



# Brookfield Timberlands Management LP

Brookfield First Quarter 2012 Global Timberlands Research Report

## Contents

- Brazil Commercial Forest Plantation Overview
- Key Timberland Metrics

## First Quarter 2012 Research Report

With Brazil timberlands amongst the most productive in the world, it is no surprise that investing in Brazil timberlands has been gaining the attention of investors globally. However, with approximately nine of the top ten forest plantation owners in Brazil being South American industrial companies<sup>1</sup>, it would seem that many foreign investors may still be watching from the sidelines. Understanding and successfully navigating the social, economic, legal and regulatory landscape in Brazil takes experience and local expertise.

This report attempts to provide an overview of Brazil’s timber industry, investment opportunities, growth drivers, and legal and regulatory considerations. Brookfield has owned, operated and invested in businesses in Brazil for more than 100-years and today manages over R\$24 billion of assets across the country. Brookfield’s Brazil timberland platform includes over 240,000 acres of pine and eucalyptus plantations located in four states.

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Brookfield Asset Management Inc. (“Brookfield”) is a global asset manager focused on property, renewable power and infrastructure assets with approximately \$150 billion of assets under management.

Brookfield Timberlands Management LP, a wholly owned subsidiary of Brookfield, has over 2.5 million acres or over \$4.0 billion of timberlands under management in North and South America.

<sup>1</sup> Consofor

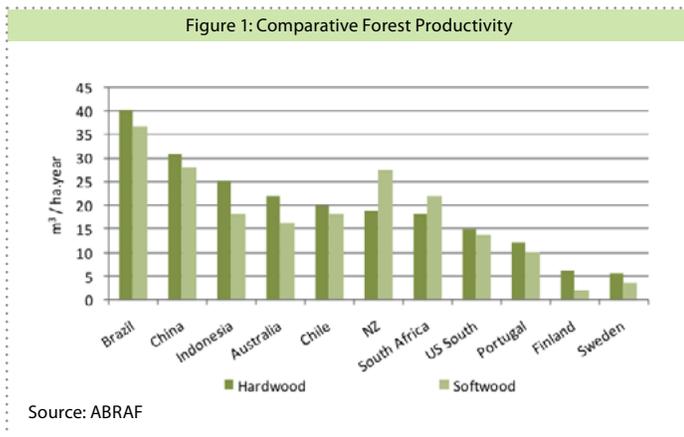


## Large and Productive Timber Industry

Brazil offers the second largest investable timberlands area by estimated value with over 6.5 million hectares of pine and eucalyptus planted forests. This includes approximately 25% and 75% pine and eucalyptus, respectively. The broader industry grossed over R\$53 billion in revenues in 2011<sup>2</sup>.

Brazil has invested continuously in forest research, advancing the quality of genetic plant material, and technologies to mitigate risks associated with fertility loss, pests, disease and draught. Brazil also has highly favorable climate and soil conditions which lead to the highest forest productivity globally as shown in Figure 1.

A large portion of commercial plantations is found in the south and southeast regions of Brazil, due to the proximity of large industrial pulp and paper manufacturers, industrialized wood-based panel mills, and charcoal-based steel manufacturers.



## Key Timber Regions

For purposes of our analysis, we have segmented Brazil into five distinct regions, as illustrated in Figure 2.

The light blue region, we call the Pine Region. Of the 1.9 million hectares of plantation area, 70% is pine and 30% is eucalyptus. This region has a well established wood products converting region with the majority of timber being used to produce wood products, furniture and panels, followed by industrial fuel wood and pulp and paper.

