Investment Management Certificate Program (IMCP)

University of Wisconsin-Milwaukee

Lubar School of Business

www.lubar.uwm.edu/IMCP

Class of 2021 Report Packet

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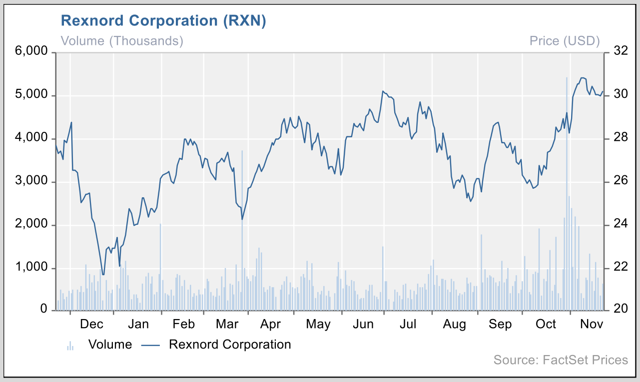
Recommendation: Hold				
Current Price	**$32.14**	---	Ticker	RXN
1 Year Bear	$20	*-38%*	Sh. Out. (M)	121.9
1 Year Base	**$27**	***-15%***	M.Cap. ($M)	$3,919
1 Year Bull	$36	*13%*	EV ($M)	$5.6

Industrials

Rexnord Corporation

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	4%	17%	15%	26%	40%	13%	6%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**20**	**19**	**19**	**18**	**20**	**21**	**22**
Gr. %	*-1.5%*	*-6.1%*	*-0.3%*	*-3.5%*	*10.8%*	*3.2%*	*4.0%*
Cons.	-	-	-	-	-	*0.7%*	*2.3%*
Ind.	*-5.8%*	*-2.9%*	*7.4%*	*9.4%*	*-2.2%*	*3.6%*	*4.4%*
EPS	**0.90**	**0.69**	**0.72**	**1.99**	**1.81**	**1.97**	**2.12**
Gr. %	*-5%*	*-24%*	*4.8%*	*175%*	*-9.1%*	*9.1%*	*7.8%*
Cons.	-	-	-	-	-	*4.8%*	*6.7%*
Ind.	*-2.0%*	*-0.1%*	*21.7%*	*16.8%*	*3.9%*	*9.4%*	*13.3%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**4.5%**	**3.6%**	**3.9%**	**11.2%**	**9.2%**	**9.7%**	**10.1%**
Ind.	*8.81%*	*8.71%*	*9.44%*	*8.46%*	*8.62%*		
ROE	*13.1%*	*12.2%*	*9.0%*	*18.2%*	*15.5%*	*15.5%*	*14.4%*
Ind.	*18.8%*	*18.5%*	*18.2%*	*17.6%*	*25.4%*		
ROA	*2.5%*	*2.0%*	*2.1%*	*5.9%*	*5.7%*	*6.2%*	*6.5%*
Ind.	*7.4%*	*7.1%*	*7.1%*	*6.7%*	*7.0%*		
A T/O	0.58	0.57	0.56	0.53	0.61	0.64	0.65
A/E	6.10	5.94	4.20	3.08	2.74	2.48	2.20

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	17.6	13.8	19.7	16.5	17.4	16.5	15.2
Ind.	17.0	24.0	23.3	19.5	21.4	19.6	17.3
P/S	1.3	1.1	1.2	1.5	1.3		
P/B	3.8	3.6	2.3	2.4	2.5		
P/CF	11.4	9.7	13.8	13.8	11.4		
EV/EBITDA	11.0	9.6	10.2	11.0	9.1		
D/P	0.0%	0.0%	0.0%	0.0%	0.0%		

Summary

I recommend a hold rating with a target of $27. Although RXN shows signs of future sales growth, worldwide market uncertainty, tariffs, and trade-wars present a significant threat to growth. The stock is slightly overvalued based on relative and DCF analysis.

Key Drivers

- Commercial airplane sales: The Process & Motion Control segment is led by sales in the aerospace industry. Increasing demand for new planes and maintenance to existing airliners has provided positive sales growth.
- Commercial construction: As the average age of buildings in the US increases, necessary retrofit of aging housing will offset some of the volatility of the construction industry.
- Margins: Steel is the largest input in the firm's manufacturing process. Ambiguity regarding trade conflicts and tariffs make projecting operating margins difficult.
- Competition: Rexnord falls relatively in the middle of its peer group of competitors. Several competitors are larger and pose a threat with greater capital at their disposal.

Valuation

Using a relative valuation approach, Rexnord appears to be fairly valued in comparison to the rest of its industry. DCF analysis implies that the stock is worth $27. A combination of the approaches suggests that Rexnord is slightly overvalued, with its current price being several dollars higher at $32.14.

Risks

- Tariffs and trade wars present significant risk to sales and margins.
- Volatility in petroleum-products could slow demand for related RXN products.
- Larger competitors can afford greater expenses for R&D and sales.

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Company Overview

Rexnord (RXN) is a manufacturer of engineered power transmission, aerospace, water management, and other precision motion technology products. As a multinational corporation, it employs 6,700 individuals, and has 128 years of history. Rexnord conducts business through its Process & Motion Control and Waste Management segments.

Process and Motion Control

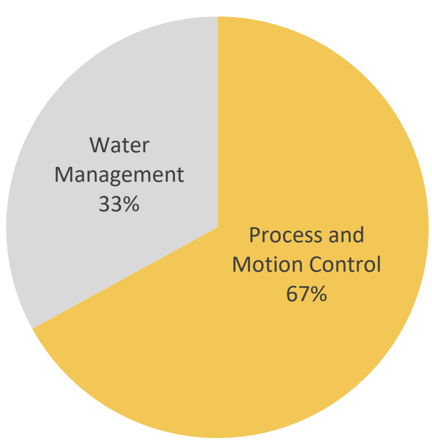
The Process and Motion Control segment comprises 67% of the firm's total revenue. This segment designs, manufactures, and markets engineered mechanical components including gears, couplings, aerospace bearings, and seals. Its products are sold and marketed under brand names including Rexnord, Rex, Addax, Euroflex, Cambridge, Omega, Stearns, Thomas, Centra, and Tollok, among others. These products are sold to various end markets such as aerospace, food and beverage, mining, energy and power generation, cement and aggregates, forest and wood products, as well as general industrial and automation applications. Its products make up an important part of the large-scale manufacturing processes where cost of component failure and resulting down-time is high. Growth in this segment has struggled since the early 2010's but has rebounded since 2016. Much of this growth can be attributed to a recent increase in demand for industrial manufacturing, specifically in the aerospace industry.

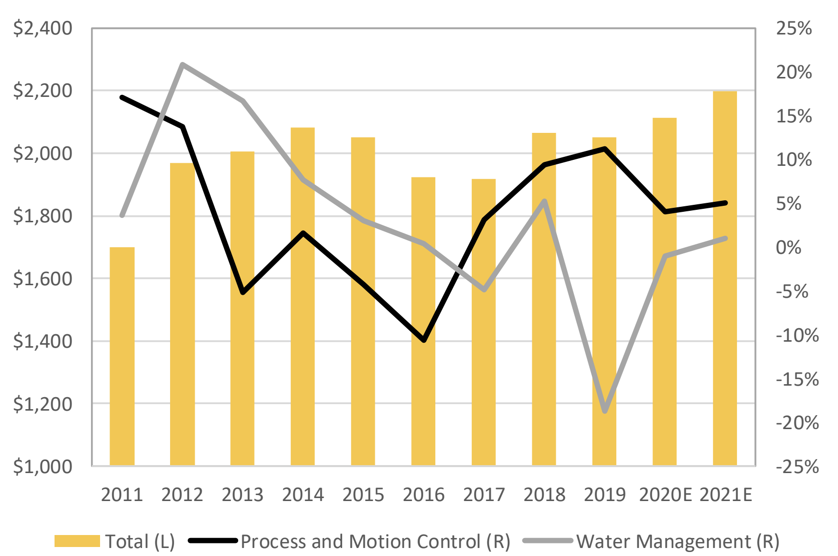
Process & Motion Control growth has rebounded (up 10% in 2019) since declining in 2016

Water Management

The Water Management segment comprises 33% of total revenue. Rexnord's Water Management platform designs, procures, manufactures, and markets products that provide and enhance water quality, safety, flow control, and conservation. The Water Management product portfolio includes professional grade water control and safety, water distribution and drainage, finish plumbing, and site works products primarily for nonresidential buildings. This product portfolio includes brands such as Zurn, Wilkins, Green Turtle, and World Dryer. Its business in the Water Management segment is mainly driven by new commercial and institutional building construction. The retrofit of existing structures to improve efficiency, as well as new infrastructure and residential construction also contribute to this segment, to a lesser extent. Water Management has seen negative growth recently, due to a decrease in demand for Rexnord's products in that segment over the last year.

Figures 1 & 2: 2019 segment revenue (left); revenue growth (in millions) and sales growth since 2010 (right)





Source: Company reports

Rexnord's product portfolio spans hundreds of offerings across both its business segments, the following is a slightly deeper look into its merchandise in both Process & Motion Control and Water Management.

Aerospace

Aerospace products go into aircraft doors, engines, gearboxes, frame structures, flight control systems, and landing gear. Electrical components, gear services, and maintenance tools also comprise a portion of this segment.

Rexnord Aerospace Bearings

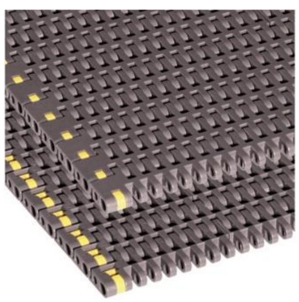
PSI Rexlon 2000 Liner Material

Cartriseal Aerospace Face Seals

Source: aerospace.rexnord.com

Food & Beverage and Mining

The firm offers conveyer belts and chains used in food processing and beverage bottling (pictured left). Rexnord gear reducers increase the torque and reduce load speed of electric and combustible motors (pictured right).



Rexnord MatTop Fryer Temperate-resistant Chain

Rexnord Gear Reducer

Source: rexnordcorporation.com/Process-Motion-Control

Water Management

A variety of products focused on improving construction, conserving water, compliance, and improving product lifecycle costs. The firm mainly operates in this segment through its brands Zurn and World Dryer.

