Timberland Investment
An AIMCo Perspective

The Timber Group
Alberta Investment Management Corporation

September 2011
Timberland is a major asset class for many institutional investors in North America and Europe. In Canada, a small number of Canadian institutional investors such as Ontario Teachers’ Pension Plan, British Columbia Investment Management Corporation, and Alberta Investment Management Corporation have invested in this asset class beginning in the 2000s. Newcomers are emerging in Europe, primarily pension funds, in addition to the sovereign wealth funds of the Middle-East and Asia.

FORESTS AND TIMBERLAND AS AN ASSET CLASS

Forest assets range from plantations, which are typically, planted forests established mainly for wood production, to natural and semi-natural forests managed for wood, non-wood products, carbon sequestration, biodiversity conservation and other environmental benefits. Assets typically consist of both land and the growing stock but investments can also be made in either one of them. Depending on the location, both softwood (coniferous) and hardwood (deciduous) species may be involved.

The world’s forest area is estimated at 4.0 billion hectares, or 30 percent of total land area. Approximately 96 percent is natural or semi-natural forest, and the remaining 4 percent consists of plantations. Fast-growing plantations require favorable growing conditions found mostly in the southern hemisphere and tropics but also in certain areas of the U.S. The mean annual growth varies from 10 to 45 m³/ha/year and rotation length from 5 to 40 years. Exhibit 1 shows the countries/regions with the majority of the world’s timberland supply. The United States is the world’s largest private timberland market. It accounts for only 8% of forest reserves, but 25% of total global production as seen in Exhibit 2. This is because the United States has some of the best tree-growing land among key timber growing regions and the recognition of property rights is well entrenched.

Exhibit 1—World Timberland Supply

Exhibit 2—World timber production

---

1 Estimated timber related holdings for:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Value (CAD in billions)</th>
<th>Organization</th>
<th>Value (CAD in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario Teachers’ Pension Plan</td>
<td>$2.2</td>
<td>Alberta Investment Management Corporation</td>
<td>$0.6</td>
</tr>
<tr>
<td>British Columbia Investment Management Corporation</td>
<td>$0.8</td>
<td>Public Sector Pension Investment Board</td>
<td>$0.5</td>
</tr>
</tbody>
</table>

Source: "OTT Annual Report 2010; b AIMCo estimate; c AIMCo Annual Report 2010/11

2 The US has the largest forest industry in the world;
The growth of timber can be divided into two important components: volume growth and value growth. The value appreciation of timber is a combination of the two. Volume growth of the forest varies considerably among regions, depending on the growing conditions, species, quality of forest management, quality of the seedlings etc. Value growth refers to change in the composition of the growing stock when low-value, small-sized trees (typically sold for pulpwood) pass the threshold to become high value, large-sized quality trees (typically sold for saw or veneer logs).

The majority of the world’s forests, about 84 percent, remain under public ownership. Differences among regions are considerable. Currently only a minority of the global forest areas is owned by Timberland Investment Management Organizations (TIMOs) on behalf of their investors. As previously mentioned, the global forest area is estimated at 4.0 billion hectares, while the forest area under TIMOs ownership was estimated at just 10.0 million hectares in mid-2009. The role of the private sector, however, is becoming increasingly important in the creation of new plantation assets, as well as in the rehabilitation of natural forests in tropical regions.

The United States has the largest private timberland ownership in the world. Financial ownership, including ownership by institutional investors such as pension funds and endowment funds, has been increasing in recent years while ownership by integrated forest companies has been decreasing correspondingly. (Exhibit 3)

Timberland investing has its roots in the U.S. During the 1980s, integrated forest industry companies started to divest their own timberland since income generated from timber harvesting would not receive the favourable capital gain tax treatment. Simultaneously, awareness of forest assets’ attractive investment characteristics started to spread among professional investors. Timberland investment managers were emerging—many of them were associated directly and indirectly with investment banks. During the 1990s the number of TIMOs and their assets under management in the U.S. increased significantly from about USD 1 billion to USD 12 billion. Over the last 10 years, the value of forest investments has continued to grow, adding another USD 30 billion by 2006. At present, the investor capital placed in timberland is estimated to amount to USD 70 to 80 billion, of which more than 70 percent is invested in the United States. Emerging markets’ share of the investments has grown as the drivers behind the higher returns have become stronger than in the mature markets and new trends such as environmental services, climate change mitigation and demand for wood-based energy have enhanced emerging markets’ attractiveness.

