

Timberland Investment Group Market Report

1st Quarter 2022



TIG
Timberland Investment Group

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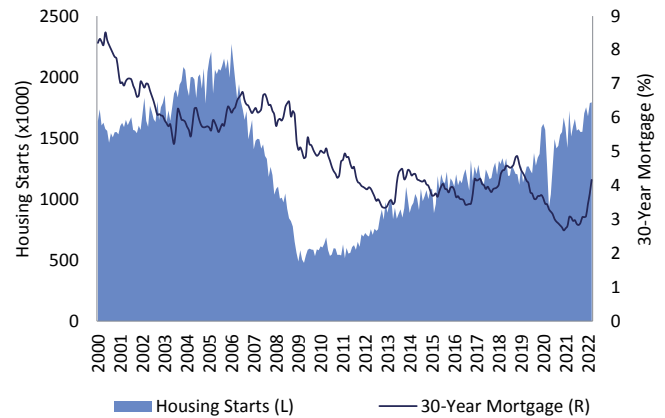
Timberland Investment Dashboard

Indexed Exchange Rates of Selected Countries vs. the US Dollar (2009=100)



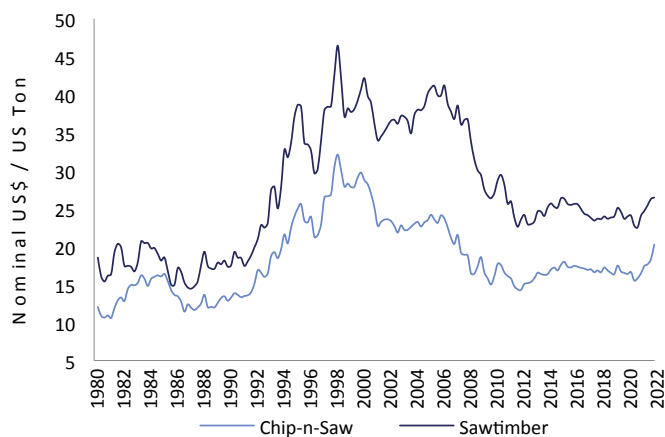
Sources: Federal Reserve Bank; Bloomberg, as of March 31, 2022

Annual US Housing Starts, Seasonally Adjusted Annual Rate, and 30-year Mortgage Rates



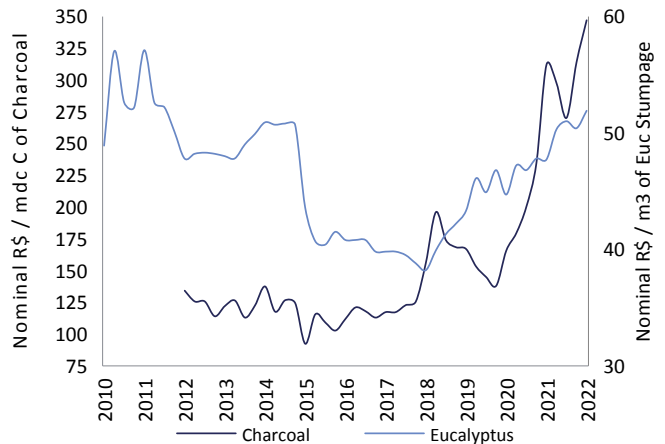
Sources: Federal Reserve Bank; US Dept. of Commerce Census Bureau, as of March 31, 2022

US South Pine Chip-n-Saw and Sawtimber Prices



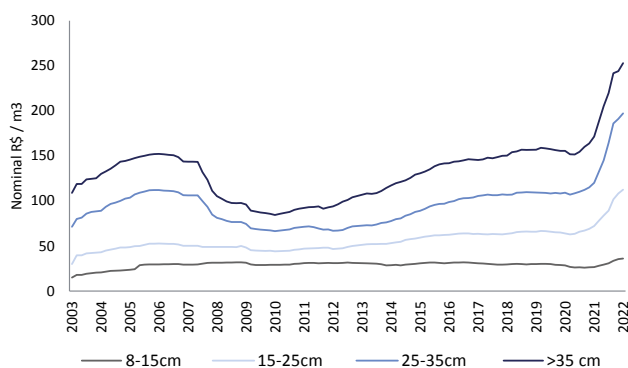
Source: TimberMart-South, as of March 31, 2022

Charcoal and Eucalyptus Stumpage Prices in Minas Gerais, Brazil



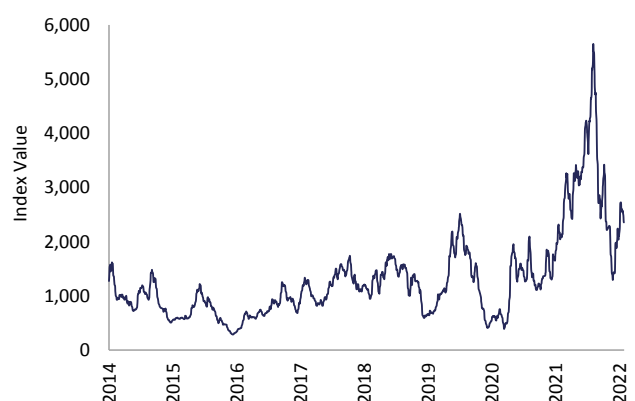
Source: Poyry Silviconsult, as of March 31, 2022

Pine Sawtimber Stumpage Prices in Paraná State, Brazil



Source: STCP, as of March 31, 2022

Baltic Dry Index: 2014-Present



Source: Bloomberg, as of March 31, 2022

Executive Summary

Macro

► In 1Q2022, the global impact from COVID-19 was uneven with several countries experiencing notable spikes in cases at the end of the quarter, including the UK, New Zealand and China among others. This is likely a reflection of differing policy responses over the course of the pandemic, population-level immunity, and the vagaries of the disease itself. While many countries across the world lifted most COVID-19 restrictions, China has imposed a zero-COVID policy in several of its major economic hubs.

► Global timber markets remained robust with continued strong pricing and consumption of wood products and pulp quarter-over-quarter.

► There were continued trade flow disruptions and commodity price inflation partially due to the Russia-Ukraine war, COVID-19, and higher consumer spending activity.

► Just after the end of the quarter, the International Monetary Fund cut its global growth projection from 4.4% to 3.6% due to the war's direct impact on global trade logistics and rising prices for food, energy and other goods.

TIG's View from the Ground

► Lumber and plywood prices in 1Q2022 rebounded to the highs seen in 2Q2021; prices in March 2022 increased 45.1% and 66.2% quarter-over-quarter, respectively.

► In the US South, timber prices continued their upward trend, strengthening across all products in 1Q2022, reaching highs not seen since 2Q2010.

► In the US Pacific Northwest, domestic demand from sawmills remained strong in 1Q2022, keeping prices for sawlogs near a two-decade high.

► In Brazil, timber markets experienced continued strength in 1Q2022 across all forest products and regions. In Minas Gerais, strong global pulp markets and higher demand from China for pig iron resulted in continued timber and charcoal price appreciation. In Paraná and São Paulo, strong demand from pulpwood consumers due to heightened global pulp markets and greater competition in Brazil pushed prices higher. In Mato Grosso do Sul and Santa Catarina, foresters cited rising harvesting and operational costs to be the largest contributor to the higher timber prices.

► In Uruguay, high ocean freight costs as well as the lack of containers and vessel space slightly hindered Uruguayan solid wood export markets.

► Chile timber prices increased quarter-over-quarter with pine pulpwood experiencing the largest gains, partly driven by heightened demand from domestic sawmills and buyers in the US over the last few quarters.

► In early March, the Forest Stewardship Council ("FSC") announced that no FSC-certified material or controlled wood from Russia or Belarus will be permitted to be traded. Russia is the largest global exporter of lumber products, which should impact global trade flows in the months ahead.

Industrial & Capacity Update

► During the quarter, Biewer Lumber began operations at their new softwood sawmill in Minona, Mississippi. The mill plans to advance production to 350 mmbf during the year, and hire up to 150 people. Idaho Forest Group announced the near completion of their 300 mmbf sawmill in Lumberton, Mississippi and expects startup in June 2022.

► Interfor restarted their sawmill in Dequincy, Louisiana in January 2022, and plans to ramp up production to reach 200 mmbf of capacity at year end 2022.

► Domtar announced the restart of their uncoated freesheet paper machine at their mill in Ashdown, Arkansas after it had been idled in April 2020 due to reduced demand brought on by the pandemic.

► In January 2022, UPM announced the delay of the launch of their new bleached eucalyptus kraft pulp mill in Paso De Los Toros, Uruguay, from 2H2022 to 1Q2023. The company attributes the delay to global shipping bottlenecks and other Covid-related issues which caused essential materials to arrive at the construction sites behind schedule. The mill expects to have a total capacity of 2.1 million metric tons and a total investment size of ~US\$ 3.5 billion.

► During the quarter, Arauco announced the postponement of the start of their mill in Biobío, Chile from the end of March 2022 to April 2022 and increased the estimate of the investment in the project from US\$ 2.4 billion to US\$ 2.8 billion. The expansion comprises a new 1.56 million metric ton-per-year bleached eucalyptus kraft pulp mill.

United States

► In 1Q2022, US GDP decreased at an annual rate of 1.4% according to a preliminary estimate versus an increase of 6.9% in 4Q2021 driven by the continued economic rebound.¹

► The unemployment rate decreased to 3.6% in March 2022 from 3.9% in December 2021.

► The ISM Purchasing Managers Index decreased to 57.1 in March 2022 versus 58.8 in December 2021, the lowest pace of growth since the onset of Covid-19.²

► March 2022 housing starts increased 2.2% versus December 2021 and 3.9% versus March 2021 as the housing market continues to thrive off relatively low mortgage rates and consumers' interest in relocating due to heightened interest in more spacious living conditions.

► Southern pine sawtimber prices increased 5.6% sequentially in 1Q2022 and 13.1% year-over-year.

► Southern pine chip-n-saw prices increased 10.4% sequentially in 1Q2022 and 28.4% year-over-year.

► Southern mixed hardwood sawtimber prices increased 1.4% for the quarter and 13.3% year-over-year.

► Southern softwood pulpwood prices increased 4.2% quarter-over-quarter and 23.2% year-over-year while hardwood pulpwood prices rose 9.9% in 1Q2022 and 39.7% year-over-year.

► Softwood lumber prices increased 45.1% quarter-over-quarter and 22.8% year-over-year while panel prices increased 66.2% quarter-over-quarter and 31.5% year-over-year.

► In late March 2022, the U.S. Securities and Exchange Commission ("SEC") proposed rules that would require registrants to disclose material climate-related business risks as well as direct greenhouse gas emissions. The initial comment period will extend through 60 days following publication of the proposed release.

