Chile Wood Markets Overview
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Economic Environment, Housing and Business Environment - Overview and Outlook

Economic Overview

Chile is one of South America's most stable and prosperous nations, and has a leading position amongst Latin American nations in human development, competitiveness, income per capita and globalization. In the 2013 edition of their annual report, Economic Freedom of the World, the Cato Institute ranked Chile 11 out of 152 nations in economic freedom, behind Canada at 8 and ahead of the U.S. at 17. In 2006, Chile moved into the position of having the highest nominal Gross Domestic Product (GDP) per capita in Latin America, and in 2010, Chile became the first South American country to join the Organization for Economic Co-operation and Development (OECD). Chile's economic policies, maintained consistently since the 1980s, have contributed to steady economic growth, and have allowed Chile to reduce its poverty rate by half (Source: Economic Commission for Latin America and the Caribbean (ECLAC)). Standard and Poor's gives Chile a credit rating of AA-, reflecting the prudent management of its public finances, which includes its adherence to closely balanced budgets, relatively low levels of government debt and an independent and efficient judicial system.

To place Chile in a global context, the following figures and table provide comparisons with a number of countries of similar scale (Figure 1, Table 1). Emerging economies with roughly similar GDP and population that also experienced strong growth in the first half of the 2000s (Poland, Czech Republic and Ireland) were chosen, as well as countries whose economies have a strong resource component (Australia and New Zealand). All of the comparison countries have some potential as targets for international timberland investment. Chile with a population of 16.6 million, falls between Australia with 22.6 million and New Zealand and Ireland with about 4.5 million, and has roughly half the population of Poland. About 85 percent of Chile's population live in urban areas, with over a third of the population in the three largest metro areas, Greater Santiago with 5.9 million people, Greater Concepción with 0.9 million and Greater Valparaiso with 0.9.

![Figure 1](image-url)
In 2012, Chile’s Gross Domestic Product reached $387 billion (current dollars), close in size to the Czech Republic, roughly twice as large as the economies of Ireland and New Zealand, and less than half the size of the annual economic output of Poland or Australia (Figure 1). From 2003 through 2012, Chile’s real GDP has grown at an average rate (in constant USD) of 4.8 percent, resulting in a 43% increase in real GDP over that period. Chile’s economic performance since 2003 has out-performed other smaller, emerging economies such as Poland and the Czech Republic (Table 1), as well as more mature economies such as Australia and New Zealand. Chile’s comparative performance was boosted by its ability to weather the aftermath of the Global Economic crisis (Figure 2), which reflected strong global demand for copper and agricultural commodities over the past five years.

### Table 1

<table>
<thead>
<tr>
<th>Country</th>
<th>Avg. Annual % Change in Real GDP 2003-2012, USD, constant prices and PPPs</th>
<th>2010 Gross National per capita income, USD, current prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>4.8%</td>
<td>$15,058</td>
</tr>
<tr>
<td>Poland</td>
<td>4.3%</td>
<td>$19,239</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>3.0%</td>
<td>$23,557</td>
</tr>
<tr>
<td>Australia</td>
<td>2.4%</td>
<td>$39,136</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1.9%</td>
<td>$28,170*</td>
</tr>
<tr>
<td>Ireland</td>
<td>1.9%</td>
<td>$33,552</td>
</tr>
<tr>
<td></td>
<td>*2009</td>
<td></td>
</tr>
</tbody>
</table>
The strong, sustained growth that Chile has experienced over the past two decades has markedly improved living standards, but per capita income in Chile still remains low relative to other emerging economies. Chile’s Gross National Income measured on a per capita basis in 2010 was reported by OECD as USD 15,058, which was 22% less than in Poland and 36% below the level in the Czech Republic (Table 1). The percentage of Chileans with per capita household incomes below the poverty line—defined as twice the cost of satisfying a person's minimal nutritional needs—fell from 45.1 percent in 1987 to 11.5 percent in 2009, according to government surveys. The officially reported poverty estimates have received criticism as understating problems. If more comprehensive measures of poverty that are employed in many European countries were used, then 27% of Chileans would be classified as poor. As of November 2012, about 11.1 million people (64% of the population) receive benefits from government welfare programs, via the "Social Protection Card", including those living in poverty and those at a risk of falling into poverty.

Although Chile has made strides in diversifying its economy by developing significant export oriented industries in forestry, fish products and wine, copper remains the country’s dominant industry. Copper mining makes up 20% of Chilean GDP and 60% of exports. Overall, Chile produces a third of the world’s copper and 14% of central government revenue came directly from copper in 2012. Chile has entered into free trade agreements (FTAs) with a network of countries, including the FTA with the United States that was signed in 2003 and implemented in January 2004. Internal Government of Chile figures show that even when factoring out inflation and the recent high price of copper, bilateral trade between the U.S. and Chile has grown over 60 percent since 2004. The value of exports of goods and services in 2011 represented 38% of Chile’s GDP.

Chile has a healthy investment environment with excellent access to both domestic and overseas pools of capital. General government gross debt represented 11 percent of GDP at the end of 2013. The national pension system (AFP), which has been privatized for over 30 years, has encouraged a high domestic savings rate which has built a significant pool of domestic capital available for investment. Over the period 2004 to 2010, net household savings as a percent of disposable income has averaged
7.6%, and was 8.1% in 2010 the last reported year. Under the compulsory private pension system, most formal sector employees pay between 10 to 20 percent of their salaries into privately managed funds, the majority of which is invested in Chilean fixed income and equities. Chile also has policies supportive of foreign direct investment, which are codified in the country’s Foreign Investment Law. Registration for foreign investment is simple and transparent, and foreign investors are guaranteed access to the official foreign exchange market to repatriate their profits and capital.

Although the overall outlook for the Chilean economy remains positive, a number of headwinds are developing that could moderate the rate of growth over the coming decade. The most prominent headwind appears to be the slowdown in the Chinese economy which is a key market for Chile’s copper exports. China’s major construction initiative to support its policy of urbanization has been a driving force in expanding global demand for copper. The Chinese government’s acceptance of slower economic growth as a necessary consequence of rebalancing their economy has raised concerns among commodity producers in general, and Chilean copper producers in particular, about the prospects for future demand growth.