**Exhibit 3—US Timberland Ownership Trend**

![Graph showing US Timberland Ownership by Ownership Category from 1996 to 2009. The graph indicates a trend where the share of ownership by Conservation, Financial, Integrated, and REIT ownership categories fluctuates over the years, with some years having a higher concentration in one category than others.](image)

Source: USDA
KEY FEATURES OF TIMBERLAND INVESTMENT

Forests differ from other asset classes in several respects. First the returns on forest assets are driven by biological growth representing 65 to 75 percent of the return on investment. The second factor is timber price appreciation typically ranging between 25 and 30 percent of the total return. Finally, changes of forestland prices contribute some 2 to 5 percent (unlevered).

Well-diversified investments in forests provide three distinct and well researched benefits to an investment portfolio:

i) diversification resulting from return drivers that are largely uncorrelated with other asset classes (Exhibit 4),

ii) the inherent inflation hedge, due to biological growth and potential appreciation of timber and forestland prices, and

iii) the compelling relative performance of forestry investments compared to financial assets.

*Exhibit 4—Return Correlations between Timberland Other Classes*

![Graph showing return correlations between timberland and other classes.]

Source: Ibbotson Associates, Luitz

---

3 While efforts are being made by the timberland investment community to capture investment performance in non-US jurisdictions, current evidence is mainly based on the performance in the US. The following table provides a comparison of 20 year return and standard deviation (1991 to 2010) of timberland, as represented by the National Council of Real Estate Investment Fiduciary (NCREIF) Timberland Index.

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Benchmark index</th>
<th>Time-weighted average quarterly return (annualized)</th>
<th>Quarterly standard deviation (annualized)</th>
<th>Sharpe ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>US timberland</td>
<td>NCREIF timberland index</td>
<td>11.5%</td>
<td>17.0%</td>
<td>0.66</td>
</tr>
<tr>
<td>US large cap equities</td>
<td>Standard &amp; Poor 500</td>
<td>8.3%</td>
<td>36.8%</td>
<td>0.22</td>
</tr>
<tr>
<td>Global equities</td>
<td>MSCI World</td>
<td>6.7%</td>
<td>38.2%</td>
<td>0.17</td>
</tr>
<tr>
<td>Gold</td>
<td></td>
<td>7.5%</td>
<td>25.5%</td>
<td>0.28</td>
</tr>
<tr>
<td>US real estate</td>
<td>NCREIF property index</td>
<td>7.2%</td>
<td>10.8%</td>
<td>0.64</td>
</tr>
<tr>
<td>Commodities</td>
<td>S &amp; P GSCI</td>
<td>6.6%</td>
<td>54.9%</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Note: Sharpe ratio assumes a risk free rate of 0.243% which is the spot yield of 1-year US Treasury notes of March 3, 2011.
Source: Timberland Investment Resources.
There are other intrinsic attributes associated with timber investment that differentiate it from other asset classes. One is the ability of a commercial forest to add value through biological growth regardless of what is happening in the financial market and the economy. Another attribute that investors may find attractive is the flexibility the asset class affords to raise or lower harvests in response to timber price movements.

Mature forests normally provide a level of cash yield from regular log harvest and sales, which is a useful feature for pension fund investors. However, shorter rotation plantations (3 to 10 years) built from bare land would not have cash yield initially. Also, timberland is an illiquid asset which may take longer time to sell should an investor decide to divest.

**INVESTOR PARTICIPATION AND INVESTMENT RETURNS**

There are several ways investors can participate in timberland investment:

- **Publicly traded securities in timber and timberland:** This universe is small, involving only a handful of timberland focused real estate investment trusts in the US, such as Plum Creek Timber Company (PCL), Potlatch Corporation (PCH), Rayonier Inc. (RYN) and Weyerhaeuser Company (WY). It is mostly suitable for investors for whom liquidity is a priority. Another appeal is that it provides continual market valuations. However, publicly traded vehicles offers investors far less control over how they participate in the timberland asset class.

- **Direct investment:** Investors who have access to strong in-house forest investment expertise may choose to purchase, hold title and directly manage forest properties. These investors sometimes use timberland investment managers for certain aspects of the investment.

- **Commingled funds:** Timberland Investment Management Organizations (TIMO)-sponsored commingled funds are appealing to investors who lack the funding capacity to invest in a separate account vehicle. They also have the potential to offer greater diversification than otherwise would be possible because the capital of several investors is pooled to create critical mass.

- **Separate account:** TIMOs also offer a separate account product which provides more control, as the investor can dictate the strategy, risk profile and investment terms. A separate account typically requires a significant level of capital commitment.

