



RESEARCH REPORT

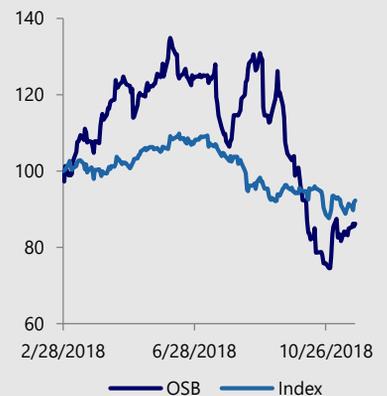
November 26, 2018

Stock Rating **HOLD**
Price Target **CAD \$37.97**
Current Price **CAD \$37.57**



Ticker	OSB
Market Cap. (MM)	\$2,468
P/E NTM	9.0x
EV/EBITDA NTM	5.2x

52 Week Performance



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Forestry Subsector Outlook Branching Out and Growing Up

This report outlines Canada's forestry sector, with a focus on Norbord (TSX:OSB), the world's leader in oriented strand board (OSB) production. In order to assess the macroeconomic conditions that Norbord is subject to, we analyzed current lumber-related trade tensions between the U.S. and Canada, as well as current U.S. housing market trends and outlooks.

In our deeper dive into Norbord, we look at some risks that the company will face in the near future, as well as how the outlook for the oriented strand board market will affect the company in the coming years. We then explore several investment theses that we believe could make Norbord an attractive name to enter into. We look at the economies of scale that Norbord possesses, its growth runway and its increasing focus on its specialty products segment. Lastly, we present our valuation on the company and use this to help us draw conclusions on the action we wish to take regarding Norbord as it relates to the M&M portfolio.

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Forestry in Canada

An economic engine from ocean to ocean, the forest industry is one of Canada's most important manufacturing sectors. Canada is the third-largest forested area in the world, representing 9% of the globe's current area with 347MM hectares of land. The forestry industry accounts for 12.5% of Canada's manufacturing GDP, and 1.3% of its overall GDP.

Product Types and Drivers

Newsprint: Canada is the world's largest producer of newsprint at about 12% of the world's total at 4MM tonnes. However, electronic media has reduced the North American demand for newsprint by 65% from 2000 to 2018, and demand is not expected to grow any further in the future.

Northern Bleached Softwood Kraft Pulp (NBSK): Canada is accredited with global leadership in NBSK production, outputting about 33% of the world's supply. NBSK is the industry's benchmark grade of pulp, and is most commonly used as reinforcement for paper. Due to the global nature of this good, the value of the dollar has a major impact on its success.

Softwood Lumber: The largest export market for Canada's softwood lumber is the U.S., where it is a main input for houses. Therefore, exports of softwood lumber prove very vulnerable to the U.S. housing market.

Wood Panels: Wood panels such as plywood, veneer, medium-density fibreboard, particleboard, and oriented strand board (OSB) are mostly used in industrial and residential contexts. Over the previous six years, the industry has grown an annualized 8.8% to \$7.8B, mostly due to urbanization and Canadian housing starts. Canadian OSB exports present high growth potential, and are forecasted to increase from 6MM square feet in 2016 to 7.6MM square feet by 2021, a 28% increase over a five-year period, with 98% of the growth being attributed to the U.S. market. OSB is forecasted to continue capturing market share from plywood, as its production utilizes less valuable and faster-growing tree species.

Combatting a Charging Market

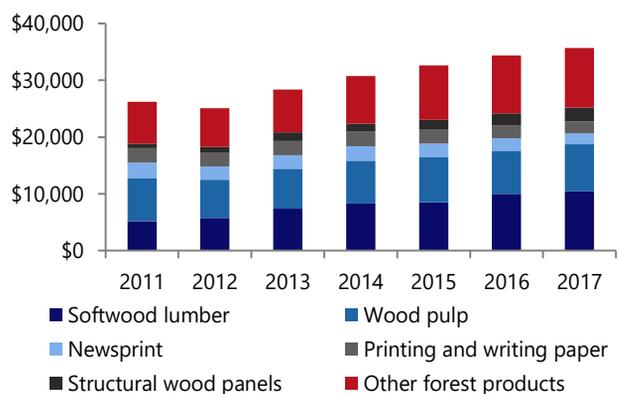
Forest product markets are exposed almost wholly to global macroeconomic forces. A commodity-focused sector that has been a constant source of contention between the U.S. and Canada's trade laws, the forestry industry (and its major players) cannot and should not be considered in isolation.

In addition, the growth of traditional forest products has been hindered by shifts in global consumer behavior. Pen and paper has been replaced by bits and bytes, and the industry is at the epicentre of climate change and other environment-related concerns. The market also has become increasingly laden with investments in new technologies and improvements in operational efficiency; for example, Canada's forest industry cut its total energy use by 31% and greenhouse gas emissions by 49% from 2005 to 2015.

Within this sector, investable names should be exposed to macroeconomic factors with positive sentiment and growth trajectories. They should also offer some sustainable points of differentiation to combat the highly commoditized and global nature of the good. Finally, they should have the scalability to capture potential growth in demand.

EXHIBIT I

Exports of Canadian Forestry Products (2011-2017)



Source: Natural Resources Canada

U.S. Housing Market and Impact on Canada's Forestry Sector

During the Great Recession in the United States (and the ensuing stagnation in the housing market), the Canadian forestry sector's total exports declined 30% in just under 90 days. There is an observable and immediate relationship between the U.S. housing market and the forestry sector, rendering sentiment towards the housing market a key factor in assessing names within this space – especially those that produce residential inputs such as OSB.

Current State: Rebound from Multi-Year Low

In September, U.S. housing starts fell a sharp 5.3% to 1.20MM, with construction activity in the South falling the most in nearly three years. This decline was mostly attributed to Hurricane Florence, depressing homebuilding for the month of September. June 2018 represented another dip, but was mostly attributable to a correction to potentially overstated demand.

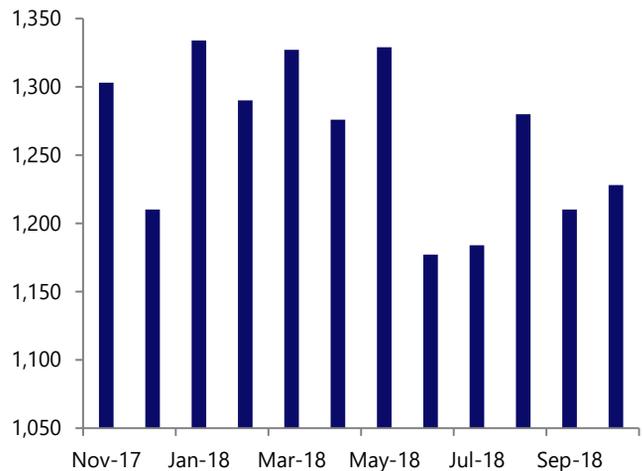
Most recently, U.S. housing starts rose an annualized 1.5% to 1.23MM, mostly propelled by the multi-family segment that rose 10.3% to 363,000 units. Single-family starts declined by 1.8% to 865,000 units. These numbers still represent below-average starts, which have a historical rate of 1.5MM starts per month.

