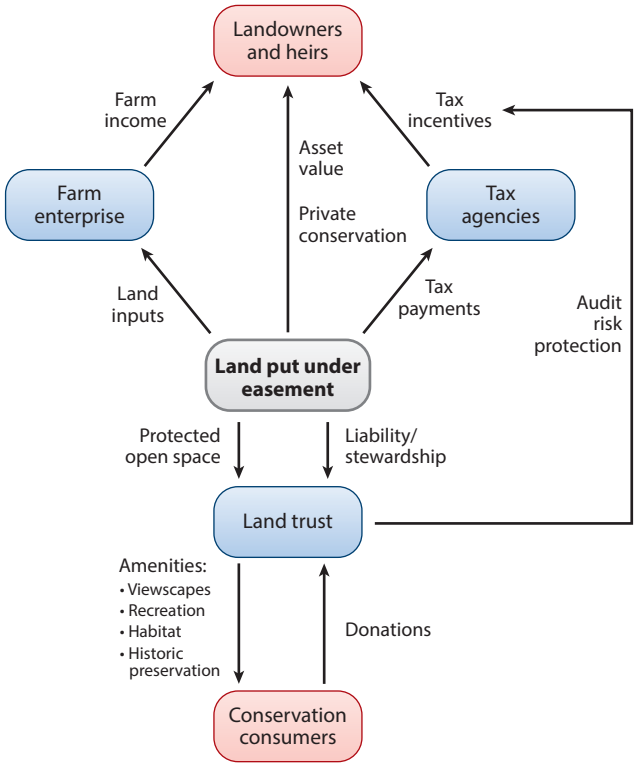

Figure 2

Residual value flows emanating from land put under a conservation easement.

The contracting costs associated with different forms and their conservation efficacy can be understood by considering a particular illustrative situation. Following Barzel (1997), **Figure 2** portrays the multiple value streams emanating from private farm land that has been put under a conservation easement. At the center of the diagram is the land, managed as a farm under the restrictions imposed by the easement. The plot provides the land base for agricultural production, represented by the upward flow of land inputs. These inputs are combined by the farm enterprise with other inputs (labor, capital, fertilizer, seed, etc.) to produce crops and, ultimately, farm income to land owners. As emphasized in the figure, farm income is not fixed by the easement restrictions; it also depends on the production choices made by farm managers.

Landowners' and heirs' wealth depends on the value of the land asset, which reflects the capitalization of future flows of farm income generated by allowable uses of the land. Land owners and heirs also receive the variable hedonic flows from different land uses, termed private conservation in **Figure 2**. Because putting land under easement is deemed a charitable contribution under federal and state tax codes, and because a number of states compensate easement donors with income tax credits, tax payments and tax incentives flowing from the land are influenced by both farm income and easement restrictions on development.

Arrows in the lower half of **Figure 2** represent flows to the land trust—an agent acting on behalf of conservation consumers but also populated with managers and employees with their own objectives. Flowing to the land trust is the raw conservation input of protected open space.

The trust combines open space with other inputs to produce flows of amenities for conservation consumers, some of whom belong to and donate to the land trust, and many of whom do not. The amenity flows are diverse, from minimally transformed land inputs such as scenic views to intensively managed service flows such as wildlife habitat and curated historical sites.

Conservation consumers provide some of the funding to land trusts through cash donations, which, like easement donations, are often incentivized by tax deductions. A primary use of such funding is the oversight and management of conservation easements held by the trust. Funds are also used by some trusts to purchase easements. Easements, both donated and purchased, create an important negative value flow: the liability borne by the trust due to its legal obligation to monitor and enforce the provisions of the easement. The term stewardship is often used to describe these responsibilities.

A significant relationship dealt with circuitously in **Figure 2** is that between the land trust and the landowner. The land trust provides important value to the landowner in terms of legal certification of the easement. A trust can do more or less to place the easement out of bounds of scrutiny by the IRS and state tax authorities. The variable value flow is labeled audit risk protection.

Figure 2 identifies the primary value flows accruing to economic actors: income, asset value, incentivized tax payments, and legal certainty to landowners; amenities to conservation consumers; and stewardship costs and donation income to land trusts. If conservation consumers and landowners are considered the principals in this system, several agents intermediate the value flows between them: farm managers (who could also be landowners), tax agencies, and land trusts. This skeletal description omits certain ellipses (with arrows) that could be inserted: taxpayers, lawyers, tenant farmers, and government officials among them.

