Timberland Investment Outlook 2013-2017
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Executive Summary

This is New Forests’ second timberland investment outlook paper. Our first paper, released in 2011, considered the investment landscape for timberland and how key drivers related to the rise of Asian demand, shifts in timber supply, and the evolution of forest products markets would likely affect investment strategy and returns. We chose a five-year horizon for this outlook as it is meaningful for investment strategy, yet short enough to identify current opportunities. Many of the forest sector trends that we previously identified continue, and in this new report we also look at the trends in institutional timberland investment. We examine how forest sector and institutional investment trends will combine to define the evolution of the timberland asset class.

Trends in Timberland Investment

We estimate the current size of the timberland asset class by identifying the main timberland investment management firms, direct investors, and listed timberland funds and REITS and their assets under management. Based on this research, approximately US$50-60 billion is invested in unlisted investment vehicles and about US$30 billion in timberland REITS. The investible universe for institutional timberland investment is more subjective. While we expect the investible universe of timberland will continue to evolve, we suggest it is currently in the order of US$150-200 billion.

The timberland asset class is maturing, as a significant proportion of the high-quality timberland estates in the US, Canada, Australia, and New Zealand are already in institutional ownership. At the same time, new capital allocations to timberland continue to increase, leading to a growing internationalization of the asset class, as well as an expanding secondary market for timberland sales between institutional investors. While this creates more liquidity in the timberland market it also leads to more competition for investment opportunities and upwards pressure on prices in key regions. Discount rates applied to timberland cash flows (a measure of expected return requirements) have declined partly because of more liquidity in the market, but also because of the extremely low returns from government bonds that serve as a benchmark. Timberland investors and timberland investment managers, therefore, have sought to increase returns from traditional US timberland assets, define new investment strategies, or identify new, higher return international opportunities.

The timberland investment rate has rebounded to about US$6.5 billion in 2012, and we expect this level of US$6-7 billion per annum of new investment to prevail over the next five years. We also expect that about half of this investment will occur in the core US timberland market and about half will be outside the US.

Forest Sector Trends

At a broad level, timber markets reflect the overall global economic outlook. Asia remains a growing source of international timber demand across the full range of timber markets. North American lumber demand is growing strongly again after the worst housing market collapse in the past 50 years. While overall demand for newspaper, printing, and writing papers is declining in North America, Europe, and Japan, paper demand is rising in Asia and new pulp and paper capacity is being added in Latin America and Asia. Timber supply on the other hand is mixed, with declining supply from Canada and Russia but significant reserves in Europe and the US. We do not see significant increases in supply from greenfield plantations in the coming five years. While there will be some growth in hardwood plantations in Latin American and Asia, there is unlikely to be any expansion in softwood timber plantations. Competition for land will force forest managers to emphasize continuous productivity improvement in existing plantation areas more than expanding plantation areas.
One key question for the coming years is the degree to which bioenergy, biofuels, and bio-materials will emerge as a major new demand source for woody biomass. Through a range of government subsidies, policy and regulatory settings, and research support, there is a sense that we may be on the verge of a suite of new markets for biomass as the world continues to face a shift away from fossil fuels. Some recent projections suggest that demand for biomass for energy could dwarf the demand for traditional industrial roundwood over the next 25 years. This may provide new opportunities for capital investment in both feedstock (e.g. intensive energy crop plantations) and in infrastructure, processing, and supply chain capacity.

For timberland investors there appear to be significant opportunities in both softwood and hardwood markets, as well as in both traditional markets and emerging markets. The challenge overall will be to add value to existing timberland assets by reducing physical impacts (fire, insects, disease), improving biological growth through silviculture and genetics, and adding value by applying new technologies in information systems, harvest and transport, and processing.

Regional Outlook

Over the next five years, we see about one-half of timberland transactions still occurring in the extensive US timberland market, with another 25% of transactions in Australia and New Zealand, and about 25% of transactions in the rest of the world. As investors expand allocations to timberland outside the US, they may also consider whether to integrate investments in timberland, agriculture, infrastructure, and processing to create stable returns and to reduce risk.

Portfolio Recommendations

In our review of timberland market opportunities, potential investments, and attitudes of institutional investors, New Forests has formed the view that currency risk should be a key element in timberland portfolio allocation. The timberland asset class is no longer dominated by US institutional investors buying US timberland. There are now timberland investors from all regions of the world, and investment opportunities also reside in multiple regions. We therefore have recommended an indicative framework that can guide investors in thinking about regional allocation of their timberland portfolio (see below).

<table>
<thead>
<tr>
<th>Investor Currency</th>
<th>US</th>
<th>Australia-New Zealand</th>
<th>Latin America</th>
<th>Other Emerging Markets (e.g. Asia)</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>60%</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
<td>0</td>
</tr>
<tr>
<td>Euro</td>
<td>30%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>GBP</td>
<td>35%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>AUD</td>
<td>35%</td>
<td>40%</td>
<td>10%</td>
<td>15%</td>
<td>0</td>
</tr>
</tbody>
</table>

Of course, regional diversification is not the only consideration, and investors will need to consider market exposures, management strategies, and appetite for risk. In addition, investors will need to determine their investment approach, including whether to manage investments in-house, outsource to a single global manager, or outsource to a number of specialist regional managers.

Overall, timberland remains an attractive asset class for many institutional investors. The forestry sector and timberland investment opportunities are both growing and evolving. We hope this investment outlook can provide some insight into a fascinating asset class that cuts across so many aspects of our economy, our society, and our environment.
Introduction

Interest in real assets generally, and timberland in particular, continues to grow among institutional investors. The trend is supported by macro-economic factors, including low bond returns, market volatility, and increasing concerns about inflation, which are driving the continuing evolution of portfolio allocation toward assets that both provide diversification and stabilization of investment portfolio performance. While institutional investment in timberland expands, the nature of the forest sector is evolving at the same time. Investors will need to both navigate a maturing asset class and position their timberland portfolio to gain from shifts in market conditions and competitive dynamics to be successful.

In 2011, we published our inaugural Timberland Investment Outlook,¹ which focused on high-level factors that are contributing to the ongoing restructuring of global timber production and trade. In this paper, our second five-year outlook, we expand on the themes we developed in 2011 and provide some fresh insights that will be of use to investors in thinking about where attractive returns will be found in the coming years. In large part, the transitions we introduced in our first outlook paper remain underway, and we provide updates on several of these trends throughout this paper. In particular, we discuss the continuing maturation of the asset class, how returns are evolving, and how an increasing number of investors seeking to place capital in timberland will be accommodated. We then consider several trends in the forest sector, including structural market changes, new and innovative markets for timber and biomass, and the role of productivity enhancement in maintaining returns, which we believe will underpin successful investment strategies. Finally, we provide a picture of the regional timberland markets and discuss how investors may think about successfully deploying capital into areas of opportunity. To do this, we balance investor specific factors like currency risk with the trends and associated opportunities that we see over the next five years. Ultimately each investor will have portfolio allocation considerations, return objectives, and views on risk, which will drive manager selection, geographic diversification, and even market exposure priorities. Whatever the timberland investment objectives, we hope that this paper will provide food for thought.

Trends in Timberland Investment

The timberland investment business has grown substantially in size, from about US$20 billion in 2000 to approximately US$80-90 billion of assets under management today. This figure includes investment through Timberland Investment Management Organizations (TIMOs), by direct investment, and in publicly listed timberland Real Estate Investment Trusts (REITs). In this paper, we focus on institutional investment in timberland, which primarily takes place through TIMOs and direct investments. The vast majority of all institutional capital deployed to date has been as part of a primary rationalization of asset ownership from corporations and governments to institutional investors. It is fair to say that the timberland market has significantly matured, and we now have robust competition among managers and also between managers and direct investors for the remaining flow of these primary assets. In addition, the secondary market of asset sales between institutional investors is also growing. In line with this maturation the valuation methodologies have also evolved, and both buyers and sellers are largely standardizing how assets are priced, what risks and opportunities to consider in due diligence, and how best to maximize value upon exit.

