Internalizing externalities when there are significant private non-market rents

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Introduction

Conservation easements are one of the most common tools for conducting land preservation. Land remains in private ownership, but the landowner enters into a contractual agreement to place restrictions on development or use of the land. Land that is privately owned but presents positive benefits to the public (such as open space or wildlife habitat) is an example of a positive externality. The classic model of externalities described by economists like Baumol and Oates (1998) is commonly used to explain the marginal social and private benefits provided by such environmental goods. Using this classical approach, a landowner will not alter his/her land use unless the commercial rents for the "converted" land are greater than the rents from the original use (Geltner, Riddiough, and Stojanovich, 1996). If the rents from development exceed agricultural use, a rational agent will convert the land into development.

According to this traditional environmental model, a landowner will keep land in an undeveloped state to the point where private marginal benefits equal marginal costs. Therefore, a sub-optimal amount of land preservation will occur if the land presents social benefits that exceed private benefits, and the landowner is not compensated for this externality. Thus, in theory, a conservation easement can be a successful policy tool if it provides financial compensation that bridges the gap between the private and social benefits. The key to attaining social efficiency is most often linked to quantifying the gap between the private benefits curve and the social benefits curve, and ensuring that the financial benefits provided by the conservation easement are equal to this gap.

Whether or not a conservation easement is necessary to maintain the land in an undeveloped state is determined by the commercial and non-market compensation that a landowner receives.

In our study we conducted an iterative qualitative research process with 59 attendees (both landowners and land trusts) at the annual Land Trust Alliance Conference to identify social benefits provided by conservation land. During the qualitative research process we found that landowners often place intrinsic value on land beyond the traditional commercial rents. Thus, a private landowner may feel compelled to preserve the land from development, despite the fact that they may derive greater commercial rents from development. This intrinsic value may be added to the social benefits curve, thus widening the difference between the private and social benefits curves.

During the study we identified non-market rents that are important to private landowners; however, these rents have largely been ignored in the economic literature because private rents are a subset of public rents. In our paper we graphically integrate several of these private and social values in the private and social benefit curves to make policy suggestions on how to make the market for conservation land more efficient

Study Design

In order to determine the social benefits provided by conservation land (or land protected by conservation easements), we implemented an iterative qualitative research process.

Although inductive and qualitative research is commonly used in disciplines such as anthropology, sociology, and psychology, this process remains relatively informal in economic research. Utilizing qualitative research techniques utilized in an economic study of qualitative research by Johnston et al. (1995) and sociological qualitative research techniques presented by Lofland et al. (2006), we developed a formalized protocol to create a process for identifying social benefits provided by conservation land (Keske, 2006).

Research subjects were selected from the 2005 Land Trust Alliance Conference attendee list in Madison, Wisconsin. There were 59 attendees and the participation attendance was 78.85 percent. Attendees held a number of positions in the land trust community, including attorneys, appraisers, land protection specialists, and executive directors. One focus group also consisted of Midwestern landowners. Table 1 presents a list of social values that these participants identified as contributing to the social values for conservation land:

Table 1 Social Values in conservation Land

Wildlife habitat protection
Biodiversity
Natural areas
Proximity to other protected lands
Connectivity to create synergy
Ecosystems
Prime, sustainable agricultural lands
Public access
Working lands (forests, ag)
Scenic beauty
Historic lands
Open space
Nature based recreation or activities
Specific landscapes
- *Coastal terrace prairie
- *Woodlands
- *Farmland as a view

Buffer to development and encroachment
Cultural uses
Hunting rights
Preservation of family lands
Spatial location of buildings or conservation values
Educational opportunities
Privacy or solitude
Wilderness
Water
- In close proximity to water or recharge
- Headwaters
- Riparian areas
- Buffers to water
- Wetlands
- Public water supply
- Water rights
- Reduction of pollution (pollution treatment)

During the qualitative research process, a number of land trust participants (as well as landowners) articulated that landowners often sought to protect their land for personal or non-commercial reasons. While land trusts acknowledged that many landowners seek to protect their land in part for financial compensation (in the form of federal, state, local, and estate tax benefits), nearly all participants agreed that landowners usually had a personal tie to their land or to their community's sense of place that motivated them to preserve the land. It is also worthwhile to note that usually this personal tie to the land involved the landowner foregoing compensation for preserving their land.

