RESEARCH ARTICLE

J. For. 110(7):355–361
http://dx.doi.org/10.5849/jof.12-015

social sciences

Institutional Timberland Ownership in the US South: Magnitude, Location, Dynamics, and Management

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We have compiled an exhaustive list of timberland investment management organizations (TIMOs) and timberland real estate investment trusts (REITs) and used USDA Forest Service, Forest Inventory Analysis data to quantify their acreage, distribution, dynamics, and management practices. We find that TIMOs and REITs own/manage about 16 million ac or 10% of the timberland across 11 southern states and that they manage these forests in a sustainable fashion in terms of growth-to-removals and reforestation. Furthermore, TIMOs and REITs own/manage more forest plantations than other owners and harvest more hardwood than is grown. Most of the timberland owned and managed by TIMOs and REITs, located mainly in the southern coastal plain and Piedmont regions, were previously owned by forest industry firms.

Keywords: institutional timberland ownership, industrial timberland ownership, Timberland Investment Management Organizations (TIMOs), Timberland Real Estate Investment Trusts (REITs), forest management, forest sustainability

In the last 30 years, private forestland in the United States has evolved from traditional family (private individuals) and industrial (i.e., vertically integrated forest products companies) ownerships into a diverse group of ownerships that include families, institutional investors, industrial firms, real estate investment trusts (REITs), conservation organizations, and others such as tribes, trusts, and hunting clubs. The biggest change is associated with the decline of industrial timberland ownership and the rise of institutional timberland ownership. In the early 1980s, industrial forest landowners owned some 66 million ac or 13% of all US timberland and contributed 29% of the nation's timber supply (Smith et al. 2004). Since then, especially in the last 15 years, virtually all large publicly traded forest products companies have either sold most or all of their timberlands, often to institutional investors, or converted themselves to timberland REITs.

Institutional investors typically include pension funds, endowments, foundations, and insurance firms that favor diversified investment portfolios. These investors often hire forest professionals, called timberland investment management organizations (TIMOs), to look for, purchase, manage, and sell timberlands on their behalf. TIMOs hold institutionally owned timberland through (a) direct, separately managed accounts; (b) closed comingled funds that have a limited investment period of 5–20 years; or (c) occasionally, in the form of open funds that have an unlimited term. For legal and other reasons, institutional owners may be structured as a corporation, a limited partnership, or a private REIT (see later in text). With the exception of a few exchange traded funds, these funds are not publicly traded. Recently, US-based institutional investors have bought timberlands in other countries such as Australia, Brazil, Canada, China, New Zealand, and Paraguay. Similarly, foreign investors have bought, mostly through US-based TIMOs, timberlands in the United States.

Timberland REITs, on the other hand, have shares that are either publicly traded or privately held. REITs are a special tax designation for corporations that invest in real estate, such as commercial properties, farms, or timberland, and offer the advantage of

Received February 14, 2012; accepted June 13, 2012; published online July 12, 2012.

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Acknowledgments: *This project was funded in part by USDA Agriculture and Food Research Institute (AFRI) Competitive Grant 2011-67023-30051. The authors thank Jaketon Hewes for his cartographic/GIS assistance and Eric Dooly, Tracy Evans, and Chung-Hong Fu, two anonymous reviewers, and an associate editor of this journal for their comments on an early version of this article.*

facing little or no corporate income tax relative to traditional C-Corp firms. REITs are required to distribute 90% of their income back to their investors. Although institutional investors typically invest in timberlands managed by TIMOs, they may, like many individual investors, acquire exposure to the timberland asset class by purchasing shares of publicly traded timberland REITs. In fact, a close look at their annual reports reveals that most stocks of public timberland REITs are held by another type of institution—mutual funds. Thus, broadly speaking, institutional timberland owners cover all institutions owning timberland through TIMOs and REITs.

This change of timberland ownership is attributed to (a) government tax policies that disfavor C-Corp structured ownerships, (b) generally accepted accounting principles that undervalue timberland owned by industrial firms, and (c) the rising interest in timberland as an alternative investment by institutional investors (e.g., Rinehart 1985, Zinkhan et al. 1992, Binkley et al. 1996, Clutter et al. 2005, Binkley 2007, Fernholz et al. 2007). Collectively, these policy, institutional, and market factors have induced a high opportunity cost for forest products companies to continue to own large amount of timberland, despite the fact that timberland ownership may enhance the profitability of these firms and lower their levels of risk (Li and Zhang 2011).

