DISSERTATION

RENTS, EFFICIENCY, AND INCOMPLETE MARKETS:

EXPLORING THE INNER WORKINGS OF THE EMERGING MARKET FOR PRIVATE LAND PRESERVATION AND CONSERVATION EASEMENTS

Submitted by Catherine M. Keske

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

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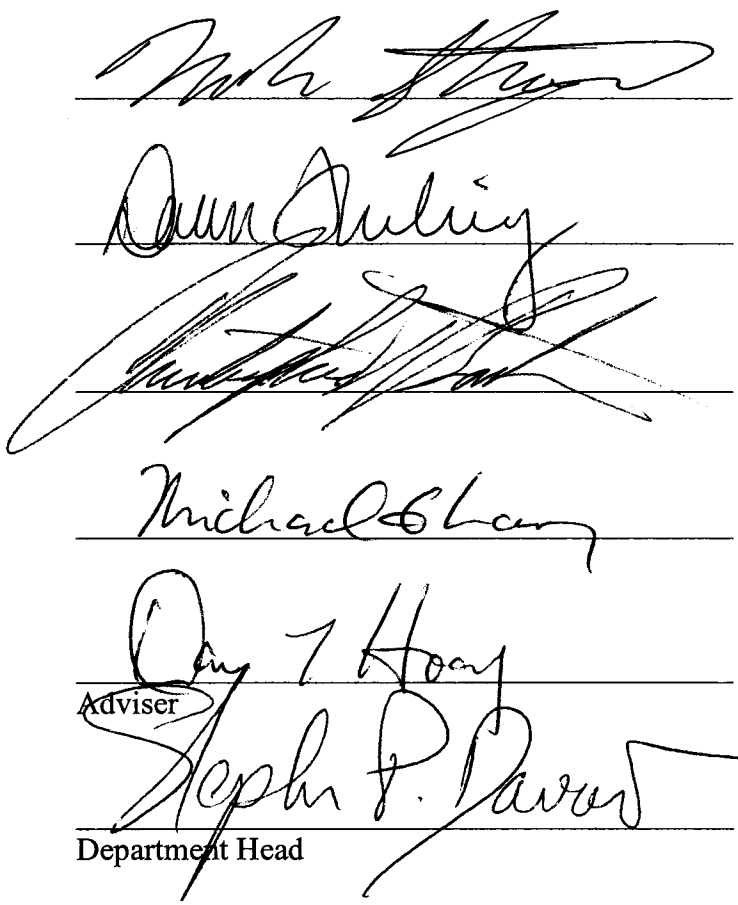

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ABSTRACT OF DISSERTATION

RENTS, EFFICIENCY, AND INCOMPLETE MARKETS: EXPLORING THE INNER WORKINGS OF THE EMERGING MARKET FOR PRIVATE LAND PRESERVATION AND CONSERVATION EASEMENTS

This economic study explores land market development and identifies contributing sources to incomplete markets (markets that do not operate efficiently or yield consistent price information). I make the case that the market for private land preservation—land that is preserved through the efforts of NGOs or land trusts—is an incomplete, but emerging market. Using graphical and mathematical arguments, I discuss the positive externality from private lands that present public benefit, and resulting impact upon efficiency and landowner rents. I present a comprehensive economic analysis of conservation easements (the policy tool most often used by the private land preservation movement) and I use this analysis to determine contributing sources to the incomplete market.

I make the case that markets that display limited or no price information require a thorough inductive research analysis for appropriate economic model specification. This is because there may not be enough information in the current economic literature on which to base priors; hence the researcher will inflict her own biases on the study if inductive qualitative research is not implemented. In this publication I use a mixed methods research protocol that incorporates qualitative research in the first stage of the study to yield an economic model in the second stage of the project. I compare and

contrast the results from my mixed methods model with a strictly deductive economic research approach and illustrate that the private land preservation community is seeking to preserve "a sense of place", rather than just specific attributes or features of the land, which yields implications for market efficiency.

Using results from the qualitative phase of my mixed methods model, I perform the first known surgical dissection of the marginal private benefits curve to illustrate that commercial rents, option values, landowner private amenity rent (PAR), and policy failure can each contribute to an incomplete market. I draw the conclusion that although the market for private land preservation shows signs that it will eventually develop into an efficient market, the government could implement policies to accelerate the efficiency, due to the irreversibility of converting undeveloped land for development and market information failures.

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DEDICATIONS

The completion of this dissertation and my Doctor of Philosophy degree could not have been achieved without the support of my family, friends, and colleagues. The saying "It takes a village to write a dissertation" couldn't be more true, and I would like to take a moment to reflect upon my journey, as well as recognize several special people who helped me accomplish my lifelong dream.

Like many driven young adults from humble beginnings, I chose my first profession, audiology, because I was forced to commit to an undergraduate major. Audiology seemed to be the most interesting choice of professions, based upon my knowledge of the world at that time. Once I entered the profession and realized that my intellectual interests seemed to be anywhere but audiology, I was too stubborn to let a hard-earned education go to waste; so I dedicated the early part of my career to improving the lives of the hearing impaired, by working as a medical audiologist and a technical field trainer and executive in the medical device industry.

I believe that I provided valuable contributions to the field and touched the lives of many hearing impaired patients; however, there was a void that did not go unnoticed by friends and family. I spent most of my 20's and early 30's in search of my true professional calling, which sent me in a number of different directions and yielded countless hours of soul searching and contemplation (often after midnight in the company of a sympathetic listener and a bottle of wine). It was shortly after the birth of my second son in 2001 I began to recognize that "natural resource and environmental policy" would be the discipline to which I would dedicate the rest of my professional career, and that the foundation for policy making was economics.

Although I recognized the value of economic principles and this analytic approach to natural resource management, the downside was that I had little training in economics at the time. Furthermore, to say that the coursework for a graduate degree in natural resource is vastly different than coursework for a degree in hearing and speech sciences is an understatement. Pre-requisite work would need to be done before I pursued a Master's, let alone Ph.D. degree in economics. Though this seemed like the path to self-fulfillment, the journey would not be an easy one; and although my internal compass was leading me in this direction, I wasn't entirely sure that I had the strength to endure the hardship. However, to make a first step in the right direction, I took the graduate school entrance exams on June 16, 2001.

Tragically, the next day (Father's Day 2001) my brother Carl was involved in a fatal pedestrian-motor vehicle accident on the way back to his hotel room following a friend's wedding in Philadelphia. He passed away on June 21, 2001 and was buried at Arlington National Cemetery with full military honors.

Following the loss of a family member it is not unusual for individuals to become reflective. What perhaps makes my story unique was the fact that Carl was one of the most dynamic individuals who walked the face of the earth, and he was just as skilled at

"enjoying the moment" and the beauty of life, as he was at executing a well-organized mission. His death had a profound effect on everyone who knew him, even tangentially, and his passing served as a wake-up call to me: Life is much too short to not live your dreams. Thus, as a result of my sadness and my determination not to give in to complacency, I applied—and was admitted—to graduate school for the Spring 2002 semester.

The early part of graduate school turned out to be even more difficult than I had bargained. I took my course pre-requisites simultaneously with my graduate work, and I carried 17 hours of grad courses the first semester, and 12 hours that summer so that I could make-up for starting the program during the middle of the academic year. It took some time for these new concepts to "sink in" to my rather tired brain, while I tried to balance being a conscientious parent to Maverick and Braeden, and living quite far away from school.

The first two years of grad school were a blur, but when I transferred to CSU in 2004 to complete my Ph.D. degree, the crazy quilt of natural resource economics began to be sewn together. Although Fort Collins was even further away from my home (and during that first semester I had to live apart from my family), I had a clear picture of my area of specialization, and perhaps for the first time in years I was able to see a bright future ahead. In my adviser Dana Hoag, I found a tremendous mentor and friend, and with his guidance and commitment to matching my hard work minute-for-minute, I was able to produce this doctoral dissertation, which represents a culmination of years of longing, hard-work, and a passion for my true professional calling: natural resource economics.

It is therefore with great joy that I am able to formally recognize many of the special people in my life who helped me find my inner strength to complete this journey:

This dissertation is dedicated to my brother, *Captain Carl Loren Keske*, whose life served as an inspiration, and whose passing provided me with the strength to fulfill my dreams.

I am indebted to:
My family *Jeff, Maverick, and Braeden Handley*, who sustained years of sharing my attention with textbooks and journals and who accommodated my zany schedule with an amazing amount of understanding. I recognize and appreciate the enormous amount of time and energy that you have devoted to support my academic endeavor. Boys, I hope that you understand that part of the beauty of life is being able to find yourself, and I pray that you never lose sight of your dreams.

My adviser *Dana Hoag* for his clear vision, hard work, and dedication to helping me succeed, even when I doubted myself.

My sister *Theresa Keske Sberna*, and her family *Tony* and *Carson*, who endured countless hours of conversation and tears (often after midnight) and who always came through with a massage or an adventure to relieve stress just at the right time.

My father *Loren Keske*, for his eternal pride and support of his "Ca-Cookie". Dad, simply put, I could not have made it through this program without you.

Jeff's parents *David* and *Pamela Handley* for stepping in during dire moments to ensure that I did not lose sight of my goal.

Friends, family members, and *colleagues* who have lent a comforting shoulder, swooped in with last minute baby sitting, provided me with food following surgery, offered editorial suggestions and career guidance, given me a place to stay in Northern Colorado, and provided notes when I was absent from class. There are too many of you to name, but your kindness during the critical times of my life will always be remembered and appreciated.

To all of you, Godspeed!

CMK
Bailey, CO
May 2006

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Chapter One: The Emerging Market for Conservation Easements

"Although economists claim to study the working of the market, in modern economic theory the market itself has an even more shadowy role than the firm."

Ronald Coase

"The price system works so well, so efficiently, that we are not aware of it most of the time. We never realize how well it functions until it is prevented from functioning."

Milton Friedman

"The free market is not a panacea. It does not eliminate old age, and it won't guarantee you a date for Saturday night. Private enterprise is fully capable of awful screw-ups. But both theory and practice indicate that its screw-ups are less pervasive and more easily corrected than those of government enterprises, including regulatory ones."

Gene Callahan

Why Markets Form and How They Develop

Why do markets form? At first blush this may appear to be a very basic economic question. Yet the study of market mystique has been the royal crown for several Nobel Laureates and has been the source of contemplation for many a pensive graduate student. According to the classic writings of Ronald Coase (1937, 1988), the dynamics of market formation are frequently overlooked and price analysis often upstages market study, because traditional markets simply exist to facilitate exchange. In other words, the classic market is merely a venue for buyers and sellers to interact in a manner that minimizes transactions costs.

However, despite this rather simplistic definition of a market, Coase notes that market study is of increasing importance because a greater number of market transactions are now regulated. According to Coase, the new regulations are implemented not to restrain competition, but rather, to minimize transactions costs and to bolster the greater number of trades. In other words, markets may potentially move towards perfect competition and more efficient pricing as a result of increased regulation, because the regulation may actually increase number of transactions.

While Coase's call for further study of market formation is clear, it is also worth noting that other esteemed economists such as Milton Friedman sing a different tune. In contrast to Coase, Friedman (1962) is an outspoken critic of government intervention in

the free market, as well as a staunch believer of in the role of the price system to communicate information. According to Friedman's viewpoint, the market consists of multitudes of voluntary buyers and sellers, and the "market" serves as a matchmaker for these buyers and sellers, with price serving as a signal for both sides of the market.

But what if the price information is inconsistent or counterintuitive to economic theory? One of the main assumptions of a mature, well-developed market is that prices will convey consistent price information (Innes, 1990; Grossman, 1995), and several authors indicate that inconsistent price signals are one sign of a market that is incomplete, or not fully formed (Innes, 1989; Lundholm, 1991; Marin and Rahi, 2000). These studies, as well as the writings of Coase and Friedman, clearly reflect an interest in the structure of markets, and emphasize the value in studying why markets form and the role of price as a communicator of market integrity.

The writings of Coase and Friedman are not as polarized as one would initially believe. Both economists agree that markets are efficient creatures that take on independent lives of their own; Coase and Friedman's disagreement pertains to the degree of government intervention necessary to nurture the market's efficiency. As indicated by several previously mentioned studies, in the early days of the market creature's infancy, the market is typically not operating efficiently and price information is inconsistent. In other words, the market is incomplete. This prompts three market development questions to consider:

1) Will the market always remain incomplete, and if not, when will this immature market develop into a mature and efficient market?
2) Under what conditions will the emerging market be able to shed its adolescence and transition into a mature market that operates efficiently?
3) What is the role of government for transitioning the incomplete market into an emerging market?

As follows are several examples of markets that have been incomplete in the early, formative stages of their development; however, the degree to which these markets have evolved varies greatly. It is important to note the relationship between level of government intervention and the degree to which each market develops:

- In the mid-to late 1990's, the market for Louisiana's "nutrias" (commonly known as the swamp rat) emerges as an epicurean dining experience, but the market fails to thrive and disappears altogether. This occurs despite the valiant attempts of several local Bayou and New Orleans chefs to promote the swamp rat delicacy as an inexpensive high-protein, gourmet alternative to chicken. Nutrias return to their esteemed role as common lowland pest (National Public Radio, 1998).
- For centuries the international community has sought diamonds for both industrial and gemstone uses, although since 1887 when the DeBeers Mining Company was formed, DeBeers has kept a lock on the international diamond market. Through a series of clever business arrangements, DeBeers has managed to arrange for an estimated 65%-80% of all world diamonds to be bought or sold through its Clearinghouses. Each year DeBeers and its subsidiaries agree to the amount of

diamonds that will be sold each year in order to drive up scarcity. So although the market for diamonds has existed for centuries, the market for diamonds remains stuck in an emerging market or adolescent phase of development, to the credit of the loosely regulated DeBeers cartel (Kretschmer and Cabral, 1998).

- The emerging market for DVD players quickly shed adolescence and developed into an efficient market during the past decade. After the product was first sold to the public in 1996, increases in consumer preferences and improvements in technology has made the real price of a DVD unit decrease from hundreds of dollars to less than one hundred dollars in 2006.
- The market for organic foods began largely as an experimental market in the 1950's. Preferences for "naturally grown" products gradually increased the demand for organic products in the 1960's, 1970's, and 1980's, but it was the Organics Food Act of 1990 that distinctly increased the demand for organic foods, in part because the government was able to decrease information asymmetry regarding product content (Golen et al., 2001). Although there are several policy tools that may overcome market failure, Golen et al. reference Magat and Viscusi's (1992) findings that labeling can be an effective strategy when consumer preferences vary based upon a number of attributes, such as sugar, sodium, or nitrate content. Hence, in the words of Golen et al., "One man's meat is another man's poison" (p.17). Food labeling can be used to distinguish between attributes that make products heterogeneous—including the "credence attributes" –characteristics that provide value to consumers, but that are typically unobservable, such as where the product is grown. Therefore, government

intervention policies that resolve information asymmetry and reduce transactions costs (such as product labeling programs) may nudge the market out of its emerging market state to become efficient.

As the above examples have shown, there are multitudes of markets that have emerged in recent years. Markets for some goods, such as DVD players, have become efficient due to pure market forces. Other markets, like the market for Louisiana nutrias have disappeared, despite the fact that the good may have a number of desirable attributes. It is also clear that when market distortion exists, as is the case of the DeBeers dynasty, without government intervention, the market may remain emerging or incomplete indefinitely. Although market dynamics and circumstances may influence whether the incomplete market emerges into an operationally efficient one, government intervention may also facilitate the transition of an incomplete market into a complete, fully efficient market—which may be the case for the market for private land preservation. In the remainder of the chapter I discuss the market for private land preservation as an emerging market that is moving towards efficiency, and whose progress might be expedited with government intervention. Ultimately, I will resolve the Coase-Friedman dilemma of government intervention, by concluding that sometimes government intervention can expedite the metamorphosis of an emerging market into an efficient one—one that allows price to work as the purveyor of market information.

Dissertation Goals and Objectives

In this dissertation I conduct an analysis of the market for land conservation, and more specifically, the market for land placed under conservation easements. I will make the case that the market for conservation easement land is still incomplete, and that price information is not consistently signaled to conservation buyers and sellers. The market for conservation easement land is developing, and because price information is beginning to be conveyed about these exchanges, the market is considered to be "emerging." Therefore, I propose a research study to develop an economic model of the market for conservation easements. I will use this model to provide insight into how to overcome the current market failures, and how to facilitate better economic efficiency. This will resolve the dilemma presented by Coase and Friedman that ponders on the role of government intervention in the market. As follows are the goals and objectives of my dissertation:

Goal One: Define and understand the market mechanisms supporting conservation easements and make policy recommendations to improve the social welfare and efficiency of the conservation easement market.

Objective One: Identify criteria that qualify the conservation easement market as an incomplete but emerging market.

Objective Two: Develop a social welfare function based upon a mixed method research model that uses both qualitative (ethnographic) and quantitative research techniques. This social welfare function will communicate what trusts and landowners are trying to preserve in land conservation transactions.

Objective Three: Identify a list of land attributes and characteristics that landowners and trusts seek through land preservation. These attributes will be incorporated into a vector of conservation values.

Objective Four: Disentangle the rents that comprise the landowner's private benefit curve, and illustrate how these three rents (commercial rent, option value, and landowner utility) can improve efficiency. Knowledge about the values of these rents will provide more complete information about landowner reservation prices.

Goal Two: Present, for use by other economists, the mixed methods research design that revolutionized how I collected and interpreted data that were used to formulate my model of the conservation easement market.

Objective One: Discuss the continuum of inductive and deductive research and the applicability to economic research.

Objective Two: Demonstrate how the results of my model changed when I implemented an ethnographically-based qualitative research approach, rather than a qualitative study designed to capture only language for a survey.

Objective Three: Contrast the mixed methods approach that combines inductive and deductive research strategies with traditionally deductive economic research methods, which have the potential to underutilize or bias data.

Objective Four: Recommend a qualitative research protocol that can be used by economists to identify non-market values or to model an emerging market. This qualitative research protocol is noteworthy because it is a combined inductive-deductive approach to data collection and data analysis. This hybrid approach will mitigate data loss, decrease survey bias, and present a unique contribution to the economics literature, where there is an under-represented amount of qualitative research.

Goal Three: Based upon results from my qualitative research, develop an economic model that presents the market for conservation easement land as a function of commercial rents, appraisal value, and landowner utility, and discuss how each of these three components affect market completeness and market distortion.

Objective One: Identify the rents that contribute to the conservation easement valuation process: commercial rent, option value, landowner private amenity rent (PAR) and social values.

Objective Two: Define the difference between the private benefits curve to which the landowner is entitled and the perceived private benefits curve, which consists of the private benefits that the landowner actually realizes. Show how market inefficiency and government policies may impact each of these curves, and illustrate how market efficiency is impacted.

Objective Three: Present "a sense of place" as a social welfare function that is also a function of land attributes, and illustrate how matching the

attributes between land trusts and landowners can improve market efficiency.

Objective Four: Demonstrate how the conservation easement market is evolving from an incomplete market to one that is complete, and make the case that the role of government should be to increase efficiency by making information more available and by facilitating more conservation easement transactions.

The general flow of the dissertation, which explains how I will address these goals and objectives, follows. To familiarize the reader with the literature, each section will be accompanied by a literature review:

- In Chapter One, I continue my discussion about markets by presenting a literature review to define the parameters of an incomplete market—a market that is not yet fully developed. I make the case that, due to thin markets, uncertainty, and asymmetrical or incomplete information, an incomplete market yields inconsistent price information.
- In Chapter Two, I apply the market discussion from Chapter One to conservation easements. I present a thorough literature review on the market for private land preservation and make the case that the market for conservation easements is incomplete, but emerging. I use graphical models to illustrate the inefficiencies that conservation easements are attempting to resolve, as well as potential inefficiencies that may arise from current conservation easement policies.

- In Chapter Three, I compare the mixed methods research model that I used to build my social welfare function, with the original method that I was going to use to construct an attribute-based survey. I use this comparison to illustrate how economists who use a purely deductive research approach and incorporate qualitative research *solely* for the purposes of constructing a pre-defined research survey may potentially lose data and ideas that would be useful in the economic modeling process. In doing so, I provide a detailed literature review on a continuum of inductive and deductive research techniques. I present a unique contribution to the literature by proposing a mixed methods research model that economists can use to collect data to study non-market values or to create a model of an emerging market. While these techniques are widely available, information about them is diffuse and they are not traditionally used by economists. My purpose is to benefit others through my synthesis of the literature and application to economics.
- In Chapter Four, I present a model of the market for conservation easements that is based on the results from my qualitative research study. Using algebraic and graphical arguments, I provide a unique contribution to the literature when I illustrate how rents impact market efficiency and that the market for conservation easements is an emerging market. I show that the market may become more efficient when land trusts have more complete information about each of these rents and that the government could facilitate market efficiency by making information more complete.

- In Chapter Five, I summarize how my research has fulfilled the goals and objectives that I have outlined in this chapter. I describe how I made the conclusion that the conservation easement market is an evolving and that it will most likely mature into a complete market without the need for government intervention. However, the trade-off to minimum government intervention is the real potential for a loss of "a sense of place," due to the rate at which undeveloped land is being converted to developed land. As a result of the irreparable effects of land conversion, I draw the conclusion that government intervention is necessary to provide more complete information, to reduce uncertainty, and to increase the number of conservation transactions. This government intervention will be necessary until the market for conservation land has become a complete market fully capable of sending complete price information.

The Beginnings of a Market

Markets form to conjugate sellers with buyers, and prices provide information about scarcity. But what is it, exactly, that causes buyers and sellers to clamor around a good? A market case study by Rosa et al. (1999) suggests that there is a socio-cognitive component to markets, and that markets reflect "knowledge structures" held by consumers and producers. Rosa et al., essentially explain that these knowledge structures are created and developed to satisfy psychological desires and needs; as a result, characteristics of the newly formed market are relatively unstable or incomplete. However, as time elapses, a relatively stable consensus forms with regard to the product's definition and features—both desired and expected.

The existence of a stable consensus of expectations between buyers and sellers is significant. According to Buzzell (1999), in order to define a market, let alone measure the evolution of the market, it is first important to finely specify the scope of the good around which the market is forming. Thus, a good of somewhat amorphous definition (which could arguably include land conservation) makes it difficult to determine the scope of the market, let alone assess the market's efficiency. Therefore, when defining the market for private land conservation it is critical to define exactly what it is that trusts are seeking to protect.

Once the scope of the market has been defined, economists will be able to judge a fully developed market by observing consistent price information. There is a well-documented stream of literature that indicates that a fully developed market will present consistent price signals and provide information to market participants about market efficiency (Beaver 1981; Innes, 1990; Lundholm, 1991; Grossman, 1995; Martin and Rahi, 2000). This informational efficiency also implies Pareto efficiency (Lundholm, 1991; Innes, 1995), in that one person can improve his welfare without decreasing the well-being of another. In other words, when depicted within an Edgeworth box, the producer and consumer indifference curves are not tangent; thus, there is room for welfare improvement, and a transaction takes place to improve the well-being for both the buyer and the seller. One of the main assumptions of a mature, well-developed market is that price information is consistently conveyed so that the producer and consumer recognize the opportunity for welfare improvement. Several authors indicate that inconsistent (or counterintuitive) price signals are one sign of a market that is incomplete, or not yet fully

developed, and one side of the market may fail to recognize that a welfare improving situation exists (Innes and Rausser, 1989; Lundholm, 1991; Marin and Rahi, 2000).

Whether or not a market evolves from an inchoate one to a mature system of consistent price signals seems to pertain less to market tenure and more to whether or not sources of market failure can be overcome. Market failures may be resolved early in the development of a market, although in some cases, the market failures are never truly overcome, as may be in the case of a monopoly; hence, market growth is stunted and does not develop into an efficient process. As a market matures, price data may begin to emerge. In this dissertation I refer to the process by which an incomplete market evolves into an efficient one as an "emerging market". I show throughout this dissertation that government has the ability to intervene to correct market failure and facilitate the development of the market from emerging to complete.

Literature on incomplete markets suggests that there are three main categories of market failures that contribute to an incomplete market and inconsistent price signals: thin markets, uncertainty, and incomplete or asymmetric information. Although some authors purport that incomplete markets are capable of providing efficient price signals in a partial equilibrium model (Marin and Rahl, 2000; Baron 1979), the incomplete market literature supports that a market is efficient when it is complete using a general equilibrium model, where all prices are brought to equilibrium and there are no market failures.

Thin markets are defined as markets in which there are few buyers or sellers, and the sparse amount of transactions leads to market failure because there are not enough participants to generate consistent price information, and transactions costs may be high (Rosenzweig et al., 2002; Coase 1988). Uncertainty is a hallmark characteristic of an incomplete market, particularly in the study of financial and securities markets. Forsyth and Lundholm (1990) and Lundholm (1991) note that uncertainty regarding the motivations of buyers or sellers yields market failure due to lack of knowledge of market performance, because participants must speculate on an asset's value. In contrast, markets with more certainty will generate more consistent price signals because buyers and sellers are better able to gauge asset performance.

Information failures, as in the case of incomplete or asymmetric information, present a third market distortion which may yield market incompleteness (Marin and Rahl, 2000; Wang, 1994; Roth, Sönmez, Ümar, 2005). With these information failures, at least one side of the market lacks knowledge about market issues associated with risks or price information. To be clear, incomplete and asymmetric information actually present different economic problems. Information asymmetry is one example of incomplete information, and it results when information is known to some, but not all, of the parties involved. Incomplete information is broadly used in economics to describe a situation when players do not have full information about the economic environment. Incomplete information may also include lack of knowledge regarding the pay-offs or benefits of the economic problem. While incomplete information and asymmetric information may require different policy solutions in practice, in this dissertation I often use these two

terms together to refer to the information failure that occurs in the land preservation market. I have chosen to do so because asymmetric information is clearly present in the market for private land preservation; however, at times it is unclear whether the information is asymmetric or simply incomplete. Regardless, overcoming these information market failures will lead to a fully formed market.

Incomplete markets have been frequently studied in insurance and financial markets, but the use of these principles is much less common for niche markets, such as environmental issues and land conservation. Rosenzweig et al. (2002) developed a technical report for the Pew Center on Global Climate Change on the emerging market for International Greenhouse Gas credits as part of the Kyoto Protocol. In this report, the authors note that high transactions costs associated with Greenhouse Gas Credits has resulted in a thin market and relatively few market transactions to date. Uncertainty regarding the intents and emission/transaction practices of other nations, along with an absence of clear trading rules, has also yielded inconsistent price signals—an observation consistent with the writings of Coase.

In summary, markets form out of a need for buyers' and sellers' to consummate a psychological connection to a good. In a complete market, prices provide full information to buyers and sellers; however, when the market is incomplete or emerging, price signals may be inconsistent, which is indicative of market failure. Overcoming market failures is critical in developing a complete market, but it may be difficult to ascertain when that nirvana has been reached. In the words of Sidaway and Pryke (1997,

p.3): "Intuitively we knew that 'emerging' implied 'developing' or 'underdeveloped' but we could not ascertain what the cutting off point for 'emerged' versus 'emerging' would be." Thus, in frontier markets (such as the market for land conservation protected by conservation easements), it is important to first specify the market itself, before developing a model that exemplifies how an efficient model of the market for conservation easements would ideally operate. In the next chapter I apply the principles of incomplete markets to the market for conservation easements to support the premise of conservation easements as an emerging market.

Chapter Two: Conservation Values, Conservation Easements, and the Private Land Trust Movement

First thing you do is move out of the city. Then, after a while, you move again. And then again. Until you realize that you can't go far enough.

Frank Lloyd Wright, 1947

If you are lucky enough to live in the mountains, you are lucky enough.

Author Unknown

Chapter Overview

In Chapter Two I discuss how the private land preservation movement was borne out of a need or desire to correct a failure in the market for land preservation. I present conservation easements as a policy tool that is being implemented in an emerging, incomplete market for private land preservation, which I will refer to periodically as the "market for conservation easements". I discuss the components that comprise the emerging market for conservation easements, and at the conclusion of the chapter, I propose a course of research to better define the market for conservation easements and to make the market more efficient.

The objectives of this chapter are as follows:

- Present a brief literature review on the history and development of the land preservation movement.
- Illustrate the market failures that the private land preservation movement is trying to alleviate.
- Define and identify the social and private values that exist in the market for land preservation, including landowner private amenity rent (PAR).
- Outline the assumptions of a competitive market, examine the conservation easement market, and show that the market for conservation easements is an example of an emerging market.
- Present a compelling case that proper identification of the attributes and specification of the market can lead to improved market efficiency.
- Build the framework to deliver the following research results:
    - A qualitative research methodology that will reveal what trusts are trying to preserve with their land conservation efforts.
    - An economic model of the emerging market for conservation easements that incorporates what trusts are trying to buy.

The History and Evolution of the Land Preservation Movement

The human desire to expand civilization beyond urban boundaries is not merely a 20th or 21st century phenomenon. Neither is society's concern for open space preservation. In the 1840's the most prominent example of land expansion was referred to as Manifest Destiny—our still young nation's quest to expand its domain from ocean to ocean to flee

from "creeping urbanization" and an influx of immigration (Haynes, 2005). The 1950's yielded suburban expansion and associated fringe cities referred to as the "exurbs"—prosperous bedroom communities reliant on an Interstate system for commuting to separate work from a peaceful residential life. Thus, it should be no surprise that in the latter part of the 20th century and in the early 21st century, U.S. citizens have continued their yearning for open space and tranquility by expanding into low density or fringe communities heavily reliant on the automobile, long commutes, and decentralized employment (Bento et. al, 2005).

However, what differentiates 21st century growth from past eras is the rate at which undeveloped land is being converted to development. Furthermore, as a 2002 econometric study by Lubowski points out, once land has been developed, rarely does that land return to either its previous land use or to an undeveloped state; and when it is reconverted, the human footprint arguably leaves an indelible mark upon the land. Specifically, the imprint of development upon the U.S. West has been dramatic in recent years, and previously remote counties in the Rocky Mountain Region with national forests, national parks, mountains and lakes are experiencing surges in population (as are counties with a more traditional agricultural/ranching based economy (McLeod et al., 2003)). For example, selected mountain counties in Wyoming and Colorado grew between 15.1 and 39.8 percent between 1990 and 2000 (U.S. Department of Commerce, 2001), among the fastest rates of growth in the nation.

Land economics received considerable attention in the Classical and modern economic literature; however, most Classical and natural resource economic theory, such as the writings of David Ricardo, have pertained to productivity of the land, rather than preservation. A likely reason for this is that open space (particularly in North America) was perceived to be abundant in the 18th and 19th centuries throughout much of the U.S. Hence, the lack of scarcity resulted in few concerted land preservation efforts. However, this is not to say that land preservation was not a concern during the 19th century. A classic example of preservation by federal government ownership was the classification of Yellowstone as a National Park in 1872. Since this time, U.S. public land management has vacillated between conservation and preservation practices. For example, in 1908, U.S. President Theodore Roosevelt established the U.S. Forest Service for the mission of conserving land for use by future generations, and until the last two decades of the 20th century, nearly all of land designated for preservation was owned and managed by the U.S. government—a practice that still remains the most common today.

The first known U.S. conservation easement was implemented in the 1880's to permanently protect scenic parkways in the Boston area from development (Gustanski, 2000). However, the practice of conservation easements remained largely experimental for decades due to common law property restrictions preventing landowners from precluding future development on their property. Eventually, as open space became more scarce due to rapid population growth and expanded land development in the 1950's and 1960's, state statutes were passed to enable landowners to donate non-possessory rights

to a "qualifying agency" for purposes of land preservation—namely a government agency or an appropriate charitable organization.

In decades past, the most commonly accepted practice for land preservation was management by federal, state, or local agencies, such as U.S. Forest Service Wilderness Areas and Colorado's Jefferson County Open Space. However, in response to the rapid rate of development, there has also been a surge in the private land conservation movement, as evidenced by the increase in the number of land trusts formed to protect land from development. According to the most recent Land Trust Alliance (LTA) statistics (2004), the number of local and regional land trusts in 2003 increased to 1,526—a 26 percent increase over the number of trusts in existence in 1998.

The most common tool for these land trusts to employ in their quest for land preservation is a conservation easement (Land Trust Alliance, 2004). A conservation easement is an agreement by which the landowner perpetually extinguishes the property's development rights and changes in land use that are not defined within the contract. Meanwhile, the other contracting party (usually a land trust, qualifying as an IRS 501(c)(3) "charitable organization") agrees to enforce the terms of the agreement. In return, the land trust performs periodic stewardship of the property to ensure that the agreed upon terms and conditions are appropriately upheld. In return for the charitable donation, the landowner may qualify for a number of federal, state, and local tax benefits. Landowners can sell their conservation easements too, but the practice of donating conservation easements is far more prevalent.

According to these LTA statistics, conservation easements have been utilized in approximately 5 million of the 9.3 million acres of land under protection by land trusts. It is worth noting that conservation easement practices are not unique to the land trust community, and the policy tool is often utilized by governmental agencies. Likewise, private land preservation methods such as fee simple transactions and conservation leases are also employed by land trusts. However, because of the relatively low transactions costs and the fact that the preserved land remains in private ownership, conservation easements remain the policy darling of the land preservation community.

Although conservation easements are touted as a "market based solution" reflective of economic bargaining between land owner and land trust, the amount of economic research available has not kept pace with the increasingly commonplace use of conservation easements in the land preservation efforts (Keske et al, forthcoming). This paucity of economic research is somewhat ironic, as the conservation easement could be considered a poster child for the economics community as a mechanism for negotiating an externality, via a Coasian Bargain (Anderson, 2004; Keske, 2004). Oddly enough, although the practice of conservation easements has quickly multiplied in recent years, input from economists has not been actively sought by the land preservation community until relatively recently (Keske et al., forthcoming). Although the majority of academic research has been published in legal journals (McLaughlin, 2004; McLaughlin, 2005) and popular press publications, such as the LTA "Exchange", some economic research on conservation easements has dotted the academic literature (Hoag et al., 2002; Anderson and King, 2004; Hoag et al., 2005; Bergstrom and Ready, 2006) and technical reports

(Ozdemir et al., 2004; Parker and Thurman, 2004). However, the majority of "economic" research is light on economic theory, and has taken the form of case studies that present conservation easements as a "market based solution" between the conservation community and industry (Edwards, 1995; Ginn, 2005). Thus, due to the few number of conservation easement articles appearing in economic journals, the economics literature review for this chapter will be presented when the appropriate economic topics are addressed.

A plausible explanation for the absence of involvement from economists in the private land preservation movement may be because, while conservation easement audits were occasionally conducted in the past, the conservation community enjoyed a relatively quiet proliferation of conservation properties, under what some considered a relatively "obscure" provision in the tax code (Small, 2000). This all but changed when, in December 2003, the Washington Post conducted an undercover expose into the preservation practices of a prominent, high-profile preservation organization, revealing abuses in land preservation practices, including alleged abuses in tax policies specifically designed to encourage conservation easements (Stephens and Ottaway, 2003). As a result, throughout the subsequent years, conservation easement practices have been under investigation by the Senate Joint Committee on Taxation and other watchdog groups. While the decision to completely abolish conservation easements has been at least temporarily avoided, the IRS has promised that it will increase its investigation and audits to usurp façade easements that have been placed with limited regard to conservation value.

In light of the political climate surrounding conservation easements, an analysis about the economics of conservation values is timely. During the past year the IRS has embarked on a focused mission to evaluate how well trusts are able to acquire and steward lands deemed preservation-worthy by the IRS "conservation values" criteria, and are thus eligible for tax benefits. The IRS Tax Code §170(h)(4), states that protection of the following four "conservation values" will qualify for conservation easement tax benefits:

1) Public outdoor recreation and education
2) Significant wildlife habitat
3) Qualifying open space or scenic views
4) Historic property

While it is clear that land trusts will strive to ensure that most lands they protect can be compartmentalized into one of these four categories, what has not been calculated are the measured and precise benefits, both social and private, from the IRS delineations of these conservation values.

Current policies can under-allocate some conservation values, while simultaneously over-allocating other conservation values. From a policy standpoint, the fact that the IRS has spelled out four particular values determines the criteria that have higher weight than other potential conservation values to the IRS, such as open access for recreation. Trusts cannot ignore IRS designations due to the tremendous proportion of income that tax breaks provide. In this sense, the IRS has pre-determined the "vector" of conservation values that will be most protected by conservation easements, which could result in the

under-allocation of other "conservation-worthy" values that are not recognized by IRS Tax Code §170(h)(4)—or over-allocation of those that are included in the Tax Code. In effect, this tax provision has turned a particular view of conservation into a commodity that heavily influences the market for conservation easements. As a result, the conservation community either performs policy acrobatics to compartmentalize land into one of these four categories, or foregoes land if it does not fit into this pre-determined vector. Clearly, from a policy standpoint, research is needed to identify the values that the land trust community, not just the IRS, finds worthy of preservation. In this next section I will discuss how the proper identification of these conservation values has the potential to improve the efficiency of the market for conservation easements.

The Market for Conservation Easements

The market for conservation easements and the private land preservation movement was borne out of the need to correct a positive externality created by private lands that provide social benefits (Bergstrom, Dillman, and Stoll, 1985). At least in theory, in a mature market, this positive externality can be overcome with a conservation easement because of provisions permitted in the U.S. Tax Code. According to Section 170 (A)(2)(d) of the U.S. IRS Tax Code, land under conservation easement must provide social benefit purposes that are consistent with practices of preservation. Examples of these IRS defined social benefits are reservation of land for outdoor recreation or general education purposes, preservation of open space for natural habitats, scenic enjoyment, relief of "urban closeness", farmland, and lands of historical value, and protection of environmental systems. The fact that the land remains in private ownership and others

may be excluded from accessing the property means that the social benefits provided by the land do not yield a traditional "public good" market failure, as a public good is both non-rivalrous and non-exclusive.[1,2]

In reality, the presence and the extent of the positive externality may be difficult to measure due to the current legal policies and appraisal practices, and sub-optimal land allocations may result. This is exemplified by the current United States Performance Appraisal Standards (USPAP) code that forbids appraisers from including social value measurements in the conservation easement appraisal process,[3] despite the legal requirements that easements be enacted for social benefit purposes that are consistent with the practices of preservation (Land Trust Alliance, 1999). As will be shown graphically in a moment, not accounting for potential benefits that the public may receive from a parcel of land may generate a lower than expected unrestricted value of the land, which may prompt an under allocation of land for preservation.[4] Requiring a property to

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[1] Excludability is one of the key components for land under private ownership. Private landownership actually consists of a "bundle of rights", enabling an individual to:

1) Possess and use a property
2) Exclude others from using the property
3) Transfer (buy or sell) the property

By imposing a perpetual restriction upon how the property may be used, the conservation easement agreement has (in a sense) stripped the land of one of the well-established private property rights, which is why conservation easements are often referred to as "partial interests".

[2] Several other authors (Bergstrom, Dillman, and Stoll, 1985; Marshall, 2002) have referred to this externality as a public good or a public value that occurs on private land.

[3] This suggests that there are blemishes and potential indiscretions in the appraisal process—an issue also of great concern to the Joint Committee of Taxation and the IRS.

[4] Perhaps one of the most interesting cases to illustrate a flaw in land appraisal practices (and the failure to account for social values) is the example of the Sand Creek Massacre property, in Kiowa County, Colorado. The site of a gruesome massacre of unarmed Native Americans by Union Troops in 1864, this historic property presents social value to both Coloradoans and Native American tribes. A large part of the massacre site was owned by a ranch family, who were willing to enact a conservation easement on the property. However, due to lack of comparable sales data on "historical massacre sites", the landowners were dissatisfied with the "fair market value" determined by the appraiser. In this particular instance, the

provide social benefits without including the benefits in the appraisal process (that is, neglecting to compensate the landowner for the social benefits) is an example of a government failure, where government policy has overcompensated to address a market failure, yielding inefficiency.

To return to the market failure discussion, given that social benefits are provided on private lands, failure to compensate the private landowner for these social benefits yields a positive externality to society, which may result in an under-allocation of land for social benefits (Bergstrom, Dillman, and Stoll, 1985). This point is further illustrated on Figure 2.1, which applies the well-established positive externality curve to the market for land preservation (Baumol and Oates, 1998). Land will be allocated for preservation where the private benefits equal the private costs, resulting in an efficient amount of acreage (A*) at an efficient price (P*). However, if the land presents social benefits that are not accounted for in the price of the land, the socially optimal amount of acreage that should be applied is A*′ at a price of V* per acre. Thus, failure to compensate the private landowner for these social benefits may result in a deadweight loss to society equal to area BCD. In order to attain market efficiency, the value of the conservation easement and the financial benefits to the landowner as a result of the conservation easement[5] should appropriately compensate the landowner for social benefits provided by the land.

