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13

Unique By Nature

TIMBER INVESTMENT IN A GLOBAL ECONOMY

*By Matthew J. Haertzen, CFA, Chief Investment Officer and
Brian K. Hayes, Managing Director, Cogent Partners, L.P.*

Cogent Partners is an international investment firm specializing in the investment of alternative assets and transactions of private equity secondary assets. The firm's clients include tax-exempt organizations, financial institutions, corporations and individual investors. Cogent Partners' depth of insight of alternative assets remains unmatched in the industry, as the firm draws on extensive experience and proprietary tools to produce maximum value for our clients. Cogent Partners offers advisory services in a number of non-traditional assets.



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Mr. Haertzen brings experience to Cogent Partners from the State of Idaho Endowment Fund Investment Board where he acted as the Manager of Investments responsible for \$1.2 billion in financial assets. While with the State of Idaho, Mr. Haertzen also performed portfolio analysis for the \$2 billion Idaho real asset portfolio comprised 90% of timberland. Mr. Haertzen holds a BA in Economics and Business from the University of Minnesota, Morris and an MBA in Finance and Strategic Management from the University of Minnesota Carlson School of Management.

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Investing in Timber

Opportunities

- Harvest of biological growth
- Additional returns from environmental benefits

Traditional Barriers

- Timber values vary by local market
- High entry point makes diversification difficult
- Limited liquidity

The Solution

- Investing through a “fund of separate accounts” improves access, investment oversight, diversification and liquidity

Timber: A Growing Investment Class

Since the beginning of recorded history, groups have owned and profited from the forests that surrounded them. Only recently, however, has the opportunity to invest in timberland become a viable option for modern-day investors. In this paper, Cogent Partners provides an overview of timber as an asset class, and discusses the market forces making timberland throughout the world an attractive long-term holding. Where high entry points, unmanageable risk and a lack of liquidity once kept investors out of the forest, now a different approach to timber investment is changing the rules of the game.

As institutions and high net-worth individuals seek investment alternatives to diversify their traditional portfolios, an increasing number find themselves returning to nature. Nature, in this case, means timber – the world’s source for an abundance of paper, lumber and other wood products.

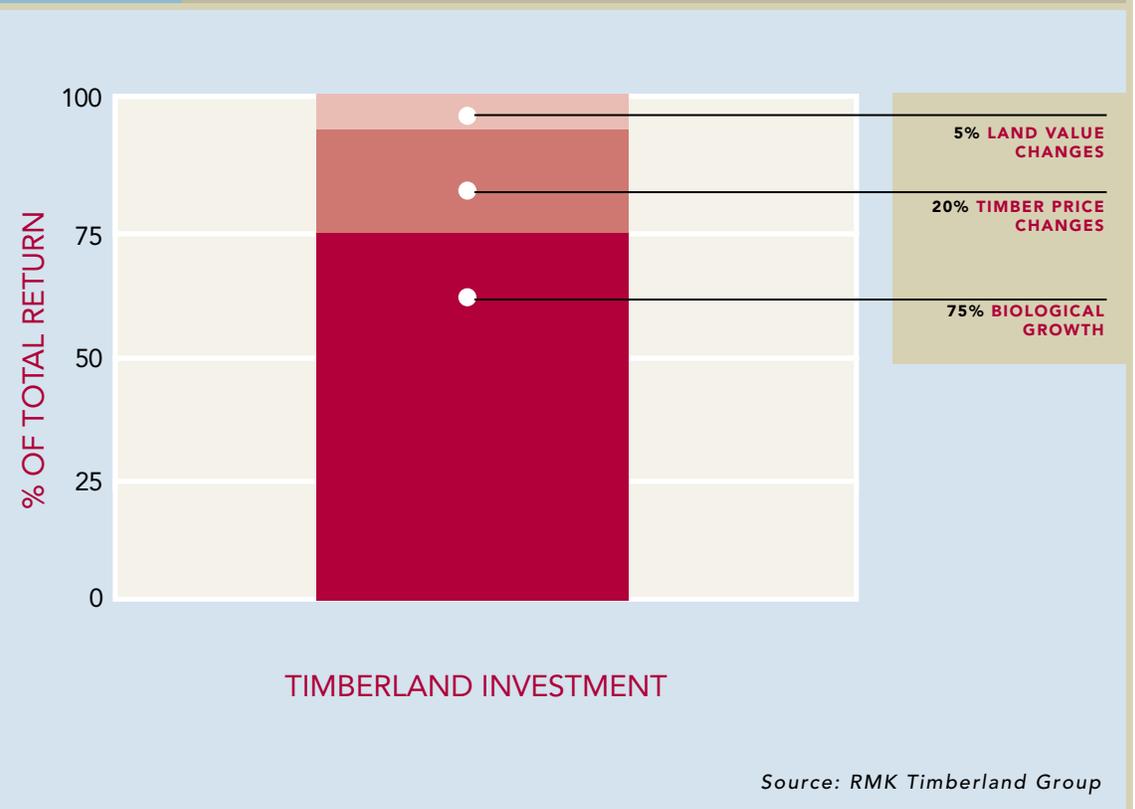
Timber is a unique investment opportunity. Even for a portfolio with traditional alternative assets like private equity, hedge funds, or real estate, timber can provide another layer of diversification with relatively low risk and the potential for substantial returns.

A Dual Opportunity

The single characteristic that best defines timberland as an investment class is biological growth, which has historically comprised about 75% of the total return from timber investments (Exhibit 1). More importantly, biological growth is not dependent on market forces. In other words, trees continue to grow, without concern for the economy.

EXHIBIT 1

Timberland Return Sources



Rather, biological growth is related exclusively to environmental factors such as soil nutrients, climate, rainfall, tree type, and growing season. Moreover, modern silviculture – the science of forest management – can improve this growth rate through techniques such as thinning, fertilization, and the use of genetically improved seedlings, making timber a truly renewable resource.

Not only is timberland valuable for commercial use upon harvesting, but its positive effects on the environment create additional opportunities for investment return. Good forestry management practices protect the habitat for fish and wildlife while improving air and water quality. The markets place value on these attributes, and the measurable effects can now translate to financial gain from the sale of carbon credits, watershed benefits, and conservation rights. These embedded options will provide an increasing portion of the total return from timber as the global economy continues to expand and environmental issues continue to grow¹.

¹See for example, Speth, J. G. 2004. *Red Sky at Morning*. Yale University Press, and US Central Intelligence Agency Publication "Mapping the Global Future", (http://www.cia.gov/nic/NIC_globaltrend2020_es.htm)

Growing Your Portfolio with Timber

The unique factors that characterize an investment in timber have made it an attractive asset class for several reasons:

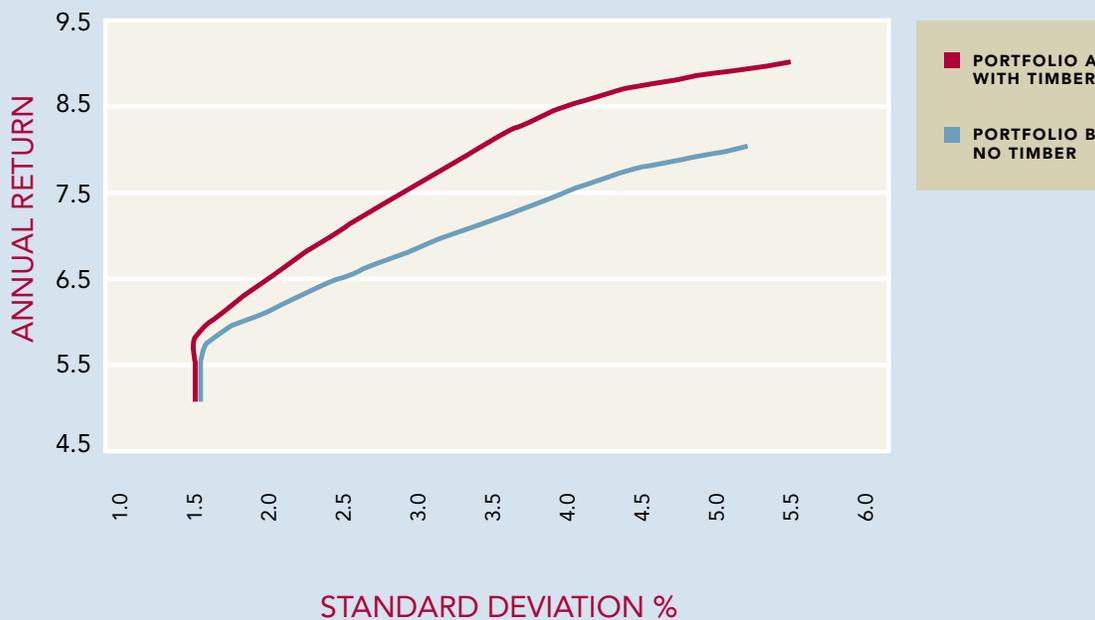
1. Timber has provided consistently strong long-term returns, as evidenced by the performance of the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index:

NCREIF INDEX*	1 Year	3 Year	5 Year	10 Year	Since Inception
	14.1%	8.6%	4.5%	7.7%	14.9%

* As of 6/30/05. Periods greater than one year are annualized.

2. The diversification benefits and low volatility of timberland move the efficient frontier upward and to the left, improving the risk/return characteristics of an investor's overall portfolio (Exhibit 2).
3. A well-diversified timber portfolio can provide a consistent yield to meet expenses or provide for beneficiary payments. The NCREIF Timber Index has averaged over a 6% income yield since inception, and timber portfolios can be tailored to deliver targeted income levels based on investor needs.
4. Timber provides a hedge against inflation. Historically, timber prices have increased at a rate 3% above inflation.

EXHIBIT 2 Efficient Frontier for Multi-Asset "Traditional" Portfolio



Source: The Campbell Group

Overcoming Investment Challenges

Despite its attractive potential, until recently timber has proved an elusive asset class for most investors, due in large part to several limitations. First, even as globalization has occurred, timber's value has continued to vary heavily by region, depending on local mill capabilities and the state of local timber markets. This local focus makes it essential to diversify any timber portfolio in order to achieve the highest risk-adjusted returns.

Unfortunately, a direct investment in timber requires a great deal of capital. Even if small institutions or individuals could afford a single direct investment in timber, making additional investments to achieve appropriate diversification would be out of reach. Thus, the high entry point has kept many investors out of the timber market altogether.

Further complicating the effort is the long-term nature of most timber investments. Even the fastest-growing trees don't yield a return for 15 years or more, which has led many investors to opt for a more liquid asset class.

Finally, direct investors in timber may also have difficulty capturing the environmental optionalities mentioned earlier, since success in this area depends on substantial scale in timber holdings, sophisticated information systems, and detailed market knowledge.

However, as this paper illustrates, the rules are changing to make timber a realistic investment alternative for a wider range of investors.