This ownership change has generated a public interest in knowing more about institutional timberland owners, either through TIMOs or REITs. Who are the largest TIMOs and timberland REITs? How much timberland is owned by institutional investors, through TIMOs and timberland REITs? Where are their timberlands located? How have ownership dynamics and land-use conversions been affected? Do they manage their timberlands differently from industrial or family owners? In this article, we try to answer these questions as they relate in particular to the US South, a region that contributes some 62% of the nation's timber harvests (Smith et al. 2009).

Methods

It is estimated that TIMOs, REITs, and industrial firms collectively managed or owned 57 million ac of timberlands in the United States in 2010 (Forisk Consulting 2011). By networking and communicating with firms that manage timberlands for institutional investors, we have identified a list of TIMOs and timberland REITs as well as major industrial firms in the United States as of the end of 2010 (Table 1). Although a few TIMOs on the list have since dissolved or merged with other companies, they all managed some timberlands for institutional investors at some time in the last 20 years. The list of TIMOs and timberland REITs in Table 1 is considered to be exhaustive and serves as our database when we classify ownership.

Table 1 is an impressive list in itself. It shows that TIMOs and timberland REITs are diverse and evolving. The diversity of these firms is reflected in their location and size of timberlands under their management and their management focus (e.g., at least one TIMO is focused on hardwood). Some TIMOs manage timberland for their investors in the US South only; others extend to various parts of the country. Still others manage timberlands in both the United States and overseas. A few are purely international players, and we list them because they are either based in the United States or have intent to invest in the United States. The evolving nature of TIMOs, which is beyond the scope of this article and will be covered elsewhere, means that most of these TIMOs grow out of a few original TIMOs (e.g., Hancock Timber Resource Group, Forest Investment Associates, Wachovia Investment Management, and Resource Investments) and that mergers, spinoffs, and acquisitions among TIMOs take place all the time. As a result, some TIMOs only have lived for several years and may even be constructed to facilitate a particular transaction (e.g., TimberSTAR).

We have used the US Forest Service Forest Inventory Analysis (FIA) database and collected primary ownership data to examine the management of forests owned by TIMOs and REITs. FIA is charged with assessing the country's forest resources, including ownership changes, and has established a grid of permanent inventory plots across the country (Bechtold and Patterson 2005). There is one sample plot per approximately 6,000 ac and the plots are remeasured once every 5–7 years in the eastern United States. For every forested plot that is encountered, the ownership is determined from tax records and forest mensuration data are collected in the field.

Before 2007 (e.g., Smith et al. 2004), FIA reports classified private timberland landowners into industrial and nonindustrial private forest (NIPF) landowners. Industrial owners included those who owned and operated primary wood processing mills, and the remaining private owners were called NIPFs. Starting with the 2007 report (Smith et al. 2009), private landowners were classified into corporate and noncorporate ownerships. The corporate owners include all firms such as industrial, TIMOs, REITs, other forestry corporations (forestry consultants, loggers, and tree farmers), incorporated family operations (such as Johnson Farm, LLC), and nonforestry corporations (such as utility, mining, and real estate). The noncorporate owners include individuals (or families) and entities such as conservation organizations, unincorporated partnerships (associations and clubs), and tribal. FIA still records whether or not a landowner owns a primary forest products processing facility, but it is no longer used in its national reports.

TIMOs and REITs are not specifically identified in the FIA database; they are simply lumped in with all other corporate owners. To assess the magnitude of institutional timberland ownership and timberland REITs, a list of the names of all corporate forest owners, protected by a nondisclosure agreement and disassociated with plot data, was used to classify each owner according to (Figure 1):

- Industrial status—a variable indicating the owner's objectives toward commercial timber production.
- Mill status—a variable indicating if the owner owns or operates a primary wood

Management and Policy Implications

This study is a first attempt to systematically quantify the size and management of timberlands under institutional ownerships in the US South. As such, it fills the need for better information on institutional timberland ownerships and establishes a baseline for future assessments. As forests under institutional ownerships are managed sustainably in terms of growth-to-drain and reforestation, the study suggests that TIMOs and REITs are up to about what industrial owners were up to—growing timber. Finally, we outlined some potential policy and research questions concerning TIMOs and timberland REITs going forward.