► The Biden Administration announced a US\$ 131 million package as part of the Bipartisan infrastructure law to advance the USDA Forest Services' 10-year wildfire mitigation strategy. This will work on improving the resilience and protection of forests across core forested regions of the American west.

¹For the US, real GDP reflects preliminary 1Q2022. For every other country mentioned, real GDP reflects 4Q2021; 1Q2022 real GDP will be released between late May and mid-June.

² The Institute for Supply Management ("ISM") is a diffusion index with values below 50 indicating decline.

Latin America

► In 4Q2021, Brazil's GDP increased 0.5% quarter-over-quarter versus a 0.1% quarter-over-quarter decrease in 3Q2021.

► The Brazilian Real appreciated 12.0% against the US dollar in March 2022 versus December 2021 and 12.0% year-over-year to BRL ~4.97: USD 1.00 in March 2022.³

► Brazil's central bank raised interest rates to 11.75% in March 2022 from 9.25% in December 2021 and 2.00% in December 2020 as the country manages surging inflation over the last several quarters.

► Brazilian softwood timber prices were stronger for the quarter, particularly for larger diameter logs.

► In 1Q2022, charcoal prices increased 10.5% quarter-over-quarter and 11.3% year-over-year due to higher Chinese demand for pig iron. Charcoal pricing also tends to be one of the central drivers of regional eucalyptus stumpage pricing. In 1Q2022, Minas Gerais eucalyptus stumpage prices increased as well, rising 3.0% quarter-over-quarter and 8.8% year-over-year.

► Brazil country-wide eucalyptus pulpwood prices increased 4.8% versus November 2021 and 32.3% year-over-year for the period ending February 2022.

► In Uruguay in 1Q2022, *Eucalyptus grandis* delivered pulpwood prices increased 1.0% quarter-over-quarter (up 1.7% year-over-year) while *Eucalyptus globulus* delivered wood chip prices increased 6.2% quarter-over-quarter (up 9.1% year-over-year).

► At the end of the quarter, the recently elected Chilean president, Gabriel Boric, announced a US\$ 3.7 billion package labeled the "inclusive recovery plan" which has three main components:

(1) job creation and support for sectors still experiencing negative impacts from Covid-19, (2) direct aid for households, (3) support for small and medium sized businesses. The final approval from Congress is yet to be determined.

Europe

► In the eurozone, 4Q2021 GDP increased 0.3% quarter-over-quarter following a 2.3% increase in 3Q2021.

► Central Europe, the core forestry market in Europe, has been experiencing reduced market and trading activity given the reduction in harvest volume due to the impacts of the Spruce bark beetle. The amount of damaged wood from the beetle peaked in 2019, declining 5% in 2020 and 24% in 2021. The harvest levels are expected to fall by 10–20% per year until 2025, closer to its historical average. With the sanctions imposed on Russia, European countries will likely have to rely more on domestic markets to meet their demand for various forest products, therefore reducing exports of products to other markets such as the US.

New Zealand / Australia

► In 4Q2021, New Zealand's GDP increased 3.0% quarter-over-quarter versus a 3.7% quarter-over-quarter decrease in 3Q2021. New Zealand's A-grade export log prices declined by 23.8% in December 2021 to NZ\$ 125/m³ F.O.B. versus NZ\$ 164/m³ F.O.B. in September 2021, given a notable reduction in demand from China during 4Q2021.

► In 4Q2021, Australia's GDP increased 3.4% quarter-over-quarter relative to the 1.9% decrease quarter-over-quarter in 3Q2021. During 4Q2021, Australian softwood and hardwood roundwood and woodchip prices were higher.

³ Bloomberg, as of March 31, 2022.

*GDP is reported in real terms while timber and wood products pricing are reported in nominal terms.

Global Pulp & Paper Markets

► In March 2022, bleached hardwood kraft pulp (“BHK”) prices increased 3.2% versus December 2021 and 36.0% year-over-year. Hardwood pulp prices have increased over the last year and remained high this quarter due to global supply-side issues precipitated by the Russia-Ukraine war and continued logistical issues at Chinese ports.

► Bleached softwood kraft pulp (“BSK”) prices increased 5.7% in March 2022 versus December 2021 but increased 30.3% year-over-year. Softwood pulp prices increased over the last year and remained high this quarter given high ocean freight costs and congestion along with supply side disruptions in softwood pulp mills across Europe.

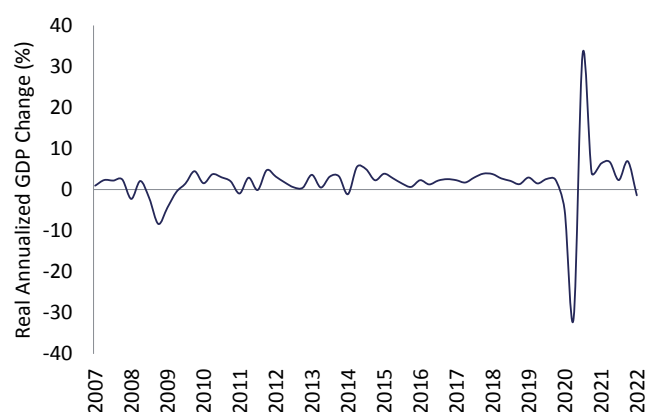
United States

In 1Q2022, US GDP decreased at an annual rate of 1.4% according to a preliminary estimate versus an increase of 6.9% in 4Q2021 (Figure 1). The unemployment rate decreased to 3.6% in March 2022 from 3.9% in December 2021 while the labor force participation rate increased to 62.4% in March 2022 (Figure 2). In late February 2022, President Biden signed an order to provide US\$ 600 million of military assistance to Ukraine, coupled with several other commitments which imposes severe economic costs on Russia including removing Russia from the Swift Payment System, banning imports of Russian oil and gas, and further restrictions on the Russia central bank and oligarchs. Additionally, the Biden Administration announced a US\$ 131 million package as part of the Bipartisan infrastructure law to advance the USDA Forest Services’ 10-year wildfire mitigation strategy. This will work on the improving the resilience and protection of forests across core forested regions of the American west.

Economic activity in the manufacturing sector remained strong in March 2022. The ISM (a diffusion index) remained high at 57.1 in March 2022 but fell slightly versus 58.8 in December 2021 (Figure 3). The total value of private residential construction of new structures or improvements to existing structures in place reached an all-time high of US\$ 851 billion in February 2022 versus US\$ 729 billion in February 2021 (Figure 4). Excessive spending activity, which took place over the last several quarters, has contributed to a reduced nationwide personal savings rate, dropping to levels below pre-COVID in February 2022 (Figure 5).

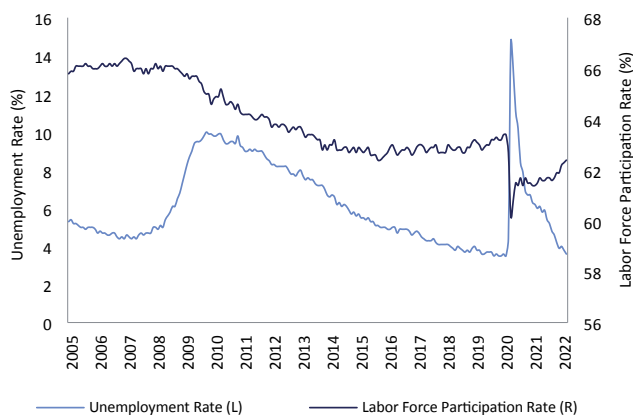
COVID-19 related supply chain disruptions, the Russia-Ukraine war and pent-up consumer demand over the past two years have all contributed to the recent inflation of consumer goods and products, including forest products. The inflation rate, measured by the consumer price index, climbed to 8.5% year-over-year in March 2022, the highest level since 1982. One example of the recent notable increase in pricing is forest harvesting costs, reflected in the UGA’s forest logging cost index which increased 12.6% year-over-year, faster than the pace of inflation (Figure 6).

Figure 1. Annualized Quarterly US Real GDP Growth (%).



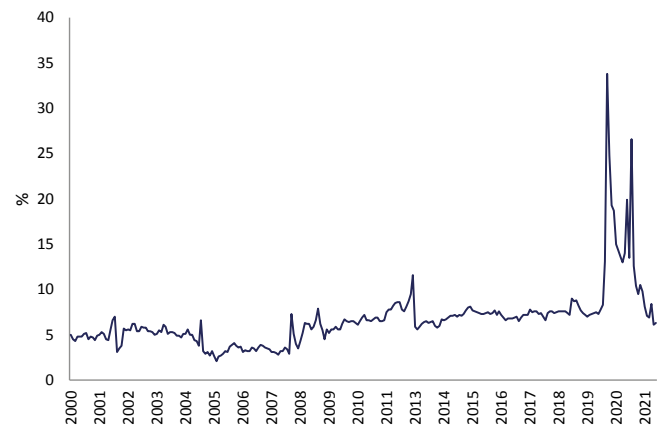
Sources: US Dept. of Commerce, BEA., as of March 31, 2022

Figure 2. US Unemployment and Labor Force Participation Rates.



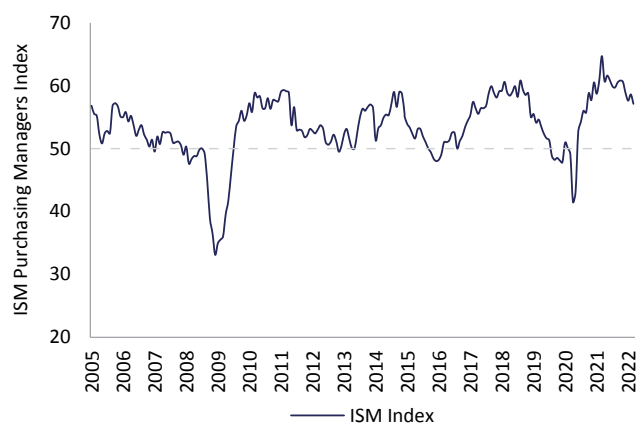
Sources: US Dept. of Labor, BLS., as of March 31, 2022

Figure 5. US Personal Savings Rate.



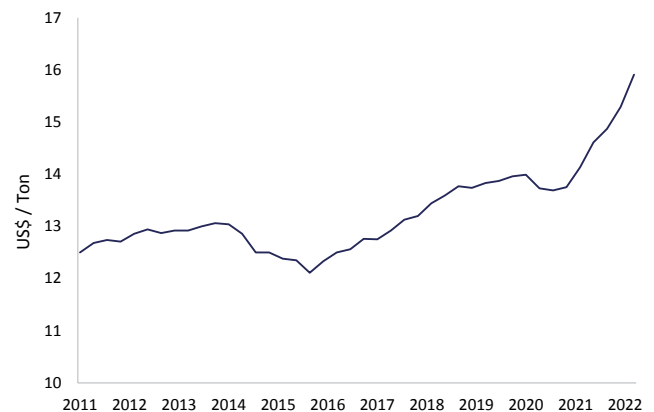
Sources: U.S. Bureau of Economic Analysis, as of March 31, 2022

Figure 3. US ISM Purchasing Managers Index.