Zurn Urinal

Zurn Pressure Reducing Valve

World Dryer Hand Dryer

Source: rexnordcorporation.com/Water-Management

Business/Industry Drivers

Though several factors contribute to Rexnord's success, I have identified the following as the most important:

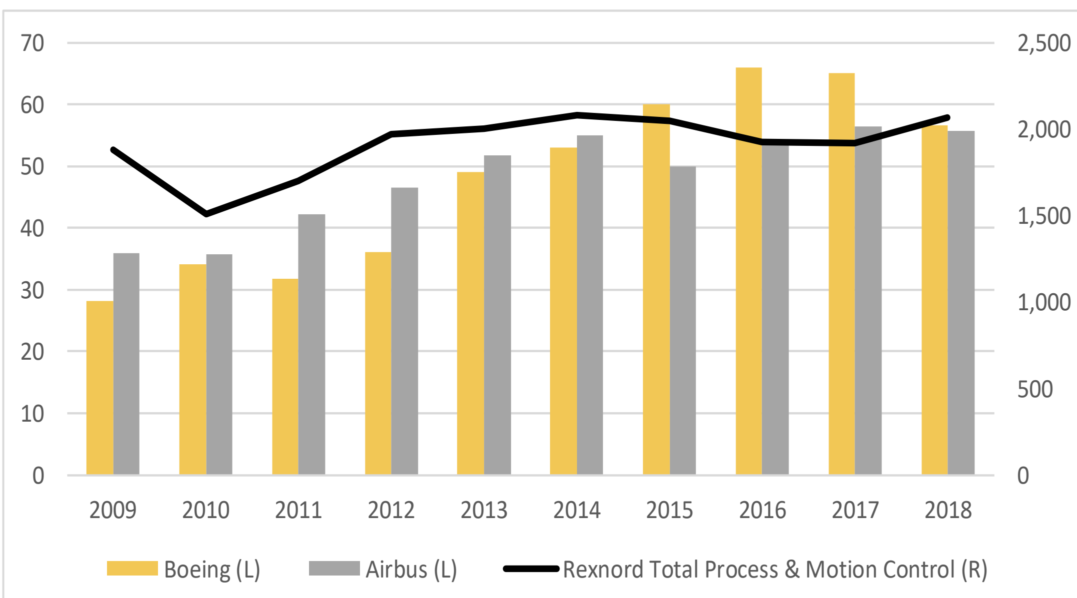
1) Commercial Plane Sales
2) Commercial Construction
3) Margins
4) Competition
5) Macroeconomic Trends

Commercial Plane Sales

Rexnord's Process and Motion Control segment makes up an important part of the business. Not only because it comprises 67% of the firm's revenue, but also because it has recovered since 2016. One of the largest sources of revenue inside of the Process and Motion Control segment, estimated to be between 50% to 60%, comes from component sales to the aerospace industry. These sales account for both new parts in the construction of new commercial planes, as well as replacement and repair parts for existing planes. These components are critical to optimal performance of commercial airliners, and as such their maintenance is of the utmost importance. Products include bearings, seals, and gears, which operate aircraft doors, engines, gearboxes, flight control systems, and make up airframe structures. Revenue for this segment is shared exclusively between the sale of these parts and the maintenance and upkeep performed on them. The growth over time to RXN's Process & Motion Control segment is made clear when comparing against commercial plane sales from large aerospace manufacturers (Boeing and Airbus) (figure 3).

Process & Motion Control is correlated with commercial aircraft sales

Figure 3: Boeing & Airbus commercial plane sales (in billions) (L) vs. Rexnord Motion and Process Control (in millions) (R)

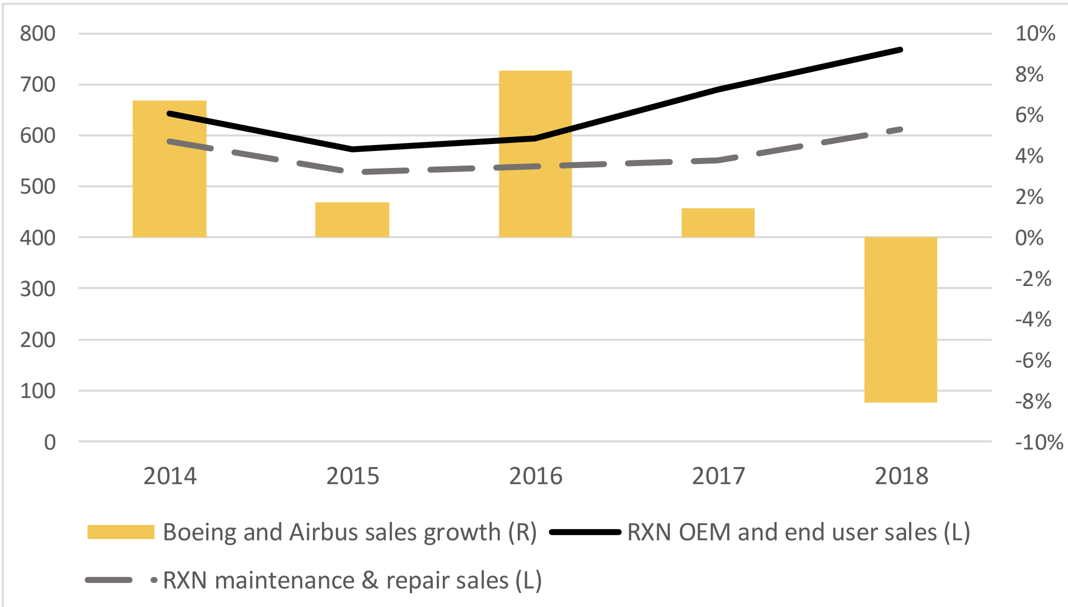


Source: FactSet

Rexnord's Process & Motion Control segment has grown 11.2% in 2019 after softer commercial plane sales in 2018. Sales of parts to OEM's and end users account for a larger share of the revenue stream for Process & Motion Controls, but maintenance and service makes up an equally important share.

Rexnord's maintenance and repair sales of Motion & Process Control products provides a steady stream of yearly income

Figure 4: Boeing and Airbus commercial plane sales growth vs. RXN sales to OEMs and maintenance revenue (in millions)



Source: FactSet, Company Filings

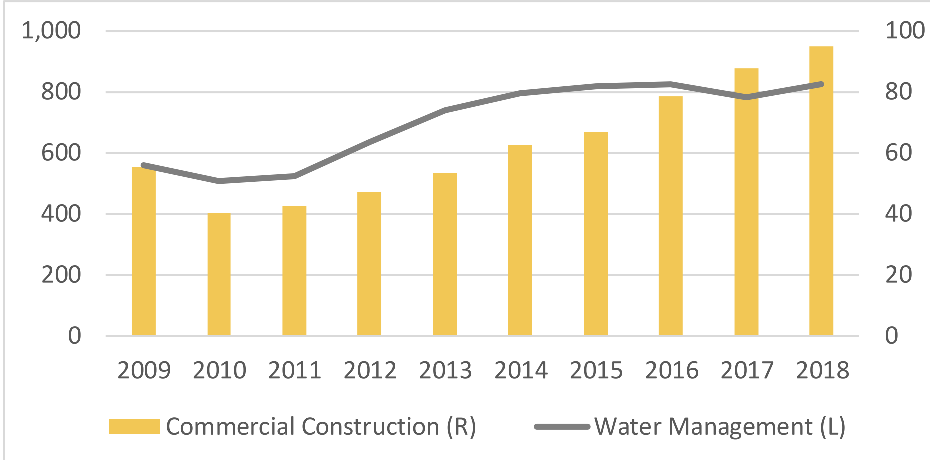
Sales to OEMs and for production of new planes have grown since 2016. Rexnord's Process & Motion Control maintenance and repair sales, however, are much more stable or moat-like for the firm. Consistency in maintenance sales plays an important part in the health of the Process & Motion Control segment and provides a stable base from which OEM and end user sales can continue to grow.

Commercial Construction

US urban land is growing at 1 million acres per year, and currently makes up only 3.6% of all US land

Rexnord's Water Management segment comprises the other 33% of its revenue stream. Roughly 90% of this area of its business is the installation and retrofit of commercial buildings, with the remaining percentage dedicated to residential dwellings. As such, commercial construction is extremely important to sales. Urban areas in the United States make up just 3.6% of the available land in the contiguous United States, however; this area is growing at a rate of approximately one million acres annually. Urban expansion drives commercial construction spending directly. Figure 5 shows RXN's Water Management segment sales compared to spending on US public commercial construction since 2009.

Figure 5: Rexnord water management sales (in millions) vs. US public commercial construction spending (in billions)

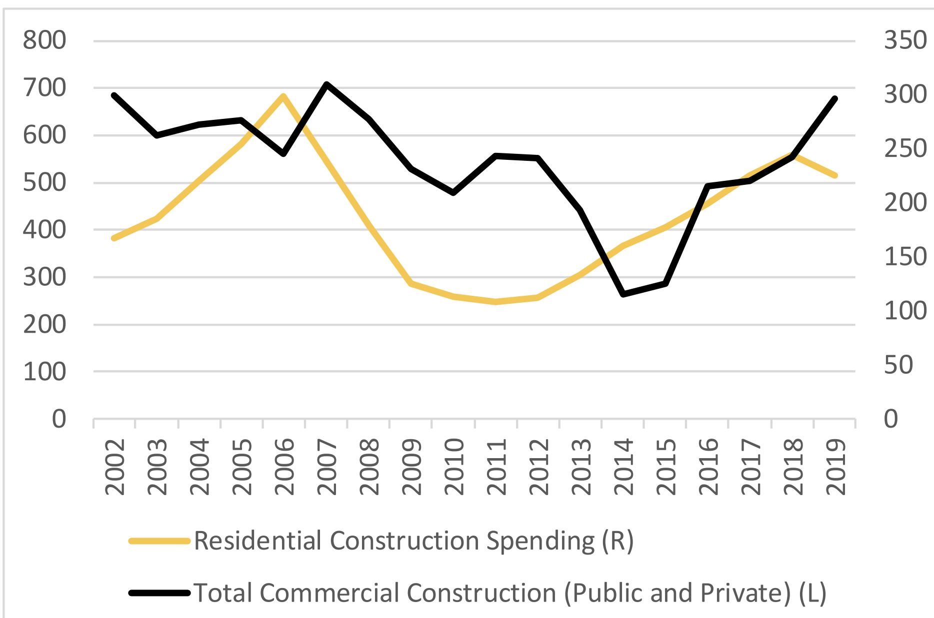


Source: FactSet

Looking purely at public commercial construction, we can see relatively steady changes in spending without drastic variation. After a decline in 2010, commercial construction has steadily increased year over year, and the firm's sales have as well.