Table 1. A list of top owners and managers of timberland in the United States.

Firm/organization	Type	Acres in the United States
Top 20 owners/managers[a]		
Plum Creek	Public REIT	6,800,000
Weyerhaeuser	Public REIT (industrial before 2010)	5,800,000
Forestland Group	TIMO	3,400,000
Campbell Group	TIMO	3,040,000
Hancock Timber Resource Group	TIMO	2,948,000
Resource Management Service	TIMO	2,600,000
Forest Capital Partners	TIMO	2,500,000
Rayonier	Public REIT	2,100,000
GMO Renewable Resources	TIMO	2,100,000
Forest Investment Associates	TIMO	2,000,000
Sierra Pacific Industries	REIT (industrial)	1,900,000
Molpus Woodlands Group (Woodland Resource Management Group)	TIMO	1,800,000
Potlatch	Public REIT	1,600,000
Wagner Forest Management	TIMO	1,400,000
J.D. Irving	Private REIT	1,200,000
Region Morgan Keegan (RMK) Timberland Group	TIMO	1,100,000
Seven Islands Land Management	TIMO	1,000,000
Timbervest LLC	TIMO	825,000
Prentiss & Carlisle	TIMO	800,000
MeadWestvaco	Industrial	730,000
Others (in alphabetical order)		
Brookfield Asset Management	TIMO	
Conservation Forestry	TIMO	
Dasos Capital	TIMO	Based in Finland
Essex Timber Company	TIMO	
First Forest	TIMO	Based in Germany
Forest Legacy Investments	TIMO	
Forest Systems	TIMO	
Fountains Forestry	Property management firm	
Four Winds Capital Management	Manager of Phaunos Timber Fund	Traded on the London Stock Exchange
Global Forest Partners	TIMO	
GreenWood Resources	TIMO	
GTX		
International Woodlands Corporation	TIMO, consultant	Based in Denmark
McDonald Investment Company		
Molpus Timberlands Management	TIMO	
National Timber Partners	Subsidiary of National Land Partner	
Olympic Resource Management	Subsidiary of Pope Resources	
Pinnacle Timberland Management	TIMO	
Pope Resources	Master limited partnership (industrial)	
Prudential Timber Investments	TIMO (acquired by Hancock Timber Resource Group)	
Resource Investments	TIMO	
Simpson Investments	TIMO	
Southern Timber Ventures	TIMO	
Stafford Timberland Limited	Timberland funds of fund managers	Based in London, UK, and Sydney, Australia
Strategic Timber Trust		
TC&I Timber Company		
The Lyme Timber Company		
Timber Value/Brazil Timber	TIMO	Based in Brazil
Timberland Investment Resources	TIMO	
Timberland Investment Services	TIMO	
TimberSTAR	TIMO	
Travelers Realty Investment Company	TIMO	
UBS Resource Investments	TIMO	
United Investment Managers	TIMO	
US Timberlands	TIMO	
Wachovia Investment Management	TIMO	
Wells Timberland	Private REIT	

[a] Acreage data from Forisk Consulting (2011).
Sources: Various TIMOs and REITs.

processing plant within the state or a nearby state or province.

• TIMO/REIT status—a variable indicating whether the manager/owner is a TIMO or a REIT, each classified separately.

Examining the list of corporate FIA plot owners, disassociated with the plot data, we have then identified TIMOs and REITs from our list in Table 1. For our purpose, we have classified the ownership as the time when the plot was measured. For example, if a plot was measured in or before 2009 and the owner was Weyerhaeuser Co., it would be marked as industrial ownership. The same plot, if measured in 2010, would be

identified as a REIT because Weyerhaeuser Co. converted itself to a REIT in early 2010. Finally, the classifications were returned to the FIA who merged the new ownership categorization variables with the underlying FIA database.