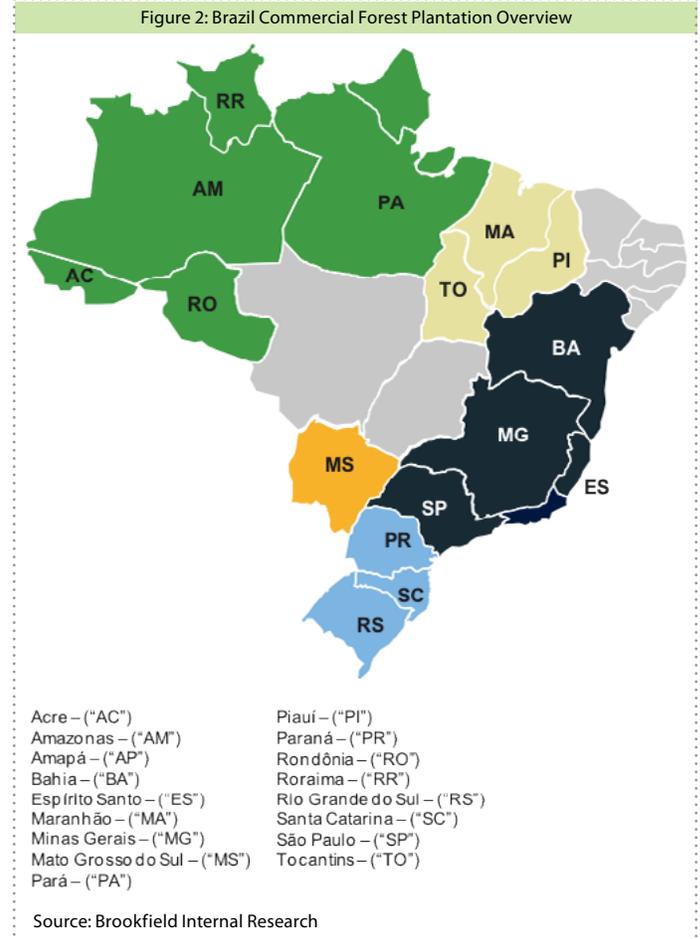
The dark blue region, the Pulp & Steel Region, is comprised of 3.5 million hectares of plantable area of which 93% is eucalyptus and 7% pine. This is a well estab-

lished pulp and pig iron<sup>3</sup> region.

Brazil's Emerging Center-West Region (primarily Mato Grosso do Sul state), shown in yellow, is now experiencing new pulp, pig iron and diversified wood products investments. Expanding infrastructure and potential conversion to higher intensity agricultural uses is expected to provide future capital appreciation opportunities in this region. The plantation area of 0.45 million hectares is predominately eucalyptus.

The Emerging Northeast Region, shown in light green, is expected to increasingly support new pulp and paper, pig iron and biomass (export) investments and is expected to offer future land price appreciation opportunities due to the associated infrastructure development. Plantation area in this region is 0.26 million hectares dedicated to eucalyptus.

The Amazon Region, located in northwest Brazil is shaded in green<sup>4</sup>. The Amazon region is increasingly



<sup>2</sup> Consutor

<sup>3</sup> Pig iron production involves heating iron ore with coking coal or vegetal charcoal in a blast furnace. Although pig iron is quite brittle due to its high carbon content, a subsequent process is undertaken which results in the formation of stronger forms of iron, cast and wrought iron. Additional elements, such as manganese and chromium, are added, in order to form steel.

<sup>4</sup> Amazon region, as shown in Figure 3 is for illustrative purposes only and may not accurately reflect official boundaries of the legal Amazon.