Forward-Looking Sentiment

While housing start drivers are both complex and nuanced, post free trade adjustments, higher mortgage rates, and economic uncertainty may reduce new home building within the immediate future. House prices are expected to rise at twice the speed of inflation and pay, each at 3% and 5% respectively. However, population growth and household creation is expected to foster an annual growth rate of 2.4% through 2022. It is expected that new home construction will trail demand (i.e. inventory will be determined by the capacity of home builders), pushing many new families to rent instead of own. Lumber prices and land permits are highly vulnerable to federal administration, and will surely contribute to the rate of housing starts. All in all, the housing market proves promising for those building houses, but bleak for those looking to buy.

EXHIBIT II

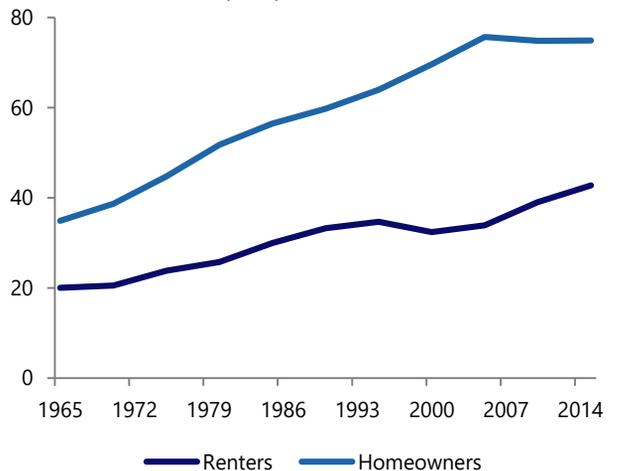
Housing Starts in U.S. (MM) (2017)



Source: Trading Economics

EXHIBIT III

Number of Household Renting vs. Owning Their Homes in the U.S.(MM)



Source: Pew Research Center

The Ignition of the Lumber War (and Other Feuds)

The U.S.-Canada lumber dispute has been one of the most persistent points of deliberation between the two countries. Citing U.S. tariffs as “unfair, unwarranted and deeply troubling”, the Canadian government has even involved the World Trade Organization, NAFTA regulators, and U.S. courts to set up contexts for adjudication in order to resolve the issue.

The Heart of the Issue

In Canada, only 6% of Canada’s forests are privately owned, with the other 94% owned by Crown lands. Harvested timber directly parallels this divide, as only 10% comes from private land. However, in the U.S. 56% of the 751MM acres of forest land is privately owned, of which 62% is owned by families and individuals. While the Canadian government claims that timber sold out of Crown corporations accurately reflect a competitive market, U.S. stakeholders argue that Canadian prices are artificially low. They claim that the lumber industry is illegally subsidized by the Canadian government, and have threatened the imposition of countervailing duties (20-30%) and anti-dumping duties (10-15%). In addition, harvesting in Canada is dominated by long-term contracts called tenures, which involve an agreement that spans about 20-years with high probability of renewal. In the U.S., stumpage fees are determined by competitive auctions, and wood is sold on the open market.

President Trump has readily engrained this debate into his trade war rhetoric, and has created a polarized landscape marked by one’s stance on both countries’ respective bargaining powers.

Where we Currently Stand

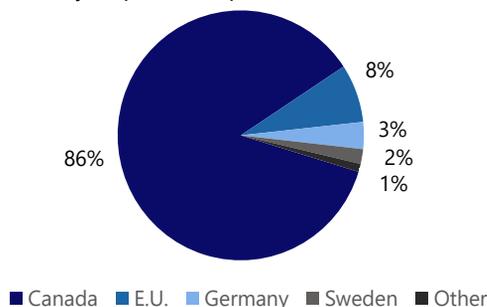
The 2006 Softwood Lumber Agreement (SLA), a bilateral agreement that laid the framework for a stable and predictable trade environment, expired on October 12, 2016 – allowing the U.S. government new-found agency to challenge previous laws. As of September 2018, U.S. tariffs for softwood lumber averaged 20.23%; however, Chapter 19 of NAFTA (a clause that allows a multinational panel of arbiters to pass judgement on trade regulation and the key citation in the lumber debate) was preserved verbatim, a supposed win for Canada.

How This All Matters

U.S. trade stability should be a key consideration when assessing the Canadian forestry space. The necessity of softwood as both an output and an export to the U.S. cannot be diminished; however, investable companies should have a healthy financial cushion to absorb potentially imminent and impactful changes to trade regulation. In addition, names that produce a wide array of goods may be able to diversify away from the softwood-centric discussion.

EXHIBIT IV

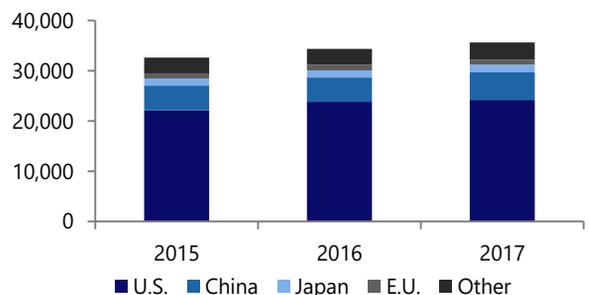
U.S. Forestry Import Companies (2017)



Source: Natural Resources Canada

EXHIBIT V

Balance of Trade of Forestry Goods (2017)



Source: Natural Resources Canada

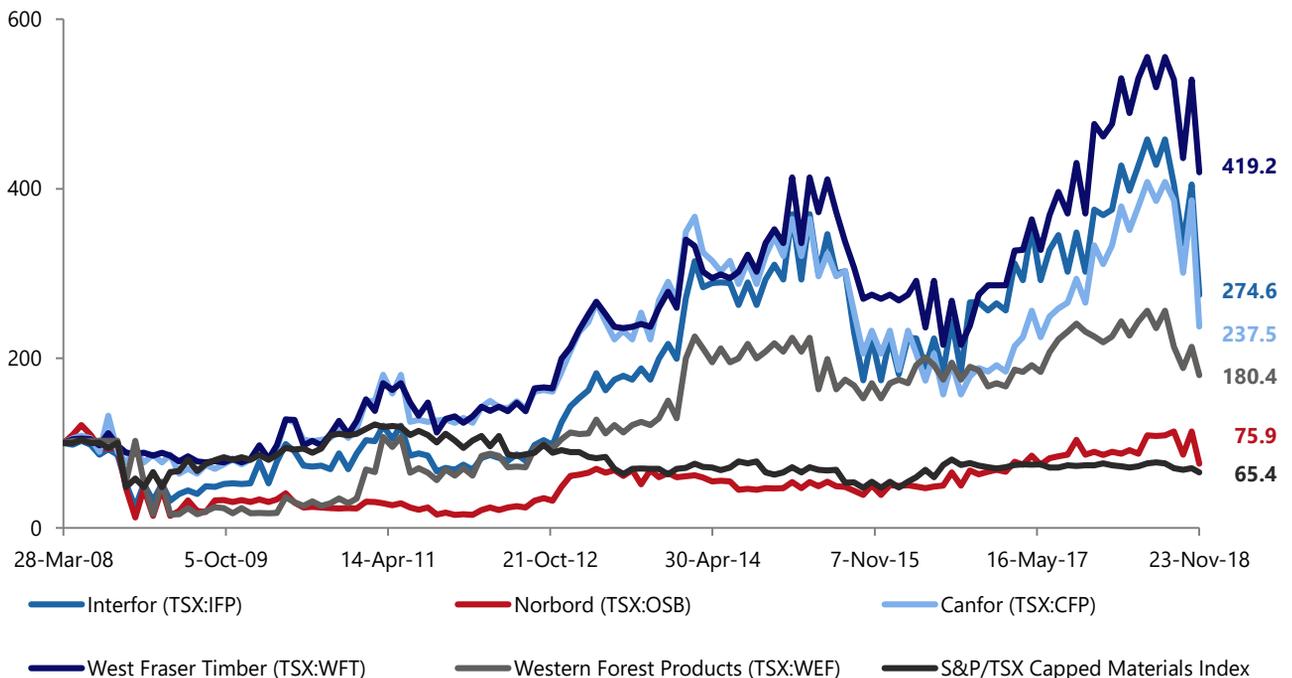
Current State of Subsector and Future Outlook