Returns vary considerably between regions and countries. In North America, timberland returns are more dependent on the performance of the housing market which, as the largest consumer of wood products such as lumber and panelboard, remains weak at this juncture. Due to strong interest in timberland investment by institutional investors, timberland prices in the US remain high and, as a result, the risk-adjusted returns from timberland investment in the US are typically lower. In contrast, emerging markets offer significant potential opportunities for high returns albeit at higher risks. Unfortunately, other than the National Council of Real Estate Investment Fiduciary that tracks performance of timberland investment in the US, there is not a return index that can be tracked for the purpose of monitoring investment performance in non-US jurisdictions. Nevertheless, Exhibit 5 shows the target returns for timberland investment in the key timber regions in the world relative to the associated country risk. It should be noted, however, that these returns evolved with time and according to market conditions. Over time, the associated country risk premium in developing countries can be expected to decrease.

**Exhibit 5—Target returns and perceived country risk**

<table>
<thead>
<tr>
<th>Developed regions/countries 6-8% real</th>
<th>Newly developed 8-12% real</th>
<th>Developing 13-19% real</th>
<th>Frontier 20+% real</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>Brazil</td>
<td>Central America</td>
<td>Russia</td>
</tr>
<tr>
<td>Canada</td>
<td>Uruguay</td>
<td>Central/Eastern Europe</td>
<td>Southeast Asia</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Chile</td>
<td>Argentina</td>
<td>East Africa</td>
</tr>
<tr>
<td>Australia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
NON-TIMBER OPPORTUNITIES ASSOCIATED WITH TIMBERLAND

Timber harvests and land sales are not necessarily the only sources of income timberland investments generate. Timberland also can produce revenue from a variety of sources such as forestry carbon credits.

A growing forest sequesters carbon. If the necessary systems and procedures can be put in place, this sequestered carbon can be monitored and registered. A landowner’s capacity to certify that a certain amount of carbon has been “locked up” in a particular forest ecosystem can be monetized in the form of registered carbon credits. These credits are typically acquired, voluntarily or under some government regulations, by entities that are emitting greenhouse gasses (GHGs) into the atmosphere. A variation of this strategy is selling carbon credits based on one’s active preservation of a natural forest, such as a native tropical rainforest. This is known as Reducing Emissions from Deforestation and Forest Degradation (REDD). The REDD market is concentrated in developing economies like those in sub-Saharan Africa, Latin America and the Pacific Rim where deforestation is a problem.

It should be noted that investment opportunities in forestry that are based on the production and sale of carbon credits are currently very limited due to the lack of an effective global compliance market for forest-based carbon emissions offsets. This may change if a new global carbon accord is adopted to replace the Kyoto Protocol.

Other potential sources of income are: recreational licenses (e.g., hunting), mineral rights, right-of-way and access rights, wetlands and stream mitigation banking, and species and conservation banking.

KEY FORESTRY INVESTMENT DRIVERS

Traditionally, demand for a wide range of forest products such as lumber, panelboard, pulp and paper has been the main driver behind the demand for logs which, in turn, dictates the profitability of timberland investment. This driver is expected to continue to be very dominant in light of population growth in emerging markets. For example, China’s demand for wood products has been a major driver for log exports in key timber regions such as Russia, the US, New Zealand and Canada. Exhibit 6 shows China’s forest products imports by products from 1997 to 2009.

Exhibit 6 – China’s forest products imports by products

![Diagram showing China’s forest products imports by products from 1997 to 2009.]

Source: Chinese customs statistics, as compiled by Forest Trends2
In recent years, increasing demand for new products, non-timber forest products and ecosystem services have also increased the interest in timberland investment. Biotechnological solutions may bring new products for markets such as the energy and food industry. Growing demands are also being placed on various forest based ecosystem services. In particular, the role of forests in climate change mitigation and adaptation has opened up new investment opportunities. Other ecosystem services such as conservation of biodiversity, maintenance of hydrological cycles and prevention of erosion are increasingly being compensated to landowners and thus represent new revenue streams in areas where the supply of these services has become critical.

Demand for plantation wood has also been growing. From the wood processor and consumer point of view, plantation wood can offer consistency in quality. Additionally, illegal logging of native forests, particularly in tropical regions, has become a major concern for civil society interest groups and consumers in the developed world. National governments in the producer countries are increasingly reacting to this issue by encouraging the development of plantations. Moreover, global companies, which depend on timber supplies, apply selective procurement policies and sustainable timber production standards. Buyers in developed countries demand certified or at least legal wood and paper products. All of these trends strongly support the use of plantation wood.

Over a longer horizon, carbon forestry is expected to play an increasingly meaningful role in timberland investment as a return enhancer. It represents an upside in jurisdictions where forestry carbon credits are recognized in the cap-&-trade programs. Climate change mitigation actions in forestry include afforestation, reforestation, sustainable management of existing forests, reducing emissions from deforestation and forest degradation (REDD) and increasing the volume of wood products in use.