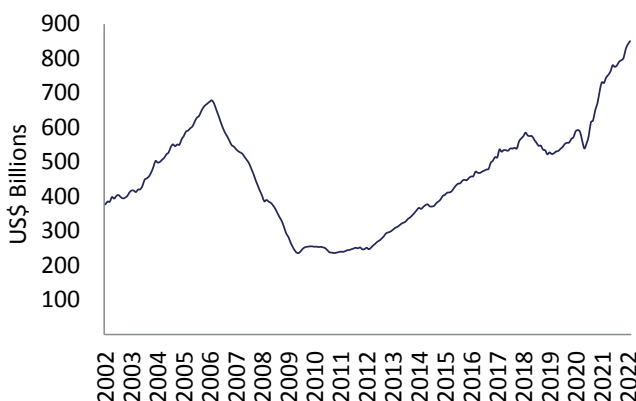
Source: Institute for Supply Management, as of March 31, 2022

Figure 6. UGA Forest Logging Cost Index.



Sources: TMS/UGA, as of March 31, 2022

Figure 4. US Total Value of Private Residential Construction in Place.



Source: US Census Bureau, as of February 28, 2022

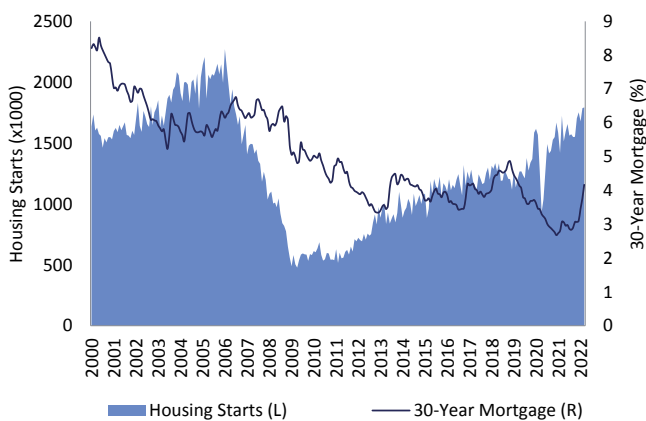
US Housing

Housing activity in 1Q2022 maintained strong momentum after a previously strong year. In March 2022, housing starts were at a seasonally adjusted annual rate (SAAR) of 1.793 million units (Figure 7), up 2.2% versus December 2021's 1.754 million units (SAAR) and up 3.9% versus March 2021's 1.725 million units (SAAR). This is the highest level since June 2006, led by apartment projects, which suggests that despite building material costs increasing and skilled labor shortages, there was still significant demand for new construction, especially in the multi-family space. The share of multi-family starts as a percentage of total starts

⁵ https://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr199.pdf, USDA, Solid Wood Timber Products Consumption in Major End Uses in the United States, 1950–2009

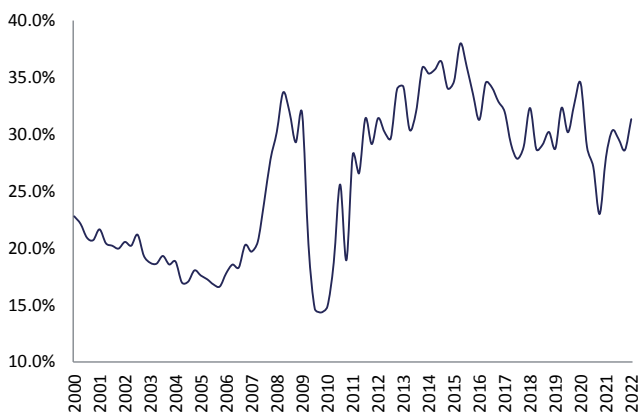
increased in March 2022 to 30.8% versus 26.6% in December 2021, partly due to normalization of interest in condominium and apartment living after a strong interest in rural living during the peak months of COVID-19 (Figure 8). Housing is one of the most significant drivers of US wood products and timber demand. Based on TIG's analysis, on average, each single-family home (typically situated in suburban settings) consumes around 35.3 m³ of softwood lumber and 8.8 m³ of panels while each multi-family unit (typically situated in more urban settings) consumes around 11.8 m³ of softwood lumber and 2.7 m³ of panels, a factor of ~3x in both cases.⁴

Figure 7. Annual US Housing Starts, Seasonally Adjusted Annual Rate and 30-year Mortgage Rate.



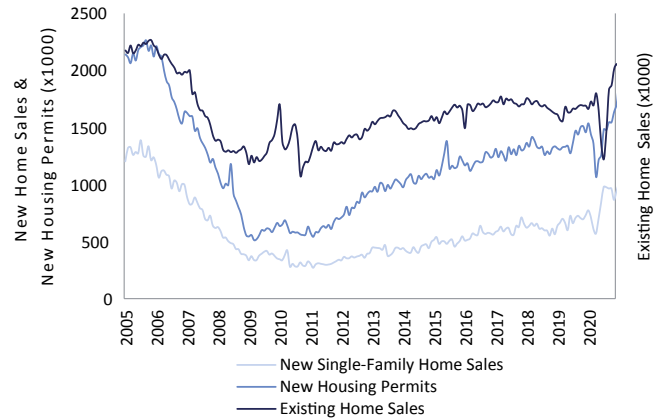
Sources: Federal Reserve Bank of St. Louis, US Dept. of Commerce Census Bureau, as of March 31, 2022

Figure 8. US Multi-family vs. Single-Family Housing Starts.



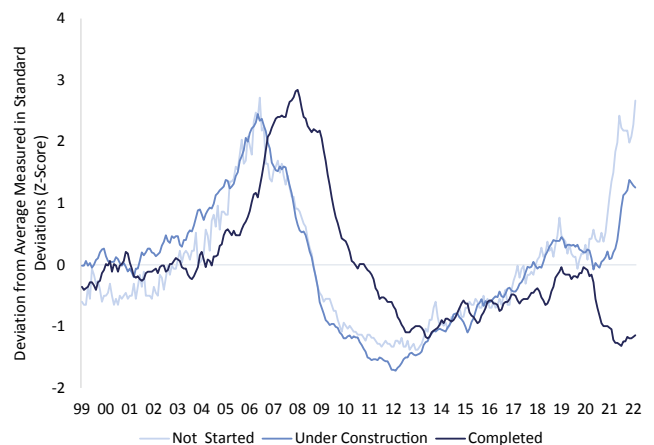
Sources: Federal Reserve Bank of St. Louis, US Dept. of Commerce Census Bureau, as of March 31, 2022

Figure 9. Monthly New Home Sales, New Building Permits, and Existing Home Sales, Seasonally Adjusted Annual Rates.



Sources: US Dept. of Commerce Census Bureau, National Association of Realtors, as of February 28, 2022

Figure 10. Standard Deviation of Housing Construction Stages from their Average.



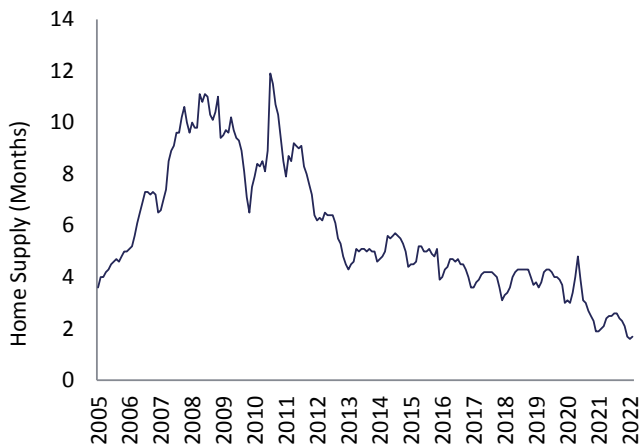
Sources: FEA, Quill Intelligence, and US Census Bureau, as of February 28, 2022

In February 2022, new single-family home sales of 0.77 million units (SAAR) increased 2.5% versus November 2021 but decreased 6.2% year-over-year (Figure 9). February 2022 existing home sales of 6.02 million units (SAAR) decreased 4.9% versus November 2021 and 2.4% year-over-year. Inventory of existing homes dropped to 1.7 months of supply in February 2022 relative to 2.1 months in November 2021, practically the lowest level in the last two decades (Figure 11). This is due in large part to the bull housing

⁴ https://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr199.pdf, USDA, Solid Wood Timber Products Consumption in Major End Uses in the United States, 1950–2009

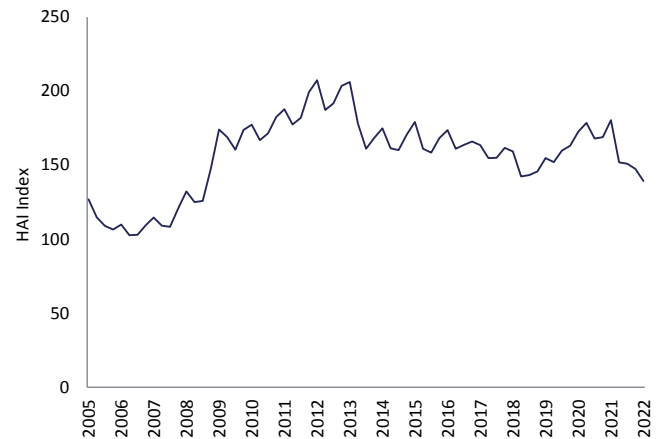
market which took place during COVID-19, where families bought up a significant share of the available homes on the market due to low rates and interest in relocating, while curtailed construction capacity from labor and material shortages could not keep up. Additionally, in February 2022, building permits increased 8.1% year-over-year. Given the higher permit issuances in 1Q2022, and despite rising rates and reduced personal savings rates, there is still demand for new construction. Higher building material costs and housing shortages since the onset of COVID-19 have led to a reduction in single-family construction completions, and a sharp increase in the number of single-family homes which haven't begun construction or are still in the construction phase (Figure 10). In 1Q2022, the housing affordability index (HAI) was 139, 22.8% lower than in 1Q2021 and 19.3% lower than in 1Q2020 (Figure 12).⁵

Figure 11. Existing Home Sales Supply.



Sources: Bloomberg, National Association of Realtors, as of February 28, 2022

Figure 12. Housing Affordability Index.