Identified drivers of long-term global demand for wood products prove positive, indicating that demand is predicted to be on a constant upward trajectory. Population growth and continued economic expansion will both build to the overall demand of wood products as well as its geographic distribution. It is also predicted that there will be a decline in harvesting from natural forces, and that technological development will dominate sources of competitive advantage in the future. The Asia Pacific region is forecasted to increase in dominance as both a producer and a consumer of wood-based panels (although per capita consumption will still remain higher in North America and Europe). In addition, the U.N. Economic Commission predicts that wood-based panel production will rise by 77% in Canada by 2030.

For the purposes of this report, we have decided to focus our analysis on Norbord, Canada's largest OSB producer. A brief comparable companies analysis suggests that it is trading on relatively low multiples, and its exposure to the U.S. housing market may allow us to take advantage of its projected recovery. From this analysis, we wish to determine how directly correlated Norbord is to the housing market, how insulated it is from general trade discussions, and whether now is a good time to enter the name. This analysis will supplement our intentions of further exploring the forestry and lumber space.

EXHIBIT VI

Relative Performance of Selected Comparable Companies



Source: S&P Capital IQ

Introduction to Oriented Strand Board

Oriented Strand Board (OSB) is a versatile structural wood panel which is made from thin perpendicular layers of aspen, poplar, or U.S. southern yellow pine strands that are bonded together under heat pressure using a waterproof binding adhesive known as resin. OSB is primarily used in the construction of housing and buildings, serving as an insulator and structural support. It serves a similar purpose as plywood in construction but with definitive advantages. Produced in large mats of consistent quality, void of laps and gaps, OSB minimizes joints between panels and thus reduces heat and sound leakage.

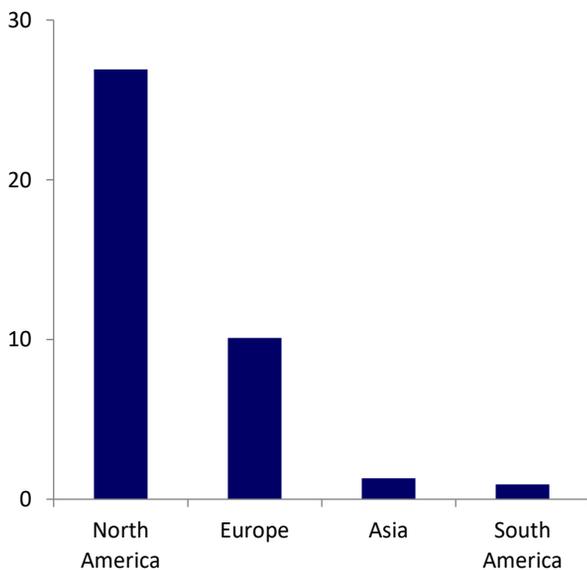
It is important to note that there are different grades and types of OSB with varying end-uses, which may be priced differently. While the majority of OSB on the market behaves as a commodity, there are growing applications in specialty and value-added offerings such as engineered packaging containers.

Advantages Over Plywood

Presently representing 68% of North American panel production (a mere increase from 67% in 2017) and 80% of North American residential construction, OSB is forecasted to continue to capture market share from plywood. OSB outlook benefits from consumption trends towards more efficient use of forest resources and the usage of less valuable and faster-growing tree species. By contrast, plywood is formed through peeling continuous sheets of veneer from older-growth tree logs. The sheets are then hot-pressed with an adhesive, similar to OSB. Through utilizing strands instead of sheets, OSB more efficiently uses lumber resources; while plywood plants typically only utilize 40% of log volume in marketable products, OSB uses 80% of its log supply. In addition to being more environmentally sustainable, OSB panels are less expensive than plywood in most applications.

EXHIBIT VII

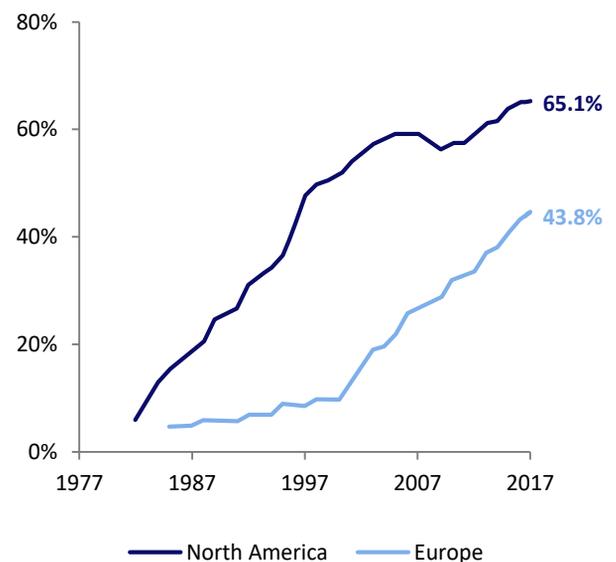
Global OSB Industry Capacity (MMsf-3/8")



Source(s): Company Reports

EXHIBIT VIII

OSB Shares of Structural Panels



Source(s): Company Reports

Oriented Strand Board Outlook

Outlook

Over the last three and a half years, North American OSB prices have seen consistent growth with 27% Y/Y growth from 2016 to 2017. However, the most recent quarter marked a decline from the year prior as the onset of new supply has created consumer confidence that future prices will improve. In 2017 and 2018, a total of 5 mills were starting in North America, with a total of two greenfield mills and the remainder being restarts. At \$363 for the standard measure, OSB prices in the most recent quarter still exceed the 15-year average of \$249. By nature of supply flexibility in this industry compared to other commodities in our universe, OSB prices have not remained elevated above average for much more than three years (over the last 15 years). Elevated prices and outlook over the last three years incentivized new supply investments; consequently, there appears to be more downside for OSB than upside. While North American demand is expected to continue to benefit from housing starts and repairs, demand growth is not expected to exceed supply.