**Chilean Peso**

Currency exchange rates have a significant influence on a country’s competitive position in global markets. The Chilean peso (CLP), as is typical for the currencies of resource-based, export oriented economies, responds to global economic trends and the accompanying cycles in commodity markets. The CLP has strengthened in periods of strong global economic growth and high demand for commodities, and retreated during global slow-downs (Figure 1). The Chilean Peso (CLP) experienced a major depreciation in the late 1990s and early 2000s, which built downward momentum with the popping of the tech bubble, the 2001 U.S. recession and 9/11. The CLP dropped from 482 CLP/USD in June 1997 to 785 CLP/USD in March 2003. The CLP slowly recovered lost ground over the next five years, returning to 484 CLP/USD in March 2008. The steady recovery in the CLP in the mid-2000s reflected the growth in global demand for agricultural and mineral commodities in general and copper in particular. During this period, construction activity in the U.S., Europe, Australia and China was booming, providing strong markets for some key Chilean exports; copper and wood products.

With the on-set of the global financial crisis in the second half of 2008, the CLP dropped sharply, hitting a quarterly low of 629 CLP/USD in the first quarter of that year. The plunge in the value of the CLP was driven by falling commodity demand in the U.S. and Europe coupled with global capital flowing back to the U.S. seeking a safe haven in a time of heightened financial uncertainty. The value of the CLP bounced back in 2009-2010, supported by robust commodity markets, including record setting copper prices, which were driven by a surge in housing construction in China. By the fourth quarter of 2010, the CLP had recovered to 480 CLP/USD, and has since been trading in a range between 470-520 CLP/USD.

In 2013, the CLP weakened, passing the 500 CLP/USD mark in early June for the first time since July of 2012. Contributing to the current deterioration of the value of the CLP are a number of factors, including: declines in copper prices; moderating commodity demand in China due to slower economic growth; and concerns that the U.S. Federal Reserve will shift to a less accommodating policy that will result in higher interest rates and a stronger US dollar.

The Chilean peso has moved in close alignment with the Brazilian real (BRL) although generally with smaller swings in value as illustrated in Figure 1. During the period 2002 to 2011, the BRL appreciated
seventy-five percent compared to a thirty percent rise in value for the Chilean peso. The lower volatility of the CLP compared to the BRL reflects a number of factors: the underlying stability of the country’s political and social institutions; the government’s financial prudence, balanced federal budget and large pools of domestic capital; and Chile’s success in moving to a more diversified economy less dependent on copper exports.

**Figure 1**

**Construction and Housing**

Construction activity (as measured by area permitted) in Chile over the past two decades has experienced cyclical ups and downs, but total new construction permits have stayed within the same range of between 1.0 and 2.0 million square meters per year (Figure 1). Despite a slower average rate of overall economic growth in the 2000s versus the 1990s (3.9% vs. 6.5%), total construction activity in Chile actually increased marginally (Table 1). The stable level of construction activity even at a reduced, but still quite healthy, rate of economic growth would suggest that economic growth would have to drop to substantively lower levels before impacts on total construction activity would be felt.
The housing component of Chile’s construction activity did respond to the slower growth in the economy in the 2000s, dropping 11% from an average of 0.8 million square meters in the 1990s to 0.7 million in the 2000s.

Looking out over the next decade, the pace of growth in Chile’s economy will be hard pressed to repeat the performance of the 2000s, based on slower growth in China, softer global commodity markets and a still slow economic recovery in the developing economies. Consequently, construction activity in Chile could ease a bit from the pace sustained over the past two decades. A moderation in Chilean construction activity would slow the growth of domestic demand for lumber, plywood and reconstituted panels and further shift the focus of Chile’s solid wood products industries to increasing their efforts to expand existing and develop new export markets.

Table 1

<table>
<thead>
<tr>
<th>Chilean Construction and Economic Activity Compared</th>
<th>Permit Construction Activity (Million m² per year)</th>
<th>Average % Change in Inflation Adjusted GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Residential</td>
</tr>
<tr>
<td>1991-2000</td>
<td>1.37</td>
<td>0.80</td>
</tr>
<tr>
<td>2001-2010</td>
<td>1.39</td>
<td>0.71</td>
</tr>
</tbody>
</table>
Overview of Timber Supply

Regional Land Use Patterns

The central portion of Chile is predominantly native grassland and native forest, while the northern and southern ends of the country have large areas of barren land. Most industrial forest plantations are in Regions VII, VIII, IX and XIV, with the majority in Region VIII. By contrast, agricultural uses have a much wider footprint and a more even distribution across regions, ranging from Region V to XIV. Figure 1 illustrates relative land uses by region, oriented north to south. A larger proportion of native grassland is found in the northern regions, and more of the native forest is concentrated in southern regions. Region III is the Atacama Desert, accounting for the spike of barren land in that region.

Figure 1

Proportion of land base in different uses, by region oriented north to south

Source: VII CENSO NACIONAL AGROPECUARIO Y FORESTAL

The topography of the timber producing regions (VIII-XIV) generally features a coastal mountain range, a central valley, the foothills of the Andes, and the Andes. The fertile Central Valley is where most agricultural activities are found, particularly to the north in Regions V and VI. The southern portion of
the Central Valley also is conducive to agriculture, but commercial forestry begins to occupy more of the landscape. Forest plantations in this region have been established on marginal farmlands, characterized by eroded and depleted soils and areas with hilly topography that is more expensive to farm. Forest plantations are also found in the foothills of the Andes and in many of the steeper parts of the coastal mountain range. Figure 2 shows the regions of Chile.

Figure 2 Regions of Chile
Regional Descriptions

Region VII – Maule

Region VII is named for the Maule River, which bisects the region running from the Andes to the Pacific Ocean. The Maule River also feeds five hydroelectric plants that provide regional energy.

Forestry and agriculture are the primary economic activities in the region. Most of the agriculture is wine grape plantations, and Maule is the leading wine producing region in the country. The dominant wine appellations are the Maule Valley and the Curicó Valley.