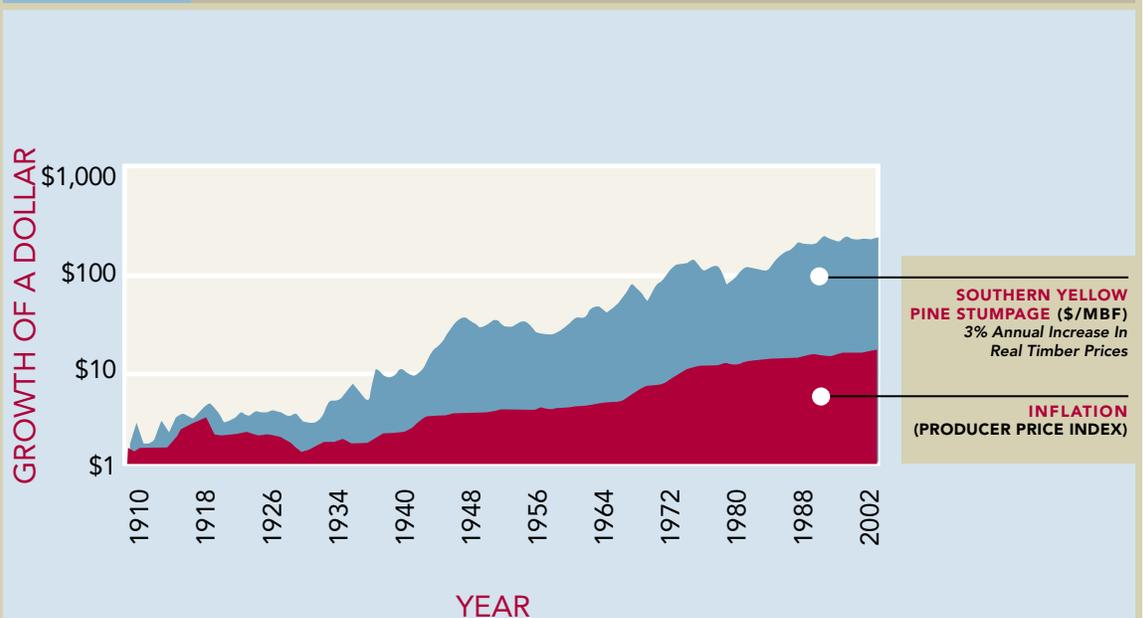
Keys to Success

A well constructed fund-of-funds, or perhaps more aptly a "fund of separate accounts," can make timber investment accessible and profitable for investors without a multi-billion dollar portfolio. Pooling funds from various sources to create and manage a broad portfolio of timber holdings provides the diversification, specialized investment oversight, and increased liquidity investors need to realize the true potential of timber.

Furthermore, the fund-of-accounts approach gives investors the resources and localized expertise to gain from environmental optionalities while generating regular cash flow.



EXHIBIT 3 Historical Real Timber Price Changes



Source: U.S. Forest Service, U.S. Department of Labor

A Growing Investment Class

As discussed in the executive summary, over the last century the real price of timber has increased at an average of 3% per year (Exhibit 3), regularly outpacing inflation. Several important macro-economic trends lead industry researchers to predict an even brighter future for timber's investment potential.

Supply is Shrinking ...

Land available for timber production is in a state of decline. Working forests continue to come out of production as the land is sold for housing development and other uses. In other areas, environmental conservation efforts increasingly restrict timber harvesting, particularly on publicly owned lands. As resources grow more scarce, they become more valuable.

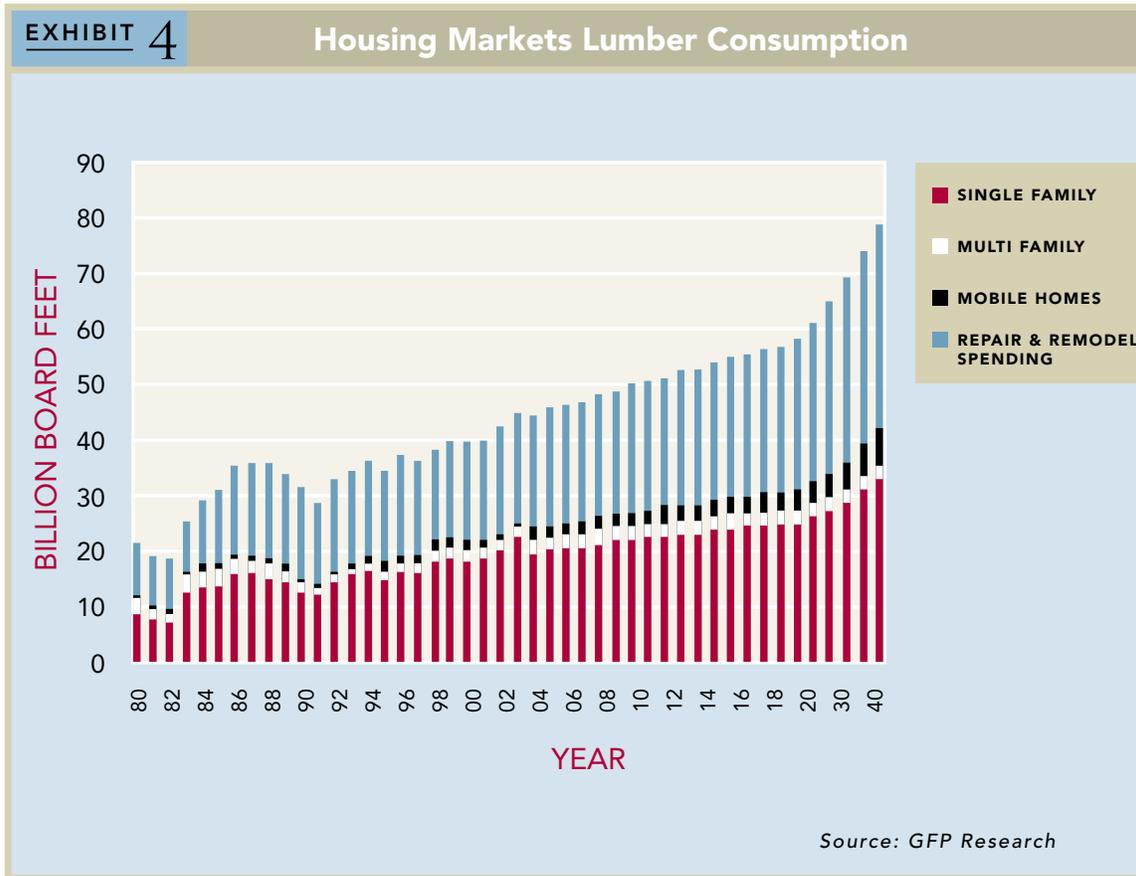
... While Demand Keeps Growing ...

Aging homes increase the need for lumber, and research shows that homes in the U.S. are getting older.

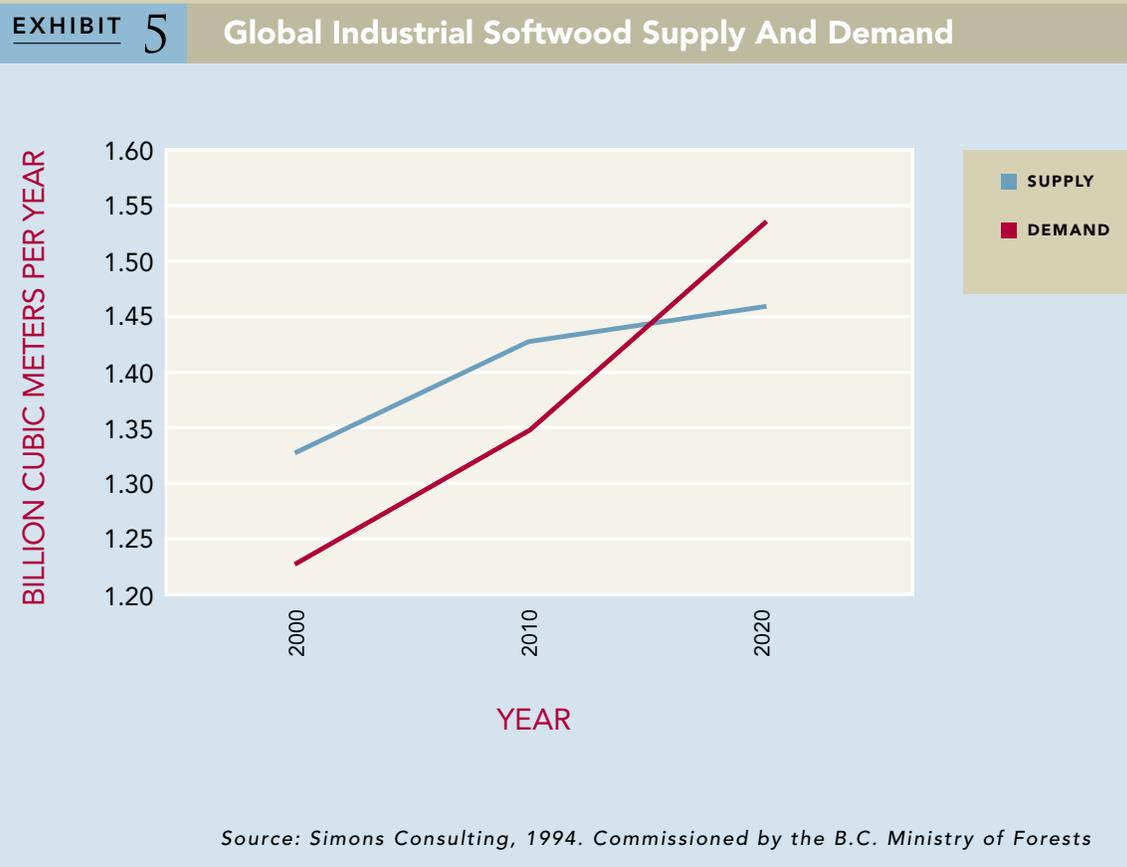
Despite record levels of new home construction, Global Forest Partners (GFP) reports that the median age of homes in the U.S. housing stock is 31 years, up 10 years since 1980. According to GFP, new housing starts still represent only 2% of the existing home base. This implies that as the current housing stock ages, more people will look to remodel and improve their existing homes.

The average age of the U.S. population also is increasing, prompting higher demand for home renovation versus new construction. These improvements support demand for premium grade materials like paneling, flooring, and furniture (Exhibit 4).

Furthermore, the outlook for timber investment on a global scale may be equally positive. Exhibit 5 illustrates Simons Consulting's prediction that demand for softwood will outstrip supply in the marketplace by 2015.



If these expectations are met, timber pricing should continue to provide a solid inflation hedge.



New Opportunities Arise

Perhaps the most exciting aspect of the timber asset class is its ability to generate value before a single tree is harvested.

In almost all alternative assets, infrastructure transactions and real estate investments, successful managers seek ways to extract value from active management. The same mindset is now being applied to forests to create new revenue streams that complement the sale of timber itself.

These “embedded optionalities” generate revenue either through additional uses of the land and its byproducts, or through the sale of “credits” issued for the positive environmental effects of the forest.

Alternative Land Use

Forest owners have long created additional income by allowing others to use their land. The idea originated with the fishing and hunting leases sold to sporting clubs by many early timberland investors. The sporting clubs were good stewards of the land, carefully protecting the resource and quickly reporting any suspicious activity.

Importantly, their presence had no negative effects on the timber crop. As a positive side effect, the leases created a sense of goodwill between the landowner and the local community. Today, the same model exists to generate additional revenue for timberland investors.

Similarly, timberland is also used for cattle grazing. The landowner benefits two-fold in this case: through the sale of the lease, and through improved timber growth rates as cattle reduce competing vegetation and help to fertilize the land.