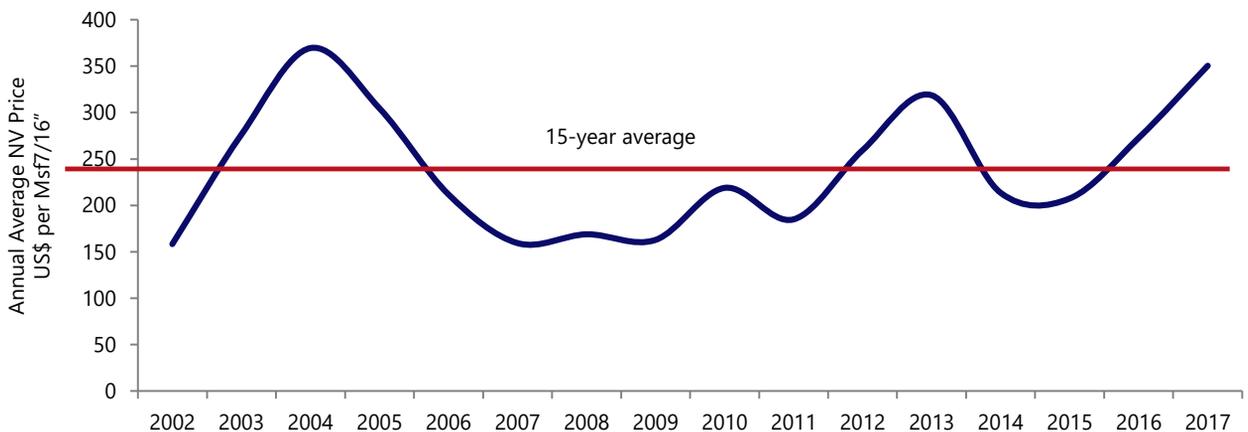
High Long-Run Viability of OSB

OSB was conceptually invented and patented in 1965 as waferboard, and began to evolve in the late 1970s as technology and investors caught up with the concept. Nearly three decades were required thereafter to investigate strand size, strand orientation, and other factors before the development of the specifications and manufacturing codes that were required to make it the successful commodity that it is today.

OSB is required to comply with a number of regulatory bodies globally, meeting requirements for consistency, humidity resistance, and other factors affecting structural safety. The detailed regulatory process, high research and innovation lead time, and very recent market transition to OSB will hinder the development of substitute technologies. Moreover, technological improvements to existing OSB technologies have helped to create a more versatile range of marketable OSB applications.

EXHIBIT IX

North America Historical OSB Price – North Central Benchmark



Source(s): Company Reports

Company Overview: Norbord

Norbord is the world's largest producer of Oriented Strand Board (OSB). The company owns 13 mills in North America which manufacture OSB for home construction, repair & remodeling, and industrial use. Moreover, it has four mills in Europe and is the largest wood-based panel manufacturer in the UK. Its European mills manufacture a range of OSB, medium density fibreboard, furniture, and particleboard for home construction. The company reported sales of US\$2.8B for 2017, of which 76% were from North America (compared to 73% last year) and 24% from Europe. The company stopped reporting the percentage of its sales attributable to Asian markets as of FY 2018 although it has invested in generating sales through growing Asian markets via its agreement with the sales company Interex Forest Products.

In North America, Norbord's market share is at a high and stable 27% with its two closest competitors by volume, Louisiana-Pacific and Georgia-Pacific, at 19% and 15% market share respectively. In Europe as a

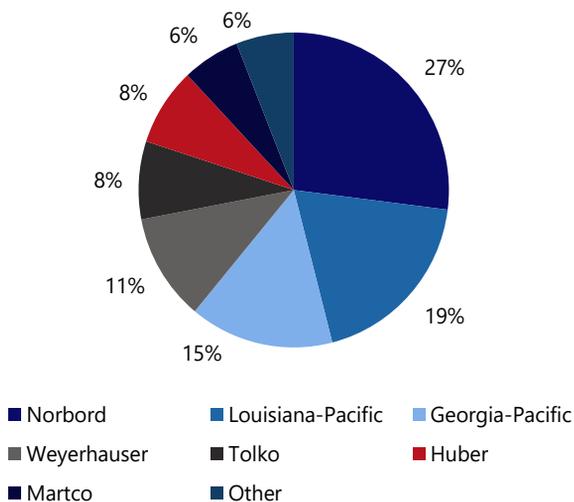
whole, which is less fragmented, Norbord has a market share of 8%. The largest player in Europe, Kronospan, holds 39% of the European OSB market.

Within its North American division, Norbord offers commodity, value-added, and specialty OSB offerings, which are catered to a growing diversity of end-use applications in its industrial and home repair segments. The company's primary customers include major retail chains, contractor supply yards, and industrial manufacturers.

Historically, panel prices in Europe have been less volatile for Norbord due to the variety of demand applications within this region. Moreover, there is higher potential for demand growth through expanded penetration of OSB within the European wood products segment. High adoption of OSB within U.S. housing markets means that overall housing starts and repair market growth are needed to drive demand upwards.

EXHIBIT X

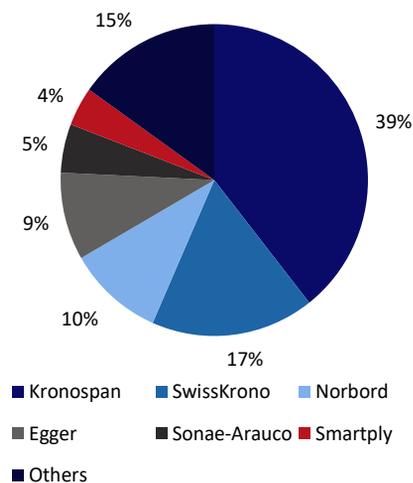
North American OSB Capacity Share



Source(s): Company Reports

EXHIBIT XI

European OSB Capacity Share



Source(s): Company Reports

Increased Capacity Among North American and European Segments

Increased Capacity Overview

Norbord management has recently increased its investing in North American projects including Huguley, Chambord, and Grand Prairie mills in North America, and the Inverness mill in Europe. This has led to a 12% increase in North America and a 38% increase in Europe with respect to current running capacity base. These additions have brought Norbord's total position in the North American and European industry to 27% and 14% respectively. Total capital investments on the year are expected to reach around \$200M. These expansions have directly carried results towards an adjusted EBITDA in North America of \$190M and an adjusted EBITDA in Europe of \$23M, representing a 6% increase YoY.

Grand Prairie

In this past year, Norbord has put forward \$41M of capital investments towards their Grand Prairie, Alberta mill. The mill is currently bottlenecked in the segments prior to the forming line and press. Apart from this they are also aiming to redeploy wood handling, heat energy, and drying equipment, which upon completion is expected to increase mill production capacity by 100 MMsf, and offer further savings through wood and natural gas usage.

Chamford

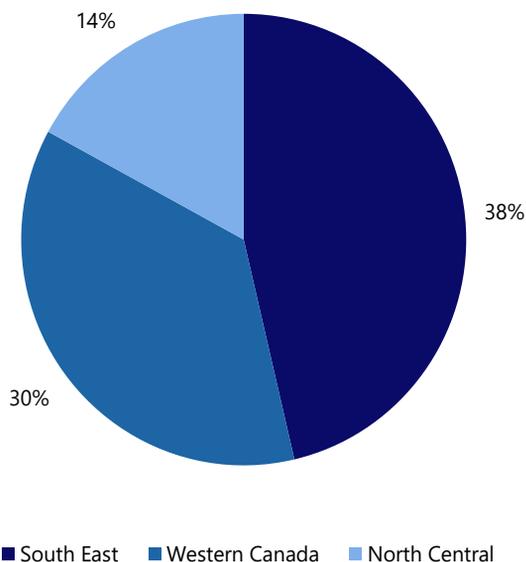
Throughout this past year, Norbord has also invested \$11M of capital into the Chamford, Quebec mine project. They have initiated rebuilding and preparing the mine with an eventual restart date as the end goal. This project includes reducing manufacturing costs, upgrades in personal safety systems, and environmental equipment upgrades to accelerate the mill up to current industry standards. This investment is a step into a total project budget of \$71M, which will increase the mills annual production capacity from 470 MMsf to 550 MMsf.