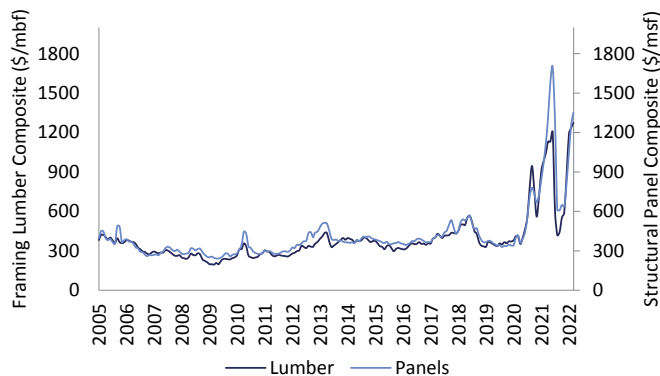
Sources: Bloomberg, National Association of Realtors and FRED, as of February 28, 2022

US Forest Products and Timber Markets

Lumber, oriented strand board (“OSB”), and plywood market prices rebounded at the end of 1Q2022 to levels near the lumber spike in late 2Q2021. The March 2022 framing lumber composite price increased 45.1% versus December 2021 following a 98.0% quarter-over-quarter increase in 4Q2021 (due to the notable slump in 4Q2021) (Figure 13). There was continued demand from home centers as consumers continued purchasing lumber for new housing construction, and fencing, decking, landscaping, and do-it-yourself construction projects given the continuing work-from-home dynamics across the country. Strong demand for housing construction, tariffs on US imports from British Columbia, and logistical issues with mills sourcing materials and labor all contributed to the squeeze in the market and caused prices to increase out of proportion.

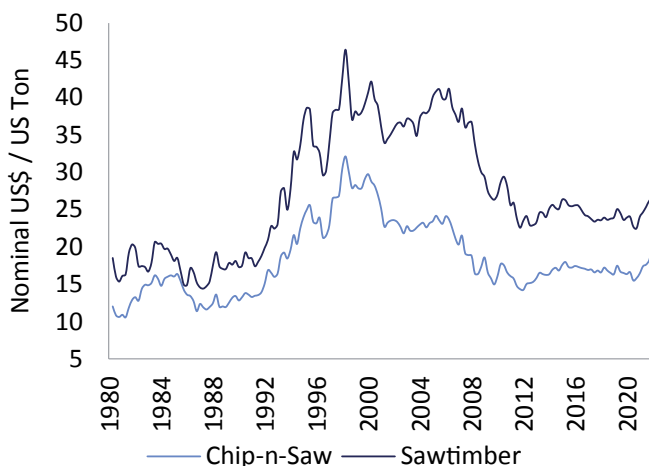
⁵ The HAI index has a value of 100 when the median income family has just enough income to purchase a median-priced existing home, with values higher than 100 indicating more affordability.

Figure 13. US Framing Lumber Index and Panel Composite Prices.



Source: Random Lengths, as of March 31, 2022

Figure 14. US South Quarterly Pine Chip-n-Saw and Sawtimber Prices.



Source: TimberMart-South, as of March 31, 2022

TIG's View from the Ground

Across the US South, TIG's regional foresters reported strong conditions for sawtimber, and mildly strong pulpwood markets in 1Q2022 relative to past quarters given the sustained demand for finished wood products, lower inventories due to supply chain logistics and weather-related dynamics. Increased finished wood prices were passed through to the timber producers as timber prices increased

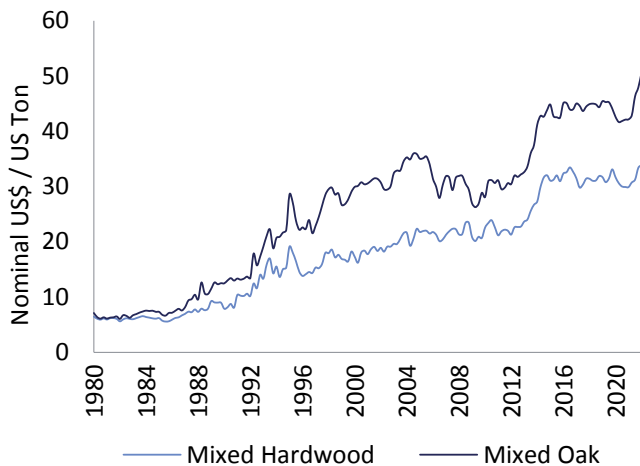
across the board. Hardwood sawtimber, after lulls over the last few years, performed better this quarter following last quarter's initial price increase with the following end uses being the major drivers of consumption: housing-related flooring and cabinetry, railroad ties and equipment mats for industrial uses, and remanufacturing markets for production of outputs such as bourbon barrels.

Throughout the US South, pine sawtimber prices increased 5.6% sequentially in 1Q2022 and 13.1% year-over-year (Figure 14). Pine chip-n-saw prices increased 10.4% sequentially in 1Q2022 and 28.4% year-over-year. Pine sawtimber prices averaged the highest in Florida and lowest in Tennessee.

Meanwhile, US South hardwood sawtimber prices were also stronger during 1Q2022. Region-wide, mixed hardwood sawtimber prices increased 1.4% for the quarter and 13.3% year-over-year. Oak sawtimber prices increased 5.6% quarter-over-quarter and 20.1% year-over-year (Figure 15). Southern hardwood pulpwood prices increased 9.9% in 1Q2022 and 39.7% year-over-year while pine pulpwood prices increased 4.2% quarter-over-quarter and 23.2% year-over-year (Figure 16).

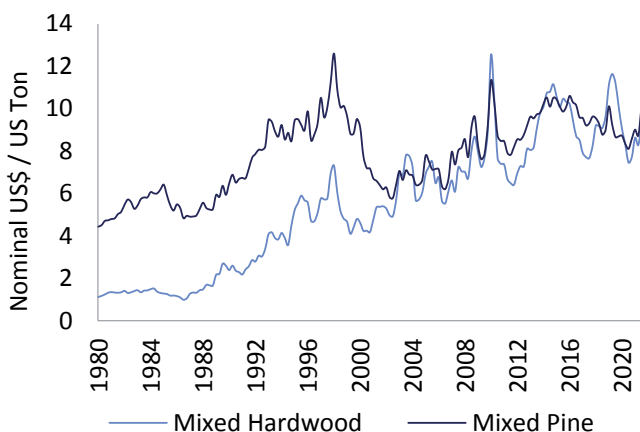
The US Northeast maintained positive momentum for most products in 1Q2022. In New York's Adirondack region, timber prices remained high in 1Q2022 in part driven by continued demand for lumber products increasing the desire for high quality logs, increased capacity utilization at mills and labor shortages constraining supply. Northern red oak sawtimber prices fell 11.1% quarter-over-quarter but rose 14.3% year-over-year. Hard maple sawtimber prices rose 5.0% quarter-over-quarter and 15.0% year-over-year (Figure 17).

Figure 15. US South Quarterly Mixed Hardwood and Mixed Oak Sawtimber Prices.



Source: TimberMart-South, as of March 31, 2022

Figure 16. US South Quarterly Mixed Hardwood and Mixed Pine Pulpwood Prices.



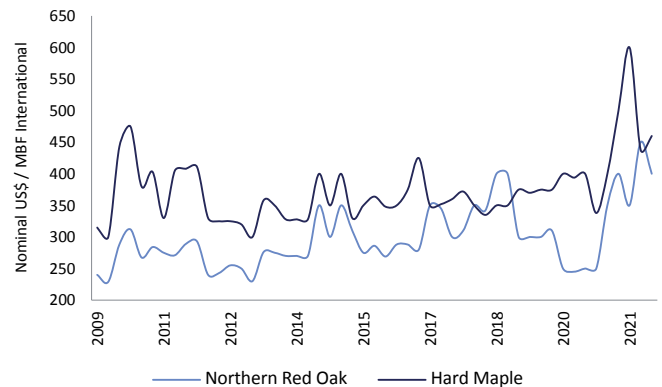
Source: TimberMart-South, as of March 31, 2022

In Ohio, timber prices remained strong in 4Q2021 relative to the last several years but were overall mixed this quarter with white oak sawtimber outperforming the other products. Red oak sawtimber decreased 4.3% versus 4Q2021 and 1.5% year-over-year. Hard maple sawtimber prices declined 3.0% quarter-over-quarter but rose 3.7% year-over-year. White oak sawtimber increased 2.5% quarter-over-quarter and 9.7% year-over-year (Figure 18).

In Wisconsin, northern red oak sawtimber prices were flat quarter-over-quarter but rose 35.7% year-over-year through 1Q2022 (Figure 19). Hard maple sawtimber was flat quarter-over-quarter but rose 38.9% year-over-year.

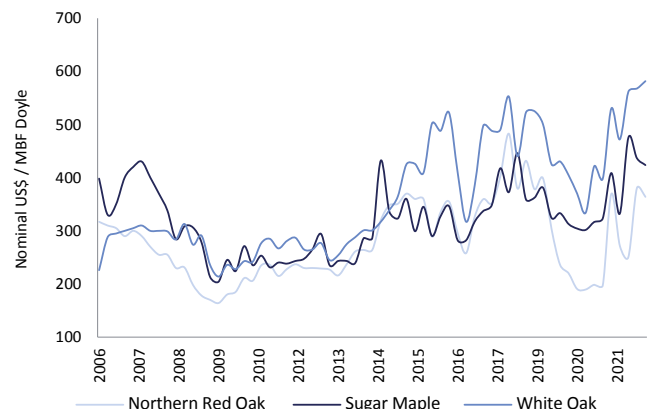
Yellow birch sawtimber increased 2.2% quarter-over-quarter and 15.0% year-over-year.

Figure 17. Quarterly Northern Red Oak and Hard Maple Sawtimber Prices in New York.



Source: Forest2Market, as of March 31, 2022

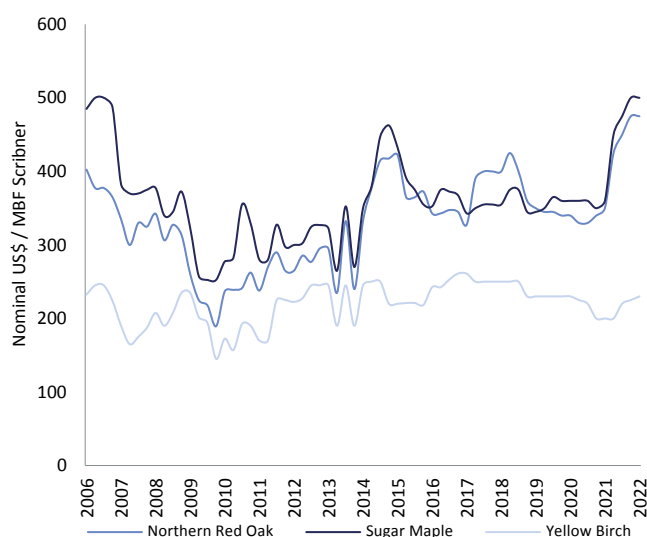
Figure 18. Northern Red Oak, Hard Maple, and White Oak Sawtimber Prices in Ohio.