Considering the variable value flows in **Figure 2** helps bring the contracting problems and transaction costs of private land conservation into focus. Due to multiple value flows and asymmetric information, principal-agent problems abound. Correspondingly, each of the value flow arrows generates contracting, or transaction, costs. An interesting question, which we pose but do not attempt to answer, is: How large in total are the transaction costs incurred in producing the value flows shown? More relevant to policy analysis (as in the issues highlighted in the previous section) is the marginal question: How do alternative public policies influence the value flows and transaction costs?

Public policy impinges directly on the value flows by (*a*) influencing the tax incentives felt by land owners and heirs and their exposure to audit risk and possible sanctions, and (*b*) influencing the tax favoring of cash donations to land trusts from conservation consumers. Policy impinges indirectly by (*c*) affecting agricultural land use resulting from land trust involvement in farm management under the terms of the easement, and (*d*) changing the composition and quality of amenity outcomes by changing the tax incentives to donate easements.[12]

4.2. An Incomplete Contracting Perspective on Land Trusts

Barzel (1997) provides a general treatment of the role played by property rights in determining economic outcomes. A central concept in his theory is that of incomplete contracts, which arise from transaction costs, which, in turn, arise from the inherent unobservability of certain

[12]The situation of easements in **Figure 2** is similar to the analysis of agricultural share tenancy found in Barzel (1997) and Cheung (1969). It differs in that the share tenancy problem involves only the division of farm income. Contracting in easements involves the division and quality of multiple outputs: public and partly fungible conservation value, private perpetual prohibition on further development, agricultural output, and tax revenue.

economic flows. Property rights to assets, according to Barzel, are in an efficient equilibrium held by those with the greatest influence over the variable returns that flow from the assets. The previous discussion of value flows from easement-encumbered land provides relevant examples.

Barzel (1997) notes that many residual claimants (property owners) are typically involved in economic production, by a classical for-profit firm or otherwise. Here he departs from the more standard model of the firm presented in Coase (1937), which considers the firm to be an organizational boundary inside which decisions are made by a single profit-maximizing owner. Other related theories include those of Alchian & Demsetz (1972), Klein et al. (1978), and Grossman & Hart (1986). Applying these concepts to the production of private conservation leads naturally to a focus on the nonprofit nature of land trusts, the contractual choice between renting and owning, and the unique tax treatment of land put under easement. We discuss here the implications of theories we deem relevant to an understanding of these issues.

4.2.1. The role of measurement costs. Hansmann (1980, 1996) and Sunder (2018) develop measurement theories that provide an explanation for why nonprofit organizations are prevalent providers of environmental goods in our economy. These measurement theories complement more traditional economic theories. These suggest that nonprofits exist to satisfy the needs of people with higher-than-average demands for public goods (Weisbrod 1975) and to supplement provision beyond what may be provided by the government as determined by the median voter's preferences (Borcherding & Deacon 1972).

Hansmann (1980, 1996) and Sunder (2018) discuss the information gathering and reporting problems addressed by public organizations or donative NGOs, which are nonprofit entities that produce goods not sold or otherwise charged for. To Sunder, the important operational difference between for-profit and nonprofit organizations is that the former give wide discretion to managers, including discretion over product choice. For-profit managers are evaluated according to the net revenue their choices generate; within legal and moral boundaries, the products produced and sold are matters of indifference. Hansmann suggests that nonprofits are better suited for producing output for which quality is very costly to measure and verify, because for-profit producers would be too incentivized to cheat consumers.

Even in the for-profit setting, identifying the contributions of managers is imprecise and costly when team production matters and exogenous shocks intervene—which is to say always (see, e.g., Alchian & Demsetz 1972, Knoeber & Thurman 1994). Sunder (2018) points out that measurement problems are further magnified in nonprofit firms, which cannot measure managerial performance with dollars.

Land trusts are nonprofits and face the information problems inherent to the organizational form. Trusts are set up to produce land-based amenities, and the choice of which deals are done and which amenities are produced requires monitoring. Sunder (2018) notes that the oversight required in such situations results in lengthier reporting than required in the for-profit setting. Another implication of nonprofits' inability to use profits as a yardstick is that nonprofits can restrict managerial discretion by being narrower in focus themselves (see, for example, the Civil War Trust, the Katawba Valley Land Trust, and the Buzzards Bay Coalition). There are large land trusts, notably The Nature Conservancy, but even that has a focus narrower than similarly large private firms, and many land trusts are small and local.