Figure 6: US commercial construction spending (Public & Private, in billions) (L) vs total residential construction spending (millions) (R)

Residential construction struggled to recover from downturn as quickly as commercial construction



Source: Federal Reserve Economic Data

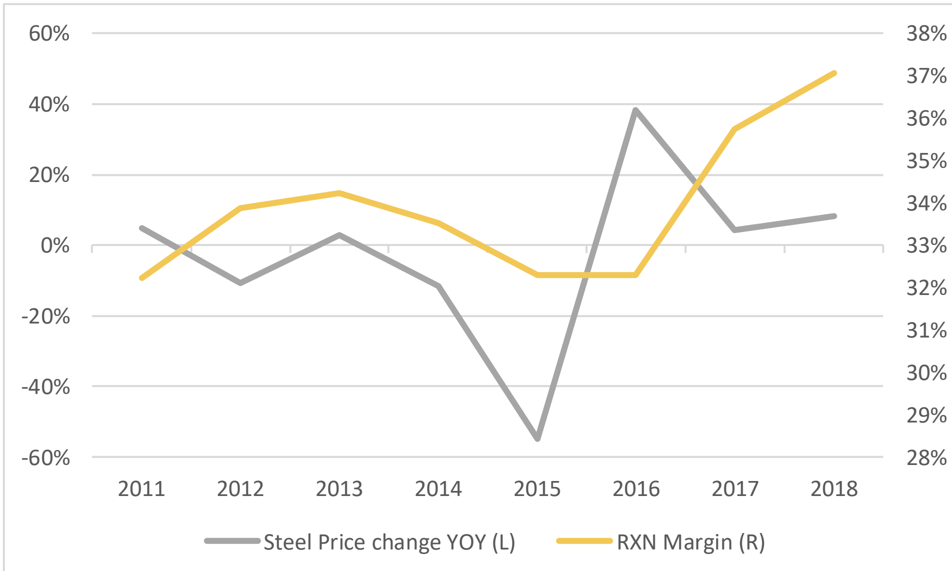
Looking at Figure 6, now taking private commercial construction into account, commercial construction appears more volatile. Total commercial construction fell nearly 2/3 from its 2007 peak and has grown to nearly a new high. Commercial construction has mostly preformed better than residential construction since 2002. By targeting the commercial segment of construction for a majority of its Water Management segment, Rexnord has poised itself to avoid the drawbacks of the residential construction industry.

Margins

As an industrial manufacturer, Rexnord relies heavily on material inputs for production. Cost of materials represented 34% of net sales in fiscal 2019. While Rexnord utilizes a variety of materials such as plastic, castings, and forgings, steel is one of the most integral.

Cost of materials represented 34% of Rexnord's net sales in fiscal 2019

Figure 7: US Midwest Steel Prices percent change YOY and RXN gross margin percent change YOY



Source: FactSet

Steel prices tend to be coincident to or lead the firm's cost of goods sold by a year. Since steel is a key component to both its Process & Motion Control as well as its Water Management segment, the company has taken steps to safeguard itself against price fluctuations. While it generally purchases its materials on the open market, it has entered into contracts for some commodity purchases. With steel prices uncertain as threats of tariffs loom, Rexnord faces pressure in this area. Without a plan for suppressing added tariff costs it risks lower margins and increasing costs on a large portion of its product offerings.

In an effort to offset steel price uncertainties elsewhere in its business, Rexnord has made efforts to streamline its business process. This comes primarily in the form of its DiRXN system. DiRXN is aimed at automating and accelerating the design, selection, order and re-order of critical components. The system also integrates elements of the Industrial Internet of Things, increasing the technical capabilities of the firm's portfolio of tools, products, and services. I anticipate saving associated with DiRXN to provide relief to margin shrinkage from commodity prices by automating tasks in order to respond more quickly and lower manual costs that will now be automated.

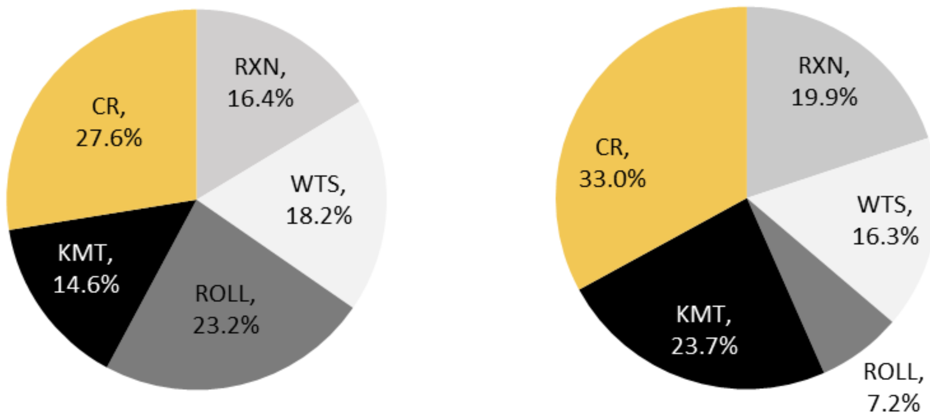
Competitors

Industrial production is a highly specialized industry. The costs of committing capital, meeting environmental standards, research and development, and constantly improving technology are all substantial barriers to entry. While there are pressures that dissuade new entrants, current operators face pressures to consistently grow and turn a profit. Producing high quality components at acceptable prices is paramount to the success of industrial production firms. Rexnord's two segments both operate in fairly fragmented markets. The Process & Motion Control segment tends to be more heavily fragmented with fewer competitors, both national and international. Water Management offerings by competitors tend to vary from RXN's product portfolio as well, with a smaller number of comparable competitors.

RXN's main competition comes from Crane (CR), Watts Water Technologies (WTS), RBC Bearings (ROLL), and Kennametal (KMT). These competitors manufacture industrial components for aerospace, fluid handling, and precision bearings among others. As shown in figures 8 and 9 RXN's share of market capital is a lower percentage (16.4%) than its percentage of sales in comparison (19.9%). This implies that the market is less optimistic on growth and risk for Rexnord than the competitors since P/S is driven by margin, risk, and growth.

RXN's share of market cap is lower than its share of sales

Figures 8 & 9: Industry concentration by market cap (left) vs. sales (right)

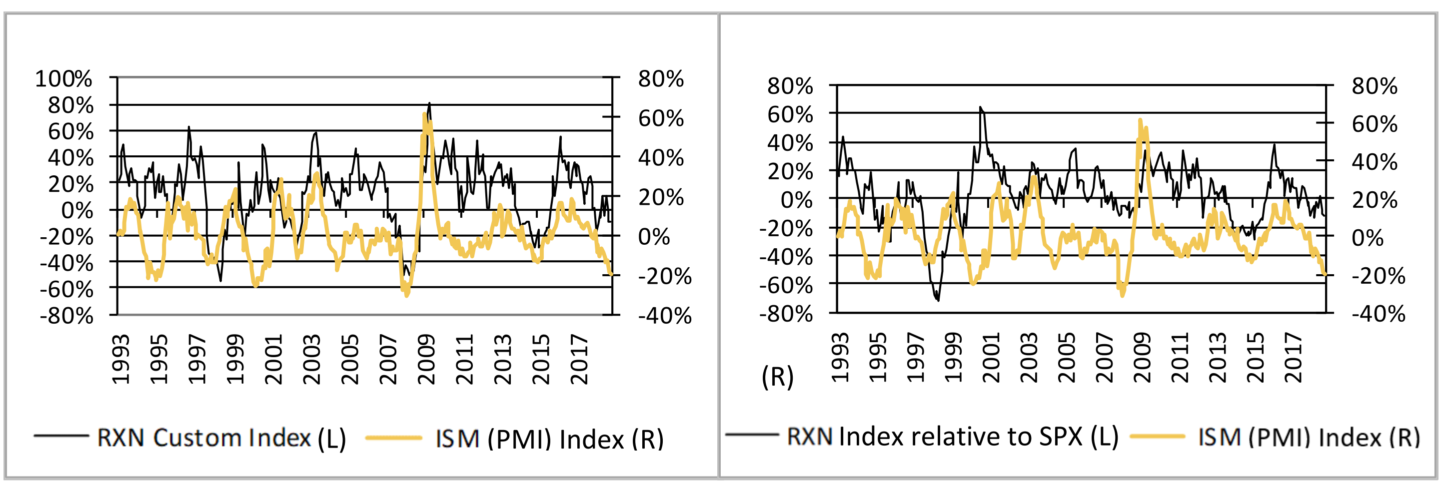


Source: FactSet, Company Reports

<u>Macroeconomic Trends</u>

Rexnord operates primarily within the United States (75%), with the remaining percentage of its business generated internationally. Its recent push for growth in foreign markets means it may someday not be as tied to US markets; however, as shown in figure 10, a custom composite of RXN and its peers is quite correlated with the ISM PMI index. Sometimes there is a lead or lag, but one can see that the index is positively correlated with the ISM PMI index, a gauge of manufacturing growth.

Figures 10 & 11: Industrial capex vs RXN custom composite (left) and Industrial Spending vs RXN custom index relative to S&P (right)

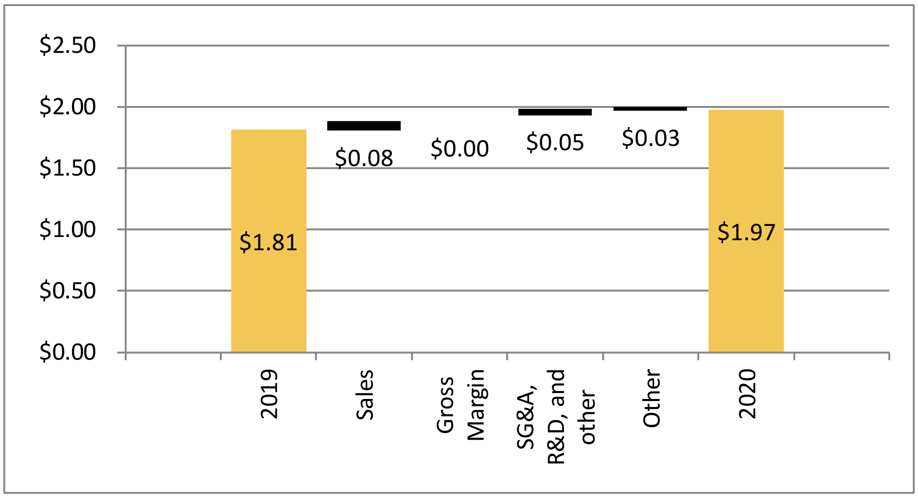


Source: Bloomberg, IMCP

Financial Analysis

I anticipate EPS to grow to $1.97 in 2020. I project a 3.2% increase in sales driven primarily by upward trends in demand for process and motion control as well as commercial construction. I anticipate sales growth will add $0.08 to earnings on a per share basis. Due to uncertainties with the trade war and commodity prices, I do not forecast Rexnord's gross margin to improve and contribute to growth in EPS. I believe Rexnord's commitment to its DiRXN system, which will simplify and streamline its business process, will add a further $0.05 to EPS.