Source: Forest2Market, as of March 31, 2022

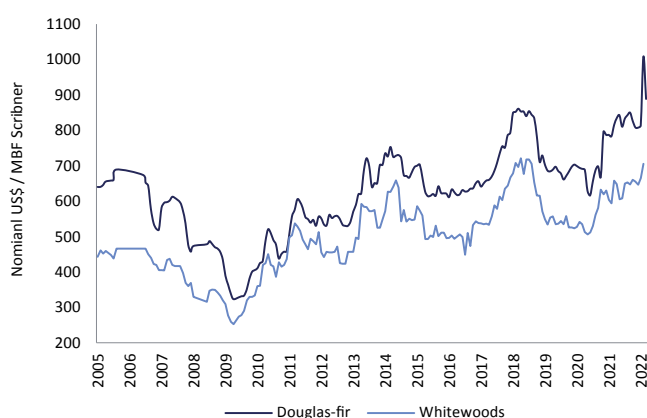
During the first quarter in the Pacific Northwest, TIG's regional foresters reported domestic markets continued their notably strong performance. Solid domestic demand for finished wood products and sawmill capacity increases contributed to continued strength in pricing. The price of Douglas-fir #2 increased 10.0% quarter-over-quarter and 9.0% year-over-year (Figure 20). In January 2022, the price of Douglas-Fir hit its all-time-high of US\$ 1,008/MBF, 17.0% higher than its previous peak in February 2018. The price of Whitewood #2 sawlogs increased 7.6% quarter-over-quarter and 18.7% year-over-year. As of February 2022, Whitewood #2 was 2.2% below its April 2018 peak.

Figure 19. Northern Red Oak, Hard Maple, and Yellow Birch Sawtimber Prices in Wisconsin.



Source: Steigerwaldt, as of March 31, 2022

Figure 20. Monthly Columbia River #2 Douglas-Fir and Mixed Whitewood Log Prices.



Source: Log Lines, as of March 31, 2022

Industrial Capacity Update: Wood Products

During the quarter, Biewer Lumber began operations at their new softwood sawmill in Winona, Mississippi. The mill plans to advance production to 350 mmbf during the year and hire up to 150 people. Idaho Forest Group announced the near completion of their 300 mmbf sawmill in Lumberton, Mississippi and expects startup in June 2022. Interfor restarted their sawmill in Dequincy, Louisiana in January 2022, and plans to ramp up production to reach 200 mmbf of capacity at year end 2022.

Industrial Capacity Update: Paper Products

At the end of the quarter, Domtar announced the restart of their uncoated freesheet paper machine at their mill in Ashdown, Arkansas after it had been idled in April 2020 due to reduced demand brought on by the pandemic. Westrock announced the permanent closure of their containerboard mill in Panama City, Florida which employs 450 people. Lastly, Rayonier Advanced Materials commenced a 50-day maintenance downtime period during February at their mill in Jesup, Georgia, partly to rebuild their advanced boiler system.

Trade Disputes & Duties

In February 2022, the US Department of Commerce (DOC) published the findings from their 2020 administrative review of the antidumping duty on softwood lumber imported from Canada to the US. They found that producers and exporters executed sales of softwood lumber at below-average levels. As a result, the new countervailing duty rates will be reduced to 11.6%, scheduled for November/December 2022, down from the current level of 17.9%. Later in the quarter, the General Administration of Customs of the People's Republic of China announced that all US pine logs and lumber exports will need to fully comply with specific guidelines regarding sampling treatment practices, port of entry quarantine requirements, phytosanitary benchmarks and will only be able to be sent to designated Chinese ports.

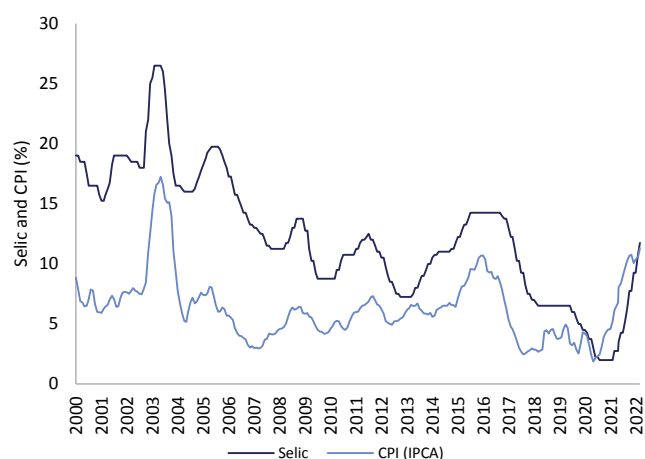
Latin America

Brazil

In 4Q2021, Brazil's GDP increased 0.5% following a 0.1% quarter-over-quarter decrease in 3Q2021. Quarter-over-quarter, agricultural production increased 5.8% following unusually dry conditions in 3Q2021, while the services sector increased by 0.5%. Unemployment decreased to 11.2% in February 2022, down from 11.6% in November 2021.

During 1Q2022, inflation, as measured by the IPCA, increased to 11.3% annualized in March 2022, up from 10.1% annualized in December 2021 (Figure 21).⁶ Additionally, Brazil's central bank raised the Selic rate (Brazil federal funds rate) to 11.75% from 9.25% in December 2021. In March 2022, real rates have trended higher over the last several months as evidenced by increasing Treasury inflation-protected bond yields (Figure 22). The Brazilian Real strengthened 12.0% against the US dollar in March 2022 versus December 2021 and 12.0% year-over-year (Figure 23).

Figure 21. Brazilian Selic Rate and Annualized IPCA Index.



Source: Banco Central do Brasil, Brazilian Institute of Geography and Statistics, as of March 31, 2022

Figure 22. Brazilian Treasury Inflation Protected Bond Yield.



Source: Brazil National Treasury, as of March 31, 2022

Figure 23. US Dollar: Brazilian Real Daily Exchange Rates.



Source: Board of Governors of the US Federal Reserve System, as of March 31, 2022

Brazilian Forest Products and Timber Markets

In 1Q2022, softwood timber prices in Brazil were notably stronger with large diameter logs experiencing the largest growth over the last year. Pulpwood (8-15 cm) prices increased 7.4% sequentially and 35.4% year-over-year in local currency terms. Small sawtimber (15-25 cm) increased 10.6% sequentially and 55.8% year-over-year while large diameter sawtimber (25-35 cm) rose 6.0% sequentially and 64.1% year-over-year. Veneer logs (35+ cm), used primarily for export-oriented plywood and lumber, increased 4.6% sequentially and 47.5% year-over-year (Figure 24).

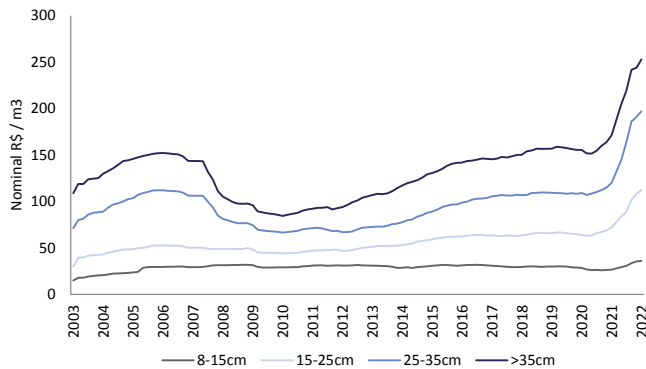
Wood charcoal, which is used to produce pig iron and in turn to make steel, has improved after years of significant supply/demand imbalance challenges. During the quarter, there was higher pricing of pig iron at Chinese steel mills due to reduced supply from Russia and Ukraine, which contributed to all-time-high charcoal pricing in Minas Gerais. **In 1Q2022, charcoal prices increased 10.5% quarter-over-quarter and 11.3% year-over-year (Figure 25, left axis).** Charcoal pricing also tends to be one of the central drivers of regional eucalyptus stumpage pricing. In 1Q2022, Minas Gerais eucalyptus stumpage

⁷ "IPCA" stands for Índice de Preços ao Consumidor Amplo; The IPCA tracks continuous variations in consumer prices for households with income of up to 40 times the minimum wage.

*GDP is reported in real terms while timber and wood products pricing are reported in nominal terms.

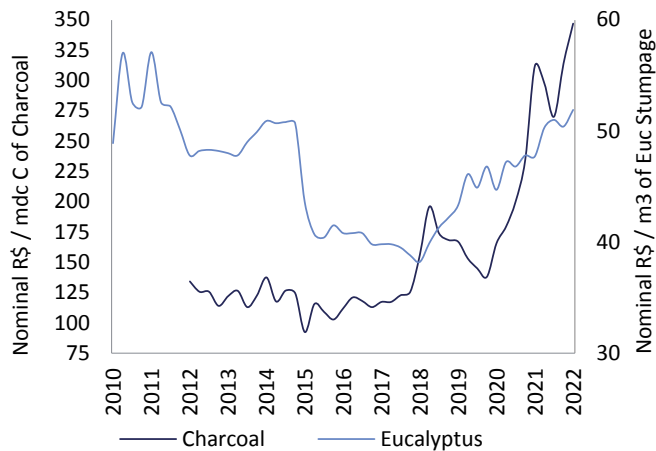
reported prices increased as well, rising 3.0% quarter-over-quarter and 8.8% year-over-year (Figure 25, right axis).

Figure 24. Pine Sawtimber Stumpage Prices in Paraná State, Brazil.



Source: STCP, as of March 31, 2022

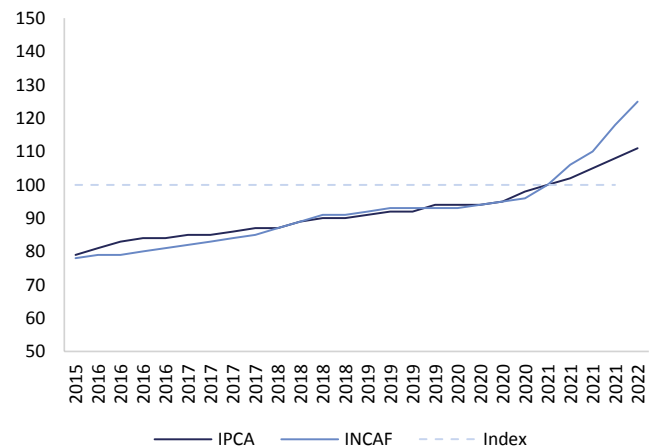
Figure 25. Charcoal and Eucalyptus Stumpage Prices in Minas Gerais, Brazil.