Marshall (2002) and Hoag et al. (2005) define this foregone private rent as "private amenity rent" or PAR. For example, several studies (Hoag et al., 2002; Elconin and Luzadis, 1998; Stewart and Libby, 1997; Rowe, Bartlett, and Swanson, 2001) found that personal attachment to the land was one of the, if not ***the primary,*** motivations for landowners to engage in land conservation. McLaughlin (2004 p. 43) also cites a joint effort by the State University of New York and the University of Vermont. McLaughlin's study noted that the landowner enacting the conservation easement was motivated to do so primarily as a result of their "personal attachment to their land, a sense of altruism, and a commitment to the stewardship of their land."

Protecting community heritage, or a community's sense of place, is also a key motivation for landowners to preserve critical parcels of land. While Section 170 of the IRS regulations mandate that conservation easements provide social value, landowners also are also intrinsically motivated to preserve land to maintain a sense of community

(Keske, 2006). A community's sense of place is very closely tied to family heritage (Cross, 2001). In a sense, by preserving a community's sense of place, landowners are maintaining their own family heritage.

Thus, although it is well-established that both communities and landowners glean social benefits from land conservation, it is also possible to over-compensate a landowner for his/her land. That is, the landowner reservation price for land conservation may actually be lower than what society has paid the landowner. Hence the market is still inefficient because society has overpaid the landowner for land protection.

Therefore, the key to establishing an efficient market is to quantify the land's private and social benefits (the former of which also includes the landowner intrinsic benefits). Once these benefits are identified, for an efficient market to take place, landowner compensation should comprise the difference between the private benefits curve and the social benefits curve. This way the landowner's externality is internalized and an efficient amount of land protection takes place. In this next section, we propose a model of how to develop an efficient market by disaggregating the private and social benefit curves to identify the proper amount of compensation a landowner should receive from a conservation easement or land conservation payment.

Graphical Model

Commercial Rents and Option Values

Traditionally, landowner private benefits (or rents) are expressed as a function of both commercial rents and option values. In the traditional environmental economics literature, commercial rents are the basic rents that comprise the marginal private benefits curve. The appraisal literature provides guidance in determining the value of the rents when the development rights are unrestricted (Plantinga and Miller, 2001; Tegene, Weibe, and Kuhn,1999; Capozza and Sick, 1994; and Capozza and Helsley, 1989; Marshall, 2002). The value of land with unrestricted development rights is expressed in price per acre.

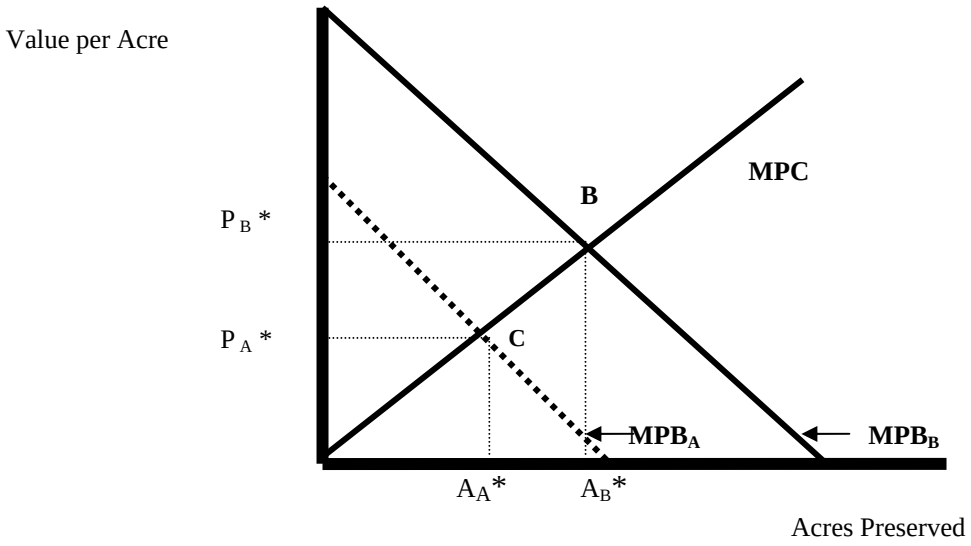
The option value is defined as the price of the undeveloped land, which is a function of all underlying stock rents, plus potential future temporal growth rate changes. The option value can also be added to the marginal private benefits curve, and when a landowner enacts a conservation easement on her property, he/she essentially extinguishes the option to develop her land in the future.