The Timberland Asset Class Is Continuing to Mature

The total investible universe of timberland could be anywhere from US$125 billion (e.g. prime timber plantations in the US, Canada, Australia, New Zealand, and Latin America) to US$470 billion or more depending on how the boundaries are defined. We believe that the timberland assets suitable for institutional investors are currently in the US$150-200 billion range, with the upper boundary dependent on the degree to which European, Latin American, and Asian timber plantation assets are included (Figure 1).

There may be some further expansion if, for example, we include European timberland, Canadian Provincial government forestry tenures, Russian forestry tenures, and African and Asian natural forest and timber plantation development concessions.

Figure 1 – Institutional Ownership of the World’s Planted Forests

There are approximately 160 million hectares of planted forests worldwide. However, only about 50 million hectares would be suitable for institutional ownership, and about one-quarter of these are already owned by institutional investors. (Sources: New Forests’ analysis of FAO Global Forest Resource Assessment 2010 and RISI 2012 Global Tree Farm Economics Review)

2 Currently, the leading TIMOs have approximately US$50 billion in assets under management, the top timberland REITs have market capitalization of approximately US$30 billion, and we estimate there is a further US$10 billion of direct investment. Based on New Forests’ analysis of major TIMOs and timberland REITs as of April 2013.

3 The boundaries of the investible universe are subjective. In 2010, IWC reported a possible investible universe of private forests of US$470 billion with an additional US$250 billion in timber licenses or forestry rights on public land. IWC, December 2010. IWC News Issue no. 32.

4 New Forests suggests the investible universe of timberland is comprised approximately by the following breakdown (in USD): $75-85 billion; Canada: $6-7 billion; Australia and New Zealand $15-18 billion; Europe: $10-40 billion; Latin American $40-50 billion; and Asia and Africa $10 billion.
As capital allocation to timberland has steadily increased, the asset class is maturing, and this will have implications for investors over the next five years. In particular, we believe that the internationalization of timberland investing will continue, and about half of incremental investment will be outside the US. We categorize potential countries with timberland investment opportunities as mature, intermediate, and emerging based on the quantum of existing institutional investment, degree of political and business risk, and availability of investible assets (see Figure 2).

*Figure 2 – Timberland Investment Regions by Market Maturity*

The regions with most attractive market conditions are North America, Western Europe, and Australia-New Zealand. Latin America, Southeast Asia, and South Africa are also increasingly attractive to timberland investors.

### Growing Allocations to Timberland Investment

Timberland continues to attract institutional investors, and the past two or three years have seen a steady flow of new allocations. The International Woodland Company (IWC) reports a 40% increase in committed capital in timberland funds since the end of 2010, growing from US$10 billion to US$14 billion, which does not include capital committed or available for direct investments or co-investments. A core characteristic of forestry investment is that biological growth delivers capital growth and so timberland returns are less dependent on the broader economic drivers that influence other assets classes. This makes timberland an attractive asset class for institutions analyzing broader portfolio concerns including the following:

- Many investors see government bonds as having zero or negative real return for the foreseeable future and seek to increase allocations to real assets with reliable and relatively low-risk returns.
- There is concern about the volatility of equity markets and a desire to increase exposure to stable assets and those with portfolio diversification benefits.
- There is increasing emphasis on portfolio design theory by institutional investors, including concepts like risk budgeting relative to returns, categorization of assets (e.g. inflation linked, defensive, alternative, etc.), and in liability matching. Many of these portfolio allocation policies tend to identify timberland as an asset performing one or more specific roles, and so this pushes more investors to set specific timberland allocations.

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5 IWC, February 2013. *IWC News Issue no. 37.*
Timberland allocations typically range from as low as 0% to as high as 10% in institutional portfolios. The size of the allocation appears to be related to the following considerations:

- The capacity to accept illiquid assets, which is higher for defined benefit pension plans, university endowments, and some insurance companies, and lower for defined contribution pension funds or for funds in jurisdictions with investor capacity to readily change pension fund provider;
- The liability profile, with high inflow funds or those with long-dated liabilities having greater capacity to allocate to illiquid assets; and
- The nature of the overarching portfolio allocation policy and how well timberland fits one or more allocation criteria.

The level of institutional investment in timberland grew steadily by about 20% per annum from 1985 to 2000. From 2004 to 2007, there was a surge of investment in the US as major corporations sold their timberland assets to institutional investors. In 2008 and 2009, the timberland market froze as investors sought liquidity. Since 2009 timberland investment has resumed its growth, but much of this growth is now via international timberland acquisitions and secondary market transactions (e.g. between institutional investors) in the US. (Source: New Forests’ analysis of multiple sources)

Differentiation between Direct Investors and Fund Investors
As investors enter the timberland asset class, they typically fall into one of two types: fund investors and separate account or direct investors. While both types of timberland investors have been active for 20 years, we are now seeing institutional investors expressing more interest in direct investment and co-investment. This appears to be part of the push by many large institutional investors to internalize management in order to reduce fees; there are a number of investors seeking to deploy large amounts of capital in timberland (e.g. US$500 million to US$2 billion) as direct investors. At the same time, the number of businesses being established as timberland managers is increasing, and the number and size of funds being offered is also growing. IWC reported 112 timberland managers worldwide at the end of 2012. IWC also found that 169 timberland funds have been offered to institutional investors since 2007; approximately one-third (54) of these were offered in the last two years alone. However, it should be noted that most of these managers

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6 Based on New Forests’ market knowledge.
7 IWC, February 2013. IWC News Issue no. 37.
8 Ibid.
will not reach a viable scale, and there are only about a dozen timberland managers that have reached US$1 billion in assets under management,\(^9\) which might be considered as the threshold for a manager to be seen as sufficiently mainstream for institutional investors. Nevertheless, with more investors, managers, and funds investing in timberland, there is increasing competition among managers to attract and retain clients.

**Emergence of the Secondary Market**

As part of the expansion of institutional investment into the forest sector, most of the high-quality corporate and government timber plantation assets in the low-risk markets of North America, Australia, and New Zealand have moved into institutional ownership over the past 25 years. The timberland market in these countries is now showing signs of maturity. Timberland transactions have been largely in the primary market, insofar as institutional capital has bought out corporate timberland holdings and government assets. Looking forward this will shift into a secondary market, at least in developed countries like the US, Australia, and New Zealand. For example, in 2012 Hancock Natural Resource Group and Molpus Woodland Group\(^10\) purchased Forest Capital Partners’ assets, effectively undertaking a 760,000 acre management consolidation. As another example, Harvard Management Company has commenced a sell down of its assets in New Zealand to secondary institutional investors.\(^11\) These secondary transactions are indicative of the likely future of the timberland asset class in mature markets.

**The Nature of Timberland Returns Is Changing**

Timberland management has also evolved substantially since the late 1980s and 1990s when institutional investors first took an interest in timberland. US timberland returns have been tracked through the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Index since 1987, and many institutional investors were initially attracted to timberland for its relatively high returns. Over time, however, returns have declined and stabilized at levels more reflective of a liquid and efficient market (Figure 4).