The proposition that nonprofits such as land trusts arise to mitigate asymmetric information and measurement problems does not imply that they completely eliminate principal-agent problems between conservation consumers, tax agencies, and land trusts. In particular, it would be naïve to assume that nonprofit employees and managers have no goals beyond maximizing patron

return per dollar acquired, especially because nonprofits are not direct residual claimants to such returns.[13]

4.2.2. Vertical integration. **Figure 2** highlights the long-term measurement and monitoring costs created by conservation easements. Land trusts have a perpetual obligation to monitor and enforce compliance, which gives rise to transaction costs that may be significant due to the uncertainty present in all long-term contracts. Even if a simple relational contract can be perfectly specified now through an easement, the contract will invariably be incomplete in the future. Due to bounded rationality, either the easement will fail to specify every contingency, or it will specify future states too rigidly (Williamson 1985). While the purpose of an easement might be to protect water quality and wildlife habitat, the actual conservation process for doing so will be contingent on future conditions and knowledge attained from scientific discovery.

Incomplete specification and costly verification leave some key dimensions of the agreement in the public domain, as characterized by Barzel (1997). When contract dimensions are left in the public domain, the supplier of an input has incentives to shirk on unspecified dimensions, such as quality, and the buyer has incentives to demand unpaid-for quality. In the context of conservation easements, landowners have incentives to claim unspecified rights to develop or farm if such rights are imperfectly delineated and valuable. Land trusts have incentives to claim broader rights to control land use than explicitly specified.

The vertical integration of contracting parties is a well-known solution to the contracting hazards just described. When important information cannot be known ex ante, integration of the buyer and seller can facilitate easier adaptation to future conditions. Vertical integration of asset ownership can also circumvent incentive misalignment problems because integration assigns residual claimancy over every attribute of an asset to a single entity. In the context of land trusts and the problem of long-run conservation, the transaction-cost-minimizing strategy might be to own land outright, rather than hold land in conservation easements. Parker (2004) describes evidence that land trusts tend to own land when transaction costs of using easements are high, although tax incentives that favor conservation easements skew the choice away from full ownership.

The discussion above focuses on the hazards of contracting, but there are benefits as well. Williamson (1996) argues that firms might use contracts, rather than vertical integration, to exploit cost advantages that a separate supplier has. These ideas closely relate to Barzel's (1997) conception of the benefits of contracting. In contrast to consolidated ownership, contracting for asset use can enable gains created from the specialized use of all of an asset's attributes. Contracting assigns control over different attributes of an asset to individuals who have comparative advantages in using the attributes. In our setting, conservation easements allow a farm specialist to own the land and extract commodities from its soil while allowing conservation specialists (land trusts) to extract the land's conservation values in the context of the surrounding landscape.

5. APPLICATIONS OF THE FRAMEWORK TO QUESTIONS OF PUBLIC POLICY

The preceding theory poses the problem of how to elicit long-term public good provision from landowners with an organizational structure that also holds in check the social costs of measuring and monitoring residual value flows. More specifically, the funding of easements through tax

[13] Alchian & Demsetz (1972) argue that nonprofit managers have stronger incentives to shirk on effort (but not necessarily quality) than for-profit counterparts. Of topical relevance here, Hewitt & Brown (2000) conclude from empirical analysis that managers at certain environmental nonprofits derive utility from spending money for purposes other than providing services to beneficiaries (patrons).

incentives has given rise to measurement costs and resulted in alleged donations of high-cost and low-conservation-value easements. What solutions exist and are they worth pursuing?

The US Congress has intermittently threatened to suspend the tax deductibility of easements but has instead continued to favor generous tax breaks. Through the proposed Charitable Conservation Easement Program Integrity Act of 2019, it is considering capping the size of an individual's easement deduction by limiting the claimed appreciated value of land after acquisition. This cap could dampen incentives for malfeasance but presumably at the cost of reducing the flow of easement acquisitions. Is there an alternative that could retain high levels of easement flows while also reducing social costs of measurement?

One alternative is for the government to give self-regulation by land trusts more time to work. Through an LTA accreditation program, the nonprofit industry is trying to certify certain land trusts as responsible and deny that label to others. Self-regulation through the LTA may be effective if (*a*) the LTA can credibly observe and label the quality and costs of each land trust's operating procedures and (*b*) funding channels respond to labeling signals. For certification to work, however, a land trust's access to public funding may need to be conditioned by certification, which is a heavy-handed condition. Returning to the framework above, self-regulation (certification) can lower patron costs of measuring output quality and costs through channels broadly described by Hansmann (1980, 1996) and Sunder (2018).