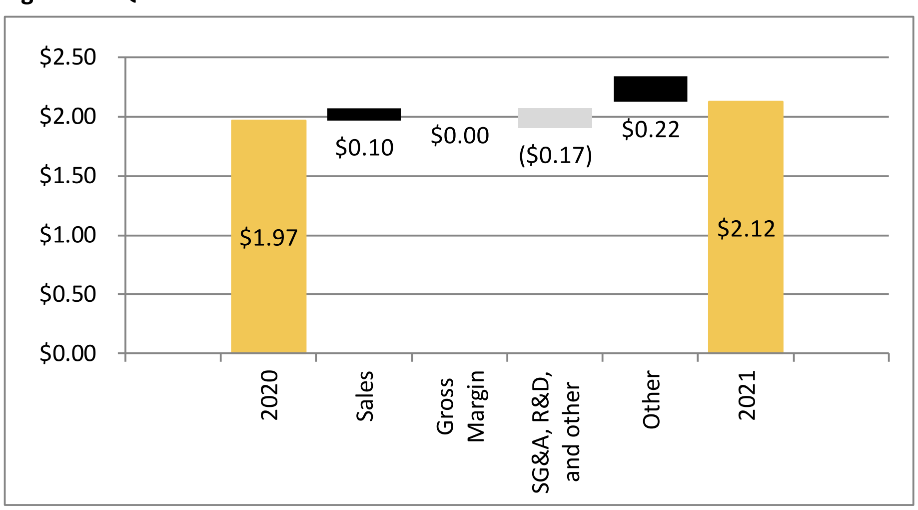
Figure 12: Quantification of 2020 EPS drivers



Source: IMCP

I anticipate about the same growth for EPS in 2021, rising from $1.97 to $2.12. I anticipate 4% sales growth adding $0.10 to EPS. As production increases on technology focused "smart" product offerings, requiring greater research and development costs, I forecast an offset of ($0.17) to EPS. Other impacts on EPS increase by $0.19 to $0.22.

Figure 13: Quantification of 2021 EPS drivers



Source: IMCP

I am slightly more optimistic than consensus estimates for both fiscal year 2020 and 2021. I predict slightly higher EPS driven by demand increases for both of Rexnord's business segments. While my estimates fall within the range of estimates, my 2021 estimates are much closer to the median consensus than higher estimates.

Figure 13: Quantification of 2021 EPS drivers

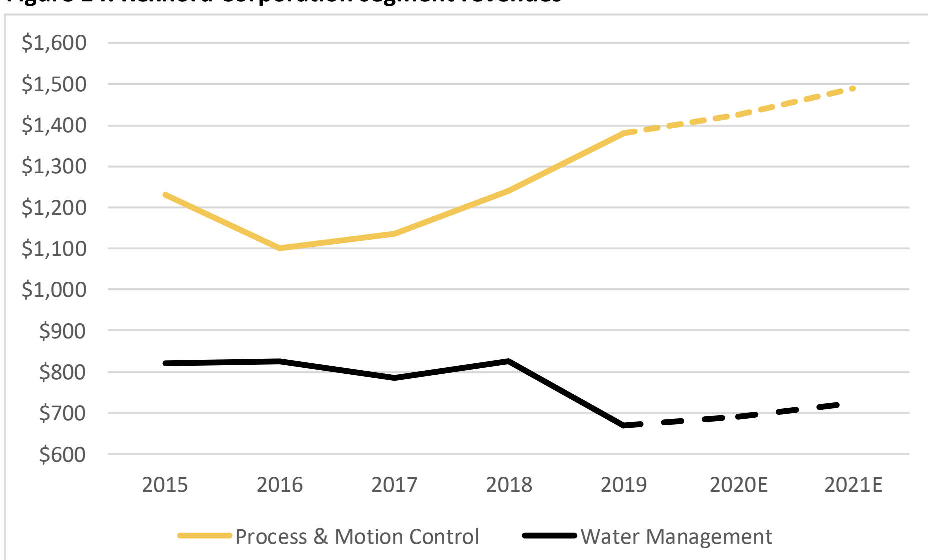
	FY 2020	FY 2021
Revenue -Estimate	$2,117	$2,212
YOY Growth	3.20%	4.50%
EPS - Estimate	$1.97	$2.12
YOY Growth	8.84%	7.61%
EPS - Consesus	$1.95	$2.11
YOY Growth	7.46%	7.88%

Source: FactSet, IMCP

Revenues

Rexnord's revenues have seen both growth and decline over the past few years. The Process & Motion Control division has shown steady growth after a short decline in 2016. Water Management was mostly stable until the dip in fiscal 2019. I have forecasted both the Process & Motion Control segment and Water Management to grow 3.2% and 4.5% in 2020 and 2021 respectively. The company had a backlog of $352.5 million at the end of the third quarter, or about 5% of one year sales, this backlog has remained stable.

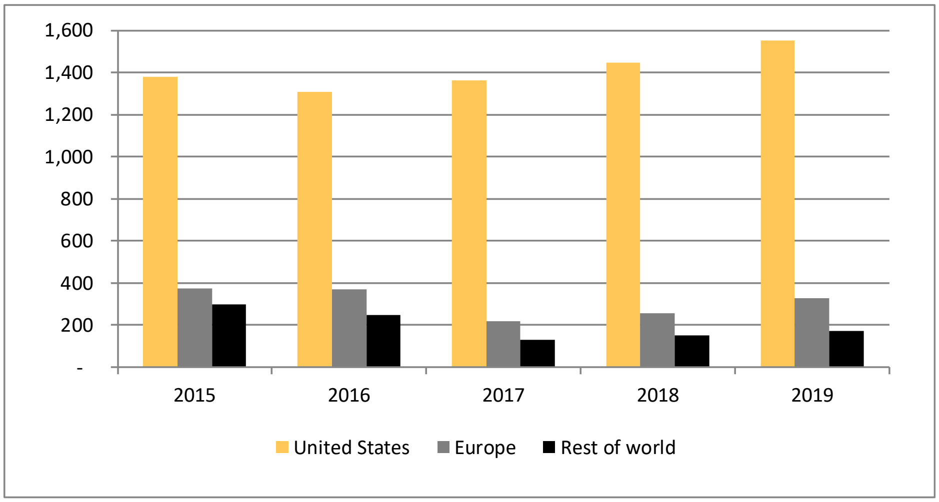
Figure 14: Rexnord Corporation segment revenues



Source: Company Reports, IMCP

RXN US sales declined during 2016 and international sales fell in 2017. Total sales have languished over the last five years, with just 2019 (up 10.8%) as an exception. Growth internationally, possibly through acquisitions, may boost growth in 2020 and 2021. Recent acquisitions targeted eastern European countries

Figure 14: Sales by geographical region (in millions)



Return on Equity

ROE has fluctuated significantly over the past four years, experiencing a rise and decline every year. Overall, the trend has been higher due to improving operating margins, lower taxes, higher asset turns and lower interest burden. The firm's leverage has fallen significantly. Going forward, I expect lower margins by 2021, but higher asset turns. Leverage will continue to decline. Overall, ROE is forecasted to decline to about 1% from 2019.

As sales rise, ROE will rise accordingly

Figure 15: ROE breakdown, 2016 – 2021E

5-stage DuPont	2016	2017	2018	2019	2020E	2021E
EBIT / sales	10.9%	11.6%	15.3%	15.7%	16.0%	15.0%
Sales / avg assets	0.57	0.56	0.53	0.61	0.64	0.65
EBT / EBIT	56.3%	64.7%	75.1%	79.8%	89.9%	90.7%
Net income /EBT	0.59	0.52	0.97	0.74	0.68	0.74
ROA	2.0%	2.1%	5.9%	5.7%	6.2%	6.5%
Avg assets / avg equity	5.94	4.20	3.08	2.74	2.48	2.20
ROE	12.2%	9.0%	18.2%	15.5%	15.5%	14.4%

Source: FactSet, Company Reports, IMCP

Free Cash Flow

RXN's free cash flows have been volatile over the past several years. 2019 is a high despite falling NOPAT, due to a decline in both net working capital and net fixed assets. After a dip in fiscal 2020 due to reinvesting in capital, I expect a rebound in 2021 due to a drop in net fixed assets.

Figure 16: Free cash flows

Free Cash Flow							
	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	$188	$179	$210	$309	$255	$268	$261
Growth		*-5.0%*	*17.5%*	*47.0%*	*-17.5%*	*5.3%*	*-2.5%*
NWC*	324	287	288	350	293	303	315
Net fixed assets	2,286	2,179	2,361	2,428	2,277	2,405	2,201
Total net operating capital*	$2,610	$2,466	$2,649	$2,778	$2,570	$2,708	$2,516
Growth		*-5.5%*	*7.4%*	*4.9%*	*-7.5%*	*5.4%*	*-7.1%*
- Change in NWC*		(37)	1	63	(57)	9	12
- Change in NFA		(108)	183	67	(151)	128	(204)
FCFF*		$323	$27	$179	$463	$130	$453
Growth			*-91.7%*	*564.6%*	*158.0%*	*-71.8%*	*247.8%*
- After-tax interest expense	76	78	74	77	51	27	24
FCFE**		$245	($47)	$103	$411	$103	$429
Growth			*-119.3%*	*-317.2%*	*301.3%*	*-74.9%*	*315.4%*

*NWC excludes cash
**No adjustment is made for debt

Source: FactSet, Company Reports, IMCP

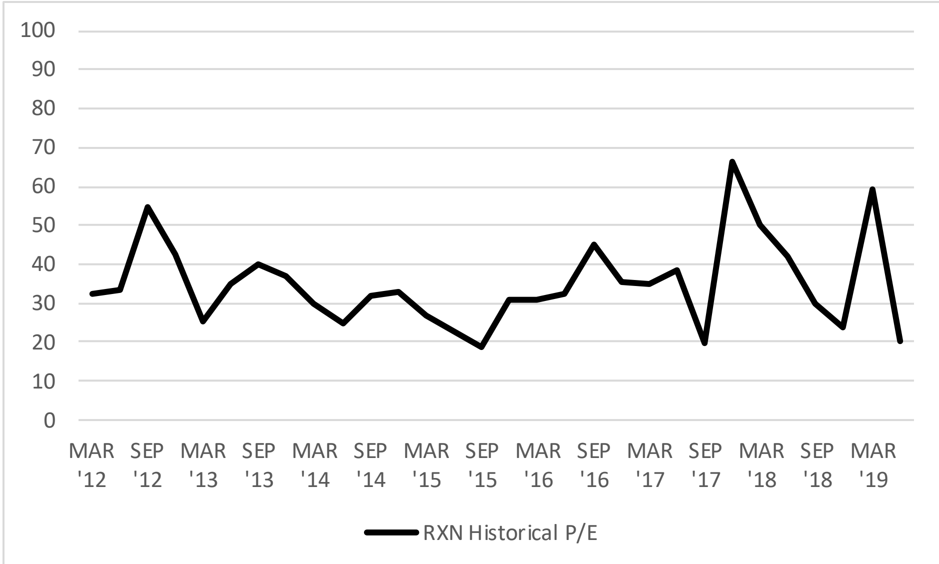
Valuation

RXN was valued using multiples and a 3-stage discounted cash flow model. Based on earnings multiples, the stock is slightly undervalued relative to other firms and is worth $26.63; however, due to the fluctuations of Rexnord's earnings the past several years this metric may not be the most accurate. Relative valuation shows RXN to be much more undervalued based on its fundamentals versus those of its peers in the industrial industry. A detailed DCF analysis values RXN at $27. I believe this value to be the most realistic because it includes assumptions that reflect Rexnord's market adaptions. As a result of these valuations, I value the stock at $27.