Not all data categories are available for all the southern states for all years. We have used 2010 FIA data for eight states (Alabama, Arkansas, Florida, Georgia, North Carolina, Oklahoma, Texas, and Virginia) and 2009 FIA data for three states (Kentucky, South Carolina, and Tennessee) to present land area, forest type, forest inventory, forest growth, and removal. Statewide estimates are developed using FIA population estimates for the respective states and years (FIADB4 2011). However, the ownership transition matrix (see later in text) is based on the time when each plot was measured in two periods that span from 1994 to 2010.

The generalized spatial distribution of the broad ownership classes are assessed using the Euclidian allocation method in ArcGIS (Esri, Redlands, CA). This technique assigned each pixel on the map an ownership category based on proximity to nearest classified plot (using approximate plot coordinates) and overlaid these data with public ownership polygons from the Protected Areas Database (Conservation Biology Institute 2010) and a nonforest mask derived from the National Land Cover Dataset (Homer et al. 2004).

Ownership and land-use dynamics are examined using ownership transition matrices. For the remeasured plots in the study area, the ownership and land use (i.e., forest or nonforest) are examined for two points in time. Only the information at plot center was used. The exact dates of the measurements varied, but the first time step (ranged from 1994 to 2003) had a median year of 1999 and the second time step (ranged from 2004 to 2010) had a median year of 2008. The mean length between remeasurements was 9.5 years (SD = 3.3).

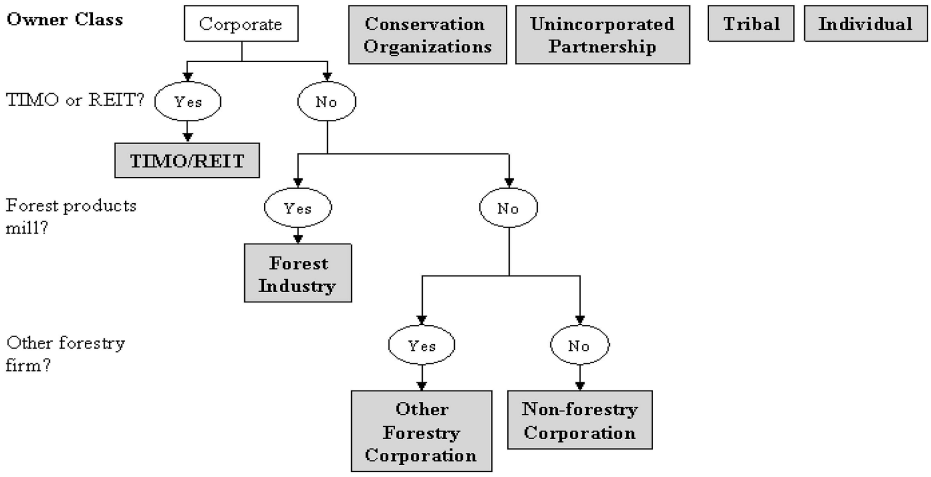

Figure 1. Classification of corporate timberland ownership in the United States.

Table 2. Estimated timberland area for 11 southern states by ownership and forest origin in acres, 2010.[a]

Ownership group[b]	Planted	%	Natural	%	All forests	%
All public (11–33)	2,937,131	7.4	21,334,635	16.2	24,271,766	14.2
Corporations (41)						
Forest industry (41.1)	3,517,364	8.9	3,379,648	2.6	6,895,930	4.0
Other forestry[c] (41.2)	971,751	2.5	1,028,065	0.8	1,999,487	1.2
Other corporation (41.3)	6,851,411	17.3	18,946,987	14.4	25,792,332	15.1
TIMOs (41.4)	5,193,211	13.1	3,573,355	2.7	8,765,423	5.1
REITs (41.5)	5,154,014	13.0	2,564,383	2.0	7,717,576	4.5
Individuals (42–45)						
Individuals (45)	14,523,391	36.6	78,088,582	59.5	92,586,971	54.2
Other entities[d] (42–44)	492,904	1.2	2,434,260	1.9	2,926,384	1.7
Total	39,641,178	100.0	131,349,926	100.0	170,991,104	100.0

[a] Including AL, AR, FL, GA, KY, NC, OK, SC, TN, TX, and VA. Data for KY, SC, and TN are for the year 2009. No data are available for LA and MS.
[b] The numbers in parentheses are ownership classification code used by FIA (the integer) and the authors of this article (the decimals).
[c] Including forest consultants, logging firms, and incorporated tree farmers.
[d] Including nongovernmental conservation organizations, unincorporated partnerships, associations and clubs, and tribal.
Source: Estimated from FIADB4 (2011).