The landowner private benefits are illustrated in Figure 1. In Figure 1 we break down the landowner private benefit curve into commercial and option values of undeveloped land:

Figure 1

The Marginal Private Benefits of Land as a Function of Commercial Rents and Option Value of a Parcel of Undeveloped Land

Measured in Acres of Undeveloped Land



P^*_A = reservation price with commercial rents
P^*_B = reservation price with commercial rents and option value

Where:

MPB_A = Commercial Rents
MPB_B = Commercial Rents + Option Values

Referring back to Geltner, Riddiough, and Stojanovich, the landowner will keep land in its original use, and not convert the land to an alternative use, up to the point where the marginal benefits curve equals the marginal cost curve. This will result in an amount of undeveloped acreage equal to level A_B*. Should a landowner choose to place a conservation easement onto her land, this extinguishes future development options. Thus, she must receive financial compensation for the conservation easement equal the

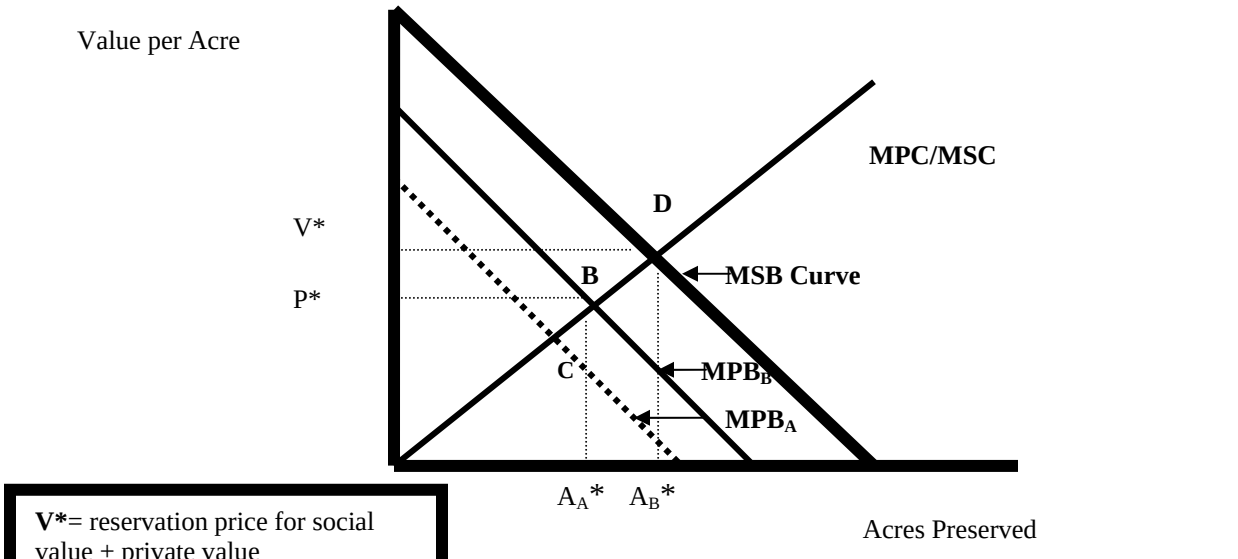
option value (distance between C and B), or there will be a sub-optimal amount of undeveloped land (A_A*).