Trading History

Rexnord is currently trading near its 52 week high. RXN's current LTM P/E is 24.0 and it has a NTM P/E of 16.3. The current LTM P/E reflects market expectations for moderate growth in 2020.

Figure 17: RXN Historical P/E



Source: FactSet, IMCP

Assuming the firms maintains a 16.3 NTM P/E at the end of 2020, it should trade at $30.16 by the end of the year.

- Price = P/E x EPS = 16.3 x $2.12 = $34.56

Discounting $34.56 back to today at 11.7% cost of equity yields a price of $30.52. When considering consensus estimates for Rexnord's growth I consider this valuation to be slightly high.

Relative Valuation

Rexnord is currently trading at a P/E relatively in the middle of its peer group, with a P/E TTM of 24.0 compared to an average of 24.2. Investors are not completely confident in growth as well as the restructuring to consolidate the business processes. Looking at P/B, Rexnord comes in lower than most of its peers, while its P/S ratio again lands near the median. This is despite an average ROE and higher than average net margin. The firm is very levered (97% debt to equity vs 48% for the average), so investors may be concerned about financial risk.

Figure 18: RXN comparable companies

Ticker	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
RXN	$32.14	$3,919	(1.4)	6.1	11.7	11.8	26.3	40.0	11.1	47.8%	5.3%	33.1%	5.4%	8.2%		1.56	97.2%		0.00%	0.0%
CR	$85.59	$5,134	(1.4)	5.5	3.0	5.1	11.0	18.6	3.4	15.9%	-41.4%	88.0%	-1.2%	-8.0%	8.1%	1.59	60.3%	B+	1.88%	27.6%
WTS	$99.19	$3,361	0.1	3.7	0.0	10.7	40.3	53.7	8.0	12.5%	-18.1%	61.7%	0.5%	-5.8%	17.2%	1.45	28.4%	B-	0.93%	23.4%
ROLL	$170.28	$4,260	(2.2)	3.0	1.7	10.6	25.9	29.9	5.9	22.9%	3.2%	19.1%	24.5%	-7.0%		0.93	4.6%		0.00%	0.0%
KMT	$37.40	$3,099	(1.3)	11.6	15.3	12.0	4.4	12.4	5.0	-13.2%	-191.9%	104.0%	19.6%	6.6%		2.44	48.0%	B-	2.30%	34.8%
Average		$3,955	(1.2)	6.0	6.4	10.0	21.6	30.9	6.7	17.2%	-48.6%	61.2%	9.8%	-1.2%	12.7%	1.59	47.7%		1.02%	17.2%
Median		$3,919	(1.4)	5.5	3.0	10.7	25.9	29.9	5.9	15.9%	-18.1%	61.7%	5.4%	-5.8%	12.7%	1.56	48.0%		0.93%	23.4%
SPX	$3,169		0.0	2.4	5.4	9.6	19.6	26.4			11.5%	22.1%	4.2%	11.2%						

Ticker	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	NM	OM	ROIC	EV/ EBIT	P/CF Current	Sales Growth NTM	STM	Pst 5yr	Book Equity
RXN	15.3%	2.67	19.7	16.5	17.4	24.0	16.3	16.5	15.2	12.2%	2.12	9.2%	15.7%	7.5%	12.6	12.9	1.8%		-0.3%	$12.05
CR	20.8%	3.07	16.9	23.4	14.7	15.5	13.4	14.9	16.2	10.4%	1.53	10.0%	14.0%	15.6%	10.7	10.9	0.7%	2.9%	5.2%	$27.89
WTS	13.8%	3.60	26.5	27.5	26.1	26.4	23.4	26.0	27.6	8.2%	2.15	8.2%	12.3%	10.2%	12.3		2.5%	4.6%	1.2%	$27.53
ROLL	9.1%	4.09	40.9	41.1	44.8	38.7	31.5	36.0	38.7	14.1%	6.31	15.0%	21.2%	10.5%	21.1	21.3	5.8%		10.9%	$41.64
KMT	16.3%	2.39	-35.6	26.6	14.7	16.3	18.7	12.3	11.5	8.9%	1.31	10.2%	14.6%	13.0%	10.2	11.3	-4.8%	3.9%	-3.5%	$15.68
Average	15.1%	3.16	13.7	27.0	23.5	24.2	20.7	21.1	21.8	10.8%	2.68	10.5%	15.5%	11.4%	13.4	14.1	1.2%	3.8%	2.7%	
Median	15.3%	3.07	19.7	26.6	17.4	24.0	18.7	16.5	16.2	10.4%	2.12	10.0%	14.6%	10.5%	12.3	12.1	1.8%	3.9%	1.2%	
spx			22.6	19.0	19.7			18.9	17.0											

Source: FactSet, IMCP

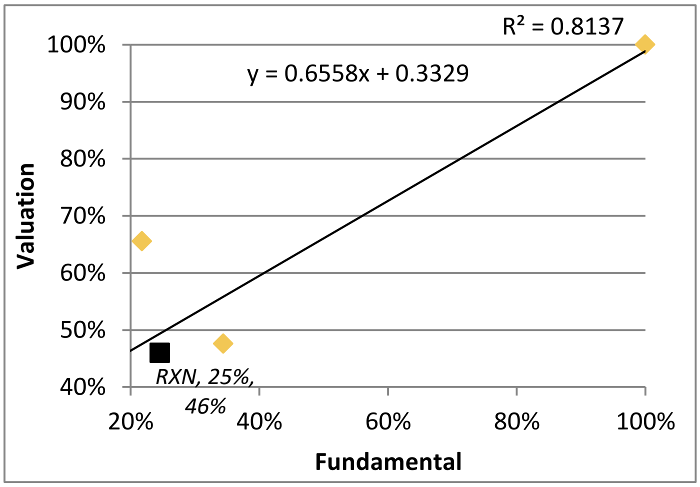
I have created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. 20% was weighted to 2020 earnings growth, 60% to long term debt to equity in addition to a 20% weighting in 2019 NPM for the fundamental composite. This was compared to a 60% weight for NTM P/E and 30% 2019 P/E with 10% in P/S for the value composite. The regression line had an R-squared of 0.81. Figure 21 shows that as a cyclical company, as RXN's fundamentals improve its value factors increase. As earnings increase for these companies, the market anticipates their cyclicality and prices it in accordingly.

		Fundamental Factors			Value Factors		
		20.0%	60.0%	20.0%	60.0%	30.0%	10.0%
		Earnings Growth	1/(LTD/	2019	P/E		
Ticker	**Name**	**2020**	**Equity)**	**NPM**	**NTM**	**2019**	**P/S**
RXN	REXNORD CORP	22%	5%	86%	52%	39%	34%
CR	CRANE CO	-5%	8%	74%	43%	33%	24%
WTS	WATTS WATER TECHNOLOGIES INC	2%	16%	58%	74%	58%	34%
ROLL	RBC BEARINGS INC	100%	100%	100%	100%	100%	100%
KMT	KENNAMETAL INC	80%	10%	63%	60%	33%	21%

Figure 19: Composite valuation, % of max

Source: FactSet, IMCP

Figure 20: Composite relative valuation



Source: FactSet, IMCP

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was also used to value RXN.

For the purpose of this analysis, the company's cost of equity was calculated to be 11.7% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk free rate, as represented by the ten year Treasury bond yield, is 1.90%.
- A ten year beta of 1.20 was utilized since the company has higher risk than the market.
- A long term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 11.7% (1.90 + 1.21 (10.0 – 1.90)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $0.99 and $4.10, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $4.17 per share. Thus, stage one of this discounted cash flow analysis contributes $4.17 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 11.7% cost of equity. I assume 4% sales growth in 2022, and constant growth at 4% to 2026. The ratio sales to NWC will be stable while sales to net fixed assets will rise 5%. NOPAT margin is expected to be essentially flat. Finally, after-tax interest is expected to rise 4% per year as the result of modest increases in borrowing.

Figure 21: FCFE and discounted FCFE, 2020 - 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$ 0.99	$ 4.10	$ 1.62	$ 1.69	$ 1.77	$ 1.85	$ 1.94
Discounted FCFE	$ 0.88	$ 3.29	$ 1.16	$ 1.09	$ 1.02	$ 0.95	$ 0.89

Added together, these discounted cash flows total $5.11.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $1.97 in 2020 to $2.79 in 2026.

Figure 22: EPS estimates for 2020 - 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$ 1.97	$ 2.12	$ 2.36	$ 2.46	$ 2.57	$ 2.68	$ 2.79

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio.

Given the assumed terminal earnings per share of $2.79 and a price to earnings ratio of 14, a terminal value of $21.58 per share is calculated. Using the 11.7% cost of equity, this number is discounted back to a present value of $9.94.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $27.29 per share is calculated (4.17 + 5.11 + 18.01). Given RXN's current price of $32.14, this model indicates that the stock is slightly overvalued.

<u>Scenario Analysis</u>

The value of the stock is difficult to predict because of its cyclicality. Thus, bull and bear scenarios are considered.

My 2026 EPS estimates do not reflect a recession through 2026, but I am also assuming moderate growth from today. Assuming today's EPS is "normal", then so it 2020's. Thus, we need a normal terminal P/E. The 10 year median P/E is 14, which seems appropriate as it is a sufficient discount to the S&P 500's 16-17 P/E for this somewhat mature and cyclical firm.

Figure 23: RXN Base Case

Summary (using P/E multiple for terminal value)		
First stage	$4.17	Present value of first 2 year cash flow
Second stage	$5.11	Present value of year 3-7 cash flow
Third stage	$18.00	Present value of terminal value P/E
Value (P/E)	**$27.29**	

Source: IMCP

In a bullish scenario RXN's P/E would rise to 18, if some of its growth initiatives materialize and the economy continues without a recession. Growth ticks up to 6% and beta drops to 1.0. These estimates, coupled with a higher sales growth rate, would result in a value of $36.87.

