

The Basics of
TIMBERLAND INVESTING

by

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Investing in Timberland

Although investing in timberland is certainly not a new concept, activities on Wall Street and in the pension fund world indicate that it is becoming a popular alternative investment. It is currently estimated that large institutional investors have over nine billion dollars invested globally in timberland as part of their overall portfolios, and indications are for this trend to continue to accelerate.

Investors, whether large or small, institutional or private, have many reasons to consider timberland. First, there is the value appreciation of both the timber and the land components. There are also periodic cash returns from the sale of timber and land and the potential for annual lease income from other natural resources and recreation.

Investing in timberland offers a good means of portfolio diversification and as a hedge against inflation. Timberland is also a “hard” (physical) asset with a limited supply. There is a great deal of satisfaction in owning undeveloped land with numerous outdoor opportunities which include hiking, camping, hunting, fishing and jogging. There are also income and estate tax advantages to owning real estate.



Allegheny National Forest - Little Arnot Area - 1927

Timberland investments offer many opportunities for appreciation in value. These factors can be broken apart and estimated separately.

Biological growth. As an investment, trees have an interesting attribute – they grow.

Influenced by species type, location and other factors, tree growth adds value to trees on a



Allegheny National Forest - Little Arnot Area - 1937

consistent basis. The United States Department of Agriculture’s Forest Service has developed a growth and yield model applicable to the northeastern United States called NE TWIGS.

For purposes of this paper, annual growth rates for the major species have been estimated by entering timber data collected from almost 200,000 acres of commercial timberland in northern Pennsylvania and southern New York into the NE TWIGS model. Here is a summary of these annual growth rates by species:

<u>Species</u>	<u>Annual Growth Rate</u>
Red Oak	3.75 %
White Oak	3.69 %
Black Cherry	5.11 %
White Ash	5.02 %
Sugar Maple	2.22 %
Red Maple	3.44 %
Poplar	4.20 %
Other Hardwoods	2.22 %
Pine/Hemlock	5.62 %
Composite Average	3.92 %

Sources: Forecon, Inc. and the USDA - Forest Service, Northeastern TWIGS model.

In summary, this growth study indicates a growth rate of between 2.22% for sugar maple and 5.62% for hemlock and pine. Assuming an even mix of volumes among this species list, a composite average would be 3.92%. In other words, an investment in timberland containing an equal stocking of timber in the species listed above will appreciate at an average annual rate of 3.92% merely because the trees on the property grow at that rate; this creates a “floor” return for an investment in timberland. Good forestry management and site conditions will improve these annual growth rates.

Price appreciation. Though renewable, timber is still a geographically limited natural resource that has experienced increased demand. Accordingly, the price of timber (hardwood timber in particular) has increased over time. Since the mid 1980’s, the Pennsylvania State University, School of Forest Resources has published a quarterly *Pennsylvania Woodlands Timber Market Report*. During the period December 1985 through December 2001, reported timber prices have increased significantly, with black cherry experiencing an 830% increase. Other valuable hardwood species have seen significant increases as well.



Allegheny National Forest - Little Arnot Area - 1947

Below is a table comparing average stumpage prices by species in northwestern Pennsylvania for December 1985 and December 2001. Total and annually compounded increases are displayed, which when combined with the annual growth rate yields a Total Annual Increase for each species.

Species	Price per MBF (Doyle) 12/31/85	Price per MBF (Doyle) 12/31/2001	% Increase (16 Yrs)	Annual Compound Rate	Growth Rate	Total Annual Increase
Red Oak	\$ 261.03	\$ 791.57	203 %	7.18 %	3.75 %	10.93 %
White Oak	\$ 147.47	\$ 271.20	84 %	3.88 %	3.69 %	7.57 %
Black Cherry	\$ 286.46	\$ 2,664.54	830 %	14.96 %	5.11 %	20.07 %
White Ash	\$ 215.27	\$ 305.10	42 %	2.20 %	5.02 %	7.22 %
Sugar Maple	\$ 93.23	\$ 608.51	553 %	12.44 %	2.22 %	14.66 %
Red Maple	\$ 77.97	\$ 296.63	280 %	8.71 %	3.44 %	12.15 %
Poplar	\$ 57.63	\$ 183.06	218 %	7.49 %	4.20 %	11.69 %
Misc. Hdwds.	\$ 49.16	\$ 111.87	128 %	5.27 %	2.22 %	7.49 %
Pine/Hemlock	\$ 52.55	\$ 67.80	29 %	1.61 %	5.62 %	7.23 %
Average	\$ 137.86	\$ 588.92	327 %	9.50 %	3.92 %	13.42 %