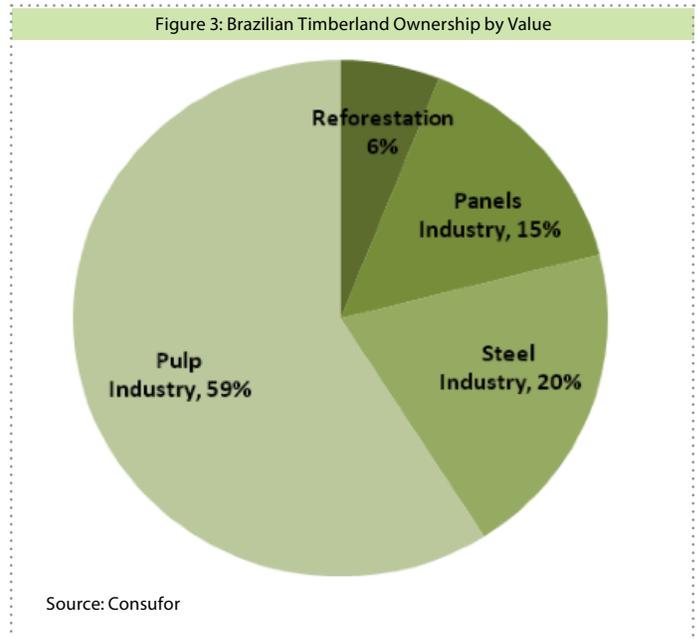
being managed for conservation and non-timber values. The region contains predominantly native hardwood species with minimal commercial plantation established.

### Plantation Ownership Dynamics

Timber plantations in Brazil continue to be held by a small number of large companies, with nine of the top ten forest plantation owners in Brazil being South American industrial companies. Six of these top ten forest plantation owners are integrated pulp and paper or forest products producers and the other four are steel producers. In a recent study ranking the top 20 timberland assets in Brazil, the pulp segment accounted for 59% of the value and 61% of the planted area, as shown in Figure 3.

In Brazil, it is common for timberland properties to be managed within an integrated business with associated processing operations including pulp and paper mills, sawmills or pig iron facilities. This type of ownership structure was seen in the U.S. until the past two decades when tax law changes, and pressure from shareholders to become more efficient, led forest product companies to focus on their core manufacturing operations following the sale of their timberlands to financial owners.

While a structural shift in timberlands ownership from integrated industry like that seen in the U.S. has not occurred in Brazil, several integrated owners in Brazil have begun to use the sale of their plantations to raise capital to finance re-investment in core converting operations. Examples of such sales have recently included those from large established eucalyptus pulp producers, from independent pig iron producers, and from diversified industrial companies with non-core softwood (pine) timber assets. However, there are also examples of integrated producers moving aggressively to secure new strategic sources of fiber, including both new eucalyptus pulp producers and large, focused South American wood products producers. As such, domestic integrated companies have continued to be aggressive buyers of timberlands in Brazil. As integrated buyers may often place a higher strategic value on a specific timberland than can a financial buyer, it is critical for financial buyers to fully understand end-use customers and the full supply chain in order to identify leverage they may have, beyond, of course, access to capital.



### Near to Medium Term Timber Demand Drivers

Brazil's wood production end-uses are as shown in Figure 4. The recent decrease in wood products exports from Brazil, due in part to the strong Brazilian Real and weak global economy, has been temporarily offset by domestic demand. The real drivers for domestic demand include several large infrastructure development projects such as "PAC", the government's infrastructure program initially announced in 2010 and targeting R\$1.6 trillion of projects, the Lula oil field development located 250km off the coast of Rio de Janeiro, and the FIFA 2014 World Cup and 2016 Olympic Games. Although these projects are driving robust incremental demand for timber in various forms, export markets will remain extremely important to Brazil over the long term, particularly for the pulp, plywood and charcoal based steel industries.

Strong domestic demand has also been supported by favorable demographics and increasing homeownership rates, which are driving healthy residential construction in Brazil. Brazil has the second youngest population among the ten largest economies in the world, with a median age of 29-years, just beginning to enter its primary income earning phase. This is expected to drive shifts in consumer spending habits that will benefit a wide range of sectors. Credit in Brazil is also expected to see significant annual growth over the medium term with a low credit to GDP ratio that sug-



gests significant monetary policy flexibility remains.