Another key drive for timberland development is the growth of the biomass energy sector. The International Energy Agency (IEA) estimates that bio-energy production with modern efficient technologies offers a cost-effective and sustainable potential to meet up to 50 percent of global energy demand. As biomass is carbon neutral, this would significantly reduce carbon emissions from fossil fuels. Bio-fuels are prominent among alternatives identified to date and governments globally are aggressively financing research aimed at new and improved biofuel technologies (including woody biomass to bio-fuels), technology adoption and biofuel systems implementation. New plantations designed to meet incremental fibre demand as a result of expansion in biomass-energy are being developed. For example, short rotation eucalyptus and poplar plantations have been introduced in South America and Europe for the purpose of meeting needs of the bio-mass energy sector. The US has also witnessed the construction of two world scale wood pellet plants that tap southern pine plantations as a main source of wood supply.

Changing industry competitiveness opens new timber investment regions. The current operational environment of forest companies in North America is particularly challenging due to the structural change that is transforming the industry. Production is shifting to emerging markets where production costs and forest growth rates are more favorable than in the North America and where mills are located close to growing consumption centers. As a result, new investment regions such as Oceania, South America and Southeast Asia, are offering higher risk-adjusted returns for timberland investment.
RISKS AND RISK MANAGEMENT

There are various risks with any investment asset class or opportunity. Specific risks associated with timberland investments can be classified into two major categories: economic risks and physical risks. With proactive timberland and portfolio management, most risk factors can be minimized dramatically.

ECONOMIC RISKS:

Economic risks can cause the most material harm to timberland. Through proactive timberland and portfolio management, these risks can be greatly reduced. Economic risks include:

- **Price** - Log prices are volatile. Price changes occur based on cyclical and seasonal fluctuations and demand dynamics. The impacts of price volatility can be diminished through active management, harvest scheduling, and diversification of a timber portfolio among log markets and regions.

- **Supply** - Supply risk is composed of two factors: productivity and environmental constraints. Productivity is a measure of the ability of forestland to grow trees. Productivity is improved through active management such as silvicultural activities, which include planting genetically improved seedlings, fertilization, thinning, and weed and brush control. Risks to productivity include poor management practices that degrade site productivity, or poor recognition of site productivity and the inappropriate application of otherwise sound management. Environmental constraints include regulations associated with environmental protection and wildlife conservation. The value of some individual private timberlands can be negatively affected if previously unknown habitat is discovered, and restrictions on harvesting are imposed. Comprehensive due diligence at the time of acquisition minimizes financial risks associated with environmental constraints.

  Harvest scheduling and long-term planning incorporate these factors to help minimize supply risk. Supply is projected utilizing economic optimization techniques that incorporate flexibility to accelerate or withhold supply in response to market changes.

- **Demand Risk** - Reductions and increases in the demand for raw logs are impacted by various external factors. These factors include:
  - Substitution of other finished products, such as steel or various recycled materials.
  - Substitution of other raw products, for example, exports substitution from other countries.
  - Reduction in overall demand for forest products related to usage, such as a decline in housing starts.
  - Population growth increasing the overall demand for wood products, reducing the impact to the entire portfolio.

- **Liquidity Risk** - Liquidity risk can be minimized through acquisition due diligence, sound stewardship principles, and the ability to identify and respond to disposition opportunities that enhance investment returns. The acquisition of well-managed properties and the continuation of high-quality management enhance the value of a given property and maintain or enhance liquidity.
PHYSICAL RISKS:

- **Fire** - Fire risk varies across forest regions and is minimized through the implementation of comprehensive fire protection plans designed to provide for early detection and extinguishing of wildfire. For example, implementing stocking level control to maintain healthy stands with minimal ground fuel (needles and dead wood) accumulation is a good practice. Similarly, well-maintained roads provide access for firefighting agencies, thus minimizing response times.

- **Weather** - This type of risk generally includes wind, hurricane and ice/snow. Proactive measures such as site selection and controlling stocking level would help minimize this risk. When weather-related damage takes place, timely salvage of damaged trees minimizes loss.

- **Insect** - Large scale insect infestation seldom happens to healthy timber. The greatest risk of infestation is associated with widespread devastation resulting from fire, wind or similar natural occurrences. Where salvage efforts have failed to remove downed timber, insect infestations and damage occur. Scientific silviculture helps maintain healthy forests. Early detection and removal of infested trees minimizes the risk associated with this pest.