Table 3. Estimated merchantable volume of growingstock by forest type on timberland (million ft³).[a]

Ownership group	Softwoods	Mixed	Hardwoods	Nonstocked and other	Total	Per acre (ft³)
All public (11–33)	13,935	5,043	25,529	544	45,052	1,856
Corporations						
Forest industry (41.1)	5,251	365	3,712	3	9,330	1,353
Other forestry (41.2)	1,338	140	784		2,262	1,131
Other corporations (41.3)	12,993	3,196	19,936	158	36,284	1,406
TIMOs (41.4)	6,717	685	3,316	14	10,732	1,224
REITs (41.5)	5,769	822	2,296		8,887	1,151
Individuals						
Individuals (45)	36,488	13,896	84,110	818	135,312	1,461
Other entities (42–44)	1,121	522	3,187	135	4,966	1,697
Total	83,612	24,669	142,871	1,673	252,824	1,479

[a] See Table 2 footnote.

Results

Magnitude

Our estimates indicate that individuals own approximately 54% of all timberland in the 11 southern states as of 2010 (Table 2). TIMOs manage an estimated 8.8 million ac or 5.1%, which is five times more than the 1.39 million ac in the whole 13 southern states in 1990 (Zinkhan 1993). Public timberland REITs own 7.7 million ac or 4.5% of timberlands in these states. Combining TIMOs and public timberland REITs, the acreage reaches 16.5 million ac or 9.6%. Industrial timberland ownership is 4.0%. A larger share of timberland—some 26 million ac or 15%—belong to other, nonforestry, corporations in which their many businesses are in utility, mining, family farms, and nontimberland real estates.

TIMOs and REITs, however, do disproportionally manage/own more (about 26% or 10.3 million ac) of the planted forests in these states. Furthermore, the per-acre inventory of merchantable volume of growing stock on timberlands managed or owned by TIMOs and REITs is lower than that owned by families/individuals and other corporate owners (Table 3). This indicates that forests owned/managed by TIMOs and REITs are more intensively managed (and harvested) than other forests. Third, most of the forests managed/owned by TIMOs and REITs are softwoods (Table 3). Forest industry owners have similar forest types as TIMOs and REITs. In contrast, families/individuals, other corporations, conservation organizations, and public ownerships have hardwoods as the dominant forest type.

Table 4 presents the annual growth and removal by forest type and ownership. Timber growth exceeds removal in all ownership categories. However, TIMOs and REITs as well as forest industrial owners have harvested more hardwood annually than its net growth. This suggests that these managers/owners have been converting some hardwood forests to softwood forests. This phenomenon is not apparent for other landowners.

Location

Figure 2 presents the location of timberlands by ownership in the South. It shows that most of the timberlands managed by TIMOs and owned by timberland REITs are concentrated in three locations: the coastal plain and Piedmont regions of Alabama, Georgia, and Florida; the coastal plain region of eastern Texas, Arkansas, and southeastern Oklahoma; and the coastal plain region of South Carolina, Virginia, and North Carolina. Timberlands owned by industrial firms are more evenly spread between the coastal plain and Piedmont regions in the South.

Dynamics

With notable exceptions, the ownership transition matrix (Table 5) shows that the dominant trend is for timberland to stay within an ownership/land-use category. This is indicated by the high values along the primary diagonal of the matrix. The main changes are in the forest industry and nonforest categories. Looking at the timberland that was owned by forest industry in 1999, 20% remained in forest industry, 24% transitioned to TIMOs/REITs by 2008, 20% was other corporates, 18% was to family, 12% became nonforest, and the rest was scattered across the other categories. Although it is not possible to tell if there were any intermediate owners, with these data, looking at marginal changes (i.e., within a column or row) the matrix shows that most (64%) of TIMOs and REITs was from forest industry, but 25% was from NIPFs, and 8% was nonforest (for which no ownership is collected). Because TIMOs and REITs were identified as NIPF before 2002, we suspect that some of the timberlands owned/managed by TIMOs and REITs in the last measurement cycle actually belonged to other TIMOs and REITs in the previous measurement cycle.