Region VIII – Bío Bío

The capital of the Bío Bío region is Concepcion, which is the second largest metropolitan area after Santiago. Tectonically active, the region has seen several strong earthquakes, including the great earthquake of 2010, and the 1960 earthquake, which was the most powerful earthquake recorded. The region has good railway infrastructure, with a railway connecting Santiago to Puerto Montt running through the Bío Bío region, with a connection to the port of Concepcion. A branch line connects the important town of Los Angeles to this railway.

The Bío Bío region is the heart of Chile’s forest industry. The region contains almost half of the country’s forestry plantations and is the largest exporter of forestry products. Along with forestry, the region’s major industries are: manufacturing, fishing, mining (mainly quartz), and agriculture. Manufacturing contributes over a third of the regions GDP. Manufacturing includes iron and steel making, food manufacturing, and petrochemicals. Most of the regions energy comes from hydroelectric power from the Laja and upper Bío Bío Rivers.

Fisheries based in the Bío Bío region make up 32% of the country’s fishing fleet, and account for 4% of the world’s seafood catch. The region’s principal agricultural crops include: fruit, grains, vegetables, beef and dairy.

Region IX – Araucanía

The Araucanía region is Chile’s poorest in terms of GDP per capita. This region also has a high proportion (almost one-third) of the population that self identifies as Mapuche Indian. The ongoing Mapuche conflict has been most active in this region. The capital city of Temuco has seen the fastest population growth in the country over the last three decades.

Dominant land uses in this region include forestry, agriculture, and grazing. The primary agricultural crop is wheat, and this region has been called “Chile’s granary,” due to the high proportion of cereal farming. The region also produces grapes, potatoes, lupine (flowering legume), fruits and flowers.

Region XIV – Los Ríos

Region XIV was added as a region in 2007, created by subdividing the Los Lagos Region (X). Los Lagos was one of the largest regions in the country, and the heavily populated province of Valdivia in the north, was very different from the rest of the region, which is more sparsely populated, and more heavily geared to fishing and cattle. Overall, Los Rios region is 32% rural, with the population being very unevenly distributed as almost half of the region’s population lives in the province Valdivia.
The clear physiographical pattern of coastal mountains-central valley-Andes that dominates Regions VII-IX is not as prevalent in Region XIV. Valdivia is technically part of Northern Patagonia. The Patagonian Cordillera follows the river Calle Calle to the Pacific. The valleys of this mountain range contain some dense, temperate rainforest. Two significant rivers – Valdivia and Bueno - cut through the coastal range. In what would be the Central Valley, several hilly features bisect the valley, creating two agricultural flatlands – the Mariquina Valley and Los Llanos.

Table 1

Overview of main forestry regions in Chile

<table>
<thead>
<tr>
<th>Region</th>
<th>Name</th>
<th>Capital</th>
<th>Area (KM²)</th>
<th>Population</th>
<th>Primary economic drivers</th>
<th>Secondary drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>Maule</td>
<td>Talca</td>
<td>30,296</td>
<td>908,097</td>
<td>Forestry, wine (largest wine producing region), agriculture: fruit &amp; vegetables, flowers</td>
<td>Power generation</td>
</tr>
<tr>
<td>VIII</td>
<td>Bio Bio</td>
<td>Concepción</td>
<td>37,063</td>
<td>1,861,562</td>
<td>Industrial (iron, steel, manufacturing), forestry, mining (non-metallic), row crop agriculture, wine</td>
<td>Fisheries, power generation, dairy</td>
</tr>
<tr>
<td>IX</td>
<td>La Araucanía</td>
<td>Temuco</td>
<td>31,842</td>
<td>869,535</td>
<td>Agriculture (primary grains), forestry, wine</td>
<td>Tourism</td>
</tr>
<tr>
<td>XIV</td>
<td>Los Ríos</td>
<td>Valdivia</td>
<td>18,430</td>
<td>356,396</td>
<td>Forestry</td>
<td>Tourism, dairy, fisheries</td>
</tr>
</tbody>
</table>

Timberland Ownership

Total forestland in Chile is estimated at 16 million hectares, most of which is privately held (Figure 8). Private ownership of forestland is highly concentrated in the large forest products companies, with CMPC and Arauco together owning almost three-fourths of all private forestland (Figure 9).

Figure 8

Types of forestland ownership in Chile

Source: FAO, 2005
Relatively few US based institutional investors have established a land base in Chile, thanks in part to the industry domination of CMPC and Arauco. Global Forest Partners (GFP) was an early investor with their Forestal Bío Bío property in Region VIII, which was sold to Arauco in 2004. Currently GFP manages assets of approximately 30,000 hectares in Chile’s Regions VII and VIII, mostly planted to pine. Other US TIMOs present in Chile include Harvard Management Corporation (5,000 ha) and GMO (3,000 ha).

**Timber Demand**

**Industrial Roundwood Production Trends**

Chile’s industrial roundwood production grew dramatically in the period 1980 to 1995, nearly tripling from 8.2 million cubic meters to 24.9 million cubic meters. This ramp up in production was almost all softwood, and reflected the maturing of the extensive Radiata Pine plantation resource that began to be established in the 1970s. After reaching a cyclical peak in 1995, Chile’s softwood timber production leveled off and did not exceed the 1995 high-point until 2004. During the second half of the 1990s and the 2000s, the increasing production of hardwood roundwood fueled overall growth in Chile’s industrial roundwood production. Chile’s production of hardwood industrial roundwood increased from an average of 1.7 million cubic meters per year in 1991-1995 to 12.0 million in 2007-2011. The growth in hardwood timber production particularly in the 2000s was based on commercially managed eucalyptus plantations, which allowed the hardwood share of Chile’s total industrial roundwood production to increase from an average of 8% in 1991-1995 to 30% in 2008-2012 (Figure 1). Despite falling production in 2009-2010 associated with the Global Financial Crisis (GFC), Chilean industrial roundwood production rose to an average of 37.7 million cubic meters per year in 2008-2012, reflecting expanded hardwood production.
Figure 1

Since the 1990s, the management of Chile’s softwood resource has been increasingly focused on the production of sawlogs. The share of total softwood industrial roundwood production represented by sawlogs rose from an average of 51% in the period 1991-2000 to 62% in 2001-2012 (Figure 2). Softwood sawlog production reached a peak volume of 18.0 million cubic meters in 2006 prior to the GFC, and then dropped to a cyclical low of 13.3 million cubic meters in 2009. Chilean softwood sawlog production subsequently staged a moderate recovery, reaching 15.5 million cubic meters in 2012, still 14% below the previous peak.