Figure 24: RXN Bull Scenario

Summary (using P/E multiple for terminal value)		
First stage	$4.29	Present value of first 2 year cash flow
Second stage	$4.24	Present value of year 3-7 cash flow
Third stage	$28.35	Present value of terminal value P/E
Value (P/E)	**$36.87**	

Source: IMCP

In a bearish scenario, RXN's P/E could fall to as low as 10, if people believe a recession is on the horizon. Beta rises to 1.41, up 0.2 from the base. These changes, plus slower sales growth of 2%, would result in a value of $24.81.

Figure 25: RXN Bear Scenario

Summary (using P/E multiple for terminal value)		
First stage	$4.07	Present value of first 2 year cash flow
Second stage	$5.80	Present value of year 3-7 cash flow
Third stage	$10.55	Present value of terminal value P/E
Value (P/E)	**$20.41**	

Source: IMCP

Business Risks

The following risks present potential hurdles to Rexnord's business, and could adversely affect it going forward.

Competitive marketplace:

Both of Rexnord's business segments operate in highly competitive markets. Several competitors have achieved substantially more market penetration in certain areas of the markets that Rexnord operates in. Several competitors are also markedly larger and can afford to adopt more aggressive sales policies and devote greater resources to development, promotion, and sales of products.

Economic and market volatility

Rexnord has experienced adverse effects from volatility and weakness in the global economy and financial markets. A weakening of the current conditions or a future downturn may adversely affect RXN's future operations and financial conditions.

Petroleum volatility

Many of RXN's products are used in the energy, mining and cement markets. Lower prices and volatility of petroleum-related products and certain other mined raw materials have historically adversely affected these industries. This, in turn, could reduce demand for Rexnord's product offerings in these areas.

International business dealings

A fair portion of RXN's sales are international. Approximately 29% of net sales in fiscal 2019 originated outside of the U.S. As such, tariff increases and trade wars or other retaliatory or trade protection measures present significant risk to RXN's sales and margins.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

Capital requirements for manufacturing processes is high. New entrants also face hurdles such as conforming to environmental production standards, establishing brand loyalty, and utilizing the latest in manufacturing technology.

Threat of Substitutes – Moderate

Many companies produce comparable product offerings in Rexnord's industrial machinery and water management segments. OEM's could choose to transition to competing firms if needed.

Supplier Power – Low

Rexnord is a price taker. Commodity prices tend to rise or fall, and manufacturing firms are forced to accept the fluctuating costs of such commodities.

Buyer Power – Moderately High

Buyer contracts can represent a large percentage of the firm's business. Due to the ability to move between sellers without great difficulty, a buyer has the ability to significantly influence Rexnord. Brand loyalty plays a large role in maintaining a good relationship, but can still be insufficient to maintain a contract.

Intensity of Competition – High

Competition is fierce. Brand loyalty helps combat some of the competition, but it does not alleviate it completely.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Specialization of products Customer loyalty Focus on innovation	Consolidation costs Gross margins Global sales
Opportunities	**Threats**
Acquisitions abroad Increasing margins Restructuring	International Uncertainty Tariffs and trade wars Buyer's sourcing

Appendix 3: Income Statement

Items	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20E	Mar-21E
Sales	$2,050	$1,924	$1,919	$1,851	$2,051	$2,117	$2,201
Direct costs	1,359	1,316	1,284	1,174	1,296	1,338	1,391
Gross Margin	691	608	636	677	755	779	810
SG&A, R&D, and other	475	399	413	394	433	440	480
EBIT	217	209	222	283	322	339	330
Interest	88	91	79	70	65	34	31
EBT	129	118	144	212	257	304	300
Taxes	17	17	8	(20)	53	63	62
Income	112	101	136	232	203	241	237
Other	20	31	62	25	14	35	15
Net income	92	69	74	207	189	206	222
Basic Shares	101.5	100.8	102.8	103.9	104.6	104.6	104.6
Fully Diluted Shares	104.7	103.3	104.6	109.2	119.2	119.2	119.2
EPS	$0.90	$0.69	$0.72	$1.99	$1.81	$1.97	$2.12
EPS Fully Diluted	$0.88	$0.67	$0.71	$1.89	$1.59	$1.73	$1.86
DPS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

Appendix 4: Balance Sheet

Items	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20E	Mar-21E
Cash	370	485	490	193	293	231	511
Operating assets ex cash	755	692	688	805	690	712	741
Operating assets	1,125	1,176	1,178	998	983	943	1,252
Operating liabilities	431	404	400	454	397	410	426
NOWC	694	772	778	544	586	534	826
NOWC ex cash (NWC)	324	287	288	350	293	303	315
NFA	2,286	2,179	2,361	2,428	2,277	2,405	2,201
Invested capital	*$2,981*	*$2,950*	*$3,139*	*$2,972*	*$2,863*	*$2,939*	*$3,027*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$3,412*	$3,355	$3,539	*$3,426*	*$3,260*	*$3,349*	*$3,453*
Short-term and long-term debt	$1,924	$1,900	$1,623	$1,356	$1,238	$1,118	$996
Other liabilities	506	463	462	405	395	385	373
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	551	588	1,054	1,211	1,230	1,436	1,658
Total supplied capital	*$2,981*	*$2,951*	*$3,139*	*$2,972*	*$2,863*	*$2,939*	*$3,027*
Total liabilities and equity	*$3,412*	*$3,355*	$3,539	*$3,426*	*$3,260*	*$3,349*	*$3,453*

Appendix 5: Sales Forecast

Items	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20	Mar-21	Mar-22
Sales	2,050	1,924	1,919	1,851	2,051	2,117	2,201
Growth		*-6.1%*	*-0.3%*	*-3.5%*	*10.8%*	*3.2%*	*4.0%*
Process & Motion Control	1,230	1,100	1,135	1,241	1,381	1,425	1,482
Growth		*-10.6%*	*3.2%*	*9.3%*	*11.3%*	*3.2%*	*4.0%*
% of sales	*60.0%*	*57.2%*	*59.1%*	*67.0%*	*67.3%*	*67.3%*	*67.3%*
Water Management	820	824	784	610	670	691	719
Growth		*0.5%*	*-4.9%*	*-22.2%*	*9.8%*	*3.2%*	*4.0%*
% of sales	*40.0%*	*42.8%*	*40.9%*	*33.0%*	*32.7%*	*2.0%*	*32.7%*
Total	100.0%	100.0%	89.2%	100.0%	100.0%	100.0%	100.0%
United States	1,380	1,307	1,363	1,447	1,553	1,602	1,666
Growth		*-5.3%*	*4.3%*	*6.1%*	*7.4%*	*3.2%*	*4.0%*
% of sales	*67.3%*	*67.9%*	*71.0%*	*78.2%*	*75.7%*	*75.7%*	*75.7%*
Europe	374	371	219	256	328	338	351
Growth		*-0.9%*	*-41.0%*	*16.7%*	*28.2%*	*3.2%*	*4.0%*
% of sales	*18.2%*	*19.3%*	*11.4%*	*13.8%*	*16.0%*	*16.0%*	*16.0%*
Rest of world	296	246	130	149	170	176	183
Growth		*-16.9%*	*-47.0%*	*14.6%*	*13.9%*	*3.2%*	*4.0%*
% of sales	*14.4%*	*12.8%*	*6.8%*	*8.1%*	*8.3%*	*8.3%*	*8.3%*

Appendix 6: Ratios

Items	Mar-15	Mar-16	Mar-17	Mar-18	Mar-19	Mar-20E	Mar-21E
Profitability							
Gross margin	33.7%	31.6%	33.1%	36.6%	36.8%	36.8%	36.8%
Operating (EBIT) margin	10.6%	10.9%	11.6%	15.3%	15.7%	16.0%	15.0%
Net profit margin	4.5%	3.6%	3.9%	11.2%	9.2%	9.7%	10.1%
Activity							
NFA (gross) turnover		0.86	0.85	0.77	0.87	0.90	0.96
Total asset turnover		0.57	0.56	0.53	0.61	0.64	0.65
Liquidity							
Op asset / op liab	2.61	2.91	2.94	2.20	2.48	2.30	2.94
NOWC Percent of sales		38.1%	40.4%	35.7%	27.5%	26.4%	30.9%
Solvency							
Debt to assets	56.4%	56.6%	45.8%	39.6%	38.0%	33.4%	28.8%
Debt to equity	349.2%	323.1%	154.0%	112.0%	100.7%	77.8%	60.1%
Other liab to assets	14.8%	13.8%	13.1%	11.8%	12.1%	11.5%	10.8%
Total debt to assets	71.2%	70.4%	58.9%	51.4%	50.1%	44.9%	39.6%
Total liabilities to assets	83.9%	82.5%	70.2%	64.7%	62.3%	57.1%	52.0%
Debt to EBIT	8.88	9.08	7.30	4.79	3.85	3.30	3.02
EBIT/interest	2.46	2.29	2.83	4.02	4.95	9.91	10.77
Debt to total net op capital	64.6%	64.4%	51.7%	45.6%	43.2%	38.0%	32.9%
ROIC							
NOPAT to sales	9.2%	9.3%	10.9%	16.7%	12.4%	12.7%	11.9%
Sales to NWC		6.30	6.68	5.80	6.37	7.10	7.13
Sales to NFA		0.86	0.85	0.77	0.87	0.90	0.96
Sales to IC ex cash		0.76	0.75	0.68	0.77	0.80	0.84
Total ROIC ex cash		7.0%	8.2%	11.4%	9.5%	10.2%	10.0%
NOPAT to sales	9.2%	9.3%	10.9%	16.7%	12.4%	12.7%	11.9%
Sales to NOWC		2.62	2.48	2.80	3.63	3.78	3.24
Sales to NFA		0.86	0.85	0.77	0.87	0.90	0.96
Sales to IC		0.65	0.63	0.61	0.70	0.73	0.74
Total ROIC		6.0%	6.9%	10.1%	8.7%	9.2%	8.8%
NOPAT to sales	9.2%	9.3%	10.9%	16.7%	12.4%	12.7%	11.9%
Sales to EOY NWC	6.33	6.70	6.67	5.28	6.99	6.99	6.99
Sales to EOY NFA	0.90	0.88	0.81	0.76	0.90	0.88	1.00
Sales to EOY IC ex cash	0.79	0.78	0.72	0.67	0.80	0.78	0.87
Total ROIC using EOY IC ex	7.2%	7.3%	7.9%	11.1%	9.9%	9.9%	10.4%
NOPAT to sales	9.2%	9.3%	10.9%	16.7%	12.4%	12.7%	11.9%
Sales to EOY NOWC	2.95	2.49	2.47	3.41	3.50	3.97	2.67
Sales to EOY NFA	0.90	0.88	0.81	0.76	0.90	0.88	1.00
Sales to EOY IC	0.69	0.65	0.61	0.62	0.72	0.72	0.73
Total ROIC using EOY IC	6.3%	6.1%	6.7%	10.4%	8.9%	9.1%	8.6%
ROE							
5-stage							
EBIT / sales		10.9%	11.6%	15.3%	15.7%	16.0%	15.0%
Sales / avg assets		0.57	0.56	0.53	0.61	0.64	0.65
EBT / EBIT		56.3%	64.7%	75.1%	79.8%	89.9%	90.7%
Net income /EBT		58.8%	51.5%	97.2%	73.7%	67.7%	74.2%
ROA		2.0%	2.1%	5.9%	5.7%	6.2%	6.5%
Avg assets / avg equity		5.94	4.20	3.08	2.74	2.48	2.20
ROE		12.2%	9.0%	18.2%	15.5%	15.5%	14.4%
3-stage							
Net income / sales		3.6%	3.9%	11.2%	9.2%	9.7%	10.1%
Sales / avg assets		0.57	0.56	0.53	0.61	0.64	0.65
ROA		2.0%	2.1%	5.9%	5.7%	6.2%	6.5%
Avg assets / avg equity		5.94	4.20	3.08	2.74	2.48	2.20
ROE		12.2%	9.0%	18.2%	15.5%	15.5%	14.4%
Payout Ratio		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retention Ratio		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sustainable Growth Rate		12.2%	9.0%	18.2%	15.5%	15.5%	14.4%