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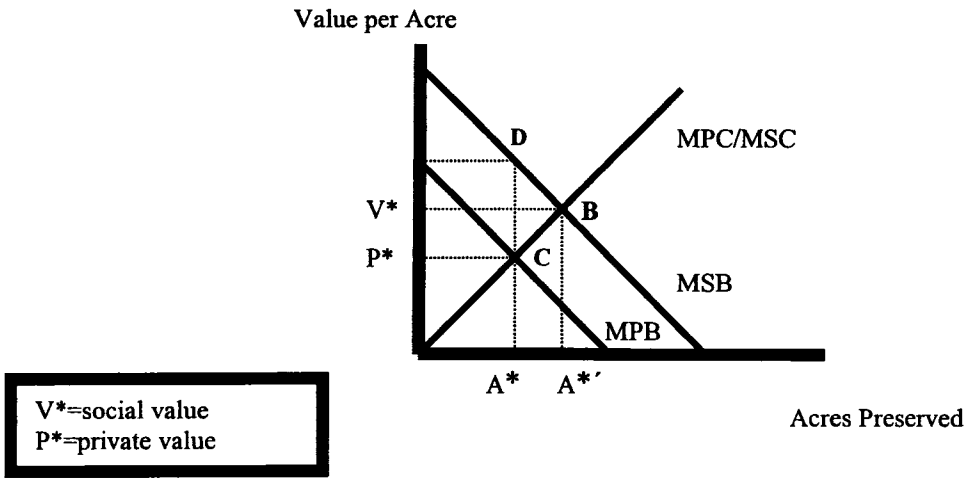
landowners sold the ranch at an asking price much higher than their appraisal, thus creating a market for a massacre site and the land was subsequently preserved for its historical values. Although many in the land preservation community believe that it is fortunate that the property was preserved, it may just have easily landed in the category of properties being developed due to lack of sales data to encompass social values. The lack of price information on the Sand Creek Massacre site is one example that supports the emerging market phenomenon, which will yield an under-allocation of land for preservation.

[5] The financial benefits that landowners may obtain from conservation easements include a number of tax incentives, which will be discussed in Chapter 4. For the sake of simplicity, at this time I have made the assumption that there is no slippage in compensation to landowners from the policy instrument.

Figure 2.1

A Positive Externality in the Market for Land Preservation

(Measured in Acres of Land Preserved—or Undeveloped)



In reality, the policy instrument itself can constrain potential compensation for conservation easements. For example, most low to middle income tax payers do not have enough income to fully utilize the compensation package provided from federal tax incentives. In Chapter Four I will further explore the limitations of this set of policy instruments, but for now I assume that the landowner is able to be fully compensated for this externality. In summary, the private land preservation movement has formed as an attempt to overcome the positive externality, which has created the market distortion.

The Emerging Market for Conservation Easements

While it is clear that the conservation easement market serves to correct market failures, the economics of conservation easements are not fully understood or documented. Furthermore, despite the considerable tenure of conservation easement practices, as outlined in Chapter One, inconsistent or absent pricing signals in the conservation easement market is one indication that the market is incomplete. This next section outlines the characteristics of the conservation easement market that support the premise of an incomplete and emerging market.

Inconsistent Price Information

In this section I discuss how, according to the limited economic research available, the resale prices on properties encumbered with conservation easements have yielded counterintuitive and mixed signals. In economics, prices serve as a signal for economic information,—and this pricing enigma indicates that the market is not operating efficiently. In addition, there are numerous practical examples of price inconsistencies (such as the unique Sand Creek Massacre property that almost didn't find a market) and observations shared by real estate appraisers during our qualitative research phase of the study. To fully appreciate how pricing and the value of a conservation easement is determined, a discussion of the conservation easement appraisal—and valuation—process is warranted. According to Boyd, Caballero, and Simpson (2000), the appraisal process for determining the value of land with a conservation easement dictates that the

restricted value of the property should be of less value than the unrestricted value of the land, or:

$$V^U = PV^D + (1-P)V^R$$

(Equation 2.1)

The value of the unrestricted (developed) land, V^U, is defined as a certainty equivalent, shown as the probability of development times the value of the developed land (V^D), plus the probability of restricted development (V^R) times the value of the restricted land.

The value of the restricted or undeveloped land (V^R) is equal to the value of all its "restricted use income" discounted back from perpetuity (I^A) at the interest rate (r) for "t" years:

$$V^R_t = \sum_{i=0}^{\infty} \frac{I^A}{(1+r)^t}$$

(Equation 2.2)

Assuming a properly performed appraisal, the landowner should be compensated for the difference between the unrestricted and the restricted values of the land. This is considered to be the value of the conservation easement. In other words:

$$V^E = V^U - V^R$$

(Equation 2.3)

Where:

V^E=the value of the easement

V^U=the value of the land with unrestricted development. In other words, the expected value of the land with no easement placed upon it, where the land may be developed

in its "highest and best use" according to United States Performance Appraisal Standards.

V^R=the value of the land with perpetual development restrictions placed upon it.

Thus, because the option to develop land has been extinguished or restricted, and the income reflects only the uses under this restricted designation, in theory the land should not be as valuable as it would be if the development option remained intact.[6] Interestingly, as shown below, several published studies have shown that this is not necessarily the case.

In one of the first economics studies to review the impact of a conservation easement program on price, Brown (1976) found an inconsistent price effect of wetlands conservation easement programs on agricultural land. The Brown study was performed before the 1976 Tax Code breathed life into the conservation easement movement, and the study reviews the economics of a regional Wetlands Conservation Program instituted in North and South Dakota and Minnesota. In this program, prime wetlands were preserved, rather than converted into productive agricultural lands and the land owner was compensated for the loss of future productive rents from the sales of duck stamps. Like the current conservation easement programs in place, the conservation easement under this program was also in perpetuity. While Brown did find a statistically significant decrease in land prices at the 10% level of significance in two of the three land

[6] The model presented by Boyd, Caballero, and Simpson and the conservation easement valuation process are further elaborated upon in Chapter 4.

regions, one region did NOT exhibit a statistically significant decrease in the price of land.

A recent study by Anderson and Weinhold (2005) of 131 land transactions in South Central Wisconsin also shows a statistically insignificant relationship between property price and conservation easements. That is, properties in this study encumbered with conservation easements *do not necessarily show a decrease in resale price* when compared to properties that are identical in all respects except for the conservation easement. Although counterintuitive with respect to the Boyd, Caballero, and Simpson model, these findings are consistent with a similar study conducted by Nickerson and Lynch (2001), which also found a statistically insignificant relationship between property price and a conservation easement.

The counterintuitive relationship between conservation easement properties and price requires a bit more exploration. There is some evidence to suggest that the resale price of land encumbered with conservation easements sales price may depend upon the amenities provided by the parcel and whether the properties are homogeneous. An econometric study by Plantinga and Miller (2001) asserts that land encumbered with conservation easements is difficult to value with traditional appraisal practices, and the authors suggest that a spatial model may be used to determine the property values. In this study, the authors determine that the value of development rights (which are, in fact extinguished by a conservation easement) are revealed as a monotonic relationship between distance from a city and a property in MOST cases. In one metropolitan area, the authors find that the

value of a property decreases $20.18 per acre; however, in another metropolitan area, the authors unexpectedly found an *increase* in rents when travel times increased from the metropolitan area. The authors note that while there is some literature to suggest a non-monotonic relationship exists between distance from a city and property values, it is likely that the relationship between price and property values is determined by land amenities. More data are required to determine the attributes that drive this change in price, and these amenities may comprise an emerging market.

In the 2005 study by Anderson and Weinhold, the authors elaborate upon their econometric analysis, and postulate that their results (which show an insignificant relationship between conservation easements and price) may be affected by the attributes on the conservation easement parcel. They assert that particular conservation easement properties may possess an attribute that is of increasing value in the resale market when it is perpetually restricted from development. Citing a Geoghegan, Lynch, and Bucholtz (2003) study showing that conservation easements increase neighboring property values, Anderson and Weinhold speculate that there may be a positive spillover effect from the now higher priced neighborhood, which experienced an increase in value as a result of the conservation easement.

To support this point, in a second phase of their analysis, Anderson and Weinhold control for permitted development limitations. To do this, the authors restricted their study size to vacant properties, with conservation easement restrictions in place to prohibit future building or development. In this reduced, more homogeneous sample, the negative

impact of conservation easement upon price is significant at the 10% level, and delivers an estimated reduction in price of approximately 47%.

Although empirical research on the relationship between price and conservation easements has been hard-pressed to demonstrate any significant effect on land prices, based upon the Anderson and Weinhold study, attributes such as "vacant" land may impact land price. After limiting the data to lots that have fully restricted development rights that preclude all future development, Anderson and Weinhold note a statistical significance at the 10 percent level of confidence, which yields several implications:

1) There is heterogeneity between conservation easement properties that results in price inconsistencies.

2) Properties with a common set of attributes or characteristics appear to exhibit similar price information. Therefore, if properties were sorted by similar features or attributes, more consistent price information of those attributes may be detected; hence, it is a worthwhile goal to define attribute information.

3) The counterintuitive and weak relationship between prices and land encumbered by conservation easements suggests that data are limited, and that conservation easements and conservation values are part of a thin, but growing market.

In summary, according to appraisal practices, land encumbered by a conservation easement should be lower in value than properties without a conservation easement,

because the development rights are restricted or extinguished. However, there have been empirical results have been very inconsistent in supporting this premise. As many authors have alluded, property attributes may influence the price of a parcel; however, it has been difficult to isolate the relationship between the attributes and corresponding weights on the price of the parcel. This may be a result of asymmetric or incomplete information, considerable uncertainty in the market, or because data on conservation easement properties are limited (i.e. the market is thin). In this next section I will briefly discuss each of these market failures as they pertain to the emerging market for conservation easements.

Thin Market (Both Buyers or Sellers)

It is well established in the world of conservation easement appraisers and in the land trust community that comparable sales for properties encumbered with conservation easements, or even the restricted sales value (V^R in the Boyd, Caballero, Simpson model) are limited (Plantinga and Miller, 2001), (Keske et al., in progress). Much of this is due to the fact that the use of conservation easements as a land conservation tool has gained momentum relatively recently (LTA 2004); thus, the proportion of conservation easement appraisals in relation to the total number of land appraisals is still rather small. In addition, because of the relatively recent momentum of conservation easement practices, a resale market for these conservation easement properties will also take some time to develop. As one appraiser pointed out during the qualitative research phase of the study (see Chapter Three), "Sure it might be based upon an appraisal, but there's no hard, flat

negotiations. You rarely see conservation easement property information available in the multi-list for sale in the book at the supermarket."

This quote summarizes the general perspective on the available data for properties encumbered in a conservation easement market: The market is thin. However, some comparison sales are available. Legal scholars (Jay, 2004; McLaughlin, 2004) have noted that re-sales of conservation easement properties have recently become more common, which has begun to provide comparison sales for encumbered properties.[7] Likewise, many appraisers have been successful in appraising properties by finding comparable sales of properties NOT encumbered by conservation easements, but with their own set of development restrictions, such as impaired properties (see Chapter Three). Exactly how thin the market is is debatable, but based upon the qualitative research study and anecdotal evidence within the land trust community, it is still very apparent that the market has characteristics of a thin market. There are a limited number of transactions, and often a limited number of participants on either the supply or demand side of the market. As will be discussed throughout this dissertation, the conservation easement market continues to develop in a direction in which there will most likely be more sales data available on conservation easement properties in the future, supporting the premise that the market for conservation easements is a thin, but emerging market. As will be shown in Chapter Four, the government can intervene in the market and facilitate more conservation easements, which in turn, will yield a less thin and more complete market.

[7] These authors also note that conservation easement properties that are once, twice, and sometimes three times removed from the original conservation easement donor are vulnerable to stewardship and legal battles.

Uncertainty

The conservation easement market also presents some uncertainty due to the interaction of attributes, or conservation values, that exist on the property. For example, a landowner who is interested in enacting a conservation easement on her property for preservation of the open space or as a buffer to urban encroachment may approach a land trust that may or may not be willing to enact a conservation easement on the property for that purpose. It is very possible that the land trust is not interested in the property for open space benefits, but the trust is interested in the land because it is adjacent to a nearby wildlife corridor. From the trust's perspective, the uncertainty lies in being able to verify the conservation values of the land and the attributes that it deems to be desirable. While a number of professional reports, such as the property baseline report, may be crafted to support the notion that a property is conservation-worthy, the trust still faces a great deal of uncertainty of whether those conservation values will be approved by the IRS, and whether the trust will be able to steward the land and preserve the conservation values in perpetuity.

In addition, because conservation easements are a perpetual restriction on development rights, there is also uncertainty about the affect of the conservation easement agreement on future landowner income. Due to dynamics inherent to farming and ranching, this effect may be exacerbated even more by landowners who rely on their properties for a substantial portion of their income. This concept will be further developed in Chapter 4.

Asymmetric or Incomplete Information

The asymmetric or incomplete information presented by the conservation easement market stems, in part, from the thin conservation easement market and the fact that trusts who seek land to preserve must be matched with conservation donors. As previously discussed, it is often times unclear whether the information within this market is incomplete or asymmetric. It was revealed during the qualitative research study that a number of donors who desire to set aside their land for preservation will shop for trusts that may be willing to undertake the conservation easements.[8] Generally speaking, however, the number of donee trusts available to the landowner is limited to a few regional and national organizations; much of the responsibility for finding a match is in the hands of the landowner, who may not have complete information. For example, the acreage for a small, lifestyle ranch in Colorado may not make the land appealing to the state-wide Colorado Cattleman's Land Trust; however, this land may present conservation values to the regionally focused Black Canyon Land Trust in the form of a wildlife corridor. If the landowner is only familiar with the former organization, he may convert his land to development if the Colorado Cattleman's Land Trust does not have an interest in enacting a conservation easement on the property. Hence, a significant conservation value may be lost due to this information gap.

Information failures may also happen on the trust side of the market. For example, a unique, trophy parcel of land (perhaps an island property with wildlife habitat and some hunting opportunities) may appeal to a special, wealthy buyer. One trust may not be

[8] The motivations of landowners who go "trust shopping" may or may not be altruistic. That is, the landowner may be equally—or more—interested in the financial benefits stemming from a conservation easement that he is for the altruism, or for the value that he gets for seeing the land remain undeveloped.

willing to match this wealthy buyer's bid offer of $10 million for the property; however, if the number of trusts actually aware of the property increases, it is possible that there may be a trust that is willing to match the wealthy buyer's bid of $10 million. It is simply a matter of connecting the right trust with the landowner. This is a case of incomplete information unless the trusts withheld information about more suitable buyers in order to gain a price advantage, in which case it would be asymmetric information. This information failure highlights the problems that occur when land trusts and landowners are being matched, and the problem will be further explored in Chapter Four.

There is some evidence that markets of incomplete or asymmetric information may continue for many years when the good is a rare, or unusual, good (Roth, Sönmez, Ümar, 2005). However, a market may also emerge, that begins at first as an incomplete market, but evolves into an economy where buyers and sellers are efficiently matched. This has recently been the case in the market for kidney transplants (Roth, Sönmez, and Ümar, 2005). Traditionally, kidney transplants were provided to recipients in order of need according to medical criteria. In the case of a kidney exchange market, a donor (whether the donor be a live or expired subject) is a poor match for the intended recipient, often a relative. As part of the kidney exchange concept, the donor is matched with a compatible recipient who also produces a donor match for the first intended recipient. This exchange economy can allow for transplants in patients who may otherwise wait for years on a kidney transplant list.

In a similar manner to kidney donation clearinghouses, this type of matching program, one that marries landowners with a land conservation organization, has also emerged in the private land conservation movement. One such example, Milford, Michigan based LandChoices, identifies preservation worthy properties and pairs the landowners with appropriate organizations for a finder's fee. Thus, while incomplete information may still be one of the root causes of market failure in the current market for land preservation, LandChoices is one example that illustrates that the market is developing and emerging into one that will eventually present complete information.

Social Benefits

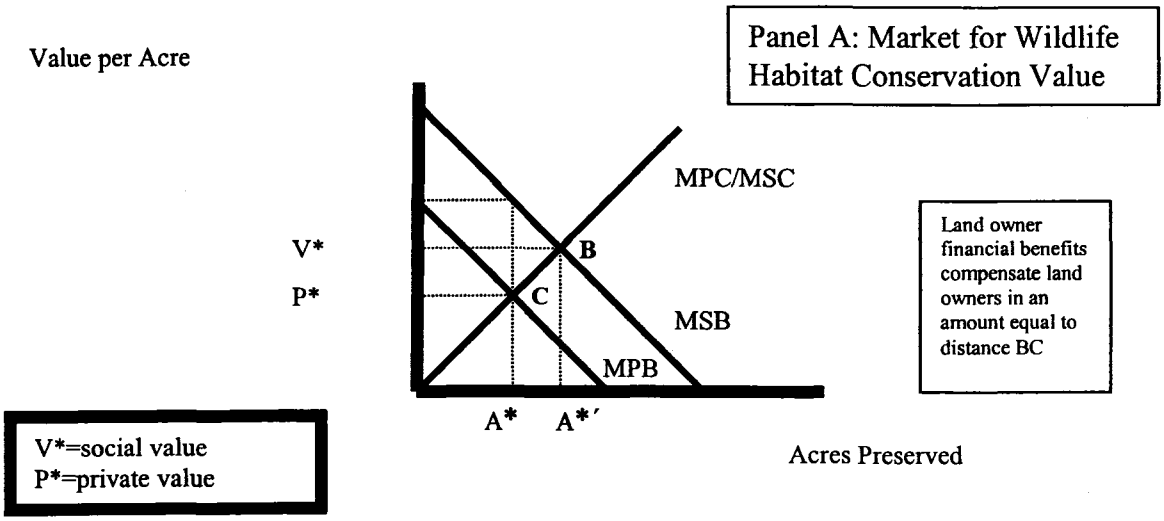
While it is clear that the conservation easement market serves to correct market failures, inconsistent pricing signals indicate that the market is an emerging one, and that the market is not operating efficiently. Thus, the objective of this section is to illustrate the principle of how proper specification of the market model and the correct identification of parcel attributes (that comprise the vector of conservation values) will improve market efficiency.

It was previously noted that a conservation easement protects a number of IRS-designated "conservation values", which promulgate a government agenda for what is deemed worthy of protection. This is shown in Figure 2.2, where a conservation easement may appropriately preserve certain conservation values, such as wildlife habitat or open space, but at the opportunity cost of other conservation values, such as outdoor education, sustainable hunting land, which are not officially recognized by the IRS as a

conservation value. Illustrating this graphically, the panel A of Figure 2.2 shows a conservation value that is fully covered by the IRS tax code[9] Wildlife habitat, Panel B of Figure 2.2 shows a conservation value that is covered by the tax definition, but only a portion of the difference between private and public value is compensated—perhaps due to flaws in the appraisal process or because the land trust performed some policy maneuvering to categorize an attribute into one of the IRS pre-defined categories. The amount for which the landowner is compensated for this attribute is reflected by the dotted line in Panel B, which is clearly at a level below the social value presented by the land. The third panel, Panel C, illustrates the case where the IRS conservation definitions do not cover any portion of the conservation value. Sustainable hunting grounds, though important to some members of society, are not included in the IRS supported vector of conservation values. In contrast, the fourth panel presents a case of when too much of a conservation value (in this case open space) is being preserved. In this case, there might be too much open space preserved at the expense of protecting sustainable hunting grounds; or, for the amount of tax dollars spent on preservation, a disproportionate amount may be spent on preserving open space at the expense at other competing policy goals. The theme of conservation attributes will be further explored in Chapters Three and Four.

[9] Again, it is assumed for the time being that tax savings fully compensate targeted conservation values.

Figure 2.2 (Panel A and Panel B)
An Example of Four Different Conservation Values Present in a Market for Conservation Easements



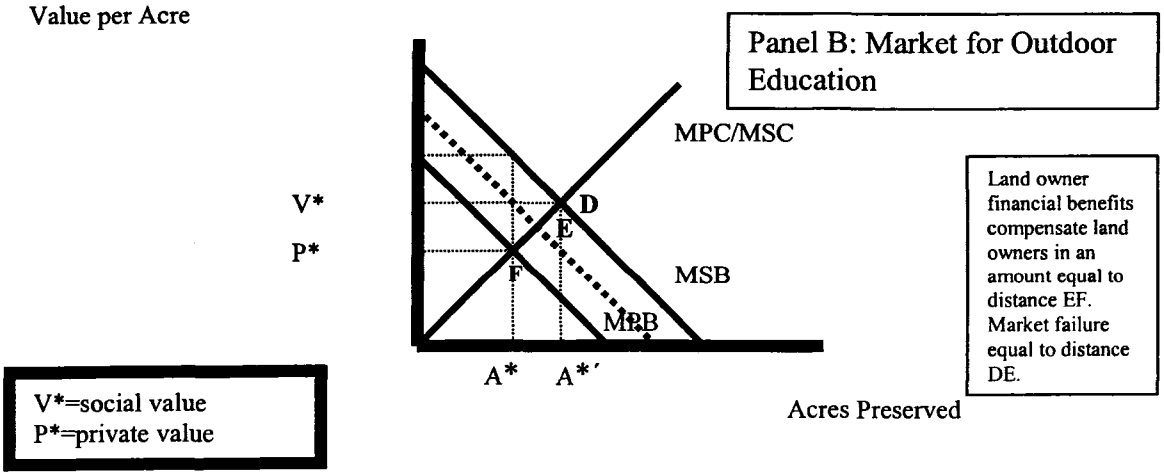
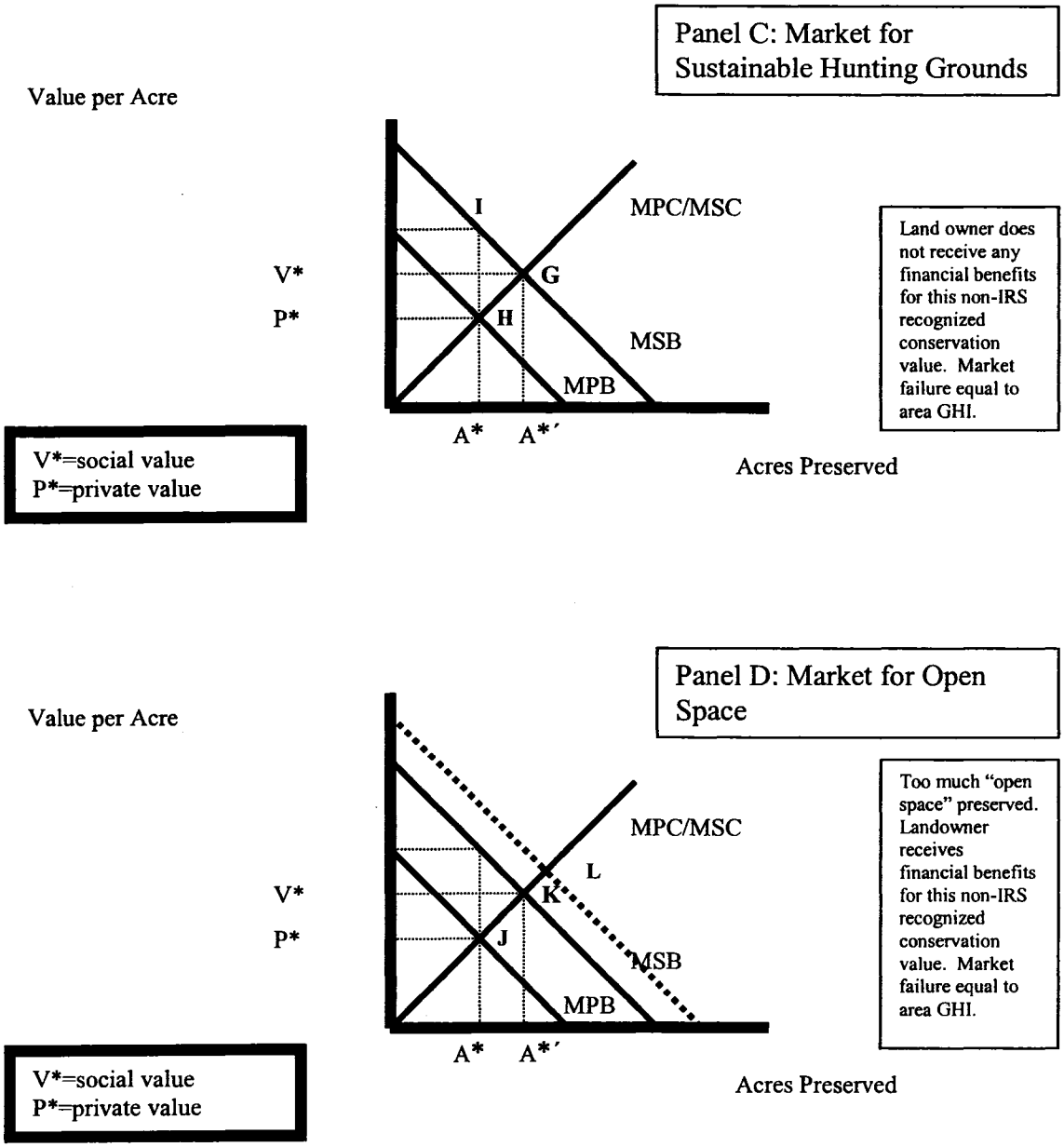


Figure 2.2 (Panel C and Panel D)
An Example of Four Different Conservation Values Present in a Market for Conservation Easements



As Figure 2.2 shows, there is still market inefficiency, which is a likely contributor to mixed pricing signals in some of the conservation easement properties. Therefore, in order to attain market efficiency, what is needed is a study that will identify the categories that belong in the conservation value vector as seen by the preservation community—not just through the eyes of the IRS. Although land trusts frequently engage in a series of policy maneuvers to apply an IRS category to a desirable parcel of land, this may still yield an inefficient amount of conservation values and an inefficient amount of land for preservation. In this case, there may be an appropriate level of wildlife habitat preserved, but not enough land for outdoor education or sustainable hunting. Likewise, as is illustrated in Panel D, too much land may be set aside for open space at the expense of other conservation values. Hence, the most efficient approach to the conservation easement process is to identify the attributes that belong in a vector of conservation values. In Chapter 3 I recommend and outline a process for methodically attaining the values that *should* belong in the IRS vector of conservation values. In Chapter 4 I will present a mathematical model that correctly specifies an efficient conservation easement market.

Private Benefits

The private benefits that the landowner receives from his land are expressed in terms of rent, which is traditionally a form of financial compensation. Rent also determines how the land will be used. Using an optimal control model to optimize resource rent, Geltner, Riddiough, and Stojanovich (1996) confirm that if the value of the "highest and best use of the land" is greater than the value of the undeveloped land, then the land will be

developed for its best use, and the market will be efficient. The authors also note that if the marginal value of the undeveloped land approximates or exceeds the value of the developed land, then the land will remain undeveloped.

Returning briefly to the Boyd, Caballero, Simpson model, private benefits are equal to the highest and best use of the land with unrestricted development potential, as determined in the appraisal process. This model is consistent with the real estate literature, which determines the value of the land and the marginal benefits to the landowner solely by the rents attained from its highest and best use. However, several agricultural economic studies have suggested that non-consumptive use rent, referred to by Marshall (2002) and Hoag et al. (2005) as private amenity rent (PAR), may also be derived from the land. For example, Stewart and Libby (1997) advocate that landowners derive an intrinsic enjoyment from simply owning agricultural land. Rowe, Bartlett, and Swanson (2001) also ranked personal motivations higher than market factors for maintaining agricultural land-uses in two rural Colorado counties.

In addition to deriving PAR strictly from landownership, several studies have shown that landowners seek to protect PAR by placing land under conservation easement. For example, in a Northeastern U.S. landowner conservation easement survey on donor motivation and satisfaction from conservation easement placement, Elconin and Luzadis (1998) found that motivation for enacting a conservation easement was primarily triggered by personal attachment to the land, sense of altruism and commitment to stewardship. However, the authors also noted that successive and second generation

landowners were less satisfied and would change their conservation easement if given the opportunity. A Colorado landowner study by Hoag et al. (2001) found similar results. In a targeted sample of Colorado agricultural landowners, respondents indicated that "maintaining agricultural land-use" was the most realized goal, and that landowner motivations for land protection stemmed more from tenure of land within the family, with less regard to financial improvements. McLaughlin (2004) also cites a joint effort by the State University of New York and the University of Vermont. The SUNY/University of Vermont 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." (p. 43)

Further evidence of utility derived from landownership is also suggested by the environmental economics literature, which has consistently shown that differences in equivalent variation and compensating variation exist, even when the income effect is small (Lesser, Dodds, and Zerbe, 1997). For example, an owner's willingness to accept (WTA) compensation to give up an environmental benefit is consistently much higher than an owner's willingness to pay (WTP) to attain an environmental benefit, which implies value, or utility in ownership.

Modeling the Relationship between Private and Social Benefits Using PAR

Although Marshall (2002) was the first to formalize PAR mathematically, this paper will apply Marshall's theoretical model to a graphical model that will relate PAR to the landowner's financial, or marginal private benefits (MPB), and the marginal social

benefits (MSB) that they may receive from a conservation easement. The principle of PAR is also critical to the mathematical model of the conservation easement market that I will present in Chapter Four.

The landowner's PAR can be thought of as a private benefit *in addition to* the rents provided by the land. Thus, it can be considered an independent, but separate extension of the traditional MPB curve. Although PAR is clearly a private benefit that the landowner incurs, the amount of PAR that the landowner receives varies between both properties and landowners. The attributes that bring utility to the landowner may also overlap with the social values provided by the property.

Although several of the aforementioned studies have surveyed landowner motivation, there has not yet been a study that identifies or measures landowner PAR for attributes. Likewise, because PAR is typically not transparent to the land trust, trusts usually do not have a sense of the landowner's reservation price. This is clearly a gap in the literature that warrants further research. Furthermore, in order to attain market efficiency, it is critical to identify the conservation values (and the associated weights) that belong in the actual conservation value vector, which may differ from the current IRS conservation values.

Summary and Future Implications

This chapter presents the market for private land conservation and conservation easements as an emerging market—one that is fraught with inconsistent price signals resulting from thin markets, uncertainty, and incomplete and asymmetric information—

but a market that is showing signs of evolving into a complete market. The market for conservation easements arose to conquer the positive externalities that exist on private lands, and based upon the increasing use of conservation easements, the land trust community is gaining momentum. The time is ripe for economic research that identifies the "big picture" of what trusts are trying to preserve in the market for conservation easements. Economic studies are also needed to model the market for conservation easements, and to identify the vector of conservation values, which will help improve several of the market imperfections and promote greater market efficiencies.

While identifying a vector of conservation values and applying this vector to the parcel level may improve market efficiency, the practical coordination of this task is no small feat. Several parallels may be drawn between this dilemma and U.S. public lands management. Like the U.S. Forest Service "multi-use" program, market efficiency does not require the presence of every conservation value on every single acre—or even on a single property (Loomis, 2002), and as will be shown in Chapter Four, a trust that maximizes its utility may, in fact, impose a "bad" upon another utility-maximizing trust that is also in pursuit of land conservation, but prioritizing different attributes. However, without using a large "master plan" to determine the focus of the private market for land preservation, the conservation community risks perpetuating market inefficiency and undersupplying certain conservation values at the expense of oversupplying other values, which ultimately leads to a decline in social welfare. Hence, the economic models that I develop in Chapter Four will also yield policy implications for improving the current market's efficiency.

In the next chapter I discuss a mixed model research method that has its roots embedded in inductive research. I use this mixed methods research model to gather data and to formulate my economic model of the market for conservation easements. Chapter 3 will reveal how I changed my data collection, research design, and economic model based upon the insights provided during the data collection process. I will also advocate that economists can benefit from infusing their traditional, deductive economic research with inductive research principles.

Chapter Three: Using Inductive Research Tools to Formulate a Deductive Analysis of the Emerging Market for Conservation Easements

"When there's a bunch of words between two quotation marks, to a sociologist, that's data."

Leland Glenna, Washington State University

Introduction: Developing an Economic Model Using Qualitative Research

The main objective of this chapter is to present an innovative research technique to find "the depth and truth" in what trusts seek when they acquire land for preservation. This research technique involves a "mixed methods" research model that uses qualitative research tools to develop an analytical model of the market for private land preservation.

To most economists, qualitative research is simply a means to an end. That is, when economists use qualitative studies such as focus group research, the primary objective is usually to refine the language that will be used in more analytic research survey, such as a contingent valuation or a random utility model study. In this sense the focus group serves as an appetizer, rather than a main course of data collection. Although the use of focus groups as a fine-tuning device is consistent with the tradition of economic research, this mindset may limit the scope of the analysis and results; consequently, useful data may be lost.

One goal of this chapter is to demonstrate how I incorporated qualitative research techniques to do more than to just "get the language right" for a rather narrowly focused survey. Instead, I discuss how I modified the data collection process in the qualitative research phase of my study, which allowed me to expand the type of data that I collected, including what trusts have expressed that they are trying to preserve with conservation easement agreements. By shedding light on what was originally a naïve approach to qualitative research, and by incorporating more holistic inductive research techniques, I modified my economic model of the conservation easement market to better reflect the "truths behind land conservation" as articulated by the private land trust community. In this chapter I will compare the results from the qualitative phase of my study (based heavily on the principles of inductive research) with the results that I would have otherwise generated from a strictly deductive, traditional economic research model. My unique contribution to the economic literature is that I incorporated an ethnographically-based data collection procedure to conduct deductive research and to develop a social welfare function for a sense of place as part of the economic modeling process. After using these ethnographic data collection techniques, including an iterative, inductive research process, I effectively changed my survey instrument and my economic model. The data, collected from landowners and land trust professionals in the land trust community, also reinforced the market for conservation easements is indeed an imperfect market—one that is hampered by asymmetric and incomplete information, uncertainty, and thinness.

A second goal of this chapter is to show that if qualitative research is conducted correctly, then pre-conceived researcher biases can be minimized and a model can be developed that effectively supports economic behavior. As a result of the ethnographically based research techniques, I will make the case that I was able to identify the "master plan" of the private land conservation movement, which includes the big picture and the attributes of what land trusts look for when they enact a conservation easement. I will accomplish these goals by fulfilling the following objectives:

- Compare and contrast the differences between deductive and inductive research processes, and conduct a literature review on several of the research techniques along this wide spectrum. This literature review will be used to build a continuum of inductive and deductive research methods that may be particularly valuable to economists conducting non-market valuation or emerging market research.
- Use the literature review to build the case that using a mixed method design (which is positioned near the center of this continuum) is appropriate for building a model of an emerging market—a market that has not fully formed, but moving towards becoming a competitive market.
- Discuss how a mixed methods research approach, which incorporates ethnographic data collection techniques traditionally used by sociologists, was used in a study of 65 land trust professionals to conduct deductive research that was used to develop an economic model that defines the emerging market for conservation easements.

- Present how I changed my economic model and my data gathering techniques as a result using an ethnographic data collection technique. Provide results that illustrate how the mixed method, ethnographically-influenced approach yields a distinctly different model than the more rigid, deductive qualitative research approach traditionally employed by economists.
- Show how using a qualitative research method that is too far on either end of the continuum between qualitative (inductive) and quantitative (deductive) may fail to capture data that may prove to be critically valuable for analyzing an emerging market or for conducting a non-market valuation study.
- Propose a qualitative data collection protocol that can be used to construct a non-market valuation survey.

From these research results, I present an economic model of the emerging market for conservation easements, which was generated from the ethnographically derived data collection and analysis tools. These results will yield a model of "a sense of place", a social welfare function that forms the foundation of what the land trust community is attempting to preserve, and that is reflective of the emerging conservation easement market. In this social welfare function, trusts will maximize their utility, which is a function of a number of variables, including a vector of conservation values. The land trust's utility function is also subject to the landowner's constraint, private amenity rent (PAR), which was previously discussed and defined in Chapter Two, and will be shown also to be a function of numerous variables, including a vector of conservation values.

Thus, the model for the emerging markets for conservation easements can be properly specified through mixed method qualitative research techniques.

An Overview of the Differences in Inductive and Deductive Research

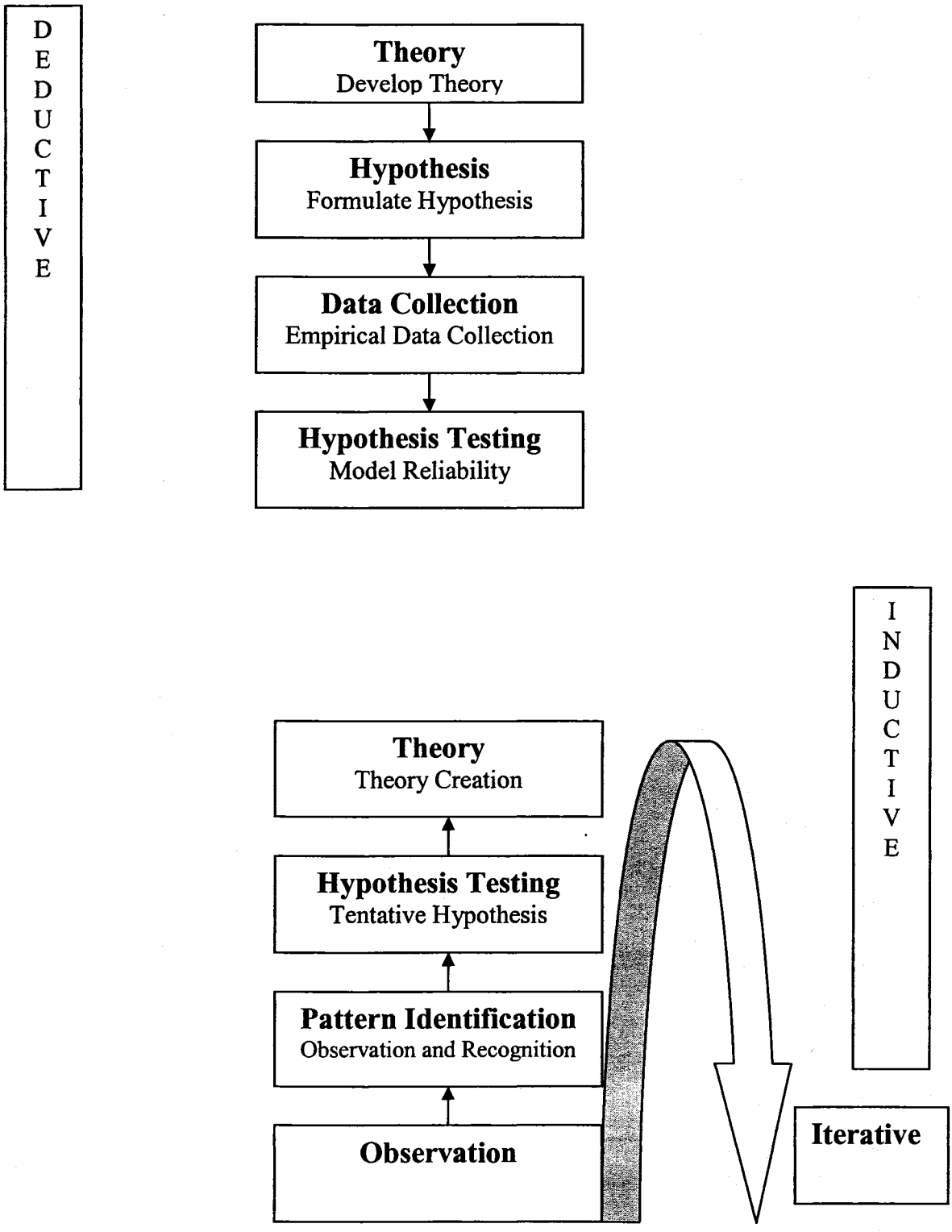
How scientists approach their research investigation greatly depends upon the research paradigm to which they subscribe. In his hallmark book, "The Structure of Scientific Revolutions" (1962), Thomas Kuhn describes a research paradigm as "linked set of assumptions" that are held by group of like-minded scientists, which serve to provide broad guidance and structure for approaching a research question. Thus, paradigms serve as a foundation for scientific research, and enable researchers to identify research question and the appropriate research methodology.