In Chile, softwood pulpwood is generally produced as a secondary product associated with the management for sawlogs of pine plantations. Pulpwood is generated through thinning operations and the capture of smaller and lower quality logs and tops in the final harvest. Even with the increased emphasis on the management of softwood plantations for sawlogs, softwood pulpwood production has trended higher since the turn of the century, rising from 7.1 million cubic meters in 2001 to a peak of 11.3 million cubic meters in 2009. The growth in softwood pulpwood production in Chile reflects the expanding domestic production of containerboard, boxboard, packaging paper grades and MDF, all of which utilize softwood roundwood as a raw material.

The Other category of softwood industrial roundwood production covers minor products, such as poles, pilings and rail-ties, and accounts for less than 1% of Chile’s total industrial softwood roundwood production.
Since the late 1990s Chile’s hardwood (non-coniferous) industrial roundwood production has been overwhelmingly focused on the production of pulpwood. In 2011, pulpwood accounted for 95% of Chile’s non-coniferous industrial roundwood production. The hardwood share of total pulpwood production has trended up from 0% in 1997 to 54% in 2012. High-yield eucalyptus plantations were established in the 1990s in Chile as an alternative tree crop to Radiata Pine. The initial market for the eucalyptus pulpwood production was export chips targeted to markets in Asia. As production trended higher, Chile’s expanding hardwood pulpwood production became a key building block for growth in the country’s pulp, paper and wood panel industries.
Softwood Lumber and Plywood Consumption, Production and Trade Trends

In the 1980s, Chile was an exporter of softwood sawlogs, principally to Asia, with shipments averaging 1.0 million cubic meters per year. Investment in domestic processing capacity at the beginning of the 1990s redirected all of the export sawlogs to domestic mills so that Chile no longer exports unprocessed sawlogs. Currently domestic lumber and plywood mills provide the sole markets for Chile’s softwood sawlog harvest. Both softwood lumber and softwood sawlog production reached a peak in 2006 and then headed lower through 2009 as the global economic slowdown associated with the GFC gained momentum (Figure 4). Over this period, softwood sawlog production dropped 26%, which was more moderate than the 34% decline experienced by softwood lumber.

![Figure 4](image-url)

Chile’s softwood sawlog demand was supported in the recent downturn and in the following recovery by rising plywood production. Chile’s production of plywood and veneer has been able to sustain its growth trajectory since the mid-1990s, reaching a peak volume of 1.3 million cubic meters in 2011, which represents about 20% of the volume of softwood lumber production (Figure 4).

Chile’s lumber industry is overwhelmingly focused on softwood products, which have consistently accounted for over 95% of total lumber production since 2001. Softwood lumber production in Chile increased dramatically in the 1990s and the first half of the 2000s, rising from 2.75 million cubic meters in 1991 to a cyclical peak of 8.38 in 2006. Negatively impacted by both domestic and export market weakness resulting from the GFC and the collapse in U.S. home construction, Chilean softwood lumber production slipped 34% between 2006 and 2009, dropping to 5.57 million cubic meters. Production has since recovered, but in 2012 was still 22% below the 2006 peak volume.

Source: FAO
Exports are a major component of the total demand for Chile’s softwood lumber, and in 2012 exports accounted for 31% of total production. Over the past 30 years, both exports and domestic consumption of softwood lumber have experienced significant growth, but up until 2000, increases in domestic demand outpaced exports. Between 1980 and 2000, net export’s share of total softwood lumber production dropped from 64% to 24%, reflecting robust growth in domestic demand for lumber as the overall Chilean economy experienced sustained strong growth. Between 1985 and 2005, the Chilean economy grew at an average annual rate in inflation adjusted US $s of 6.0%, fueling a dramatic expansion in softwood lumber consumption, which rose from 1.2 million cubic meters to 5.5 million.

**Figure 5**

[Graph: Softwood Lumber – Consumption and Trade]

Source: FAO
Although the use of softwood lumber in construction applications is an important component of the Chilean domestic demand for softwood lumber, growth in other end-uses such as packaging (wooden crates for agricultural products), furniture, cabinetry, components, millwork and industrial uses made strong contributions to the rising demand. Many of these non-construction end-use markets (agricultural products, furniture, cabinetry, etc.) for softwood lumber also have a significant exposure to off-shore markets. The connection between construction activity in Chile and domestic softwood lumber consumption is relatively loose, as illustrated in Figure 6. In the 1990s and the first half of the 2000s, construction activity cycled around a relatively flat trend that averaged 1.33 million square meters per year of combined residential and non-residential construction, while domestic consumption of softwood lumber nearly tripled.

Dating back to the mid-1970s, exports have been a major component of the market for Chile’s softwood lumber, whereas Chile’s imports of softwood lumber have been consistently minimal. Imports of softwood lumber averaged just 23 thousand cubic meters per year in the period 2001-2011 (just 0.3% of annual production). In the period 2001-2010, Chile’s softwood lumber exports averaged 2.5 million cubic meters per year, accounting for 37% of production during that period. The composition of the markets for Chile’s softwood lumber exports has been relatively diverse. In the 2000s, the U.S. was the number one destination, on average, accounting for a quarter of the decade’s exports, but significant volumes were also shipped to Mexico, other Latin American destinations, and the Mid-East and Asia (Figure 7).
The relative importance of the different destinations for Chile’s softwood lumber exports has shifted over time, reflecting the ability of the Chilean lumber industry to develop new markets and adapt to changing demand conditions (Figure 8). In the past decade, Chile was able to effectively develop expanded market presence in the U.S., taking advantage of the home construction boom of the mid-2000s. More recently, as U.S. home construction activity collapsed, Chile has shifted the focus of its softwood lumber exports to the development of markets in China and other emerging economies.
Plywood Consumption, Production and Trade Trends

Chile’s plywood and veneer sector has experienced major investment and growth over the past two decades, with production increasing from less than 0.1 million cubic meters in 1991 to 1.3 million in 2012.