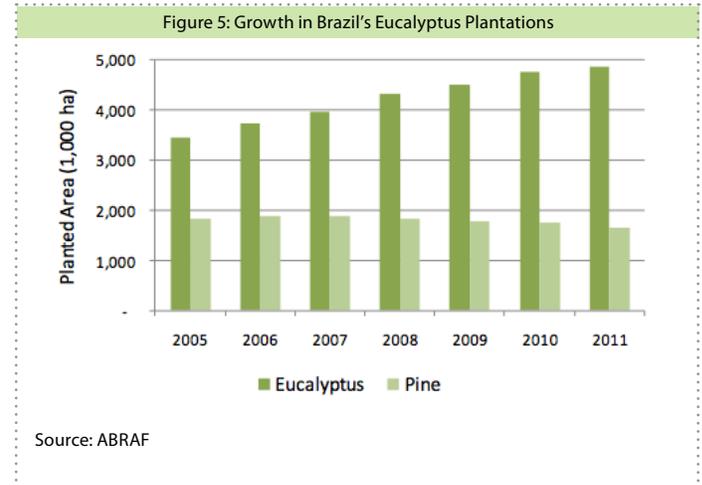
Pulp markets are the largest consumer of Brazil's softwood and hardwood fibre, with over 60% of Brazil's pulp production being exported, primarily to Europe (35%), China (26%) and the U.S. (19%)<sup>5</sup>. In 2000, Brazil was the world's 5th largest producer of pulp (long and short fiber), after the United States, Canada, Japan and Finland. In 2011, Brazil grew to become the third largest producer of pulp among integrated producers, with 21% of the market share, and first among producers that sell pulp on the market<sup>5</sup>. Over this decade, Brazilian pulp production grew 87.7% and exports grew 190.4% mostly reflecting increased exports to Asian and European countries<sup>5</sup>. Meanwhile, Brazil's paper industry is ranked 11th among the main international producers, growing on average 2.9% p.a. since 2000, with consumption stemming primarily from the packaging, hygiene and cosmetics, and printing and writing paper markets<sup>5</sup>. Growth in this sector has slowed in 2010-2011 due to global economic weakness and reduced activity in Brazilian markets, but is expected to recover with global markets.



The iron and steel industry is the second largest consumer of hardwood fiber in Brazil after the pulp industry. As Brazil has no meaningful domestic source of coking coal, the smelting process in Brazil utilizes either imported coal or domestic vegetal charcoal. Production of an intermediate product known as pig iron, both for export and for use by non-integrated Brazilian steel producers, accounts for a high proportion of vegetal charcoal consumption in Brazil.

Growth in demand for sustainably managed wood fiber

particularly that used for charcoal by the steel industry is supported by high profile government efforts to eliminate harvest of native forests. The federal government has initiated an action plan, known as "Action Plan for Prevention and Control of Deforestation in Cerrado" ("PPCerrado"), to prohibit Brazilian companies from buying charcoal made from native trees, which is expected to take effect over the next few years. We expect this to continue to drive eucalyptus plantation development, as seen in Figure 5.



### Transition to Sustainable Vegetal Charcoal Production Driving Need for Timber Plantations

Brazil is the world's largest producer of vegetal charcoal. Further to increased government regulation prohibiting the use of native forests for charcoal production, iron and steel makers are expected to place an increasing strain on supplies of vegetal charcoal sourced from sustainably managed plantations, with the upside expected to be increased competition. There are several positive changes occurring in the vegetal charcoal industry, including environmental and technological improvements that are expected to positively impact the efficiency and quality of charcoal produced. Brazil's total vegetal charcoal produced from sustainably managed forests was 11.6 million m<sup>3</sup> (mdc) in 2010, of which 66% was consumed primarily by the pig iron, steel and iron-alloy industries.