*Figure 4 – US Timberland Returns, 1987-2012*

NCREIF data is the best publicly available source for US timberland returns. However, due to the nature of self-reporting, some managers with poor returns may have deliberately avoided reporting, and there has been skepticism in periods of bear markets for illiquid assets (like 2009-2011) as to whether valuations truly reflected the price that could be obtained if the assets were presented to market. (Source: NCREIF)

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\(^9\) New Forests’ analysis of TIMO and REIT assets under management to date.


Declining Discount Rates

Early timberland deals were largely about buying timber for harvest, and often assets were mispriced or sellers lacked sophistication. Timberland buyers could typically make easy returns by simply increasing harvest rates to deliver cash earlier. By the late 1990s, the timberland investment management industry was becoming both more standardized and more sophisticated. At this time, discount rates settled at around 850 basis points over the US risk-free rate, and high-quality industrial timberlands transacted at predictable prices. By the late 1990s, the asset class became more international, with investments in Latin America, Australia, and New Zealand beginning to occur. A track record of good returns attracted a growing base of institutional investors to timberland, and this led to a growth in capital commitments and more competition for investment opportunities. By the early 2000s discount rates applied to US timberland were under pressure and in the US South fell to a low of about 550 basis points over the risk-free rate by 2007. While transactions dried up in 2009-2011, anecdotally there was some repricing of discount rates to 650 basis points during this period, but now it appears that the continuing flow of new capital commitments has pushed the discount rates back down to around 550 basis points over the risk-free rate in the US South at the time of writing. KPMG's annual timberland investor survey found that in 2012, more than 60% of US timberland investors were applying real discount rates of 6-8%, with approximately a quarter of investors using discount real discount rates of 4-6%. While 60% of managers may say that they want to apply real discount rates of 6-8%, this is unlikely to be successful in competitive tenders based on industry evidence. We also note that in some surveys respondents confuse real and nominal discount rates, which can distort the reported findings.

Over time, declining discount rates have contributed to strong returns on a valuation basis. If the US real risk-free rate was 250 basis points in 2000, and forestry discount rates were 850 basis points above that, then return expectations would be around 11% real IRR for investors in 2000. However, if those investors exited from their investments in 2012 when discount rates were 550 basis points over a risk-free rate of zero, there would have been a significant return in asset value just from this decline in discount rates. This effect of discount rate decline considerably confuses the nature of recent US timberland returns and also affects international timberland returns, which are set at least indicatively off of the US timberland risk premiums. For example, if the US South discount rate is 550 basis points, then comparable Australian softwood timberland assets are likely to trade about 200 basis points higher, as a reflection of currency risk and lower timber market liquidity. Finally, it should be noted that the converse phenomenon can occur, and if yields on US Treasury Bills begin to recover (for example, at the end of the quantitative easing process), then real discount rates applied to timberland are likely to rise, and if this occurs, valuations will decline.

Mainstreaming of Secondary Revenues

As competition has intensified for timberland transactions, managers have sought to gain competitive advantage by adding in new secondary revenues to the core return from timber sales and timber valuations. For example, payments for hunting and fishing rights, sale of conservation easements or development rights, carbon credits, gravel pits, quarries, subsurface mineral rights, water rights, and so-called HBU (Higher and Better Use) values can contribute secondary revenues and be priced into timberland acquisitions. In some
cases, seeking HBU values leads managers to subdivide properties that have more value for housing development, rural retreats, or other uses and sell these off where alternative use values exceeded that of timberland. Over time as HBU strategies have become more common, timber industry sellers have also become more sophisticated and often monetize the HBU themselves. Secondary revenues are now commonplace within the US timberland market and increasingly common in other regions as well. There are even specialist managers and funds that target deals including conservation forestry where secondary revenues like conservation easements typically form a substantial component of returns.

The Search for Higher Returns Outside the US

The rationalization of the US timberland market and reduction in transaction volume led to more effort by managers and by investors to internationalize the timberland asset class and seek new markets with greater access to investment opportunities. Over the past decade approximately US$7 billion of institutional timberland investment has flowed into Australia and New Zealand (see Figure 4), and a further US$2-3 billion has been invested into Latin America. At the same time, transaction flows in the US have reduced as much of the primary market for industrial timberland has been exhausted. In 2012, approximately half of the total US timberland transaction value was in one large secondary market transaction between Forest Capital Partners and Hancock/Molpus Woodlands Group. Putting aside this transaction, the Australia and New Zealand market would have rivaled or exceeded the entire aggregate value of US transactions in 2012.

These international investments, while representing high-quality timberland assets, also introduce currency risk and exposure to new markets, such as the Latin American charcoal market and the Japanese and Chinese hardwood woodchip markets, which we discuss later in this paper.

*Figure 4 – Value of Institutional Timberland Transactions in the US, Australia, and New Zealand*

US timberland transactions peaked between 2005 and 2008, when almost US$30 billion was invested in major timberland purchases by Institutional Investors, TIMOs, and private equity funds from US forest products companies (e.g., International Paper, Georgia Pacific, Temple Inland, and others). Transaction values in Australia have recently been rising, and will likely peak over the next two or three years and then decline. (Source: New Forests’ analysis of multiple sources)

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15 See for example: “MeadWestvaco repackages its holdings,” Available at: http://www.richmondbizsense.com/2013/03/26/meadwestvaco-repackages-its-holdings/.

The internationalization of timberland brings added complexities in valuation, for example, where timber plantations are grown on high value agricultural land. In Australia and New Zealand, the land and the trees are distinct assets and are valued separately, which is different from the US, where timberland is valued as an integrated asset. This leads to confusion when comparing discount rates, the underlying drivers of returns, and the comparison of valuation results between regions. There are also significant differences in land tenures, ranging from freehold land, perpetual leases, term leases, and leases with or without annual payments. This added complexity has occasionally led to examples of mispricing of assets by international investors.

In addition, the internationalization of the asset class requires investors to consider appropriate risk premiums for emerging markets. Timberland investment in emerging markets is relatively new and involves additional country and currency risks as well as risks around environmental, social, and governance (ESG) considerations. The emerging markets of forestry investment include areas in Latin America, Southeast Asia, and Africa, which typically present more sovereign risk, less reliable business counterparties, and more responsible investment issues for investors. New Forests believes that chief among additional ESG risks are unresolved social and community issues, poor employment practices, land tenure risk, and environmental impacts on complex ecosystems. These risks require context-specific management strategies that will be new to investors more accustomed to mature timberland investment markets.

The return expectations for investors who enter these emerging timberland regions must be higher, and managers need to resource comprehensive due diligence, management controls, and stakeholder relations processes. So while the US Southern timberland may be transacted at a 5.5% real discount rate, Latin America and Asia will require 10% to 20% real discount rates to generate comparable risk-adjusted returns. This offsets much of the productivity and cost advantages of these regions and allows countries like the US, Canada, Australia, and New Zealand to remain competitive as a source of lower return, but also lower risk investment opportunities.

Finding Opportunities in a Maturing Asset Class

If the timberland asset class is to continue expanding it must find sources of transactions. This may mean new areas like Canadian provincial timber licenses, more aggregation of smaller private forests in the US, a push into the tightly held market in Europe, more entry into emerging markets, new strategies combining agriculture and forestry, and high productivity, short rotation greenfield plantations for energy, bio-materials, and traditional pulpwood and veneer logs.