Figure 9

Although plywood is a significantly smaller source of demand for Chile’s softwood sawlogs than softwood lumber, the continued expansion of plywood production in the period following the global financial crisis provided much needed support to Chilean softwood sawlog markets. Chile’s domestic demand for plywood and veneer increased from 0.2 million cubic meters in 2001 to 0.5 million cubic meters in 2012 (Figure 9), reflecting the strong overall growth in the Chilean economy and investment in residential and nonresidential construction as well as infrastructure.

Chile’s plywood trade has increased at an even faster pace than the healthy gains in domestic demand. Between 2001 and 2012, net exports of plywood shot up from 0.2 million cubic meters to 0.9 million cubic meters, with the export share of total production moving above 60% in recent years. Chile’s success in the very competitive global markets for plywood is testimony to both the quality of the Chilean product and the scale and efficiencies of Chile’s plywood mills.

North America is the principal destination for Chile’s plywood exports, with the U.S. the number one destination followed by Mexico in second place (Figure 10). Over the period 2001-2011, the U.S., Mexico and Canada combined on average accounted for 58% of Chilean plywood exports. The other larger markets for Chilean plywood are in the UK and continental Europe.
Chile’s plywood industry’s ability to increase exports in the period 2008 to 2012 is particularly noteworthy, given the market challenges related to the global economic slowdown, the collapse of U.S. housing markets and the on-going recession in Europe. During this period Chile has been able to effectively diversify its plywood markets into smaller markets in Australia, Asia, Latin America and the Mid-East (Figure 11).
Pulpwood and Wood Panel Consumption, Production and Trade Trends

Pulpwood consumption in Chile is driven by the production of pulp, both market pulp and pulp production integrated with the production of paper and paperboard (Figure 12). Smaller sources of demand for pulpwood logs are reconstituted wood panel mills (OSB and MDF), exports of roundwood chips and production of charcoal.

Figure 12

Chile Plywood Exports by End Use

Pulp, Paper and Paperboard Markets

Chilean pulp production has experienced strong sustained growth over the past three decades, increasing from 0.8 million tonnes in 1980 to 4.9 million tonnes in 2011. The primary driver of Chilean pulp production has been expanding exports of market pulp. Exports as a share of production have increased from around half of Chile’s total pulp production to 82% in 2010-2011 (Figure 13).

The principal destinations for Chile’s market pulp exports are China and Europe. In the period 2001 to 2011, China accounted for an average of 31% of Chile’s pulp exports, while together France, Germany, Italy, Netherlands and Spain took 27% (Figure 14). The remaining 42% of Chile’s pulp exports went to a diverse mix of destinations.
Chilean pulp exports experienced strong growth in the mid-2000s, rising from 2.1 million tons in 2003 to a peak of 4.3 million tons in 2008, fueled by expanding shipments to both China and Europe (Figure 15). Chile’s success in highly competitive global pulp markets has reflected its low cost position, based on its relatively new, large scale, efficient pulp mills and low input costs (labor, wood and energy). Following the GFC, Chile has lost some of its cost advantage due to a significant appreciation in the Chilean peso.
and to falling pulpwood prices in the U.S. South, which is a direct competitor with Chile in softwood market pulp export markets.

**Figure 15**

Moving forward, Chile’s pulp industry will be facing significant challenges to replicate the growth in markets experienced in the 2000s. Prospects in Europe will be substantially constrained by the extended economic downturn that will continue to negatively impact the region in the coming decade, while the growth in demand for market pulp in China will be moderated by a combination of the country’s significant expansion of its own domestic pulp capacity and a moderation in China’s overall rate of economic growth.

Although a smaller component of Chilean pulp demand than exports, domestic consumption of pulp has maintained a healthy upward trend over the past three decades as Chile’s paper and paperboard industry expanded (Figure 16). Between 1980 and 2012, domestic consumption of pulp in Chile nearly tripled, increasing from 0.35 million cubic meters to 0.77 million. Over this same period, Chilean paper and paperboard production expanded at a more robust pace, rising from 0.36 to 1.35, as Chile’s production of paper and paperboard expanded its use of recovered paper as a source of fiber.
Chile’s production of paper and paperboard is nearly all targeted at domestic markets, with trade only a small factor in the industry (Figure 17).

Packaging and tissue products have made the biggest contributions to the growth in Chile’s paper and paperboard sector, while newsprint and printing and writing paper production have been stagnant (Table 18). The growth in Chilean packaging demand has particularly benefitted from the steady growth in Chile’s exports of products from its farms, vineyards and fisheries, while increases in domestic tissue
demand (diapers, household and hygiene products) has been fueled by sustained economic growth and rising per capita income.

**Figure 18**

![Chile Paper & Paperboard Production by Grade](image)

Prospects for Chilean demand for packaging and tissue products should remain favorable, while graphic paper demand will increasingly be confronting downward pressure from an accelerating shift in the expanded use of electronic media.