The vegetal charcoal based steel industry in the country includes both large integrated steel producers and independent pig iron producers, both of which source eucalyptus from a combination of their own and third party eucalyptus plantations grown specifically to

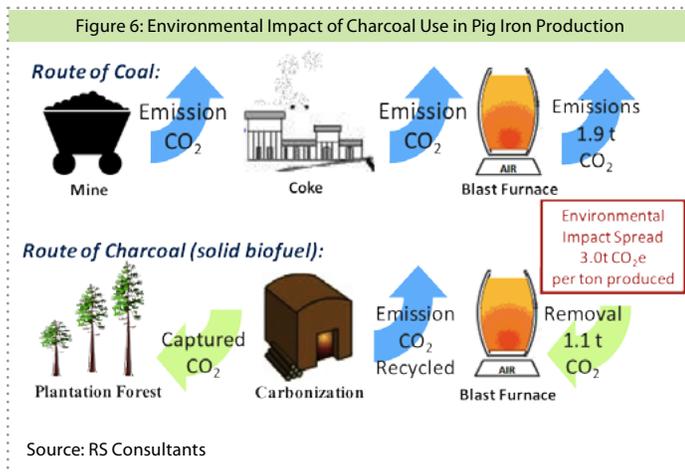
<sup>5</sup> ABRAF 2012 Annual Report



produce vegetal charcoal. With the cost of charcoal around a third of that of coking coal, technological advances in charcoal production are largely being driven by the steel industry, where significant capital is being invested in order to improve yields and control emissions. Many believe that in the near future, “green steel” will help the Brazilian steel industry to distinguish from its competitors abroad. The substitution of coking coal by charcoal can also earn a company carbon credits.

Reflecting the heavily regulated transition away from the use of native-wood based charcoal through 2013, and increasing requirements for chain of custody and other certification across the steel industry, we anticipate significant emphasis will be focused on improving health, safety and environmental standards in charcoal production, and in more effective enforcement of those elevated standards. A range of new production facility designs and configurations are rapidly changing the face of charcoal production and are expected to continue to drive out the use of very low tech/low capital kiln design in favor of modern technology utilizing more stringent and effective process controls and dramatically improving health and safety standards, while also requiring greater capital commitments. These factors should drive a consolidation of the vegetal charcoal supply chain, with those timberland owners that own and manage charcoal operations being positioned for potential margin expansion.

Vegetal charcoal provides Brazil’s steel industry with a viable economic and environmentally positive alternative to coking coal. As illustrated in Figure 6, one ton of pig iron produced from coal emits 1.9 tons of CO<sub>2</sub>,



while the production of one ton of green steel removes 1.1 tons of CO<sub>2</sub> from the atmosphere. As the Brazil steel industry relies predominantly on imported sources of coking coal, sustainable charcoal production is critical to the Brazilian steel industry. Wood sourced from commercial forest plantations (65% in 2011, according to industry estimates) has grown in response to government regulation.

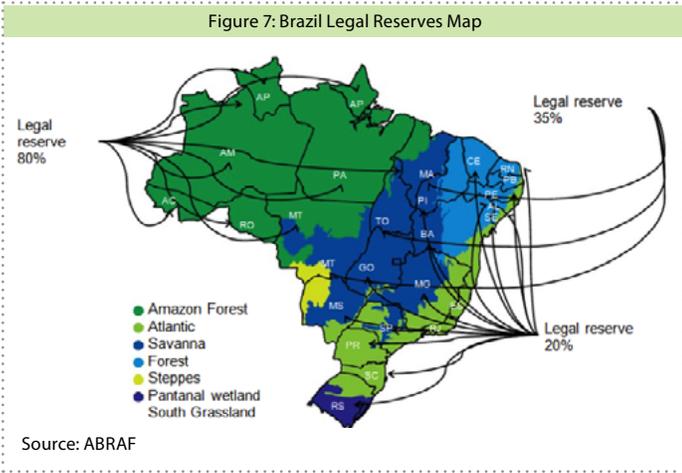
### Well Defined Regulatory Environment Manageable for Seasoned Operators