Another complementary option for forestland lies in the production of energy. Many of the timber growing regions lend themselves well to leasing land usage to wind farm operators, who need minimal space to construct windmills and generate energy. Furthermore, wood from timberland “thinnings” (harvesting young trees to improve the growth rate of surrounding trees) can be used to supply a nearby biomass energy plant. These plants, which provide substantial energy in Europe, use organic materials like wood pulp to produce energy. With rapid growth in government requirements for renewable energy (wind, solar and biomass), the forestry sector is well positioned to benefit.

Environmental Credits

A relatively new and potentially lucrative concept for timberland investors is to profit from the environmental attributes of the forest.

Essentially, forests are good for the environment. In addition to the natural beauty woodlands provide, they remove carbon dioxide from the air, help protect plant and animal life, prevent soil erosion and preserve water. As governments and businesses begin to place greater emphasis on environmental protection, financial markets are emerging for carbon trading, watershed management, and species or biodiversity conservation.

Carbon credits are the largest area currently being marketed. The carbon that trees remove from the air is measured, and the credits are then traded on exchanges both within the U.S. and internationally. The global carbon market is expected to exceed \$5 billion in 2005, rivaling the total U.S. wheat market².

This same concept is in the early stages of being applied to water quality, as governments issue salinity credits for upstream forests that improve the quality of the water available to downstream users.

Additional opportunities for incremental revenue come from governments and conservation organizations that offer compensation to encourage the protection of plants and animals. In exchange for payment, landowners grant easements to these organizations to establish protective areas for endangered species, rivers or wetlands. Furthermore, governments in some countries compensate landowners who reforest an area that was earlier cleared for other uses.

These embedded options show tremendous promise for the timber investment community. In fact, in many timber-growing regions these values already exceed the value of land for timber production. However, realizing and maximizing the return potential of the optionalities is not automatic. Success in this area requires extensive environmental

and regulatory expertise, as well as an investment of sufficient size made in the right market.

Further discussion of the carbon market can be found in Appendix A.

Timber Markets and Products

Although globalization has had a profound effect on the timber markets, particularly in higher-end hardwood products, the vast majority of timber markets are still regionally focused and local-market specific. This is due primarily to the high cost of transporting logs from the forest. Each timber region tends to be dominated by one or more specific species, end product uses, and the demand for timber in the area.

Timber has a wide range of uses depending on tree species, size, and quality. Typically, the value of a tree increases as it grows, since higher quality end products can be produced from larger trees. But value also varies by tree type, as certain species are better suited for high quality wood products. As an example of how these factors interact, a loblolly pine can reach its peak value in about 25 years, but even then it can only be used for low quality lumber. By comparison, an ash tree can be used for high quality finishing work and attract a very high price, but it can take nearly 70 years for the tree to grow large enough for that purpose.

Whether in the United States or internationally, the subtle differences between local markets for timber products create challenges for inexperienced investors, underscoring the need for active investment management.

While the following sections provide an overview of investment conditions in domestic and international timber markets, a more detailed discussion of specific markets worldwide can be found in Appendices B and C.

²Bloomberg, August 1, 2005: Morgan Stanley, Citadel Chase Profit in Pollution Trading

Domestic Markets Overview

Within the United States, there are three specific timber regions identified by the National Council of Real Estate Investment Fiduciaries (NCREIF). Timberland Index: 1) Northeast, 2) Northwest, and 3) South. In addition to these areas, investable timber parcels also exist in the Lake States, which are not part of the index (Exhibit 6).

Timberland transactions are often handled on a negotiated basis, or by limited auctions in other cases. Under these circumstances, active management can be especially important in the transaction process, as careful due diligence is of

paramount importance prior to any investment. Given the relatively large transaction size necessary to invest in timberland efficiently, these market characteristics lend themselves well to a fund-of-accounts investment approach.

Private individuals continue to hold the bulk of domestic timberland (Exhibit 7), with institutions only becoming heavily involved in the asset class fairly recently, at least by long-term investment standards (the first substantive institutional investments began in the mid 1980's). Since then, however, institutional investments have grown rapidly, as shown in Exhibit 8.

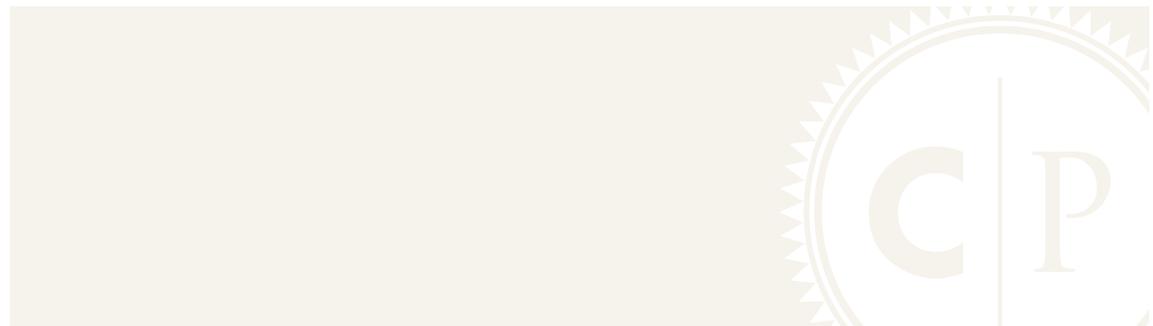
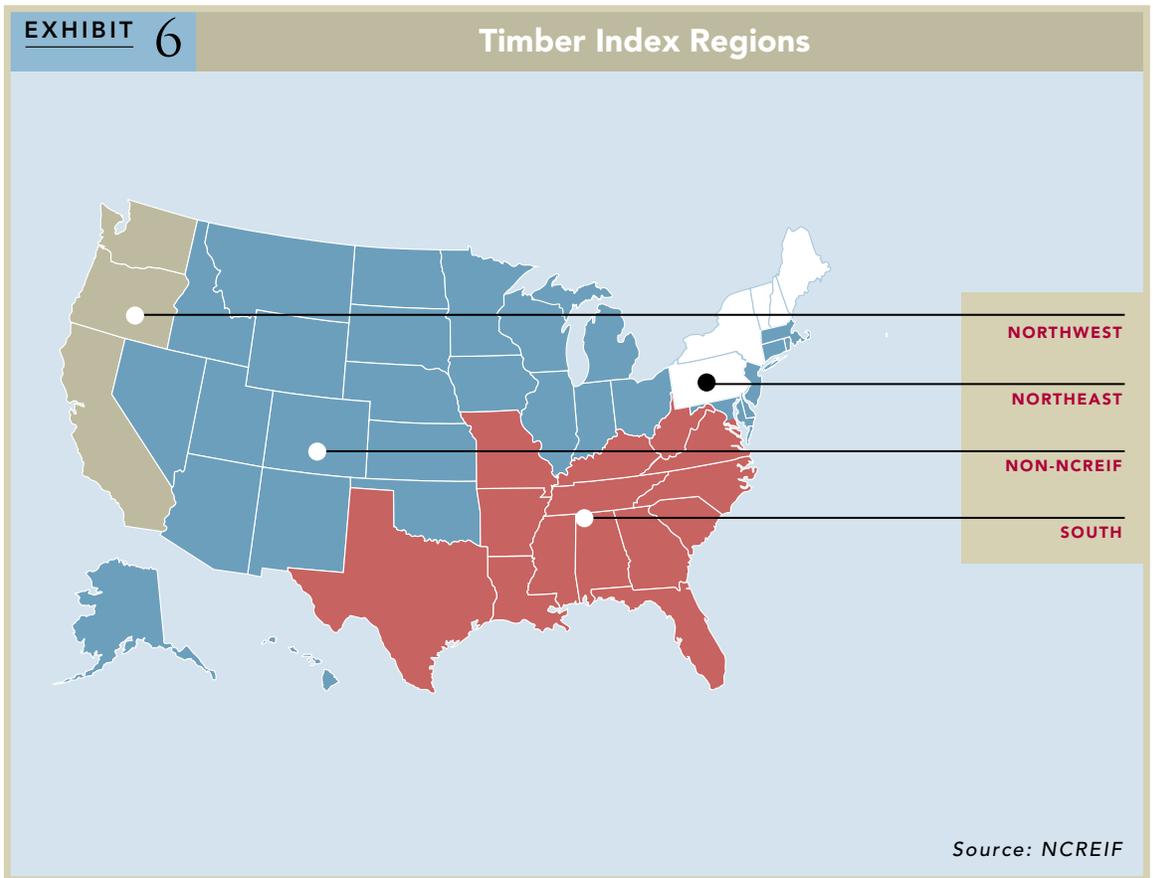
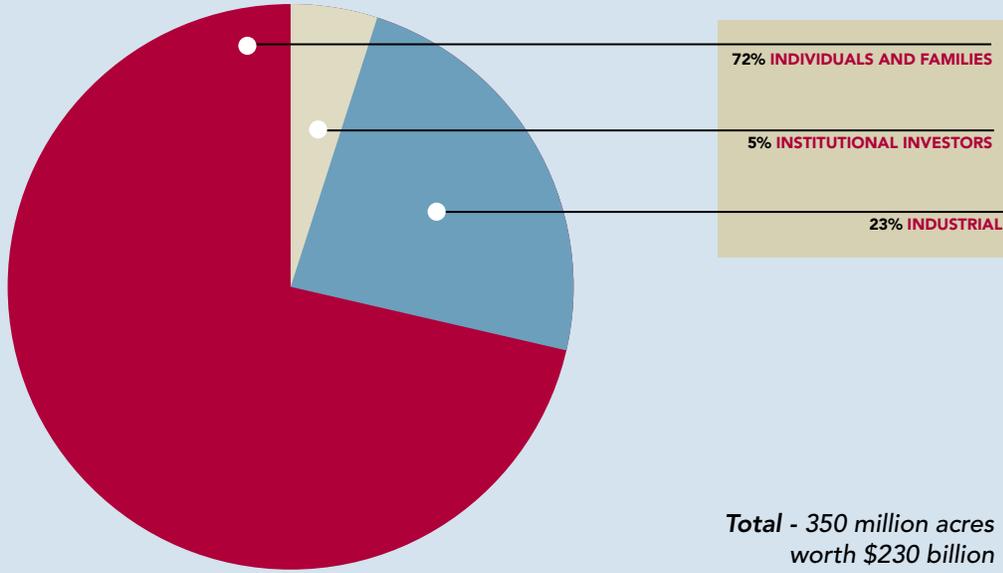
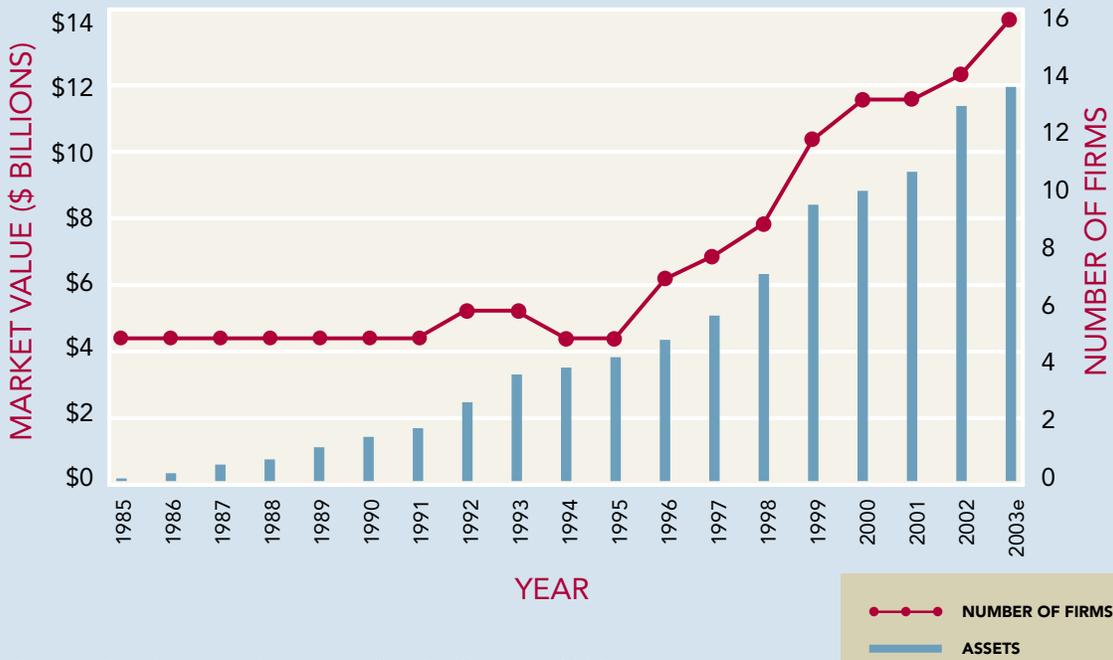