**Reconstituted Wood Panel Markets**

Chile’s reconstituted wood panel sector as reported by FAO encompasses the following product categories; hardboard, insulating board, medium density fiberboard (MDF) and particleboard. The two most important product categories are MDF and particleboard. The particleboard category includes Oriented Strand Board (OSB), and the MDF category includes compressed fiberboard (prior to 1995 the category was labeled compressed fiberboard, suggesting that it wasn’t until the first half of the 1950s that MDF accounted for the majority of production in the category). Reconstituted wood panel production maintained an upward trend from the early 1990s up until the GFC in 2008. Chile’s total output of reconstituted wood panels increased from 0.30 million cubic meters in 1980 to a peak of 1.57 million cubic meters in 2008 (Figure 19). After dropping sharply in 2009 during the global recession, Chile’s reconstituted panel production made a strong recovery and by 2012 was above the previous peak. MDF has experienced the strongest growth of any of the reconstituted wood panel products, with its share of total reconstituted wood panel production increasing from 41% in 1990 to 61% in 2012.
The expansion of Chile’s reconstituted wood panel industry has been driven by both domestic and export demand (Figure 20). Since 1990, Chile’s domestic consumption of reconstituted wood panels has quadrupled, rising from 0.19 million cubic meters to 0.81 in 2012. Over the same period net exports of reconstituted panels have increased at an even faster pace, jumping from 0.11 million cubic meters to 0.72 million cubic meters. Exports share of total production has increased, trending up from an average of 33% in the period 1990-1994 to an average of 48% in 2007-2012.
Although Chile’s total production of reconstituted panels at 1.5 million cubic meters in 2012 was larger than the production of plywood and veneer (1.3 million cubic meters), the impacts of the reconstituted wood panel industry on timber demand and timber values are more diffuse. Whereas the raw material needs of the plywood industry are sharply focused on higher quality, higher value sawlogs, the fiber needs of the various reconstituted wood panels are much more flexible and more geared to lower cost types of wood fiber. Particleboard, hardboard and insulation board generally utilized manufacturing residuals from the production of lumber and plywood as their principal source of wood fiber. MDF usually draws upon a mix of manufacturing residuals and roundwood pulpwood. Due to the need to control the size and shape of the wood fibers used to produce OSB, roundwood pulpwood is required as the raw material.

**Forest Product Sector**

**Industry Structure – Forest Product Companies**

The forest industry in Chile is dominated by two very large companies, Arauco and Empresesa CMPC, with the smaller Masisa as the remaining member of the top tier of large, internationally operating companies in Chile’s forest product sector. Arauco (Celulosa Arauco y Constitucion, CELCO) is a part of a larger Chilean corporate entity Empresas Copec, which is also involved in fuels distribution (liquid fuels, natural gas), commercial fishing, electrical power generation and mining. The two largest companies, Arauco and CMPC, are estimated to account for 72% of the forest products export market, and control 70% of pine plantations and 40% of eucalyptus plantations.

CMPC is the largest of the three first tier companies by sales (Table 1), with 2012 total sales of $4.8 billion, 12% larger than Arauco and over 3.5 times greater than Masisa. In addition to their Chilean operations, all three companies have production facilities in other locations in Latin America. CMPC has mills in Argentina, Brazil, Peru, Colombia and Uruguay; Arauco has one pulp mill and two engineered wood product plants in Argentina and two engineered wood product mills in Brazil; and Masisa has operations in Argentina, Peru, Brazil, Venezuela, Mexico and the United States.

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<th>Chile’s First Tier Forest Product Companies</th>
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<tr>
<td>Empresesa CMPC</td>
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<tr>
<td>Sales 2012 (million US$)</td>
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<tr>
<td>Market Cap (million US$)</td>
</tr>
<tr>
<td>Moody's Credit Rating</td>
</tr>
<tr>
<td>Net Income Margin</td>
</tr>
<tr>
<td>EBITDA Margin</td>
</tr>
<tr>
<td>Interest Coverage Ratio</td>
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<tr>
<td>Total Debt/EBITDA</td>
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Moody has rated CMPC as slightly more credit worthy than Arauco (Table 1), with the bonds of both companies falling into the lower-medium grade category. Masisa credit rating was significantly lower, with its bonds classified as non-investment grade speculative. Masisa’s market valuation relative to sales is substantially less than CMPC (Arauco’s market capitalization is not available as it is embedded in Copec), and reflects the sharp drop in Masisa’s share price in 2013. Since peaking at just under 60 CLP in January, Masisa’s shares have dropped in late August to under 40 CLP. Contributing to the marked deterioration in Masisa’s stock price is the recent official devaluation of the Venezuelan currency and the increasing questions about future prospects for both Venezuela’s currency and economy. Masisa generates a quarter of its revenue from Venezuela.

The three top tier companies have distinctly different product mixes. CMPC produces pulp, paper and paperboard products, with market pulp as the largest (61%) component of its total production capacity (Figure 1); Arauco produces a mix of market pulp (47%) and solid wood products (49%) (Figure 2); and Masisa is a producer of solid wood products, primarily wood panels (particleboard, MDF and OSB) as well as lumber, and interior doors, mouldings and millwork (Figure 3).

**Figure 1**

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<th>CMPC Capacity by Product</th>
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<tr>
<td>Tissue</td>
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<td>42%</td>
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**Figure 2**

<table>
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<th>Arauco Sales by Product (2012)</th>
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<tr>
<td>Pulp</td>
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<tr>
<td>47%</td>
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Market pulp is the most important product line for both Arauco and CMPC, and the scale of their pulp operations is of similar scale to other major Brazilian (Fibria, Suzano) and Scandinavian (Storo Enso, UPM) producers (Figure 4). CMPC’s pulp production is weighted towards eucalyptus (69%), while the majority of Arauco’s pulp production is softwood (65%)

In recent years, all three of these companies have aggressively targeted growth opportunities outside of Chile. In 2009, Arauco entered into a joint venture with Stora Enso building a pulp mill and purchasing timber plantations in Uruguay, making them the largest landowner in Uruguay, and in the same year acquired the Brazilian panel company Tafisa Brasil for a deal worth US$227 million. Last year, CMPC committed to building a new 1.3 million ton bleached eucalyptus pulp line at its Guaiba mill in Rio
Grande do Sul, Brazil. In 2012, Masisa acquired Rexcel, a major Mexican particleboard manufacturer for US $54 million, and this July approved construction of a MDF plant, a melamine coating line and the expansion of a resin plant all at its industrial complex in Durango, Mexico. The planned new investments at the Durango site are estimated to cost US $132 million.

**Industry Structure – Forest Products Facilities**

Chile’s Ministry of Agriculture publishes an online mapping tool that includes wood using facilities. The forest products markets in Chile are dominated by a few large facilities – namely those operated by Arauco and CMPC, and a multitude of small, independent, often informal wood processing facilities.

The Bío Bío Region, the heart of Chilean forestry, has the largest number of high production facilities, those producing over 300 cubic meters per year. Markets begin to become a bit slimmer further south in the Araucanía and Los Ríos Regions, with fewer large facilities.