Whether or not certification works is an empirical question. At the individual land trust level, certification might discourage organizations from accepting easements generating low conservation value or connected to what appear to be inflated appraisals. At the aggregate level, certification might channel easement donations to higher quality land trusts that have more capacity and incentive to steward easements over the long term. Accreditation could help land trusts better signal audit risk protection, as in **Figure 2**, and attract landowners whose central interest is ensuring high-quality, perpetual land conservation (see Parker & Thurman 2018).

Neither governmental caps on tax deductions nor self-regulation will incentivize land trusts to internalize the development value of land put under easement, but such an incentive structure might be desirable. Optimal conservation is achieved when the interaction of the actors illustrated in **Figure 2** results in consideration of all of the expected benefits and costs of a prospective easement before it is enrolled in permanent conservation. Under tax code funding, none of the agents have strong incentives to ask if the conservation value—i.e., the monetized value of public amenity flows—exceeds the costs borne by sometimes distant and diluted taxpayers.

Parker (2004) describes an alternative public funding mechanism that could, potentially, cause actors to better internalize this opportunity cost of land development. Federal tax code funding for easements could be replaced with an equivalent level of funding through federal competitive grants requiring trusts to raise matching funds from private sources and local governments. This may seem a radical step, but the potential benefits to the general taxpayer, who is already paying for easements, are worth considering. First, the alternative scheme would allocate federal dollars to areas about which there is some consensus that the value of conservation is particularly high. Supporters of the trust would pay the most and therefore guide the decision; proposals could also be evaluated by land conservation experts. This process contrasts with the current situation where a local landowner (or partnership syndicate) who has an interest in donating an easement can trigger the process. Second, once trusts received grant monies, they would have a budget constraint that would encourage them to act as if they bore the full costs of acquiring different parcels. Currently, the amount of forgone tax revenue is potentially limitless, as long as the trust can find willing landowners. In contrast, fixed allocations of grant dollars would encourage trusts to prioritize. A third and related advantage is that land trusts would have stronger incentives to oversee the appraisal of easements. Land trusts receiving federal grants would be using money

from their own budget to buy easements, so they would be motivated to question appraisals that seem unreasonably high. More generally, instead of seeking easement donors from a small pool of parties motivated by tax incentives, land trusts would have a public funding source that allowed them to negotiate with a larger pool of potential easement sellers.

Looney (2017, p. 8) proposes a reform that would convey similar advantages. He explains his proposal in the following way:

> A more fundamental reform…would take the deduction and transform it into a credit allocated to a donee organization. In this model, donee organizations would be empowered to approach landowners to "spend" the credit and to decide what kind of properties to conserve and how much to pay. Because these organizations have the right incentives to conserve properties with the greatest environmental or historic value, this approach is intended to maximize the return on the tax benefits provided without requiring adversarial IRS oversight.

The key to both alternative funding vehicles—competitive grants or allocable credits—is that each would empower land trusts with more discretion (and funding). Ideally, land trusts would then prioritize lands for acquisition based on conservation value and acquisition cost. Unlike the current system under tax code funding, land trusts would not need to prioritize their efforts based on the degree to which the land's owner is incentivized to donate, which depends on landowner income and creativity in exploiting tax advantages. To be sure, either funding reform would introduce new challenges and problems not considered here. The benefit, however, is that each reform could delink conservation from tax considerations that may not align with cost-effective conservation.

6. LOOKING AHEAD

The popularity of conservation easements, mediated by nonprofit land trusts, is driving private land conservation. This popularity can be explained by how evolved and legislated arrangements have exploited the gains from contracting in a way that generates benefits for both farmers and consumers of open space amenities, at a muted (or at least remote) cost to taxpayers. Easements also provide a seemingly attractive way for present-day charitable donors to commit to future generations.

However, problems arise from the interplay of public beneficiaries and private decisions. Building from work in institutional and organization economics in the tradition of Ronald Coase, Oliver Williamson, and Yoram Barzel, we argue that these problems can best be understood by focusing on the measurement and monitoring costs faced by stakeholders under current and prospective policy arrangements. A starting point is to ask if the current organizational form—easements that permanently divide ownership, financed by tax incentives, held by local nonprofits operating under relatively little regulation—incentivizes the greatest quality conservation achievable at the least cost.

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