Huguley

Norbord has begun early engineering work to prepare for the rebuild and automation of the Huguley, Alabama mill. In 2014, a similar project entailed in Joanna, South Carolina, the sister mill of Huguley, which enabled a capacity increase of 150 MMsf, offering positive forecasting into possible effects of the Huguley project.

EXHIBIT XII

North American Capacity by Operating Segment



Source(s): Company Filings, Credit Suisse, CIBC Capital Markets

Increased Capacity Among North American and European Segments

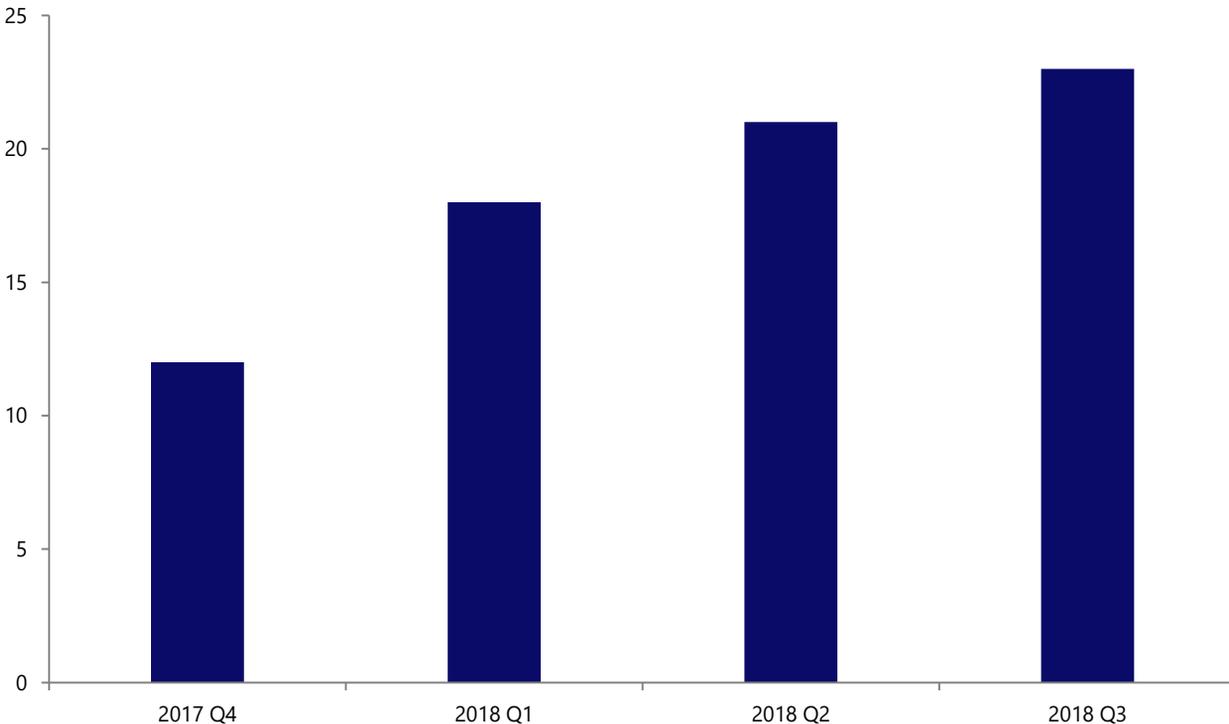
Europe

Norbord’s European EBITDA is up 64% from the same quarter last year, and is directly related to Norbord’s investment made to modernize and expand their Inverness, Scotland mill which has allowed them to fully capitalize on the demand growth seen from customers across the UK and Europe. Year to date capital investments toward Inverness stand at \$9M, however production from the expanded Inverness mill will not significantly grow until 2019 when the advanced finishing line installation and commissioning are completed.

Overall, Norbord has been able to effectively create capital, shown as operating working capital currently stands at \$173M. With the increased capacity across the Hugeley, Chamford, Grand Prairie, and Inverness projects, and \$150M of capital expenditures planned for 2019, Norbord has efficiently invested this capital directly back into their projects. Through this, Norbord has grown their annual capacity to 8.4 billion square feet in both North America and Europe, allowing them to be well prepared for increased demand across the world.