**Timber Prices**

**Pine Sawlogs**

The price of Chilean unpruned delivered radiata pine sawlogs in inflation-adjusted US dollars has maintained a moderate upward trend since 1999, increasing from $37 per cubic meter to an estimated $52 per cubic meter in 2013 (based on data for the first half of the year). The steady appreciation and limited volatility of Chilean pine sawlog prices over the past 13 years reflect the high concentration of ownership of timberlands by the top tier of Chile’s forest products companies and the significant integration of their timber production and processing operations. Chilean softwood sawlogs are all processed domestically resulting in prices which have been insulated to a large degree from the more global market events that have occurred over the past decade and a half. Including: the collapse in U.S. wood product markets (resulted in a major downward correction in U.S. southern pine sawlog prices) and the post GFC surge in Chinese softwood log imports (boosted New Zealand radiata pine sawlog prices).
Chilean radiata pine sawlog prices have tracked closer to the price movements of Brazilian softwood sawlogs, than US or NZ pine. Brazil, like Chile, process nearly all of its softwood sawlogs in domestic mills, with negligible exposure to export log markets. Brazilian softwood sawlog prices have experienced considerably more volatility than in Chile, due to the less concentrated and controlled condition of Brazil’s softwood sawlog market.

Chilean softwood sawlog prices are expected to continue their upward trend supported by steady domestic demand and increasing exports of both lumber and plywood. The continuing recovery in US construction activity will provide solid support to Chilean softwood sawlog markets, since the U.S. is the number one destination for both lumber and plywood exports.

Some relevant points of comparison for Chilean pruned sawlog prices are U.S. ponderosa pine and pruned New Zealand radiata pine. Chilean products produced from pruned radiata sawlogs (plywood and veneer, clear pine boards and moulding stock and cabinet components) are exported to the U.S. where they compete directly with ponderosa pine products. New Zealand pruned radiata pine logs are focused on similar end-use markets, although they do have some added support from offshore demand from sawlog exports principally to Asia. As is the case for unpruned sawlogs, Chilean pruned sawlogs have exhibited much more price stability than comparable products in other supply regions. Again we attribute this more limited price volatility to the concentrated timber ownership and the vertically integrated nature of the top-tier forest product companies.
Pulpwood

The price of Chilean eucalyptus pulpwood has followed the general trend set by Brazilian eucalyptus. The end product in both countries is principally the same product, Bleached Eucalyptus Kraft pulp, geared to global export markets, so the tracking between the prices of pulpwood in the two countries is expected. The combination of rising consumption and significant appreciation in the local currency in both countries has supported real increases in eucalyptus pulpwood delivered log prices in Chile and Brazil. The inflation adjusted price of Chilean eucalyptus pulpwood increased from US$ 35 per cubic meter in 2003 to a cyclical peak of US$ 54 in 2012 (Figure 3).

The significant appreciation of eucalyptus pulpwood prices over the past decade, has undercut the competitive position of Chilean eucalyptus pulp relative to other producing regions of hardwood pulp, for example, the wood fiber costs of U.S. hardwood pulp producers are on par with Brazil and significantly lower than Chile (Figure 3). Consequently, Chilean eucalyptus delivered pulpwood prices should experience some downward movement to bring Chilean pulp producers wood costs back to their historical relationship with Brazilian eucalyptus and more in alignment with other hardwood pulp producing regions.
Chilean softwood pulpwood provides the raw material for Chilean production of softwood kraft pulp for both export as market pulp as well as for use in one of the still growing segments of its paper and paperboard sector, packaging paper and paperboards. U.S. southern pine pulpwood prices provide a good reference point by which to gauge Chile’s pine pulpwood prices, since Chile’s exported softwood market pulp competes in global markets directly with pulp produced in the U.S. South. In addition, U.S. containerboard is globally traded and a potential competitor with containerboard produced in Chile. Brazil softwood pulpwood offers a comparison within South America, although Brazil is not a significant exporter of softwood market pulp, and therefore is not in direct competition with Chilean pulp.

Similar to the situation for softwood pulpwood, Chilean inflation-adjusted hardwood delivered prices have trended higher since 2003. Although softwood pulpwood prices in Chile are still below their 2008 pre-GFC levels, they are well above current pine pulpwood prices in the U.S. South (Figure 4). Chilean radiata pine delivered pulpwood prices should hold near current levels (US$ 36). U.S. South pine pulpwood prices are anticipated to increase in real terms over the next several years, driven by recovering OSB production and the opening of new large scale facilities producing wood pellets for electrical power generation. The rising real pine pulpwood prices in the U.S. South are projected to come back into alignment with Chilean pulpwood prices.
Timberland Valuation and Investment Risk Assessment

Land Values

The government agency ODEPA (Oficina de Estudios y Politicas Agrarias) publishes agricultural land values for the period 1999-2010. Land values increased sharply since 2005 in Regions IX and XIV. Note that Region XIV did not exist prior to 2007, and it was part of Region X (Figure 1).
Chilean agricultural land values are supported by counter seasonal harvests to the Northern Hemisphere. Chilean produce can generally command higher prices than similar crops from the Northern Hemisphere because they are produced at a time of year when global supply tightens.

A study of land values performed by the Universidad Catolica and reported in *El Mercurio*, identified three primary factors strengthening land values: (1) a Chilean culture that encourages families to own their own “campito,” or little plot of land, (2) high productive capacity of fruit farms, and (3) the impact of a weakening US dollar in the second half of the 2000s. IMF data indicate that per capita GDP in Chile increased steadily over the same time frame, making purchases of small tracts of land more achievable for Chileans in the past.

Chilean land values did not experience the drop in value from the 2007-2008 GFC seen elsewhere in the world. An *El Mercurio* article attributes this stability to increased purchases of agricultural land by groups outside of the agriculture sector, seeking a safe haven in physical assets from more volatile investment vehicles.