This raises questions about the future evolution of the investible universe for the timberland asset class, the source of returns, and the forward-looking risk and return characteristics of the asset class. The idea that timberland is a biological system with steady growth and regular income from timber sales remains the core attraction to the asset class. However, timberland pricing is also supported by a range of non-timberland-related factors that are part of the process of generating the returns to investors. Core timberland estates

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17 Accounting valuations are prepared in accordance with defined financial reporting standards. For example, in Australia, New Forests adheres to regulatory reporting requirements legislated under section 334 of the Corporations Act 2001. New Forests engages independent experts to determine the value of assets under management for financial reporting purposes, and the valuer’s work is conducted in accordance with standards published by the Australian Accounting Standards Board (AASB), particularly AASB 141 (Agriculture), AASB 116 (Property, Plant and Equipment), AASB 102 (Inventories), and AASB 138 (Intangible Assets).

already owned by institutional investors will turn over less frequently and buyers will be under higher competitive pressure. This leads to the need to expand the asset class while retaining the key features that provide portfolio benefits like diversification of risk, inflation correlation, and liability matching.

Later in this paper we provide specific recommendations for the timberland investor in the next five years. We expect to see some consolidation in the timberland investment management business and potentially some of the largest investors seeking to acquire whole portfolios from commingled funds. We may also see a resurgence of trade buyers, particularly from Asia, seeking to secure strategic access to raw material and reduce timber price volatility by going upstream and acquiring assets. We may see timberland investors increasingly acquiring infrastructure and processing assets to secure market access for their timber and support stability of timber pricing. In some regions like Australia, Latin America, and Asia, timberland investment may increasingly be linked with ownership of processing facilities as part of managing market risk. Similarly, regarding newer markets for biomass energy and other bio-materials, some commentators see a future where owning the core feedstock becomes the more lucrative component of linked feedstock and processing investments, much like the owners of oil reserves make higher returns than the owners of oil refineries. Finally, there may be a blending of agriculture, forestry, environmental markets, infrastructure, and real estate into mixed models that can drive returns from multiple sources.
Forest Sector Trends

Market Shifts Continue to Occur

In our 2011 Timberland Investment Outlook we identified six key trends that are restructuring the forest sector and that have implications for investment strategy:

- The rise of China as a central element in international timber markets;
- The continuing transition from natural forest logging to intensive timber plantations as the main source of timber supply, and a continuous emphasis on the enhancement of productivity of those timber plantations;
- Increased manufacturing of engineered wood products from small dimension plantation-grown timber at the expense of solid wood from larger dimension native forest timber;
- Declining demand for newsprint, printing, and writing paper, especially in Europe, North America, and Japan;
- A rising demand for biomass for a range of bio-products including bioenergy, biofuels, and new biomaterials; and
- A continuing emphasis on reducing or reversing social and environmental impacts as part of supply chain certification, investment management, and international trade rules.

In this section, we provide an update on some of these trends and explore how they may affect timberland investment strategy over the next five years.

While the economic growth of China is a near universal consideration in investment strategy across all asset classes, it is worth considering the potential implications for the forestry sector. China will achieve an urban population of 1 billion people by 2030 and will have 221 cities with more than 1 million people and 23 cities with more than 5 million people by 2025. More than 240 million people will migrate from rural to urban areas between 2010 and 2025, and the Chinese middle class will be double the population of the United States. This suggests a huge requirement for housing development and a rapid increase in per capita consumption. In fact China now represents 50% of the global market for sawlogs and exceeded the United States as the world’s largest lumber importer in 2011. The overall growth in all timber products demand results in a growing wood products deficit for the country, as shown in Figure 5.

Figure 5 – Growth in China’s Timber Deficit

![Figure 5](http://www.mckinsey.com/insights/urbanization/preparing_for_urban_billion_in_china)

China’s domestic forest resources are insufficient to supply growing timber demand across the range of wood products. This growing timber deficit makes China a central force in both Asia Pacific and global timber markets. (Source: RISI)

China, alongside Brazil and Indonesia, is also becoming a significant player in the pulp and paper sector. Brazil has the world’s largest high productivity hardwood plantation estate with 5 million hectares as of 2012, with estimated productivity of 35-40 cubic meters per hectare per annum. China on the other hand has about 3.6 million hectares of eucalyptus plantations, with an average productivity of 20 to 25 cubic meters per hectare per annum. The net result is that the Brazilian pulp and paper industry is based entirely on domestic fiber supply, while China’s growing industry is increasingly reliant on imported fiber supply, principally from Vietnam, Thailand, and Indonesia (see Figures 6 and 7).

From an investment perspective the Brazilian outlook should be more stable, as a domestic plantation industry linked to domestic processing is inherently less volatile and more predictable. This should also be true for investments in Indonesia supplying the rapidly expanding domestic market for pulp and paper, furniture, flooring, and panel products. In the case of export-oriented hardwood plantations in other Southeast Asian countries and Australia, there is significant volatility in pricing related to currency dynamics, shipping costs, and competitive dynamics. On the other hand, investors looking to the medium term may see currently depressed pricing for Australian hardwood plantations as an opportunity to enter a market with strong long-term fundamentals.

Will Softwood Markets Strengthen over the Next Five Years?
While China has steadily grown in both softwood log and lumber imports over the past several years, the US has faced its most severe housing downturn in over 60 years (see Figure 8). To some degree this has allowed China to pull excess softwood timber from the North American market. However, many market observers suggest that as US housing recovers and China continues to increase softwood log and lumber imports that a significant tightening will occur in markets for softwood timber.

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It is also anticipated that Canadian timber harvest will peak in 2015 and then decline as a consequence of the impact of the Mountain Pine Beetle and increased policy constraint. In a recent presentation by CIBC World Markets, it was estimated that the Allowable Annual Cut for the Province of British Columbia would decline from 79 million cubic meters per annum in 2010, to a low of 57.5 million cubic meters over the next 10-15 years. This is a decline in harvest almost equal to the total softwood timber production of New Zealand. At the same time, softwood log supplies from Russia have fallen from a peak of over 50 million cubic meters per annum to approximately 20 million cubic meters per annum over the past six or seven years (see Figure 9) due to the marginalization of forests at the economic frontier.

Finally, there has been little or no new softwood plantation development in the Southern Hemisphere over recent years, which suggests that the primary route to higher supply of softwood timber in future years will be via increases in productivity per hectare, rather than increases in plantation areas. Given that plantation productivity increases take place over decades, rather than years, this may further reinforce the outlook for a tightening market in the next five years (see Figure 10).

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Softwood plantation areas in Latin America and Oceania (Australian and New Zealand) are not expanding. (Source: adapted from RISI)

**Rise of Bio-markets**

Since our last Timberland Investment Outlook in 2011, there have been continuing developments around bioenergy, biofuels, and bio-materials. Alongside this has been a shift in US domestic energy markets, with the rise of unconventional oil and gas production creating the potential for US energy self-sufficiency (see Figure 11). Just five or six years ago there were plans to establish liquefied natural gas (LNG) import facilities for the US, while today the debate is on how much LNG the US should export.

**Figure 11 - US Unconventional Gas Reserves**

With new technologies for oil and gas extraction, unconventional energy sources are shifting the energy market outlook. This is of particular importance in the US where unconventional fossil fuel sources vastly exceed conventional sources and now offer a new pathway to energy independence. (Source: US Energy Information Administration, 2013. Annual Energy Outlook 2013 Early Release)

How will this new energy supply affect the demand for biomass based energy and fuels? While the potential for shale oil and gas production exists, it is associated with commercial, policy, and physicals risks related to climate change, groundwater pollution, and high levels of freshwater use. Owing to these risks, many forecasts still suggest that demand for bioenergy and biofuels will grow exponentially in the coming years. Policy approaches will likely combine unconventional energy sources, energy conservation, and the promotion of renewable energy, including energy from woody biomass.
Demand for wood pellets is rising rapidly, driven by government mandates for renewable energy, and the implementation of feed-in tariffs, tradable renewable energy certificates, and direct government subsidies. Recent estimates of wood pellet demand to 2020 suggest that total trade in wood pellets could rise from approximately 15 million tonnes per annum to 45 million tonnes by 2020.\textsuperscript{23} Associated British Ports, for example, recently announced its intention to invest 100 million GBP to expand port facilities to receive approximately 3 million tonnes per annum of pellets in support of conversion of coal-fired power plants owned by Drax to biomass fuel.\textsuperscript{24}

Figure 12 – Woody Biomass Energy Supply

Bio-energy refers to combustion of biomass for electricity generation. The original form of energy product from forestry was logging waste (branches, bark, etc.) that was referred to as hog fuel, used to fire boilers for kilns and drying processes in processing facilities. Over time as biomass demand has risen there has been a steady effort to increase energy density by moving to woodchips, later to wood pellets and most recently torrefied (charred) pellets.

