Addressing Moral Hazard Behavior in the Timberland Marketplace
by
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Abstract

Given the pronounced separation of timberland ownership and management, especially with the growth of timberland investment management organizations (TIMOs), potential conflicts of interest are often present. Financial economists have developed agency theory, which encourages owners of economic resources to structure contracts with the managers that will minimize the agency costs – including the outcomes from behavior inconsistent with the welfare of the owners. Actions by agents (the managers) that deviate from alternatives deemed to be optimal from the perspective of the owners (the principals) are considered to be moral hazard behavior. This paper introduces agency theory as a framework for describing potential conflicts of interest in the timberland marketplace and proposes financial contracting as a means for minimizing agency costs.

INTRODUCTION

In forest finance, it is generally presumed that forest resource managers will attempt to maximize value for the owners of the resource. However, contracting between timberland owners and managers may be structurally flawed so that managerial behavior that is inconsistent with value maximization is encouraged. Timberland owners need to be cognizant of such sources of conflicts of interest and be prepared to modify the contracting so that interests are better aligned.

Agency theory does not assume that managers are narrowly focused on value maximization for the owners. Financial economists such as Jensen and Meckling (1976) and Fama (1980) have explained the behavior of the firm by viewing it as a complex set of agency relationships, usually formalized with a contractual arrangement. An agency relationship exists when one entity (the principal) delegates authority to another entity (the agent). Moral hazard behavior occurs when actions by agents are inconsistent with the goals of the principal. According to agency theory, owners are motivated to minimize shrinkage of value due to agency costs, which include residual losses as well as monitoring and bonding costs. Brealey and Myers (1991) included agency theory among their six most important ideas in finance. However, it has not been systematically integrated into the models of researchers addressing forest finance issues. With the increased separation of timberland ownership and management, highlighted by the expanding ownership of forest resources by institutional investors, application of the agency framework to forest finance issues is more appropriate than ever.

The purposes of this paper are threefold:

(1) To describe the potential utility of agency theory in forest finance.
(2) To describe a specific situation to which agency theory can be applied to timberland investments.
(3) To propose research directions for applying agency theory to forest economics.

THE NEED FOR AGENCY THEORY

In addition to the common separation of ownership and management of forest resources, other factors contribute to the likelihood that agency costs are material in the timberland marketplace:

- Given the usually remote location of activities, it is generally expensive for owners to monitor and verify what the managers are doing.
- Many timberland owners have limited expertise in forestry.
- Information about forestry service providers and their performance is not well distributed, especially when compared to data available about managers of financial assets.
- Since only a minority of timberland is controlled by publicly traded entities, most forest resource managers are not subject to the discipline of financial markets.

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Given the relatively long duration between the initiation of silvicultural treatments and the realization of their benefits in the form of cash flows and the influence of numerous uncontrollable factors on financial performance, it is difficult for owners to accurately assess the success of a manager’s plans and actions.

Many agency relationships exist in the timberland marketplace. Absentee landowners (the principal) frequently delegate many of the critical resource management decisions to forestry consulting firms (the agent). In the growing TIMO sector, multiple principal – agent relationships need to be considered in order to analyze and explain forest resource management decisions and financial performance. With a commingled timberland fund, the institutional investors represent the principal and the TIMO is the agent in this relationship. When the TIMO contracts with a forestry consulting firm to provide forest management services, the TIMO is the principal and the consulting firm is the agent. If the forestry consulting firm engages a local sub-contractor to provide property custodial services, then the consulting firm is the principal and the sub-contractor is the agent. Finally, if the institutional investors borrow funds from a commercial bank to help finance acquisitions, then the bank is the principal and the institutional investors are the agent in that relationship. Just as friction can impair the fuel efficiency of a piece of machinery, poorly structured contractual arrangements between these various participants can contribute to disappointing financial performance for the institutional investors.

Consider the institutional investor – TIMO agency relationship in more detail. Most TIMOs earn the majority of their revenues from asset management fees that tend to be charged as a percentage of the value of assets managed. Similar to a mutual fund company, a TIMO may thus seek significantly greater size in an attempt to expand revenues. To achieve the desired growth in the asset base, a TIMO may opt to bid in an overly aggressive manner for properties to minimize the chances of losing the potential assets to another TIMO. Or, a TIMO may opt to construct a timberland portfolio in such a manner that it looks and behaves much like the aggregate timberland market—rather than overweighting the portfolio to those sectors that the TIMO managers believe will outperform the aggregate market. Such a “benchmark-hugging” portfolio minimizes the chance that the TIMO will significantly underperform the aggregate market. Such an approach could be based on the premise that institutional investors will not abandon an average-performing TIMO, and thus a steady stream of asset management fees will be maintained.