The paradigm that a scientist employs, write Deshpande (1983), Denzin and Lincoln (2000), and Tashakkori and Teddlie (2003), depends upon how the scientist will satisfy the question of: How do I know, or verify, that these research results are true? Debates have raged for centuries, and scientific revolutions have been staged about how to properly address this question. These musings have generated critical mass around the two different research principles of positivism versus idealism, which has been essentially boiled down to the modern day equivalent of qualitative research versus quantitative research. The roots for positivism were formed in the 15th and 16th centuries, with scientific discoveries that were based solely upon observable data input through the senses. Challenges to this theory were presented in the 18th and 19th centuries by "idealists" who promulgated the belief that the mind formed the basis for reality and

that understanding how humans think and perceive the world provided the insight to these scientific questions.

The differences between positivism and idealism have yielded quantitative and qualitative research paradigms, respectively. According to Reichardt and Cook (1979), a quantitative research paradigm is more results-oriented and prioritizes data reliability and experimental research designs that yield hard, replicable results. In contrast, qualitative research is process-driven, which produces holistically generated data with high validity—with a broad perspective, and deep, richly coded contexts. Deductive and inductive logic underline the respective quantitative and qualitative research paradigms. The scientific basis behind these research methods could span volumes, but I will briefly summarize these methods with two simple flowcharts presented in Figure 3.1. In short, deductive research is a quantitative research approach that involves theory creation, hypothesis development, empirical data collection and hypothesis testing to draw conclusions. In contrast, inductive logic is reflective of the iterative process implemented by the great detective Sherlock Holmes in works by A. Conan Doyle to develop a theory of the crime. As shown in Figure 3.1, with an iterative approach the researcher conducts observations to identify patterns. After the pattern observation and recognition stage, a tentative hypothesis is formed, which yields the research theory. This research theory is then subjected through the entire process once again, where it is retested once again through observation and repeating the process until the researcher converges upon the truth.

Figure 3.1
Flowchart of Deductive and Inductive Research



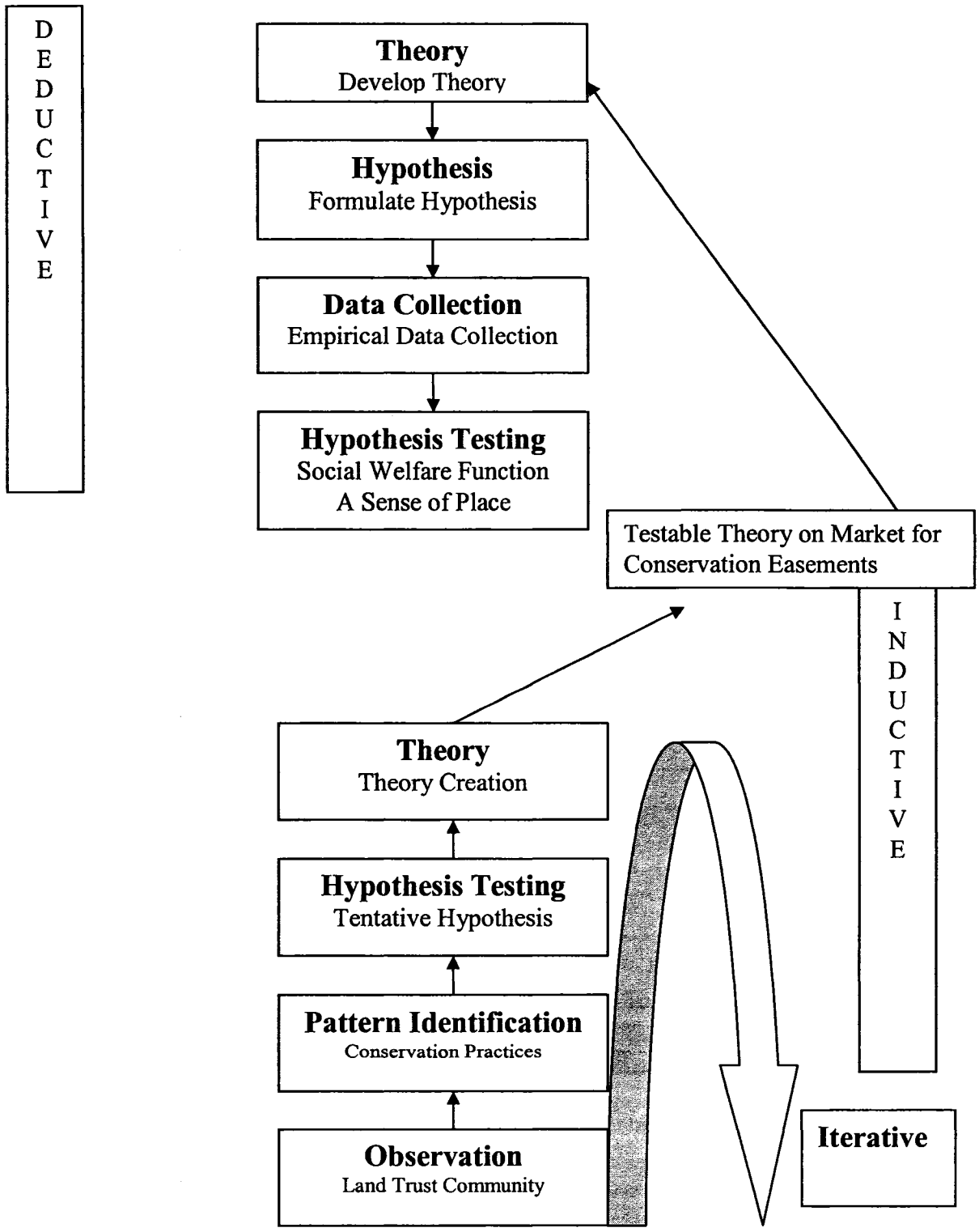
Economic research is traditionally a science based upon deductive research, where the economist formulates a theory heavily influenced by the abstractions of economic principles and the economic literature, and the economist seeks data to challenge the theory. In contrast, classic sociology and anthropology research reflects inductive techniques that involve "listening to the natives" and formulating patterns and tentative hypotheses and theories as a result. Traditionally, deductive and inductive research methods are at either end of the research continuum, and ne'er the two shall meet. In the realm of economics, while qualitative research may be used to refine the language for an analytic survey, the research process is still very much driven by a deductive research protocol.

At the beginning of my research study, I had a predetermined theory that land trusts were seeking specific attributes in the market for private land preservation, which was based upon my literature review presented in Chapter 2. It was my intent to simply fine-tune the language that would be used in a future random utility model (RUM) survey to identify the weights placed upon land attributes. In other words, I originally developed my economic theory of an attribute-driven market from an extensive literature review, and was set to conduct a rather traditional deductive research study. However, during the focus group research it became clear that the conservation easement market was an incomplete and emerging one, and that trusts were attempting to preserve something more than just land attributes. Based upon this observation, I modified my qualitative research approach to include ethnographic principles, which allowed me to observe the

underpinnings of the market for land preservation. As a result, I reformulated my economic theory, and I refined my economic model.

Based upon my revelations, my research design was more reflective of Figure 3.2. I used the qualitative phase of my research study to observe the land trust community and their patterns of land preservation activity. I then formulated a hypothesis that I used to develop a theory, and I reiterated the process until I determined that I had a testable theory of the market for conservation easements. From this combined inductive and deductive research process I developed a social welfare function for a sense of place, which is a function of attributes and other variables. Because I was able to refine my pre-existing economic abstractions, I developed an economic model that was markedly different from the original model that I would have developed using strictly a deductive research approach.

Figure 3.2
Flowchart of Deductive and Inductive Research



It is my assertion that economists can benefit from integrating qualitative research into their research design in much the same manner that I have done. While sociologists have begun to recognize the benefits of this "mixed methods research", there are still relatively few economic studies that have incorporated both inductive and deductive research methods in the data collection and data analysis process. In this next section I will provide an expansive literature review on qualitative research, and the context by which qualitative research is be useful to economists. I will organize these different research techniques onto a continuum of research that places purely inductive and deductive research techniques at opposite ends of the spectrum, and I later show how a mixed methods approach can be an effective combination of both of these strategies.

The Use of Qualitative Research in Deductive and Inductive Research

To the reader who is intimately familiar with inductive or qualitative research, this next section may come across as a lengthy literature review of the many well known and highly esteemed publications on qualitative research techniques. From the perspective of researchers well-versed in qualitative research, this may have the same effect as the illustrious aunt who reveals the same prodigious album of photographs at every holiday gathering. However, to readers with a propensity towards deductive research and who are less familiar with the qualitative literature, this next section summarizes the essence of qualitative literature and inductive research and highlights the areas that may be overlooked by the community of disciplines engaged in deductive research (which includes traditional economic research). The intent of this literature review is to educate and motivate the reader about the continuum of qualitative research approaches available,

and to present these approaches in a spectrum of techniques available to economists for data collection and model formulation.

A Background to Qualitative Research

The practice of unlocking the mysterious inner truths and cognitive processes of cultural groups using observation and elicitation techniques dates back to the Greeks (Denzin and Lincoln, 2000). The appeal of qualitative research is that the researcher is transparently exposed to the subject's world as an outsider—one who captures the massive web of truths and the inner workings of a culture by using informational tools such as field observations and memo writings, video and audio recordings of interviews, and collective references to capture the nuances of the subject. The research observer's view of the subject's world is revealed from a panoramic view of the society—although the scope and analysis may be narrowed to the precision of a sniper and verified through an array of validation techniques. Researchers must make the trade-off between a panoramic versus precise view, knowing that a more defined scope does not necessarily provide more accuracy. On the contrary, too much focus may excessively narrow the observer's scope, and valuable data may be lost, as may be the case in the survey construction process in traditional environmental economic research.

The origins of qualitative research are deeply rooted in anthropology and stem back to ancient times. Practices began to proliferate with 17th, 18th, and 19th century explorers, who used qualitative reporting techniques to document the curious practices of newly discovered cultures (Vidich and Lyman, 2000). During the 20th and 21st centuries, the

use of qualitative research has expanded rapidly, and Creswell (2003) notes that 19 complete qualitative procedures have been outlined in the sociological literature. While there are finely discernable variations of these qualitative research strategies, a review of all of these variations extends beyond the focus of this dissertation. After becoming intimate with the literature, I have found that a subset of these qualitative research variations can be molded into a continuum of distinct (but related) methods that can be used to formulate an economic model—*a process that is particularly effective to evaluate non-market values or an emerging market.* In this continuum of qualitative research, the researcher remains the central observer; and the difference in techniques is influenced by the extent of the researcher's preconceived cognitive structures when entering the qualitative research phase of the project, as well as the rigidity of the scope and the structure of the data collection instrument. The ends of the research spectrum vary greatly, from an expansive, omnipresent observer with no preconceived concepts (one end of the continuum—beyond inductive research, as no conclusions are drawn) to that of a facilitator who employs focus groups specifically as a means to validate what is a rather pre-determined model (clearly at the other end of the qualitative research spectrum).

Using Qualitative Research in Economics: A Continuum of Qualitative Research Techniques

Ethnography: The Inductive End of the Continuum

Ethnography is generally considered to be the purest of qualitative research techniques. In its untainted form, the researcher enters the world of the subject of study with eyes wide open—with unabridged open mindedness and no preconceived biases or notions of

what he or she will observe of the foreign environment. From this, the researcher develops "an analysis and understanding of the patterned conduct and social processes of society" in an objective and systematic manner (Vidich and Lyman, 2003), often through elaborate note taking of field observations and living with the natives of the culture.

According to Denzin and Lincoln (2003), and Vidich and Lyman (2003), the ethnographic process has evolved over thousands of years. The term ethnography actually stems from the Greek term "ethnos", which is defined by Princeton University as, an "ethnic group: people of the same race or nationality who share a distinctive culture". Thus, writes Vidich and Lyman, the science of ethnography is dedicated to studying human ways of life, and particularly cultures distinctly different from western culture.

Denzin and Lincoln state that the earliest ethnographic accounts, not surprisingly, were meticulously recorded observations of human cultures often found in church archives. Journals of 17th, 18th and 19th century explorers also provide rich histories of newly discovered civilizations—a context which formed the basis for the use of ethnography to reflect upon both ancient and newfound civilizations alike. Although most previously remote and exotic civilizations were "discovered" by the early to mid-20th century, the need to reflect upon a multitude of different racial and ethnic cultures heightened during this time, and the uses of ethnography expanded to include regionally segmented cultures, such as small towns, urban centers, and even central economies. As such, many ethnographers divide the use of ethnography in North America during the past 100 years

into seven separate time periods that are characterized by specific themes, thought patterns, data gathering procedures.

The purest form of this research process is better tailored for anthropological and sociological research—fields that hang their hats on analyzing often finely discrete differences that either define cultural groups or identify those groups as unique in some way. A few sociological and anthropological studies have observed the social and cultural aspects of economics to evaluate the dynamics of market practices. Colloredo-Mansfeld (2002) conducted fieldwork to examine the basis for economic competition within small, artisanal economies. In this study he determined that artisans are more apt to enter a competitive market because of their quests for artistic expression, unified national culture, and communication with the artisan community. These desires outweighed the traditional economic objectives such as rent seeking from physical and human capital or entrepreneurship. Several other ethnographic studies have been performed that review the psychological basis for art markets (Plattner, 1997; Geismar, 2001) and why buyers and sellers enter these markets. In these anthropological studies, it is clear that the focus is on the psychology for why a market is established, and on why a supply or demand side forms, rather than to create an empirical test that predicts market behavior or establishes a relationship between market variables. Although economics as a discipline clearly concentrates more on the latter, understanding *why a market may form can be critical when the market is emerging*, and price information is either not available or is inconsistent (as with the market for conservation easements). Gaining more insights into the behavior of the market participants through ethnographically based research has

the potential to help researchers to better understand economic concepts such as productivity, scarcity, and utility; furthermore, the market for a good may actually be reflective of a larger economic picture.

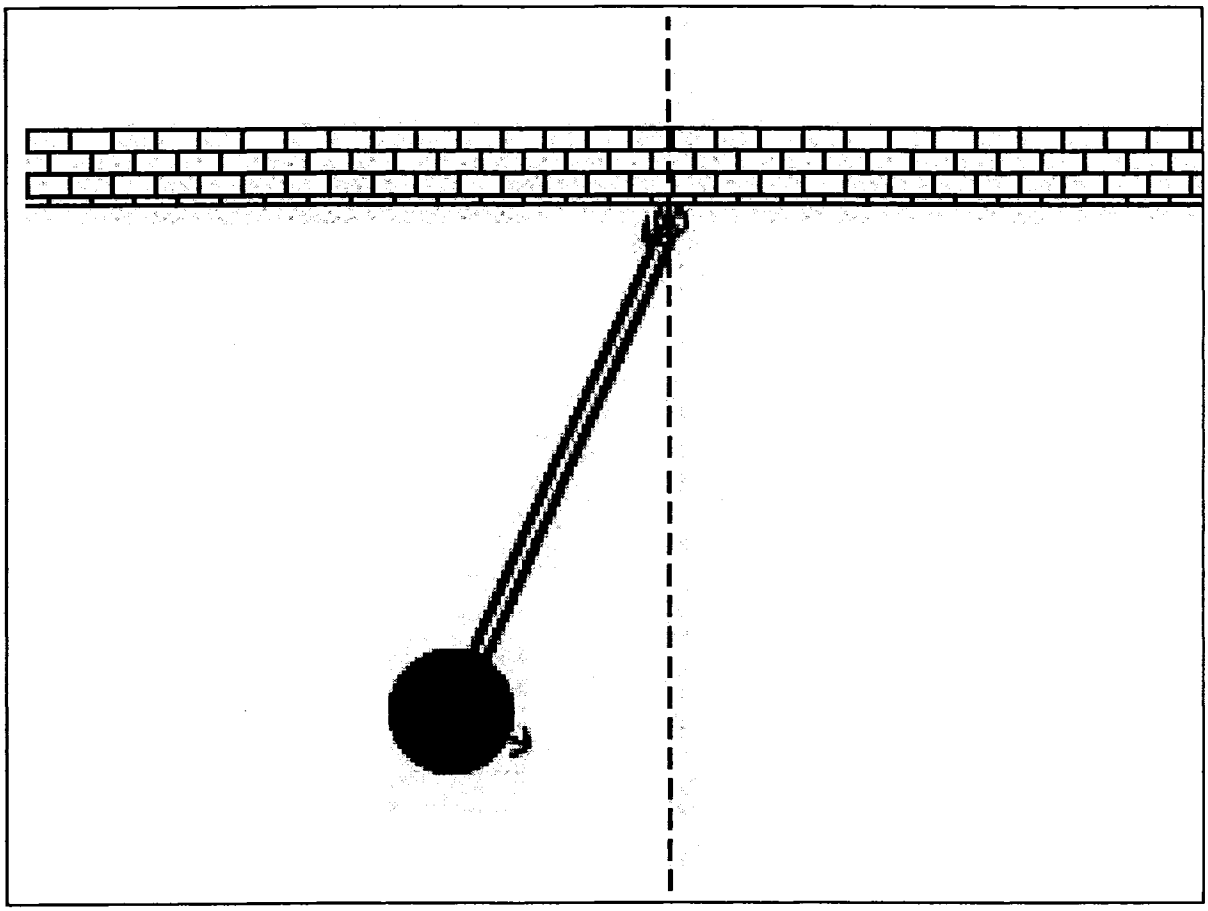
The appeal of the ethnographic process is that a research subject's "mental map" is revealed—a concept borrowed from the cognitive psychology literature (MacFadyen and MacFadyen, 1986). As a result, the ethnographic interview technique is often considered to be the foundation for qualitative research studies conducted in other disciplines. Writes Hammersley (2004), "ethnography is particularly suited for showing complex social relations, exposing the intersection of history, institutional forces, culture, and structure as they effect everyday interaction and the meanings of social life to individuals". However, Vaughn (2005) also states that while the ethnography process successfully documents the complex reactions and forms a structured observational tool that is able to provide the story behind the data, the process lacks the modeling structure to be directly used as a policy making instrument.

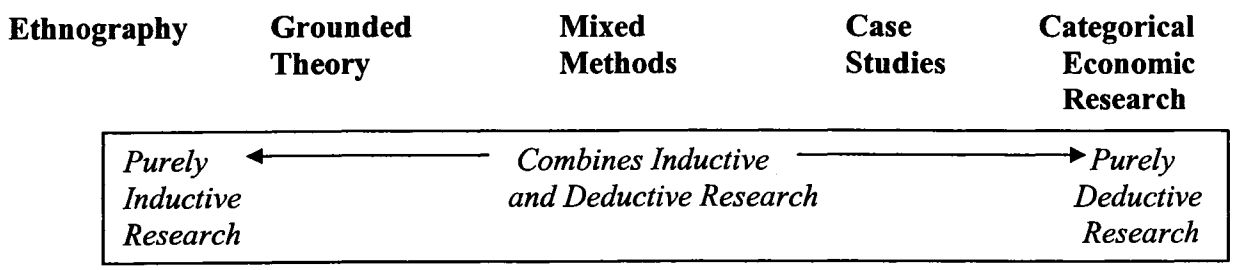
Due to the free from nature of an ethnographic data collection process, ethnography is positioned at the far left of the inductive-deductive research continuum presented in Figure 3.3. The fact that the purest form of ethnography involves "telling the stories of the natives" and that a conclusion not need even be drawn, give ethnography a position on the far left of the inductive-deductive continuum, even further to the left of the inductive process, which does yield conclusions. I will refer to the inductive-deductive

research continuum throughout the dissertation, and I will discuss the research methods along the continuum.

In summary, although free form observations may prove to be a bit amorphous for economic modeling, the principles behind ethnographic observation, data collection and analysis have a very important—but under-represented—place in the economic modeling process. As will be shown in this chapter, an ethnographically-based process can effectively assist the economist in observing the behavior of buyers and sellers in inchoate markets in order to develop a model that can be tested to draw conclusions about market behaviors.

Figure 3.3 Continuum of Qualitative Research Approaches for Economists





Grounded Theory Approach

The unstructured form of ethnography data collection is represented at the far left end of the qualitative research continuum, presented in Figure 3.3 at the end of the chapter. While many anthropologists and sociologists adhere to this pure, unabridged use of ethnography, other social scientists utilize a slight modification to the traditional free flowing narrative ethnographic techniques. In a "grounded theory" method, the researcher, "...attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study" (Creswell, 2003, pp. 14). While the researcher does perform a narration of the subject's behaviors, in contrast to the unadulterated ethnography, the researcher constantly refines the data to focus it into similar categories and to assimilate the data into emerging themes. This is often conducted simultaneously during the data collection process, and it can be performed in conjunction with other qualitative or quantitative strategies.

The grounded theory approach was developed in the mid-to-late 1960's by Glaser and Strauss (1967), during the height of the qualitative research paradigm, as an analytic strategy for collecting and analyzing empirical data. Considered to be one of the most prevalent interpretative strategies and as a format for reporting research (Denzin and Lincoln, 2003), the grounded theory approach places value and accountability on the researcher's ability to analyze data and to screen for subject selection while observing the research subjects in the field. Thus, writes Charmaz (2000), in a grounded theory strategy, the data collected have been slightly modified to include the researcher's perspectives and theories. Although some purists may argue that this "taints" of the data

collection process, the appeal is that the structure imposed by grounded theory may better organize the data for interpretation. For example, as articulated in a personal interview with Colorado State University Sociology Associate Professor Mike Lacy, "Sometimes the natives don't fully understand their own civilization or culture. It's important for the researcher to come into the observation with a backbone for what he or she is going to observe" (Lacy, 2006). The grounded theory approach is a quasi-structured data collection and analysis process, although the theory development process is still a bit amorphous. Elaborates Lacy on the grounded theory approach, "Grounded theorists hear the bells toll, but they know not for whom."

Grounded theory approaches may be relevant to economic research because the method permits for structure during a qualitative data collection process, which may be appropriate when learning about a market or an organization that is not yet fully formed. A few economic articles have been published that have contrasted grounded theory with "critical realism", an approach used to develop macroeconomic models, such as the neo-classical model and post-Keynesian model. Lee (2002) draws parallels between the grounded theory method and the critical realism, a process based upon historical observation and data analysis, as well as "common sense propositions", which is used by post-Keynsian economists in theory creation. Lee advocates combining grounded theory in macroeconomic model development to yield a systematic integration of causal-history, economic structure and intuition, from observational data collection strategies.

Although Lee nicely draws parallels between the two approaches and advocates an efficient integration process, in his paper he does not actually integrate the data and develop a model. A publication by Downward, Finch, and Ramsay (2002) also recommends combining inductive research techniques such as grounded theory with critical realism to develop neoclassical and post-Keynesian modeling, but the authors also do not present an empirical study or economic model.

The more structured data collection approach may be appealing to economists who are accustomed to working with pre-established economic theory, models and priors in their research process, but who are open to revamping or amending these classical models, much in the same manner done by Downward, Finch, and Ramsay. Hence, the grounded theory approach may be more appropriate to the economist who is observing market processes or policies in an exploratory fashion, such as observing an economic transaction, or a newly formed government or administration to gain clues about its operations. In order to actually construct a mathematical or an empirical model, a more practical qualitative process further along the continuum may be more useful for data collection and analysis.

Case Studies

One qualitative research approach more prevalent to the business, marketing and finance literature is the case study method. The case study process is an in-depth, multifaceted situation analysis; typically, a number of related case studies are compiled to develop a theme or argument (Lee, 2002). Writes Yin (2003) in one of the premier textbooks on

case study research, case studies can be used for exploratory, descriptive, or explanatory research, depending upon the type of research question proposed, the control the researcher has on historical events, and whether the event is contemporary or historical.

In contrast to the applied economics literature, which uses qualitative research methods as an "opening act", so to speak, for the "headliner", (typically a follow-up survey instrument) the marketing case study literature utilizes highly structured interview techniques to obtain rich, multi-dimensional picture as evidence to support the case study premise.

To gather evidence, the marketing literature makes a compelling case for the use of personal interviews and focus groups as research tools. In his seminal book, "Case Study Research: Design and Methods", Yin (2003, 1994) notes that personal interviews and case studies are particularly powerful to analyze contemporary events where the "relevant behaviors cannot be manipulated." While this does not necessarily mean that that the issues under investigation (and the associated contexts) will never change, it does imply that a snapshot of the relevant situation, nicely referred to by Loftland et al. (p. 21) as "a holistic investigation of some space- and time-rooted phenomenon..." In other words, the event is captured at a static point in time using a wide variety of evidence gathering tools, including interviewing. Yin further describes case study research as "an empirical inquiry" that relies heavily upon on multiple inputs, rather than data point observations. These richly encoded inputs are more similar to "variables of interest" than data points and they are used to present a large, panoramic picture of the problem. Tightly structured

interviews can be used to tap into these "variables of interest," which reveal evidence that will support the research premise during a structured interview process, making personal interviews and focus groups an invaluable part of the marketing case study evidence gathering and research process.

There is much insight to be gained from the case study focus group interview process—particularly when reviewing the recommended precise, methodical case study interview design. However, despite the strengths of this interview process, prominent researchers who have published a number of case studies (Yin, 2003; Fetterman, 1989; Jorgensen, 1989) are adamant that the interview used to develop case studies are NOT to be used as a pre-cursor to implement a research survey. Instead, the interview is used to attain the evidence to support a broad, but static, snapshot. This brings up an interesting observation that, despite the strengths presented in the case study literature, focus group elicitation techniques for marketing and business case studies are still used for a rather narrow application—one that primarily considers "how" or "why" a situation evolved over time, rather than enumerating frequencies or incidence of behaviors over time.

Case studies have frequently been used to present conservation practices (including conservation easements) as market-based solutions that can be used effectively in partnerships with private industry. One particularly relevant example of this case study approach was used by Victoria Edwards in "Dealing in Diversity: America's Market for Nature Conservation" (1995), to make a compelling argument for the private, versus public, land preservation. Published at a time considered to be at the early stage in the

private land preservation movement, Edwards follows up basic economic concepts of private land preservation with case studies of several land trusts and preservation projects successful in the early 1990's, such as the Appalachian Trail, the Montana Land Alliance, and the Leopold Memorial Reserve. In a more recent example, Ginn (2005) presents several case studies that exemplify successful market-based conservation transactions and environmental markets, such as debt-for-nature swaps, bankruptcy take-overs, and carbon sequestration credits.

In summary, while case studies may successfully present a rich context of an economic problem, the more narrow application of the case study positions this method further to the right of the continuum than ethnography or grounded theory, which approach the observation phase with a slightly less rigid structure. However, the more open ended interview and data collection techniques yield a spot on the side of a very refined scope, but broader than deductive economic research.

The Other End of the Continuum: Deductive Economic Research

As illustrated in Figure 3.3, unabridged ethnography and grounded theory strategies comprise the left side of the continuum of qualitative research methods, because these strategies advocate free form or loosely constructed data collection through observations. During this next section I will present the other end of the continuum and contrast these data collection procedures with deductive research—the qualitative research approach most commonly employed by economists to develop the data collection instruments, which are most often used in non-market valuation and stated preference surveys.

In the environmental economics community, qualitative research typically fulfills a very specific, or deductive, objective; it is used as a tool to synchronize the language of the researcher with that of the respondent when constructing survey instruments to minimize survey measurement error. In other words, the qualitative research is used to gather institutional knowledge. As noted by Salant and Dillman (1994), of the four types of research error (coverage, sampling, measurement, and non-response), measurement error can result from improper question design or survey language because the respondent's answer to a given question is inaccurate, often due to improper phrasing of the question or response choices. To borrow from sociological principles, the importance of "representing the language of the natives" is critical—so much so that the "gold standard" in non-market valuation guidelines, the National Oceanic and Atmospheric Administration's (NOAA) Contingent Valuation Panel (1993)[10], specifically recommends using qualitative research techniques such as focus groups, personal field interviews, and to eliminate researcher bias in compiling the language necessary to formulate a survey.

Although the importance of implementing the correct language to reduce measurement error was clearly recognized by this Blue Ribbon Panel, the specific focus group methods and qualitative research procedures are typically "glossed over" in most contingent valuation studies. According to Johnston et al. (1995), this may be due to the fact that precise guidelines for using focus groups and qualitative research in the economic

[10] The NOAA Blue Ribbon Panel was formed as part of the high profile case of assigning a value to the economic impact of the Exxon Valdez Oil Spill. Spearheaded by Nobel Laureates Kenneth Arrow and Robert Solow, the Panel's recommendations remain the foremost guidelines for the contingent valuation process today.

literature are not readily available, and thus, many economists forego this step in developing stated preference surveys. Qualitative research, focus group, and pre-test guidelines for stated preference surveys are also notably absent in such well-respected non-market valuation bibles such as "A Primer on Nonmarket Valuation" by Champ, Boyle, and Brown (2003); and " Valuing Environmental and Natural Resources" by Haab and McConnell (2003).

Several prominent authors have noted that qualitative research can be beneficial to environmental economic surveying techniques, such as the stated preference research process, by reducing omission errors and by identifying language that enhances the validity of the survey instrument (Boyle, 2003; Holmes and Adamowicz, 2003; Loomis, 2002). However, a key difference is that with deductive research, the methodology of the qualitative research process itself is consistently overshadowed by the survey instrument. Hence, the primary focus of the economics literature is not on the qualitative research process itself so much as it is on the integrity of the product—often a stated preference survey—that is born from it.

Thus, for those economists who do construct qualitative research, it is clear that the researcher has already formulated a model and is in search the right language to "fine tune" the model. Although the researcher may have relied upon previous empirical studies and data on which to build the priors, the effectiveness of this approach depends greatly upon the availability of data and other economic studies on which to construct the priors. In the case of an emerging market or when the good defies traditional market

valuation, it may be more difficult to build a model based upon prior market data. Hence, when constructing a model, the researcher carries with her more potential to taint the data collection procedure due to her own biases, resulting from constructing a model with few market observations. For example, it is very possible that the good that the economist believes that she is valuing may actually be part of a larger market—she is simply unaware of this because price information is neither readily available on this good, nor for the larger market of which it is a part. This phenomenon reflects the widely upheld belief by sociologists that economists have already brought in pre-conceived ideas of what the model should actually consist when they conduct their qualitative research phase of the project. They may not be able to accurately observe the true dynamics of what the market is trying to portray. Thus, the heart of the matter is the extent to which this constricted qualitative data collection procedure affects the formulation of the model, and what data may potentially be lost by adhering to excessively rigid guidelines used in a deductive process.

A few notable economic studies have made the case for using "ethnographically based" procedures to develop an economic survey, but not surprisingly these studies focus more upon refining survey language to avoid measurement error and methodological misspecification—which results when the market categories are correctly specified, but due to miscommunication between the researcher and survey respondent, the respondent misinterprets the stated choice survey question (Mitchell and Carson, 1989).

For example, Johnston et al. (1995) implemented a series of focus groups using ethnographically based procedures to draw upon participants' experiences and how they understand, perceive, and categorize resources in order to determine public preferences for water quality management. In doing so, the authors developed guidelines that draw upon ethnographic procedures to learn about the subjects' thinking processes for more effective survey design. Although the authors' mastery in the ethnographic categorization and theme finding process appropriately reflects an ethnographically-based observational approach, the authors clearly began—and concluded—the study with a specific survey model in mind, and the survey was simply refined through the use of an ethnographically-based focus group. The pre-conceived deductive model starkly contrasts with entering into a qualitative research project to "learn how the natives think" to build an empirical model. This is evidenced by the authors' conclusion that "from an economist's perspective, ethnographic methods offer a means to improve the quality and reliability of CV results, by assisting the researchers to minimize bias in focus group observations" (p. 58). However, the authors also allude to the fact that several social science surveys and studies that have incorporated ethnographic studies early in their research designs and that a qualitative/quantitative combination method may be more effective than either approach used in isolation.

In another study that reviews the validation of contingent valuation surveys, Boyle et al. (1995) advocate using a qualitative research procedure to validate a contingent valuation research design. Citing NOAA recommendations of incorporating qualitative research to formulate a survey, in this study, Boyle et al. construct an "expert panel" of river guides

to confirm the consistency in results from a contingent valuation survey used to assess the impact of river flow rates on desirability of the experience to rafters. As will be discussed momentarily, this is actually an example of a mixed methods approach, in which the researchers used sequential qualitative and quantitative study designs, and triangulated the data (although this connection was not explicitly pointed out by the authors). While Boyle et al. did use qualitative interviews with a panel of experts to validate empirical results, the researchers used a deductive model to measure satisfaction upon rate of flow. In an inchoate market that requires non-market valuation, one may argue that rate of flow might not actually be the correct variable by which to measure satisfaction, and through the use of more open ended interviews with the rafting guides, the researchers may have been able to identify other variables that would impact the level of desirability of the experience.

In summary, clearly, the process of avoiding methodological misspecification is critical. Earlier authors recognized the value that an ethnographically based focus group procedure brings to the survey development process, as it represents a systematic attempt to listen to the natives. However, when consistent price information is not available or the market is an emerging one, a misspecification error may result because of potentially incorrect assumptions about the market structure. Hence, misspecification may occur from building the wrong equations or functional form into the model, not from just identifying incorrect variables or survey language. What is needed is a qualitative research method that can extract the market structure (which includes the proper specification of the model, equations, and functional forms, not just variables) through

observation of the market's buyers and sellers, so that the economists can use this information to formulate an empirical analysis. This type of research design can be constructed by the use of mixed methods research.

Mixed Research Methods

Mixed methods research is often used as an umbrella term for "the third methodological movement" that "uses qualitative and quantitative data collection and analysis techniques in either parallel or sequential phases" (Tashakkori and Teddlie, p. 11, 2003). Although the hybridization process was used in social science research throughout the 20th century, mixed methods research as it is known today was not formalized until the 1990's, when researchers heightened their documentation during the clash between the quantitative and qualitative research paradigms. In their seminal handbook on mixed methods research, Tashakkori and Teddlie also note that mixed methods has become increasingly more complex, and that the data are more frequently being "triangulated" or combined from both the quantitative and the qualitative research strategies at all stages of the study, from problem identification, to the data collection, data analysis, and conclusions.

The mixed methods research process has never been "formally" defined for economic research, although it could be argued that the NOAA Blue Ribbon standards advocate a mixed methods process as a part of contingent valuation. In contrast, mixed methods research has become a predominant research methodology in the disciplines of psychology, sociology, nursing, management, and organizational research, and much has been written about the procedures for conducting mixed methods research in each of

these respective fields. Part of the appeal of mixed methods research is the opportunity to validate qualitative research results with empirical data and vice versa; numerous studies in other fields have integrated these qualitative and quantitative research processes as part of a validation procedure.

Validation alone is not the only reason for implementing a mixed methods approach. According to Tashakkori and Teddlie, there are at least eight designs that integrate qualitative and quantitative processes, referred to as typologies, which are categorized by the procedural implementation. The eight typologies are differentiated in three layers, which consist of the nature of the research question (exploratory versus confirmation), data analysis (qualitative versus quantitative), and inferences (qualitative versus quantitative). Thus, the construction of a mixed method consists of a wide variety of design options that may be employed to address a multitude of research angles. These eight typologies are presented in Appendix B.

A handful of economic studies are available that have implemented mixed methods to assess and to validate the contingent valuation procedure and for the use of building surveys. In a health economics narrative, Cookson (2003) lauds the potential benefits of the contingent valuation process to the health sciences/health economics fields. However, as Cookson points out, the contingent valuation process presents some potentially fatal measurement biases that may render the process undesirable in health economics:

1) Under-sensitivity: Respondents state a similar willingness to pay (WTP) for ANY reduction in the risk of death and injury.

2) A budget constraint bias: Respondents are unable to consider an entire range of goods and services for both public and private goods, forcing the WTP for each item alone to exceed the allocated health care expenditure budget.

In response, Cookson suggests that employing a reflective qualitative research method may yield insight into the "constructed nature" of preferences and thus provide a greater benefit to improving contingent valuation design (and reduce bias), compared to simply refining the survey questionnaire; however, he does not propose a means for implementing the qualitative research process. In a similar vein of thought, Shiell and Gold (2003) instituted a qualitative research process in a health economics study to seek respondent clarification for the development of a contingent valuation WTP scale, but the authors did not develop a specific quantitative data collection model.

The environmental and natural resource economic literature has a few examples of the use of mixed methods, but most pertain to developing a survey or an economic index. Parkins, Stedman, and Varghese (2001) implemented a number of data collection venues in its qualitative research process (workshops, indicators, and survey research) to develop a local-level index of sustainability. Kontogianni et al. (2001) combined WTP data attained through contingent valuation surveys with qualitative information derived from focus groups to validate preference rankings in different environmental preference scenarios. The Kontogianni et al. study also validated that respondents were able to

appropriately express their preferences through economic values and through a contingent valuation survey, and the focus groups confirmed that respondents utilized systematic, logical thinking to justify their economic preferences.

Johnson, Lilja, and Ashby (2003) also implemented mixed methodology to determine the stakeholder groups that should ideally become involved in the natural resource and environmental economics research process. The authors first conducted qualitative interviews with selected participants in a modified case study approach to determine the perceived impact of stakeholder participation in research programs. They then followed up with an empirical assessment of costs to establish a relationship between research participation and financial well-being.

An interesting mixed method study by Henwood and Pidgeon (2001) was published outside of the economics discipline, but utilized both quantitative and grounded theory qualitative research to glean attributes and values that participants found to be significant in a wooded area in Wales In the first segment of the study, researchers approached stakeholder groups to design the methodology of the study, then followed up by conducting focus groups to elicit specific attributes of wooded sites that people found to be personally significant. During the focus group, individuals were also asked to rank eight key "naturalness" issues in order of importance, first to themselves personally, then in terms of importance to the nation of Wales. These rankings were then analyzed for statistical significance. The Henwood and Pidgeon study is interesting in that focus groups and other qualitative research techniques were used to solicit a list of attributes

that were qualitatively assessed for weights. In addition, the authors performed some simple statistical regressions on the respondent's prioritization of the public versus private values.

In summary, a handful of economic and natural resource studies have implemented mixed methods design, but the bulk of those studies have specifically focused upon qualitative research to develop a contingent valuation survey or an index. While these studies reflect innovative and cross disciplinary thinking, much of the design is still deductive in nature. That is, the economist has already made up her mind as to the dynamics of the market in question, and is searching for a way to either improve communication between researcher and respondent or to communicate the preferences of study results (as through an index). Henwood and Pidgeon transcend this mold a bit with an ecological study that attempts to incorporate quantitative results to determine the preferences of public and private values; however, their study lacks the mathematical rigor and modeling present in most economic studies.

As evidenced by the profound amount of social science research and a handful of economic studies, mixed method results show promise in tapping into the psyche of the market. However, what has not yet been demonstrated in the literature is the ability to perform an exploratory investigation using a qualitative analysis to generate quantitative inferences—that is, economic model generation based upon qualitative insights. While it is clear from the economic literature that economists fall short on observing the subjects to help understand the market system and emerging markets, the inability to formulate

quantitative inferences from qualitative data is pervasive in the mixed methods literature, as well (Tashakkori and Teddlie, 2003). In the next section I will propose that a mixed methods approach is an appropriate modeling method for a market that is inchoate, and I will illustrate the stark differences in model development that occur when qualitative research is not implemented. This will be used to support the case that researcher bias may result if an economic model of an emerging market is built without implementing qualitative research that taps into the psyche of the market participants.

Using Qualitative Research to Study the Conservation Easement Market

In this next section I discuss how I approached the qualitative research phase of my study. Before I fully recognized the merits of qualitative research, my initial strategy was to conduct a valuation study for the attributes of preserved land in a two-phase process:

- In the first phase I planned to implement focus group research to identify the true conservation values of the land trust community in order to formulate a vector conservation values that extended beyond IRS protocols.
- In the second phase of the study, I intended to use these identified conservation values to construct a stated choice survey to test the reliability of my theory.

Although this initial approach is consistent with deductive economics research (similar to that presented in Figure 3.3), my literature review allowed me to recognize that I was lending my own biases to the data collection phase.

During the literature review, I contemplated whether this deductive research approach may be too focused to capture the big picture of what the land trust community was in search of in the market for land preservation, and I allowed myself to maintain an open mind during the data collection process. In addition, I also had the revelation that the market for land preservation was incomplete, and that land conservation was a "psychological good" that required further reflection to understand, and to model. As a result of these reflections, during the pilot focus groups, I continually revised my observations, pattern recognition, and tentative theories in a manner portrayed by the inductive research process illustrated in Figures 3.1 and 3.2. This allowed me to remain open-minded and to listen to what trusts were trying to communicate about the market for conservation easements.

The iterative process that I used to develop the theory of the conservation easement market ultimately changed my economic model of the market. According to Tashakkori and Teddlie (2003), this particular mixed methods design is rather unusual, as it is more common to employ a quantitative analysis that is verified with qualitative research, rather than a quantitative model that is based upon qualitative research. Thus, my research study is a unique contribution to both the economic and sociological literature. Due to the fact that my research design is rather distinct, and that there is a gap in the environmental economics literature for qualitative research, I have developed a recommended protocol for economists to use to conduct qualitative research. During this next section, I reveal more details about this research process and I recommend a

protocol that economists can use to conduct qualitative research to aid in the development of economic theory.