EXHIBIT 7 U.S. Private Forestland Ownership



Source: Forest Systems

EXHIBIT 8 Total Institutional Investment of Timberland



Source: Southern Employee Benefits Conference, 2003

Diversification is Essential

Since both the economic and physical risks to timber vary by region, achieving a diversified portfolio with assets in multiple locales is the best way to control risk and drive greater returns.

For example, pricing is dependent on the timber markets in a specific region, as well as tree type and potential uses for the wood. When prices are low in one area, the manager of a well diversified timber fund can simply choose to reduce the harvest in that area, and let the biological growth continue. Meanwhile, the fund manager can focus harvest efforts in areas where the pricing is more competitive.

Diversification also substantially reduces the physical risks to timber by limiting damage to a small portion of portfolio. If a hurricane or fire were to destroy a single timber plantation, a direct investor with only that one holding could lose everything, while the diversified investor's loss would be much less severe.

As with any investment decision, it's important to consider a timber investment's relationship to the overall investment portfolio. Many of the risk factors that affect timber have an opposite impact on more traditional assets.

Investing in Timber

The historical returns and environmental benefits of timber investments have made it an alluring asset class. But prospective timber investors with limited resources have had trouble finding the right mix of accessibility, diversification, and liquidity to capture timber's true market potential.

An explanation of the two most common forms of timber investment clarifies these limitations. The introduction of a third market entry point brings to light a more suitable alternative for both institutional investors and high net-worth individuals.

Direct Investment in TIMOs

Most institutional investors gain access to timber through groups called Timberland Investment Management Organizations (TIMOs).

TIMOs tend to specialize in specific regions of the country where they have local knowledge and site-specific forestry expertise. This local specialization can be especially important to gain insight and access to certain timber transactions.

The downside of TIMOs' specific market focus is their lack of diversification. Since most TIMOs require high initial investments (\$5 million for a commingled fund, or \$25-\$50 million for a separate account), buying into multiple TIMOs directly would require a substantial commitment to the timber asset class.

TIMOs also offer limited liquidity. The commingled vehicles generally have a 10-year lock-up period, which includes a series of renewals requiring a capital commitment ranging from 13-15 years.

REITs

Some investors get around the barriers and limitations of TIMOs by investing in timber-focused real estate investment trusts (REITs) or IShares dedicated to natural resources. Examples include the Plum Creek REIT or the Goldman Sachs Natural Resources IShares. These investments provide instant liquidity, and allow for very small initial investments.

These benefits, however, come at a price. Because REITs and IShares trade on traditional equity markets, their returns tend to be much more closely correlated with traditional assets. Exhibit 9 highlights the correlations between the S&P 500, the NCREIF Timber Index, three timber REITs, and the Goldman Sachs Natural Resources IShares.

EXHIBIT 9 Historical Correlation Data

CORRELATION	GS Natural Resource IShare	100%					
	Deltic	57%	100%				
	Rayonier	35%	6%	100%			
	Plum Creek	63%	61%	19%	100%		
	S&P 500	74%	21%	28%	42%	100%	
	NCREIF	42%	-3%	-16%	2%	10%	100%
		GS Natural Resource IShare	Deltic	Rayonier	Plum Creek	S&P 500	NCREIF

REITS AND ISHARES

Note that the NCREIF Index has only a 10% correlation coefficient to the S&P 500, versus 42% for the Plum Creek REIT and 74% for the IShare.

Another limitation to this investment approach is the limited number of options focused exclusively on timber. In addition to Plum Creek, Deltic and Rayonier round out the current spectrum of timber-focused REITs. Potlatch has announced that it will form a timber REIT in the near future. The Goldman Sachs IShares are dedicated to all natural resources, including oil and gas, and have a risk profile different from a traditional timberland investment.

Finally, publicly listed forestland equity generally trades at an implied discount to its private equity valuation. In effect there is an over-priced liquidity premium for timberland, which longer-term investors can obtain by developing a balanced portfolio.

The Fund of Separate Accounts

By understanding the benefits and drawbacks of TIMOs and REITs, we learn that the ideal timber investment would offer low investment minimums, strong diversification benefits and a reasonable level of liquidity, all without diluting returns.

Drawing from the “fund-of-funds” approach common to other asset classes, a “fund of separate timber accounts” offers the best of both worlds.

Under this structure, investors can allocate a small percentage of their portfolio to a broadly diversified fund of timberland holdings, with improved liquidity.

Equally important, the fund-of-accounts maintains the ability to generate maximum returns for timber investors. Broad diversification gives the fund manager flexibility to respond quickly to local market conditions. And, the fund-of-accounts’ access to specialized expertise allows the manager to fully exploit the embedded environmental options.

Perhaps the single largest benefit to this approach is the added level of investment oversight. The majority of the TIMOs in the marketplace today are owned and managed by timber professionals. While these organizations do an excellent job managing timberland, they have limited investment expertise. A skilled fund-of-accounts manager can easily offset the added layer of fees through higher risk-adjusted returns and more thoughtful total portfolio construction.

Ideally, the fund-of-accounts manager forms a truly global portfolio by bringing together individual timber managers with strengths in various regions and with unique expertise in the emerging environmental markets.

The Fund-of-Accounts Manager

When selecting a professional manager for a fund of separate timber accounts, an investor should look for the following key skills and competencies:

1. Access to the top TIMOs and the ability to self originate or gain exclusivity in individual deals.
2. A rigorous and disciplined approach to due diligence and asset valuation.
3. Sound planning and management systems, as well as the ability to effectively execute asset management strategies and plans.
4. The ability to extract unique value from assets and exploit forms of optionality (in asset management) that competitors cannot easily replicate.

Value in Analysis

Beyond all other factors, making the most of a timber investment portfolio requires the fund manager’s ability to obtain, analyze and interpret data correctly.

If constructed properly, a portfolio of multiple timber investments can balance the long-term potential for capital appreciation with the need for income today. However, making timber investments without a complete understanding of tree species, timber regions, and site-specific characteristics may end in disappointment.

As an example of why strong statistical analysis is crucial, consider Exhibits 10 and 11. These basic charts were created by entering data from the U.S. Forest Service into a statistical charting tool.

They show the biological growth trends of two types of trees – Northeast hardwoods and Northwest hemlock – in Scribner Board Feet (a measure of the volume of wood). Using R^2 as a measure of how well the trend line fits the data points, both charts indicate a strong fit and an accurate model ($R^2 = 0.91$ in Exhibit 10 and 0.86 in Exhibit 11; 1.0 would suggest a perfect fit). However, a closer look at Exhibit 11 reveals that the trendline fails to recognize a substantial drop-off in the growth of hemlock around the 60-year mark. Relying on flawed analysis such as this one could prove costly for investors.

Clearly, a more sophisticated method of statistical modeling is necessary to produce a more accurate forecast and make prudent investment decisions. The importance of using detailed statistical interpolation to achieve the optimal mix of species and regional diversification cannot be overstated.

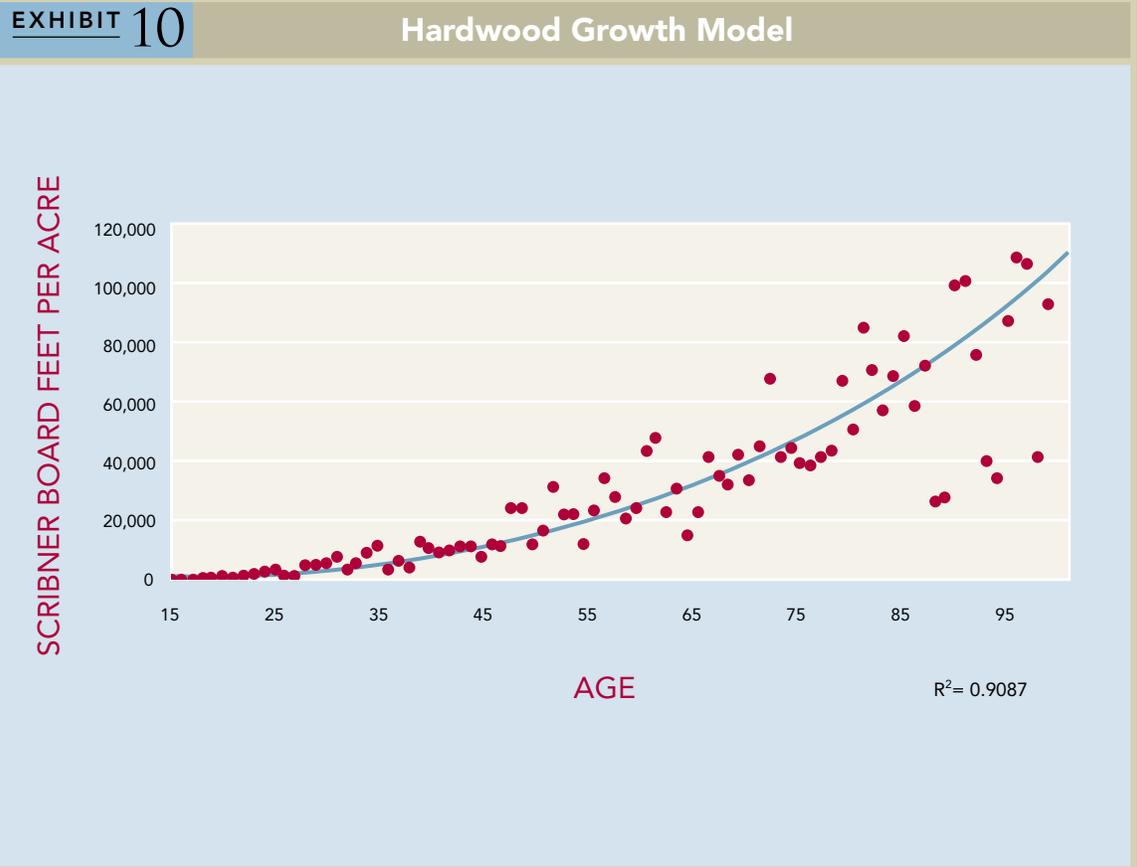
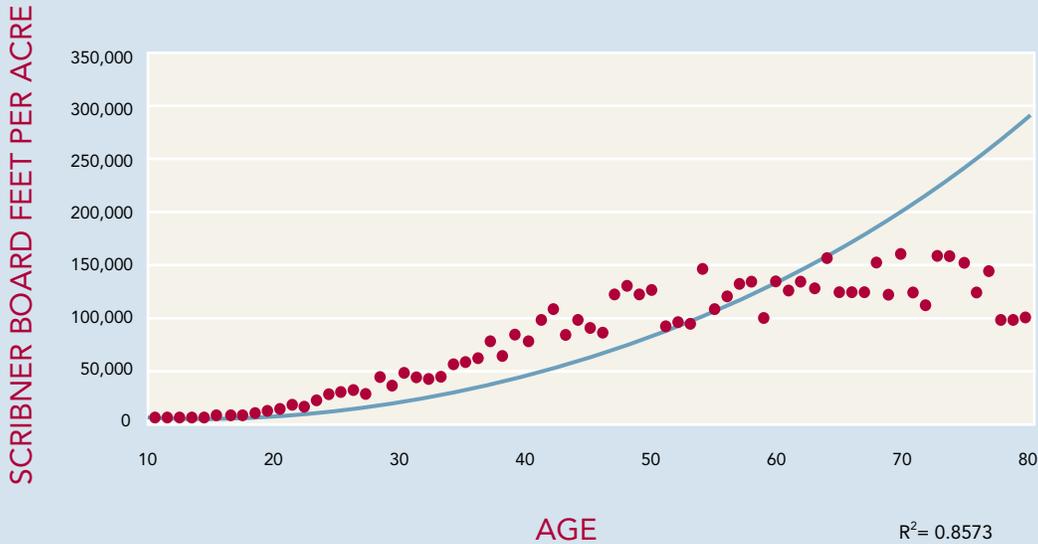