**Investment Risk Assessment**

In assessing timberland investment risk, we consider factors such as country operating risk, timber markets, timber volume risk, and investment liquidity. Considering those factors, timberland investments in Chile compare quite favorably relative to other global investment regions. Our assessment would indicate a 100 – 150 basis point premium to benchmark U.S. timberland investments is required for a typical Chilean timberland investment. This risk premium puts Chile in a similar risk category as softwood investments in New Zealand and Australia.
**Chile Business Environment**

Overall, Chile is generally ranked as a very safe country in which to do business. The Economist Intelligence Unit gives Chile a score of 21 (100 = most risky), equivalent to the United States. The International Finance Council of the World Bank ranks Chile in the top fifth of global countries for ease of business. According to the Heritage Foundation’s 2013 Index of Economic Freedom, Chile is among the 10 freest economies in the world, and it has the highest degree of economic freedom in Latin America.

The Chilean government is open and transparent. Competition is encouraged, and attracting foreign investment is a priority. Public officials are generally held accountable, and the public has a low tolerance for alleged corruption or irregularities. All these factors contribute to an attractive and business-friendly political culture, in which no large scale expropriation of foreign assets has occurred in over forty years. Courts are viewed as impartial with no instances of favoring domestic companies over foreign ones. Tax policy is fairly simple and supportive of investment.

Chile’s banking infrastructure also contributes to this low business environment risk; Chile’s banks are well capitalized with a stable domestic deposit base, judicious management, and conservative lending policies. The Central Bank is focused on preserving currency stability and protecting the domestic banking industry from external shocks. The Chilean Peso tends to swing with fluctuations in the price of copper, Chile’s main export. Companies with good credit generally have easy access to local borrowing options.

Chile has one of the better transportation infrastructures in the region. The main ports are managed through BOT concessions (Build-Operate-Transfer), the commercial airports have all been upgraded, and the telecommunications system is up to date. Rail transportation in Chile is somewhat lacking, with no evidence of upgrade on the horizon. Main roads in Chile are generally in good condition, and the government is concentrating the public works budget on upgrading and extending the network of secondary and dirt roads.

An area of risk for Chile is energy infrastructure. Energy security is low, and the projected 2013 investment in energy infrastructure will be insufficient to completely address them. Chile must import all fossil fuels, and has had past difficulty securing sufficient natural gas imports. As it stands now, the Chilean energy grid is highly dependent on hydroelectric power, which has recently shown its sensitivity to periods of drought, leading to occasional blackouts. Proposed new hydroelectric dams in the Patagonia region have been met with protests from environmental groups. Continued expansion of the energy intensive mining industry will depend on reliable and secure sources of energy.

**Legal and Regulatory Framework**

The legal framework in Chile is equitable and sound, with an independent and generally efficient judicial process. The Heritage Foundation ranks Chile as having the most secure contract rights in Latin America. Property rights are also strongly respected, with Chile scoring 90/100 on the Heritage Foundation’s scoring of property rights, putting it ahead of the US (85/100).

**Social and Environmental Risk**

Chile is one of the safest countries in Latin America, and there is minimal risk of any armed conflict. Overall crime rates are low, and organized crime is virtually non-existent. Sporadic demonstrations
against the government or planned energy projects have at times proved disruptive, though rarely violent.

Labor unrest has occurred periodically in recent years, mostly concentrated in the mining and fisheries sectors. Current estimates on unemployment average 5.5-6.0%, which approximates ‘full employment.’ This, coupled with an ongoing shortage of skilled and specialized labor, has led to tight labor markets, pushing up wages. The government offers subsidies to companies that provide on-the-job training to unskilled workers.

The Mapuche group of Indigenous People is concentrated in Southern Chile, predominantly in the Araucanía region (Region IX). Claiming ancestral rights to much of the land in this area, Mapuche claims have been a source of tension over the past century. In 1993, a law was passed granting official recognition to the group, and creating a process to transfer some land back to Mapuche ownership. To be eligible for the transfer, Mapuche groups must prove that title to the land was granted to them in the late 19th century. Once proven, the Chilean government then purchases the land from the current owners at market prices, and grants it to the claimant.

Tensions between Mapuche, the Chilean government and local landowners increased over the last few years as some of the more extreme Mapuche groups have pressed complaints about the insufficiency of reclaimed land settlements. In addition, conflicts over Mapuche demonstrations being classified as ‘terrorism,’ have prompted cries of oppression. Higher profile incidents by extremist Mapuche groups often garner widespread attention, though violent or severely disruptive events in reality are rare. President Piñera supported efforts to improve the rights and status of Mapuche groups, and to isolate the extremist minority. Piñera worked to prioritize the top 115 Mapuche claims and resolve them prior to the end of his term.

**Timber Market Risk**

To evaluate timber market risk, we consider timber price volatility, market depth, and market concentration. Timber is either traded in US dollars or effectively denominated in US dollars and the volatility of log prices has been relatively low and comparable to US South pine price volatility. Market depth in Chile is good, reflected by a large number of wood using facilities and the diversity of the types of wood using facilities and end products being manufactured. The technical quality and capital investment in the processing infrastructure receive a high rating as well. In general, the timber supply and demand situation is balanced, and in some instances is somewhat supply constrained.

Chile receives lower marks for market concentration given the large presence and domination by the two large players: CMPC and Arauco. However, there are still small to medium sized companies that are important participants in the market.

Evaluation of the above characteristics generates an overall market risk assessment that is slightly higher than the U.S., but slightly lower than either New Zealand or Australia.

**Timber Volume Risk**

Timber volume risk relates primarily to casualty loss risk factors including wildfire, storm events, and biological risk factors such as insects, pests, and disease, but also includes risks due to timber theft. Technical risk is also part of timber volume risk and this relates to the forest management execution including access to knowledge, resources, intellectual property, and skilled labor.
Overall, there is elevated fire risk in Chile relative to other investment geographies. This is mitigated through very active and cooperative fire prevention, detection, and suppression programs. Fire is the primary timber volume risk factor. Technical risk is very low as forest management practices and ability to execute those practices is considered very good.

**Liquidity**

Investment liquidity is an important consideration and is measured by the estimated number of expected market participants and the diversity of that pool of potential buyers. Chile receives an average risk rating in this category. Chile is considered a desirable investment geography by many of the global TIMOs. Both of the dominant Chilean integrated forest products companies (CMPC and Arauco) own timberlands and actively and aggressively look to grow their timberland base. Also, smaller Chilean private investment funds or investor groups participate in the timberland market.