Source: Pennsylvania State University, School of Forest Resources Pennsylvania Woodlands Timber Market Report and NE TWIGS Growth Model.

The US Forest Service prepared a similar study of hardwood stumpage prices in all of Eastern United States from 1965 through 1997. During that period the average price for all eastern hardwoods increased over 1,000% with an annual internal compound rate of 7.67%.



Allegheny National Forest - Little Arnot Area - 1958

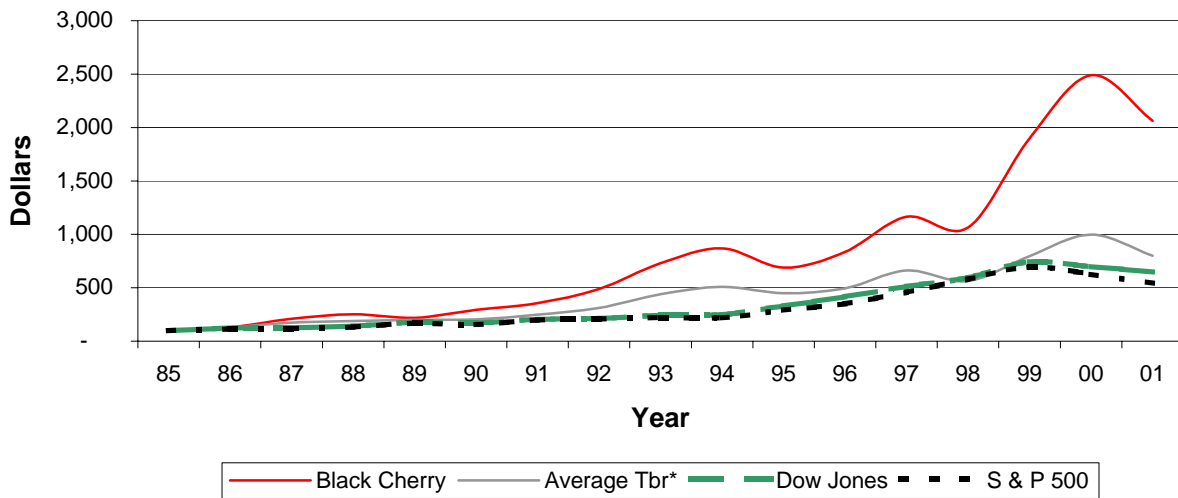
Using the US Forest Service growth estimates and the Penn State price data, the combination of growth and price indicates an annual appreciation rate of 13.42%. However, both increases actually enhance each other through compounding, and a more accurate estimate of annual appreciation in value due to average growth and price appreciation is 13.89%.

Below is a table and graph that depicts the annual value of \$100 invested in December 1985 in various timber assets and stock indices.

Annual Value of \$100 Invested in 1985 in Various Timber Assets and Stock Indices

Asset/Yr.	'85	'86	'87	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01
Red Oak	100	148	189	191	227	260	298	298	438	463	472	470	571	513	558	721	547
W.Oak	100	145	176	192	206	241	305	305	347	408	345	353	433	402	468	513	329
Cherry	100	129	209	252	219	356	487	487	732	868	688	836	1167	1065	1900	2491	2063
W. Ash	100	127	169	190	219	211	260	260	326	359	392	378	429	294	374	438	310
Hd.Maple	100	126	129	126	157	207	298	298	442	505	385	502	921	656	816	1003	928
Sft.Maple	100	117	135	130	152	184	223	223	359	424	335	410	623	563	625	812	654
Avg.Tbr.	100	133	173	188	201	248	313	313	441	509	448	496	663	565	798	998	801
D.Jones	100	122	125	140	178	205	213	213	243	248	331	417	511	594	743	697	648
S&P 500	100	115	117	141	167	197	206	206	221	217	292	351	459	582	695	625	543

Annual Value of \$100 Invested in 1985



Source: Pennsylvania State University, School of Forest Resources Pennsylvania Woodlands Timber Market Report and NE TWIGS Growth Model.