Recommended Qualitative Research Protocol for Economic Modeling

The sociology and anthropology literature is rich with recommendations for qualitative research data gathering techniques. Before implementing the data collection phase of my study, I conducted a thorough literature review for guidelines on how to conduct qualitative research for an economic study. However, as previously discussed, the amount of economic literature that provides guidance for qualitative research is limited. Hence, I relied upon the principles of ethnographic data collection and analysis presented in Lofland et al., and I implemented this process for all eight of my focus groups.

It is clear that there is opportunity to provide recommendations to the economic community about qualitative data collection and the inductive research process. This prompted me to outline a suggested protocol that can be used for researchers who are unfamiliar with inductive research techniques, but who desire to incorporate inductive research into their mixed methods research process. The protocol outlined below serves merely as a synthesis of numerous qualitative research techniques and ethnographic procedures, although the structure may be beneficial to a researcher more accustomed to conducting deductive research.

The five steps of the mixed methods research protocol for economic research are:

1) Sequencing of the qualitative and quantitative research phases

2) Data inputting with the desired data analysis structure

3) Data logging and memo-ing

4) Data coding and theme finding

5) Synthesize the data to form the economic model

I have integrated these procedures into a protocol that can be employed in either a mixed method model for economic research, or in a traditional deductive research model used in classic environmental economics research. In other words, this protocol can be used either by a researcher who is studying an emerging market through the use of a semi-structured qualitative research technique, or by a researcher who simply wants to collect the right language to develop a survey instrument (reflective of the traditional deductive research method). I paid particularly close attention to the sociological literature and I tried to develop the protocol in a way that reflects a dynamic research design, where the data analysis is tied very closely to the data input process. In fact, the preliminary part of the analysis may take place during the data input process, as will be illustrated with the memo-ing step. In the next section I elaborate further upon each step in the research protocol.

1) **Sequencing of the qualitative and quantitative research phases**

   The sequencing of the qualitative and quantitative phases of the research process provides the foundation for the entire research design. In the sequence stage, the researcher determines the order in which she will conduct the qualitative and quantitative data collection, and what type of inferences she will make during the

data analysis process. There are two options. The first option is to determine the order of the quantitative versus qualitative research approach. The second option is to decide whether the qualitative and quantitative research processes should be conducted sequentially or simultaneously. These two different options can be combined into eight different structural design combinations, which Newman et al. refer to as "research typologies". The eight different typologies—combinations of quantitative and qualitative research sequences—are presented in Appendix B.

In a sequential research design, the study is conducted in separate phases. The design may include two different types of qualitative research methods, two different types of quantitative research methods, a qualitative research method followed by a quantitative research method, or a quantitative research method followed by a qualitative research method. In the homogeneous studies (Qual/qual or Quant/quant), one approach is considered to be dominant, while the other method serves a supportive role, and can be used to perform a validity check; this may be the case with qualitative field research followed up by individual case studies, for example, that serves as a cross-check to support that data. This appears to be the most common research approach in the sociological literature

My research study utilized a sequential process, where the qualitative information was gathered first to then yield a quantitative inference (which, in my case is a

mathematical model) that can be used to draw some conclusions about the market for conservation easements. Newman et al. refer to this particular typology as a qualitative research typology which yields an inductive thrust. This is a more unusual type of mixed methods approach compared to a Quant/quant study, or a Qual/quant study, and my study's sequencing of the qualitative design to quantitative results makes this project of interest in the sociological, as well, as the economic literature.

In contrast, with the simultaneous design, both qualitative and quantitative methods are incorporated at the same time to draw either qualitative inferences or quantitative inferences. A simultaneous data collection method may be more reflective of the Henwood and Pidgeon (2001) study where they conducted group interviews and during the interviews asked subjects to rank features of naturalness, which the researchers used to run a statistical regression.

2) ***Data Inputting with the desired data analysis structure***

This step is critical because the data input process ties directly into the data analysis phase of the study; hence, the data analysis will be limited to how and what data are gathered. Lofland et al. (2006) advocate a dynamic data input process that includes continuous data inputting and assimilation during the focusing and analysis phases. The creation of the appropriate dynamic input instrument is especially critical for economic research, because the blend of observation and facilitation in the data gathering process will adjust depending upon the focus of the study. For example, the depth of qualitative research data

will be deeper if the data are being integrated into deductive research (for which there are several sources of prior information), compared to being used as a cross-check to confirm quantitative results, or collected to construct an economic model of an emerging market. As follows are key questions to help determine the appropriate depth of necessary data:

- How much of the priors are based upon pre-existing literature, heuristics, models of economic intuition, or even urban legends?
- How mature is the market, and therefore how much uncertainty exists within the model?
- How dependent will the model construction be upon observation?

Traditionally, the goal of ethnographic research is to attain the richest amount of data possible. However, as stated above, the extent to which qualitative data are necessary to build the economic model greatly depends upon the amount of already published research currently available. In my study, the literature review and priors presented in Chapter Two provided intuition that the conservation easement market was an emerging one. The emerging market concept was reinforced by the pilot group interviews. Then it became clear that there was a great deal of uncertainty and lack of information between the supply and demand sides of the market. The uncertainty and lack of information prompted us to shift from a structured interview method to a more open-ended, observational one, where we listened for insight into the characteristics that comprised conservation easement market. The more flexible interview structure allowed us to continue to

collect richly coded data during the analysis phase, and more information was revealed while transcribing the data, after we had time to reflect during the interview process. In summary, the more uncertainty that exists within a model, the more the researcher must rely upon observation and listening to input and analyze data. Understanding what will be required of this input process will then allow for a more complete data analysis.

3) *Data Logging and Memo-ing*

A data information log serves to record observations of the subjects to be later used for data coding and theme finding. Logs may consist of a transcription or a summary of video taped observations; a record of environmental and non-verbal cues observed by the researcher during the study; or both. The log may be hand-written, typed, or a blend of the two. As perhaps the most critical phase of a qualitative research study, the data log must be complete and organized, *because the recorded log actually constitutes the qualitative data.* While the role of recording the data is the most important task, data gathered through logs can also reinforce themes, or help the researcher dynamically adjust the data input process. If the subject material is audio or video recorded, Lofland et al. recommend that the researcher perform the transcription as part of the logging and data input process, rather than outsource the job, or rich information may be lost.

Another related part of the data log process is "memo-ing", where the researcher jots notes, observations, or "puzzlements" that result during the data log process.

As pointed out in the previous step, these recorded "memos" may occur spontaneously during the data input process and guide the remainder of the data inputting, or the memos may take place during transcription process after the data are collected. Memo-ing is considered one part of the data analysis procedure, and recorded memos also play a critical role in step four, the data coding process.

When performed during data collection, memo-ing can help the researcher dynamically adapt the guided interview process. This is illustrated in the data log recorded in the first 20 minutes of the first group study interview. At the beginning of the study group interview process, the research team is still focused more on finding the right language than theme building. Active memo-ing allowed the researchers to modify data collection process by adapting the interview to become less structured and more of an open format for the remainder of this group interview, as well as the group interviews that followed. The logs within this transcription also document that the rapport between researcher and subject continues throughout a slight misunderstanding, and the subject provides a very insightful comment that is supported by the interview group participants, although no other participants speak during this dialogue.

Transcription:

CK (researcher): Imagine a world without limitations. Without having to worry about the IRS requirements, budgets, or problems of practice. What is it ideally that you and your trust seek to preserve or conserve? So on your sheet of paper, please take a moment to list up to 3 of your most important goals. Once you've listed those 3 goals, if you can, write a sentence that describes the perfect parcel as seen by you and your trust that meets the needs of a conservation easement.

KR (participant): Quality of life, habitat protection, and we are moving away from open space and replacing it with natural areas. So, just to elaborate while you are writing, the idea being open space, but the words we are using more and more is the term natural areas.

DH (researcher): So open space really is a goal then, is that true, but you are really using the words "natural areas"?

KR: Right, right.

DH: One of the things that we hope to get at is the difference between what you say and what you mean. OK? Because those are becoming more and more important every day.

KR: Right.

DH: So I'm going to write open space because that's what you really meant.

KR: Well, it's not just any open space, but it is open space. *Memo: Seems frustrated because she is unable to communicate the difference. What lies at the heart of what she is saying?*

DH: OK, with?

KR: But...so...

CK: Applied open space? Would that appropriate? Applied?

DM (researcher): Just why don't you write down what she said? Natural areas.

DH: Is that what you want me to write? Natural areas? OK? *Memo: KR Nods head. Disconnect. Pursue this more in analysis. Are we dwelling too much on language? Is specification right?*

CK: So what, KR, for you defines, you know, the perfect parcel of land according to the (organization with which she is affiliated)?

Memo: Time: 18:31

KS: One that connects existing space worthy of protection or already protected that would be easy to steward. *Memo: Laughter w/ CK and a hearty round of applause from room to reinforce this idea. Reconnected with the subject.*

4) Data Coding and Theme Finding

Along with memo-ing, data coding comprises the heart of the data analysis. During the data coding process, the researcher reflects upon each line of transcription, memo-ing, and observation to determine the content of each parcel of information. Lofland et al. (2006) point out that there are two coding approaches: open-ended coding and focused coding. Open-ended coding incorporates a line-by-line review of the data in order to apply multiple, broad-based categorization during the coding process. Reflective of the observational nature of a purely ethnographic approach, open-ended categorizations are often numerous and need not be deliberately organized around a theme; in fact, many of the openly coded text may seem random until more data are analyzed and themes emerged. Open-ended coding may be more applicable for a field observation of an unfamiliar culture, as the researcher is able to review each segment for broad contexts, meanings, and interpretations. In contrast, focused coding is a more finely tuned coding process enables the researcher to specifically examine topics, questions and answers, categories, and relationships that are being observed. The researcher approaches the coding process with a tighter categorization of the codes that will be applied, and these codes often pertain to a general theme that the researcher has already formed.

The most rigorous approach to data coding and theme finding requires a line-by-line analysis of all transcription and field notes. However, a thorough but less labor intensive method to coding is to analyze the transcription by clusters, a process that keeps several lines or sentences of data together. Once the data are coded, the next

step is to rearrange the data into themes, and to investigate commonalities associated with the themes. Below is an example of a data log taken from the appraiser group interviews. In this example, the data have already been logged, memo-ed, coded and clustered into themes, and analyzed for commonalities. I have also identified the theme of landowner or governmental imposed constraints that impacted the value of the property after logging, memo-ing and coding the data.

Theme: Constraints That May Impact Land Value

CK (Researcher): In simplest terms, from our understanding, the value of a CE is determined from the value of a parcel of land unrestricted development rights minus the value of a parcel of land with restricted development rights. That's our understanding. So of course the goal of a conservation easement is to place a value on some of the attributes or some of the features that are worth protecting.
Memo: Affirming the CE appraisal values. No one disputes this.

CK (continues): So consider the attributes of the land that your clients are wanting to protect.

WW (subject): Mmmmm Hmmm
Memo: She is putting a lot of thought into this, and is trying to connect with me.

CK: Mmmmm Hmmm....What are the three most common attributes that you are asked to value as an appraiser?

WW: You know, my first thought is that you are NEVER asked to value one or two components because an easement is always a whole package deal, OK?
Memo: First instinct is to look at the property holistically—as a whole, rather than as a part (attributes may be considered a part of the whole, or a vector.)
Coding: Attributes, or variables, contained within a vector.

WW (continues): Often at the beginning stages of an easement I do something similar to what JV (another research subject) does and that's to meet with the land owner and I say, "OK, what are you...how are you going to use the land use after the easement?"
Memo: Use and future use of land is factored into the appraisal, I think.
Coding: Use and future land uses in the valuation process

WW: (continues): And so we sort of work out...and what that means is what building size do they want to retain? But it also that means things like do they want to be able to keep mowed paths? Do they want to be able to trim trees to have views of the lake, or something like that?

Memo: Restrictions/constraints as a result of building size. Uses, all posed as restrictions or constraints!
Coding: Retained uses are a form of constraint?

WW: (continues): Ah, but, so I sort of turned the question around in my mind and I thought of, "OK, what are the three things that have the most impact on land value?"
Memo: Breaks these down to three attributes, based upon what is most likely to impact land value. Do these attributes form a constraint?
Coding: Constraint

WW: And so, one is obviously, limited building. You know, if you only have 40 and you're limited to put one house on it, maybe it's at the BACK of the 40 instead of the edge of the block, that's a HUGE impact on the value.
Coding: Development restrictions, Spatial location (obstructing a view). All attributes and all possible constraints.
Memo: Interesting...spatial location within a property!

WW: The second one is no sub-division.
Coding: Continguity

WW: And this especially gets to be a Big, Big deal when you have large properties. You know, you may have a 300 acre site that allows for one 5-acre building site—fine...If that 5-acre site if sold alone it would have a certain value, but what's that worth when it's carrying this huge albatross of another 295 acres that HAS to come with it!
Memo: From a valuation standpoint, large tracts of undeveloped land are a burden (note "albatross" analogy). However, this is considered a really desirable feature from the trust perspective! May serve as both an attribute and a constraint
Coding: Attribute and constraint

WW: *Memo: (With gusto!)* It's not optional to buy only the 5. So you've gotta to look at the whole parcel and see what's the maximum value that someone would buy for the whole thing...
Memo: Given WW's enthusiasm, this is a key point in the "art" of appraisal. Buyers are "maximizing" values. Aha! We ARE talking constraints here! Does the appraisal or land use actually represent the constraint and not the objective function???? Whoa!!!!
Coding: Constraint and holistic approach

And then I group together land management, which is controls and agricultural use. I've done some farms that will forever and ever be organic farms. The first two I did,...in fact it was ironic, they were both owned by WI Farmland Conservancy (which has since changed their name) and both of them said, "This land will never be farmed

again!" (laughing) It was for the Farmland Conservancy! I said, "Do you guys realize this is your first two easements?" And they said, "We know, we're changing our name!"
Memo: Preserving under the purpose of "farmland" may also render the land unusable, if this used as the qualifying feature. Productive farmland may not necessarily be productive in the future. Is there value to an ag buffer, or is ag a qualifying category.
Coding: Personal views and desires more of a priority over uses.

From appraisers: Hmmm! Huh! (with some amazement)
Memo: Some surprise in this practice. May be usual occurrence (the exception, rather than the rule).

DH: The former farmland conservancy! (hearty laughter in room)
Memo: Joke eases tension in the room
Coding: Tension about appraisal practices

WW: The former farmland conservancy! It was exactly how the landowners wanted it!
Coding: PAR

The memo-ing in this segment documents how I began to shift my thinking from a strictly attribute-based model into an optimization model with a constraint that is imposed, in part by retained land uses. By coding and searching for themes, I was able to identify a more appropriate model that describes the market as it actually is, rather than what I initially perceived it to be. Coding the data also allows me to regroup the results into different themes. For example, I was able to take WW's last comment and cluster this into a theme about PAR and look for commonalities in that theme.

Data coding and theme construction is a worthwhile process, but it can be time consuming. There is a wide variety of software programs available to assist with this endeavor, and there are a number of diagrams and schematic adaptations available to organize the data. In this particular mixed methods application, the benefit of these schematic methods may not be necessary, because the economist is already putting

the information into the context of economic theory, of which he already has an understanding.

5) Develop the Economic Model

The next step in the mixed methods data analysis process is to develop an economic model based upon the themes learned in Step 4. This particular study is a sequential design, and this is technically where the quantitative section of the project begins. The themes that I found in Step 4 are presented in Table 3.2 (a) and Table 3.2 (b), and will be discussed in the Results section of this chapter.

The Data Collection Instrument and Pre-Test Interviews

Using the steps outlined above, I set about collecting my data. In order to conduct an exploratory interview in a finite and time-conscious manner, we chose to construct several short stories, or vignettes, to tap into the psyche of the land preservation community. Using guidelines by Fontana and Frey (2000), Fern (1999) and Yin (2003), we followed up the vignettes with a semi-structured interview format that included pre-set, but open-ended questions. This format allowed us to understand the context of the market for land preservation, and the big picture of what trusts were trying to acquire. The vignettes and follow-up questions were customized for each group interview, which enabled us to tap into the unique perspectives and thought processes encountered by land conservation professionals and landowners. According to guidelines developed by Fontana and Frey, the vignettes are considered a formal, preset, exploratory pre-test, in which the interviewer conducts a prepared interview and has a directive role over

participants. As follows is an example of the vignette presented in the interview with the Executive Directors of land trusts:

Executive Director Group Interview Vignette

Before we launch into a full-scale survey, we want to talk to experts like you to be sure that we are on the right track. First, we want to find out specifically what you are looking for when you are trying to preserve land. We know that most easements are placed to protect conservation values, which for IRS purposes includes open space, wildlife, scenic and historic values. However, we want to know more about what you want to protect, not just what you tell the IRS. We found for example that more than half of 44 mission statements from Western states mentioned open space preservation, even though we are told by some trusts that they are moving away from the use of the term open space.

- *Imagine a world without the limitations of having to worry about IRS requirements, budgets or other problems of practice. What is it ideally that you seek to protect, preserve or conserve? Please take a moment to list up to three of* ***your*** *most important goals. If you can, write a sentence that describes the perfect parcel that needs a conservation easement.*

Follow-up questions:

- *What features make one parcel more attractive than another?*
- *What are your secondary objectives?*
- *Do you have a sense for what you are NOT trying to buy?*

The vignettes and follow-up open ended questions were developed to stimulate discussion, but structured to keep interviewees on track, due to the finite amount of time available for interviews. This "guided conversation" format allowed for a number of follow-up questions and free flowing discussion. This resulted in a multitude of spontaneous conversations that provided opportunity to conduct ethnographically based observations and data interpretation.

The vignettes were developed using an iterative process, where we observed participant behavior and elicited feedback during the pilot interviews to modify our vignettes and our

interviewing skills. Two particularly interesting examples of this iterative process are the Executive Director and Attorney vignettes. In both of these cases we modified the vignettes considerably, based upon the input provided by the first two group interviews. The adaptations were so significant that we re-named these group interviews "pre-test" interviews. The pre-test group interviews were conducted four weeks prior to the Land Trust Alliance Rally, and the pre-test study consisted of two groups of land conservation professionals. The first group included a preservation specialist, a conservation manager, two Board members, and a programs manager, for a total of five participants. The second group was comprised of two prominent attorneys in conservation law. Both group interviews were administered by two researchers, and I served as the primary facilitator for both groups.

In the case of the Executive Director vignette presented above, to create the structured questions, we conducted a content analysis on 44 trust mission statements in Colorado to identify common attributes between land trusts. (Results are presented in Appendix A). The attribute we found most frequently in the mission statements of more than half (23) of the land trusts was open space preservation. So our first question was intended to verify whether or not land trusts found open space to be a common attribute that their trust is seeking to protect, and to probe as to what additional land features their trust sought to protect.

In response, trusts divulged that the relationship between the land trusts and the IRS had become a tenuous one in recent years, and that the land features that trusts sought to

protect may include "open space", although "open space" may also be a convenient classification for other features that the land trust truly found to be desirable. It was also revealed that some land trusts have begun to steer clear of use of the term "open space" because it had become a red flag for IRS monitoring. Thus, after these pilot test interviews, it became clear that there was more elaborate story behind simple attribute identification, and our focus changed into conducting a semi-structured, exploratory interview process for model specification—not just attribute identification. This prompted us to change our vignette, as well as our approach to data collection.

In another example of the pre-test focus interview, we approached several land conservation attorneys for their insights into the legal definitions of open space, in order to identify legally-imposed attributes of conservation land to construct a vector of conservation values. The attorneys began rattling off legal definitions to us, which initially appeared to be insightful, but the conversation turned towards, "Why are you asking us these questions? What's the big picture here?"

To this inquiry, we solicited their help in providing to us the "big picture" of their world as conservation attorneys working with the land conservation community. Their response was that some attorneys represent those who seek land conservation (often times land trusts) and other attorneys represent landowners who choose to enact land conservation on their land. In other words, what was revealed was that there was, indeed, a market for land conservation, and that a structured interview of attorneys had the potential to provide unique insights into both sides of the market. As a result, we modified our vignettes and

data collection instruments. In the example of the land conservation attorneys, we changed our vignette to inquire whether the attorney represented the land conservation "buyer" or "seller", and we were able to more appropriately explore those sides of the market. The remainder of the structured interview questions and vignettes are presented in Appendix A at the end of this document. The lists outline the pre-determined questions, as well as the semi-structured format of the follow-up questions, although the transcriptions reveal a lively, engaged group interview that sheds light on the conservation easement market and the market for land preservation.

The Structured Interview Process

Although my approach to the study changed during iterations of data collection, the basic study objective remained the same throughout the research phases: Derive an economic model of the market for conservation easements to improve the economic efficiency on both the supply and demand sides of the market.

As stated in the previous section, the first round of data collection was performed on two pre-test group interviews. The pre-test group interviews revealed that the seemingly logical relationship between attributes and the market (priors gathered in a relatively extensive literature review) was more complex than preliminary economic intuition had lead us to believe, which we attributed to the emerging nature of the conservation easement market. This prompted me to revise the structured interview approach into a semi-structured interview technique with more open ended questions in order to develop a more sophisticated qualitative research tool. As a result, I was better able to learn the

language of the natives in order to tap into the true structure of the conservation easement market, and in response I developed a mixed method research protocol to develop the model.

Although I adapted my data collection process as a result of this enlightenment, the problem of time restrictions forced me to maintain a semi-structured format. The group interview technique was selected for data collection because of the opportunity to obtain a large sample size and a diverse set of land conservation professionals at the annual North American Conference for conservation professionals—the 2005 Land Trust Alliance Rally in Madison, Wisconsin. The large number of attendees and wide range of professional backgrounds enabled us to stratify the research subjects into groups with similar backgrounds, as recommended by Fern's (1999) focus group guidelines, published in his highly acclaimed group interview guidebook, *Advanced Focus Group Research.* The rationale for group interviews, (or focus group interviews, as they are also officially known in the sociological and marketing literature) is verified by Fontana and Frey (2000) as an appropriate method for conducting exploratory research to answer a research question of "why" or "what", and it serves as a venue for a researcher to test methodological techniques, particularly in a short amount of time.

Study Focus Interviews

During the annual meetings, eight separate group interviews were conducted with five different sets of land conservation professionals: land preservation specialists, land preservation attorneys, appraisers, trust executive directors, and landowners. A diverse

composition of groups was secured to derive different perspectives on the conservation values that trusts are seeking when acquiring a tract of land for preservation. The composition of these focus groups, including rates of attendance, is featured in Table 3.1.

For the sake of consistency, I was the facilitator for all 8 sessions, and I received assistance from three other colleagues in memo-ing, note taking and environmental management. For exploratory applications, which include research in a specific field, Fern (1999) asserts that it is more appropriate for the facilitator to have experience in the specific discipline, rather than to simply have a background in focus group facilitation. Fern also recommends utilizing one facilitator for experimental research in order to ensure consistency is maintained.

	Table 3.1 Madison Focus Groups Number of Participants By Type					
		Land Protection Specialists	Executive Directors	Attorneys	Land Owners	Appraisers
Invited	**Group Number** 1	10	12	10	7	5
Attended		9	6	9	7	5
Invited	2	8				
Attended		5				
Invited	3	open				
Attended		2				
Invited	4	open				
Attended		7				
Total Attendance		23	6	9	7	5
Rate of Attendance (By Demographic)		77.78%	50.00%	90.00%	100.00%	100.00%
Total Attendees	59					
Overall Rate of Attendance	78.85%					

Group interview sessions were 75 minutes in length and the sessions were tape recorded with subjects' permission. The number in attendance ranged from 2 to 9 persons, with the attendance rate ranging from 50% to 100%. 5 of the 8 sessions contained the "ideal" number of individuals for a group interview according to Fern's (1999) focus group size recommendations, which recommends a range between 4-8 attendees. One of the breakfast sessions, an open session early in the conference available to early registration

attendees, drew only 2 people. The other 2 sessions outside the planned range contained 9 attendees. The total of number of research subjects for the test group interview was 59, and adding in the pre-test pilot group brought the grand total of research subjects to 66. According to Lofland et al. (2006), this is an appropriate sample size of subjects for a qualitative research study. Due to the rich, multiple layers of research, interviews with more than 100 subjects are quite rare, and interviewing approximately 50 subjects is considered a relatively large sample. Environmental research by Calheiros, Seidl, and Ferreira (2000) recommends that roughly 30 interview subjects will invoke the theory of central limits, implying that we had an appropriate number of interviews to attain valid results.

Data Analysis

Two types of data analysis were performed on the data attained through the 8 group interviews conducted at the Land Trust Alliance Rally in Madison, Wisconsin. The first level of data analysis was performed using guidelines from Lofland et al.'s (2006) guidebook for qualitative research analysis, "Analyzing Social Settings." During this process the data were compiled and separated into themes in a manner consistent with ethnographic data analysis. The second level of data analysis was conducted simultaneously by Christopher Bastian and Donald McLeod, two of the other researchers present during the group interviews of the data collection process. These researchers analyzed the data in a manner consistent with the original research intent, which was to collect a complete and expansive list of attributes to include in the vector of conservation values, which will form the basis of a random utility model (RUM) survey to be

implemented at a later date. Each of these two levels of data analysis will be discussed in the next section, followed by the results of each segment of study, an integrated analysis of the data, and preliminary conclusions.

Preliminary Results

"A Sense of Place" as a Social Welfare Function

After following the step-by-step process outlined earlier in the chapter, several themes emerged that revolutionized how I was originally approaching the problem. The land trust oriented focus groups (land trust employees, half of the attorneys, and a few appraisers) voiced that land trusts were *not necessarily* out to preserve a particular *type* of parcel or *attribute* exhibited on the land; rather, the land trust community by and large seeks to preserve parcels of land that present a connection to the community's *sense of place*. That is, the market for conservation easements has formed around the preservation of land that makes communities special—signature parcels that make a community say, "This is what our community is all about! If this parcel of land is developed we will lose a key part of our community's identity." Several participants presented these thoughts in elegant language, although the theme of "a sense of place" became very clear during the theme-finding process. This message is clearly communicated in the following excerpts, where focus group participants are responding to the question of what their land trust or their community is trying to preserve:

Transcription 1: "Psychological connectedness" to the land

DD (participant): One of the things deals with location. Whether or not it's along the Hudson River or one of its tributaries, usually a first order tributary. Also if that area is connected physically or psychologically to a community—a riverfront community itself. People, I mean, not just ecological.

CK (researcher): Did you say ecologically connected or psychologically connected?

DD: Physically or psychologically attached to a community.

CK: Psychologically. Could you elaborate upon that? The psychological connection to the community?

DD: Um, I mean we've had many projects where there's a particular piece of land that the community has been using as long as, you know, Grandpa Jones can remember. And the community's been using it for hiking or for hunting or fishing happens here or whether there's any number of things that have happened to families in the community. It's just known. There's events that have happened at it that are not really sponsored by anybody that are just happening for years. And so when there's that kind of attachment, that usually helps the protection process. Especially...that wouldn't be the only protection criteria...especially if there are natural communities, scenic quality, there's historical. For us, there's historic buildings. Things like that are also important to protect.

Transcription 2: "Landscape of the Region"

PF (participant): Well, this is only my, sort of my opinion as a relative newcomer. I think of this as the landscape that defines the valley. I mean, they are beautiful and you know you have a high desert, basically. This flat, high desert. You have the city of Boise which is characterized, I mean "du bois" is the trees. So it's you know, it's this patch of green that's in the middle of this sagebrush desert. But then you have these Rocky Mountain Foothills that rises above it. I think they form the landscape you know, sort of our landscape if they will. And so there's a very strong sense of preservation of it.

DH (researcher): mmmm Hmmmm.

PF: And as DM and I were talking before we started, many areas of those foothills have been owned by ranch families for 4 generations. And we're talking, you know, hundreds, if not thousands of acres that have literally all transferred in the last year to large, nationwide home builders. (Someone: Oh!) So there's a lot, you know when you talk about...I heard a figure the other day that acreage dollar value is shooting up to anywhere between 50-85K per acre for some of these properties...

Entire crowd: Whoa! Wow! DH: Geez....

PF: In three months. In three months there was a property, a guy came in and they bought it six months ago for $50,000 and they flipped it six months later for $75,000.

CK (researcher): Wow....

PF: ...1400 acres. So those are the kind pressures that we're starting to see. Fortunately, BLM has some lands up there, the Forest Service has some lands up there and the state has quite a few holdings up there. The city of Boise did a plan 10 years ago, maybe a little bit longer, and then they passed a Bond or initiative to acquire—it was 10 million dollars—spent half of it and they've got about half of it left. And they are acquiring pieces close to the city and you know, of course...but it really does for me, define the landscape of the region.

Transcript 3: Keystone places

CB (participant): For me, I'm looking for those **keystone places** that are in the location in the landscape that makes the difference. If you lost that piece, the rest would unravel. That the habitat quality is there or can be restored and that protecting that parcel reverses a threat—a BIG threat—to what are other conservation targets might be. (CK: OK) And then the last one is leverage. That protecting that parcel will help protect other parcels and will also be a connection to the communities, because if we don't have that community connection, it will never work. And a big part of our work on a landscape scale is working with those communities and making sure that they're "driving the bus" and they're saying, "Yes, this is what we want you to do" and we come in.

Transcript 4: A Sense of Place

CD (participant): I'm really thinking more about what I want to protect, like to protect, and there really is a lot more alignment with our organization. Our organization also is really active in getting communities to do green infrastructure plans and comprehensive plans. So that is something that we work a lot on, we've had a lot of success with. So, number one for me is, "Sense of place."

So for me that's the race track. Sense of place, really, includes a lot of things for me. And the building, historic preservation is, too. So, um, I think that these two loves of mine really form together and create a sense of place.

And the third sense of place is that people in the community act and interact to the open space and to the historic structures that are there and to the people of the community. So that's my third sense of place that I want to protect.

These four participants were from very different regions of the country, and represented a spectrum of positions in the land preservation community (land preservation specialist, city planner, programs director, Board member). Although the exact language that they chose was different ("psychological connectedness", "landscape of the region", "keystone properties", "a sense of place"), the overall theme that they communicated was that the market for conservation easements has actually formed to create a market for a sense of place. The diverse observations formulate the "validity testing" for the qualitative research phase of the research process.

Background and Literature Review of a Sense of Place

One of my unique contributions to the literature is the social welfare function for a "sense of place" that was developed using qualitative research techniques. A sense of place is actually a social welfare function that consists of variables, including the vector of conservation values that contains a set of attributes. This model is in stark contrast with the original approach that I intended to take, which was solely attribute based. However, rather than only seeking land attributes, it was clear from the qualitative study that trusts sought a bigger picture than this. "A sense of place" is a critical finding, in that it is a function of several variables. In Chapter 4 I show that the uncertainty associated with the variables, such as wealth, can prevent the conservation easement market from maturing into a fully developed market. First, in this chapter, I provide a bit of background into the literature for "a sense of place."

During the data analysis phase of the study, after analyzing the data and recognizing a "sense of place" as a social welfare function, I returned to the literature and found that a sense of place has also been identified as a psychological phenomenon in the environmental psychology literature. Work by Williams and Stewart 1998 calls for an increased use of natural resource management policies that are centered on preserving a sense of place. While several authors have published studies describing the psychological phenomenon of a sense of place, the majority of those studies focus upon "place attachment theory", where attitudes and cognition are linked to behaviors. Jorgensen and Stedmen (2006) describe the majority of these studies as "chaotic", rather than cohesively organized to formulate a sense of place model. In contrast, Jorgensen and Stedmen estimate the correlations between sense of place variables (such as demographic and predictive variables, including landowner age and length of land ownership). These authors first develop a survey that organizes attributes into a hierarchy of place dimensions that summarize the landowner's sense of connection to their lake front properties. After administering the survey to 290 landowners, the authors establish a correlation between predictive variables such as landowner age and length of landownership with the sense of place dimensions. The Jorgensen and Stedmen study is noteworthy for several reasons:

1) The study validates the importance of a "sense of place" as a theme for land preservation.
2) A sense of place is recognized by landowners.
3) A sense of place is a multi-dimensional experience that includes psychological and cognitive dimensions, as well as physical

performance with land. For example, landowners in the Jorgensen and Stedman study reported greater correlation of "sense of place" variables such as dependence on the land and attachment to the land, with less property development.

4) The findings verify that land consists of more than just a bundle of attributes, and that a strict, attribute-based study may overlook the interaction of these attributes and the underlying "sense of place" theme.

5) The authors implement an empirical study to define a sense of place; however, the process is still consistent with the environmental psychology deductive research and researcher predefined constructs. While the sense of place predictive variables appear to be well thought out, this study may have been more compelling if the authors were able to pre-interview the landowners to formulate the categories that the landowners felt reflected their property's sense of place. In other words, an ethnographic procedure may have enabled the researchers to capture the essence of these landowners believe comprises their own sense of place.

Clearly, a sense of place is a psychological connection with the land that has been recognized by the field of environmental psychology; however, no one has yet modeled the economic the workings of this phenomenon. The contributions of Jorgensen and Stedmen, as well as my qualitative research findings, indicate that a sense of place is a

phenomenon that occurs with landowners and land trusts alike. Given that both sides of the land preservation market experience a sense of place, an economic model of this phenomenon is timely. An economic model would serve to lend order to the chaos that currently characterizes the market for conservation easements, which are enacted to preserve a sense of place.

The Social Welfare Function of a Sense of Place

Pareto efficiency is often held as the "pie in the sky" standard for public policy, because it is relatively difficult to enact a policy that makes one individual better off without making another individual worse off (Weimer and Vining, 1999). There are several models of social welfare function, which define the allocation of a good to maximize the "greatest good" for society. For illustrative purposes in this dissertation, the "Utilitarian" social welfare function, which sums the utilities of society, will be used as a model for the social welfare function. Founded on the writings of Bentham (1789) and Mill (1861) in this case, Utilitarianism is the sum of the social welfare functions of each land trust in the land trust community.

As was articulated by the land trust community during the qualitative research phase of the study, a conservation organization's utility reflects their ability to preserve their community's sense of place; thus, a conservation easement is instituted to preserve this sense of place. Since conservation easements are an agreement between the land trust community and the landowner, this arrangement consists of two parts: The land trust is trying to maximize its utility, which is a function of several variables, including

conservation values, subject to a constraint imposed by the landowner's utility function. Based upon my results from the qualitative research study presented in Tables 3.2 (a) and (b) discussed in a few pages from now, the social welfare function for a sense of place is:

Social Welfare Function of a Sense of Place

Land trusts maximize Utility (U)=f(C, I, L, S, SS, P, PAR, R)

Where:

Conservation Values (C)

Vector of conservation values are presented in Table 3.2 (b)

Conservation Values are a vector that is a function of attributes x weights of the i^{th} attribute and the k^{th} weight:

$$C = \sum_{i=1}^{I} \sum_{k=1}^{K} a_i w_k$$

Budget/Income (I)
Location (L)
Landowner self-sacrifice (SS)
Ease of Stewardship (S)
Consistency with Strategic Plan (P)
Landowner PAR (PAR)
IRS and Local Regulations (R)

This utility maximization is subject to the landowner utility constraint. The landowner utility constraint is defined as private amenity rent, or PAR.

Landowner utility, which is considered PAR, is a function of:

Landowner PAR (PAR)=f(C, W, SS, RU, A, D, R)

Where:

Conservation Values (C)

Conservation Values are a vector that is a function of attributes x weights

Vector of conservation values are presented in Table 3.2 (b)

The landowner places different weights on these attributes, which yields:

Conservation Values are a vector that is a function of attributes x weights of the i^{th} attribute and the k^{th} weight:

$$C = \sum_{i=1}^{I} \sum_{k=1}^{K} a_i' w_k'$$

Wealth (W)

Wealth is a function of cash flow, tax policy, and retained uses.

Landowner self-sacrifice (SS)

Retained uses (RU)

Acreage (A)

Development rights (D)

IRS and Local Regulations (R)

Although these can be solved simultaneously or sequentially, the qualitative analysis showed that practically, land trusts maximize their utility subject to landowner constraints, as follows:

$$MaxUtility\,(U) = U(C(a_i \bullet w_k), I, L, SS, S, P, PAR, R) + \lambda(PAR(C(a_i' \bullet w_k'), W, SS, RU, A, D, R)$$

While the qualitative research study enabled me to identify the model as a social welfare function and was insightful in determining the variables that belong in the model, the functional form of the social welfare function, including potential interaction terms, still requires further investigation and analysis. For example, it would be reasonable to expect that self-sacrifice and wealth to interact; or, for the impact of wealth to be increasing at an increasing rate. Further investigation of the model and the correct functional form will be pursued in a separate publication.

Based upon the results of the qualitative segment of the research study, I learned that trusts and landowners may choose to maximize utility through three possible approaches:

- A recursive model in which trusts maximize utility subject to the landowner constraint
- A recursive model in the direction of the landowner maximizing utility subject to the land trust constraint.
- A simultaneous model, in which both land trust and landowner are trying to maximize their utility.

The qualitative results of this mixed methods model indicated that any of these strategies may be used during the land conservation process. In reality, some degree of negotiation seems to take place, which indicates that approaching this problem as a simultaneous equation may be appropriate. However, the clear pattern that emerged during the qualitative study was that the land preservation movement was driven more by an excess supply of potential conservation land. Landowners approach trusts with a very specific idea in mind for preserving their land—a viewpoint that also makes the problem more tractable than a simultaneous equation model). Although the motivations from the landowner may range from the purely altruistic to compensation-driven (a subject that I will explore further in Chapter 4), more often than not, the land trust must decide whether it is able to accept this land as part of its "strategic plan" for preserving a sense of place due to the pre-determined, landowner imposed constraints. Hence, the most applicable model is the first option, a recursive model where land trusts maximize utility subject to landowner constraints.

Using this recursive option, in an efficient market, the land trust maximizes utility according to a particular complexity of variables and attributes that are subject to landowner imposed constraints. The social welfare function is an overall sum of the utility function of all of the land trusts.

Attribute Identification and Weights

As the research subjects articulately described, a sense of place is comprised of several characteristics that are unique to a community, and these characteristics form a social welfare function. Group interview participants also articulated that in order to create a sense of place, they seek the qualities that best fit their conservation goals. In economic-speak, this can be boiled down to a utility maximization model where trusts and the land trust community are maximizing their utility, which is a function of several variables that were identified and validated throughout the group interview process. These variables are presented in Table 3.2 (a). Focus group participants also discussed specific attributes that they seek for preservation, which have been formulated into a vector of conservation values that can be used to construct the private and social benefits curves. Tables 3.2 (a) and 3.2 (b) were constructed after the data were coded, analyzed, and sorted into themes. As part of an internal validity check, the organized results were presented to one of the research study participants five months later as part of a follow-up protocol to verify that we had correctly identified the themes we heard articulated in Madison.

Table 3.2 (a) Themes and Sub-Themes from Study Focus Groups

Main Theme: Preservation of a "sense of place"	
Sub-Themes Pertaining to Trusts:	**Sub-Themes Pertaining to Landowners:**
Trusts maximize utility	Landowners maximize PAR (form of utility)
Landowner requirements present a constraint to the landowner	Trust requirements present a constraint to the landowner
Trust utility is a function of:	Landowner PAR is a function of:
Budget	Wealth, which is a function of:
Location	*Cash flow
*Connectivity	*Tax policy
*Proximity to key parcel or project area	*Retained uses
Ease of stewardship	
Conservation Values	Conservation Attributes:
*Can be described as a vector	*Can be described as a vector
*Weights can be individually determined	*Attributes the same as trusts
*"Protection worthy" yields a higher weight	*Weights will differ
Time:	Time: Perpetuity vs. discrete
*Perpetuity vs. discrete	
*Imminent threat of development	Retained uses
Fit into strategic plan	Acreage
Landowner Self-Sacrifice	Landowner Self-Sacrifice
Landowner PAR	Development rights
IRS and Local Regulations	IRS and local Regulations

Table 3.2 (b) Vector of Conservation Values
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)

While the list of attributes appears to be comprehensive, it is important to note that the weights that each trust places on these attributes may vary considerably, both between trusts and between parcels of land. To elaborate upon the latter point, while a trust may

actively seek specific attributes that may be present on a parcel of land, (such as large acreage size or contiguity to another parcel), the preservation of parcels with these desirable attributes may be trumped by a different piece of land that may be viewed by the community as delivering something "special". This may even occur when the attributes of that "special" land appear to be inferior to the attributes on a comparison piece of land. This implies that the weights of the attributes may change according the interaction of the conservation values. For example, whether or not the land trust is able to maintain the conservation values on a parcel of land and whether the trust's stewardship program is able to preserve that "special" feel of the parcel appears to trump many other attributes such as parcel size, even when large parcels appear to be a dominant attribute that the trust seeks. In the below transcription, one participant articulates that size of a parcel is important, but that there are certain attributes that may allow for the trust to shift criteria and to undertake a parcel that the trust may not otherwise consider for preservation. Likewise, the participant also points out that a property that is difficult to steward may create more cost than benefit to preservation:

JE (participant): So the thing is...what we wouldn't actively seek out to acquire would be the smaller scale properties. You know, we have a smaller staff and limited amount of time and limited time to move on bigger projects, so if something comes to us that is 10 acres, or if something comes to us that is 1000 acres...all things being equal we'll go after the larger one to make a larger difference and let the smaller projects slip along the wayside.

