Do Markets Provide Barriers or Incentives for Sustainable Forest Management: The U.S. Experience

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Abstract:

The renewed interest in sustainable forestry raises questions about the role that market prices play in influencing management decisions made by individual land owners and managers. Evidence from several U.S. regions suggests that land owners/managers have relied on sustained upward changes in timber prices to provide positive incentives to improve the intensity and extent of forest management practices. But we face a future of relatively stable prices and some forest management advocates are concerned that expectations of lower returns to various forestry practices may lead the myriad of landowners each with their own objectives to respond to various market signals in ways that are not supportive of sustainable forest management.

Keywords: Forest management, prices, private landowners.
Introduction

The United States and Canada are signatories to the Montreal Process for Sustainable Forest Management (SFM) which is one of several frameworks that seeks to balance environment, economic, and equity considerations of forest management from a societal viewpoint (Mihajlovich 2001, Tittler et al. 2001). These frameworks generally attempt to place the debate about sustainable forest management in the context of broader societal goals for sustainable growth (Mendoza and Prabhu 2000).

The various frameworks for assessing sustainable forest management assume that participating countries will develop national implementation programs. In the United States, however, this has not happened since the bulk (71 percent) of U.S. timberland is privately owned and there is little consensus among landowners about management goals or financial objectives. Here implementation will instead be determined by numerous management decisions made by individual land owners and managers. These decisions will be influenced by a mix of market incentives and regulatory actions. The variability in these decisions introduces different levels of predictability in assessing progress towards sustainable forest management. This is especially the case where the unpredictable role prices play causes some proponents of sustainable forest management angst because prices might provide insufficient incentive for what they believe are necessary forest practices.

The purpose of this paper is to explore the evidence for the concerns that markets might not provide sufficient incentive for sustainable forest management. Looking at several indicators (fig. 1a for softwoods and fig. 1b for hardwoods) associated with sustainable forest management
suggests that for the past 50 years that land owners and managers have undertaken sufficient management actions to insure that growth equals to or exceeds harvest and that there have been generally rising inventory conditions. At the same time these conditions have been maintained, harvest levels have increased by more than a third for both softwoods and hardwoods.

What is the Price Evidence?

The price signals that emerge from major sawtimber markets all suggest that landowner perceptions are influenced by relatively long histories of rising prices (both in nominal and real terms). That is, most landowners can expect higher returns to their investments than just what might result from stand growth alone. For example if prices increase on the average at 1 percent per year than returns at harvest (assuming a 30 year rotation) would be 35 percent higher.

The data in table 1 shows three variations of the long-term price trends (both 1961-1990 and 1961-2002), the price trends for the last decade, and projected price trends for the next 50 years. The hardwood data in table 1 came from updates to Sendak (1994) and the softwood data came from the Outlook for Timber in the United States (USDA FS 1973) and Howard (2003). The long-term trends reflect slightly faster growth in consumption relative to timber supplies since WWII (see Haynes 2003 for an expanded discussion of the timber situation). The general history of rising prices suggests that timber is relatively scarce and, all else being equal, that there should be changes in various market factors to alleviate the price increases. This behavior is expected since these are relatively free markets comprising numerous producers and consumers making decisions based on understanding of available information. The history of rising prices should also encourage consumers to substitute nonwood material in some uses such as residential
construction (e.g., steel studs for framing) because the real prices of the substitute are less (or more stable) than wood prices and they will encourage increased product imports. These rising stumpage prices have encouraged increased efficiency and diversity in the mix of forest products as producers looked for ways to increase returns. Rising prices should also encourage landowners and managers to increase the intensity or extent of land management to produce more timber (to the point where timber prices become stable).

The general slowing of the price trends in the 1990s reflects the growing importance that managed forests play in providing timber supplies in the United States. The projected trends (see fig. 2) reflect this increased role of managed forests on a relatively small part of the forest land base (that is, we anticipate a large increase in both harvest and inventory volumes on a relatively constant set of acres). Such forests offer a relatively certain supply of timber at a lower logging costs (because who are responsive to changes in timber markets. The projected trends reflect continued growth in U.S. consumption (roughly 0.9 percent per year), increases in imports (U.S. net trade continues to favor imports relative to exports) and increases in U.S. forest resources (both total inventories and net growth increase).