Appendix 7: DCF Model

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*3.2%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*
NOPAT / S	*12.7%*	*11.9%*	*11.9%*	*11.9%*	*12.0%*	*12.0%*	*12.0%*
S / NWC	*6.99*	*6.99*	*6.99*	*6.99*	*6.99*	*6.99*	*6.99*
S / NFA (EOY)	*0.88*	*1.00*	*1.01*	*1.02*	*1.03*	*1.04*	*1.05*
S / IC (EOY)	*0.78*	*0.87*	*0.88*	*0.89*	*0.90*	*0.91*	*0.91*
ROIC (EOY)	*9.9%*	*10.4%*	*10.5%*	*10.6%*	*10.7%*	*10.8%*	*11.0%*
ROIC (BOY)		*9.7%*	*10.8%*	*10.9%*	*11.1%*	*11.2%*	*11.3%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$2,117	$2,201	$2,289	$2,381	$2,476	$2,575	$2,678
NOPAT	$268	$261	$272	$284	$296	$308	$321
Growth		*-2.5%*	*4.2%*	*4.2%*	*4.2%*	*4.2%*	*4.2%*
- Change in NWC	9	12	13	13	14	14	15
NWC EOY	*303*	*315*	*327*	*341*	*354*	*368*	*383*
Growth NWC		*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*
- Chg NFA	128	-204	65	68	70	72	75
NFA EOY	*2,405*	*2,201*	*2,267*	*2,334*	*2,404*	*2,476*	*2,551*
Growth NFA		*-8.5%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
Total inv in op cap	138	-192	78	81	83	86	89
Total net op cap	2708	2516	2594	2675	2758	2845	2934
FCFF	$130	$453	$195	$203	$213	$222	$232
% of sales	*6.2%*	*20.6%*	*8.5%*	*8.5%*	*8.6%*	*8.6%*	*8.7%*
Growth		*247.8%*	*-57.1%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*
- Interest (1-tax rate)	27	24	25	26	27	28	30
Growth		*-10.3%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*	*4.0%*
FCFE w/o debt	$103	$429	$169	$177	$185	$194	$203
% of sales	*4.9%*	*19.5%*	*7.4%*	*7.4%*	*7.5%*	*7.5%*	*7.6%*
Growth		*315.4%*	*-60.5%*	*4.6%*	*4.6%*	*4.6%*	*4.6%*
/ No Shares	104.6	104.6	104.6	104.6	104.6	104.6	104.6
FCFE	$0.99	$4.10	$1.62	$1.69	$1.77	$1.85	$1.94
Growth		*315.4%*	*-60.5%*	*4.6%*	*4.6%*	*4.6%*	*4.6%*
* Discount factor	0.90	0.80	0.72	0.64	0.58	0.51	0.46
Discounted FCFE	$0.88	$3.29	$1.16	$1.09	$1.02	$0.95	$0.89
Third Stage							
Terminal value P/E							
Net income	$206	$222	$247	$258	$269	$280	$292
% of sales	*9.7%*	*10.1%*	*10.8%*	*10.8%*	*10.8%*	*10.9%*	*10.9%*
EPS	$1.97	$2.12	$2.36	$2.46	$2.57	$2.68	$2.79
Growth		*7.8%*	*11.3%*	*4.2%*	*4.2%*	*4.2%*	*4.2%*
Terminal P/E							14.00
* Terminal EPS							$2.79
Terminal value							$39.06
* Discount factor							0.46
Discounted terminal value							$18.00

Summary (using P/E multiple for terminal value)

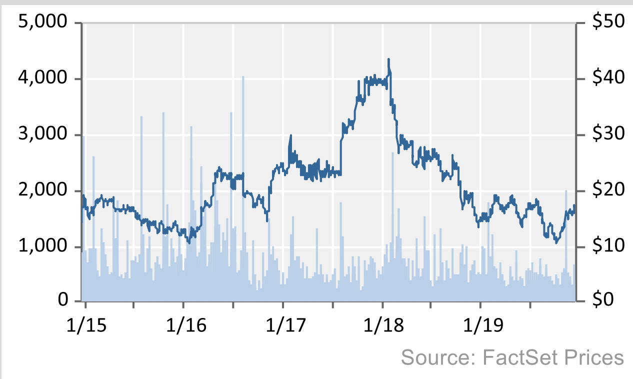
First stage	$4.17	Present value of first 2 year cash flow
Second stage	$5.11	Present value of year 3-7 cash flow
Third stage	$18.00	Present value of terminal value P/E
Value (P/E)	**$27.29**	

Recommendation: Hold				
Current Price	**$16.02**	---	Ticker	MTW
1 Year Bear	$14	*-9.5%*	Sh. Out ($M)	35.3
1 Year Base	**$17**	***8.3%***	M.Cap. ($M)	611.5
1 Year Bull	$21	*29.0%*	EV ($M)	958.5

Industrials, Crane Construction

Manitowoc Company, Inc.

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	8.2%	-25.1%	-56%	13.3%	17.1%	21.8%	17.0%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**1.87**	**1.61**	**1.58**	**1.85**	**1.86**	**1.76**	**1.83**
Gr. %	*-52%*	*-13.5%*	*-2.0%*	*16.8%*	*0.8%*	*-5.5%*	*3.8%*
v. Cons.	-	-	-	-	-	*-7.2%*	*4.9%*
Ind.	*-13%*	*-10.7%*	*-5.2%*	*10.9%*	*-4.1%*	*5.9%*	*6.6%*
EPS	**1.86**	**(10.9)**	**0.27**	**(1.89)**	**1.64**	**1.35**	**1.67**
Gr. %	*-55%*	*-666%*	*102%*	*-814%*	*173%*	*-18.1%*	*24.8%*
v. Cons.	-	-	-	-	-	*-21.1%*	*20.4%*
Ind.	*-17%*	*-38.4%*	*-1.6%*	*24.2%*	*16.5%*	*-36.3%*	*18.1%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**1.8%**	**-23.3%**	**0.6%**	**-3.6%**	**2.6%**	**2.3%**	**2.8%**
Ind.	*4.3%*	*-3.1%*	*4.3%*	*3.2%*	*3.3%*		
ROE	*-8.4%*	*-52.5%*	*1.5%*	*-10.5%*	*8.0%*	*6.3%*	*7.3%*
Ind.	*6.6%*	*-1.3%*	*5.4%*	*7.8%*	*10.4%*		
ROA	*-1.9%*	*-14.8%*	*0.6%*	*-4.3%*	*3.1%*	*2.5%*	*3.1%*
Ind.	*5.4%*	*1.2%*	*2.6%*	*3.1%*	*5.2%*		
A T/O	0.51	0.64	1.01	1.17	1.19	1.11	1.14
A/E	4.43	3.55	2.46	2.46	2.55	2.46	2.32

Valuation

	2014	2015	2016	2017	2018	2019F	2020F
P/E	20.6	31.9	0	150.0	0	13.0	14.2
Ind.	11.7	6.5	51.4	18.2	10.7	17.4	14.5
P/S	0.78	1.12	0.51	0.89	0.28		
P/B	3.63	2.49	1.42	2.05	0.87		
P/CF	30.9	20.7	0.7	0	0		
EV/EBITDA	10.7	42.0	62.8	20.5	5.6		
D/P	*0.4%*	*0.5%*	*0.0%*	*0.0%*	*0.0%*		

Summary

I recommend a neutral rating with a target of $17. Although MTW has an opportunity to dramatically improve sales, increase margins, and expand internationally. MTW revenue is highly dependent on the economy. The uncertainty with the economy seriously offsets my optimism that the core business can greatly improve. The stock is fairly valued based on relative and DCF analysis.

Key Drivers

- International expansion: Over 50% of MTW's revenue come from international business. Greater international expansion will allow MTW to introduce new products in multiple end markets.
- Increased costs in raw materials: Tariffs have played a big part in dictating MTW's recent sales. Orders dropped 16% during 2019 due to increased tariff costs.
- Competition: MTW operates in a very competitive industry. MTW has a competitive advantage by operating in all crane end markets.
- Macroeconomic trends: Construction is highly dependent on economic conditions. The economy appears late cycle, but manufacturing is recently bottoming.

Valuation

Using a relative valuation approach, MTW appears to be fairly valued in comparison to the industrial industry. DCF analysis implies that the stock is worth $16. A combination of the approaches suggests that MTW is fairly valued, as the stock's value is about $17 and the shares trade at $16.02.