EXHIBIT XIII

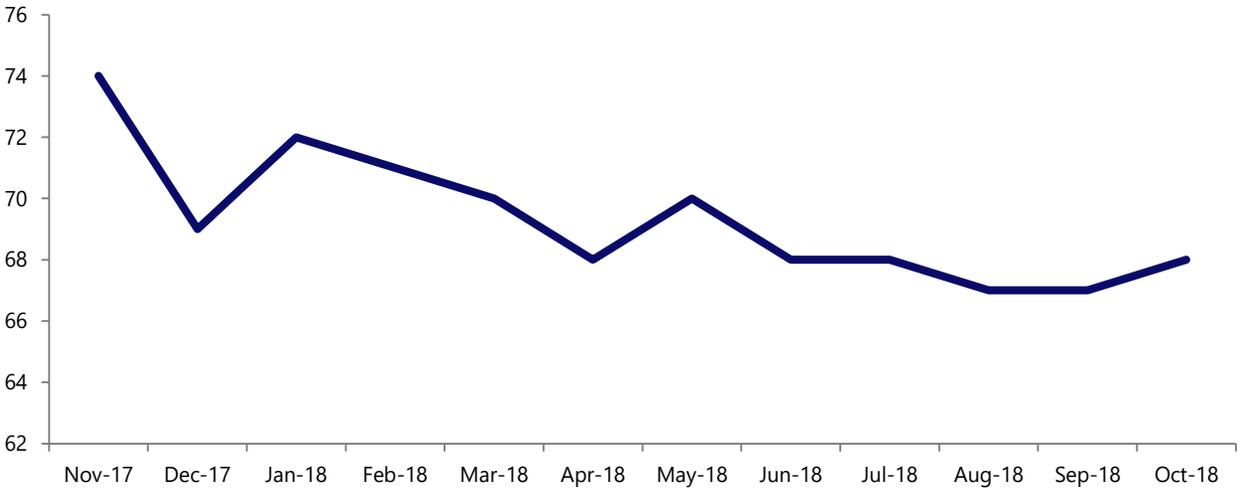
European Segment Adjusted EBITDA



Source(s): Company Filings, RBC Capital Markets

EXHIBIT XIV

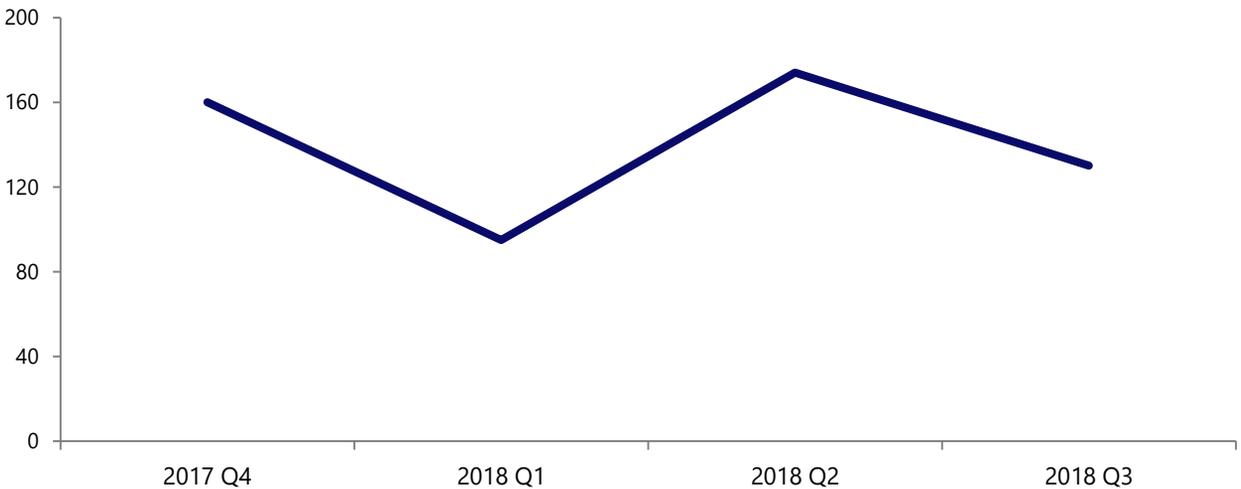
U.S. Housing Market Index



Source: National Association of Home Builders

EXHIBIT XV

Norbord Net Sales (\$MM)



Source: Company Reports

U.S. Housing Market Recovery Implications

The trend of US start-up housing has been a slowing trend, with its Q3 average down 7.8% from the Q1 average. This has significantly weakened prices of building material which directly correlates to Norbord. A further halt in the pace of the recovery of the US housing market recovery could further affect Norbord's North American segment in terms of their rates and projected prices. Furthermore, there has been a distinguishable shift in the US housing sentiment in the past while, that has created significant negative pressure on wood products. However, housing economists believe this is a temporary pause in demand, and they forecast new home construction growth over the next year. This is partly due to more people becoming first-time house-buyers, and a strong desire to own. Apart from this US housing starts

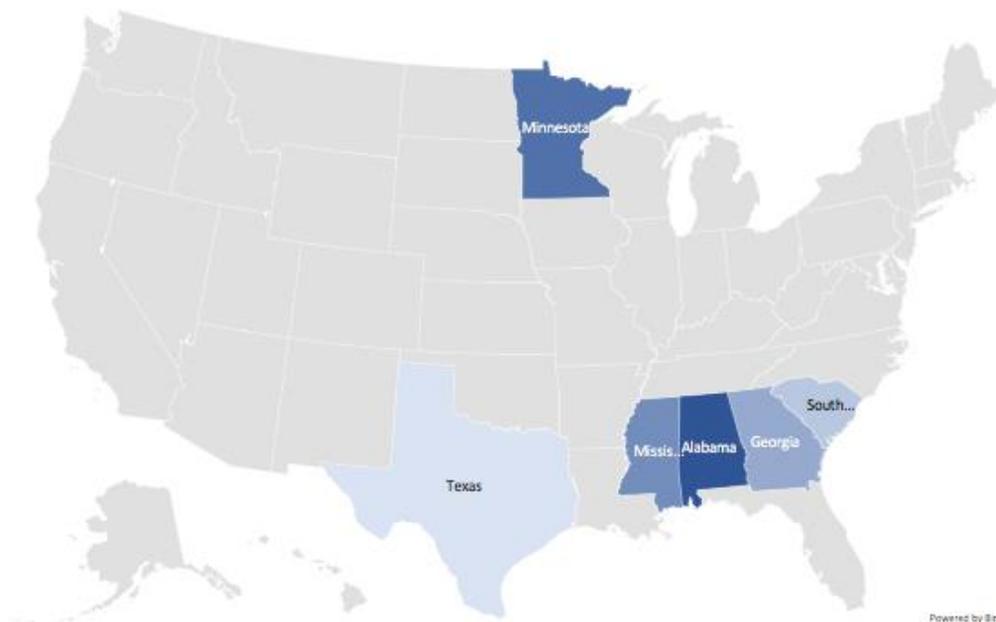
were up 6% compared to last year, with a predication of 1.28 million starts in 2018.

With this fluctuation existing in the US housing market, it is important to note how sensitive the pricing of OSB is in respect to these fluctuations. A US\$10/Msf change in OSB price would annually affect adjusted EBIDTA by \$59M according to company reports. A €10/m change would roughly impact annually adjusted EBITDA by approximately US \$12M.

However, Norbord is a strong believer that this is just a temporary pause in market demand, and due to their capital expenditures, Norbord is in a strong position to capitalize off market recovery and newfound demand.

EXHIBIT XVI

Norbord's US Presence



Source(s): Company Filings, Credit Suisse, BMO Capital Markets

Norbord Thesis I: Economies of Scale

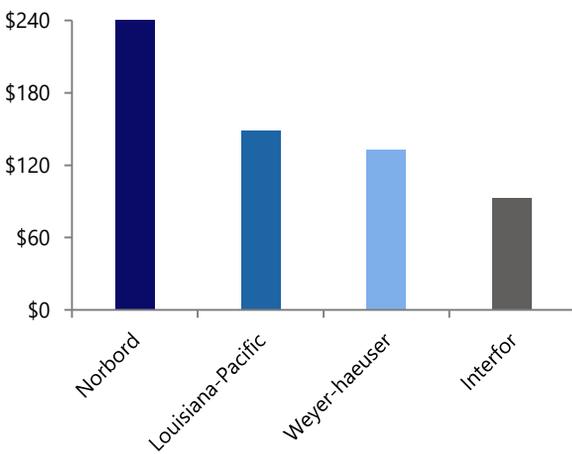
The strongest advantage that Norbord possesses is its industry-leading scale and the resultant economies of scale it is able to realize. With 27% of North American market share, Norbord is the clear market leader in the region where they generate over 80% of their revenues. This leading position allows them to outspend their competitors on relevant R&D as well as on investments in their plants to improve their productivity and efficiency. Norbord has an extensive R&D program entirely focused on the development of new production techniques and product quality improvements, with a central laboratory in Quebec. They have also been investing aggressively in implementing process improvements at their existing plants through their Margin Improvement Program (MIP), allowing them to realize an additional USD\$12M worth of additional cost savings in 2017. Their size also allows them to invest in and build larger scale production plants, such as their Cordale, Georgia mill, which, with its 990M square feet of capacity, is the largest in North America.

Norbord has capitalized on these economies of scale advantages to produce industry leading margins and profitability metrics. Norbord's 2017 52.25% return on capital employed and 20.03% net income margin are both substantially higher than the nearest competitor. It is worth mentioning that both these metrics were higher than normal in 2017 as a result of inflated OSB prices.