The Land's Social Value

As previously stated, land qualifying for conservation easement tax benefits must provide social benefit. Land that provides greater social benefit than private benefit yields a classic environmental economics externality graph (Baumol and Oates, 1998), presented in Figure 2. For an efficient amount of undeveloped land, the landowner must receive compensation equal to the distance from B to D (the social values provided by the land), as well as compensation for the option value equal to distance C to B. The additional distance B to D occurs due to non-market values that are assumed be held by the public. This is a key assumption that we challenge later. If a landowner's reservation price can be determined, then the efficient amount of land will be allocated and the proper amount of compensation can be provided to the landowner. Thus, we propose that the amount of social benefit provided by protected land may change the distance between the private and social benefits curves, as well as the amount of compensation due to the landowner for an efficient market to take place. We now present private amenity rent (or PAR) as a rent that can be added to this diagram.

Figure 2

Marginal Social Benefits and Marginal Private Benefits from a Parcel of Undeveloped Land



V*= reservation price for social value + private value
P* = landowner reservation price for land with commercial rents and option value

Where:

MPB_A = Commercial Rents Only
MPB_B = Commercial Rents + Option Values

Measured in Acres of Undeveloped Land

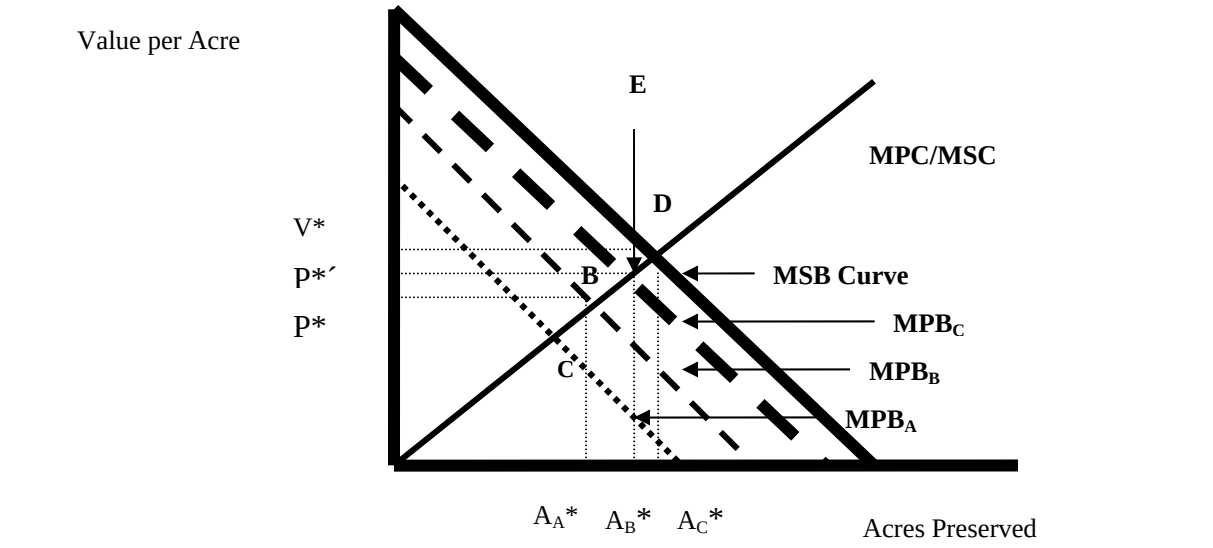
Landowner Private Amenity Rent (PAR): A Third Source of Rent

We propose that landowner utility is one means by which the gap between the MPB and MSB curve can be narrowed. The landowner's PAR can be a large share of the total public non-market rents. PAR is considered a non-consumptive rent that can be added to the MPB curve, in addition to the land's "highest and best use" and option value. Figure 3 illustrates the addition of PAR to the MPB curve. When PAR>0, the gap between the MPB curve and the MSB curve is clearly narrowed, which reduces the amount of the market failure, and closes the gap between the MSB and the MPB curves. In other words, the "sense of place" that is provided by the land is also realized by the landowner, who is also part of society. Thus, the landowner does not need to be compensated for this utility, or rent, that she already receives from the land. This can result in markedly improve market efficiency, illustrated in Figures 3.