Table 4. Estimated per acre net annual growth and removals by forest type and ownership group (ft^3).[a]

Ownership group	Softwoods		Hardwoods		Total	
	Growth	Removals	Growth	Removals	Growth	Removals
All public (11–33)	53.3	17.8	50.9	2.8	51.8	8.4
Corporate						
Forest industry (41.1)	133.4	74.4	35.6	39.4	97.7	61.7
Other forestry (41.2)	123.8	75.4	30.4	4.8	84.4	45.6
Other corporations (41.3)	110.8	72.0	37.7	35.1	67.1	50.0
TIMOs (41.4)	129.2	81.7	34.5	63.0	100.7	76.1
REITs (41.5)	130.4	89.6	38.8	74.9	103.6	85.3
Individual						
Individuals (45)	114.1	44.0	42.0	30.4	63.3	34.4
Entities (42–44)	120.4	90.7	57.1	57.6	76.5	67.7
Average	109.9	56.0	42.3	29.6	68.1	39.7

[a] See Table 2 footnote.

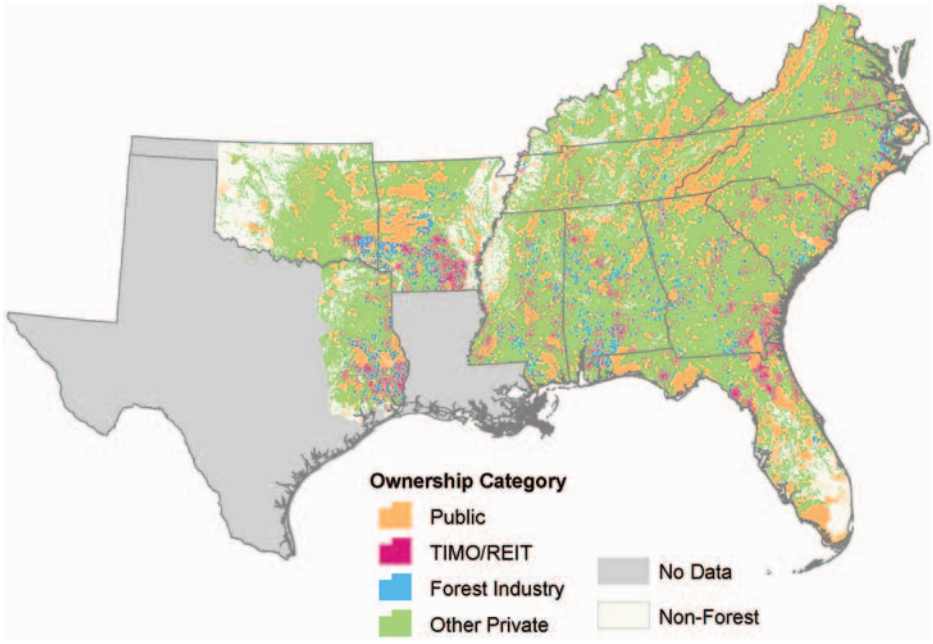

Figure 2. Forest cover by ownership type in the southern United States in 2010.

Management

Because a large portion of institutional timberland owners have a short- to medium-term investment horizon, the sustainability of their management has been a common question. Their rate of timber harvesting is certainly lower than the rate of timber growth (Table 4). Furthermore, comparing with other ownerships, TIMOs/REITs have a healthy, perhaps better, grow/drain ratio and are, arguably, generally more sustainable, at least in terms of growth, to removals ratios (Table 4). Another indicator would be their reforestation behavior.

We have also examined reforestation practices of TIMOs and REITs. We found that TIMOs and REITs do reforest their lands soon after timber harvesting. The rate of reforestation for both TIMOs and REITs

Table 5. Forest ownership transition matrix for the US South from 1999 to 2008.[a]