Figure 13 – Global Wood Pellet Consumption for Energy Projections

While wood pellet and biomass energy forecasts vary in magnitude of anticipated growth, Europe is broadly viewed as likely to continue leading market demand. Wood pellet markets are responding to rising European demand supported by renewable energy policies, for example with wood pellet export growth from the US South to Europe. However, rising demand from Asian markets is also expected, with Chinese demand set to outpace North American demand, increasing from less than 1 million BDMT consumption in 2010 to as much as 10 million BDMT by 2020. (Source: International Wood Markets, February 2013. \textit{Wood Markets Monthly International Report}; Vol. 18, Number 1, “Wood Pellet Market Outlook.” Reference within: Wood Pellet Association of Canada)


\textsuperscript{24} Associated British Ports, March 27, 2013. “News Release: Major jobs boost for Humber Ports as ABP invests £100m to support Drax’s biomass transformation.” Available at: \url{http://www.abports.co.uk/admin/content/files/Press%20Releases/ABP%20News%20Release%20-%20Humber%20Ports%20Investment.pdf}.
Manufacturing biofuels from wood is also steadily progressing to commercial scale. The three main technologies are:

1) Cellulosic ethanol, which is based on biological digestion of wood into ethanol;
2) Pyrolysis, which heats wood to produce volatile oils that are then hydrogenated to liquid fuels; and
3) Bio-gasification, which is based on combustion of biomass into carbon monoxide and hydrogen gas or ‘syngas,’ which is then converted to liquid fuels.

While these technologies are still largely at the research and pilot phase, there is a growing expectation that they will become commercially viable over the next few years. For example a recent survey suggests that cellulosic ethanol technologies will be cost competitive with corn based ethanol production by 2016.25

Finally, another element is the growth of both existing and new bio-materials. Already some pulp and paper firms are repositioning through a strategic rebranding as ‘bio-materials firms’26 or moving towards bioenergy or higher growth markets (e.g. tissues,27 fluff pulp,28 and dissolving pulp for rayon29). New fiber-based materials are also being developed that decompose wood into ever more refined components like microfibrils, nanocellulose, and cellulose nanocrystals.30 Within the bio-materials industry there is also a range of chemical processes that can extract platform chemicals, resins, bio-plastics, and other substitutes for fossil fuel based plastics and chemicals. These new markets are expected to experience dynamic growth and could provide alternatives to traditional forest product markets (see Figure 14).

Figure 14 – Projected Growth in Wood-based Bio-materials (Canada)

<table>
<thead>
<tr>
<th>Products</th>
<th>Annual Growth Rate (%) 2009-2015 (approximate)</th>
<th>Global Market Potential 2015 (US$ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Chemicals</td>
<td>5.3%</td>
<td>62.3</td>
</tr>
<tr>
<td>Alcohols</td>
<td>5.3%</td>
<td>62.0</td>
</tr>
<tr>
<td>Bio-plastics and plastic resins</td>
<td>23.7%</td>
<td>3.6</td>
</tr>
<tr>
<td>Platform chemicals</td>
<td>12.6%</td>
<td>4.0</td>
</tr>
<tr>
<td>Wood fiber composites</td>
<td>10.0%</td>
<td>35.0</td>
</tr>
<tr>
<td>Glass fiber market</td>
<td>6.3%</td>
<td>8.4</td>
</tr>
<tr>
<td>Carbon fiber</td>
<td>9.5%</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Canadian forest products industry</strong></td>
<td><strong>neg. to 0-2%</strong></td>
<td><strong>50.0</strong></td>
</tr>
</tbody>
</table>

New bio-materials could provide significant opportunities for the forestry sector. For example, the value of combined bio-materials markets could be nearly quadruple the value of the Canadian forest products industry by 2015, as these markets experience annual growth rates of 5-20+% while the traditional forest products market stays flat. (Source: Forest Products Association Canada, 2011. “The New Face of the Canadian Forest Industry” and references within)

26 See for example, http://www.pwc.com/gx/en/forest-paper-packaging/events/25th-fpp-conference/assets/pwc-hans-sohlstrom-upm-may-10th-2012.pdf. UPM has re-branded as "The Biofore Company" leading "the integration of bio and forest industries into a new, sustainable and innovation-driven future."
27 See for example, http://www.euwid-paper.com/news/singlenews/Artikel/chinas-sun-paper-enters-tissue-market.html. Sun Paper, one of the five largest paper companies in China, has formed a joint venture to install two new tissue producing plants. China’s tissue demand is second only to the United States, and demand is fast growing according to RISI who also note expanding capacity among the country’s largest producers. See “China’s booming tissue industry,” http://www.risinfo.com/techchannels/papermaking/Challenges-amid-fast-expansion-1880.html.
29 See for example, http://www.fortresspaper.com/company/2012-02-16-15-09-10. Fortress Paper has converted a former Canadian bleached hardwood kraft pulp mill into a dissolving pulp plant with annual capacity of approximately 200,000 tonnes of specialty cellulose and a cogeneration facility.
While collectively the bioenergy and bio-materials markets are still small relative to traditional timber products, they are growing steadily and investors should see more and more impact on timberland returns. Some of the developments we expect over the next five years include:

- Growth in international biomass energy trade across a range of products from hog fuel to woodchips to pellets and bio-char or torrefied pellets;
- More co-firing of biomass with coal in existing power plants driven by feed-in tariffs, renewable energy portfolio standards and carbon markets;
- New free standing biomass energy, bio-fuel, or bio-materials facilities, in many cases co-located with wood processing facilities; and
- Emergence of investment opportunities related to energy crops. There is already a significant market in Brazil for charcoal production and for short rotation woody biomass production in Europe, but market growth may expand this significantly.

The Productivity Challenge for Timberland Managers

Existing traditional markets for pulp and paper, timber, and panels consume approximately 1.5 billion cubic meters of industrial roundwood per annum. Forecasts suggest that demand will rise to 2.0 to 2.5 billion cubic meters per annum by 2050. After that, human population should begin to stabilize, and demand may begin to stabilize. However, other forecasts have suggested a far higher growth in wood demand if the bio-markets discussed above become a reality. Two separate studies by the WWF and Indufor suggest global industrial wood demand could reach 6-8 billion cubic meters by 2050, with up to three-quarters of that demand in bioenergy and biofuels (see Figure 15).

![Figure 15 - Future Demand Estimates for Industrial Roundwood and Woody Biomass](image)

Forecasts for both roundwood and biomass demand are based on a number of assumptions and can vary wildly. The above chart shows one such estimate by WWF based on the Living Forests Model, comparing a relatively flat demand for roundwood demand through 2050 dwarfed by a rapid rise in biomass wood demand, which is shown split between wood for industrial energy sources (energy wood) and domestic use (household fuelwood). Both biomass scenarios are based on increases in energy wood use driven by a combination of policy and market dynamics, and the biomass+ scenario assumes renewable energy targets are met through the use of woody biomass. (Source: WWF, 2012. Living Forests Report.)