Figure 3

Market for Land Preservation, Adding PAR to the MPB Curve

PAR>0



V* = reservation price for social value + private value
P*´ = landowner reservation price for land with PAR, commercial rents and option value
P* =landowner reservation price for land with only commercial rents and option value

Where:

MPB_A = Commercial Rents Only
MPB_B = Commercial Rents + Option Values
MPB_C = Commercial Rents + Option Values + PAR

Figure 3 presents the landowner's marginal private benefits curve when it includes commercial rent, option value, and non-commercial rent (PAR). When only commercial rent and option value are added to comprise the MPB curve, acreage will be preserved in the amount of A_A*, and the landowner's reservation price for converting the land for development will be at P*. However, when PAR is also added to the marginal benefits curve, the landowner will preserve land equivalent to amount A_B*´ and the reservation price for converting the land to development will also increase, at value P*´. Thus, the

landowner is less likely to convert land for development. Likewise, when social values provided by the land are factored into the equation, A_C* and V* represent the socially optimal level of acreage and reservation price, respectively. Although market distortion (the distance between Point D and Point E) is present, the gap between the MPB and MSB curves has clearly narrowed when PAR is added to the MPB curve, as the market distortion would otherwise equal the distance between B and D.

Clearly, landowner PAR may impact the landowner's land use decisions, by tipping the scale in favor of one land use over another, and PAR can explain why some landowners retain ownership of land (for agricultural use, for example), when the land should actually be designated for another use that garners higher financial rents. Therefore, it would be in land trust's best interest to have an understanding of the landowner PAR. If the land trust is willing to pay price P*´ for a parcel of land but only has to pay P* due to the landowner's PAR and thus lower reservation price, the trust may potentially "overpay" for a parcel of land in the amount equal to the distance between P* and P*´.[1]

There is also a significant policy twist when it comes to conservation easement practices. Regardless of the presence of landowner PAR, that there will still be a sub-optimal amount of preserved land, because the landowner is not fully compensated for the social benefits provided by her land due to policy failure in the IRS tax code . Section 170(h)(4) of the IRS Tax Code prohibits compensation for social values on conservation easement lands, despite the requirement of the presence of social values for a

[1] It is worth noting that conservation organizations rarely actually "pay" for a conservation easement on a parcel of land. Usually the conservation easement is donated. Therefore, by "pay" we are actually referring to the financial compensation provided to landowners that are provided in the form of tax benefits.

conservation easement to take place. Thus, in light of this tax policy, referring again to Figure 3, a greater amount of land is preserved when PAR is taken into consideration than when it is not factored into the equation. This is reflected in the distance between A_C* and A_B*. Thus, the increase in landowner reservation price due to PAR may help the market edge closer to efficiency, because the gap between Point B and Point D has been narrowed.

Thus, under the current rules and regulations, the market will not be efficient *unless* one of the following occurs:

1) *A fee simple transaction (or outright purchase of the conservation land for preservation) in an amount equal to what the trust believes to reflect the difference between a landowner's private benefits (including PAR) and the land's social value.*
2) *Landowner PAR makes up the entire difference between the MSB and the MPB curves.*

With respect to the first point, under current appraisal regulations it may still be difficult for an appraiser to include these social values in a property appraisal. Hence, policy failure exists for both the conservation easement and the appraisal regulations, and so another recommendation for improving market efficiency is to amend appraisal policy to include social values in part of the landowner compensation package. Appraisals aside, Figure 3 makes it clear that landowner PAR has the potential to fully deliver market