Of course, astute institutional investors will demand contractual arrangements with TIMOs that provide motivation for consistent, higher-than-average returns. Contractual elements that might minimize agency costs in this relationship include performance-based incentive fees, a requirement that the TIMO managers personally invest in the timberland portfolio, and modest asset management fees. In the next section, a simple case is presented to demonstrate the importance of the structure of the institutional investor-TIMO contract for minimizing moral hazard behavior.

**A SIMPLE CASE**

Consider the following contractual elements between an investor (the principal) and a TIMO (the agent) in conjunction with a timberland property having a cost basis of $10 million:

- a 1% annual asset management fee on the property’s cost basis; and
- an incentive fee equal to 15% of the surplus return above a 10% gross annual return.

In this case, the TIMO is considering two disposition scenarios for the property:

- **Sell**—TIMO managers sell immediately for $11 million; and
- **Hold**—TIMO managers expect to hold the property for four years and achieve a gross annual return of 12%.

Finally, the following assumptions are made for this analysis:

- The discount rate for the investor and the TIMO on future asset management fees is 7%;
- Given the concentration of their wealth in the TIMO, the TIMO managers select a higher discount rate on future expected incentive fees than does the investor: 20% versus 10%;
- The expected gross annual return on the property: 12%;
- The discount rate used by the TIMO to value the property: 10%; and
- The annual marginal expenses to the TIMO’s management company (not to the investors): 0.3% of the property’s cost basis.

A comparison of the net present values (NPVs) of expected net cash flows to the investor and the TIMO is shown in Table 1 for both scenarios.
Obviously, a conflict of interest exists between the principal and the agent. The investor would prefer the immediate sale of the property, but the TIMO would prefer the hold scenario. This contract provides the TIMO with a short-term incentive to deviate from the “right” choice and commit moral hazard behavior.

Two simple modifications to the contract could be considered. Table 2 reveals the results from changing the incentive fee to 50.3% of the surplus return above a 10% annual gross return on the property.

<table>
<thead>
<tr>
<th>Sell</th>
<th>Investor NPV</th>
<th>TIMO NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell</td>
<td>$497,000</td>
<td>$503,000</td>
</tr>
<tr>
<td>Hold</td>
<td>$33,000</td>
<td>$502,500</td>
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</tbody>
</table>

Table 3 reveals the results from reducing the annual asset management fee to 0.50% of the property’s cost basis and returning to the original incentive fee structure.

<table>
<thead>
<tr>
<th>Sell</th>
<th>Investor NPV</th>
<th>TIMO NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sell</td>
<td>$850,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Hold</td>
<td>$466,000</td>
<td>$147,000</td>
</tr>
</tbody>
</table>

Notice that the modifications of the fee structure resulted in an alignment of interests in both Tables 2 and 3. That is, the TIMO managers would have a financial incentive to make the “right” choice in both cases. Investors should carefully consider fee structures and their impact on managerial incentives when selecting a TIMO and investment vehicle.

**RESEARCH AVENUES**

Two general methodologies are likely to be used when forest economists and others study principal-agent relationships in the timberland marketplace. In order to better understand the selection process of outcome-based contracts (such as a contract including a commission) versus activity-level contracts (such as paying a consultant by the hour), researchers might use questionnaires, interviews, and laboratory experiments. Such dimensions as outcome uncertainty, outcome measurability, duration of the service, task programmability, and quality of the information systems might be investigated as to their influence on contract types selected. Or, microeconomic analysis, simulation, and game theory could be adopted to identify optimal contracting given value-maximizing principals and agents. Such studies should incorporate the following features:

- principals and agents can possess differing levels of risk aversion;
- complete versus incomplete information;
- information is a commodity that can be purchased; and
- costs of measuring behavior and outcomes can be estimated.

Such studies should contribute to improvements (1) in the design of agency relationship contracts used in the timberland marketplace and (2) in models used to predict the investment performance of forest assets and the selection of alternative forest management regimes.

**LITERATURE CITED**