* Average timber is equal mix of all species reported by Pennsylvania State University

In summary, this data indicates that \$100 invested in December 1985 in a portfolio of stocks comprising the Dow Jones Industrial Average and the S & P 500 would be worth \$648 and \$543, respectively, in December 2001. Similarly, a \$100 investment in black cherry, hard maple and red oak would be worth \$2,063, \$928 and \$546 respectively, in December 2001. In fact, \$100 invested in 1985 in an equal mix of all species reported by Pennsylvania State University would have been worth \$801 in December 2001.

Grade improvements. Timber also increases in value because of grade improvements. For instance, one MBF (thousand board feet) of twenty-four inch diameter material is worth considerably more than one MBF of eighteen-inch diameter material, which in turn is worth more than one MBF of twelve-inch diameter material. Furthermore, veneer grade trees are worth considerably more than sawlog grade trees. Similarly, a straight tree with little branching is more valuable than a poorly formed stem.



Allegheny National Forest - Little Arnot Area - 1968

Good forestry produces grade improvements in at least two ways. First, poorly formed and unhealthy trees are removed from the stand through intermediate thinnings thereby allowing the straighter, healthier trees to remain. Second, a well maintained stand grows faster and is more likely to regenerate in genetically superior trees.

One method of estimating this grade appreciation is to consider the reported price range from the Penn State Market Report. In their quarterly report they indicate price levels both one standard deviation unit above and below the average price. Statistically, this range of prices includes two-thirds of all reported prices for that species.

Using this reasoning, if the timber sold from the property can increase in price one standard deviation unit because of good forest management practices, an additional 2.98% of annual appreciation over this same sixteen year period would apply.

Species composition. Another means of enhancing the value of a timberland investment is to improve the species mix on the property. Good forestry often dictates the removal of undesirable species while retaining species diversification. This factor is difficult and impractical to estimate. Existing conditions and landowner considerations play major roles in this alteration of species composition. But obviously, a change from a beech / hemlock stand to a black cherry or oak stand will yield a considerable change in value per acre.



Allegheny National Forest - Little Arnot Area - 1978

Vegetation control and integrated pest management. Proper control of competing vegetation and pest control will increase the growth rate and density of timber on a tract. There may be times during the management of timber that pest or vegetation control needs to be considered. A cost benefit analysis can be performed for the ownership unit to aide in this decision.

Timber sale administration. Timber sales can be timed and presented to maximize value. A prospectus requesting sealed bids can be prepared and mailed to many potential timber buyers.

With some flexibility, timber sales can be accelerated or delayed to match market conditions. Sawmills with special needs (shortages, species demands, etc.) can often be matched with the subject timber offering.

In short, investments in timber are often purchased and subsequently sold in different markets. In theory, an investor purchases timber at “wholesale” and sells timber at “retail”.

Regeneration. The key to sustainable forestry is in providing for the forests of tomorrow. The ability to naturally regenerate a forest by using proper silvicultural techniques is the cornerstone for ensuring that a timberland investment remains productive long into the future. When an investor harvests and sells timber in the proper manner, one of the many beneficial results is the natural development of a new stand of trees, with attributes sometimes different than the previous stand.

Summary of timber appreciation. Combining all of these factors - growth, price, quality, management, and proper marketing - indicates an annual appreciation rate of 15% to over 20% for timber in our region.

There is also the bare land to consider.