Discussion

Past prices and markets for various types and sizes of timber have influenced the goals for land management and the evolution and application of various management regimes. As shown in figures 2 and 3, these forest product prices are often characterized as highly volatile but increasing faster than the overall rate of inflation. In both the Douglas-fir region and in the South, rising prices for timber products led to the adoption by those owners sensitive to financial
returns of relatively systematic forest management regimes consisting of practices that tend to speed development of well-stocked forests (see Haynes et al. 2003 for a history). At the same time rotation ages for these managed forests have dropped leading to more frequent entities and greater proportion of the forest in relatively young stands (stands 20 years or less). This increases the financial returns to those (individuals, companies, and various publics) who own timberlands. Current and expected trends show private timberland owners continuing to invest in forest management, subject to increasing regulations of various forest practices (see Haynes 2003). Public lands, on the other hand, are expected to be managed for diverse goals—many not involving the marketplace—reflecting increased recognition of the benefits of many nontimber forest goods and services

In the United States, we frequently debate the role that prices play in private timberland management. In periods of weak stumpage markets (e.g., for some hardwoods or for small softwood trees in the west) there is concern that landowners and managers will not implement certain forest practices such as thinning to reduce fire risk. In the case of private timberlands, relatively low returns to forestry may also lead to changes in land use as landowners seek higher returns by converting to agriculture or residential developments (see Kline and Alig. 2001, Ahn et al. 2002, USDA FS 1988, and Haynes 2003 for additional details). At the same time, the lack of perceived effectiveness of markets in increasing quantities of timber supplies (or other forest outputs) in periods of rising prices and perceived scarcity causes concern among advocates of forest management (see Cubbage and Haynes 1988 for a summary). These doubts have often prompted the establishment of public and private programs designed to improve forest management with the intention of slowing the expected rises in timber prices.
The recent downward changes in expectations for long-term returns for forest management (see fig. 2) will raise, in some manager’s minds, questions about the incentives for sustainable forest management. From their perspective, the issue is how to produce a range of goods and services as they practice forest management that also meets their financial expectations. This concern has long been recognized as the heart of the forest management question (see Baker 1950, Davis 1966, Davis and Johnson 1987, Davis et al. 2001). The concern about financial aspects is a fundamental component of how forest management decisions made by numerous land owners and managers contribute to sustainable forest management. Simply put, forest management has to demonstrate that it can pay for itself on private timberlands before we can assume the forest land owners will implement practices thought of as contributing to sustainable forest management. The importance of financial returns also means that many of the benefits of forest management need to accrue to those who pay the costs. Landowners lack the incentive to implement costly practices that have mostly broad societal benefits.

**Conclusion**

Forest management advocates are slow to acknowledge that markets can act as a barrier to sustainable forest management. Expectations of low returns to various forestry practices may lead the myriad of landowners each with their own objectives to respond to various market signals in ways that are not supportive of sustainable forest management. For many years, upward changes in timber prices have provided largely positive incentives for landowners (both public and private) to improve the intensity and extent of forest management practices. These
price changes, which are also a function of changes in wood quality, have provided incentives for the development (or contraction) of various forest products industries.

The projections of relatively constant real prices (fig. 2) for the next five decades will provide an incentive for those landowners with a strong propensity to manage (industrial land owners, large private land owners, timberland investment organizations, public timberlands) but by themselves will not engender a lot of enthusiasm among the majority of landowners who display a lower propensity to manage. Put in another way, relatively stable price expectations are necessary for improved forest management but not necessarily a sufficient condition for sustainable management.

What does this mean in the context of sustainable forest management? Simply put it means that the majority of timberland will be lightly managed while a small minority of acres will be heavily (or actively) managed (on relatively short rotations). The net effect is that prices, while not a barrier, will also not provide a strong incentive to improve land management by many landowners. This may raise a dilemma among the advocates for improved forest management when they find themselves supporting more regulation to insure progress towards sustainable forest management across a broader number of forestland acres.

Literature Cited


Table 1–Rates of stumpage price appreciation

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<th>A. Prices for traditional softwood sawtimber</th>
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Figure List

Figure 1a—Softwood removals, inventory, and growth/removals index.

Figure 1b—Hardwood removals, inventory, and growth/removals index.

Figure 2—Softwood sawtimber stumpage price by major U.S. region, with projections to 2050.

Figure 3—Stumpage prices for Douglas-fir, ponderosa pine, and southern pine, 1910-2002.