- **Disease** - As with other physical and biological risks, disease losses are minimal due to active management and maintenance of healthy, well-stocked stands of timber. Disease damage generally occurs in single trees or small stands of trees. Disease may not cause immediate death of the tree, but rather a reduction in value. Careful management of seedling selection and continued research helps to keep losses at a minimum. Physical removal of affected trees or treatment designed to deal with individual disease on-site eliminates spread of the disease.

- **Other** - Other types of risk are worth noting include animal damage and theft. Animal damage occurs when certain animals are attracted to trees at various stages, potentially killing individual trees, but more often reducing growth rates. Seedling protecting devices and provision of alternative sources of food minimize the risk associated with animals like deer, beaver and bear. As with any product, the potential for log theft exists. Numerous controls are in place within the industry to reduce the risk of theft, including log tracking within a customized log accounting system, which provides timely management information to field foresters.

INTERNATIONAL TIMBERLAND INVESTING

The global investable forestry area available for institutional investors is estimated to be USD 250 to 300 billion. The total value of the forestry investment by institutional investors reached USD 70 to 80 billion in 2009. This corresponds to only about 27 percent of the value of global forestland available to investors worldwide, leaving major opportunities for institutional investors to access the asset class in the years to come. Most forestry funds invest in timber asset in the U.S. with only a small share of the assets outside the country (mainly in Australia, New Zealand and South America). New, non-U.S.-based funds are being formed, especially in Europe, to focus on investment in ex-US regions. Currently, more than 50 established timber funds exist globally.

AIMCo considers four countries (in addition to Canada and the U.S.) as having the highest potential for timberland investment internationally in the near term: New Zealand, Australia, Chile and Brazil. A complementary strategy of pursuing offshore international timberland investments today generally means investing in fast-growing plantations of non-indigenous species. The most common species that have been planted in these countries are radiata pine (Pinus radiata) and southern pine (which are native to California and the Southeast U.S., respectively) and eucalyptus species (native to Australia). The advantages of offshore investment include: growth rates that are faster than in temperate latitudes, competitive rates of return, access
to new and emerging world markets, and increased diversification. The risks include: native land claims disputes, exchange rate exposure, and foreign ownership control issues.

Exhibit 7 shows the commercial timberland regions in the world where timber investment opportunities exist.

Exhibit 7—Distribution of commercial timberland in the world

Another important consideration is timing. In more mature markets like North America, prime properties are much less likely to become available than in the less mature timberland markets. Within the last few years, for instance, some of the best timberland in Australia and New Zealand has become available. That makes this a good time to be in this market. It should be emphasized that each country offers specific hosting conditions which need to be taken into consideration in the final investment decision.

Any potential international investment, of course, would be balanced in regard to risk and return against other potential investments in North America. The overarching criteria for any investment would hold that it provides the best risk adjusted return for the client. AIMCo’s Timberland Investment Team would provide the due diligence to be sure that the varied risks and opportunities would be considered in acquiring international properties for investment.

INVESTMENT PHILOSOPHY AND PRINCIPLES

Alberta Investment Management Corporation is a signatory to the United Nation Principles for Responsible Investment (PRI). The PRI are a suite of voluntary and aspirational environmental, social and corporate governance (ESG) investment principles developed by institutional investors, the United Nations Environment Program Finance Initiative and the UN Global Compact in 2005.

AIMCo’s investment policies reflect many of the same ESG principles that the PRI promotes, and as a signatory, we are committed to working toward fully integrating the Principles into timberland business
practices. Under the guidance of PRI principles, AIMCo supports initiatives to institute good environmental, social and governance efforts. We have a distinct preference for timberlands investments that are currently (or will soon be) certified by an independent third-party certifier to a recognized certification system.

AIMCo’s TIMBERLAND INVESTMENT STRATEGY

AIMCo employs a disciplined and cautious approach to timberland investing. We use fundamental economic research and biometric analysis to identify geographic regions that offer the potential to generate superior risk-adjusted returns from both diverse sources of revenue and long-term asset appreciation.

Our investment strategy also entails allocating capital across a diversity of end-use markets and tree species. The portfolio will be anchored by a selection of high quality, core investments in the North America, and will consider a broad range of strategic opportunities in South America, Australia and New Zealand. A particular and early emphasis will be placed on Australia, New Zealand and Brazil. These regions and countries are characterized by developed or emerging forestry infrastructures and they offer the potential to meet global demand for wood fiber and other forest products and services on a highly competitive basis because of their growing mill capacities and the emergence of legal and regulatory structures that are conducive to forest ownership and management. Over time, investment focus will also be expanded to cover newer timber regions in sub-Saharan Africa and Southeast Asia, involving new species, particularly the fast growing varieties.