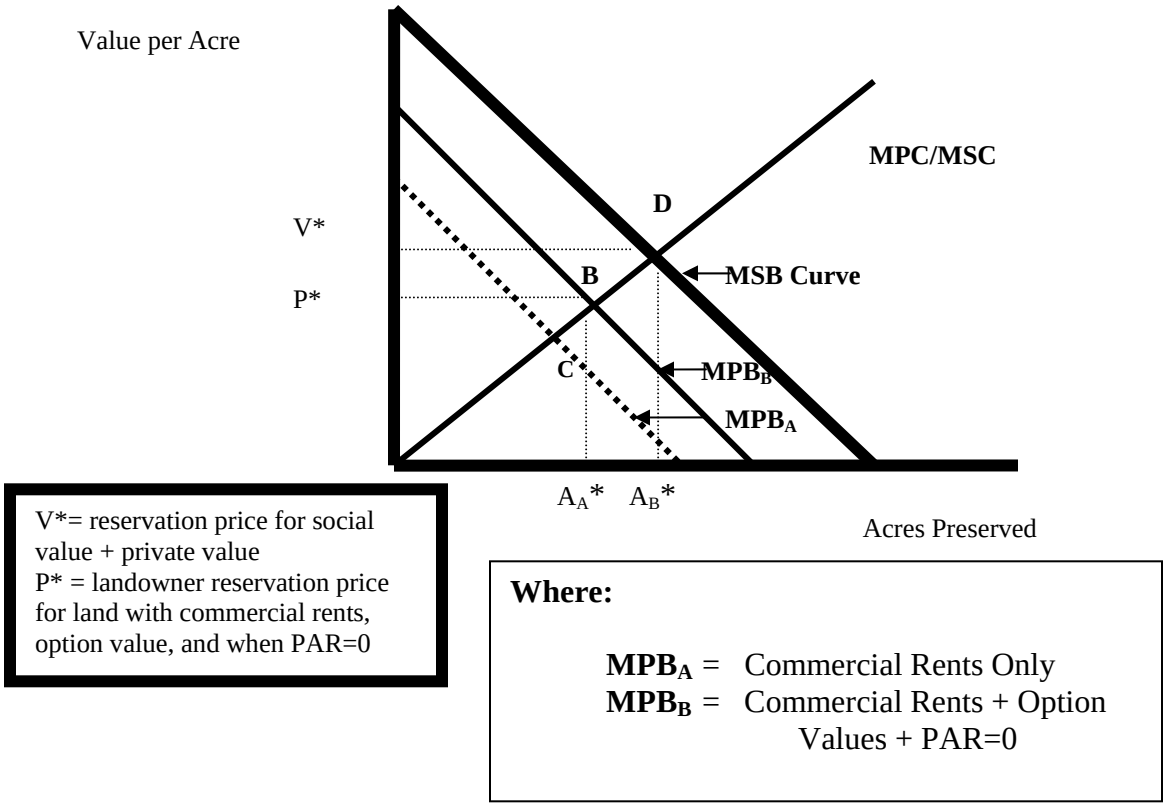
efficiency, when the landowner engages in an act of self-sacrifice to see that parcel preserved indefinitely.

A situation may also arise in which the landowner has no private amenity rent from the land. In this case, demonstrated in Figure 4, PAR=0, and the MPB is effectively a sum of the commercial rents and the option value, which looks very similar to Figure 2. However, in Figure 4 the market failure, represented by the distance between Point B and Point D, is greater than the market distortion presented in Figure 3, reflected in the distance between Point D and Point E. This is because the landowner's lack of PAR fails to bridge some of the gap between private and social benefits provided by the land, as it did in Figure 3. Hence, the landowner's reservation price for converting the land for development is lower when PAR=0, compared to when PAR>0. In the former case the landowner is more likely to convert the land for development unless she receives full compensation equal to the distance between the MSB and MPB_B curves. In this case, in order to have an efficient amount of undeveloped land preserved, society must pay for the full difference between Point D and Point B, most likely as part of a fee simple transaction.