Now let's say that person on 10 acres comes to us and just wants to donate to us the land...then whenever we acquire a land in fee we also need to have a stewardship endowment so we can actively monitor the easement, so we can take someone to court if something occurs so we need to have money to go along with that easement. So if someone comes up to us and says, "Here, here is this 10-acre parcel. I want to donate it to you and give you a stewardship endowment, then it's an easy answer. Generally speaking, we'll take that.

Um, but there are a few we won't take even if it did come with money and it's just donated. One would be, let's say a small .5 acre wetland that's surrounded on all sides by urban development. That would just be a large headache. Regulations already protect that wetland. (CK—researcher: OK) So, we probably wouldn't want to spend...that would just be a stewardship headache. There would be encroachment issues everywhere...dumping with invasive species...and I don't think we'd want to become the holder of that wetland.

Unless, of course that was a .5 acre wetland that had headwaters to some salmon bearing stream. (CB—participant: laughter) You know, there's always an exception, but generally speaking, you know, we wouldn't want that.

CK: That's good to know.

JE: You know, another thing we're rethinking right now is that Snohoma County is very large with meth labs. And this is becoming a huge liability for us. We recently had a meth lab on one of the properties that we own and we were on the hook for several thousand dollars to clean it up. We had to get haz-mat teams out there to go and even do stewardship. And this is something that I'd like to encourage everyone to start thinking about because this was a huge headache for us.

For even our stewardship team to go out and monitor the property, we had to talk to the Sheriff. And the Sheriff was like, "Well, you may want to....I'll come along with you..." And if you have a Sheriff in a bullet proof vest and we're going out to look at our property, it's because basically because these properties are these remote properties in Puget Sound. So for these people...it's great to set up meth labs. You just take your boat out there, you set it up...hardly anyone ever goes out there...and when we go out there when we go out on our annual stewardship visit, and sure enough what do we find? Meth lab here, meth lab there....and you have to get it cleaned up. So, we're really thinking here right now, OK, do we really want to start acquiring these sort of properties based upon the stewardship risks that are involved with these properties?

JE's example of stewardship problems (meth labs on remote island properties) usurping desirable attributes such as large parcel size and solitude—which would otherwise make a parcel a priority—implies that a sense of place is a function of the interaction of attributes. In the utility maximization problem, the land trust may maximize utility with respect to a specific attribute, which optimizes their land preservation strategy. In essence, these variables (including the attributes), represent private and social values, and proper identification of these variables leads to better identification of the private and

social benefit curves. However, as was also revealed during the structured interviews, trusts do not only consider benefits; trusts also face constraints.

Constraints Imposed by the Landowner or the IRS

During the structured interviews, in addition to the theme of utility maximization in the market for a sense of place, participants expressed that trusts have also found themselves facing several constraints, imposed by either the landowner or the IRS regulations. In this section I discuss the components of the landowner utility maximization problem that are presented in the second column of Figure 3.2 (a). The data were gathered from all focus groups, but the landowner, attorney and appraiser focus groups provided some of the more rich insights.

One such example of a landowner imposed constraint was the landowner's reserved development rights, discussed earlier in the paper. These reserved development rights may be optimized by landowners as part of their utility maximization problem, but the reserved rights are also part of a constraint experienced by the land trusts. To reiterate an earlier point, trusts often find themselves as one part of a recursive utility maximization problem. While trusts articulated that they often do seek some "perfect parcels" of land that embodies their community's sense of place or maximizing one of their attributes (such as contiguity), more often than not, private land preservation is supply driven. Hence, the trust must try to maximize utility subject to landowner imposed constraints.

A classic example of this supply-driven conservation was articulated by an Executive Director of a Florida-based land trust that was approached by a landowner about a conservation property that was prime sand hill crane habitat. At first glance, the property characteristics embodied the conservation criteria for the Executive Director's conservation organization, and the property would have easily have qualified for the IRS conservation values. This property provided rich wildlife habitat, a large number of contiguous acreage, an "old Florida atmosphere", and the property served more of a recreational site to the landowner than a home site, so there was not a frequent human presence on the land. However, after further discussions with the landowner, it was clear that the landowner used this property for occasional duck hunting, and was adamant about retaining the use of an airboat to cruise the property in pursuit of game. In this case the landowner imposed constraint was binding and the conservation transaction did not take place because use of the airboat posed a direct threat to the sand hill crane habitat, and the property would have become a "stewardship nightmare". While the sand hill crane habitat was well suited to the trust's conservation goals, the landowner revealed his constraint first, which is an example of a recursive model and a constraint that proved to be insurmountable to the land trust.

One further thought is that it is conceivable that a trust that does not put as much weight on the attribute of wildlife habitat may have been willing to accept the landowner conditions, and would have accepted the conservation property as consistent with preserving a sense of place. This is an example of a signaling strategy, where trusts may signal their weights and preferences by including priority attributes in their organization's

name—a process that is reminiscent of niche marketing. The concept of signaling to promote better attribute matching will be further explored in Chapter 4.

Another example of landowner utility maximization is presented in the transcript below. In this excerpt, the landowner and his wife both describe their property, and the landowner's motivation for preserving the property:

RR (participant): Well, Nan captured the essence of what we're doing there. In essence, the goal, the preservation goal is for the visual pleasure of it, but also for the wildlife habitat. It's a fairly large chunk of property in that area. 250 and some acres, so it provides the contiguous wildlife habitat area. Just to describe a little there, it's really a nice little mix. We have uplands where we have savannah that we're restoring, we have woodlands, and some wetlands that we're restoring. We have a class 2 trout stream that we're restoring on the property. And it's interesting birds from the air and everything else in the area. And we've restored about 140 acres of the well cropped areas.

One of the goals is preservation but also to, I guess, to have a little dent, to try to stop some urban sprawl. And just a little bit about the setting, New Glarus is 25 miles from here. So it was small town with a population of 2000 people and the township where we are is another 1000 and we're getting tremendous pressure from the Madison area coming down here, because 25 miles....25 miles is...pretty much equates to a mile a minute because there isn't a lot of traffic. So we're getting a lot of pressure around us to...we're seeing farms our size or larger...this has been primarily a dairy farm area around here the past 100 years, really being chunked up and broken up into 1-acre lots, or 5 or 10 acre so we're seeing all the hilltops, where we used to see even in the short time that we've been there, 10-12 years, where we would see cows on the hilltops, now we're seeing houses.

Where you can go to the top, the high end of our property and see a 360 degree ring of lights where like 10 years ago you wouldn't see it. You would see dotted lights from farm lights, and now it's house lights. And so it's changed and we can't stop that. But maybe set some sort of example. And we have some neighbors who are doing similar types of things with big acres. There's 300-400 acres and we're hoping, they're along the stream. We're hoping we can keep development off of our property.

Reinforcement of Emerging Markets Theme

In addition to an optimization problem, the data also reinforced the hypothesis that the conservation easement market is emerging. The emerging markets theme is illustrated in the following data logs from the appraiser focus group:

Transcriptions (Taken from various points in the group interview):
MW (appraiser): And uh, you know, it's really tough in a region where there is no data. And so how do you find the data, well, what do you do?
Coding: Difficulty finding data/incomplete data.

JV (appraiser): You know, I spent considerable amount of time talking to people from around the country... and this part of the reason I attend Farmland, and this is where I met MW and I have met other people, and I use them as my trap line informational source from time to time and they also contact me from time to time.
Memo-ing: Implies small group/network. Perhaps a small network of buyers, too?

MW (appraiser): You may find 1-2 sales somewhere that kind of tie together that can maybe you can use as supporting information.
Coding: Thin market/market failure

Or something like this. You have to be a little bit more creative on that one. When it's all said and done, you stick it in the pot and then you give it a stir and then you do one last call and make a decision on it. And that's the best that you can do!
Memo-ing: Still a "second best" world. (?)
Coding: Asymmetric information/market failure

Over time, you know, information will be coming available and I think that's one of the important things about, you know, the CE movement is that as the status starts to happen there should be more of a central base that's available that kind of happens. Right now it's kind of a loosely related network. I know that there are some states like MT where it's not even a recorded status. Where their markets are not even a recorded state so you really have to beg, borrow and steal to get information from anybody in that state because they hold in their pocket because it burns their feet (slight chuckle in group). So when you come to certain states like that you have to have a pretty good information source.
Coding: Information asymmetry/market failure
Memo-ing: Variation in communication. More information available as the market becomes more fully formed.

MW: ...no one knows other than their accountant, maybe the IRS and God what they've paid for their property. (CK: Hmmmm) And nonetheless, appraisers manage to make

livings in those market areas. And you dig and you develop resources and you double check stories that you're told.
Joking: To make a point and to emphasize the difficulty of the environment, but that appraisals and transactions still take place.
Coding: Asymmetric information/market failure

In summary, by using a qualitative research approach, I was able to develop an economic model that was based upon what land trusts were seeking to protect with a conservation easement: a sense of place. During the process it was revealed that trusts are actually maximizing their utility subject to landowner and IRS imposed constraints. In addition, it was revealed that landowners and land trusts are also rent-seeking. These models will be further developed in Chapter 4; for now, though, it is clear that these models, transcended the original, attribute-based study. In this next section I discuss an internal validity check that we conducted to verify the differences between the original and modified economic models.

Deductive Research Validity Test

In order to more fully demonstrate the full spectrum of the qualitative research continuum, I developed a deductive validation test to compare to the mixed model results. The experiment involved dividing the research team into the Colorado and Wyoming components, relying on the Wyoming team to develop a traditional deductive model from the focus groups in Madison. This next section compares the results of the ethnographically-based qualitative research phase, which was conducted at the same time as a deductive data analysis by two other members of the research team. The only difference between the analyses is that the Wyoming researchers implemented an

analysis protocol reflective of the original study objective: Attain the language to implement a random utility model (RUM) survey that will be implemented with the land trust community. To avoid contamination of the data analysis, much of the following section was written by the Wyoming team, Christopher Bastian and Donald McLeod:

Background: The goal of collecting the project focus group information is to gather information that will permit the proper identification of issues and variable definitions within the land trust community. This then allows estimation of a random utility model (RUM) from a stated choice experiment.

Random utility theory, in the context of our conservation easement study, indicates that on a given choice occasion someone would prefer to enter into an easement that would maximize their utility given their constraints. The utility function for an individual then contains both a deterministic component (V) and a component that is unobservable to the researcher or stochastic (ε). This is represented in equation 1.

(1) $U=V+\varepsilon$

where V is the indirect utility function and can be characterized as follows:

(2) $V_i=\beta_k X_i$

For this function (2) X is a vector of k attributes associated with alternative i and β is a coefficient vector. These attributes include a vector of parcel attributes and a vector of transaction categories that emerged from the focus groups, that could affect the choice to enter into an easement for a given decision period. The attributes and transaction values are presented in Table 3.3 (a).

Table 3.3 (a)
Parcel Attributes and Transaction Issues Frequently Identified in Focus Group Data

Parcel Attributes	Transaction Issues
Enhancement of quality of life – Psychological connection to parcel by community	*Legal transaction costs* – legal versus business issues; contractual issues associated with transaction
Ecological importance – provision of wildlife habitat; biodiversity; natural area; provision of ecosystem services; keystone species	*Budget constraint of easement purchaser* – lack of financial resources of land trusts; budget of land trust;
Open Space – agricultural and forest lands not developed for human habitation	*Conservation ethic of landowner* – producer willing to sacrifice some personal benefit on behalf of conserving/preserving land for future generations
Scale of parcel – parcel is a large tract; attainment of parcel provides large contiguous block of protected land	*Conflict potential due to development encroachment* – Too much existing development near parcel (potential for conflict, drive up the price of land).
Scenic amenities	*Bad community relations* – potential conflict from donor and community or land trust conflict with community
Presence of recreation amenities	*Ability to partner/leverage across organization* - access issues as well
Working landscape – Property used for agricultural production	*Restrictions on easement* – How restrictive is the conservation easement
Presence of water amenities – Property is on lakeshore frontage or river frontage; provides ecosystem services to watershed via water quality	*Easement Valuation* – proper valuation by appraisers; proper valuation of non-market attributes
Minimal stewardship costs – ease of monitoring and stewardship once easement is acquired	
Threat of Development – imminent danger of housing development encroaching on property; scarcity of property under easement in area being developed	

Although the objective of this section is to serve as an internal validity test to document the differences between the mixed methods approach qualitative research model versus a focus group used to refine the language of a random utility model, it is still relevant to discuss the survey that would be implemented with a random utility model. In a random utility model approach, after identifying the general attribute areas and transaction issues, the next step is to operationalize the general descriptions of these measurable levels variables into a survey which requires respondents (in the land trust community) make choices between two variables and their respective attributes. In other words, the means by which these attributes would be presented to respondents as options in a random utility model survey are shown in Table 3.3 (b). After collecting the results and after running a regression using a binary dependent variable model (such as logit), the statistical results will indicate the preferences of the land trust community in the ordering of attributes. In summary, the survey respondent would reveal preferences about the attributes listed in the first column by responding to information presented in the second column of Table 3.3 (b). The data would be regressed and we would be able to draw conclusions about land trust preferences.

Table 3.3 (b) Potential Variables Given Parcel Attributes and Transaction Issues

Attribute/Issue	Variable Measurement
Parcel Attribute	
Enhancement of quality of life	Parcel viewed as historically or culturally significant by community leaders - Yes / No
Ecological importance	% of land area in parcel contains important wildlife or keystone species habitat – levels 0-25%; 26-50%; 51-75%; 76-100%
Open Space	Parcel provides open undeveloped space – Yes / No
Scale of parcel	Parcel is considered large relative to other easements in the area or is contiguous to other conserved parcels – Yes / No
Scenic amenities	Level of parcel's scenic amenities relative to other easements in area is: High/ Medium / Low
Presence of recreation amenities	Parcel's potential for provision of recreational opportunities is: High / Medium / Low
Working landscape	Under easement the dominant use of the land will remain production agriculture – Yes / No
Presence of water amenities	On the parcel there is either a pond, stream or river which supports aquatic life – Yes / No
Minimal stewardship costs	Given the nature of the parcel and the easement the necessary time and costs associated with stewardship relative to other parcels under easement in the area are: High / Medium / Low
Threat of Development	The probability that this parcel will be converted to housing development within the next 12 months is: High / Medium / Low

Transaction Issue	
Legal transaction costs	Given the nature of the parcel and the easement the necessary time and costs associated legal work to complete the transaction relative to other parcels under easement in the area are expected to be: High / Medium / Low
Budget constraint of easement purchaser	Relative to other land trusts in the region your organization's financial resources to conduct transactions is: High / Medium / Low
Conservation ethic of landowner	The landowner interested in transacting the easement has indicated conservation is their primary objective: Yes / No
Conflict potential due to development encroachment	The probability that the community wants this parcel to be converted to housing development within the next 12 months is: High / Medium / Low
Bad community relations	Current public relations between your organization and the local community affected by the easement transaction are: Good / Bad
Ability to partner/leverage across organization	The probability that another land trust in the region is willing to partner with your organization in transacting the easement is: High / Medium / Low
Restrictions on easement	The current usage of the parcel under easement will be restricted if the transaction is completed: Yes / No
Easement Valuation	The nature of the parcel is such that the value of the easement can be readily determined by appraisers in the area: Yes / No

Comparison of the Mixed Methods Research Approach and the Deductive Model

The differences between the models generated by the two data analysis procedures are considerable. After listening to both sides of the market for land preservation—those who are considering placing a conservation easement on their land (and the accompanying professionals who may facilitate the transaction), as well as the land trust community—it is clear that the market for conservation easements has, in fact, yielded a market for a sense of place. Comparatively speaking, both my model and the Wyoming team's model identified "a sense of place" as a theme (for the Wyoming team it was reflected in "enhancement of quality of life" in Table 3.3 (b)). The difference in the results between the two approaches lies in the modeling of "a sense of place". After listening to the land conservation community with a more inductive research approach, it was clear that "a sense of place" was an overall objective—a social welfare function which was a function of several variables and attributes. In contrast, the Wyoming team compartmentalized "a sense of place" as just one of several attributes that land trusts were trying to acquire.

This difference between how these two methods identified "a sense of place" is noteworthy because the inductive research approach that I used allowed me to "listen" to the land trust community to learn about their values and how the land preservation market was structured. In contrast, while the deductive research model successfully reveals a rather complete set of attributes, along with language that would be useful in constructing a random utility model survey, the deductive model reflects a preconceived economic theory that we, as a complete research team, initially thought described the market for

land preservation. The difference in the structure of these models shows that the openness in the inductive research data collection process is particularly important when studying an incomplete, or emerging, market, because it verifies how researchers must be cautious in applying their own preconceived ideas to explain market function or price signals. As discussed in Chapter Two, price signals may be inconsistent due to incomplete information, rather than as a result of a specific variable or attribute.

It is also worth mentioning that many of the attributes that the Wyoming team captured were similar to variables that I recognized as part of my social welfare function (transactions costs, budget, development restrictions), the Wyoming team's model compartmentalized these variables into attributes. Although the Wyoming team may have identified language useful for structuring a random utility model (such as separating the attributes into land attributes versus transactions issues), once again, the difficulty arises because the transcripts from the qualitative research study reveal that trusts are not merely pursuing land with a bundle of attributes. Trusts are pursuing something more complex, which is the interaction of these attributes that combine to maximize utility. Thus, when creating a model, if we were to ONLY use a random utility model, we may miss this dynamic interaction of attributes, or we may simply optimize the wrong variable, such as acreage or connectivity, when in fact it is the interaction of acreage and connectivity with the sense of community that creates this sense of place.

There does appear to be quite a bit of overlap between the attributes of both models—all of the land attributes and the transactions issues identified by the Wyoming team appear

either in my vector of conservation values presented in Table 3.2 (b), or as a theme for my utility maximization social welfare function 3.2 (a) . This shows that there is quite a bit of consistency between the two methods when it comes to information and content, which supports the internal validity check. However, the bottom line is that the functional form of the model is very different when the researcher conducts the observation and theme finding inherent in an ethnographically-based procedure. A random utility model, which can be created from the deductive research model presented in Tables 3.3 (a) and (b), can be very effective for measuring the attributes and weights present in the vector of conservation values. However, the random utility model stops short of representing what trusts are seeking to preserve, and the big picture along with its accompanying data, may be lost, if a more expansive qualitative research study is not conducted. In other words, a specification error has occurred from the purely deductive procedure based upon traditional economic theory. In short, the market for conservation easements is truly a market to preserve a sense of place, rather than merely a market for a bunch of attributes associated with a parcel of land.

Summary and Preliminary Conclusions

In summary, I have shown that ethnographically-based qualitative research can yield refinements to economic theory. This particular study combined the principles of inductive and deductive research to develop an economic model that was vastly different from the economic model that would have been developed based solely upon traditional deductive research methods. Furthermore, without implementing a mixed methods protocol I may have lost some valuable "big picture" data, which yielded "a sense of

place" as a utility function. I provide a recommended protocol for economists who endeavor to implement similar practices in their study of incomplete markets and in non-market valuation studies.

It is also clear that using a mixed methods research model has allowed me to specify the market for conservation easements and the market for a sense of place as an emerging market. It is my prediction that, if the market for conservation easements were a mature market, that I would attain similar results. The difference is that in a mature market, more information would be available on which to base the priors, so there would be better intuition of the model set-up, and a more in-depth qualitative research study may be more useful to serve for validation, rather than exploration. I also assert that in the case of any emerging market, when economists do not fully understand the market dynamics of the good in question, that a methods approach is invaluable, and this step should be implemented before implementing any valuation study.

In this particular example, without conducting an ethnographically based data collection and analysis we would have misunderstood the big picture of what land trusts are really trying to preserve: a sense of place. We also would not have had the foresight to construct the model as an optimization problem. In the next chapter I will model the market for a sense of place, and I will show that the inconsistent price information actually stems from the behavior of specific variables—a phenomenon consistent with the current empirical literature.

Chapter Four: A Market for a Sense of Place

Adam Smith's key insight was that both parties to an exchange can benefit and that, so long as cooperation is strictly voluntary, no exchange can take place unless both parties do benefit.

Milton Friedman

Chapter Overview: Unique Contributions to the Literature

In Chapter Four, I deliver a model of a market for conservation easements that allows me to identify the source of the incomplete market, and that allows me to make recommendations about how to improve the efficiency of the market. This model presents a unique and timely contribution to the literature for several reasons. It is the first economic model of a market for land preservation, and the model was developed using a mixed methods approach to frame an incomplete, but emerging market. It is also the first research study that disentangles the components of the private benefits curve to make policy recommendations that will improve market efficiency. Finally, by using results from my qualitative research, I provide the first study that delivers what land trusts are trying to preserve when they earmark land for conservation: a sense of place. Based upon results from my qualitative research study presented in Chapter Three, I

modeled a sense of place as a social welfare function that is a function of attributes. In this chapter I show that appropriate attribute matching can also improve market efficiency, in part, because attribute matching creates symmetry between the landowner and the land trust sides of the market.

My initial model of the conservation easement market is competitive, where both the supply and the demand sides are fully developed and there is efficient operation. Next, I look at the standard theory of externalities, and I relax the assumption of perfect competition, where the marginal private benefits curve is equal to the marginal social benefits curve (Baumol and Oates, 1998). Using the appraisal literature, I perform what I believe to be the first surgery of a private benefits curve, and I dissect private benefits into three parts: commercial rents, option value, and private amenity rent (PAR). Using data gleaned from my mixed methods research model, I explain how a sense of place, landowner utility, and social benefits affect the landowner and land trust reservation prices for enacting a conservation easement. This allows me to identify the sources of the incomplete market and to then offer recommendations about how to make the market for private land preservation more complete. I also draw a distinction between the landowner *entitled* "marginal private benefits" (MPB) curve, which is a sum of all of the rents received by the land that the landowner should receive in a completely efficient market, and the *realized* MPB curve, which contains the rents that the landowner actually does receive. The distinction between these two curves provides implication for market efficiency.

Ultimately, as a result of the qualitative analysis, I have been able to refine a standard theory to yield insight into how to make both sides of the conservation easement market bid more effectively to make the market more efficient. I maintain that the market for private land conservation is incomplete due to:

- A thin market on which to base option values
- Policy failure for omitting social values in the conservation easement appraisal process
- Incomplete information to determine the landowner and land trust reservation prices
- Uncertainty due to gaps between the landowner's "realized" versus "entitled" marginal private benefits curve.

After I present my economic model of an emerging conservation easement market, I make the case that, without government intervention, the market may "self correct", but it will require an increase in the number of private land conservation transactions. However, with a better understanding of the private rents in the market for land preservation and with minimum intervention, the government can facilitate more complete information to landowners and land trusts, which will result in improved efficiency, more complete information and reduced uncertainty. This will lead to a more mature market that is capable of yielding consistent price information, in part because more information is known about the private rents provided to the landowner. Thus, at the end of this chapter I will return full circle to the point that I made at the beginning of

this dissertation: The market for conservation easements is emerging and inefficient but with the right nurturing, it shows signs of evolving into an efficient and complete market.

Rents and the Conservation Easement Market

In this section I incorporate work from prior economic and appraisal research to present the impact of conservation easement on private and social rents, and the appraisal process. I use mathematical and graphical arguments to illustrate the impact of conservation easements and rents on the marginal private benefit and marginal social benefits curve.

To construct the supply side of the conservation easement market, I return to the premise promulgated by Geltner, Riddiough, and Stojanovich (1996) that a landowner will not alter her land use unless the rents for the "converted" land are greater than the rents from the original use. Thus, in order for the land to remain in its original, undeveloped state, the aggregate economic rents from the undeveloped land must exceed the aggregate rents from the converted land use, assuming that the landowner is a rational economic agent.[11] Pulling from the appraisal literature, the most basic method for assessing the trigger value is to quantify the aggregate commercial rents and the option value for both uses.

[11] For the purposes of this model, "undeveloped" land use refers to land that may be undeveloped, minimally developed, or designated as "working lands", which may include agricultural or forest lands. "Developed" land refers to land designated for residential housing, or commercial or industrial development.

Commercial Rents

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). According to Marshall and the previously published appraisal literature, the value of land with unrestricted development rights is expressed in price per acre, and the market price of an undeveloped acre today (t=0) faced by buyers and sellers is:

$$V^{u}(0) = \int_{0}^{T_{con}} Ue^{((\lambda - r_u)t)}dt + \int_{T_{con}}^{\infty} De^{((\alpha - r_u)t)}dt - TCe^{(-r*T_{con})}$$

(Equation 4.1)

V^u	Value of undeveloped land with no development restrictions
U	Undeveloped land rents in time t
D	Net developed land rents in time t
TC	Conversion cost incurred when undeveloped land is converted to developed use at $t = T_{con,}$ with $T_{con} \in [0, \infty]$
λ	Growth rate for future undeveloped land rents $\lambda \sim N(\mu_\lambda, \sigma_\lambda)$
α	Growth rate for developed land rents $\alpha \sim N(\mu_\alpha, \sigma_\alpha)$
r_u	Landowner's risk equivalent discount rate
T_{con}	Optimal date of conversion

Restated, Equation 4.1 defines the present day price of undeveloped land $V^U(0)$, as being equal to the capitalized and discounted commercial rents (U) from the *undeveloped* land

up to an optimal date of conversion ($t=T_{con}$). Potential capitalized and discounted commercial rents from the *developed* land (D), should the landowner decide to develop the land sometime in the future, are also added to the equation, less a one-time cost of conversion in time "T" (TC). As expressed in Equation 4.1, the landowner's allocation of land is purely a function of commercial rents across time, and the model assumes that the landowner possesses complete information to determine the optimal conversion time that will maximize the return on land investment.

Option Value

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, she is essentially extinguishing the option to develop her land in the future. Using work by Marshall (2002) as a foundation, the first assumption in determining the option value of the land is that both undeveloped and developed rents follow a nonlinear rate of growth across time. In other words, each rental stream is defined as:

$$U_t = Ue^{\lambda t} \quad \text{and} \quad D_t = De^{\alpha t}$$

The landowner must time the conversion of her land from an undeveloped to a developed state to maximize rents, and in doing so, she needs to consider the multiple rents that may flow from both the undeveloped and the developed land. This endogenous determination

of multiple rent flows influences the optimum conversion date, which in turn influences the market valuation.

The integration of Equation 4.1 results in Equation 4.2, which shows that today's price of convertible, undeveloped land, is equivalent to capitalized undeveloped and developed rents. This integration will be used to demonstrate the restricted value for the land (V^R), which occurs when the option value on the undeveloped land is extinguished:

$$V^U(0) = \frac{U}{r_u - \lambda}(1 - e^{(\lambda - ru)T_{con}}) + \left(\frac{D}{r_u - \alpha} e^{((\alpha - r_u)T_{con})} - TCe^{(-r_u * T_{con})} \right)$$

Equation 4.2

(a) (b) (c)

Equation 4.2 can be used to make a unique contribution to the literature in this way: With Equation 4.2, I am able to disaggregate a classic MPB curve into two separate and meaningful values. By disentangling the MPB curve I can illustrate that there is a market for each of the separate values (segments (b) and (c)), which contribute to the landowner and land trust reservation price for private conservation land. This will be presented in a graphical argument in Figure 4.1 momentarily; however, the bigger picture is that, by identifying these separate segments of the private benefits curve, I am able to identify the source of the incomplete market.

Returning to Equation 4.2, the land value (a) can be dissected into two separate parts: the commercial value of the land (b), and the option for future development of the land (c).

Next, Equation 4.2 can be maneuvered to illustrate the concept of option value, and the ramifications of when the option to develop is restricted. If a landowner were to separate the net developed rents (c) and extinguish them through a conservation easement agreement [(a) – (c)], the only remaining value for the undeveloped land would be the present day commercial value (b). Thus, the value of the land with development restrictions (V^R) is:

$$V^R(0) = \frac{U}{r_u - \lambda}(1 - e^{(\lambda - ru)T_{con}})$$

Equation 4.3

According to work presented by Boyd, Caballero, and Simpson (2000) that was presented in Equation 2.3 in Chapter 2, the value of a conservation easement is: $V^E=V^U-V^R$. Thus, the value of the conservation easement is equivalent to discounted future development rents, less transactions costs, or:

$$V^E(0) = \left(\frac{D}{r_u - \alpha} e^{((\alpha - r_u)T_{con})} - TCe^{(-r_u * T_{con})} \right)$$

Equation 4.4

Graphical Representation of Commercial Rents and Option Value

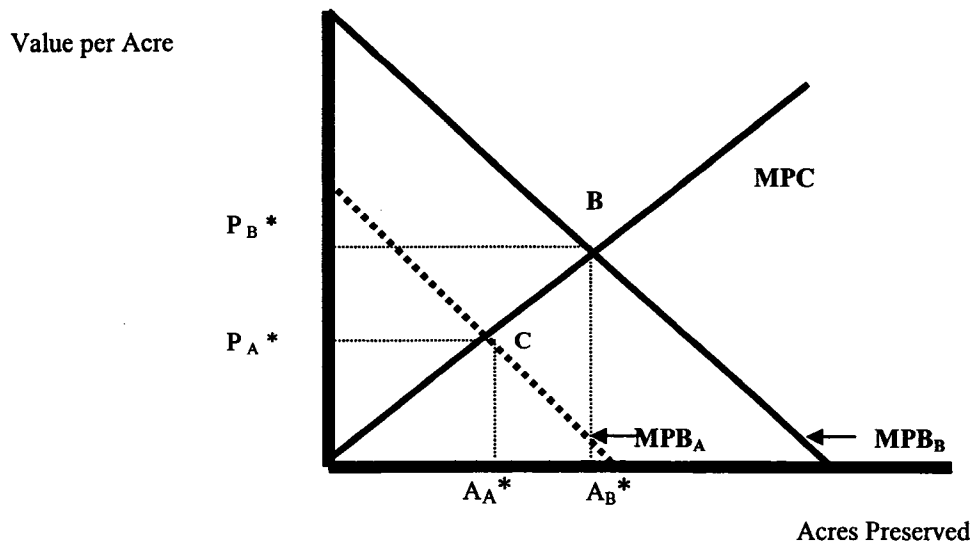
In Figure 4.1, I present a classic MPB curve in a perfectly competitive market that is expanded to accommodate the graphical arguments for the previous equations. In Figure 4.1, the marginal private benefits curve reflects the private rents provided by the land, which consists of commercial rents (Equation 4.2 (b)) and the option value of the land (Equation 4.2 (c)). The distance from the origin to Point C is the value of the commercial

rents of the land, and the distance between Point C and Point B represents the option value of the land.

Figure 4.1

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 (which includes opportunity cost) for that particular land use. This will result in an amount of undeveloped acreage equal

to level A_B*. Now, with respect to Equation 4.4, 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*).[12]

Once again, this revelation provides an enlightening contribution to the literature, because now there is a distinction in the rents that contribute to the landowner MPB. By isolating the elements with an established market (the commercial rents and the option value), one can more easily identify the uncooperative variable that is contributing to the market failure. Based upon the information just presented, the value of a conservation easement is determined as a function of the future and present discounted rents from the land, less the costs.

This model assumes a perfectly competitive and complete market. In reality, the option value of the land may be difficult to predict. Appraisers who participated in the qualitative research phase of the study report having difficulty finding comparable sales to reflect the restricted option value of the land, because the market is thin. For example, when asked about how to value the extinguished option values of the land, they divulged the following insights and adaptive strategies:

[12] At least in theory, only the option value for development and not the commercial rent stream is affected by the conservation easement. This part of the discussion also makes the assumption that the current policies in place are capable of providing full financial compensation to the landowner, as well.

CK (researcher): How do you determine the restricted value of the land?

WW (appraiser): PFA: Pluck from Air! (On a more serious note) What I rely on now when I don't have sales of encumbered land is primarily a paired sales approach. Where every time I find a sale of unbuildable land, I try to pair it with a very comparable sale of land that is buildable. And I have developed, I've got about a dozen of these, that I have developed ratios of the rate of buildable to unbuildable land. And it doesn't matter how old they are or what market you're in, you can adapt these to anyplace.

JW (appraiser): ...if you really don't have any sales you have to come up with an answer somewhere and the best you can do is support it with reasonable research and try to document what you're finding and stabilize it based upon your own best estimate of what's there. You may find 1-2 sales somewhere that kind of tie together that can maybe you can use as supporting information. In some circumstances you can look at things...for instance in my region we have some impaired sales. Maybe you can find something like a tailings mine, you know, that maybe someone has bought for hunting purpose, but maybe you could never go in there and develop it for one sense... Maybe there is some similarity in characteristics between that and what the removed or the extinguished rights may represent on a given piece of property. So you might be able to do something like that. You might be able to find some type of a remainder... odd remainder parcel somewhere that's an out lot in some subdivision somewhere that didn't join a neighbor lot for some kind of reason. Or something like this. You have to be a little bit more creative on that one. When it's all said and done, you stick it in the pot and then you give it a stir and then you do one last call and make a decision on it. And that's the best that you can do!
Note: Slight chuckles in the group

Over time, you know, information will be coming available and I think that's one of the important things about, you know, the CE movement is that as the status starts to happen there should be more of a central base that's available that kind of happens. Right now it's kind of a loosely related network. I know that there are some states like Montana where it's not even a recorded status. Where their markets are not even a recorded state so you really have to beg, borrow and steal to get information from anybody in that state because they hold in their pocket because it burns their feet (slight chuckle in group). So when you come to certain states like that you have to have a pretty good information source.

MW (appraiser): Well, the same sort of litany of sort of analogies that JV was talking about. And I'm going to be a broken record on this, but I'll go back again to what our government imposes we must do...
Memo: Said with an interesting amount of anger and gusto

Say that the first thing you do is go and seek sales of CE interests in areas where there is a regular program of government purchase of CEs.
Memo: Speech becomes quite fast and he speaks with a great deal of annoyance.

MW: And all the appraisers in here...our hair just stood up when we heard that, because there is nothing less indicative of market failure normally than what a government agency might choose to pay for something. Sure it might be based upon an appraisal, but there's no hard, flat negotiations, you rarely see CE available in the multi-list for sale in the book at the supermarket. They're not property interests that are typically bought and sold and it's typically not a competitive market that breaks down to useful units of comparison like price break, or price per floor line dwelling unit, or price per mile of river. Nonetheless, the Treasury regulations say this is what you have to do if you are preparing an appraisal for income tax purposes. So normally, I think that most property appraisers that live in that world would say, "I went and looked. And there is no regular government program of purchase of easements in my market area. So I checked but forget it—I'm not going to do it." Now let's go on to the actual measurement techniques. More and more there are comparable sales.

Based upon the appraisers' insights, it is clear that the market for option value is thin, but emerging. There are times when there is sufficient information about the loss of development rights, but at other times the information is lacking and the appraisers must enact professional judgment in order to derive the loss in option value, which may result in a degree of error. With increased conservation easement activity, over time the option value market will evolve and the market failure will be corrected. However, the government may expedite the process by increasing and improving upon the amount of information available to appraisers about properties with restricted development rights.

To return to the model of conservation easement land, for now, I will make the assumption that the market is complete for option value (although the assumption will be relaxed later in the chapter). Thus, in a complete market the value of a conservation easement is a function of:

$$CEV_1 = f_1(U, D, TC, r) \qquad \textit{(Equation 4.5)}$$

Where:

CEV_1	landowner's perpetual conservation easement price per acre or equivalent WTA development
U	capitalized rents per acre of undeveloped land accruing up to conversion
D	capitalized net rents per acre of developed land captured after conversion (or the option value)
TC	landowner transaction and conversion costs to gain urban rents
r	relevant and appropriate landowner discount rate

The implications for appraisal practices are profound. This mathematical and graphical discussion supports the premise advocated by Boyd, Caballero, and Simpson in Chapter 2 that appraisers must anticipate the probability that the parcel will be developed sometime in the future, and they must anticipate the value of all potential future rents from that property that have now been restricted by the conservation easement.

The Land's Social Value: A Source of Policy Failure

Land qualifying for conservation easement tax benefits must provide social benefit; however, the current structure of the appraisal system yields a policy failure that affects the conservation easement valuation process. This policy failure contributes to the incomplete market.

Inefficiencies due to incomplete information are made worse by the government through tax policy. According to Section 170 (A)(2)(d) of the U.S. IRS Tax Code, in order to

receive consideration for a conservation easement, the land must possess IRS designated "conservation values" that, by definition, provide social value. Examples of social benefits include reservation of land for outdoor recreation or general education purposes, preservation of open space for natural habitats, scenic enjoyment, relief of "urban closeness", farmland, and lands of historical value, and protection of environmental systems.

In the published guidelines for appraising conservation easements (1999), the Land Trust Alliance reiterates that the main objective of a conservation easement is to preserve land for the purpose of providing social benefit. In reality, the presence and the extent of the positive externality may be difficult to measure due to the current legal policies and appraisal practices, and sub-optimal land allocations may result. For example, under current United States Performance Appraisal Standards (2006), appraisers are forbidden from including social value measurements in the conservation easement appraisal process, despite the paradoxical legal requirement that social benefits are *required* in order to enact a conservation easement. Thus, the lack of adequate compensation to the landowner will yield a sub-optimal amount of land for preservation, which will be addressed in the discussion on Figure 4.2.

To demonstrate how incomplete information effects market efficiency, I alter my previous model to include social values. Returning to Equation 4.1, *in order to provide an efficient allocation of land for preservation*, the value of the undeveloped land should *actually* include the discounted social value provided by the land, or:

$$V_u(0) = \int_0^{T_{con}} Ue^{((\lambda - ru)t)}dt + \int_{T_{con}}^{\infty} De^{((\alpha - r)t)}dt + \int_0^{\infty} Se^{((\theta - r)t)}dt - TCe^{(-r*T_{con})}$$

(Equation 4.6)

Where: S "Undeveloped land" social values in time t

Θ Growth rate for societal land benefits, as land rents become more scarce over time. $\theta \sim N(\mu_\theta, \sigma_\theta)$

The assumption of non-linear growth of societal benefits as conserved land becomes more scarce yields the following growth rate:

$$S=Se^{\theta t}$$

(Equation 4.7)

Integrating and rearranging this equation leads to the following result:

$$V^U(0) = \frac{U}{r_u - \lambda}(1 - e^{(\lambda - ru)T_{con}}) + \left(\frac{D}{r_u - \alpha}e^{((\alpha - r_u)T_{con})} - TCe^{(-r_u*T_{con})}\right) + \frac{S}{r_u - \theta}e^{((\theta - ru)T_{con})}$$

(Equation 4.8)

Based upon this equation, when the land presents social value in addition to the commercial rents and the option value, the undeveloped value of the land exceeds the marginal private benefits curve. Land that provides greater social benefit than private benefit yields a classic environmental economics externality graph (Baumol and Oates, 1998), presented in Figure 4.2. My contribution to this classic graph is the disentanglement of the MPB curve to reflect commercial rents and option values; otherwise, it is clear that the benefits that society receives from the land are greater than the private benefits. In the case of a conservation easement, 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.