At the same time as demand for wood is forecast to increase, so too will demand for grains, meat, cotton, wool, milk, fruit and vegetables, and oil seeds. Already there is significant conflict over land—whether because of conversion of natural ecosystems to agribusiness, purchase of large land concessions from governments where existing land users have been displaced, or simply large-scale acquisition of agriculture by private investors. Overall there is a view that human society needs to find a way to meet its future needs for food, fiber, and energy from a finite land base, which means through increases in productivity rather than increases in land.

Agricultural productivity has steadily increased over the past 50 years through systematic deployment of technology and best practice. Agricultural productivity, accounting for all inputs and outputs, in the United States increased by 170% between 1949 and 2009, with average outputs increasing at 1.6% per year. While similar data are not available for forestry, anecdotal evidence suggests equal or greater productivity enhancement, for example the suggestion that productivity of Brazilian eucalyptus plantations has quadrupled in 40 years\(^3^3\) and that Australian radiata pine plantations have shown 33% increases in productivity from tree breeding in the first rotation and another 10% in the second rotation.\(^3^4\)

Figure 16 - US Annual Agricultural Productivity Gains by Growth of Outputs and Total Productivity

Continuous improvement has increased agricultural outputs at 1.6% CAGR. The left graph shows average annual growth of total agricultural outputs, which ranges from approximately 0.8% to 4.0%. The graph at right shows the trend of increasing total agricultural productivity since the base year, with productivity increasing 170% over 60 years. Similar gains in productivity in timber plantations over the long term will be necessary for forestry investments. (Source: US Economic Research Service, 2012. Agricultural Productivity in the US)

The focus on timberland productivity enhancement is also central to the capacity to generate returns. Not only do higher productivity plantations produce more wood, they show valuation gains during the rotation. Therefore timberland managers are increasingly focused on the elements of productivity enhancement, which generally include:


- Species selection, genetics, and tree breeding strategies to increase productivity and wood quality;
- Pest control, especially reductions in chronic pests where interventions need to be carefully timed or controlled to produce economic benefits;
- Management or insurance strategies related to physical risks such as fire, windstorms, and ice or snow damage;
- Nutrition and fertilization strategies that can spur early growth and increase site occupancy after thinning;
- Management of stand density to ensure the maximum amount of tree growth ends up in harvested materials;
- Estate consolidation, where for example low productivity properties are sold off and properties with higher potential productivity are acquired; and
- Technology advancements for information management systems, simulation models, harvest and haul, and infrastructure.

Effective interventions increase income from higher quantities of timber being sold from each hectare and can lead to steady increases in capital appreciation over time as forest productivity becomes measurable and translates into valuation results. This is leading to systematic approaches to productivity enhancement where managers set goals for increasing growth or wood quality and then monitor these initiatives over time (see Figure 17).

**Figure 17 – Management Strategies to Increase Forest Volume - Radiata Pine Example**

Substantial productivity gains can be achieved by focus on risk management, nutrition, and genetics in timber plantation management. This chart shows strategic planning for increasing Total Recoverable Volume on a radiata pine plantation located in Australia. (Source: Timberlands Pacific Pty Ltd)
Global Timberland Investment Opportunities

The pool of timberland assets now owned by institutional investors is overwhelmingly based on timber plantations in temperate and sub-tropical regions of North America, Latin America, and Oceania. Investors need to look at timberland as a universe of investible assets and determine an allocation strategy or diversification strategy to address inter-country or inter-regional factors. Within this allocation strategy, there remains the challenge for managers to focus on adding value by improving productivity, market access, and profitability in a world of shifting market demand, currency volatility, and changing competitive dynamics.

At a broad level, the global timberland universe can be broken into distinct investment regions, such as the US South, US West, US Northeast, Eastern and Western Canada, Europe (including Scandinavia, Western Europe, and Eastern Europe), Latin America (primarily Brazil, Uruguay, and Chile), Oceania (Australia and New Zealand), Asia (primarily Southeast Asia and China), and Eastern and Southern Africa. As described above, we would further categorize the timberland investible universe into mature, intermediate, and emerging timberland investment markets (see Figure 18). In general this split is important for investors in thinking about risk—especially sovereign risk, business risk, and sustainability factors. Over the next five years it is not likely that there will be significant change in these categories, although some countries may be perceived as less risky by investors.

Figure 18 – Institutionally-owned Timber Plantations by Maturity of Timberland Investment Region, 2013 (by Area)

(Source: Based on New Forests’ analysis of planted forest ownership)
Regional Overview
In this section, we provide a brief synopsis of the state of play of timberland investment in the regions in which we invest – Australia and New Zealand, Southeast Asia, and the United States – as well as other major timberland investment regions. In sum, we see an expected transaction flow of about US$6-7 billion per annum of investment opportunities, and we expect that will be split about 50:50 between US and non-US timberland.

United States
The US is the original home of the timberland asset class and represents at least US$75 billion of investible asset value and 50-60% of the investible universe. Much of the growth of timberland investment came through a 20-year process of corporations selling down their forestry assets to timberland managers and timberland REITs. As noted earlier in this paper, the US timberland market is tightening. Some of the slowdown in transactions has been related to the general economic and housing decline in the US, as institutional investors have a capacity to hold assets until the market recovers. We expect to see some increase in turnover in the next five years, possibly to US$3-3.5 billion per annum, as housing recovers and buyers and sellers become comfortable transacting at prices at or above those from before the financial crisis. The US timberland investment arena will remain dominated by US investors because of currency risk considerations for non-US investors and the challenging US tax regime for foreign timberland investors.

Australia and New Zealand
There are about 2 million hectares of softwood plantations in New Zealand and one million hectares each of softwood and eucalyptus plantation in Australia. The two countries represent about US$7-8 billion each of timber plantation assets. Currently about half of the assets in each country are in institutional ownership, and the rest are owned by corporations, government management companies, and private investors.

The New Zealand timberland assets were to a significant extent established by the public sector and then privatized at the peak of a softwood price spike in the mid-1990s. When timber prices returned to the longer term average, this led to the corporate owners becoming either bankrupt or financially stressed, and the core forestry estates of Fletcher Challenge and Carter Holt Harvey ended up in institutional ownership. In the future, we expect most transactions in New Zealand will be smaller, in the range of US$20-$300 million, and we expect a mix of corporate exits and secondary market sales from institutional exits. While it is difficult to forecast, we would expect that the New Zealand market will turn over about US$500-800 million per annum of transactions, and these will be competed for by international institutional investors and Asian strategic buyers seeking resource security for softwood timber.

Australia, on the other hand, is still in the middle of the large-scale primary institutionalization of the ownership of its plantation forestry assets. The transaction sources have been two-fold: a continuing sell down of plantation timber assets by State Governments and the restructuring of the Managed Investment Scheme industry.35 There are about AU$1 billion of State Government plantations yet to sold, about AU$600 million of ex-MIS assets to be sold, and then another AU$400-600 of corporate forestry assets likely to be sold. Over the next three or four years, we expect this pool of around AU$2 billion in assets to be sold to institutional owners. Finally, under current market circumstances we do not see significant new areas being

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planted in either country, and in some regions there is continuing pressure to convert poorer performing timber plantation areas back to higher value uses in dairy farms, cropping, and grazing.

Europe
Western European timberlands have been viewed as too expensive relative to their returns, very tightly held, and there has been little penetration of institutional ownership. In Eastern Europe there has been some capacity for institutional investment in the post-Communist era, and both timberland investments and new plantation projects have been undertaken by US TIMOs. There is an expectation that interest in Europe will grow in the next five years. The economic difficulties facing the Eurozone, significant extent of the forestry asset base, and growing participation of Euro denominated institutional investors in timberland should mean that there is both an increase in the supply of and demand for European timberland. The aggregation of timberland at scale may be challenging, but we would expect new specialist managers to begin focusing on the Eurozone to offer currency-risk-free investments at scale to European investors.