Source: Poyry Silviconsult, as of March 31, 2022

Meanwhile, eucalyptus pulpwood prices on a countrywide basis increased 4.8% versus October 2021 and 32.3% year-over-year during the bimonthly period ending in February 2022 (Figure 27).

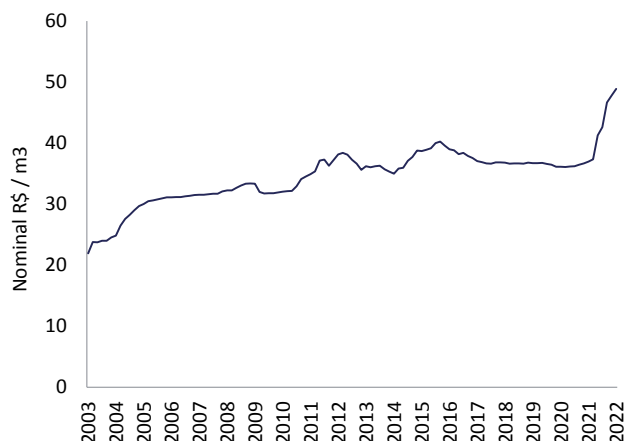
Figure 26. Historical Brazil Forest Activity Cost Index (1Q2021 Considered as Base 100)



Source: Poyry Radar, as of March 31, 2022

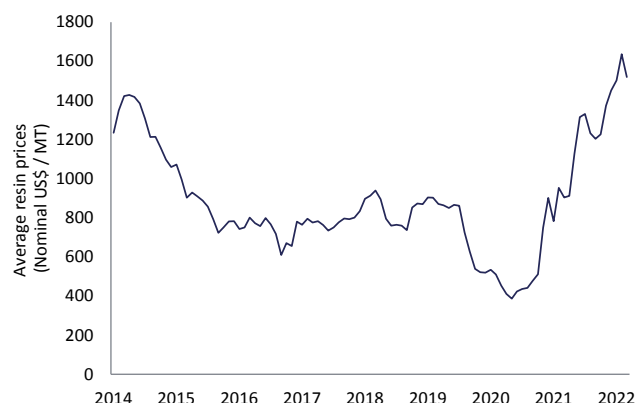
Pine resin, a secondary product that can be collected from certain pine species between harvests and is used in the production of glues, adhesives, printer inks, and other products, experienced strong price increases over the last year driven by curtailed capacity and increased demand. During the quarter, both mixed tropical pine resin and slash pine resin prices increased 4.7% quarter-over-quarter (Figure 28).

Figure 27. Brazil Eucalyptus Pulpwood (8-15 cm) Stumpage Prices.



Source: STCP, as of March 31, 2022

Figure 28. Average Annual Resin Prices in Brazil.



Sources: Associação dos Resinadores do Brasil; TIG Analysis, as of March 31, 2022

TIG's View from the Ground

In 1Q2022, TIG's Latam regional foresters reported notably strong market conditions driven by strong global and domestic pulp markets, continued demand from the US and Europe for solid wood products and mills' continued interest in locking in new contracts. Rising harvest and transportation costs took place during the quarter, outpacing the rate of inflation, contributing to higher stumpage prices across almost all the regions and products (Figure 26). While the Brazilian Real strengthened this quarter, the historically weak Brazilian Real drove continued international demand for Brazilian timber products.

In Mato Grosso do Sul, pulpwood markets were stronger due to the increased demand from the major mills buying product, Suzano and Bracell, who have been eager to negotiate futures contracts for the coming 3–5 years.

In São Paulo (Itapeva region), timber markets showed continued strong performance in 1Q2022 with exports of solid wood, plywood products and pallets to the US strengthening to meet the high pricing overseas. Klabin and other wood buyers continued to aggressively buy up pulpwood in the region, leading to a

notable undersupply of pulpwood logs, thereby driving prices up.

Paraná (Guarapuava region) and Santa Catarina experienced strong sawtimber and pulpwood demand from domestic and global sources, along with notably high harvesting and transportation costs. This, coupled with slightly reduced supply, resulted in increased log pricing.

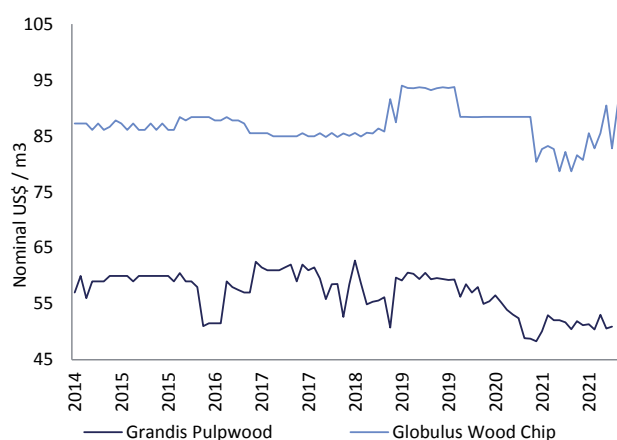
In Minas Gerais, timber demand from charcoal/pig iron production (more than 50% of Minas Gerais' wood demand) was stronger quarter-over-quarter given export demand from India, South Korea, Taiwan and China driven by continued favorable currency rates and reduced supply due to the Russia-Ukraine war. Demand for pulpwood (15–20% of Minas Gerais' wood demand) remained strong domestically and internationally in 1Q2022, driving pulp mills in the region to continue seeking new capacity increases.

Uruguay

In 4Q2021, Uruguay's GDP increased 2.0% quarter-over-quarter versus 3.4% quarter-over-quarter in 3Q2021. Household spending increased 4.5% year-over-year in 4Q2021 while gross fixed capital formation expanded 9.8% year-over-year. Exports increased 26.3% year-over-year while imports increased 25.5% year-over-year in 4Q2021. During 1Q2022, the Uruguayan peso appreciated 4.6% quarter-over-quarter against the US dollar.

In Uruguay in 1Q2022, *Eucalyptus grandis* delivered pulpwood prices increased 1.0% quarter-over-quarter (up 1.7% year-over-year) while *Eucalyptus globulus* delivered wood chip prices increased 6.2% quarter-over-quarter (up 9.1% year-over-year) (Figure 29). Since 2012, *Eucalyptus globulus* has primarily been exported from Uruguay in the form of chips.

Figure 29. Uruguay *E. globulus* Wood Chip and *E. grandis* Pulpwood Prices (Nominal US\$ / m³).



Source: Pike & Co Consultora Forestal, as of March 31, 2022

TIG's View from the Ground

In 1Q2022, solid finished product demand and pricing from the US and Europe coupled with port congestion strengthened pricing relative to 4Q2021 for plywood production, but still limited capacity for trading higher volumes. Separately, pulpwood markets remained roughly flat quarter-over-quarter with continued strength in global markets balancing out the logistical challenges experienced at Uruguayan ports. In January 2022, UPM announced the delay of the launch of their new bleached eucalyptus kraft pulp mill in Paso De Los Toros from 2H2022 to 1Q2023. The company attributes the delay to the global shipping bottlenecks and other COVID-related issues which caused essential materials to arrive at the construction location behind schedule. The mill expects to have a total capacity of 2.1 million metric tons and a total investment size of ~US\$ 3.5 billion.

Chile

In 4Q2021, Chile's GDP increased 1.8% quarter-over-quarter following a 4.5% increase in 3Q2021. During the quarter, the gross fixed capital formation increased by 19.9% year-over-year, personal consumption increased 16.1%

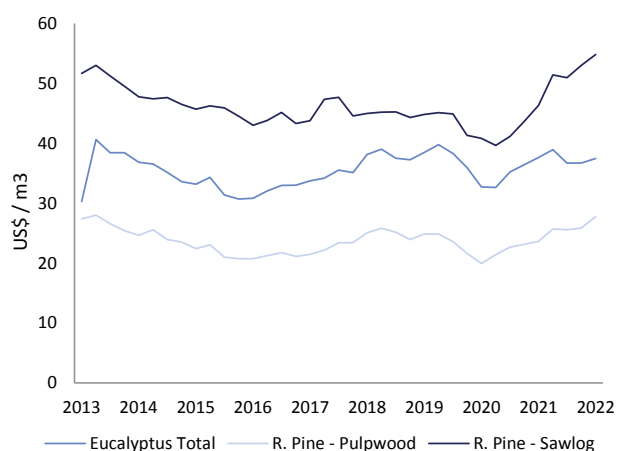
year-over-year and import activity increased 38.4% year-over-year. In 1Q2022, the Chilean peso appreciated 6.2% quarter-over-quarter against the US dollar.

At the end of the quarter, the recently elected president, Gabriel Boric, announced a US\$ 3.7 billion package labeled the "inclusive recovery plan" which has three main components: (1) job creation and support for sectors still experiencing negative impacts from COVID-19, (2) direct aid for households, (3) support for small and medium sized businesses. The final approval from Congress is yet to be determined. Chile's March CPI rose to 9.4% year-over-year, similar to several other countries across Latin America, and higher than most projections. Additionally, the Chilean Congress set September 4th as the day Chilean citizens will vote on the referendum of the constitution, initially enacted in 1980 under dictator Augusto Pinochet's regime.

During the quarter, Arauco announced the postponement of the start of their mill in Biobío from the end of March 2022 to April 2022 and increased the estimate of the investment in the project from US\$ 2.4 billion to US\$ 2.8 billion. The expansion comprises a new 1.56 million metric ton-per-year bleached eucalyptus kraft pulp mill.

Chile timber prices increased quarter-over-quarter with pine pulpwood experiencing the largest increase in pricing. Country-average eucalyptus pulpwood prices increased 2.0% quarter-over-quarter but fell 0.4% year-over-year. Pine pulpwood log prices increased 7.2% quarter-over-quarter and 17.3% year-over-year while pine sawlogs increased 3.4% quarter-over-quarter and 18.3% year-over-year, partly driven by heightened demand from domestic sawmills and buyers in the US over the last few quarters (Figure 30).

Figure 30. Chile pulpwood and sawlog stumpage prices (US\$ / m³).