EXHIBIT 11 Hemlock Growth Model



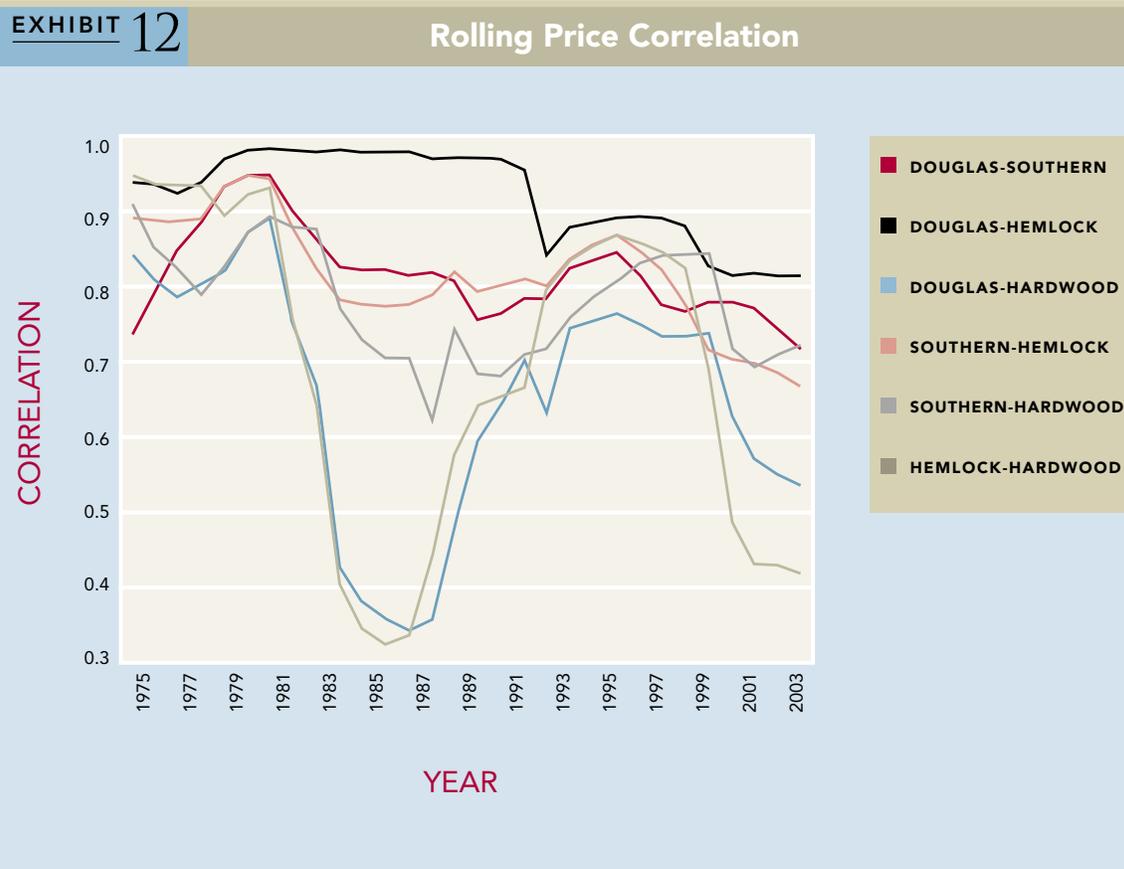
In addition to biological growth, successful portfolio construction also depends on analyzing the long-term price movements of timber. While many firms focus their efforts on forecasting timber pricing for a given species, a more useful gauge of a healthy portfolio may actually be analysis of how different species move relative to each other. As long as the historical correlations of price movements between tree species stay consistent, overall returns may vary, but the portfolio allocations remain in balance.

An illustration of this concept is seen in Exhibit 12, where each line shows the historical price correlation between two domestic tree species. These correlations are strong and consistent in most cases, but can vary substantially during times of stress.

For example, in the mid 1980s, a change in federal land management policies drove a divergence in the price correlation between Western species such as Douglas-fir and hemlock, and the hardwood species found in the East. But by the early 90s, the correlations had returned to their normal levels.

These short-term variations do not affect the long-term modeling necessary to construct a portfolio, but they do present opportunities to create incremental revenue. The active manager of a well-diversified fund of timber accounts can exploit price variations by increasing production in the relatively strong timber class, while reducing harvests in the weaker class until more favorable conditions return.

Again, the necessity for the skilled interpretation of market data becomes clear.



In Conclusion

Investors considering a move into the timber market should keep several essential points in mind:

- Timber has historically provided strong returns, and predictions of shrinking supply and growing demand suggest equally solid returns for years to come.
- Compared with the volatility in traditional investments, the relatively stable and non-correlated concept of biological tree growth can be an attractive source of portfolio diversification.
- Embedded environmental optionalities are a growing source of revenue for timber holdings that promise even greater returns for investors in the future.
- The single greatest challenge for prospective investors has been gaining access to diversified timber holdings without overweighting timber relative to their overall portfolio.
- The fund-of-accounts structure addresses the shortcomings of traditional timber investments, providing a globally diversified portfolio that can maximize returns through local market expertise and embedded optionalities, while offering more liquidity to investors.
- To maximize the potential of the fund-of-accounts approach to timber investment, the fund’s management firm must have in-depth knowledge of the asset class and specific expertise in analyzing the complex matrix of factors that affect investment performance.

Appendix A: The Kyoto Protocol, Reforestation and Carbon Trading

Excerpts from "Information Memorandum – The Carbon Trading Partnerships," October, 2005. Reprinted with permission from Carbon Capital Limited, a UK company. Carbon Capital creates and manages businesses operating in the new carbon economy.

Climate Change

The vast majority of the international scientific community is now united in accepting global warming as fact. Various human activities - notably the burning of fossil fuels - have led to excessive warming of the atmosphere by releasing into it large amounts of greenhouse gases, the most important of which is carbon dioxide (CO₂). The build-up of these gases causes the "greenhouse effect," through trapping heat in the atmosphere in much the same way as heat is trapped in a greenhouse.

The main source of these greenhouse-gas emissions is energy production. Burning coal, oil and natural gas accounts for roughly 80% of all greenhouse-gas emissions. What is less well known is that the second largest source of greenhouse-gas emissions is deforestation. When forests are cleared for agriculture or development, most of the carbon in the burned or decomposing

trees escapes into the atmosphere as CO₂. It is estimated that 3-9 billion metric tons of CO₂ are released in this way every year. Reforestation, however, can have the opposite effect, because growing trees absorb CO₂.

Models predict that average global temperatures may rise by up to 5.8°C by 2100, with dramatic consequences. Melting ice-sheets and glaciers are expected to raise the mean sea level by up to 88cm, causing low-lying areas to flood. Some scientists also attribute the increase in extreme weather conditions - storms, floods, droughts - to global warming.

Stabilizing atmospheric concentrations of greenhouse gases will require a major - and concerted - international effort. Unchecked, atmospheric concentrations of CO₂ could rise from today's level of 367 parts per million (ppm) to as much as 1,260 ppm by 2100, representing an increase of 350% since 1750. Stabilizing concentrations at, say, 450 ppm would require worldwide emissions to fall below 1990 levels within the next few decades. Given an expanding global economy and growing populations, this would require dramatic improvements in energy efficiency and fundamental changes in economic priorities.



The international community is confronting this situation through the United Nations Framework Convention on Climate Change, adopted in 1992, and which now includes 185 members. The set of agreements that it brokered is known as the Kyoto Protocol.

The Kyoto Protocol

Key amongst the various achievements of the Kyoto Protocol (see related information below) was to establish a set of legally binding greenhouse-gas emission quotas that was accepted by most industrialized countries. The Kyoto Protocol requires member countries to reduce their collective emissions to 5.2% below their 1990 levels throughout the first commitment period of 2008 to 2012.

Crucially, Kyoto permitted the establishment of a market-based system for trading carbon allowances, or “Certified Emission Reductions” (CERs). Carbon trading allows polluting companies to meet their targets by buying carbon emission allowances from other companies, which have not used up their allowance, or carbon credits generated by emissions-reducing projects. The underlying rationale behind this system is that because global warming is, by definition, a global problem, then the place where reductions are

achieved becomes irrelevant. Accordingly, these can be made where costs are lowest.

The Clean Development Mechanism

The aim of the Clean Development Mechanism is to help non-industrialized countries to develop sustainably in a way that contributes to the goals established by the Climate Change Convention.

The CDM Executive Board is responsible for validating projects in developing countries that will result in the generation of CERs. These projects can involve private or public entities and must have measurable and long-term effects on the host country’s net carbon balance.

Reforestation, Sustainability and Biodiversity Background

It is known that forests play an important role in the world’s CO₂ balance. Forests contain vast quantities of carbon. Some forests act as sinks by absorbing CO₂ from the air, while others whose carbon flows are in balance act as reservoirs. Deforestation and changes in land-use currently make the world’s forests a net source of CO₂. But when areas are reforested and managed sustainably, they can start to absorb significant amounts of CO₂ both in the trees and the soil.