Southeast Asia
Southeast Asia is currently a very dynamic but complex investment environment for timberland and agriculture investors. Across the region, there are millions of hectares of oil palm, rubberwood, acacia, and teak plantations, with over a century of plantation management expertise. The combined agriculture and forestry estates are probably worth in the order of US$150 billion. The extensive teak plantations in Indonesia and Thailand are government controlled. Most of the large oil palm estates are owned by large listed family-run or state-owned conglomerates and have been extremely profitable as a result of recent strong market conditions. However, there remains significant scope to boost oil palm yields through a combination of improved management and genetics. Much of the rubber plantation area in Thailand, Malaysia, Indonesia, and Vietnam is managed under low productivity regimes by smallholders. However, there is an opportunity for investors and corporations to invest into larger scale rubber plantations and benefit from the positive medium-term outlook for both latex and rubberwood timber. Recent research is also leading to tapping systems that dramatically reduce labor requirements. On the timber plantation side, there has been rapid growth in Indonesia, Vietnam, and Thailand in developing very short rotation pulpwood crops (e.g. five to six years) to meet rising domestic and Chinese demand for pulp and paper, and all the governments in the region are actively promoting more timber plantation development to support the continued development of local wood-based industries as native forest timber resources decline and domestic demand for lumber, plywood and pulp and paper rises. Institutional investor participation in this industry is limited to date, but we believe that the high demand for patient capital to upgrade and expand the plantation estate will lead to a steady growth in capital deployment from institutional investors. This may rise from US$100 to US$200 million per annum in 2013 toward US$500 million to US$1 billion per annum by 2017. Much of this will be greenfield forestry and may include mixed investments with timber and biomass feedstock plantations, agribusiness, processing, and infrastructure, often in partnership with local firms needing access to capital.

37 New Forests estimate.
38 Simon Lord, New Britain Palm Oil, presentation to RI Asia 2013.
Latin America
There are now approximately 15 million hectares of plantation worth an estimated US$55 billion in Latin America, dominated by Brazil, Chile, Uruguay, and Argentina. However, Latin America has been a challenging investment region for timberland investors over the past couple of years. Chile has had very little transaction flow, and assets appear tightly held between a couple of large domestic firms. Uruguayan land prices have escalated to a point where forestry is not meeting realistic return rates. Brazil has legislated to prevent new foreign majority ownership of land, effectively repelling international investment. Argentina appears to be subject to concerns about sovereign risk. While it is difficult to forecast whether and when these factors will change, we anticipate limited opportunity for institutional investors over the next five years in Latin America.

Africa
Africa remains a frontier of timberland investment and has primarily attracted corporate plantation development companies, often with processing as a key part of the investment strategy. There have also been some greenfield plantation investments seeking to combine timber and carbon revenue from funds specializing in climate change related investments. Some funds have been organized to invest in Africa, and we expect the rate of new institutional investment over the next five years will potentially rise from about US$50-100 million per annum to something like US$250-500 million per annum.

Global Timberland Summary
As we have noted, the overwhelming majority of timberland transactions will be in the developed country regions of the US, Australia, and New Zealand. We believe that roughly half of all timberland transactions over the next five years are likely to remain in US timberland, although more and more of these will be secondary transactions coming from institutional exits. The other significant region should be Australia and New Zealand with about 25% of the value of all investment transactions. We expect that the rest of the world will represent another 25% of transaction value with growing investment in Asia, and possibly Europe. Investors will show more interest in emerging markets and likely some specialist strategies, but over the next five years these markets will not rival the established markets in terms of capital deployed. At present there does not appear to be significant investment opportunity for foreign direct investment in Latin American timberland. However, if we look out 10 or 15 years, and expect reasonable development of political, legal, and business systems, then Latin America and Asia will likely emerge as the areas of highest investment growth. For long-term investors it may be worthwhile taking early positions in these regions to gain experience and scalable investment positions.

39 New Forests’ market knowledge and personal communications.
Building a Timberland Portfolio for 2013-2017

From the above discussion of trends in timberland investment, the forest sector, and regional timberland investment markets, it is clear that the timberland asset class is and will remain dynamic, and timberland investors face many considerations in building a timberland portfolio. We see three key areas that need to be addressed:

- How will investors navigate increasingly diverse and complex regional timberland markets?
- How will investors manage the risks and opportunities of international investment through portfolio allocation?
- How will strategies to add value contribute to the continuing evolution of timberland returns?

In considering the above questions, we provide the following set of recommendations for investors.

Seek Out Local Expertise

The global nature of today's timberland markets requires that investors and managers take a more international view, but at the same time we recognize that regional sub-markets require specialized approaches to investment. Investors can access a global timberland portfolio either through direct investments, fund structures or private account portfolios with a global TIMO; or investors may build international portfolios tailored to their portfolio requirements by investing with specialized regional managers. The decision to use a single global manager versus regional specialists will generally come down to the size of the timberland allocation and the degree to which the investor can manage multiple manager relationships. For many US pension funds that may have US$100 to US$200 million allocations, the bulk of which is targeted at US assets, it may make sense to simply appoint one US TIMO as manager. However, for larger investors or non-US dollar denominated investors, who may be seeking greater exposure to non-US markets, using regional specialists to complement core US timberland managers may be preferable.

Given the diverse investment environments of timberland regions, there are clear advantages for any manager that has localized market insight and access. Some of the benefits that regional managers may offer in this respect include:

- Ability to originate deals by providing early and direct access to off-market transactions
- Ability to undertake complex transactions such as bankruptcy restructures, rationalization of assets with multiple or complex ownership structures, and dealing in leasehold transactions with multiple counterparties
- Relationships with local industry, government, and NGOs that can reduce business and sovereign risk
- Ability to manage multiple transactions simultaneously within a market
- Enhanced integration and oversight of operational management with strategic planning

Consider Regional Issues in Determining Portfolio Allocation

The primary attraction of timberland remains related to its low correlation with listed equity markets, positive correlation with inflation and the relatively high risk-adjusted returns (Sharpe ratio) it is able to deliver. However, as the asset class globalizes, investors must consider how their regional allocation will affect their timberland portfolio’s performance relative to overall investment portfolio objectives. While this is not new, we find in particular that currency risk and country risk are of growing prominence in making portfolio allocation decisions.
Currency Risk

Investing in an internationally diversified timber portfolio will introduce complexities around currency risk. Some investors have expressed concern that currency volatility will counteract some of the benefits of investing in stable assets.

Investors seeking to invest in timber as a low-risk asset generating consistent returns should generally seek to maximize their allocation to timberland assets in their own currency to the extent possible. For example, US investors may wish to allocate 50-100% of their portfolio to US dollar denominated assets and emphasize international assets that reflect US dollar timber pricing directly or indirectly. The question for US investors is whether the diversification benefits and higher returns in non-US timberland are sufficient to address the currency risk or cost of hedging currency risk.

On the other hand, nearly all non-USD investors will need to accept international diversification and by extension currency risk. Given the effect of currency risk, it may be therefore comparatively more attractive for non-US investors to seek more diversified portfolios than it is for US-domiciled investors. For example, for non-US investors, taking a position in Southern US timberland at 5.5% real rates of return and accepting or hedging currency risk and US tax treatment, means returns are more likely to be 3.5% to 4% real IRR. At such a level, the 8% real returns of Australia and New Zealand, 10% real returns in Latin America, or 15% real returns in Asia look relatively more attractive. Even for US investors a regional allocation may make sense given the superior returns and ability to access a far larger opportunity set.