Source: Infor, as of March 31, 2022

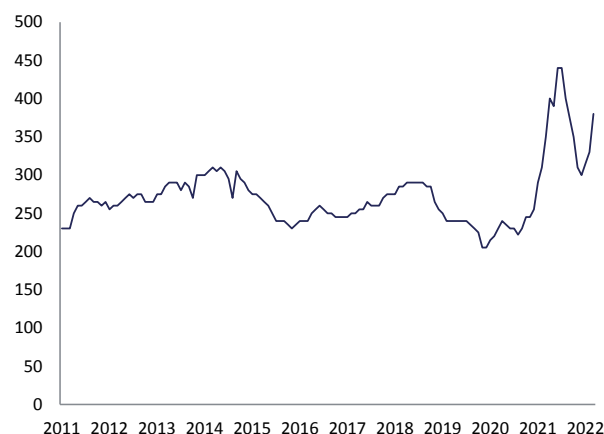
Europe

In the eurozone, 4Q2021 GDP increased 0.3% quarter-over-quarter as compared to a 2.3% increase in 3Q2021. Gross fixed capital formation increased 3.5% quarter-over-quarter in 4Q2021, while personal consumption declined by 0.6% quarter-over-quarter in part due to rising consumer costs.

Central Europe, the prime forestry market in Europe, has been experiencing reduced market activity given the declining harvest volume due to the impacts of the Spruce bark beetle. The amount of damaged wood from the beetle peaked in 2019, declining 5% in 2020 and 24% in 2021. The harvest levels are expected to fall by 10–20% per year until 2025, closer to its historical average. With the sanctions imposed on Russia, European countries will likely have to rely more on domestic markets to meet their demand, in turn reducing exports of products to other markets such as the US. This has caused certain market prices to increase in

1Q2022, such as the price of lumber exports to China, increasing 27% quarter-over-quarter (Figure 31).

Figure 31. Lumber Import Price, China from Europe (Nominal US\$/m³)



Source: FEA, as of March 31, 2022

New Zealand

In 4Q2021, New Zealand's GDP increased 3.0% quarter-over-quarter versus a 3.7% quarter-over-quarter decrease in 3Q2021 largely due to the nationwide lockdown being lifted. In 4Q2021, the New Zealand dollar strengthened 1.2% quarter-over-quarter against the US dollar (Figure 32).

New Zealand Timber Markets

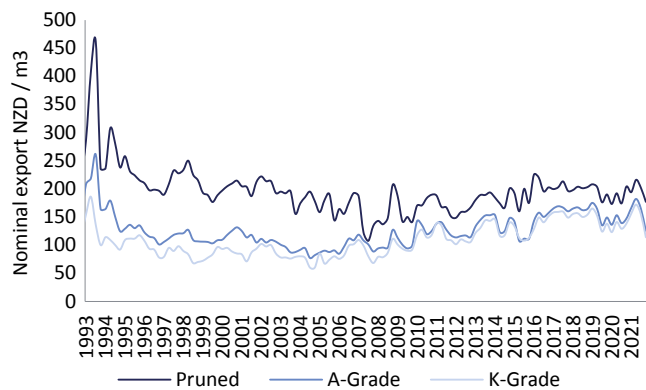
New Zealand's A-grade export log prices decreased 23.8% in December 2021 to NZ\$ 125/m³ F.O.B. versus NZ\$ 164/m³ F.O.B. in September 2021 (Figure 33), given reduced Chinese demand for logs. For domestic structural logs used in construction in 4Q2021, S1 decreased by 2.6% and S3&L3 decreased by 15.8% (Figure 34).

Figure 32. NZ Dollar to US Dollar Exchange Rate.



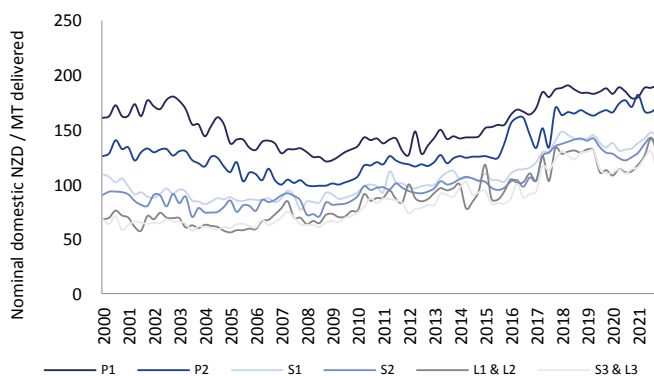
Source: Federal Reserve Bank of St. Louis, as of March 31, 2022

Figure 33. NZ Export Log Prices.



Source: New Zealand Ministry for Primary Industries, as of December 31, 2021

Figure 34. New Zealand Domestic Log Prices.



Source: New Zealand Ministry for Primary Industries, as of December 31, 2021

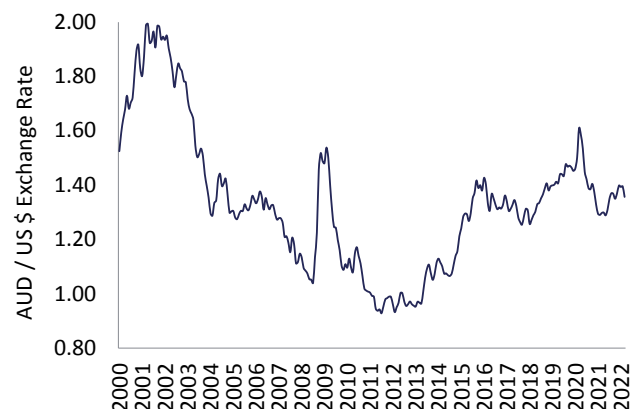
Australia

In 4Q2021, Australia's GDP increased 3.4% quarter-over-quarter versus a 1.9% quarter-over-quarter decrease in 3Q2021, partly due to the rebound in consumer spending after more aggressive COVID-19 restrictions in 3Q2021. Household consumption increased by 6.3% quarter-over-quarter as government spending increased 0.1%. In 4Q2021, the Australian dollar strengthened 3.1% quarter-over-quarter against the US dollar (Figure 34).

Australian Timber Markets

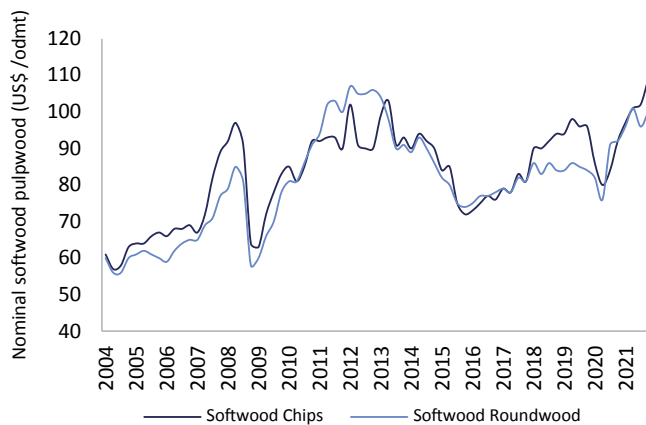
During 4Q2021, softwood roundwood prices increased 4.2% quarter-over-quarter to US\$ 100/odmt (Figure 36). Hardwood roundwood prices increased 0.8% quarter-over-quarter to US\$ 126/odmt (Figure 37). Softwood and hardwood chip prices slightly rose. While Australian log prices slightly increased year-over-year in 4Q2021, China still has a ban on all imported Australian softwood and hardwood logs.

Figure 35. Australia Dollar to US\$ Exchange Rate.



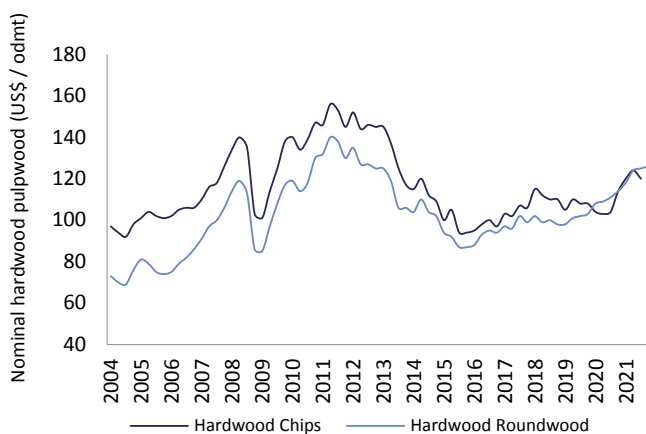
Source: Federal Reserve Bank of St. Louis, as of March 31, 2022

Figure 36. Australian Softwood Pulpwood Prices.



Source: Wood Resource Quarterly, as of December 31, 2021

Figure 37. Australian Hardwood Pulpwood Prices.



Source: Wood Resource Quarterly, as of December 31, 2021

New Zealand and Europe remain the largest two exporters to China. This is partly attributable to the continued Chinese ban on softwood log imports from Australia after claiming they discovered bark beetles in Australia's exported timber products, and Russia's significantly reduced log exports. Collectively, China's exports fell by 34.1% quarter-over-quarter and 34.8% year-over-year (Figure 38).

Despite this quarter's notable reduction, over the last few years China has steadily increased log imports to support domestic lumber production, which is also reflected in gradually reduced global lumber imports. In 1Q2022, total lumber imports increased 0.8% versus 1Q2021 but fell 14.9% versus 1Q2020 (Figure 39). China remains the largest driver of timber trade activity across the Pacific Rim.

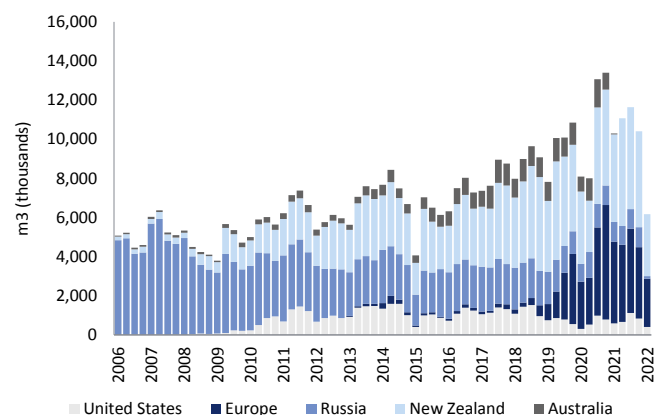
Trade relations between Russia and NATO-country forest product companies largely ceased toward the end of the quarter due to the war between Russia and Ukraine, which contributed to a reduced supply of solid wood products across Europe and several countries in Asia. Given that Russia is the largest exporter of lumber globally, there is expected to be a measurable shift in solid wood trade dynamics in the quarters to come.