Although commercial forestry activity is highly regulated throughout Brazil, it is relatively stable, with regulation primarily relating to environmental protection. Forest regulation in Brazil differs by state with the main differences relating to obtaining environmental licenses. There is a federal environmental law (Forest Code) that establishes the preservation areas (Permanent Preservation Areas and Legal Reserves), but it is up to each state to determine the requirements. For example, in Paraná the primary requirement is to convert the Permanent Preservation Areas that have been planted to commercial species back to native vegetation. In Mato Grosso do Sul, a form is required regarding plantation and harvesting once a year. In Minas Gerais and Santa Catarina, licensing for silviculture is required and is generally valid for four years. The environmental agency conducts an audit prior to approval, establishes conditions to be met and reporting required for the duration of the license. The goal of the license system is to avoid deforestation and provide more control by the State, especially in Minas Gerais where high levels of consumption of charcoal from native forest continues to occur.

The map in Figure 7 shows Legal Reserves requirements (“LR”) by state and is described in the Forest Code as any “area located within a rural property or possession, except for those of permanent preservation, necessary for the sustainable use of natural resources, conservation and rehabilitation of ecological processes, biodiversity conservation, shelter and protection of native flora and fauna.” Legal reserves typically must be reviewed and approved as a requirement of property registration.

### Conclusion

Brazil timberlands are among the most productive in the world and include two primary species groups: pine and eucalyptus. Uses for timber vary across Brazil from



the established pine-based wood converting region in the south to the emerging northeast region, supporting new pulp and paper and biomass investments. In the near to medium term we expect timberland investment opportunities to arise as industrial owners seek to invest in core manufacturing businesses funded by the sale of their plantations.

Strong Brazilian demand, supported by favorable demographics, are driving robust incremental demand for wood fiber in various forms, including for use as structural lumber and panels, pulp and paper and for charcoal for pig iron production. While we do not see equal risks and investment opportunities across all parts of the industry, we continue to see excellent growth prospects for the industry.

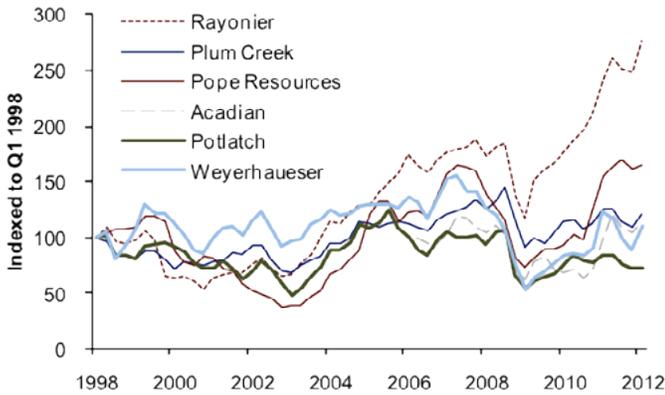
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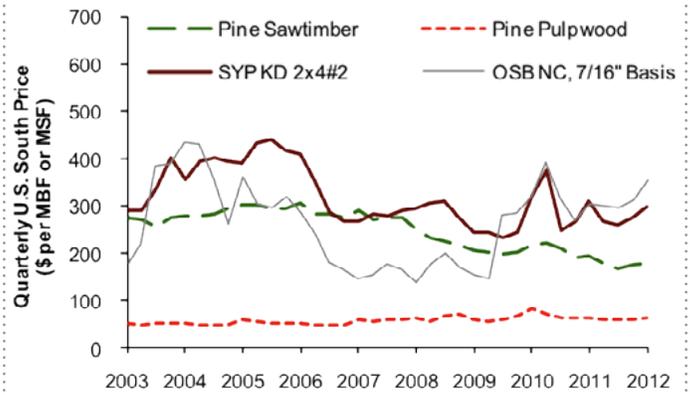
## Key Timberland Metrics