What did Kyoto agree?

- | | |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Specified legally binding emissions targets for industrialized countries to reduce collective CO ₂ emissions to 5.2% below 1990 levels throughout the commitment period 2008 to 2012. |
| 2. | Specified subsequent 5-year commitment periods for which further reductions will be agreed. |
| 3. | Defined an international market-based trading system whereby carbon emissions allowances and credits may be bought and sold. |
| 4. | Approved an accreditation system whereby carbon credits may be issued in non-industrialized countries under the Clean Development Mechanism (CDM) or in industrialized countries under the Joint Implementation Mechanism. Designated CO ₂ as the standard trading unit, assigning a “global warming potential” to each of the five non-CO ₂ greenhouse gases (methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons) measured in “metric tons of CO ₂ equivalent.” |
| 5. | Promotion of inter-governmental cooperation, improved energy efficiency, reform of energy and transport policies, renewable energy and managed carbon sinks such as forests and grazing lands. |

Reforestation under the CDM

Reforestation and afforestation projects can both qualify under the CDM. However, projects must be in line with the host country’s sustainable-development objectives and must also promote the preservation of biodiversity.

For development to be sustainable in the long term, it must take place within a framework that does not focus solely on short-term financial returns, but also addresses wider economic, social and environmental issues.

The current practice of deriving energy primarily from fossil fuels is not sustainable. The world’s reserves of oil, gas and coal are finite and once

used, cannot be replenished. Further, the burning of fossil fuels has created large emissions of CO₂ and is a major contributor to climate change.

Deforestation is not sustainable either as it reduces the world’s forestry reserves, with the consequent effect of depleting carbon sinks, thus undermining the ability to cope with increasing greenhouse-gas emissions. At the same time, deforestation destroys the environments necessary to sustain biodiversity.

For a reforestation project to qualify under the CDM it would typically be required to address issues such as the following:

1. The re-establishment of natural biodiversity, to provide an environment where the natural flora and fauna of the region can thrive. This requires that over much of the area to be reforested, a range of indigenous trees and other plants must be established and grown in such a way that they would provide the natural habitat, cover and corridors that would promote the re-establishment of the indigenous fauna within the area.
2. The provision of wood-fuel and construction timber to support the needs of the indigenous peoples of the area, thus reducing pressures on deforestation and timber collection and to contribute to meeting the country’s internal and export needs. This may require that in any reforestation scheme, a certain area of commercial woodlots is set aside in which non-indigenous, fast-growing trees may be planted, managed and harvested in a sustainable manner.
3. The ongoing management and protection of the reforested area, to prevent its subsequent deforestation or destruction.
4. The creation of local sustainable industry such as agriculture and eco-tourism.
5. The selection of areas for reforestation in line with the country’s development and environmental protection plans.

In recent years large-scale reforestation projects have often attracted criticism, because they have not taken into account the wider sustainable-development and biodiversity requirements of the areas concerned. For example, in Brazil, there has been criticism of projects that have focused on planting monocultures of eucalyptus, which while providing timber and fuel, have done little to help support the country’s natural biodiversity.

Evidence for the Value of Reforestation

While reforestation will qualify under the CDM for carbon credits, no reforestation projects have been certified so far.

By the summer of 2005, eleven reforestation and afforestation baseline and monitoring methodologies had been submitted to the CDM Executive Board. Of these, five had been rejected, four were to be assessed and two were returned to their proponents for further clarification. In consequence, there is still uncertainty around the methodologies used for calculating and validating the carbon sequestration achieved by such projects, thus necessitating further research.

The type of trees grown and the planting density used heavily influence net carbon sequestration. The Intergovernmental Panel on Climate Change estimates sequestration rates for commercial plantations of 240 to 360 metric tons of CO₂ per acre over a project life. In tropical areas such as Brazil, various studies indicate 440-530 metric tons of CO₂ per acre may be sequestered.

The crediting period for a project is the period in which it is allowed to qualify for CERs under the CDM. Developers of reforestation projects may choose to apply for a crediting period of 30 years,

or for a crediting period of 20 years with the option to renew twice, giving a maximum total crediting period of 60 years.

CERs generated by reforestation projects will be "long term" CERs (ICERs), which are a variant of the "normal" CERs that will be generated by other projects. Whereas a normal CER is valid for compliance under the Kyoto Protocol in perpetuity, ICERs expire at the end of the last crediting period and must be replaced. For example, if a project has a total crediting period of 60 years, then all ICERs from that project will expire at the end of the 60 years, irrespective of when they were generated.

An ICER may have less value than a CER, first because it expires, and second because it is not currently accepted under the EU Emissions Trading Scheme (although this is scheduled for review in 2006). It is widely accepted that predicting the exact value of an ICER is difficult. However, it is estimated that an ICER generated by a project with a 60-year lifetime would have a value equivalent to around 70% of that of a normal CER generated by a project in the same time frame¹.

¹See 'Value and Risks of Expiring Carbon Credits from CDM Afforestation and Reforestation' (Hamburg Institute of International Economics Discussion Paper 290).



Appendix B: Discussion of Individual Timber Markets Worldwide

When researching potential investments in timber, fund managers carefully consider unique characteristics of specific timber markets. A number of important factors determine the long-term viability of investments in a given timber region. These may include the dominant species of trees and their corresponding growth rates, the regulatory or political climate in the area, as well as other special considerations such as the potential to exploit embedded environmental optionalities.

The following pages provide an overview of relevant characteristics in key markets currently being pursued by institutional investors.

U.S. TIMBER MARKETS

U.S. Northeast:

The Northeast is dominated by high quality hardwood species including maple and ash. These particular trees are slow growing, but ultimately very valuable as they can be used for finished products and high-end export. The typical cycle for a Northeast hardwood is 60-65 years, with an initial improvement cut occurring around year 55. At this time, younger, lower-quality trees are removed to improve the growth prospects for the remaining trees. Exhibit 13 illustrates the biological growth rates for this region.

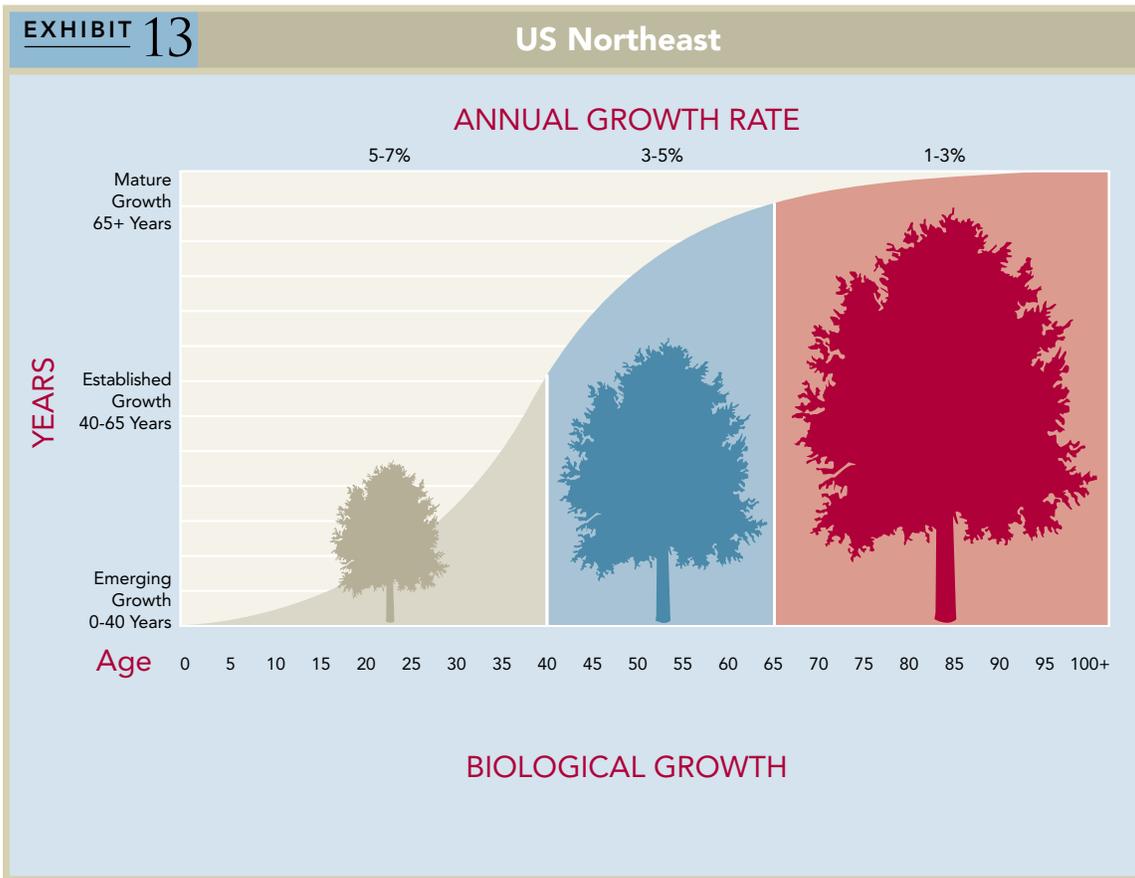
U.S. Northeast

Dominant Species:
Hardwoods (maple, ash)

Growth Rate: Slow

Regulation: Heavy

Other Considerations:
Additional revenue from hunting and fishing leases, and conservation easements



From a regulatory perspective, the Northeast is a challenging region, as the federal and state governments enforce environmental protection and resource management laws that affect how and when timber can be harvested. Nonetheless, landowners and investors can operate profitably through good stewardship and relationship building with local communities and regional conservation organizations. Subscribing to best management practices is critical to long-range success in this region.

Private ownership is prevalent in the Northeast, so incremental revenue can be obtained by marketing hunting and fishing leases to private sporting clubs.