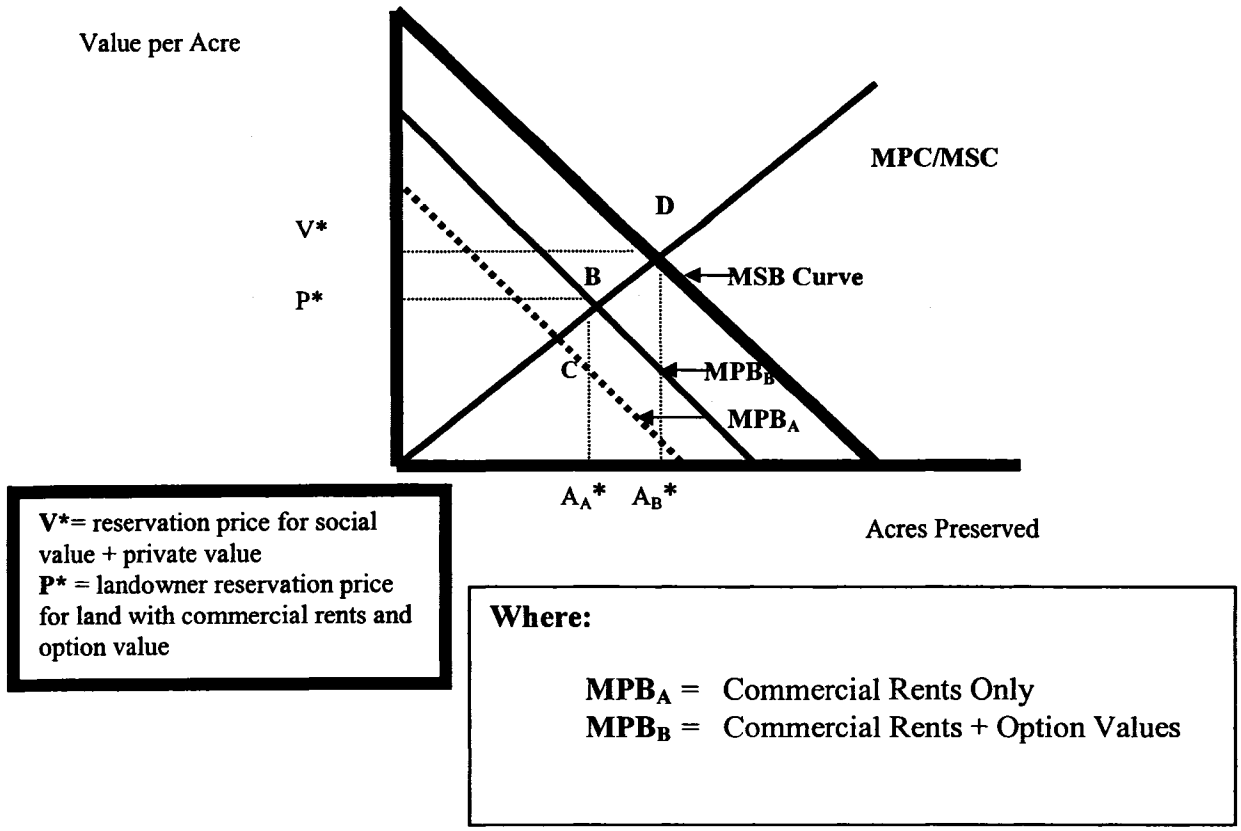
It is clear from a market efficiency standpoint that the value of the undeveloped land should be equal to Equation 4.8, which is equal to the distance from the origin to Point D. The capitalization of social values, the distance between B and D, is equal to:

$$\int_0^{\infty} Se^{((\theta-r)t)}\,dt \qquad \text{Where: } \int_0^{\infty} Se^{((\theta-r)t)}\,dt > 0$$

Equation 4.9

Figure 4.2

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



Measured in Acres of Undeveloped Land

As stated in the IRS Tax Code, Equation 4.9 must be non-negative in order for a conservation easement to be enacted, but the actual financial compensation package to the landowner presents a twist. As previously discussed, social values are forbidden for being factored into the appraisal values of the land. This yields a policy, or government, failure. Due to the policy failure, this value presented in Equation 4.9 must be equal to

zero in Equation 4.8, since the landowner cannot be financially compensated for the social values presented by the land. Thus, there will be a policy failure equal to the distance between B and D that is equal to Equation 4.9. This policy failure will occur unless the landowner somehow receives equivalent indirect compensation for her land's positive externality.

Interestingly enough, these tax and appraisal policies have been instituted for years, and although there have been waves of controversy about conservation easement practices, this particular angle has not appeared to be one of the particularly sore spots. One likely explanation for this is that, due to the incomplete market, society probably *believes* the distance from Point C to Point E is all option value (not really "social value"), because Point E may appear to be observable in the market—particularly when a buyer appears to "pay more for a property than it's worth" when encumbered by a conservation easement. Because this selling price is observable to the market, the individual components tend to be ignored, and society really believes that it is justly compensating the landowner for the loss of option value. Thus, by disaggregating the MPB and the MSB curves (of which the landowner is a part), *one can determine one source of the incomplete market, or the amount of the market inefficiency, which is the gap between the MPB and MSB curves,* represented by the distance between B and D on Figure 4.2, and thus identify the *actual* amount for which the landowner should be compensated.

The significance of this finding cannot be overstated. In essence, the land's social value is what provides "a sense of place" to the land trust community, which was uncovered in

Chapter Three. This also reflects the source of the incomplete market. Mathematically, I showed that conservation easement policies only permit compensation to the landowner in an amount equal to the option value, and that an under-allocation of land may occur when the landowner is not compensated for social values. Thus, the outstanding question is, "How does the land trust community compensate the landowner for a sense of place?"

The remainder of Chapter Four discusses other contributing factors to the imperfect market. I also explore the remedies and policies that may resolve the incomplete market of conservation easement land, and I provide an explanation on how the landowner may receive compensation for the "sense of place" that her land provides: through his own landowner utility. In this next section, I propose that landowner utility is one means by which the gap between the MPB and MSB curve can be narrowed, and I present this landowner utility as a third kind of private rent—private amenity rent (or PAR). PAR is manifested in one of two different ways:

1) Landowner PAR for the parcel of land as a whole.
2) Landowner PAR for specific attributes

PAR: A Third Source of Rent

As articulated in Chapter Two, several authors have demonstrated that there is a basic utility that landowners receive from allocating land for a specific land use that, until now, has not been factored into the commercial rents garnered from the land. In this next section I reflect upon the PAR for the entire parcel of land that the landowner gains from

seeing her land remain undeveloped. This rent product is also dependent on time, present (current enjoyment including heritage) and future (endowment and legacy), that grows with continued ownership. Next, I show that when the landowner utility is added into the marginal private benefits curve, along with commercial rents and option values, that the market comes closer to becoming efficient.

Equation 4.4 can be modified to include this landowner utility, or PAR. Consider the conservation easement that is a function of the same variables presented in Equation 4.5, including PAR:

$$V^{E}_{2} = f_{2}(U, TC, r, PAR)$$

(Equation 4.10)

Where:

CEV_2	landowner's perpetual conservation easement price per acre or equivalent WTA development
U	capitalized rents per acre of undeveloped land accruing up to conversion
D	capitalized net rents per acre of developed land captured after conversion (or the option value)
TC	landowner transaction and conversion costs to gain urban rents
r	relevant and appropriate landowner discount rate

Based upon Marshall's work, PAR is represented by an average ($nx1$) vector of *non-market* amenity attributes valued by the landowner from an acre of her land.

A scalar can be generated by multiplying the landowner weight (represented by a vector of dimension (*1xn*)) with the landowner's non-market price to create a scalar value:

$$PAR = \Sigma(B_{(1xn)} * X_{(nx1)})]$$

(Equation 4.11)

$B_{(1xn)}$ qualitative vector of attribute weights or non-market prices for all *n* amenity attributes within an average acre of undeveloped land. This represents the landowner's average non-market price or weight vector across all acres within a market or landscape.

$X_{(nx1)}$ quantitative vector of levels for the landowner's *n* amenity attributes per undeveloped acre. This represents the landowner's average attribute quantity vector across all acres within a market or landscape.

Equation 4.8 can be rewritten to incorporate landowner *PAR* into the market price of undeveloped land:

$$V_u(0) = \int_0^{T_{con}} Ue^{((\lambda - ru)t)}dt + \int_0^{Tcon} PA\mathrm{Re}^{((\delta - ru)t)} \int_{T_{con}}^{\infty} De^{((\alpha - r)t)}dt + \int_0^{\infty} Se^{((\theta - r)t)}dt - TCe^{(-r*T_{con})}$$

(Equation 4.12)

Where: $PAR_t = PAR * e^{\delta t}$

δ growth rate for private amenity rents
$\delta \sim N(\mu_\delta, \sigma_\delta)$

Like commercial rents and option value, private amenity rents exhibit growth dependent upon δ. Expanding Equation 4.9 and taking the limit of each integral with respect to time ($t \rightarrow \infty$), yields the following capitalized market value for undeveloped land:

$$V_u(0)=\frac{U}{r_u-\lambda}\left(1-e^{((\lambda-r_u)T_{con})}\right)+\frac{PAR}{r_u-\delta}\left(1-e^{((\delta-r_u)T_{con})}\right)+\frac{D}{r_u-\alpha}e^{((\alpha-r_u)T_{con})}+\frac{S}{r_U-\theta}e^{((\theta-r_U)T_{con})}-Ce^{(-r_u*T_{con})}$$

(Equation 4.13)

(a) (b) (c) (d) (e)

These values are defined, respectively, as:

(a) Capitalized rents from the undeveloped land at growth rate λ

(b) Capitalized rents from landowner PAR at growth rate δ

(c) Capitalized rents from developed land (or future option value) at growth rate

(d) Capitalized social values from the undeveloped land at growth rate θ

(e) Transactions costs

The chief difference between Equation 4.13 and Equation 4.8 is the addition of PAR to the value of the conservation easement. In other words, 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 4.3 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, depending on the share of social benefit held by the landowner, because the gap between the

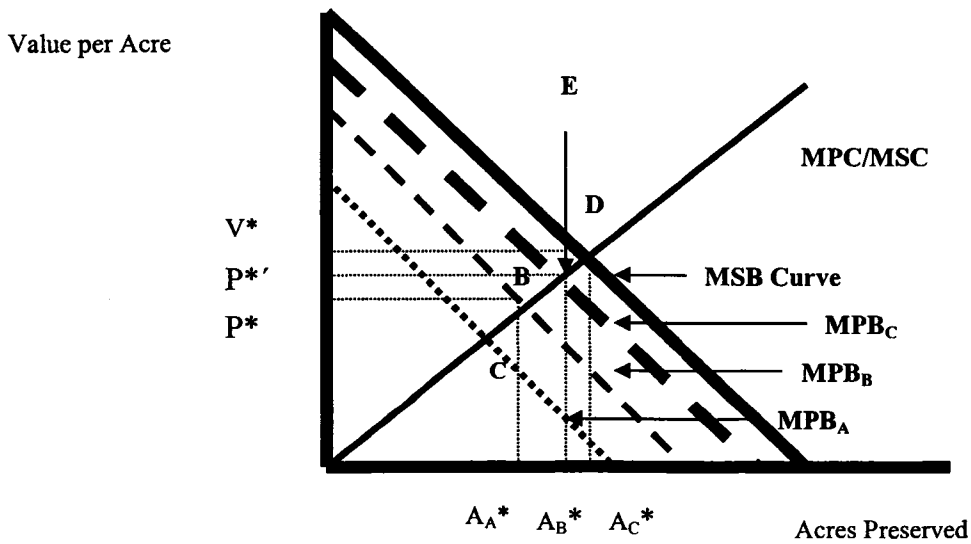
landowner private benefits and social benefits is narrowed. This is illustrated in Figures 4.3 (a) and 4.3 (b).

Figure 4.3 (a)

Market for Land Preservation, Adding PAR to the MPB Curve

PAR>0

(Measured in Acres of Land Preserved—or Undeveloped)



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 4.3 (a) 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 her reservation price to for converting the land to development will also increase, at value P*′, and 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 clearly 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.

This situation is reminiscent of a point made earlier, that there are cases when an individual has seemingly "overpaid" for a property encumbered with a conservation easement. Referring to Figure 4.3 (a), when a sale of this type of property occurs, the sales price includes PAR, rather than just the commercial rents and the option values. That is, the new landowner is willing to pay a price (Point E on Figure 4.3 (a)) that is above the sum of the commercial rents and option value (Point B), and this is the price that is visible to society. According to appraisal logic, the value of the property should sell at point C once the development rights to the property are extinguished. By all logical accounts this should be true, as the property would never *really* be worth as much

with extinguished development rights compared to the intact development rights, because buying the intact rights gives the landowner (at the very least) the option to dissipate the development rights and receive full compensation through a conservation easement. However, the component that makes the sales price much higher (Point E) is the landowner PAR. Transcripts from two appraisers divulge that it is not unusual for this to be the case with large or unique "trophy properties":

JV (appraiser): I was involved with the land three times prior to this action. And the property only had development opportunity for two sites on it because of the soil characteristics. So in that particular case the conservation easement did not truly restrict the land from what it could have been whether it was unrestricted. So you really have to look at the terms of the easement and ask, what does it really restrict it? In that case, the buyer paid more money for the land than it would have been appraised for as unrestricted. But then you have to look at his motivations. A mile down the road from that is a 4,000 acre private club. And there's no more land in that private club available. This individual's a member of that club. His son wanted a home site, but there's no more space available in side of that club. Now is that a market transaction? Is that a market price? A market spike?

WW (appraiser): I would say the primary thing that those properties have is, um, as JV was saying....but they're a trophy site because they offer a wonderful view or an unusually large piece of land or something like that...it has to be something really unique but it also has to be close enough to a wealthy pool of buyers to have that happen. I went to one live auction of a property that was down on Lake Pepin, in the Mississippi River in Wisconsin, which is a really wide part of the Mississippi—and extremely scenic with high bluffs over it. And I had done a lot of easement appraisals down there and this property went for more than any other property that I had seen. More than...Way more than I expected it to. And a week later I got a call from the bank asking me to appraise it, and I said, "I'm sorry, that sold for $430 K, and the highest that I could appraise it for is $250 K based on sales. I can't do it. And so I'm sure they found someone else to do it....

While landowner PAR may explain why these "trophy properties" appear to sell for greater than sales price, the reason why these standout sales seem like an anomalies is that the market is thin. As articulated by these appraisers, there may be a small pool of

buyers or sellers and not many comp sales on which to base the seemingly "atypical" market activity. From a market maturation perspective, however, as the market for private land conservation grows there will be more properties on which to base these "comparative sales"; hence, what appears to be unusual activity influenced by personal preferences of the wealthy may actually evolve into a complete market.

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, the trust may potentially overpay for a parcel of land in the amount equal to the distance between P* and P*′.[13]

It is also noteworthy to point out that, 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. Referring again to Figure 4.3 (a), 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*

[13] As previously mentioned, trusts rarely actually "pay" for a conservation easement on a parcel of land. Usually the conservation easement is donated. However, this theory can be applied to either a fee simple conservation easement transaction or a donated conservation easement because "someone" is still paying for the conservation easement (V^E) equal to V^U-V^R. In the case of the donated conservation easement, this "someone" is the taxpayer. Thus, if trusts are aware of the landowner reservation prices less money would need to be paid from the federal or state coffers for one particular parcel, and the money could be reallocated for different conservation properties.

and A_B*. If the landowner were to only consider commercial rents and option value, then at A_B*the land would be converted to development at a lower reservation price (P*'). 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.

As demonstrated by Figure 4.3 (a), landowner PAR can actually help the market edge closer to efficiency. This is because the landowner PAR is one portion of society's spectrum of benefits. For example, if the aggregate societal benefit can be scaled to be equal to "100%", the landowner PAR is considered a ratio of the total societal benefits, because the landowner represents part of society. So, as shown in Figure 4.3 (a), if a large portion of these social benefits are recognized by the landowner as contributing to his own personal utility, the gap between option value and social benefits is narrowed. This gap can be called the "social benefits gap", and I will refer to the PAR to social benefits ratio simply as the "social benefits ratio." For example, when the landowner presents a high social benefits ratio, it means that he derives a high percentage of his PAR from the social benefits of the land. Likewise, a low amount of PAR means that the landowner receives relatively little utility from the non-commercial aspects of the land relative to the benefits that the land provides to society, and the landowner will need to be compensated for more of the social benefits provided by his land in order to for an optimal amount of undeveloped land to be preserved.

Once again returning to the landowner compensation issue for conservation easements, current policy calls for compensation of the option value, not for the land's social

benefits. 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 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 4.3(a) 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. I contrast Figure 4.3 (a) with the absence of PAR, presented in Figure 4.3 (b), which results in a sub-optimal amount of land for preservation.

Figure 4.3 (b) illustrates an example where PAR=0, which is a low landowner social benefits ratio. In this circumstance, the MPB is effectively a sum of the commercial rents and the option value, which looks very similar to Figure 4.2. In Figure 4.3 (b), the market failure, represented by the distance between Point B and Point D, is greater than the market distortion presented in Figure 4.3 (a), reflected in the distance between Point

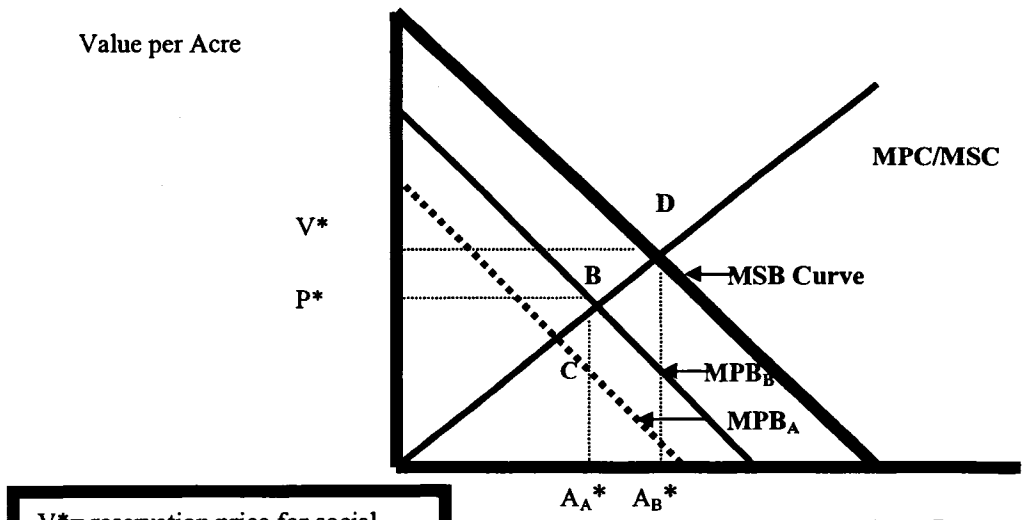
D and Point E. This is because the landowner's lack of private amenity rent in Figure 4.3 (b) fails to bridge some of the gap between private and social benefits provided by the land, as it did in Figure 4.3 (a). Hence, the landowner's reservation price for converting the land for development is lower when PAR=0, compared to when PAR>0, and 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 4.3 (b)

Market for Land Preservation, Adding PAR to the MPB Curve

PAR=0

(Measured in Acres of Land Preserved—or Undeveloped)



V*= reservation price for social value + private value
P* = landowner reservation price for land with commercial rents, option value, and when PAR=0

Where:

MPB_A = Commercial Rents Only
MPB_B = Commercial Rents + Option Values + PAR=0

In contrast, Figure 4.3 (c) presents an efficient market, in which the landowner's PAR completely bridges the gap between the private and social benefit curves. Hence, 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 (which is also included in the "social benefits curve") 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 presents a high social benefits ratio. Such may be the case of an island of undeveloped land surrounded by commercial development. 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), if policy makers were to only consider society's benefits, excluding the landowner.

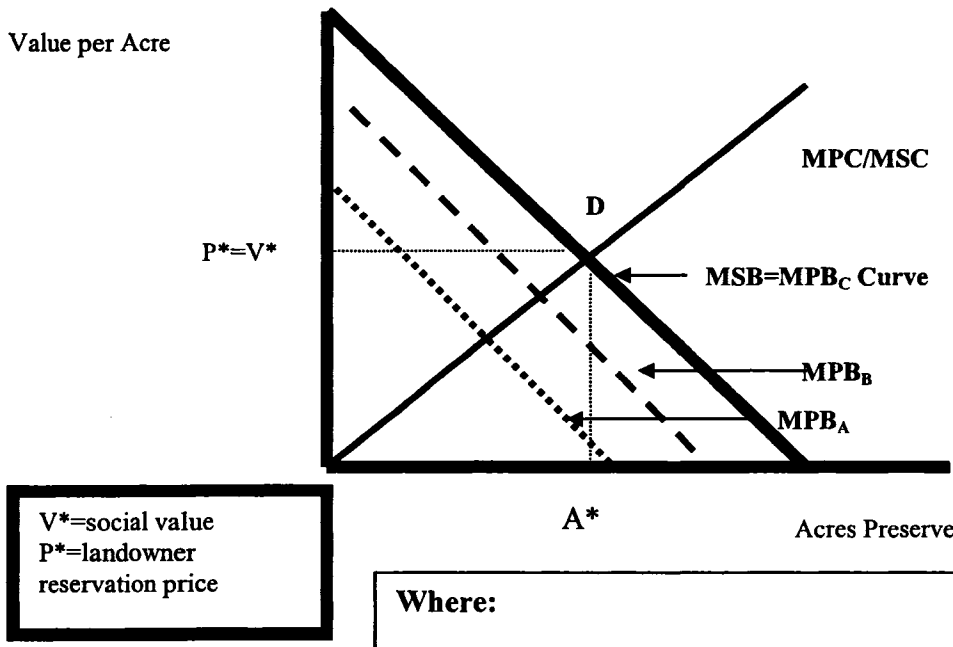
Once again, it is important to reflect upon the point made about thin markets and imperfect information. In cases where land prices may appear to be inflated for land encumbered with conservation easements, what is truly happening is that the landowner PARs are being captured by the price revealed to the market. Due to the thin market, these properties seem like anomalies; however, once the market for private land preservation becomes more mature and more information is available, these prices will become absorbed into competitive sales used during the appraisal process. Furthermore, a high landowner social benefits ratio may edge a property close to efficiency, as demonstrated in Figure 4.3 (c), or it may yield an over preservation of undeveloped land that *shouldn't* actually be preserved, when policy makers consider the societal benefits *less* the personal utility provided to the landowner. Therefore, it is logical that more care be given to determine the actual benefits provided to society, as well as benefits provided to the landowner.

In summary, in the case where MPB f(commercial rents, option value, PAR) = MSB, a landowner may be willing to donate her entire property for a conservation easement because she never had the intention to develop the land in the first place. As illustrated in Figures 2.4 (a), (b), and (c), the greater PAR a landowner has for the land, the more acreage will remain undeveloped, and the more efficiently a market will operate.

Figure 4.3 (c)

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)



Where:

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

Up to this point, I have discussed the supply side of the market, and I have reflected upon the landowner's reservation price for converting undeveloped land to development. Through algebraic manipulation, I have disaggregated the private benefits curve and I have shown that there are two segments of the market for land preservation that can be quantified because a market already exists: the commercial rents of the property and the option value of the land. For land to qualify for a conservation easement, the land must also provide social value; however, due to policy failure the uncompensated social values lead to an incomplete market. 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.

Demand side dynamics also contribute to efficiency. I have shown that the social benefits provided by the land comprise the "sense of place" that land trusts seek to preserve. If land trusts could quantify the owner's PAR for her land, and especially for specific conservation values or attributes, greater economic efficiency could be attained because trusts would be able to better understand the landowner's reservation price and trusts would make better use of their budgets. Government policy programs would also be able to better allocate tax benefits. However, without properly understanding a landowner's PAR, it is likely that a trust will overpay to enact a conservation easement, because the greater the PAR, the less likely a landowner will convert the land from an undeveloped to a developed land use. Thus, more complete information about landowner PAR and land attributes will create more symmetry in the market, and will lead to a more

complete market. Due to challenges in identifying each landowner PAR, it is also likely that PAR is manifested in the error term within a random utility model.

Impact of Buyer and Seller Preferences on Market Symmetry

In this next section I illustrate how information asymmetry between land trust and landowner can result in market incompleteness. Information asymmetry may result when either landowner PAR or the reservation price for specific attributes is unknown. A thin market may also exist for certain types of conservation attributes, and when there are not enough land trusts to accept conservation easements on that type of land, a matching error between both sides of the market may result, which yields market failure.

I have discussed the concept of the private benefits curve for the land as a whole as being comprised of three types of values: commercial rent, option value, and PAR. I have also made the connection that a landowner's PAR has the potential to improve market efficiency, because the landowner is less apt to convert her undeveloped land to development due to higher reservation prices. In making this point, I assert that if a land trust has information regarding the landowner's PAR, the market may become more efficient, because there will be less of a gap between the MPB and MSB curves and the trust is less likely to overpay for the land.

In reality, PAR is difficult to assess, because the landowner and the land trust are on different sides of the bargaining table. Likewise, it may be difficult for the landowner to

fully understand, much less articulate, the extent of her PAR for the land. Regardless of these difficulties, based upon the qualitative research phase of this mixed methods model, it became clear that trusts and landowners alike are in tune with specific land characteristics, and that certain features or combinations of features contribute to a community's sense of place. What often transpires is that the landowner weights specific attributes of her land as being worthy of protecting, and thus seeks out a trust that places similar weights on this attributes or combination of attributes.

To represent this concept, I return to the conservation value graphs presented in Chapter Two. Based upon results from the qualitative research model, there is commercial rent and option value that underlies each of these conservation values. In this case the landowner has positive PAR for the land, which is manifested by differing amounts of landowner PAR for different attributes. If the landowner finds a trust that is a good match, and that places a similar amount of emphasis (or weight) on these similar attributes, the market is more apt to operate efficiently, at least in terms of preserving those attributes. However, if a good match is not found, the market may not operate as efficiently. That is, correlation between weights of buyers and sellers increases market efficiency.

For example, in Figure 4.5, Panels a and b present the market for wildlife habitat and the market for open space, respectively. In this case I will make the assumption that the quantity of acres appropriate for open space and wildlife habitat are equal (and may even be the very same acres), but that the landowner values only open space. Thus, it is the

attribute of open space that yields the reservation price for the property as a whole, as reflected in Price P*′ in Panel 4 (b), and the zero PAR for wildlife habitat does not change the price. The landowner PAR for open space reduces market failure, as the distance between Point D and Point E is made relatively less than the distance between Point B and Point C, where the value that society cares about is of no consequence to the landowner. This reflects a higher landowner reservation price for converting the land for development *because the landowner places a high weight on open space as a conservation attribute.*

Figure 4.5 (Panel a)
An Example of Two Conservation Values That Provide Amenity to the Land Trust and to the Landowner

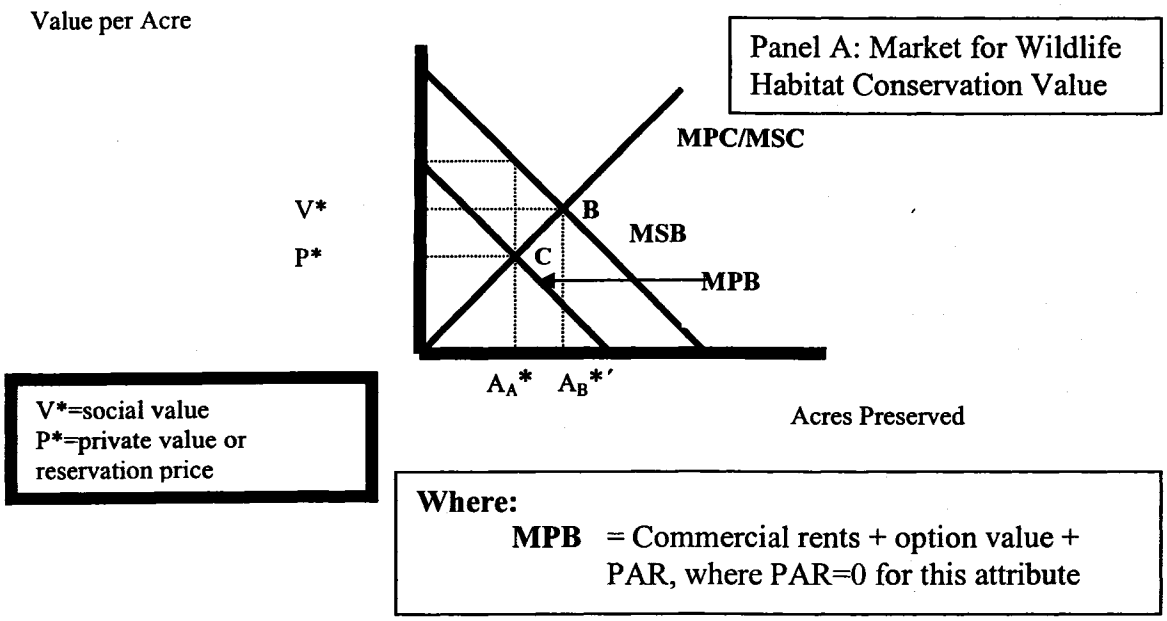
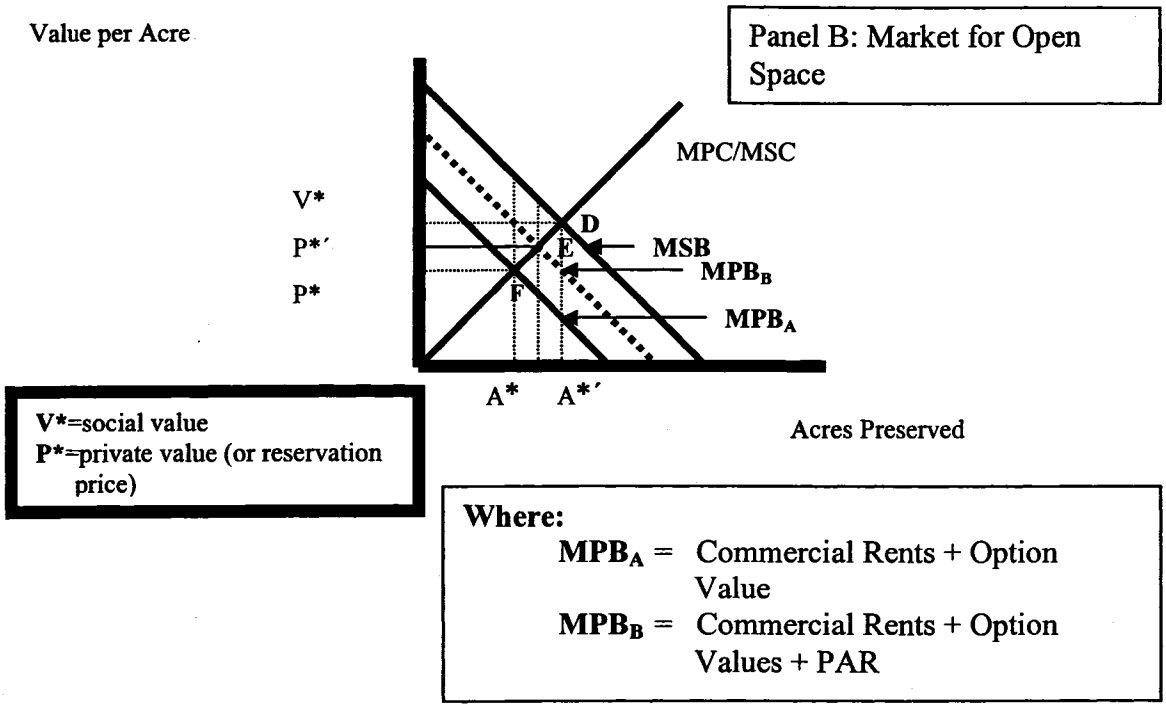


Figure 4.5 (Panel b)
An Example of Two Conservation Values That Provide Amenity to the Land Trust and to the Landowner



With full information, this landowner will be matched with a land trust that places similar weight on open space. A conservation deal for this property is made more likely to take place, because the landowner PAR has decreased the gap between the MSB and MPB curves, thus reducing the amount of money that must be paid for land conservation. This is also consistent with the findings presented in Chapter 3, that land trusts desire some form of self-sacrifice from the landowner who is enacting a conservation easement on her property. When a conservation easement is enacted, the landowner will be compensated for the value equal to the loss of development option value.

In the case of asymmetric information, a land trust that places greater weight on wildlife habitat as a conservation value may not be a good match for this landowner, who possesses small or 0 PAR for this particular attribute. This is because the land trust will need to ensure compensation of the full value for the landowner's reservation price for wildlife habitat, which is at P*. Thus, the land trust will either decline the offer or accept the opportunity and pay more than needed, because the trust could acquire the property based upon the landowner reservation price that is different for another attribute: open space. Returning to the information asymmetry argument, if the land trust is able to recognize that the landowner has a different reservation price for open space compared to wildlife habitat and negotiate accordingly, a more efficient market will be achieved. Thus, full and complete information is important, particularly in the case where a landowner may have no amenity for the "environmental" attributes identified during the qualitative phase of the research project, but may place value personal attribute like such as the family heritage for the property. To briefly revisit a point made earlier in Chapter 3, land trusts may be able to reduce some of the information failures by signaling to landowners the weights that the trusts may have for specific conservation attributes, such as open space. For example, by including the specific attribute in the organization's name (e.g. Colorado Open Lands), the land trust may make itself more identifiable to the landowner as a better potential match. This "niche branding", commonly used in the marketing field, represents one step of the market evolving from incomplete to emerging, because earlier conservation organizations adopted more broad names that were less focused upon the specific conservation attribute (e.g. "The Nature Conservancy"), and

hence did not communicate to landowners the specific weights that they may place upon these conservation attributes.

Thin markets may also play a role in problems with attribute matching. Although a trust may be interested in either the wildlife habitat or the open space conservation values of the property, because the landowner possesses 0 PAR for wildlife habitat, the landowner may not even consider approaching a land trust whose mission is to protect wildlife habitat. Despite the fact that there are more land trusts in the U.S. than ever before, the land trust movement is still a growing phenomenon in many areas of the country. A landowner may still have difficulty finding a land trust that may represent his specific conservation needs, particularly in the case of working or family heritage lands. Thus, due to the thin market for land trusts, the landowner may end up converting his land to development because he is unable to find a land trust appropriate for his conservation needs. Clearly, the landowner has some utility for the land that is based on the open space conservation value; however, there must be complete information on both sides of the market so that the trust and the landowner are aware of one another's weighting system. As discussed in Chapters 1 and 2, this is a market failure that still haunts the conservation easement market, and thus, it is very possible that a transaction may not take place between a habitat-minded land trust and a landowner with 0 PAR for wildlife habitat.

A third issue to consider is the degree to which these attributes embody the IRS conservation values. As previously discussed in Chapters 2 and 3, what often seems to

be the case is that the attributes (or the weighting of the attributes) that are deemed conservation worthy by either land trusts or landowners can be quite different from the IRS designated conservation values. It would be more efficient to balance the conservation values embraced by the conservation community (which includes land trusts and landowners alike) with those conservation priorities outlined by the IRS, and to optimize those conservation values that have been identified as critical for preservation, rather than to manipulate the land to fit within the restricted confines of the IRS Tax Code. In this regard, it may be in the government's best interest to consider the conservation values presented by the conservation community and to expand the IRS Tax Code to better reflect these "true" conservation values.

Clearly, resolving information asymmetry, both between the landowner and the land trust community, and between the government and the conservation community, will improve the market incompleteness and help the conservation easement market evolve into a more complete market. In this next section I elaborate upon this theme further when I show that there may be a difference between the private benefits to which the landowner is entitled and the "realized benefits" that the landowner actually receives. Using tax policy as an example, I show that the gap between entitled and realized landowner benefits may reduce the private benefits curve, and result in a sub-optimal amount of land for preservation.

Uncertainty and Its Impact on Landowner Wealth: The "Entitled" and "Realized" Private Benefits Curves

Holding all else equal, it is now time to relax an earlier assumption—that there is no uncertainty in terms of financial compensation to the landowner. I now make the case that there *is* uncertainty with respect to landowner income and wealth that is the result of the current tax policy system and the pecking order theory. By relaxing the assumption of certainty, the actual landowner private benefits may fall short of the private benefits to which the landowner is actually entitled. Hence, there is market failure and a sub-optimal amount of land may be allocated for land preservation due to policy implementation and financial compensation to the landowner.

Tax Policy and the Realized Financial Incentives from Conservation Easements

To understand the role of uncertainty on landowner wealth and the private benefits curve, it is first important to have a grasp of the financial incentives to which the landowner is entitled. While some landowners are able to sell their conservation easements, we heard in the qualitative research phase of the study that the bulk of the financial benefits that a landowner reaps from a conservation easement emanate from a myriad of tax benefits offered at several different levels: federal, state, property, and estate. As illustrated both mathematically and graphically earlier in the chapter, these benefits should fully comprise V^E, or the value of the conservation easement presented in Equation 4.4. As I will show, when the tax benefits are fully equal to what the landowner is entitled, the market will be efficient; however, when the landowner does not receive all of the benefits

to which they are entitled, it results in market distortion. As follows is a brief overview of the different levels of tax benefits:

- Federal: Under IRS Code Section 170, landowners may qualify for a federal income tax deduction equal to the value of the conservation easement as a charitable donation. McLaughlin (2004) describes the federal income tax deduction as an "upside down" incentive effect, because the federal income tax is based upon the marginal income tax rate, which stair steps from 0 to 10% to 35%, as the donor income increases.[14] Thus, the greater the donor's income, the greater the benefit from the charitable contribution, as a $1 tax donation will save donors at the margin $0.10, $0.15, $0.25, $0.28, $0.33 and $0.35, in the respective tax brackets illustrated in Table 4.1 in Appendix C. In the case of donated conservation easements, unused income tax deductions may be carried over for five additional years.

  Writes McLaughlin, despite the carryover, low and middle-income landowners find it difficult to benefit from the typically sizable charitable income tax deduction generated by an easement donation. At this writing, a landowner who donates a conservation easement is eligible to claim only 30 percent of the landowner's adjusted gross income ("AGI") in any year as a charitable contribution of long term capital gain property. The 30 percent AGI rule also applies to the five years that can be carried over. McLaughlin's findings are confirmed in Figure 4.6, which will be discussed momentarily.

[14] This example, which will be used throughout the essay, uses a tax rate for a "married, filing jointly" tax status.

- State: In eight states, landowners who enact a conservation easement are eligible for a state tax credit *in addition to* federal tax benefits. In two of these states, Colorado and Virginia, this state tax credit is transferable. That is, the unused portion of the tax credit (which is deducted dollar-for-dollar on a tax form) may be transferred (i.e. sold) to a third party, usually at a discounted rate.[15] The Colorado income tax rate is approximately 4.65%; thus, the donating party is eligible to either use the state tax credit against their state tax liability, or transfer the credit to another party. I test the hypothesis that the transferable tax credit will encourage lower and middle income tax payers to increase their conservation easement donations relative to people with higher incomes.

- Local: In many cases, local property taxes are assessed on the value of the property with restricted development, rather than the value of the property with unrestricted development. The restricted value is generally significantly lower than the property value with an unrestricted development option. Local property taxes vary in Colorado according to county, as well as by land use. For example, the state of Colorado allows for land to be taxed according to agricultural productivity of the land, which lowers the tax liability on the land and may help the landowner retain the land for agricultural use. Furthermore, Colorado H.B. 1268 allows for land to qualify for an agricultural property tax classification if the land is covered by a permanent conservation easement on 80 acres. The land use

[15] At this writing, the transferable tax credit in Colorado appears to have settled at an equilibrium level of $0.80 on the dollar, per transaction, with an additional $0.05 tacked on for a broker fee. (Strugar, 2005).

classification can also make it more difficult to retain land for preservation. In Wisconsin, for example, idle lands are taxed at the fair market value, unless they are declared working agricultural or forest lands, which are assessed at a much lower tax rate. Clearly, Wisconsin's disparity in use-value taxes has the potential to discourage land preservation.

- Estate Tax: Conservation easements can reduce the total amount of the inheritance tax when the estate is bestowed upon the heirs. At this writing, following the Economic Growth and Tax Relief Reconciliation Act of 2001, the rate of the inheritance tax is scheduled to decrease each year until 2010, when the estate tax is scheduled to disappear for one year only, in 2011, after which point it is scheduled to return, to 2002 levels. A number of political pundits predict that legislation will be enacted to permanently eliminate the estate tax during the next several years (Parker and Thurman, 2004).