Figure 8: Publicly Traded Timberland Company Trading Performance



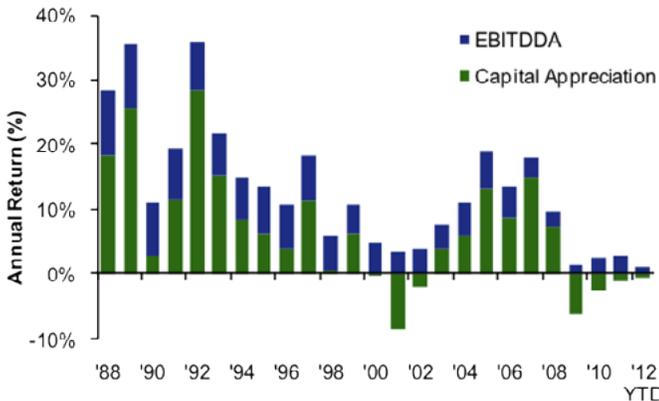
Source: Bloomberg and Brookfield internal research.

Figure 11: Quarterly Average Prices for U.S. South Sawlogs, Pulpwood, Lumber, and OSB



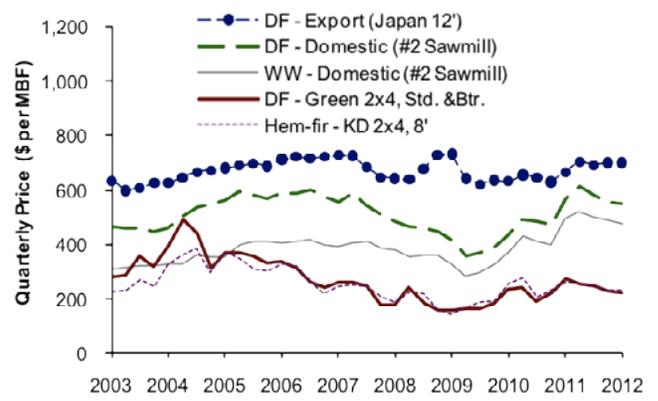
Source: Timber Mart-South and Forestweb.

Figure 9: Annual Returns for Private U.S. Timberlands



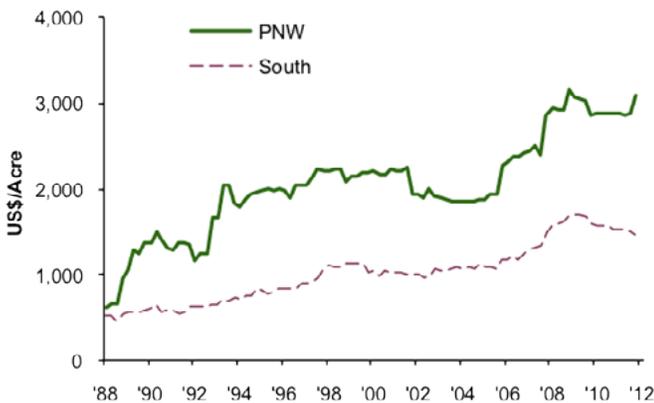
Source: NCREIF Timberlands Index.

Figure 12: Quarterly Average Prices for PNW Sawlogs and Lumber



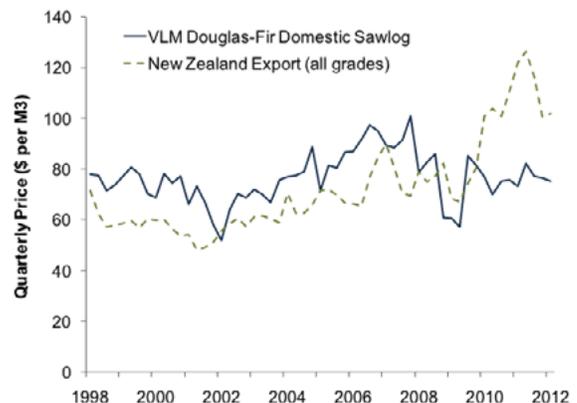
Source: LogLines and Forestweb.

Figure 10: Quarterly U.S. Timberland Values (\$ per Acre)



Source: NCREIF Timberland Index.

Figure 13: Global Sawlog Prices



Source: B.C. Ministry of Forest and Range, NZ Ministry of Agriculture.



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