Counter-intuitively, their scale gives them added flexibility in their ability to deal with fluctuations in demand for OSB. In good times, when OSB demand is increasing, their larger balance sheet allows them to more effectively deploy capital to increase capacity. When the market is in a down-cycle, they can reduce production, or pause production entirely, at one of their mills in a given region, while still being able to supply the region due to their multiple production facilities in any region. This gives the added advantage of allowing them to quickly restart production at shuttered facilities when the market improves.

EXHIBIT XVII

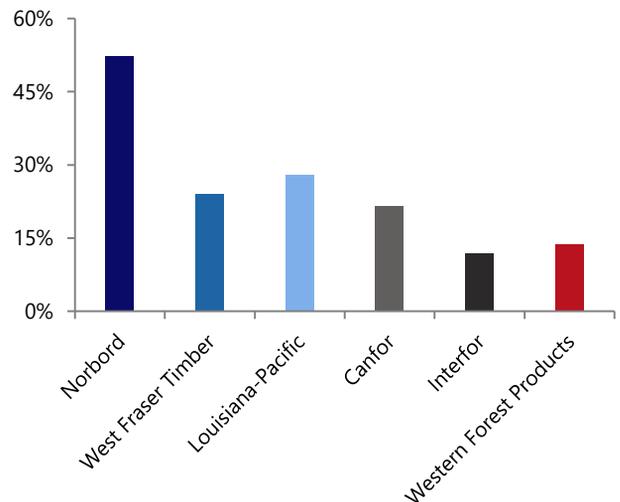
2017 CapEx of Comparable Companies (USD)



Source(s): S&P Capital IQ

EXHIBIT XVIII

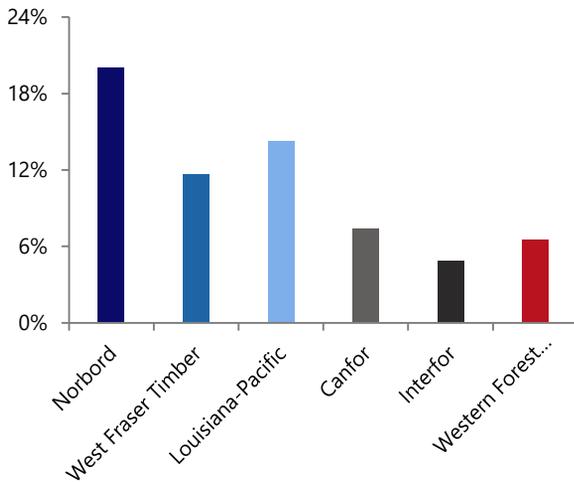
2017 Return on Capital Employed of Comparables



Source(s): S&P Capital IQ

EXHIBIT XIX

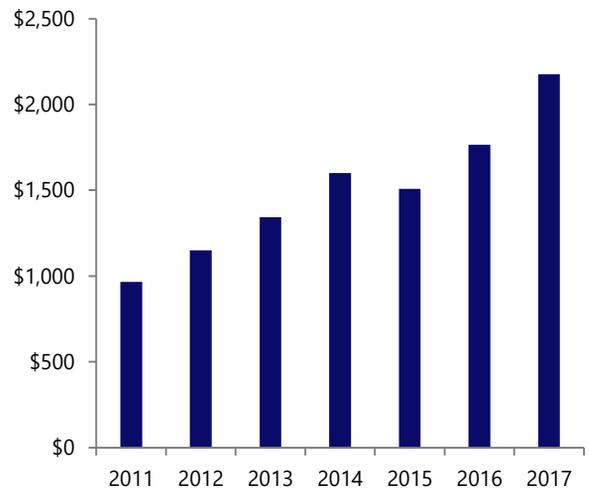
2017 Net Income Margin of Comparables



Source(s): S&P Capital IQ

EXHIBIT XX

Norbord Revenue 2011-2017 (USD)



Source(s): Company Filings

Norbord Thesis II: Growth Runway

Norbord has experienced exceptionally strong growth over the last seven years, as they have expanded production organically and grown through acquisitions. A large contributor to growth over this period was their merger with Ainsworth Lumber Co. which significantly expanded their production capacity. The OSB industry lends itself well to inorganic growth, as there are a number of smaller players that only have a few production plants, making future acquisitions a very viable avenue for growth. The primary source of competition in the OSB industry is on the basis of price. This, combined with the industry structure, positions Norbord favourably for organic growth, as it gives them the opportunity to utilize their cost advantages to capture market share from smaller players.

The European market also presents strong prospects for growth as OSB continues to represent a growing share of the overall structural panel market. While

Norbord is not the market leader in Europe, they have invested USD\$135M in their Inverness project in Scotland, which will have 720M square feet of capacity once finished. Current market conditions in Europe are such that demand is somewhat dependent on the supply of OSB, as it has historically been fairly limited. This makes it highly likely that Norbord will be able to fully utilize this new capacity once it comes online in 2019.

Norbord's strong balance sheet gives them a solid platform for further growth. With USD\$550M of liquidity available for immediate deployment, they have the ability to deploy capital for growth quickly if desired. Additionally, with a net debt to EBITDA ratio of 0.5x, Norbord has plenty of room to issue debt to fund growth opportunities.

Norbord Thesis III: Specialty Products

Norbord has made a major effort in recent years to diversify their product lines away from highly commoditized, basic OSB products and toward specialty, value-added products. These specialty products are primarily comprised of OCB products that are produced for industrial and export end-markets. They now represent 25% of Norbord's total sales volume, with the company aiming for 50% of sales to come from specialty products by 2021.

These specialty products have two primary advantages. For one, they generally have higher selling prices than more commoditized products, allowing Norbord to earn higher margins on sales of specialty

products. Second, demand for specialty products tends to be less cyclical than the demand for basic OSB product. This reduced cyclical can be explained by the lower volatility in the end-markets of these products, when compared to the residential housing market that comprises the majority of OSB demand.

On the whole, this diversification toward these specialty products should allow Norbord to reduce the cyclical of their sales while realizing higher margins. It is however difficult to assess the specific impact that increased sales of specialty products will have on the company as management has been somewhat vague in their guidance on this product segment.

EXHIBIT XXI

Comparable Companies Analysis

Comparable Companies	Market	Enterprise	EV / EBITDA			Dividend	Price / Earnings		Net Debt/EBITDA	
	Cap (\$MM)	Value (\$MM)	LTM	2018E	2019E	Yield	2018E	2019E	2018E	2019E
West Fraser Timber Co. Ltd.	\$3,757	\$4,041	3.4x	3.6x	5.0x	1.1%	5.9x	9.2x	0.3x	0.4x
Louisiana-Pacific Corporation	\$3,273	\$2,640	3.3x	3.8x	4.8x	2.2%	8.0x	10.6x	nmf	nmf
Canfor Corporation	\$1,818	\$1,930	2.2x	2.6x	2.9x	-	5.0x	9.3x	nmf	nmf
Interfor Corporation	\$822	\$825	2.7x	3.6x	4.1x	-	8.3x	9.2x	0.0x	0.0x
Western Forest Products Inc.	\$594	\$561	4.7x	4.7x	4.6x	4.5%	10.0x	8.5x	nmf	nmf
Mean	\$2,053	\$1,999	3.3x	3.7x	4.3x	2.6%	7.4x	9.4x	0.1x	0.2x
Median	\$1,818	\$1,930	3.3x	3.6x	4.6x	2.2%	8.0x	9.2x	0.1x	0.2x
Maximum	\$3,757	\$4,041	4.7x	4.7x	5.0x	4.5%	10.0x	10.6x	0.3x	0.4x
75th Percentile	\$2,663	\$2,319	3.3x	3.8x	4.7x	2.6%	8.2x	9.3x	0.2x	0.2x
Median	\$1,818	\$1,930	3.3x	3.6x	4.6x	2.2%	8.0x	9.2x	0.1x	0.2x
25th Percentile	\$822	\$825	2.7x	3.6x	4.1x	1.7%	5.9x	9.2x	0.1x	0.1x
Minimum	\$594	\$561	2.2x	2.6x	2.9x	1.1%	5.0x	8.5x	0.0x	0.0x
Norbord Inc.	\$2,468	\$2,816	3.4x	3.7x	5.2x	6.4%	5.7x	9.0x	0.5x	0.7x