Figure 4

Market for Land Preservation, Adding PAR to the MPB Curve

PAR=0



To address the second point, PAR may also result in an efficient market when the landowner's PAR completely bridges the gap between the private and social benefit curves. Here, the landowner reservation price is exactly equal to the social value garnered from the land. By all accounts, this appears to be an efficient market, although technically, it is possible that the landowner's utility from seeing the land remain undeveloped constitutes almost the entire social benefit of maintaining the land in an undeveloped state. In other words, the landowner receives the entire amount of social

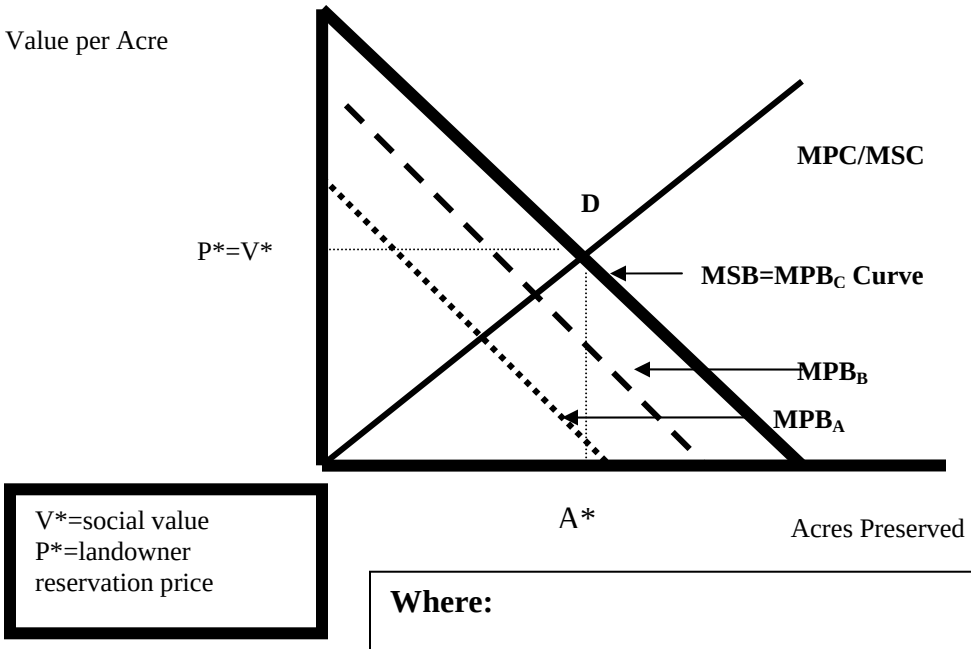
utility. Such may be the case of an island of undeveloped land surrounded by commercial development that a landowner wants to see maintain as undeveloped. In this situation it is conceivable that this island of open land should actually be converted to development (and the financial benefits be spent elsewhere preserving other potentially threatened areas). This situation is illustrated in Figure 5.

Figure 5

Market for Land Preservation, Adding PAR to the MPB Curve

MPB=f(Commercial Rents, Option Value, PAR)=MSB

(Measured in Acres of Land Preserved—or Undeveloped)



V*=social value
P*=landowner reservation price

Where:

MPB$_A$ = Commercial Rents Only
MPB$_B$ = Commercial Rents + Option Values
MPB$_C$ = Commercial Rents + Option Values + PAR

Policy Implications

In summary according to IRS tax codes, in order for land to qualify for a conservation easement, the land must provide social value. However, policy failure actually occurs because landowners are not compensated for these social values. The most obvious improvement to conservation easement policy is a revision of IRS appraisal values to compensate landowners for social values.

However, instead of launching a political war, another means for improving the efficiency of the conservation easement and land conservation market may be to construct an instrument to assist in the identification of landowner PAR. As discussed, when the landowner PAR is included in the private benefits curve, the market may come closer to operating efficiently because the landowner reservation price for converting the land to another use becomes higher, and thus, the landowner is less likely to convert his land for development. If conservation organizations could identify landowners with higher amounts of PAR, greater economic efficiency could be attained. Likewise, without properly understanding a landowner's PAR, it is possible that a conservation organization will overcompensate a landowner. Research into and the development of such an instrument may be a worthwhile effort, for once land is converted into development, rarely does it return back to an undeveloped state.

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