U.S. Northwest

Dominant Species:

Douglas-fir, hemlock

Growth Rate: Moderate

Regulation: Heavy

Other Considerations:

Additional revenue from development rights, carbon credits, other environmental options

U.S. Northwest:

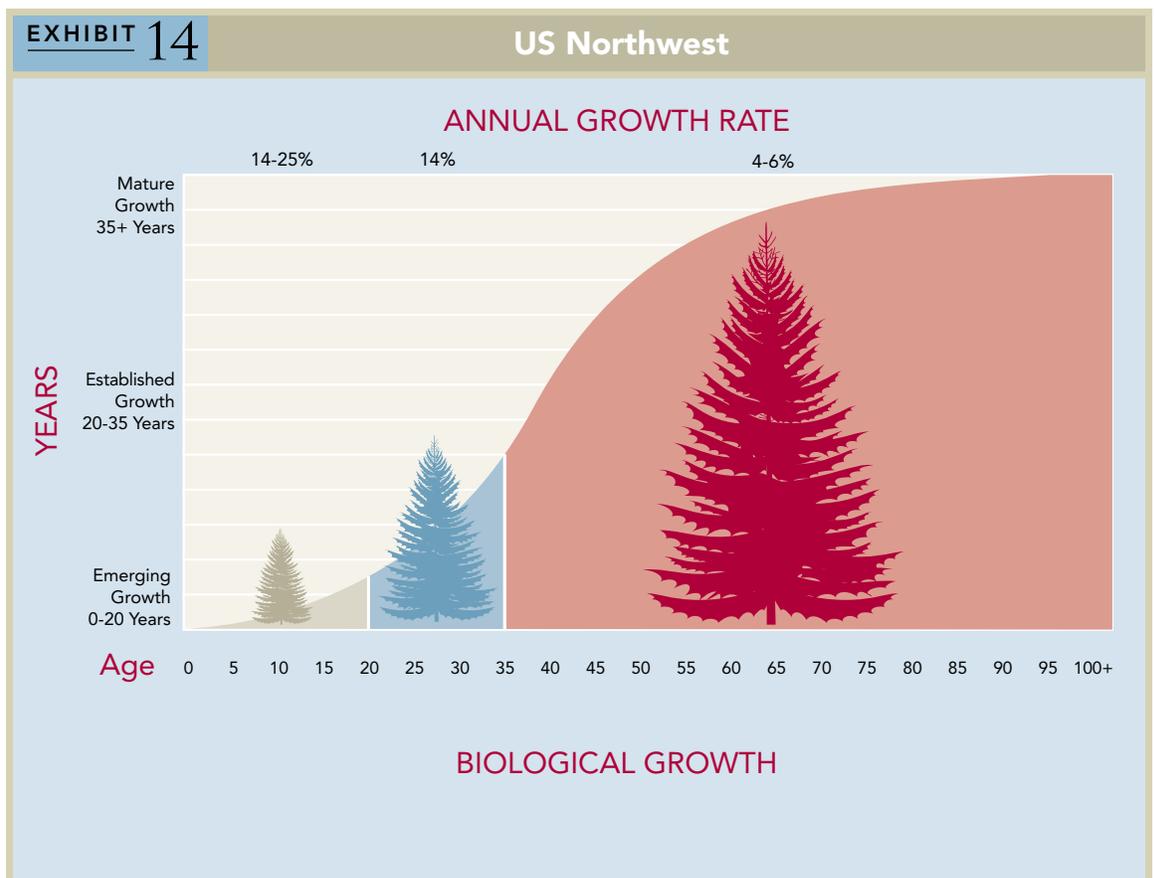
The two primary species in the Northwest are Douglas-fir and hemlock, which are well adapted to the region’s climate. Though not as long as in the Northeast, the growing cycle in the Northwest is fairly long. On less actively managed public lands, it may take up to 80 years for the trees to reach full maturity. But private forest owners can nearly cut that time in half, yielding a final harvest in the 40-45 year timeframe – a true testament to today’s advanced silvicultural techniques. The initial thinning in the Northwest takes place around year 20, but does not yield a marketable harvest. A commercial thin is possible in the 30-33 year timeframe if market factors permit. Exhibit 14 illustrates the biological growth rates for the Northwest region.

The Northwest is the most challenging environment in terms of government regulation. The older public forests and concerns about endangered species nearly shut down the logging market on public lands in the Northwest during the 1980s. Only good stewardship and careful

subscription to forest practice laws allow a manager to be successful in this region. It is also important for local managers to work closely with the regulatory agencies in the area to establish harvest and other management policies at an acceptable level.

Since many public lands in the Northwest are available for hunting and recreation, lease revenue in this region is minimal at best. However, a rise in non-timber values, such as the sale of development rights to the land, helps to offset the loss of lease revenue. Additionally, the state of California now has a carbon registry, and there are also substantial issues surrounding water rights and salmon habitat, all of which can be commercialized.

The moderate biological growth rate in the Northwest is enhanced by the fact that the larger trees, particularly Douglas fir, are valuable when harvested. Northwest trees can be used for larger-scale, high quality lumber, and the nearby international shipping ports enable growers to capitalize on high demand in Asia.



U.S. South:

The dominant species in the South is loblolly pine. The region is characterized by smaller non-contiguous pine plantations that are intensively managed to take advantage of the long growing season and ability to harvest in a fairly short 25-year cycle. Initial thinning occurs at about year 15.

With most land holdings under private ownership and fewer government restrictions, the South poses a stark contrast to the Northwest. Southern landowners are able to maximize the timber growing capacity of the land and harvest with minimal constraints.

The lack of public land also improves the ability for complementary land uses such as hunting and fishing leases. Nearly all of the private forests are leased to various clubs, which provides incremental revenue and additional stewardship of the land.

With the dominant species in the South being a softwood pine, the bulk of the timber is used for products such as woodpulp (primarily for paper production) or small lumber. To achieve competitive returns from these low value products, growers rely on sheer volume. With a 25-year harvest cycle, the South produces a mature tree in about half the time of the other domestic regions. Exhibit 15 shows the growth cycle for southern pine.

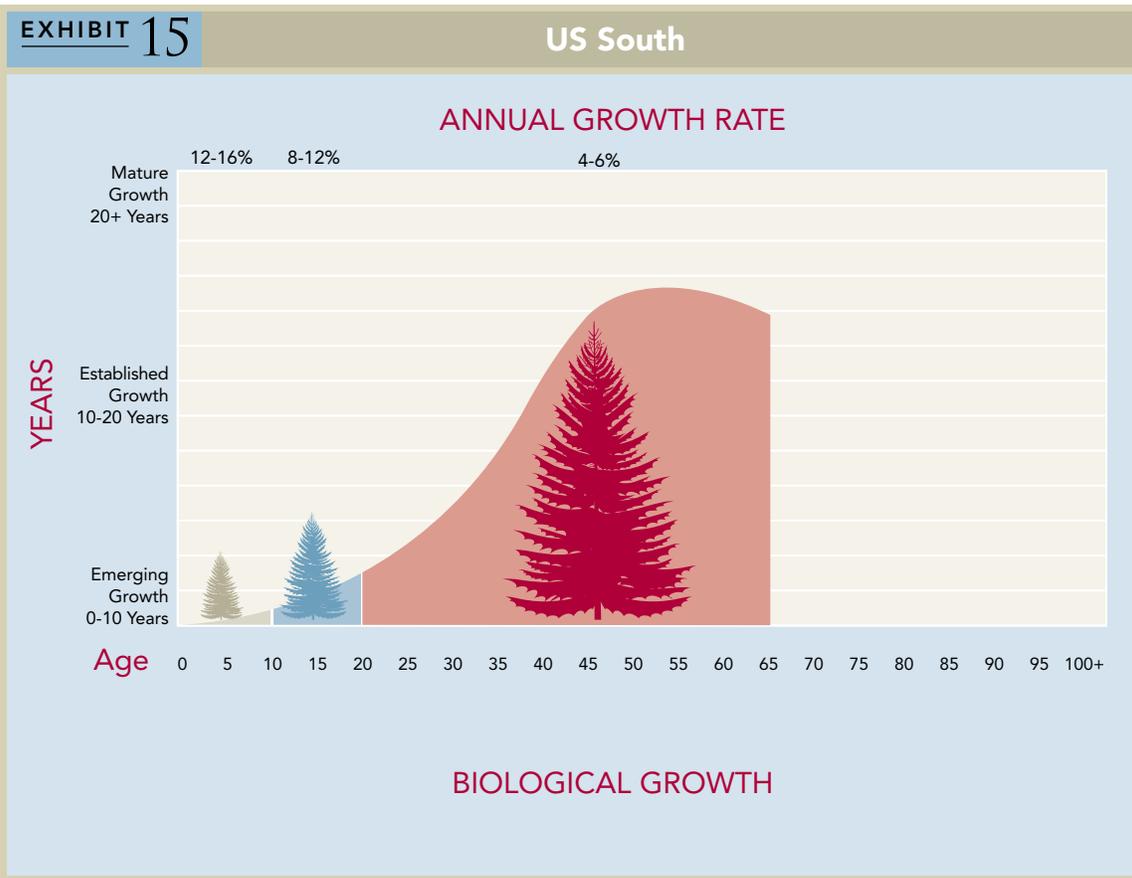
U.S. South

Dominant Species:
Loblolly pine

Growth Rate: Fast

Regulation: Minimal

Other Considerations:
Additional revenue from hunting and fishing leases



US South

U.S. Lake States

Dominant Species:

More diverse (most valuable include oak, maple, and aspen)

Growth Rate: Slow

Regulation: Moderate

Other Considerations:

Additional revenue from hunting and fishing leases; emerging markets show promise for early investors

U.S. Lake States:

Though not included in the NCREIF’s Timberland Index, the Lake States region has become a significant timber producer as growth has outpaced timber removal for the last 50 years. Michigan, Minnesota and Wisconsin contain 47 million acres of forestland, amounting to 36% of their total land area. Virtually all of this acreage is capable of producing commercial timber crops.

Still, the absolute volume of forest products produced in the Lake States is far smaller than in other U.S. regions. And, the types of trees grown in the Lake States are much more heterogeneous. The rich species mix means there is much greater variability in the amount of harvestable timber per acre, and wide-ranging values for individual trees.

The most valuable on a per-unit basis are red oak, hard maple, white oak and aspen. Others include soft maple, birch, beech, yellow poplar and softwood species components like eastern hemlock and white pine.

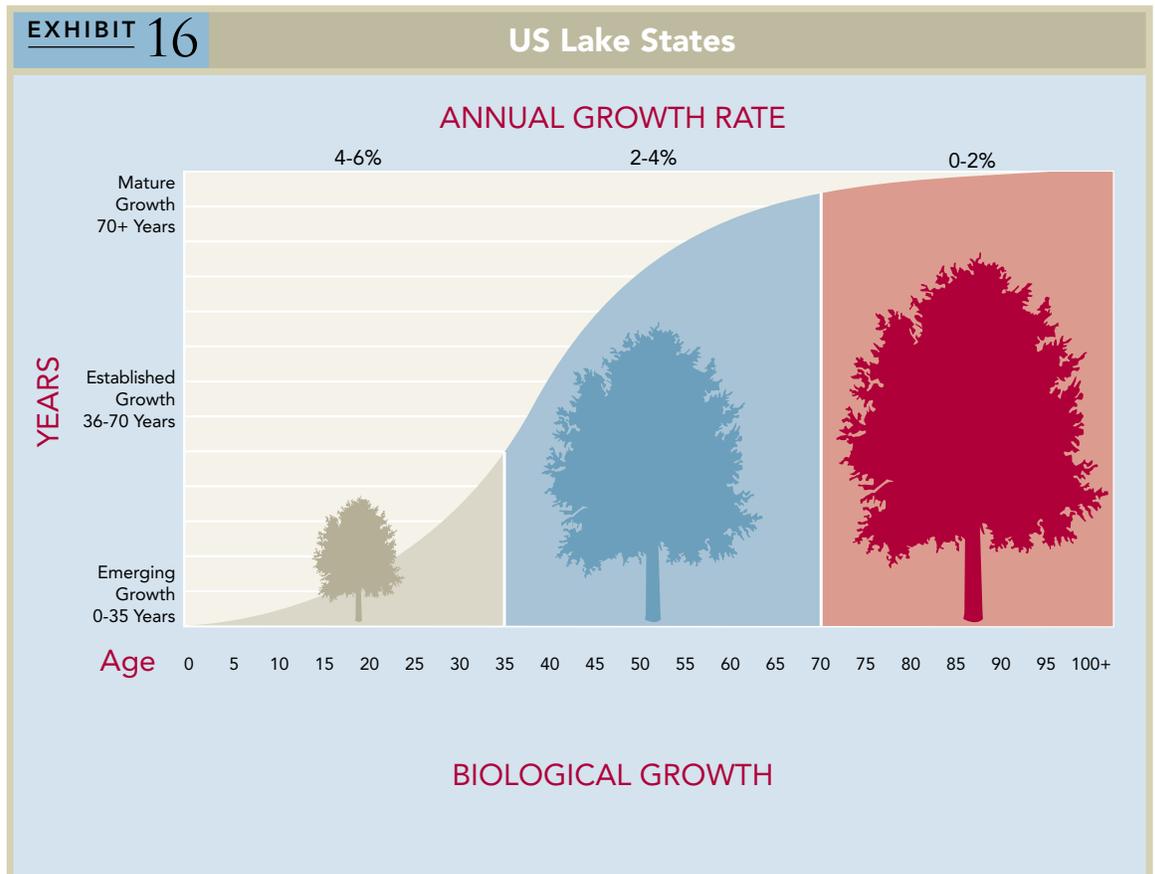
By and large, however, hardwoods are the most important timber species group utilized, accounting for 77% of total wood consumption.