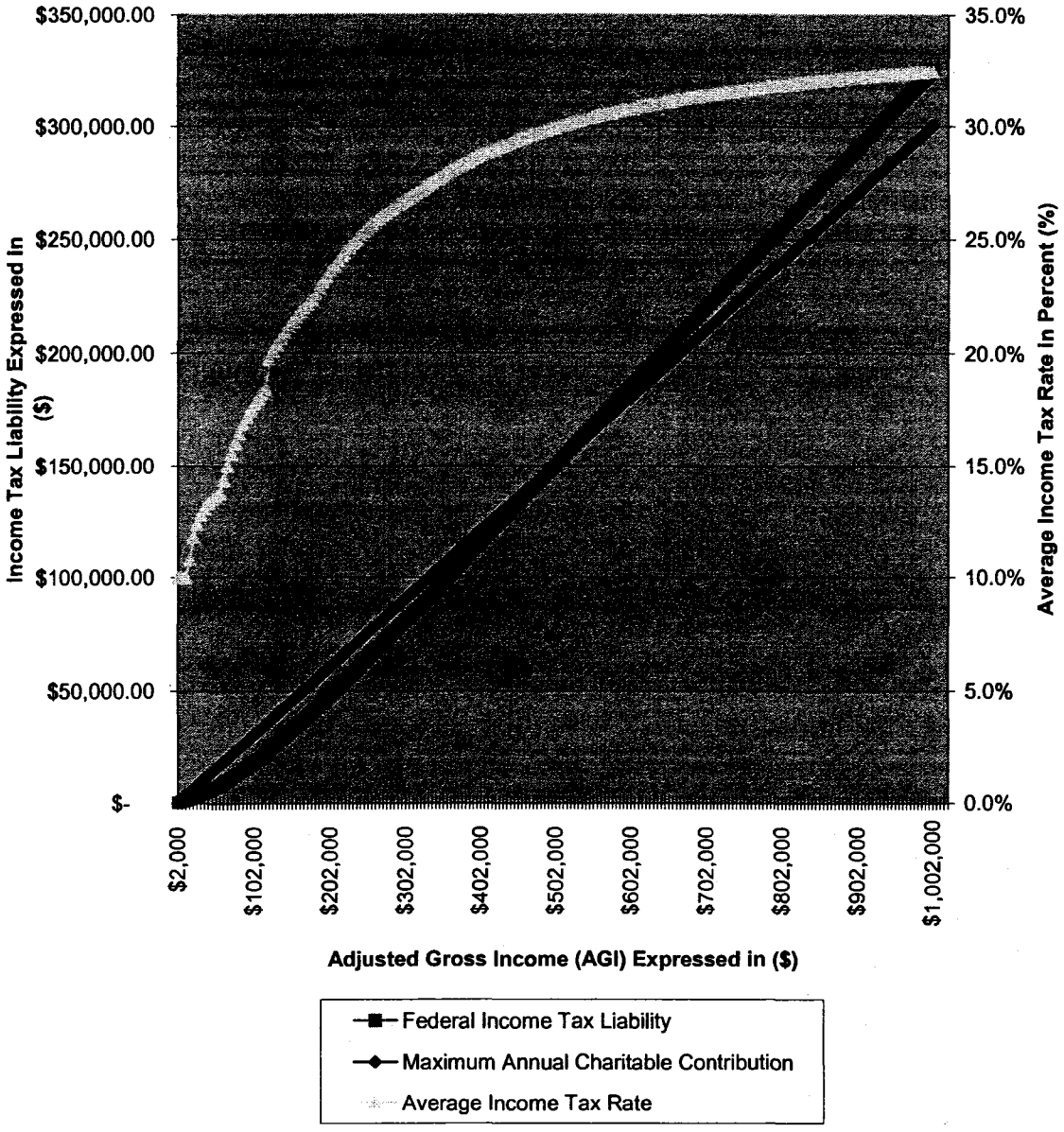
The four layers of taxation presented above show that calculating a tax payer's total financial incentive from a conservation easement can be a complex task. When considering the impact of conservation easements on property and estate taxes, it becomes obvious why professional legal and financial advice are paramount to a landowner who is considering enacting a conservation easement. While each landowner's specific tax benefit profile is complex, as individual benefits will vary depending upon the specific state, county, and estate, it is possible to describe the relative incentives provided by the different tax programs. By invoking the law of ceteris paribus

and holding the property and estate taxes constant, one can formulaically determine the landowner's approximate financial benefits, based upon federal and state tax liability. To do so, we can demonstrate the impact on the landowner's "entitled" benefits versus "realized" benefits on reimbursement of the loss in option value, and thus, the MPB curve. This next section presents an in-depth analysis of tax policies to show how many tax policies may favor the wealthy, which may impact the efficiency of land set aside for preservation.

The Impact of Federal Tax Policy on Landowner Private Benefits

The first policy component I consider is the impact of federal tax liability on various levels of income. Figure 4.6 illustrates income tax liability, average income tax rate, and maximum allowable annual charitable contribution as a function of adjusted gross income (AGI), based upon current federal tax policies. These values are based upon the "married filing jointly" schedule, which is presented in Table 4.1 in Appendix C.

Figure 4.6 Federal Income Taxes as a Function of Income



Several interesting points can be deduced from Figure 4.6. First, the average income tax rate is parabolic, with several relatively minor discontinuities. There is a significant gap between the maximum allowable charitable contribution and the federal income tax

liability until a substantially large income is reached. Ceteris paribus, regardless of the level of the conservation easement donation, when considering only federal income tax liability and the maximum annual charitable contribution allowable under federal tax law, an individual's tax liability will be less than the allowable charitable contribution until one's income reaches approximately $507,000. Unless carryover is permitted to future years, charitable contributions will be limited for all but the wealthiest of individuals. This figure is consistent with McLaughlin's finding that current federal tax laws may encourage more charitable contributions, and thus more conservation easements, from the wealthy. This finding is also consistent with the observation that a landowner may be enticed to fragment a large, valuable parcel into smaller parcels in order to maximize the benefits of the first parcel, and to spread the benefits of a charitable contribution over many more years by creating additional parcels.[16]

In the case of conservation easements, federal charitable contributions can be carried over for five additional years, resulting in a total of six years to utilize a conservation easement. Thus, the extent to which an individual can utilize a charitable contribution will greatly depend upon the amount of the charitable contribution, and whether they carry it over, which is illustrated in Figure 4.7.

[16] While financially beneficial to the landowner, this fragmentation results in several conservation easements on parcel that may have been a large, complete tract of land. Because these sub-divided parcels may be individually bought and sold, the possibility for a higher number of building envelopes increases, as does the possibility that multiple landowners may own the now sub-divided properties (thereby potentially increasing the likelihood of a violation.)

Figure 4.7 Percentage of Charitable Contibution as a Function of Income

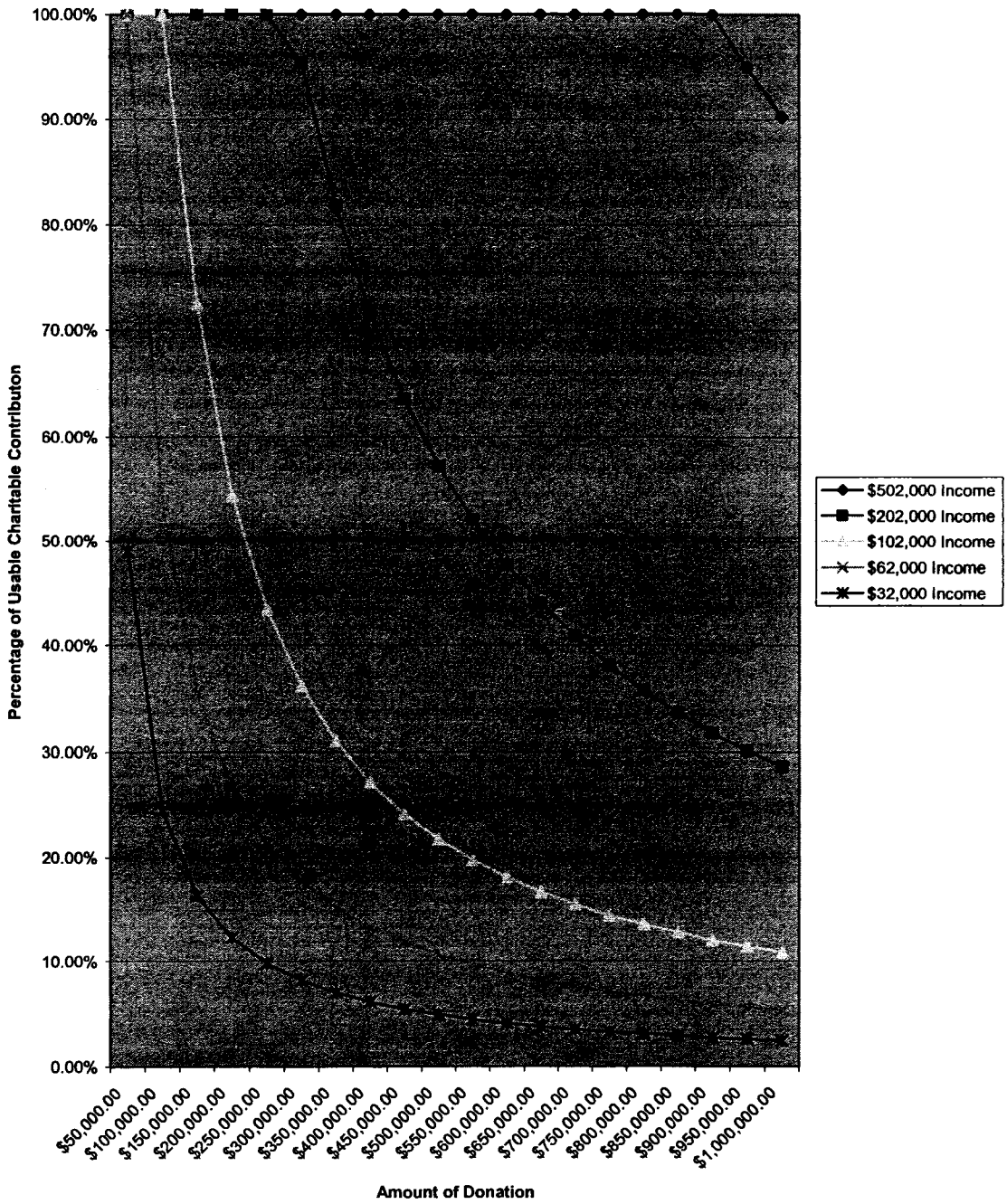


Figure 4.7 maps the percentage of charitable contribution (undiscounted and carried over for five additional years) that can be used as a function of income. As illustrated by a

series of five different income levels, *while federal income taxes may be progressive, conservation savings per dollar donated are regressive.* The average tax savings per dollar donated will be larger for people with higher incomes. For example, a tax payer with a $32,000 income level will only be able to use roughly 50% of a $50,000 charitable contribution, although the tax payers with incomes over 62,000 will be able to use this $50,000 contribution in full. A tax payer with a substantial income of $102,000 (who would not necessarily be considered wealthy), would maximize his per-dollar tax deduction with a charitable contribution just over $100,000—which is probably at the lower end of a conservation easement value. In contrast, a landowner with an income of $502,000 will fully utilize a charitable contribution that is valued up to just over $900,000.

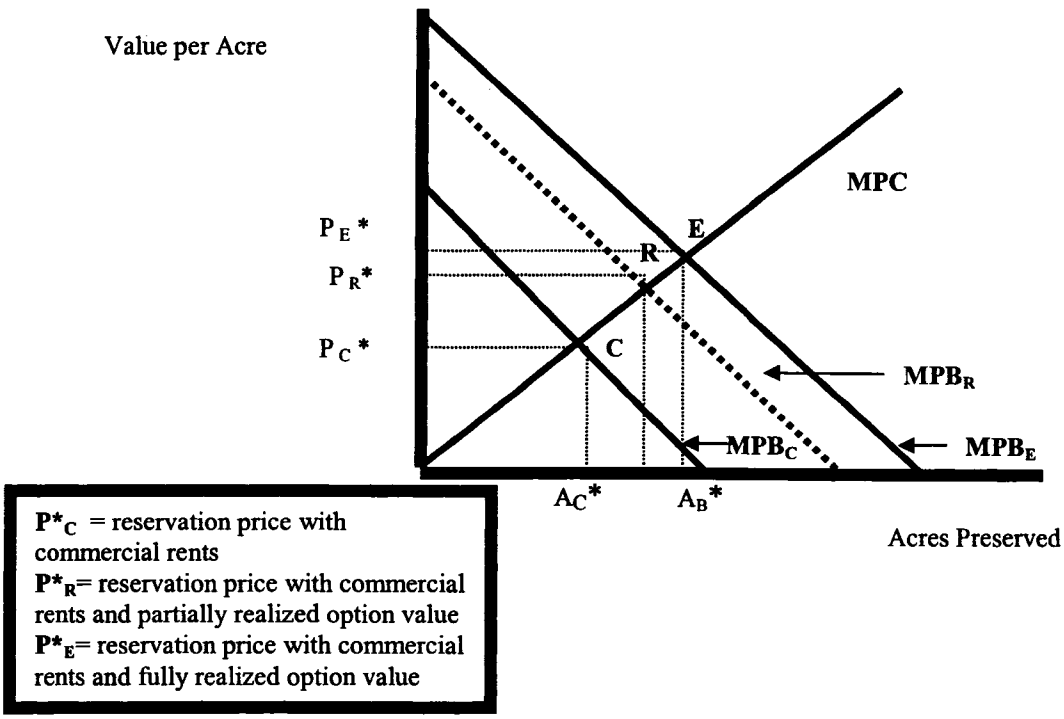
The result of these tax policies on the landowner realized private benefits are illustrated in Figure 4.8. Should the landowner's income not be large enough to capitalize on all of the tax benefits, this will cause a rift in the amount of the tax benefits that the landowner may "realize" compared to what they are entitled. In other words, landowners who make less than $507,000 per year are forced to forego some of these private benefits, and thus will operate on a realized MPB curve that is much lower than their actual MPB curve. As shown in Figure 4.8, this wedge in the private benefits curve occurs because the landowner is not fully compensated for their loss of option value. This results in a lower reservation price for converting land to development, and a market failure equal to the distance between Point R and Point E. However, for a wealthy landowner who is able to

capture all of the financial benefits, there is no gap in this MPB curve, and the realized MPB curve is equal to the entitled curve. (That is, MPB_R=MPB_E).

Figure 4.8

The Entitled Versus Realized Marginal Private Benefits from a Conservation Easement

Measured in Acres of Undeveloped Land



Where:

MPB_C = Commercial Rents Only

MPB_R = Realized MPB Curve
(Commercial Rents + Partially Compensated Option Value

MPB_E = Entitled MPB Curve
(Commercial Rents + Fully Compensated Option Values

Although some tax laws for conservation easement activity clearly favor the wealthy, a key question is whether, in practice, a disproportionate amount number of conservation easements take place with wealthy individuals. While a number of conservation practitioners anecdotally report that this is the case, statistics are difficult to observe due to taxpayer privacy laws. In light of this, a number of conservation practitioners in the qualitative research phase of this study also noted that a number of landowners who would NOT fully benefit from all of the financial incentives available still enact conservation easements on their land. This is likely the case when landowner PAR is large enough to compensate the landowner for the loss of development rights. That is, PAR must equal the difference between Point E and Point R, or a conservation easement will not take place. If the difference between Point E and Point R is fully closed by landowner PAR, then there is an efficient market; however, when there is not enough PAR to make up the difference between the entitled and realized financial compensation, there is market inefficiency.

In order to bridge the gap between the entitled and realized compensation for the loss of option value, one role of government may take is to institute tax policies that are progressive rather than regressive. One example of a more progressive tax policy for conservation easement benefits is the Colorado transferable tax credit, which is offered *in addition to* the federal, local, and estate tax benefits that a landowner may receive.

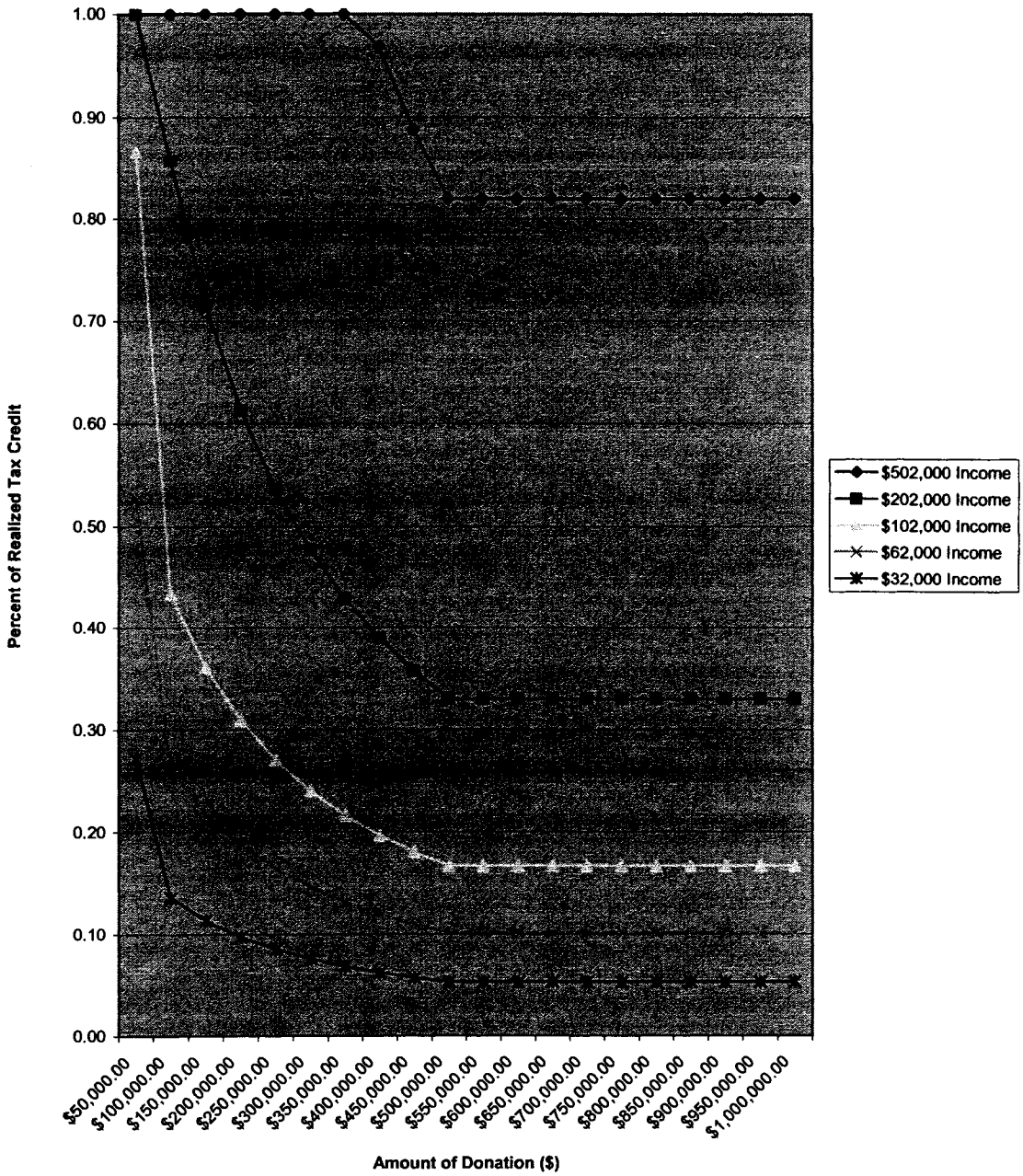
State Tax Incentives

There are eight states that currently provide tax incentives for conservation easements including Colorado and Virginia, which offer the option to transfer the state tax credit. The tax incentives in these eight states will therefore include the federal plus state incentives. Figure 4.9 presents the financial benefits that a Colorado tax payer may realize as a function of the amount of donation, without considering the aspect of transferability. These benefits are calculated by multiplying the Colorado state income tax rate (simplified to 4.65% for the purposes of this study) by the taxpayer's adjusted gross income to determine annual tax liability. This value is multiplied by 20, as state tax credits may be carried over for twenty years in the state of Colorado, and discounted at a private discount rate of .04, which is consistent with the discount rate value used in private investment decision making (Loomis, 2002).

For simplicity at the moment, if there were no federal taxes, a tax payer with a $32,000 annual income level will only be able to utilize 27% of a $50,000 donation, as is shown in Figure 4.7. In contrast, tax payers with annual incomes of $62,000 and $102,000 will be able to only utilize 53% and 87%, respectively. Tax payers with annual incomes of $202,000 and $502,000 will be able to use the entire credit. It is also interesting to note that wealthy landowners with annual incomes in excess of $502,000 are able to fully utilize a donation of $350,000 or less. Large contributions of $500,000 or greater do not yield more financial incentives to these tax payers, due to the restrictions on how the Colorado state tax credit is calculated. Currently, Colorado law provides tax credits on a dollar-per-dollar allocation for the first $100,000 of the property's appraised value. The

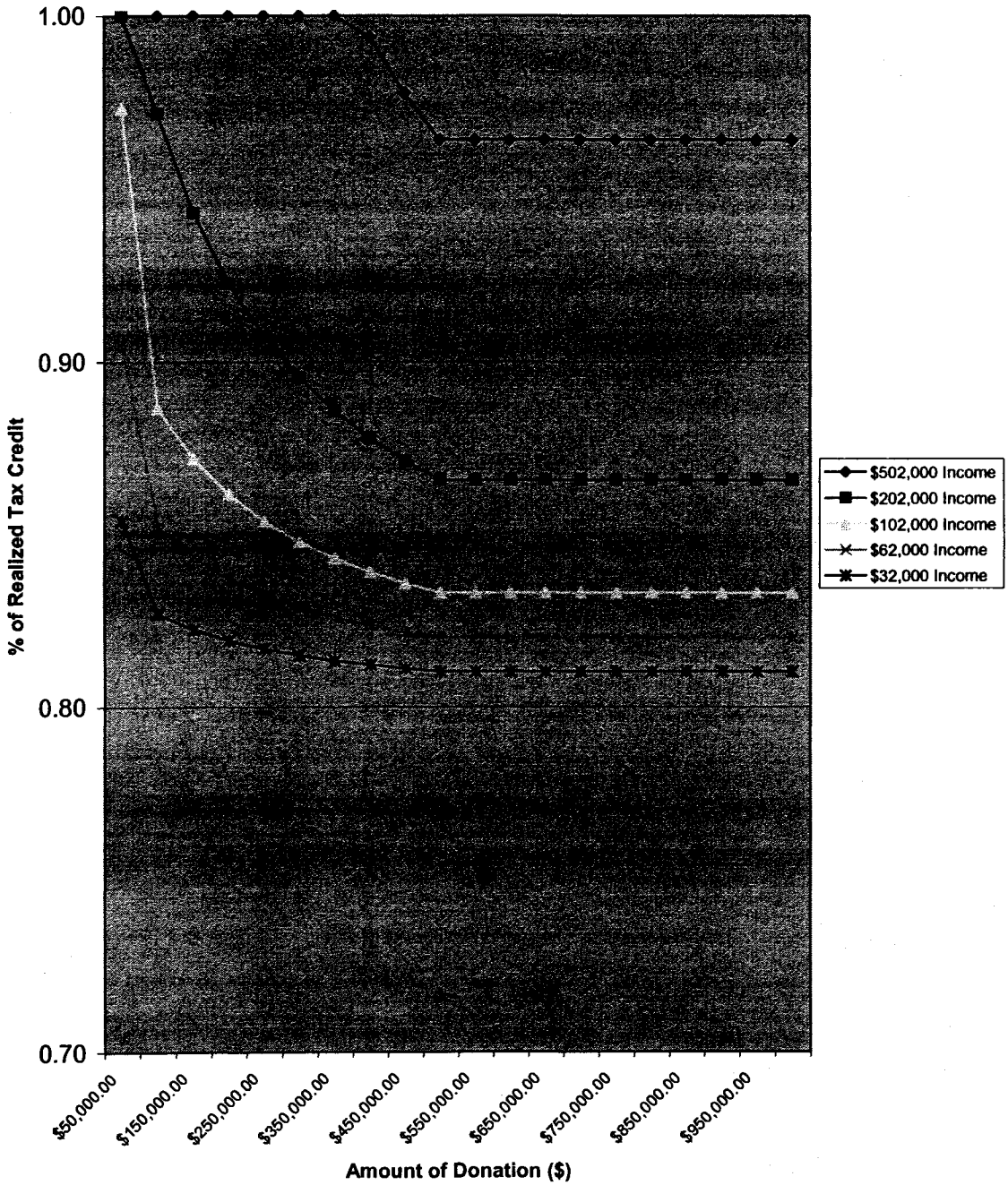
tax credits are then allocated on a $.40 per dollar basis, with a cap of $500,000, resulting in a $260,000 income tax credit ceiling per easement donation.

Figure 4.9 Colorado Income Tax Realized Credit as a Function of Donation Value



The results presented in Figure 4.9 are congruous with the federal tax incentives. The lower income tax payers do reap some additional benefits from state incentives, but the bulk of the benefits are captured by the wealthy. However, there is one more state policy to consider and it is biased in the opposite direction. The gap between the wealthy and the poor narrows dramatically, and the tax becomes progressive when the unused tax credits can be transferred to another party. As illustrated in Figure 4.10, the lowest income tax payer in this example is able to now realize 84% to 81% of the tax benefits offered, if the donation is $50,000 or $1,000,000, respectively, compared to 27% and 14% before the transferability policy was made available. While the tax payer with the highest income in this example is able to use 96%-100% of the state tax incentives, the asymmetry in the incentives available to high and low income tax payers is much less pronounced than when transferability was not an option.

Figure 4.10 Impact of Colorado Transferable Tax Credit

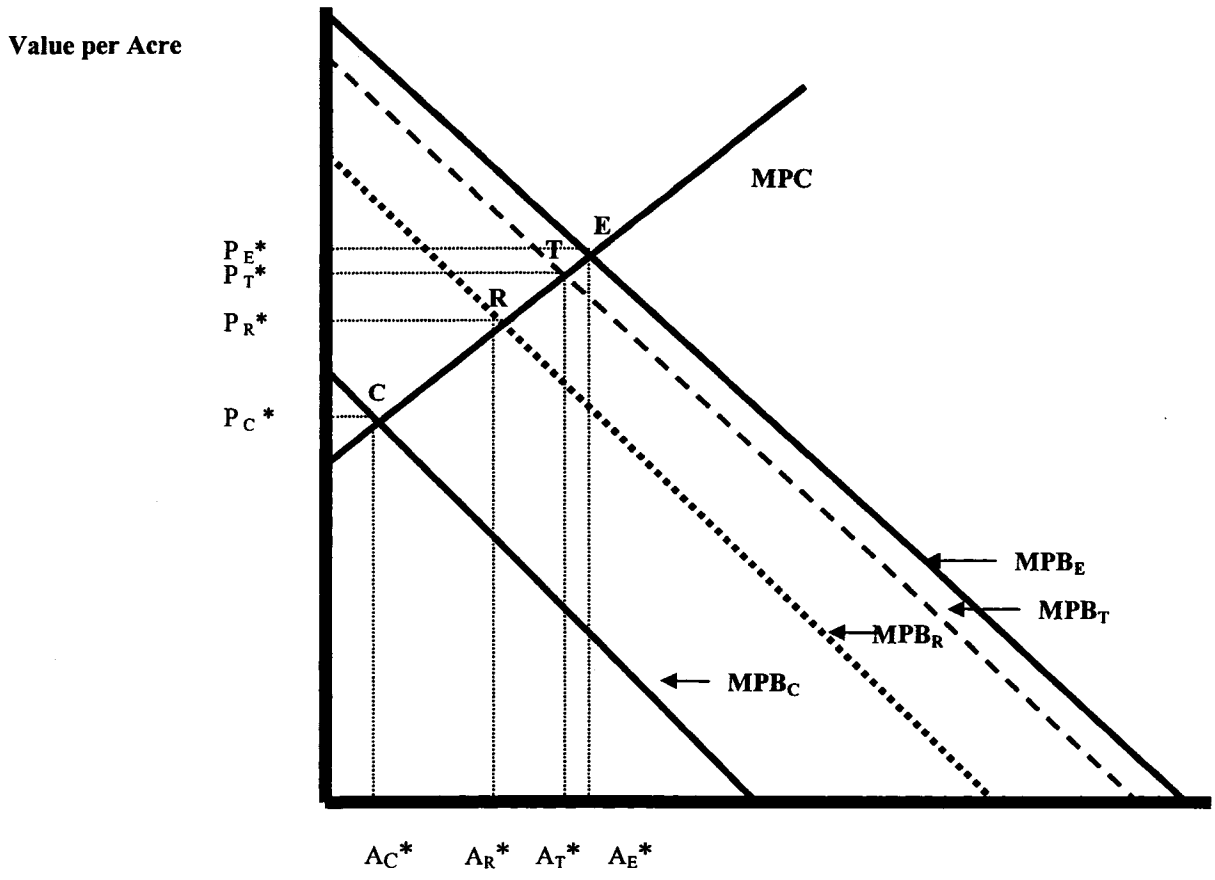


This observation can be used to formulate a hypothesis that the Colorado transferable tax credit may serve as a mechanism to increase conservation easement activity with low to mid income tax payers. Although taxpayer privacy laws make data somewhat difficult to attain, the theoretical impact on the landowner rents is clear. Figure 4.11 illustrates the potential impact of Colorado's transferable tax credit. In this case, the landowner is entitled to financial compensation equal to the distance of C and E; this is V^E as defined in Equation 4.4, equal to the loss of the development option. Based upon the combined federal and state tax incentives that are calculated according to his income, the landowner will only realize benefits from Point C to Point R. This yields a lower land conversion reservation price, and unless the distance between Point E (the amount of financial benefit to which the landowner is entitled) and Point R can be closed by landowner PAR, there will be a sub-optimal amount of undeveloped land. However, when the transferability of the Colorado state income tax credit is considered, the landowner private benefits (in other words, the compensation for loss of development rights) are increased to Point T. Thus, the market distortion is much less, and it only reflects the distance between Point T and Point E, which is a fraction of the market distortion created between Point R and Point E. It is very likely that the landowner's PAR would be able to bridge the gap between the Point R and Point E, and there would be an efficient market.[17]

[17] Based upon the results of the qualitative research component of the study, it is also very likely that the land trust would EXPECT that the landowner would be willing to expect this PAR, which is a function of landowner self-sacrifice.

Figure 4.11
The Entitled Versus Realized Marginal Private Benefits from a Conservation Easement

Measured in Acres of Undeveloped Land



P*$_C$ = reservation price with commercial rents
P*$_R$= reservation price with commercial rents and partially realized option value
P*$_T$= reservation price when used tax credits can be transferred to a third party
P*$_E$= reservation price with commercial rents and fully realized option value

Where:

MPB_C = Commercial Rents Only
MPB_R = Realized MPB Curve (Commercial Rents + Partially Compensated Option Value
MPB_T= True MPB Curve when unused tax credits can be transferred to a third party
MPB_E = Entitled MPB Curve (Commercial Rents + Fully Compensated Option Values

It is easy to understand why, when the Colorado transferable tax credit policy was introduced in 2000, it was heralded as a victory for land preservation supporters. As the first state to allow for the transferability of the tax credits, the motivation of the policy was to encourage "land rich, cash poor" landowners (often ranchers who have a large amount of wealth tied up in their land assets) to designate their land for preservation, rather than sell the land for residential development—a premise which can be supported by Figure 4.11. As shown in this deterministic model, transferability reduces the tax benefit advantage for the higher incomes and thus increases the incentive for lower income donors at the margin. Transferability also increases the total size of donations at any income because a greater share of the donation can be returned through tax savings.

Political Considerations Related to Transferable Credits

At first blush, the preliminary data show that the transferable state tax credit strategy may be working; the fastest growing region in the nation for conservation easement activity is the U.S. West, which includes Colorado. However, the financial impact from this policy upon the Colorado state budget (and the change in social welfare) from this recently implemented policy is still unknown. At the time that the policy was implemented, Colorado was experiencing a state budget surplus. During the maiden years, the foregone state revenue to support this program (which enjoyed strong bi-partisan support) was not as critical as the 2002, 2003, and 2004 fiscal years, when Colorado plunged into recession in early 2001 and state income tax revenues significantly declined. The state's

restricted economic growth that resulted from the TABOR amendment,[18] coupled with questionable conservation easement appraisals in the state, has more recently made the foregone revenues an object of affection. With the foregone revenues at the forefront in the minds of policy makers and tax payers alike, it is important to reflect upon the opportunity cost of the transferable tax credit policy.

The critical question appears to be whether, by encouraging more conservation easement transactions with this population, the state is better able to attain its policy goals. As articulated by Jay (2005), "If the tax credit incentive causes Colorado taxpayers to conserve Colorado properties that they would not otherwise have conserved and, at the same time, provides a new source of income for such taxpayers, the tax credit is accomplishing exactly what its sponsors intended. It brings Colorado taxpayers—and more important, additional Colorado properties—to the conservation arena."

Although Jay's point reinforces the principle that the transferable tax credit can make the market more efficient by yielding more acres of conserved land, it is also important to recognize the social benefits ratio, and the case presented by Figure 4.3 (c). Recall that

[18] TABOR is an acronym for the Colorado "Tax Payer Bill of Rights". Under this 1992 amendment, Colorado surplus state tax revenue must be returned to the state tax payers, tax payers must approve all tax rate increases, and growth in property tax rates is limited. According to a State of Colorado research report (2003), "When revenues fall, the following year's limit on collections is still based on the allowed collections of the previous year. The result is that in years following a recession, allowed revenues will grow only from the worst revenue collection year of the recession to the extent allowed by rate of population growth and inflation. Although citizens may vote to allow the state to keep the excess, TABOR limits the times when such votes may occur." Therefore, in light of the reduced rate of growth in Colorado in 2000 and 2001, revenues from the subsequent tax years have been in high demand to fund other programs.

In November, 2005 Colorado tax payers voted for a temporary relief to TABOR, which will temporarily increase the amount of funds to the state coffers, although the foregone tax revenues that are being used to fund conservation easement programs are still in being eyed for other programs.

Figure 4.3 (c) presented an example where the landowner reservation price is exactly equal to the social value garnered from the land because 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, this landowner possesses a high social benefits ratio. While this is an efficient market, several alternative scenarios may also be possible. In this situation the landowner may not consider converting the land for development at all, and thus does not need the tax incentives. It is also conceivable that the land should actually be converted to development (and the financial benefits be spent elsewhere preserving other potentially threatened areas) because the land provides little other social benefit other than to the landowner. In the case of the latter, a high "social benefits ratio" may even reflect fraudulent or abusive preservation practices, such as enacting a conservation easement on a golf course.

In summary, while it is clear that the transferable state tax credit actually facilitates conservation easements—and financial spending—on land that would otherwise NOT be developed, it is still important to recognize that Colorado may be "conserving land" that may not otherwise be considered in immediate threat of development—or worthy of a conservation easement. While the tax credit facilitates a more efficient amount of undeveloped land, further analysis should be undertaken to determine whether this greater amount of undeveloped land is deemed worthy of conservation. Hence, the ultimate impact of the transferable tax credit on policy goals requires further investigation.

Uncertainty Associated with Income and Wealth and the Effect on Private Benefits Curve

Although the actual impact of the Colorado transferable state income tax credit on conservation properties remains unclear, I make the case in the next section that without this type of progressive tax policy available nationwide, a large percentage of landowners would not be able to engage in conservation practices. This is because policies such as the Colorado transferable state income tax credit effectively reduce the amount of uncertainty associated with income and wealth, because the landowner is able to receive more (if not all) compensation for the loss of development rights when he enacts a conservation easement on his property. As a result, the uncertainty to landowner wealth and income can affect the landowner PAR, and subsequently the landowner social benefits ratio, and market efficiency. This will be later illustrated in Figures 4.12 (a) and (b).

It is also noteworthy to point out that this concept reflects seminal writings by Fisher (1927) and Frisch (1926, 1932), that indicate that there are differences in marginal utility of one dollar, which can be affected by level of income. Using this logic, the realized marginal benefits curve of a landowner may vary, depending upon the landowner's income. If the marginal utility of income assumption holds true for conservation easement donors, then low to middle income conservation easement donors (with incomes up to approximately $102,000 per year) may receive even more benefit to their realized marginal private benefits curve from policies such as the transferable tax credit than landowners with greater income.

This premise is consistent with several studies. According to Marshall, Hoag, and Seidl (2001), the top reason listed by landowners for NOT placing a conservation easement on a family ranch was financial—including insufficient funds available to facilitate the $11,300 in average transactions costs, and limited benefit from income and estate tax breaks. Thus, a more progressive tax policy may allow for increased realization of private benefits.

The transferability of the Colorado tax credit may also provide the necessary infusion of cash that may be needed to keep a family ranch solvent, a problem that many small, family-owned businesses face, resulting from their financial strategy. As empirically shown by Barry, Bierlein, and Sotomayor (2000), in terms of financial management, farmers and ranchers generally manage their land in a manner consistent with Myers (1984) and Myers and Majluf's (1984) pecking order theory. That is, for a number of operational reasons specific to farming and ranching (such as high capital intensity), these small business owners tend to exhaust internal funds before seeking external debt, which often leaves the landowner with a constrained cash flow.[19]

When cash flows increase, money is applied to paying down long term debt or added to reserves in order to refrain from borrowing, rather than applied as an investment that has the potential to increase future earnings potential. In contrast, during times of low cash flows these landowners turn to increased borrowing and lower investments. Reluctant to

[19] Pecking order theory contrasts with the partial adjustment theory of finance, in which investment opportunities drive the business and investment decisions, which includes internal financing and cash flows, as well as debt structuring. Under the partial adjustment theory, businesses frequently substitute debt with capital leasing.

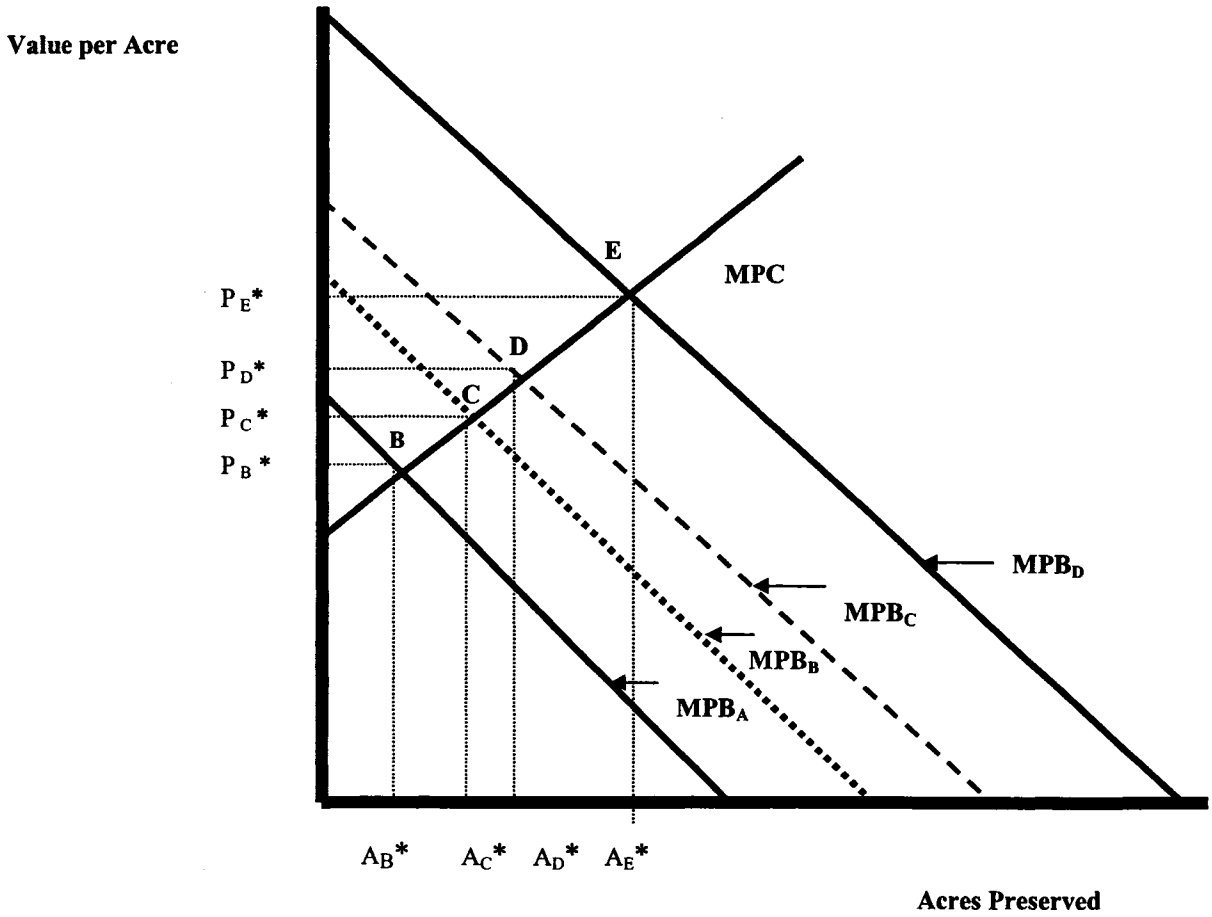
seek external debt to finance operations during times of high cash flow and often unable to secure financing during times of weak cash flows, farmer and ranchers (particularly those under the age of 40 according to Barry et al.) often find themselves in a cash constrained situation for operational expenses.