Global Timber Markets

Pacific Rim Trade Dynamics

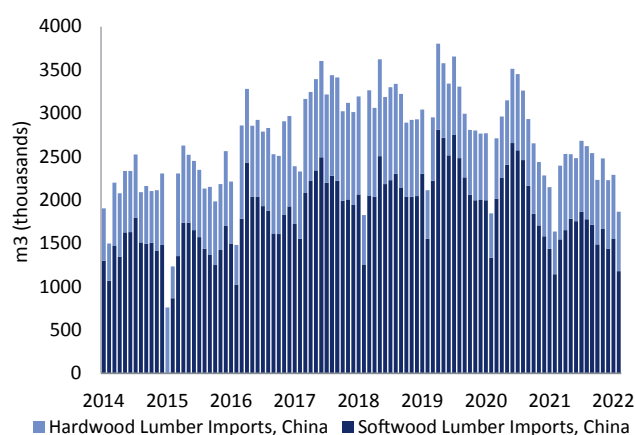
In 1Q2022, Chinese forest product market activity tapered off relative to 4Q2021, a typical seasonal trend due to the reduced operational capacity around the time of the Chinese New Year. Even so, several other dynamics contributed to the reduced activity during the quarter in the Pacific Rim. First, China imposed a zero-COVID policy which made importing/exporting difficult given the strict border controls, along with widespread, targeted lockdowns in many major economic hubs across the country. As a result, Chinese import volume levels fell in 1Q2022.

Figure 38. Chinese Softwood Log Imports from Several Major Timber Markets



Source: FEA, as of February 28, 2022

Figure 39. Chinese Softwood and Hardwood Lumber Imports



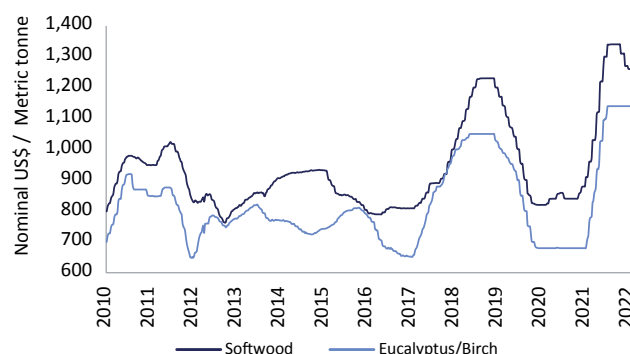
Source: FEA, as of February 28, 2022

International Pulp and Paper Markets

During the quarter, unexpected downtime, global shipping and logistical issues, and strong demand for global pulp pushed prices for almost all grades and products upward. Strong demand for hardwood pulp products across developed economies drove pulp prices upward and inventories downward. Bleached Hardwood Kraft (BHK) pulp prices in Europe, a key benchmark, increased to US\$ 1177/MT at the end of March 2022, 3.2% higher relative to December 2021, and 36% higher year-over-year (Figure 40). Global hardwood pulp producer inventories were at 40.8 days of supply in February 2022, lower than the 43.7 days of supply in November 2021 (Figure 41).

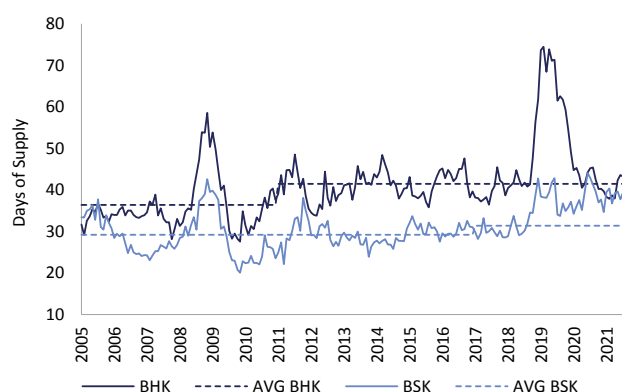
The price of Bleached Softwood Kraft (BSK) in Europe, a bellwether of the pulp and paper sector, increased to US\$ 1,342/MT at the end of March 2022, up 5.7% versus December 2021 and 30.3% year-over-year (Figure 40). Softwood pulp prices remain high quarter-over-quarter given notably high ocean freight costs, congestion at ports, and stronger demand for containerboard and tissue products, which comprise close to 60% of total global market pulp consumption. In February 2022, global softwood pulp producer inventories were at 43.9 days of supply, lower than the 45.9 days of supply in November 2021 (Figure 41).

Figure 40. Global BSK and BHK Pulp Prices.



Source: FOEX, as of March 31, 2022

Figure 41. Global BSK and BHK Pulp Inventories.



Source: FOEX, as of February 28, 2022

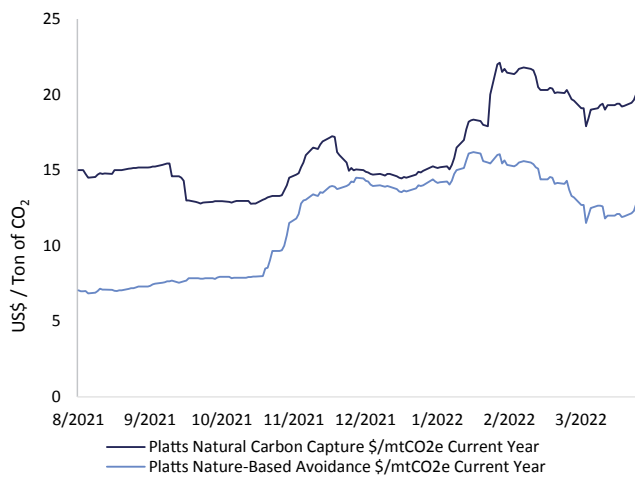
Natural Climate Solutions and the Bioeconomy

The Nature-Based Solutions (“NBS”) carbon price indices varied in movement quarter-over-quarter. As of quarter end 1Q2022, the Natural Carbon Capture offset price increased 30.8% quarter-over-quarter while the Nature-Based Avoidance offset price fell 6.8% quarter-over-quarter (Figure 42). In addition, California Air Resources Board allowance auction prices increased to US\$ 29.15/ tonne of CO₂ in February 2022, up 64% versus February 2021 (Figure 43).

In late March 2022, the SEC proposed rules that would require registrants to disclose material climate-related business risks as well as direct greenhouse gas emissions. The initial comment period will extend through 60 days following publication of the proposed release.

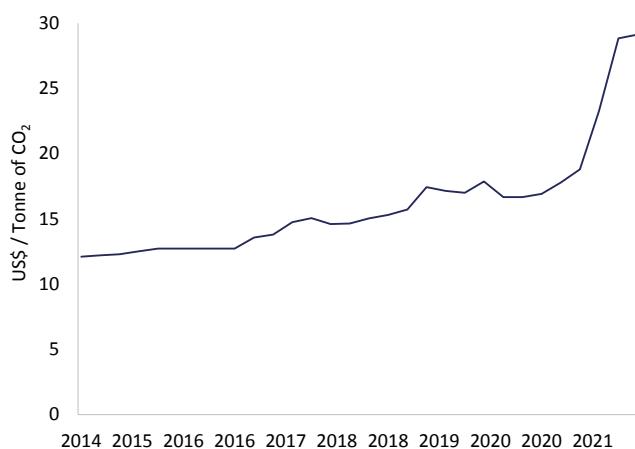
These newly proposed rules are designed to align with the guidance of the Taskforce on Climate-related Financial Disclosures (TCFD). In addition, the Greenhouse Gas Protocol, which provides the global architecture for corporate carbon accounting, is continuing a multi-year effort to develop guidance for biogenic carbon (e.g. forest carbon), with pilot testing of such a rule expected to begin later in 2022.

Figure 42. Natural Carbon Capture and Nature-Based Avoidance Offset Prices, Voluntary Carbon Market.



Source: S&P Platts, as of March 31, 2022

Figure 43. California Air Board Allowance Auction Prices.



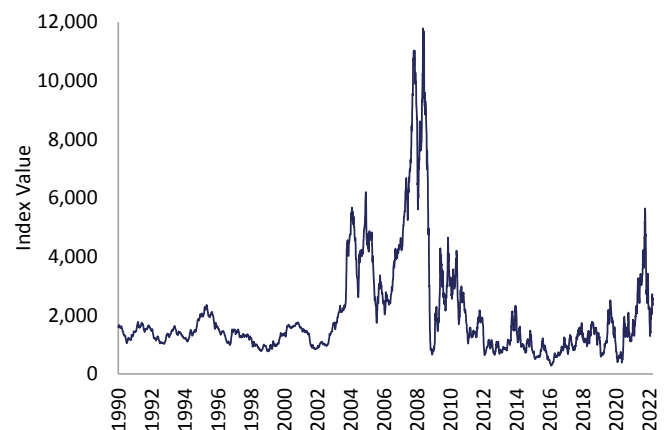
Source: California Air Resources Board, as of February 28, 2022

Baltic Dry Index

In 1Q2022, the Baltic Dry Index, which provides a benchmark for the ocean transportation costs

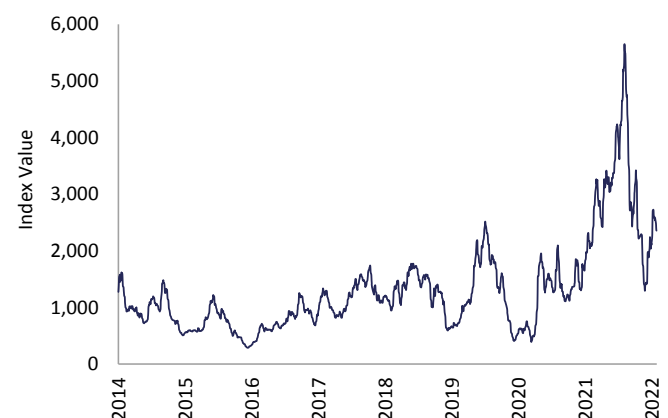
of major raw materials including grains, coal, and iron ore, decreased 13.0% quarter-over-quarter but remains high relative to the last decade, still 22.1% higher year-over-year (Figures 44 & 45). At a value of 2,358 on March 31, 2022, the index remained well below its peak of 11,793 reached in May 2008 but is more than 5 times greater than the recent low of 393 in May 2020, which was driven by reduced economic activity during the first part of the COVID-19 wave. Iron ore and coal account for over 50% of dry-bulk demand, and continued logistical challenges in China and South America this quarter kept bulk markets tight. China's reduced activity during the quarter due to a stringent zero-Covid-19 policy lessened the amount of iron ore supply on the market, pushing prices up to US\$ 155 / tonne at quarter end (this is compared with US\$ 227 / tonne during the height of the global supply chain issues at the end of 2Q2021).

Figure 44. Baltic Dry Index: 1990–Present.



Source: Bloomberg, as of March 31, 2022

Figure 45. Baltic Dry Index: 2014–Present.



Source: Bloomberg, as of March 31, 2022

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