P/E Share Price Calculation	
Median P/E 2018E	8.0x
2018E EPS	\$5.01
Implied Share Price	\$40.18
Current Share Price	\$37.57
Implied Return	7.0%

Blended Implied Share Price Calculation			
	Weighting	Share Price	Contribution
DCF Gordon Growth Method	33%	\$41.63	\$13.88
DCF Multiples Method	33%	\$32.09	\$10.70
Comparables P/E	33%	\$40.18	\$13.39
Implied Share Price (CAD)			\$37.97
Current Share Price			\$37.57
Implied Return			1.1%

Source(s): S&P Capital IQ

Valuation

In determining a valuation for Norbord we used a comparable companies analysis and a DCF. For the comps, we used a comparables universe made up of forestry companies that engage in similar operational activities to Norbord. We derived an implied share price based on the median P/E ratio taken from the comps, returning an implied share price of \$40.18 and an implied return of 7.0%. We used the P/E ratio instead of EV/EBITDA as depreciation expenses are a considerable part of the cost profile of companies in this industry and all comparable companies had similar

debt loads, meaning interest costs had little effect on earnings.

In our DCF, we used consensus analyst estimates for 2018 and 2019 revenue, with a conservative 2% growth rate following that period. We believe this growth rate balances the increases in production volumes that Norbord is likely to realize, with the expected fall in OSB prices that is projected in coming years.

EXHIBIT XXII

Discounted Cash Flow Analysis

	Historical Fiscal Year Period			Projection Period				
	2015 FY2015	2016 FY2016	2017 FY2017	2018E FY2018	2019E FY2019	2020E FY2020	2021E FY2021	2022E FY2022
Revenue	1,509	1,766	2,177	2,447	2,258	2,303	2,350	2,397
<i>Year over Year Growth %</i>	-5.75%	17.03%	23.3%	12.4%	(7.7%)	2.0%	2.0%	2.0%
COGS	1,376	1,378	1,499	1,688	1,694	1,728	1,762	1,797
<i>% of Revenue</i>	91.2%	78.0%	68.9%	69.0%	75.0%	75.0%	75.0%	75.0%
Gross Profit	133	388	678	759	565	576	587	599
<i>% of Revenue</i>	8.8%	22.0%	31.1%	31.0%	25.0%	25.0%	25.0%	25.0%
Operating Expenses	103	109	118	150	139	141	144	147
<i>% of Revenue</i>	6.8%	6.2%	5.4%	6.1%	6.1%	6.1%	6.1%	6.1%
Net Unusual and Non-Operating Expenses	(51)	15	(13)	-	-	-	-	-
EBIT	(21)	294	547	608	426	434	443	452
<i>% of Revenue</i>	-1.4%	16.6%	25.1%	24.9%	18.9%	22.9%	22.9%	22.2%
Interest Expenses	52	50	30	30	30	30	30	30
<i>% of EBIT</i>	-247.62%	17.01%	5.5%	4.9%	7.0%	6.9%	6.8%	6.6%
EBT	(73)	244	517	578	396	404	413	422
<i>% of Revenue</i>	-4.8%	13.8%	23.7%	23.6%	17.5%	17.6%	17.6%	17.6%
Less: Income Taxes	(27)	61	81	110	76	77	79	81
<i>Effective Tax Rate %</i>	37.0%	25.0%	15.7%	19.1%	19.1%	19.1%	19.1%	19.1%
Net Operating Profit After Taxes	6	233	466	498	350	357	364	371
<i>Year over Year Growth %</i>	-76.00%	3783.33%	100.00%	6.84%	-29.64%	1.97%	1.97%	1.97%
Plus: Depreciation and Amortization	86	94	107	120	111	113	115	118
<i>% of Revenue</i>	5.7%	5.3%	4.9%	4.9%	4.9%	4.9%	4.9%	4.9%
Plus: Stock Based Compensation	0	0	0	-	-	-	-	-
Less: Capital Expenditures	59	95	240	270	249	254	259	264
<i>% of Revenue</i>	3.9%	5.4%	11.0%	11.0%	11.0%	11.0%	11.0%	11.0%
Less: Change in Net Working Capital	21	(9)	11	9	(11)	3	3	0
Unlevered Free Cash Flow	12	241	322	339	223	214	218	225
<i>Normal Discount Period</i>				1.0	2.0	3.0	4.0	5.0
<i>Mid-Year Discount Period</i>				0.25	1.25	2.25	3.25	4.25
<i>Discount Factor</i>				97.8%	89.6%	82.1%	75.2%	68.9%
Present Value of Unlevered Cash Flows			-	332	200	176	164	155

Source(s): Company Reports, S&P Capital IQ

Valuation

Our gross profit margin projections were based on the margins that Norbord typically realizes when OSB prices are near their 15-year average of ~USD250. We believe this is the best way we can predict the margins that Norbord will likely see in the long-term, while still being conservative in our projections. Our DCF shows an implied share price of \$41.63 using the Gordon Growth Method and \$32.09 using the multiples method.

The projections in our DCF were difficult to determine with much certainty as Norbord's revenues and margins are heavily linked to the macroeconomic factors that drive OSB prices. That being said, on the whole, we believe that our projections represent a conservative view of the likely future.

Overall, our valuation shows that Norbord is likely quite fairly priced by the market at this time, both on a relative and intrinsic basis. This indicates that the selloff in its shares after September was probably a quite reasonable response to new outlooks on the OSB market moving forward. Thus, we believe that from a valuation perspective there is not a great deal of upside in Norbord at this time as a result of what the future likely holds for OSB prices.

Conclusions

After analyzing the strengths and weaknesses of Norbord and looking at a valuation of the company we believe that the company is not a buy at this time. We think that on the whole it is quite a strong company that will perform well within the context of the OSB market. However, right now we are not comfortable with the risks associated with entering into a name in the OSB space. The OSB market has strong potential for continued demand growth, but it appears more likely than not that a price correction is in store in the near future. Based on past cycles, OSB supply capacity appears to take only around three years to respond to price increases, something we have begun to see materialize recently. Demand growth is not likely to be enough to compensate for

supply increases, making the outlook for OSB ominous.

We believe that as a result of its competitive advantages Norbord is the best way to bet on the strength of the OSB market. Going forward, we will keep Norbord on our watchlist as we monitor developments in the North American OSB market and look to reevaluate the company and the OSB market at some point in the future.

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