Based on this well-established theory, farming and ranching business strategies that are grounded in the pecking order theory may also have an interesting interaction between a landowner's operational cash flow (commercial benefits) and level of PAR, because the landowner's PAR may be closely tied to the level of liquidity of the farm or ranch. For example, under circumstances when farms have a low liquidity ratio or a high current ratio, PAR may actually decrease because it is superseded by the need for operational cash. Thus, the realized tax benefits may be reduced in times of low cash flow, but increase in times of greater cash flow, which means that the landowner social benefits ration increases and decreases, respectively. This is illustrated in Figures 4.12 (a) and (b). In Figure 4.12 (a), the commercial rents are lower than in Figure 4.12 (b) to reflect the times of lower cash flow. Consistent with pecking order theory, the PAR is also less than in Figure 4.12 (b), which generates a market failure equal to the distance between Point D and Point E, and a lower level PAR as a percentage of the land's social benefits.

Figure 4.12 (a)

Pecking Order Theory and the Entitled Versus Realized Marginal Private Benefits from a Conservation Easement

Measured in Acres of Undeveloped Land



P^*_B = reservation price with commercial rents
P^*_C= reservation price with commercial rents and partially realized option value
P^*_D= reservation price with commercial rents, partially realized option value and PAR
P^*_E = reservation price with Fully realized benefits

Where:

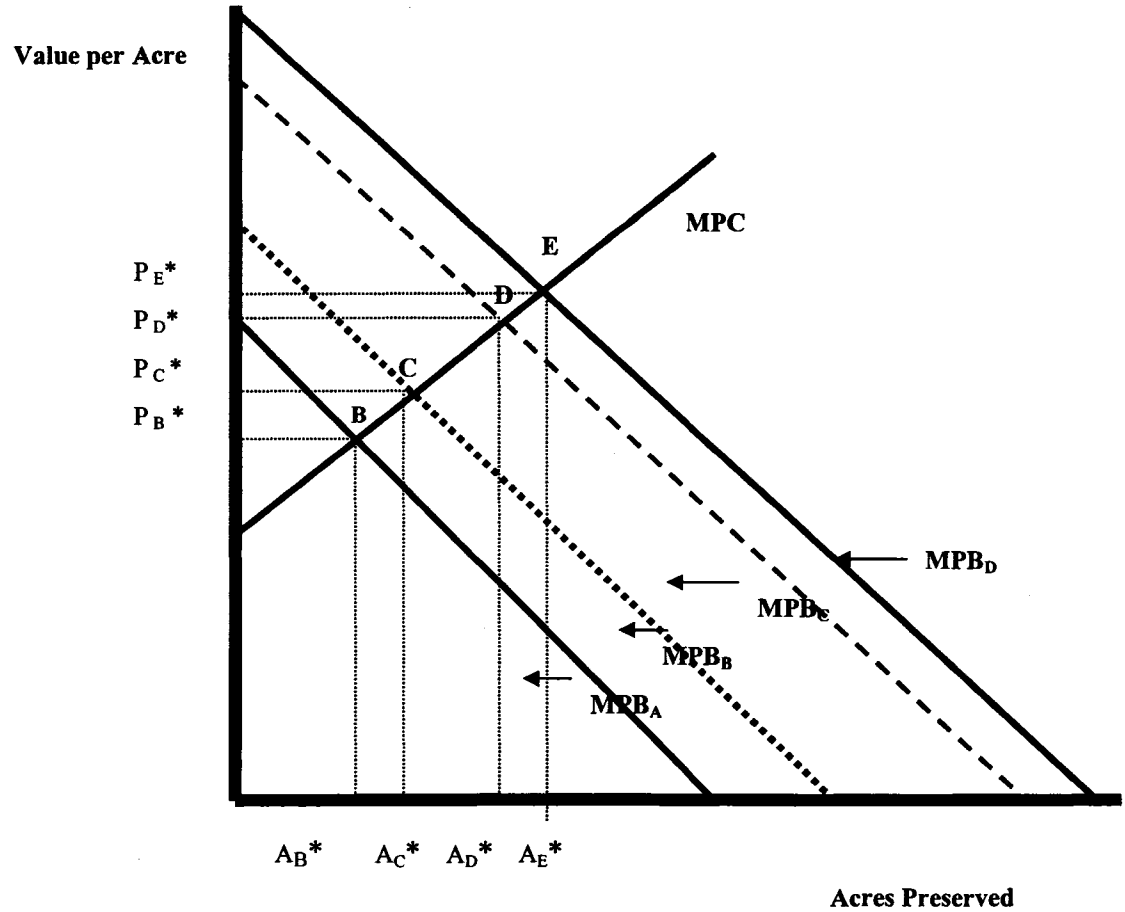
MPB_B = Commercial Rents Only
MPB_C= Commercial Rents + Partially Compensated Option Value
MPB_D = Commercial Rents + Partially Compensated Option Value + PAR
MPB_E = "Entitled" MPB curve

In contrast, although the amount of landowner compensation for the option value has remained the same, in Figure 4.12 (b), the landowner's commercial rent is higher, which yields greater PAR according to pecking order theory, and it yields a higher landowner social benefits ratio. Thus, the difference in market failure, the distance between Point D and Point E, has been greatly reduced compared to Figure 4.12 (a), and the landowner has a higher reservation price for converting his land for development. According to pecking order theory, the greater the cash flow into the business, the higher the landowner PAR, and the more optimal amount of land that will remain undeveloped. Thus, because the marginal utility of a dollar may be greater for landowners with less income, it becomes even more important to implement policies that allow the landowners to realize all of the financial benefits stemming from the loss of development rights. When assessing policy impacts, one must also consider that PAR may fluctuate during times of higher and lower economic prosperity. In summary, the transferable tax credit policy presents the possibility of facilitating a greater number of conservation easements because it presents results that increase the marginal utility of income and may decrease the uncertainty associated with fluctuations in income and wealth.

Figure 4.12 (b)

Pecking Order Theory and the Entitled Versus Realized Marginal Private Benefits from a Conservation Easement

Measured in Acres of Undeveloped Land



P^*_B = reservation price with commercial rents
P^*_C= reservation price with commercial rents and partially realized option value
P^*_D= reservation price with commercial rents, partially realized option value and PAR
P^*_E = reservation price with Fully realized benefits

Where:

MPB_B = Commercial Rents Only
MPB_C= Commercial Rents + Partially Compensated Option Value
MPB_D = Commercial Rents + Partially Compensated Option Value + PAR
MPB_E = "Entitled" MPB curve

Chapter Summary

The objective of this chapter was to deliver a model of the emerging market for private land preservation and conservation easements. This model was developed, in part, from the qualitative research phase of the mixed methods study—an approach that presents a unique contribution to the economics literature, as most economists use qualitative research only to fine-tune survey language. In developing the model of the conservation easement market, I have taken the classic environmental economics model of externalities, and I have disentangled the private benefits curve to isolate a source of the market failure for the market for private land preservation. This approach adds value to the literature because it expands upon what is a generally accepted principle of the environmental economics literature—the private benefits curve—and advocates taking a closer examination at the components that can impact market efficiency. Included in these benefits is landowner private amenity rent (PAR), which has the potential to improve market efficiency, but may also interfere with public policy goals if it is used to prioritize benefits to the landowner over the benefits to society

After identifying the offending market failures, I offer policy recommendations where the government may intervene in order to improve the efficiency of the market for conservation easements and private land preservation. These recommendations will also ensure that the market continues to evolve from an emerging one to a market that is mature and presents complete and consistent price information:

- Facilitate policies that provide full compensation of the loss of development rights, which represents the value of the conservation easement (V^E). Policies that are progressive, such as the Colorado transferable tax credit, have the potential to better enable the landowner to realize all of her entitled financial compensation and thus produce a more efficient market.[20] These programs also reduce the uncertainty that is associated with fluctuations in income and wealth that is experienced by many working farmers and ranchers.
- Fund programs, such as state-wide data bases, that will provide more complete information about the value of certain development rights, or attributes associated with certain development rights, so that appraisers have more complete information on which to base appraisals. This type of information service will needed until the market for conservation easement land is no longer thin, and becomes more developed.
- Design landowner and land trust matching programs to pair landowners with land trusts that prioritize similar conservation attributes. This decreases the information asymmetry that exists between landowners and the land trust community.
- Develop investigative and analytical tools that will assist land trusts in better understanding of landowner PARs to determine landowner reservation prices, in order to reduce information asymmetry.

[20] At the time of this writing, legislation has just been enacted into law that amends the manner by which compensation to Colorado landowners for a conservation easement is calculated, and also increases the amount of potential compensation to the landowner from $260,000 to $375,000. At this time there is also federal legislation that is being weighed by Congress to increase the number of years for which a conservation charitable donation can be extended. The federal legislation would also exempt working ranches from yearly limits for using the charitable donation. Both these Colorado and the federal tax policies are considered to be progressive.

- Amend current policies, especially IRS codes, to consider social values when appraising and compensating landowners for their land. These social values reflect the "sense of place" that land trusts are trying to preserve within communities. Without compensating landowners for providing "a sense of place", a sub-optimal amount of undeveloped land will be preserved and the community's sense of place may be lost.

In conclusion, it is my recommendation that the government intervene in the market to reduce the thinness of the market by increasing the number of transactions or buyers and sellers (reflective of Coase's recommendations), and to lessen information asymmetry, incomplete information, and policy failures. This government intervention will make the market for private land preservation more complete. Although the market shows signs of evolving and providing more consistent price signals, based upon the rate at which land is being converted to development, there is a sense of urgency for a more complete market. Otherwise, our sense of place may be forever lost. Thus, although the market may "self-correct" in a manner consistent with the writings of Milton Friedman, this self correction will require a substantial increase in the number of private land conservation transactions. The opportunity cost is also significant. Acres of conservation-worthy lands will be irreparably converted to development, and the sense of place within our communities will be unable to be reclaimed. Therefore, government intervention is imperative in order for the market for land preservation to evolve into an efficient and complete market in a timely manner.

Chapter Five: Summary and Conclusions on the Emerging Conservation Easement Market

What's in a name? that which we call a rose

By any other name would smell as sweet

William Shakespeare

This dissertation sought to specify the good around which the supply and demand sides of the market for private land preservation have formed, . The ultimate goal was to make policy recommendations for improving market efficiency. Along the way I analyzed the factors that have contributed to the inefficient operation of the market, in order to determine how it may grow into a mature market that is capable of yielding consistent price information. What I learned presents a large economic picture of the market for private land preservation and the land preserved through the use of conservation easements.

I discovered that the market good that land trusts seek to protect extends beyond merely attributes or IRS designated conservation values. Land trusts seek to preserve a sense of place. Although trusts may not always refer to it by this exact name, "a sense of place" refers to the psychological or even spiritual connection that humans have with the land,

and it is the character of that land that helps define the community. It is a social welfare function that is based upon a number of different variables that were identified during the qualitative phase of the research study, and by implementing a qualitative research phase, I was able to identify the aspects of the market to which both land trusts and landowners attach value.

What constitutes a sense of place varies greatly from community to community, from "the ring of green" undeveloped land that surrounds Boulder, Colorado to the quaint New England dairy complete with the red barn. Regardless of whether trusts have a strategic plan in place for securing their "a sense of place", it is clear from the ethnographic techniques used in the qualitative research phase of the study that there is a social welfare function that land trusts seek to optimize. A sense of place is made up of variables that include, but are not limited to, conservation attributes. This finding was quite different than my initial research approach, which was based upon the currently available economic research on the field of conservation easements, where my intentions were to simply gather language to implement a stated choice survey in order to determine the values that land trusts place on these attributes. I now recognize that because sense of place is multidimensional and individualized, that my future survey instruments must elicit how attributes contribute to sense of place.

Although I showed in Chapter Three that the specification a sense of place was different than merely a bundle of attributes, the question of whether my social welfare function is an appropriate model is an empirical one, which will be explored in a later phase of this

research project. In the next phase of the study I will explore how the variables that land trusts optimize are affected by landowner imposed constraints, which will help me determine the proper functional form of the social welfare function and the potential interaction between variables. I will also discover how attribute matching between land trusts and landowners impact market efficiency. Thus, future research extensions will determine the relationship between the "sense of place" that trusts are trying to preserve and the attributes and conservation values to which trusts preserve through current policies and practices. In other words, I will seek empirical data to verify that "a sense of place" is more than just differences in the weights that various land trusts place on certain attributes.

This chapter also returns to answer several of the questions posed in the beginning of this dissertation:

1) Will the market always remain incomplete, and if not, when will this immature market develop into a mature and efficient market?
2) Under what conditions will the emerging market be able to shed its adolescence and transition into a mature market that operates efficiently?
3) What is the role of government for transitioning the incomplete market into an emerging market?

To address the questions of market incompleteness and market adolescence, Chapters One and Two established that the market for conservation easements is an incomplete

(yet emerging) market due to thin supply and demand side dynamics, incomplete (and at times asymmetric) information, and uncertainty. As discussed throughout this dissertation, these three sources of market failure can be difficult to define, let alone address with policy tools. For example, it is clear from the qualitative literature that there are often few transactions on which to base property appraisals, leading me to believe that the market is thin; however, it is unclear how many more transactions or market participants (i.e. buyers and sellers) are necessary to ensure that this thinness is overcome. Therefore, while acknowledging that these improvements will certainly assist in the appraisal process, it may be difficult to determine when we have reached the point where the market is no longer considered to be "thin." Furthermore, it is important to note that the cairn that informs us that we have achieved market efficiency can be difficult to visualize. To recount the words of Sidaway and Pryke (1997, p.3), "Intuitively we knew that 'emerging' implied 'developing' or 'underdeveloped' but we could not ascertain what the cutting off point for 'emerged' versus 'emerging' would be."

This brings us to the third question of whether the market is able to yield consistent price information, or whether government intervention is necessary to shuffle this debutante market into the throes of an adult-like market society. Although most economists would love to boast of having a crystal ball as a tool in the figurative economist toolbox, the reality is that without the crystal ball, no one knows for certain what the outcome from government intervention really will be. However, when comparing the conservation easement market to other incomplete markets, the market for conservation easements shows signs that it is advancing through several development stages and that it would

As discussed in Chapter Two, the land preservation movement has clearly been gaining momentum during the past decade, and as transactions become more common place, there will be more complete and consistent price signals for conservation easement properties and conservation attributes. In this respect, Milton Friedman is absolutely correct in that there is no need for government intervention.

However, when weighing in on the necessity for government intervention to expedite market maturity, it is also important to recognize another classic economic principle: opportunity cost. Thus, when we rebuff government intervention to facilitate a more efficient market, we must ask ourselves "What is the opportunity cost of letting the market work itself out?" As pointed out early on in this dissertation, the conversion of undeveloped land to developed land has occurred at an alarming rate, and these conversions rarely return land to an undeveloped state. Likewise, when working agricultural lands are converted to another use, rarely do these land return to agriculture. Thus, the real question is whether policy makers are willing to make the trade-off between government intervention and market sovereignty in order to preserve a sense of place before it becomes too late. In addition, government intervention is often warranted when information is difficult to find or asymmetric between buyers and sellers. It remains to be seen whether the conservation easement market will provide free flowing and high quality information on its own.

The works of Rosa et al. (1999) promulgate a socio-cognitive component to markets, and that markets are created to satisfy psychological desires and needs. As reflected in the

increased conservation activity throughout the past decade and in the ethnographically-based qualitative research study of the private land conservation movement, land preservation is on the forefront of many community agendas and it is a very important tool that can fulful the psychological desire to preserve a sense of place. From an economics perspective, as discussed in Chapter Two, the private land conservation movement has formed to overcome the positive externality market failure, which is the result of public benefits that arise on private lands.

One of my important contributions to the literature is the disentanglement of the private benefits curves to localize the source of the incomplete market. As I showed in Chapter Four, there may be several contributing sources:

- The landowner may not receive full compensation for the loss of the development option due to the impact of the thin market on the appraisal process.
- The landowner may not be paired with a land trust that has the same prioritization of the conservation attributes due to incomplete or asymmetric information.
- The landowner may experience uncertainty in income and wealth, due to the interaction of tax policies and cash flow.
- Policy failure prevents the landowner from receiving full compensation for the social benefits provided by her land.

Although I have made a compelling case that landowner private amenity rent (or PAR) can bridge the market failure by providing insight about the landowner reservation price, information about PAR may be difficult to attain. Hence, better analytical tools are

needed to provide insight into landowner PAR and to provide better matches between landowners and land trusts.

There is a psychological desire in the U.S. to see the market for private land preservation evolve into a complete market, and the time is ripe for more economic research into conservation easement practices and the land trust community. A further understanding of how to incorporate non-market values into appraisals is necessary if the market is to become wholly efficient. Likewise, more research into the impact of tax policies such as the Colorado transferable tax credit is also a timely topic. Furthermore, more insights into the dynamics of the landowner/supply side of the market, as well as tools (such as indices) that can assist in matching landowners with the appropriate land trust, would provide benefit to the conservation community, as well as the academic literature.

In summary, through my investigation into the market for private land preservation, I have determined that the market for conservation easements is in its adolescence. The market is showing an increased amount of activity and it is beginning to show signs of presenting price information, but that information is inconsistent and there are many sources that contribute to the market incompleteness. Due to irreparability of land conversion from an undeveloped to a developed state, it is my conclusion that increased government intervention is necessary to improve the efficiency of the market. I have made the case throughout this dissertation that the government can increase the market efficiency by improving available information about appraisals and the weights that are placed upon conservation attributes (by both land trusts and landowners); providing a

progressive tax policy to fully compensate landowners for the loss of their development rights; compensating landowners for the social values that their private land provides to society; and by making it easier to facilitate conservation transactions—a process that is resounding of Coase's position, presented early on in the dissertation. Ultimately, the recommendation for government intervention hinges upon the need to preserve a sense of place before it is lost—for once a sense of place has been lost, it will never again be regained.

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APPENDICES

Appendix A
Vignettes and Group Interview Questions

A-1: Content Analysis of 44 Trust Mission Statements
Used for pilot group interviews and as a basis for vignettes and study interviews.

A-2: Instructions for Study Group Interviews
A-3: Executive Directors and Miscellaneous Preservation Professionals
A-4: Attorneys
A-5: Appraisers
A-6: Landowners

Appendix A-1 Content Analysis of Colorado Land Trust Mission Statements

Number of Colorado Conservation Groups/Land Trusts: 44
http://www.coloradoconservationtrust.org/resources/ccgroups.php#mountainarealandtrust

Specific to a sub-region within CO 23

Agricultural/Ranching
"productive farmland" 1
"promote farming practices" 1
"help Colorado farmers and ranchers" 1
"agricultural lands" 9
"continuing agricultural production" 1
"ranching tradition or heritage"4
"ranch lands" or "ranching"3
"family lands"1
"agriculture" 6
"farmlands" 1

Actions
"stop the loss" 1
"preserve", "preservation", "preserving" 21
"protect" 19
"conserve" or "conservation" 10
"acquires" or "acquisition"4
"assists 3
"ensure and enhance" 3
"fulfill annual lifecycle needs"1
"enhancing" or "enhancement"3
"restoring" 3
"managing important aspects" 1
"dedicated" 2
"create a legacy" 1
"advance"1
"maintain integrity of our natural environment"2
"secure"1
"support"3
"promoting"3
"facilitate"2
"recognizes"1
"utilize the strategy"1

"promote excellence"1
"promote entrepreneurship of developing innovative conservation practices"1
"creates partnerships"1
"improve quality of life"1
"assure"1
"transfers"1

Political

Facilitating voluntary agreements

"voluntary conservation"3
"voluntary stewardship"1
"willing land owners"3
"non-adversarial"1
"win-win efforts"1
"non-political"1

"help land owners"1
"provide access to public land"2
"private landowners or lands"3
"federally designated"1
"provide a local resource or partner"1
"public agencies"2
"public ownership"1

Environmental Values

"natural resources"4
"healthy environment" 1
"national heritage" 1
"natural heritage" 2
"rural quality of life" 2
"diminishing natural resources"1
"outdoor heritage"1
"natural" 3
"enjoyment" 2
"conservation benefits"1
"mountain character" 1
"most beautiful" 2
"fragile" 3
"undeveloped land" 3
"North American water fowl"1
"special concern"1
"important"2
"ecological"2
"environmentally sustainable"1
"priorities"1

"significant"2
"permanent"2
"diverse"2
"economic vitality"1
"cultural vitality"1
"life"11
"elk and other wildlife"1
"stewardship"1
"special needs"1
"spectacular"1
"enhance the quality of life"1
"immense and immediate need"1
"strong"1

"open space" or "open lands" 23
"scenic" ,"scenery", "scenic beauty or views" 9
"view corridors"2
"historic" 7
"land" (general) 4
"habitat" or "natural habitat" 11
"recreation" or "recreational" 5
"grasslands" 1
"wetlands"4
"forest lands" 1
"wildlife habitat" 8
"critical wildlife habitat" 1
"river corridors" 1
"ecosystems" 1
"unique" or "unique character" 2
"valleys" 1
"wildlife"2
"environmentally sensitive"1
"biodiversity"1
"archaeology"1
"native plant habitat"1
"educational opportunities"1
"wildlife sanctuary"
"declining shortgrass prairie ecosystem"
"plants"1
"animals"1
"natural communities"1
"where people live and work"1
"suburbs"1
"urban"1
"wilderness"1

Beneficiaries:
"general public" 1
"local public" 11
"themselves" 1
"their families" 1
"all of Colorado's citizens" 1
"of people"1
"future generations" or "in the future" 14
"present generations" or "today" 9
"religious organizations"1
"spiritual projects"1
"related educational endeavors"1
"youth and adults"1
"indigenous people projects"1
"national and international outreach and networking"1
"local landowners"1

Water
"watersheds" 1
"acquisition of water rights"1
"integrity of the riverfront"1
"water"3
"rivers"1
"rivers for all of its inhabitants"1
"water use" 1
"water quality" 1
"riparian areas" 2
"important wetlands"1
"associated uplands"2
"streams"1
"downstream issues"

Mechanisms
Conservation easements 5
Development rights 1
"conservation of private lands" 1
"private partnerships" 2
"public partnerships" 1
"innovative land conservation techniques" 1
"strategic leadership" 1
"field managed partnerships" 1
"land acquisition" 1
"wildlife research" 1
"mitigation programs" 1

"education" 2
"private" 2
"non-profit"5
"conservation organization" 2
"land stewardship" 2
"land owner consultation"1
"facilitation of deals"1
"builds public awareness"1
"land conservation options"1
"purchases"1
"donated conservation easements"1
"monitors"1
"enforces and restrictions"1
"Ensure permanent protection"1
"charitable organization"1
"fund raises"1
"distributes funds"1
"public"4
"composed of individuals, families, and businesses"1
"marketplace incentives"1
"landowner participation"1
"outreach program"1
"public lands reform"1
"leading voice"1
"grantee organization for recorded easements"1

Appendix A-2 Instructions to Study Focus Groups

Welcome!

Thank you for agreeing to attend our focus group session. We know that your time is extremely valuable and that the Rally is always event-packed, so we really appreciate your willingness to meet with us for the next 75 minutes.

We are a team of 4 researchers from Colorado State University and the University of Wyoming who have been funded by the U.S. Department of Agriculture's National Research Initiative Program to study conservation easements and land preservation. We are studying both the donee and the donor sides of the "conservation easement market." Results from our study will be published in the academic literature, as well as several of the journals with which you are familiar, such as Exchange. We anticipate that you will be able to use the results of our study such that you may use limited resources to target conservation and preservation better.

Today we would like to get your perspectives about several of the issues that you face when you are in the process of conducting a land preservation transaction. We will be asking about methods and motivations for preserving land as you see them in your unique roles. Your responses will be used to design our surveys of land holders and land trusts in Spring 2006. Your answers are of course treated as confidential, and there will be no way in which you can be identified by others outside of this room.

We value your openness and honesty, and we want you to feel comfortable in sharing information with us. There are no "right" or "wrong" answers—and we are very appreciative of all of the opinions that you express. Our conversation will be tape recorded, and before doing so, please let us know if you have any problems or questions about this. These tapes are confidential and are only used to accurately record your responses—no one outside of these researchers (even LTA) will have access to the tapes.

You are also being provided with a tablet of notebook paper. We are going to ask you a series of questions and present you scenarios, in the form of vignettes. We would like for you to first record or organize your thoughts before we open up the forum to everyone in the room. The notebook paper is for organizational purposes and you can take the notebook paper with you when you leave the room.

Let's introduce everyone before we get started. In the interest of time please just tell us your name, where you work and your position if you wish.

Are there any questions?

One more thing, please keep in mind that we have X people in the room, so be mindful to limit your comments to give others the time to speak.

Appendix A-3 Vignettes and Open Interview Questions
Executive Directors or Trust Staff

Vignette 1

Before we launch into a full-scale survey, we want to talk to experts like you to be sure that we are on the right track. First, we want to find out specifically what you are looking for when you are trying to preserve land. We know that most easements are placed to protect conservation values, which for IRS purposes includes open space, wildlife, scenic and historic values. However, we want to know more about what you want to protect, not just what you tell the IRS. We found for example that more than half of 44 mission statements from Western states mentioned open space preservation, even though we are told by some trusts that they are moving away from the use of the term open space.

Directions:

- Imagine a world without the limitations of having to worry about IRS requirements, budgets or other problems of practice. What is it ideally that you seek to protect, preserve or conserve? Please take a moment to list up to three of **your** most important goals. If you can, write a sentence that describes the perfect parcel that needs a conservation easement. During the first part, please list—don't elaborate.

Leaders put up list on poster board, then ask people about the most frequently listed item, XX. (This is the one we see most commonly.) Work your way down to the least frequently listed goals...

- First, let's hear from those of you who said XX. Beginning on my left one-at-a-time please tell me more about you mean and why this goal is important to you.

At this time, allow for each person to individually speak and to elaborate. It is fine to allow for other participants to interject, as long as we don't go too far off task and as long as a single person does not dominate. This will help people to "warm up" a bit to the task, which will promote spontaneity.

Follow-up questions to consider to promote discussion:

- What features make one parcel more attractive than another?
- What are your secondary objectives?
- Do you have a sense for what you are NOT trying to buy?

Purpose of Vignette 1:
The purpose of Vignette 1 is to elicit a list of primary attributes that trusts are trying to acquire. Keeping in mind Chris's suggestion for creating a table that We will list, then prioritize.

Vignette 2

Think about the transactions that you've conducted over the past year. Some parcels fit perfectly with your goals. Some were not so perfect, but were good opportunities. Still others were rejected. How did you prioritize which parcels that you would spend your precious time and energy on? Based upon your experience, what is different about parcels of land that your trust acquires versus ones that it chose to let go?

Follow-up questions:

- Flipping things around, what are the practical attributes that you look for, such as cost, location, etc..

Purpose of Vignette 2:
Again, the primary purpose of this vignette is to find out the attributes of the land that trusts seek during the acquisition process. Writes Johnson et al. (1995), in order to understand the meaning, implication and attributes of different resource categories, it is important to discover the participants' distinctions between the categories. One targeted method of achieving this is to ask contrast questions. Contrast questions may help further clarify attributes in order to implement the random utility model. Johnson et al. also state that the contrast questions "allow the discovery of attributes which distinguish various resources, and thereby define different goods."

Vignette 3

Sometimes people contact trusts offering to place easements. Other times, the trusts go looking for parcels in areas where their goals are threatened most. How do you find parcels of land that have what you are looking for?

Appendix A-4 Vignettes and Open Interview Questions
Background Information Regarding Attorney Focus Group

Purpose: We are looking for attributes that are expressed in legal terms, in contrast to the more "visionary" attributes that may be articulated by the Executive Directors, or in the mission statements of the trusts.

Background: There will be several Executive Directors, Board members, and trust staff who are attorneys by training, but the primary role that they play within the organization is not staff counselor. When we interview an Executive Director who happens to be an attorney, it is possible that this individual's legal training will influence his/her response; however, the questions posed and the vignette will pertain to the E.D. focus group, or the group for which they were recruited.

In contrast, the attorneys that we identify for the "attorney vignette" are those who play a more "traditional" legal role either for trusts or in their own legal practice. "Traditional" attorney roles are considered contract writing, legal counseling, and negotiating. The reason why we want to include attorneys in the focus group vignettes is that attorneys may introduce legal constraints, and view attributes of land that as joint products or complementary products (i.e. if I want to preserve rangeland, I also need to acquire the water rights). Attorneys may also be able to observe attributes of land that trusts overlook due to monetary or time constraints. During the pre-screening process, I will be searching for attorneys who fulfill these roles to participate in this focus group.

Attorney Vignette and Group Interview Questions

Vignette 1

This is the first phase of our research study. In other focus groups we've asked Executive Directors what they think is important to their trusts when they seek land for preservation. In this group, we want to learn about legal aspects that may affect the land that your clients are trying to preserve. By legal aspects, we do not mean the routine tasks that attorneys would help out with in a typical transaction, such as legal description of the land, title work or environmental hazards.

Some attorneys specialize in helping buyers or recipients of donations, while others specialize in helping the sellers or donors. Some represent both. Clients on both sides of the fence have an objective they are trying to accomplish with the conservation easement. ***Please take a moment to write down which type of client you know most about, and then write down three of the most common attributes that they are looking to protect? Do you work most often with buyers or sellers?*** What are the three most common things that your CLIENT wants?

Follow-up Questions:

- Is there a difference between what a person seeks to protects and what you advise them to protect, for legal reasons?
- *Are these the objectives that the clients want, or is it what you advise?*
- *Focusing on the characteristics of the land, what are some of the things that a trust may need to include in the contract in order to facilitate the transaction?*
- *How do the objectives of the trust compare to the legal process that the trusts must go through?*

Vignette 2

Background: The purpose of the "Why-Why Diagram" is to focus on a specific problem, then "work backwards" to discover the source (cause) of the problem of the problem, by asking the person to contemplate what the cause is for each layer of the problem. First presented by Barra (1983), and presented in "Processes, Techniques, and Tools", this method will requires some skilled facilitating. A general question will be asked, and the participants will reveal their answers one at a time. Their answers will be recorded on a whiteboard or flip chart; however, only a few specific answers from the attorney focus group will be mapped using a "Why-Why Diagram". Thus, the facilitator will need to (somewhat spontaneously) determine which answers will reveal the most about the characteristics of land being pursued by land trusts. These characteristics will be exposed, similar to peeling back the layers of an onion. For more specific details on this process, I will provide a hand-out will a fully illustrated example by Berra.

Question:
Please list on your scratch paper what you believe are the top three legal or financial challenges that your client encounters when trying to secure a parcel of land for preservation.

We will go around the room and list all of the challenges on the board, then the facilitator will decide which challenges will work the best to reveal characteristics of the land that land trusts seek (or are failing to seek). Depending upon how much time elapses, several "Why-Why" diagrams may be made for different challenges that the attorneys observe.

e.g. What gets listed the most, and expand upon it. "I see that you said this. Why is it?"

Vignette 3
Placing a conservation easement requires careful legal work, but legal work is costly. Thinking about the clients that you have worked with in the past, how might the legal costs related to developing an easement alter or influence a client's ability to attain their objectives.

Purpose of Vignette 3:
Again, time and financial constraints may pose a contrast between the characteristics that a land trust DESIRES to acquire and the land that a trust ACTUALLY acquires. It is more likely that an attorney unaffiliated with a land trust will reveal this information (compared to, for example, an Executive Director), because the attorney probably has less of an emotional attraction to the land, and will be less biased than others closer to the transaction. The attorney will be more likely to identify the "shadow value" of another dollar spent on land or another hour of time.

Appendix A-5 Vignettes and Open Interview Questions
Appraisers

Vignette 1

In its simplest terms, the value of a conservation easement is determined by the value of a parcel of land with unrestricted development rights minus the value of land with restricted development rights. ($V_{UR} - V_R$). The goal of an easement of course is to place a value on attributes worth protecting. Consider the attributes of the land that your clients want to protect. What typically are the three most common attributes that you are asked to value?

Followup Question:

- How do you appraise property to take into account these values?

Purpose of Vignette 1:

The bulk of the published literature on conservation easements (particularly the earlier work on conservation easements, such as studies by Tegene and Weibe, as well as Boyd, Caballaro and Simpson) address the valuation process for conservation easements. In addition, the appraisal process for conservation easements has been recently under fire in the popular press and with the Congressional sub-committees. Thus, it is important to address both the appraisal process and the valuation process in any study that we do on conservation easement valuation, even if it is an indirect study of the appraisal process.

In addition, the process by which the RESTRICTED value of the land is determined is very controversial for a number of reasons, including the lack of comparable sales. Since a thin market is the basis for much of our research, it will be revealing to find out WHAT CHARACTERISTICS of the land the appraisers consider when they are determining the restricted value of the parcel.

Vignette 2

It is routine in appraisals to use comparable sales. However, in the case of conservation easements, this is more difficult because information about restricted sales is scarce. What are the determinants of unrestricted value that you consider in your appraisals of conservation properties.

Vignette 3

As you are aware, one of the most controversial elements in determining the value of a conservation easement is anticipating the timeframe of impending development. It is our

understanding that if a parcel is in danger of imminent development, its value increases because there are competing alternative uses in the near future.

- As an appraiser, what features of the neighboring parcels of land signal to you when a parcel of land may be developed?
- What features of the land may become more valuable when development is impending?
- Are there features of the land that you believe may cause the property to increase in value when the parcel's development is restricted?

Purpose behind Vignette 3:
One aspect of land preservation (and the conservation easement process) that is extremely important is the time element. Preservation knocks out the development option, and the value of the development option is somewhat difficult. It is thus important to identify the attributes of the land that are impacted by inter-temporal characteristics, and the most qualified professional to identify inter-temporal characteristics is the appraiser.

Appendix A-6 Vignettes and Open Interview Questions
Landowners

Background and Purpose of Vignette 1:
The land owners that will attend this focus group have somewhat diverse backgrounds and varied levels of education. Although the attendees will have just attended a seminar by a prominent conservation easement attorney, it is possible that the group may be somewhat fatigued after the 4-hour seminar. Thus, the first vignette begins with a more conversational (but structured) overtone, before moving into some of the more pointed questions about the financial benefits of conservation easements. The first vignette uses the "Six Thinking Hats" Method first described by de Bono (1990). In the interest of time, we will only use four of the six "hats.

The objective of this vignette is to extract the characteristics that land owners value in their land. We accomplish this by trying to maintain a comfortable atmosphere where they feel comfortable talking, and at the same time direct them to think in a "different" direction.

Vignette 1
It is our understanding that all of you are landowners from Wisconsin who are considering setting aside all or a portion of your land for preservation. From what we know of Wisconsin, it is a large state with a variety of beautiful landscapes and diverse environments, and so we would like to learn a little bit about your property.

We would like for you to very briefly summarize and describe your property, as well as what you think are the benefits it presents to other Wisconsinites or your family. However, when describing your property we would like for you to think of your land from different perspectives. We are going to assign different various perspectives that you could take when describing your property.

- First consider an unbiased viewpoint of the land; you should be neutral in describing your property—like a computer. For example, describe the facts about your property, such as location, size, and features on the land. Again, like they said on "Dragnet", "Just the facts!"

Directions:

- *After providing the participants a few minutes to collect their thoughts, begin on the left, moving clockwise, provide each participant 1-2 minutes to describe their property.*
    - *At the focus group there may be participants who are spouses or relatives. Point out that it is important that each individual provide their own description of the land.*

- *Record these characteristics on the flip chart.*

Continuation of Vignette 1:

- Next, we would like for you to go in the "opposite" direction; think about your land from more of an emotional viewpoint. What are the features of the land that are important to you and your family?

Proceed in a similar manner as was done with the white hat. Continue to ask the questions using different hats.

- Now think of your land from a public perspective. What are some of the positive characteristics that your property provides to other Wisconsinites or visitors to your state? What features does your property have that someone else would pay to preserve?
- Now we will once again go in the opposite direction.. What are some of the characteristics of your property that may not be compatible for land preservation? Remember, your answers are confidential and will not be shared with anyone else outside this room.

Vignette 2

Some of you recently attended a seminar conducted by Stephen Small, who is one of the foremost experts in preserving family lands. One of the key topics discussed was the tax code and the benefits that you and your family may receive by enacting a conservation easement on your land.

How important is it to you in your decision making process that you receive financial benefits from placing a conservation easement on your land? Are there characteristics of your property that would not otherwise be preserved, or what would otherwise happen to your property without an easement? Would you consider placing a conservation easement on your property without receiving the current tax benefits?

- *This question may be somewhat challenging to the landowners, and some may not feel comfortable sharing their thoughts. After giving the participants a couple of minutes to contemplate their responses, first ask for volunteers to communicate their perspective. Once a few people have voiced their opinions, others may feel more "safe" in sharing their opinions. Throughout the discussion, a facilitator may wish to call on others who have not shared their opinions. If the group is reticent we may wish to begin the discussion, starting with the person who is on the facilitator's immediate left.*

Purpose of Vignette 2:
The main objective of this question is to extract the characteristics of the land that land owners may believe are "priceless", and would like to see preserved regardless of financial benefit. These features may very well end up to be the "deal breakers" during conservation easement negations. Because so few CE articles have been written from the landowner perspective, citing Stephen Small, the author of the "Preserving Family Lands" series (one of the seminal works available for landowners), provides a solid basis for this question. A number of prospective land owners are advised to read his publications before enacting a conservation easement on their land, and the bulk of Small's work addresses the tax codes.

Vignette 3
Wrap-Up Question—If we have time, or if the group is either small, or reticent (the four hats will likely take up the majority of the time)

"What is your number one goal as a land owner for preserving your land?"

Purpose of Vignette 3:
Again, pointing to the scarce literature on conservation easement donors, Marshall, Hoag, and Seidl (2002) and Elconin and Luzadis (1998) explored the theme of conservation easement satisfaction and donor motivation. While the former theme is not appropriate to explore with participants, the latter presents a good summary question and is consistent with what exists of the donor motivation literature.

Appendix B
Types of Multimethod Designs[21]

Inductive (Theoretical) Research Questions:

1) **QUAL + qual**
   Two qualitative methods used simultaneously
   One qualitative method is the dominant method and provides the foundation for the research project.

2) **QUAL→qual**
   Two qualitative methods used sequentially
   One qualitative method is the dominant method and provides the foundation for the research project.

3) **QUAL + quan**
   One qualitative method and one quantitative method used simultaneously
   The qualitative method is the dominant method and it provides an "inductive theoretical thrust."

4) **QUAL→quan**
   One qualitative method and one quantitative method used sequentially
   The qualitative method is the dominant method and it provides an "inductive theoretical thrust."

5) **QUAN + quan**
   Two quantitative methods used simultaneously
   One quantitative method is the dominant method and provides the foundation for the research project.

6) **QUAN→quan**
   Two quantitative methods used sequentially
   One quantitative method is the dominant method and provides the foundation for the research project.

7) **QUAN + qual**

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[21] Newman, I., C.S. Ridenour, C. Newman, and G.M.P. DemMarco, Jr. 2003. "A Typology of Research Purposes and Its Relationship to Mixed Methods." In Tashakkori, A., and C. Teddlie, eds. *Handbook of Mixed Methods in Social & Behavioral Research.* Thousand Oaks, CA: Sage Publications.

One quantitative method and one qualitative method used simultaneously
The quantitative method is the dominant method and it provides a "deductive theoretical drive."

8) **QUAN→qual**
One quantitative method and one qualitative method used sequentially
The quantitative method is the dominant method and it provides a "deductive theoretical drive."

Appendix C

2004 U.S. Marginal Income Tax Rates

Table 4.1 2004 Tax Rates for Married, Filing Jointly				
If Taxpayer's Income is...		Then Estimated Taxes Are...		
Between	But Not Over	Base Tax	+ Rate	Of the Amount Over
$ -	$ 14,300	$ -	10%	$ -
$ 14,300	$ 58,100	$ 1,430.00	15%	$ 14,300
$ 58,100	$ 117,250	$ 8,000.00	23%	$ 58,100
$ 117,250	$ 178,650	$ 22,787.50	28%	$ 117,250
$ 178,650	$ 319,100	$ 39,979.50	33%	$ 178,650
$ 319,100	------	$ 86,328.00	35%	$ 319,100