Most of the aspen harvested is consumed by pulp and paper mills. The growth rates for this region are illustrated in Exhibit 16.

Two additional factors make the Lake States especially interesting from an investment perspective:

1. As comprehensive price reporting is now becoming available for the Lake States, early investors in this region may benefit from increased competition.
2. Demand for hardwood timber exported from the Lake States region continues to grow in foreign countries, where overharvest and increasing regulation have limited the availability of tropical hardwoods.

From a regulatory standpoint, the Lake States region falls comfortably in the middle of the other zones. The region is much less regulated than the Northwest, but not as supportive of private landowner rights as the South. As such, good forest stewardship is important, and some incremental revenue can be driven from private leasing opportunities.



International Timber Markets**Australia**

Australian sawlog markets are primarily based on radiata pine (softwood) plantations and native forest eucalyptus (hardwood) logs. The market is mostly domestic, with large softwood mills located in proximity to softwood plantation regions. The hardwood mills tend to be smaller, and are evolving to focus on specialized “appearance grade” products such as hardwood flooring.

The government remains a significant market player in the Australian timber industry, owning approximately 70% of softwood plantations and 10% of hardwood plantations. But that fact could soon change. Insufficient returns from timber market pricing have led investors to put pressure on governments to privatize their plantation forestry assets. These assets will likely be sold to institutional investors over the next five years, and TIMOs will be major players in these transactions.

Participation in these government privatizations presents one point of entry for prospective timber investors in Australia, but there are others, including:

1. Managed investment scheme (MIS) rationalizations and buyouts, in which institutional investors buy into timber holdings originally designed to create tax benefits for Australian investors.
2. Partnership transactions, in which corporations in the forestry industry enter into structured agreements with institutions as a form of resource protection.
3. Investment in non-traditional plantations, which focus on revenue generation from a number of environmental mechanisms including carbon markets, renewable energy markets, privatized water rights, dry-land salinity credits, bio-banking and stewardship payments.

New Zealand

The New Zealand forestry sector is almost entirely based on plantation softwoods, and 90% of the plantation estate is radiata pine.

The forestry sector has gone through two significant ownership transitions: first from government ownership to largely private industry ownership, and now from industry ownership to institutional ownership. The new diversity of ownership and wide variety of assets provide continued buying opportunities for investors, as well as increased liquidity and exciting potential for high returns.

Unlike in Australia, New Zealand timber is frequently exported via international log markets, and currency exchange and overseas shipping make timber pricing more volatile. If managed correctly, however, this added volatility can benefit the performance of New Zealand timber investments.

Another opportunity for investors lies in the high value New Zealand places on carbon credits. As the government seeks to reduce agricultural emissions, it rewards private investors who establish permanent forest sinks in New Zealand. And currently, the price of a ton of carbon dioxide in the European market is about double the value of the wood if sold as timber.

On the downside, asset management of timber investments in New Zealand is more difficult. As land values have risen in New Zealand and timber prices have remained low, forestlands are increasingly being converted for agricultural use. This makes asset management more complex. To ensure favorable returns, managers must continuously evaluate the land and timber management strategies associated with the holding.

The most significant issue in forestry investment in New Zealand is determining how and when the timber pricing will rebound.

Australia**Dominant Species:**

Radiata pine, eucalyptus

Growth Rate: Fast**Regulation:** Heavy**Other Considerations:**

Investment opportunities will increase as government lands are privatized, increasing opportunities within environmental space

New Zealand**Dominant Species:**

Radiata pine

Growth Rate: Fast**Regulation:** Moderate**Other Considerations:**

Widespread investment opportunities; volatile pricing; high return potential from carbon credits

Southeast Asia

Dominant Species:

Acacia

Growth Rate: Fast

Regulation: Minimal

Other Considerations:

Opportunities in partnerships and new plantations; high risk/return scenario with less stable political environments

Southeast Asia

Southeast Asia has yet to become a significant destination for traditional institutional investors, largely due to the perception of risk. While few would argue that unstable political climates make timber investments especially risky in some Asian countries, several reliable sources of risk analysis data show that other timber-growing countries in Asia present attractive opportunities (Exhibit 17).

Partnership investments are likely to be most promising for institutions. Many Japanese trading houses and paper companies have established pulpwood plantations in Southeast Asian countries and may want to sell the assets to investors.

The growing demand for high value hardwood sawlogs and a dwindling supply in Southeast Asia also may provide opportunities to either acquire existing assets or establish new hardwood plantations. Due to illegal and unsustainable practices, native hardwood resources in the region are expected to be nearly wiped out by 2015. This

unfortunate circumstance opens the door for investors to establish high quality plantation forests to replace existing timber supplies.

Southeast Asian projects also can generate carbon returns via the Clean Development Mechanism (“CDM”) of the Kyoto Protocol. The CDM is one of the Kyoto flexibility mechanisms, and allows developed countries to invest in developing countries, and then repatriate the carbon credits.

While forestry investment in Southeast Asia has the potential to generate premium returns, these projects also entail higher risk. Risk factors include social unrest, corruption, lack of infrastructure, and cronyism in business.

Whether establishing corporate partnerships or new timber plantations, the decision to enter the Southeast Asian market should be made carefully with a knowledgeable local partner and extensive due diligence of all parties involved.



EXHIBIT 17		Forestry Investment Factors			
COUNTRY	International Risk Ranking	Forestry Treefarm Attractiveness	Timber Growing Cost	Forestry IRR ³	
	USA	3	5.71	Douglas-fir South Pine \$ 60	US West 4.7 US South 5.1
Australia	17	5.56	P. Radiata \$41	E. Globulus 8.9 P. Radiata 7.9	
New Zealand	23	5.37	P. Radiata \$21	P. Radiata 7.8	
Malaysia	49	4.93	Sabah Acacia \$14	Sabah Acacia 3.4	
Thailand	51	4.32	-----	Teak 10.4	
Philippines	61	4.05	Acacia \$9	Gmelina 14.9	
Vietnam	84	3.98	Acacia \$10	Acacia 13.6	
Indonesia	102	3.68	Acacia \$10	Acacia 14.2	

Source: New Forest Pty. Ltd.

³The IRR figures are real, unleveraged forecast returns from New Forest Pty. Ltd. They should be considered indicative only.

South America

The South American forestry sector is large, diverse and fast-growing. Four countries – Brazil, Chile, Argentina and Uruguay – constitute virtually the entire sector. Brazil and Chile are by far the two largest producers, but Argentina and Uruguay have grown quickly over the last decade.

In all four countries, forestry is dominated by plantation-grown exotic pine and eucalyptus species. Pine is used primarily for sawtimber and panel products, and, to a lesser extent, pulpwood. Conversely, the major end-use for eucalyptus is pulpwood, with some wood going to high-quality sawtimber or panel products.

Most notably, South America can grow both types of trees at some of the fastest rates in the world. Pines can be grown for pulpwood in 12 years and for sawtimber in 20 years or less. Eucalyptus pulpwood rotations can be as short as 9 years, creating a tremendous opportunity for investors to capitalize on high demand and favorable pricing in the European export market.

Since Brazil has the fifth largest population in the world, it also has a high domestic demand for forest products. So while Brazil is a significant exporter of forest products, most of its production remains onshore. By contrast, the forest industries of Chile, Uruguay and Argentina are large relative

to their populations and domestic demand, making them much more reliant on export markets.

While the governments of South America do encourage forest development through legislation, they are insignificant players in the ownership of industrial forest plantations. Again, this lack of oversight makes it easier for landowners to maximize the output of the plantation.

In addition to these considerations, several other factors make South America an especially desirable destination for timber investment:

1. South America offers an outstanding opportunity for further diversification in the timber portfolio. For example, price changes for eucalyptus products in Uruguay have shown virtually no correlation to those of U.S. southern pine.
2. Land prices in South America are a relative bargain. Although prices have risen in recent years, they are still lower than other timber regions such as the U.S. South or West.
3. Timber prices in several South American countries are currently close to a cyclical low, but the addition of new processing capacity promises to push prices upward in the near future.

South America

Dominant Species:

Exotic pines, eucalyptus

Growth Rate: Fast

Regulation: Minimal

Other Considerations:

Economic conditions, export markets prime for investment



Appendix C: Gauging Economic Viability in International Markets

Several independent organizations attempt to evaluate the investment stability of various countries around the world, and the following excerpt from a recent paper by RMK Timberland Group does a nice job of highlighting one of these attempts. RMK focused on the Heritage Foundation, which publishes an annual Index of Economic Freedom (IEF).

Heritage Foundation:

The IEF employs 50 independent variables to rate a country's level of economic freedom. These variables are used to construct 10 individual categories, or factors of economic freedom. A country's IEF ranking shows the relative degree to which it achieves economic freedom. The factors used to construct the IEF are:

1. Trade Policy
2. Fiscal Burden (Taxation)
3. Government Intervention
4. Monetary Policy
5. Capital Flows and Foreign Investment Policy
6. Banking
7. Wage and Price Controls
8. Property Rights
9. Regulations
10. Informal Market

The above factors are viewed as inputs to determine economic freedom, in that they measure government policies that either increase or restrict economic freedom. Monetary policy, for example, does not measure the results of economic freedom, but rather, the relative lack of restrictions that exist in a country on that type of economic activity. Put another way, it measures one aspect of a country's political, economic and social environment that is necessary for economic activity to take place. Each country receives an overall score based on the average of the 10 individual factor scores. The lower the IEF for a country, the greater the degree of economic freedom.

Four broad rankings are assigned to economic freedom by the IEF:

- 1. Free:** Countries with an average score (of the 10 factors) of 1.99 or less
- 2. Mostly free:** Countries with an average score of 2.00 to 2.99
- 3. Mostly not free:** Countries with an average score of 3.00 to 3.99
- 4. Repressed:** Countries with an average score of 4.00 or higher.

Exhibit 18 shows the IEF rankings of selected countries (note: the U.S. ranked 12th with a score of 1.85).



EXHIBIT 18 Economic Freedom Index Rankings by Country



COGENT PAPERS N^o 13

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