Land. Historically, land has been slow to appreciate in value. A few axioms do apply, however, such as “location is the key to value” and “they are not making any more ground”. Proper management of the timberland can enhance the “bare land” value. A well maintained forest with a good road system and identified boundary lines will greatly enhance value. Furthermore, the increased demand for recreation properties and leases has started to improve the market for rural real estate in our region.

Costs. Like any investment, timberland costs money. Besides the initial investment, there are also annual costs associated with the ownership of timberland. There are recurring items such as real estate taxes, forest management costs, road development and maintenance and general property maintenance that need to be provided for on an annual basis. Although these annual costs can be sizable, in perspective they appear to be more reasonable.

At this time, in our area, we are experiencing “bare land” values of \$100 to \$600 dollars per acre for timberland. On the other hand, timber values range from \$500 to \$3,000 per acre with timber values in excess of \$7,000 per acre not unusual. In general, annual real estate taxes range from \$3 per acre in Pennsylvania to \$20 per acre in some areas of New York. Similarly, property maintenance costs can range from \$5 per acre to \$25 per acre.

Accordingly, a high cost property may be nearly \$40 per acre per year. If this tract contains \$2,500 per acre in timber and the timber is appreciating in value at 18%, this is a gross annual return of \$450 per acre. Taking these “expenses” into account, a reduction of \$40 per-acre yields a net annual appreciation of \$410 per acre or a rate of 16.4% rather than 18%. Oftentimes, annual costs are offset by lease income. Annual recreation (hunting) leases range from \$3 to \$15 per acre.



Allegheny National Forest - Little Arnot Area - 1989

Tax Advantages. There are income tax advantages to owning real estate and timberland in particular. The occasional sale of real estate qualifies for long-term capital gains. Also, the sale of timber qualifies for capital gain treatment, either as the sale of a capital asset or with a Code Section 631 election, which provides capital gain status for the sale of timber, coal and iron ore and ordinary deductions of business expenses if certain requirements are satisfied.

The Internal Revenue Code also provides for a reforestation tax credit. This tax credit, which reduces an individual’s tax liability dollar for dollar, is 10% of up to \$10,000 per year per

individual for qualified reforestation expenditures. After reducing the expenditure by one half of the credit, the balance of the expenditure can be deducted over an eight-year period.

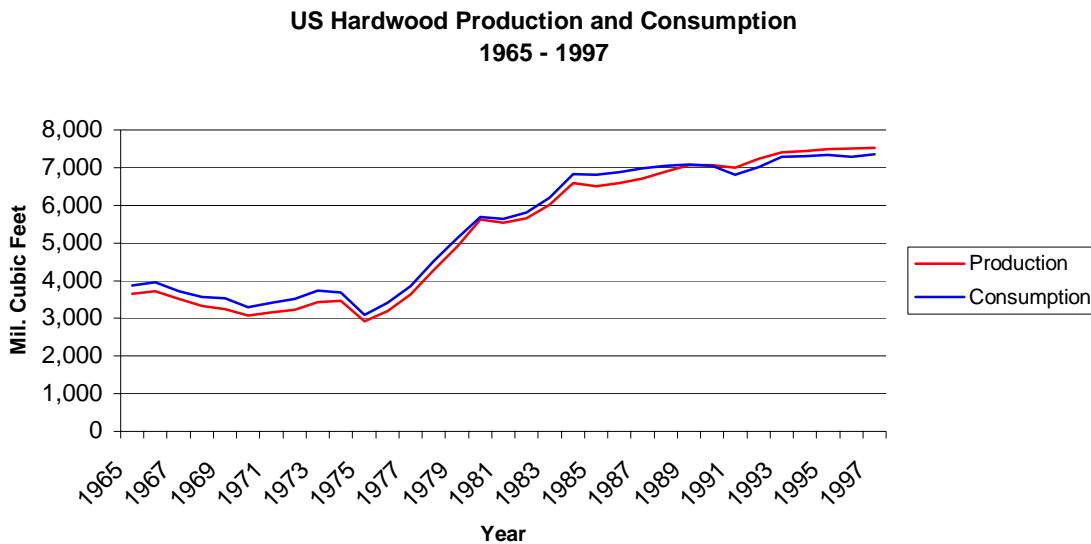
Ownership of real estate also lends itself well to the like kind exchange provisions of Section 1031 of the Internal Revenue Code. Without going into details, Section 1031, provides great flexibility to taxpayers that want to transfer a property, yet reinvest the proceeds into other real estate. With the correct steps and intermediaries this “exchange” can be accomplished tax-free.