		To									
		Public			Private						
		Federal	State	Local	Forest industry	TIMO/REIT	Other[b]	Individuals	Conservation organizations	Nonforest	Sum
From	Federal	**3.5**	0.1	0.0	0.1	0.0	0.2	0.5	0.0	0.6	5.1
	State	0.1	**0.7**	0.0	0.0	0.0	0.1	0.1	0.0	0.4	1.4
	Local	0.0	0.0	**0.2**	0.0	0.0	0.0	0.0	0.0	0.1	0.4
	Forest industry	0.3	0.3	0.0	**1.9**	2.3	1.9	1.7	0.2	1.2	9.7
	NIPF[c]	0.7	0.5	0.1	0.8	**0.9**	**5.5**	**23.5**	**0.5**	5.3	38
	Nonforest	1.0	0.7	0.2	0.3	0.3	1.5	3.7	0.3	**37.4**	45.4
	Sum	5.6	2.3	0.7	3.1	3.6	9.2	29.5	1.0	44.9	**100.0**

[a] Numbers represent percentage of all plots—forested and nonforested. Numbers in boldface indicate diagonal and represent the percentage of timberland remained in the same ownership between the two measurement cycles. This table includes AL, AR, FL, GA, MS, NC, SC, TN, TX, and VA. KY, LA, and OK were excluded due to lack of data.
[b] Including other forestry corporations and nonforestry corporations.
[c] NIPF owners.

Table 6. Estimated probability of reforestation within two inventory cycles by ownership.

Ownership	Estimated probability
Forest industry	80%
TIMOs and REITs	84%
All other ownerships	69%
Average of all ownerships	75%

is more than 80%, which is comparable with that of forest industry owners and is much higher than all other forest landowners (Table 6). Although detailed statistical analysis needs to be performed to better explain the difference in the rates of reforestation among these landowners, it suffices to point out that institutional timberland owners have a longer investment horizon than their period of investment may indicate. At a minimum, it appears that TIMOs and REITs believe that their investment in reforestation will bring them an adequate return in capital appreciation even though their trees may not be mature when they decide to sell their timberlands.

Conclusions and Discussion

We have identified a list of both major TIMOs that manage timberland for institutional investors and public timberland REITs and mapped their general distribution across the South. Most of the timberlands owned/managed by these two groups were previously owned by forest products companies. Collectively, these two groups now manage/own nearly 10% of timberlands and some 26% of planted forests in the 11 southern states. Their forests are mostly softwood, and the overall timber growth in these forests exceeds removal, suggesting that these forests are managed sustainably. As these managers/owners remove more hardwood than is annually grown on their lands, a positive net growth in their forests suggests that they convert some hardwood forests into softwood forests. Finally, these two groups, as industrial forest owners, do promptly reforest after timber harvesting. These results are indirectly confirmed in separate surveys conducted by Siry and Cubbage (2001) and Rogers and Munn (2003). The former finds that planted pine dominates the holdings of TIMOs who manage their lands as intensively as industrial owners in the South, and the latter reveals that institutional timberland owners manage their timberland as intensively as industrial owners in Mississippi.

Divestment of industrial timberland ownership by vertically integrated forest products firms has occurred in the last 30 years because of a mix of corporate decisions, investor desires, and public policies. The infusion of capital from institutional investors into timberlands was instrumental to provide a transition to a different structure for sustainable forest management in the country. Although much of the industrial timberland ownership has changed, TIMOs and timberland REITs still focus on productive forests and harvest hardwoods and convert to pines, but they do this in a sustainable fashion in terms of growth-to-drain and reforestation.

We do not suggest that institutional timberland owners and industrial timberland owners are the same or that they behave similarly in all aspects of forest management: their corporate objectives and incentive structures are different, which will ultimately affect their decisionmaking and management activities. For example, a concern among some policymakers has been that institutional investors might be more likely to convert their timberlands to developed uses. The reasonableness of this concern is yet to be substantiated or refuted in a scientific manner. Furthermore, the rise of institutional timberland ownerships in general and the long-term timber supply agreements between some TIMOs and forest products companies, in particular, may have triggered a significant change in the structure of timber markets, the conduct of the forest industry, and the ownership-specific and aggregate timber supply in the country. Third, it remains to be seen what institutional investors will do and how TIMOs and timberland REITs evolve after large tracts of industrial timberlands have now largely been bought. Finally, timberland ownership through TIMOs (the TIMO model) or public timberland REITs (the REIT model) each offers different advantages and disadvantages to institutional investors in terms of economies of scale, management and control, liquidity, risk diversification, and financial returns. Although both models can increase and have their respective market share, one may gain market share at the expense of the other in the future.

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