Country and Sovereign Risk

Country and sovereign risk primarily relates to the business environment of an investment’s host country. This includes business culture, legal system effectiveness, government policy environment, and regulatory and tax system stability. Such factors are particularly important for investments in emerging markets. Fortunately, there is a growing body of investment tools available to enable improved management of country risk, including both qualitative and quantitative methods. Qualitative analysis relies on subjective analysis of risk factors and investment climate, such as significant political news or market information. From a quantitative perspective, country risk may be accounted for in the investment process using a country risk premium in setting expected returns and discounted cash flow-based asset valuations. Given these tools for calculating and managing country risk, when investors contemplate whether or not to invest in a country or region, it ultimately comes down to whether the risk-adjusted returns meet the expectations of their portfolio allocation policy.

While each investor’s needs are different, New Forests suggests the following portfolio allocation framework for diversification across major timberland investment regions. We address USD, Euro, GBP, and AUD currencies as we find these to be the predominant investment currencies of institutional timberland investors.

Figure 19 – Addressing Currency Considerations in Timberland Portfolio Allocation

<table>
<thead>
<tr>
<th>Investor Currency</th>
<th>US</th>
<th>Australia-New Zealand</th>
<th>Latin America</th>
<th>Other Emerging Markets (e.g. Asia)</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>USD</td>
<td>60%</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
<td>0</td>
</tr>
<tr>
<td>Euro</td>
<td>30%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
<td>15%</td>
</tr>
<tr>
<td>GBP</td>
<td>35%</td>
<td>25%</td>
<td>15%</td>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>AUD</td>
<td>35%</td>
<td>40%</td>
<td>10%</td>
<td>15%</td>
<td>0</td>
</tr>
</tbody>
</table>
Generate Value through Sustainability and New Markets

Much of our discussion in this paper has been about investment diversification and investment allocation across regions and market exposures. However, once these decisions are made the goal is to execute on the timberland strategy. To be successful, the three elements of creating excellent returns are related to buying well, managing well, and exiting well. Buying and selling well are about being disciplined in valuation, understanding market cycles and potential entry and exit points, and understanding how to present assets as well managed and documented in a way that reduces buyer due diligence costs and creates competition upon exit.

Managing timberland well is about reducing risk, generating stable returns, increasing asset value, and ultimately supporting a strong realized value on exit. As we look out over the next five years, we can see some of the trends we identified in our first timberland outlook maturing and becoming clearer.

- **Sustainability and certification of timber products**: There is a continuous expansion of disclosure obligations, investment policies, and regulations related to environmental, social, and governance criteria in all areas of investment. Managers need to successfully understand and integrate these obligations to reduce risk, ensure compliance, and support reporting requirements. It is now becoming critical for successful timberland managers to implement social and environmental management systems, annual sustainability reports, and integrate sustainability principles and policies into all aspects of asset management.\(^\text{41}\)

- **Environmental markets**: While global efforts to address climate change have struggled to reach the level of political consensus that is needed for significant mitigation efforts, we are seeing a continuing evolution in a range of environmental price signals that affect forests either directly or indirectly. In the US there is now a functioning carbon market in California that is intersecting with forest management and valuation. There is also a steadily expanding market for conservation of wetlands, stream, and endangered species habitat, and some early markets for reduction in nutrient pollution. In Australia there is a nascent carbon market forming and a rapid maturation of the pricing and markets for water rights. New Zealand has set a price signal for carbon in forestry, including putting a price on converting existing plantations established before 1990 to agriculture. In the tropical regions, while REDD\(^\text{42}\) has been slow to reach commercial scale, it has been linked with significant government to government funding and efforts by multilateral organizations to provide incentives to reduce land conversion. The expanding influence of roundtables convened to govern certification of sustainable production in palm oil, soy, timber, sugar, and other commodities is also influencing forestry in emerging markets. These markets will shift how forestry is perceived and how investments may be structured in the future and may lead to integration of timber plantations, agribusiness, and forest conservation in landscape-level investment structures.

- **Actively pursuing productivity gains**: If the world population rises to 9 or 10 billion people in the coming decades and we see billions of people moving towards a so-called middle class lifestyle, then

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\(^\text{42}\) REDD (Reducing Emissions from Deforestation and Degradation) refers to a class of forest carbon activities that reduces greenhouse gas emissions by avoiding the deforestation or degradation of forested areas and maintains carbon stocks. REDD, also referred to as REDD+, when considering other related forest carbon activities, is a feature of international climate change negotiations and an activity type in voluntary carbon markets, for example under standards such as the Verified Carbon Standard.
the world’s capacity to produce food, fiber, energy, and materials will be under significant pressure. We can expect that the productivity of forestry and agriculture will need to rise at a rate commensurate with economic growth and that this will include pressure for genetic gains in crop species, improved pest management, increased efficiency in processing systems, reduction in waste through the entire supply chain to the consumer, and recycling, re-use, and recovery systems.

- **Proactively engaging with new product opportunities**: As we have noted earlier in this paper, the forest sector may be restructured in the next 10 to 20 years to incorporate bioenergy, biofuels, and bio-materials. Several forecasts suggest that the traditional industrial roundwood markets may expand from 1.5 billion cubic meters per annum of total demand, to 2.0 or 2.5 billion cubic meters per annum. However, the demand for woody biomass for new bio-markets may reach 5 or 6 billion cubic meters per annum. Timberland investment managers need to understand how their markets will restructure, where opportunities will arise, and how to manage assets to take advantage of these opportunities. This may include diversifying rotation lengths, species, cultural regimes (e.g. stand density), and harvesting systems.

In some cases the timberland assets that we acquire today may be exposed to entirely different markets, public expectations, and management regimes in ten years’ time. While this provides exciting opportunities for investors it also can present risks and a need for institutional investors to select managers who have the capacity to navigate these changes successfully.
Conclusions

In this timberland outlook we have tried to present an objective picture of a maturing but increasingly complex asset class with more competition for investment transactions but also with new opportunities in Asian market growth and the emergence of new markets for bioenergy, biofuels and bio-materials. In fact the forestry sector is so diverse in terms of geographies, markets, ecological conditions, and risks that it can be challenging to contemplate and settle on a coherent investment strategy. Nevertheless the role of timberland to provide portfolio diversification, good risk-adjusted returns, and inflation hedging appears to still be the prime attraction. We hope that this timberland outlook provides a useful primer for new investors in the sector and provides some new insights for existing timberland investors.

About New Forests

New Forests was established in 2005 and manages over AU$1.3 billion in timberland and associated environmental market assets, such as carbon and biodiversity. Among timberland managers, we are distinguished by our regionally focused investment strategies, which capitalize on our combination of dedicated local expertise and disciplined forestry investment process. We offer our clients investment products organized around three key strategies that provide diversity and choice across risk-adjusted returns, geography, and market exposure.

New Forests has focused its business on offering three distinct investment strategies related to Australia-New Zealand timberland, Southeast Asian timberland, and US environmental market and conservation forestry investments. We have dedicated teams to invest in each strategy, located in Sydney, Singapore, and San Francisco, respectively. We offer these strategies as individual components that may be part of a wider timberland portfolio for our clients. If you have an interest to learn more about our business please feel free to contact us.

Each investment team is responsible for originating investment opportunities, undertaking due diligence, and managing investments through to exit. All of our investment products are supported by our Sydney headquarters, which provides centralized executive management, finance, governance, risk and compliance, client relations, research, and sustainability functions. This approach ensures consistency and efficiency across our investment programs.