The Future. The preceding information is largely historical. It is more difficult to look to the future, but there are numerous long-term trends that support private investment in timberland and hardwoods in particular.

Our region of Western New York and Northwestern Pennsylvania is blessed with some of the finest hardwoods in the world. The highest quality black cherry in the world is grown within a 100-mile radius of Kane, PA or roughly from Pittsburgh to Buffalo and Cleveland to Elmira. Our region is also known for its high quality red oak and sugar maple.

Another favorable trend in hardwood demand and the ownership of timberland is the changing demographics in the United States. Not only is the U.S. population growing, but, also as we mature we are more likely to purchase hardwood products in the form of furniture, cabinets and flooring. Furthermore, technology changes have enabled many people to work out of their homes, accommodating a more rural lifestyle.

The following chart prepared by the USDA - Forest Service shows data on domestic production and consumption of hardwood products in millions of cubic feet for the period 1965 through 1997.



Source: United State Department of Agriculture, Forest Service

This data indicates that hardwood production rose from 3,647 million cubic feet (MMCF) in 1965 to 7,526 MMCF in 1997. Similarly, hardwood consumption rose from 3,865 MMCF in 1965 to 7,263 MMCF in 1997.

Intangible Factors. There are many other reasons to own real estate and timberland in particular. An investment in timberland provides portfolio diversity and reduces risk. Furthermore, the timberland itself is a diverse asset of many components.



Allegheny National Forest - Little Arnot Area - 1998

There is also a high degree of satisfaction in owning real property; a place to go, woods to visit, a recreation site, in short - a hard, tangible asset. Timberland is considered to be environmentally friendly, as trees absorb carbon dioxide (a “greenhouse” gas). This is called “carbon sequestration,” and may have financial benefits to timberland owners in the future, as there is discussion of trading the environmental benefits of reducing greenhouse gases with other operations that want to increase emissions of greenhouse gases.

Summary. Appreciation and value of a timberland investment is realized in many ways:

- ❖ Timber growth
- ❖ Price appreciation
- ❖ Grade improvement by size
- ❖ Grade improvement by removal of poorly formed and unhealthy trees
- ❖ Species enhancement by removal of undesirable competing vegetation
- ❖ Growth acceleration by
 - Proper thinning
 - Pest control
- ❖ Natural regeneration

- ❖ Land enhancements
 - Boundary line maintenance
 - Sound forestry
 - Vegetation control
 - Recreation considerations maximized, hunting, trails, wildlife, etc.

- ❖ Financial incentives
 - Capital gain treatment for timber sales
 - Capital gain treatment for occasional land sales
 - Reforestation credit and deduction
 - Tax-free exchange
 - Basis recovery

Allegheny National Forest – Little Arnot Area 1927 – 1998. The photographs in this report were taken by individuals from the United States Forest Service, Allegheny Experimental Station. The site is near Little Arnot Creek in Warren County, PA. The pictures were taken in nearly ten year intervals at the same location.

In 1927, the timber was removed in two harvests. The first was a sawtimber removal in the winter of 1927. Later that year most of the remaining trees were removed for use as chemical wood. By 1937, there was extensive regeneration, primarily shade intolerant black cherry.

By 1947, within twenty years of the harvests, the forest was reestablished and growth rate differences were apparent. The dominant species were black cherry, hard maple and pin cherry, a short-lived species.

During the next fifty years, to 1998, the stand continued to mature. In 1998, there was 8,032 board feet of sawtimber per acre with black cherry comprising 67% of the total. The next most dominant species was hard maple followed by basswood. Today, the sawtimber on this stand is worth over \$10,000 per acre.