Risks

- Economic downturns adversely affecting MTW's revenue
- Large or rapid increase in prices or tariffs on raw materials
- Competitors introducing new products in specific end markets

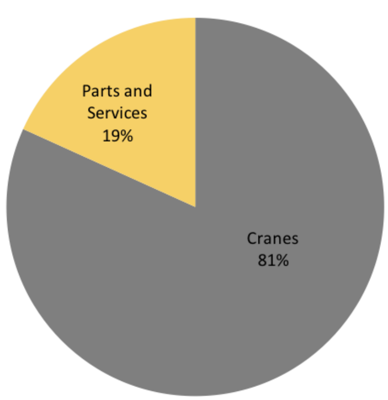
Company Overview

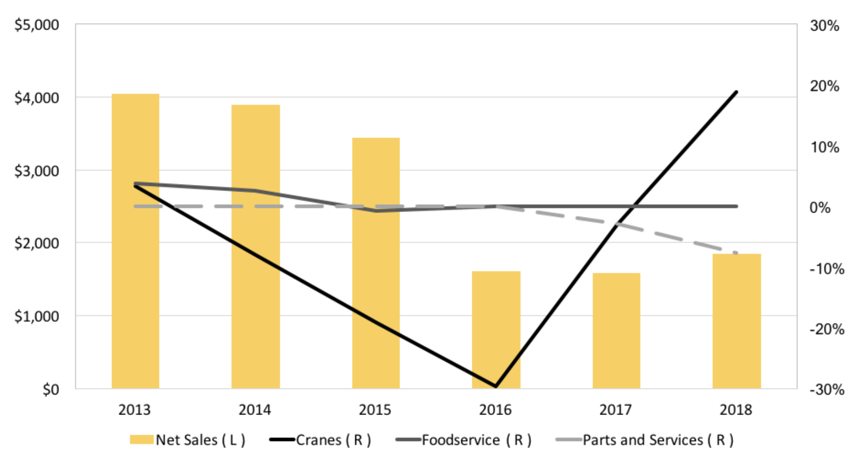
The Manitowoc Company, Inc. (MTW) is an industrial company engaged in designing, manufacturing, distributing, and supporting one of the most comprehensive lines of mobile telescopic cranes, tower cranes, lattice-boom crawler cranes and boom trucks. On February 11, 2016, MTW announced the separation of the company's crane and foodservice businesses into two independent, publicly traded companies. MTW serves a wide variety of customers, including dealers, rental companies, contractors, and government entities. Its crane products are principally marketed under the Manitowoc, Grove, Potain and National Crane brand names. The firm's operations take place in the Americas, Europe, Africa, the Middle East, and the Asia Pacific regions. MTW was founded in 1902 and its headquarters are located in Milwaukee, Wisconsin.

MTW generates 81% of its revenue from cranes and 19% of its total revenue from aftermaket parts sales and revenue from CraneCare services such as training and field service work. Before the separation of the crane and foodservice industries, cranes accounted for approximately 60% of the company's revenue, while the foodservice accounted for approximately 40%.

- Crane revenue is primarily generated through the sale of new and used cranes. Crane sales have improved from 2015 to 2018, increasing 38%. Crane sales are generated through Grove Mobile Telescoping Cranes, Manitowoc Lattice Boom Crawler Cranes, National Crane Boom Trucks, Potain Tower Cranes, and Shuttlelift Carrydeck Cranes.
- Aftermarket part sales are generated through the sale of new and used parts to end customers and distributors. MTW has three distribution centers allowing access to the Americas, Europe and Asia Pacific.
- Other revenues consist of repair and field work as well as training and technical publications.

Figures 1 & 2: Revenue (in millions) by segments in 2018 (left) and revenue history (in millions) since 2013 (right)





Source: Company reports

Business/Industry Drivers

Though several factors may contribute to The Manitowoc Company's future success, the following are the most important business drivers:

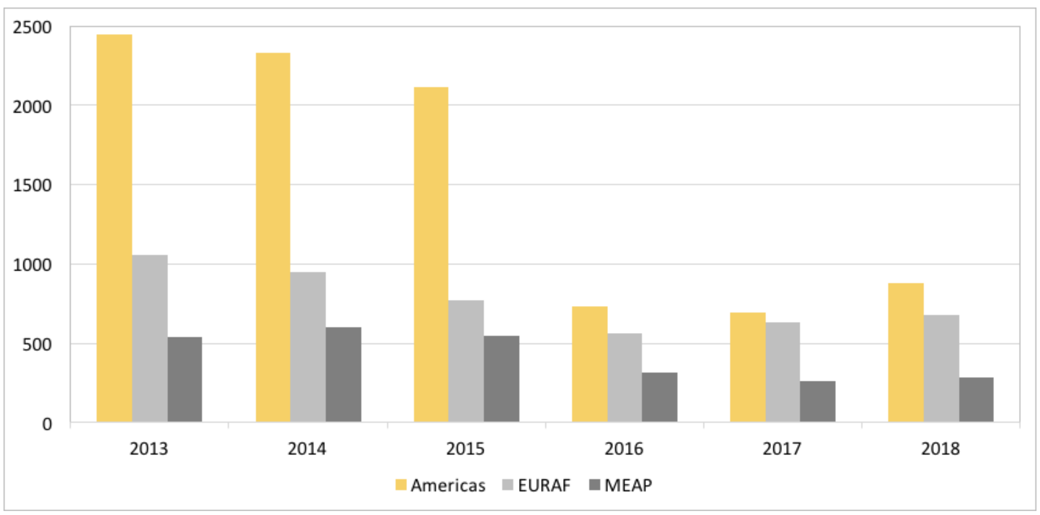
1) International expansion
2) Increase in the cost of raw materials
3) Competitor analysis
4) Macroeconomic trends

International Expansion

MTW has operations throughout the world. The firm has four manufacturing facilities in the Americas, while there are 11 facilities located in the EURAF comprised of Europe and Africa, and three facilities in the MEAP comprised of the Middle East and Asia Pacific. MTW first expanded its operations to Europe in 1917. The Americas segment makes up approximately 47% of net sales, while EURAF makes up 37% and MEAP 16%. The majority of net sales are generated through the United States and Europe. In 2018, the United States made up 43% of sales while Europe added 36% of sales. 2016 sales fell when the foodservice business was separated but EURAF has risen 22% since then while MEAP is down 10%.

In 2016, America's net sales decreased $1,378 million dropping 65% after the separation of crane and food industries

Figure 3: MTW net sales by region



Source: Company reports

In 2018, Americas' net sales increased 27.3% due to increased crane shipments to the commercial construction and energy end markets. Operating income also increased 765% because of lower restructuring expenses and selling costs due to better utilization of U.S. manufacturing facilities.

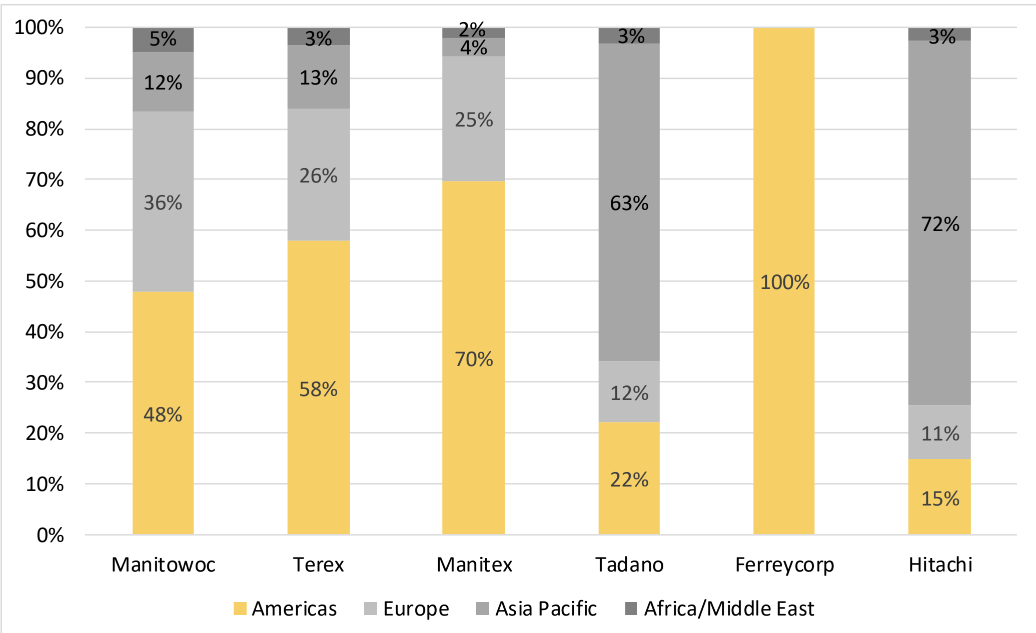
EURAF net sales increased 8.2% in 2018 due to higher demand for cranes in the commercial construction end market. Net sales were favorably impacted by $24.0 million from changes in foreign currency exchange rates. EURAF recorded a non-cash goodwill impairment charge of $82.2 million or $1.80 EPS in 2018. The goodwill impairment charge resulted from a reduction in the estimated fair value of the reporting unit based on the decline in the company's equity market capitalization.

MTW is focused on international expansion rather than expansion in the United States, although, growth in 2018 was higher in US.

MEAP net sales increased 9.5% in 2018 due to shipments of cranes for the commercial construction and energy end markets. Operating income decreased 4.8% in 2018 primarily due to unfavorable geographic product mix within the MEAP segment. The segment also faced an increase of $2.5 million from raw material input costs.

For the years 2018, 2017, and 2016 approximately 57%, 61%, and 60% of MTW's net sales were attributable to products sold outside of the United States. The rise in urbanization and industrialization in developing countries provides opportunities for significant growth. The company has focused on expanding its international sales as a main attribute to its growth strategy; to do this the firm has released five new all-terrain crane models at the beginning of 2018. MTW also plans on introducing five more crane models in February 2020. These models are for construction, industries, utilities and others. Figure 4 shows that the firm is more geographically dispersed than other US based firms (Terex, Manitex, and Ferrerycorp).

Figure 4: Revenue percentage by region among competitors

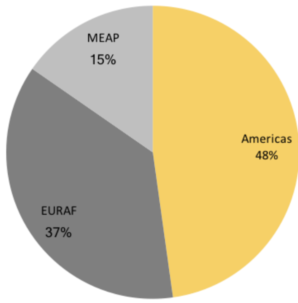


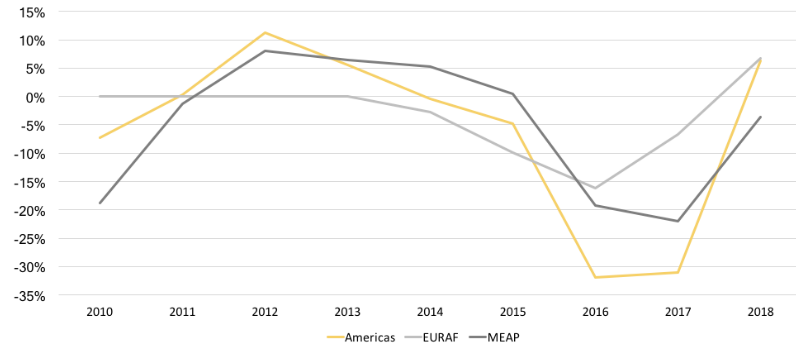
Source: Company reports

MTW's 5-yr Sales CAGR: -14.5%

Asia Pacific is the firm's largest international opportunity, which is attributable to China and the development of Vietnam and Australia. Europe is the second largest market for all-terrain cranes and accelerated spending on infrastructure has fueled the 2018 growth from negative rates in 2017. However, 2019 growth is flat due to a slowing market.

Figures 5 & 6: Revenue (in millions) by region in 2018 (left) and 3Y CAGR (right)





Source: Company reports

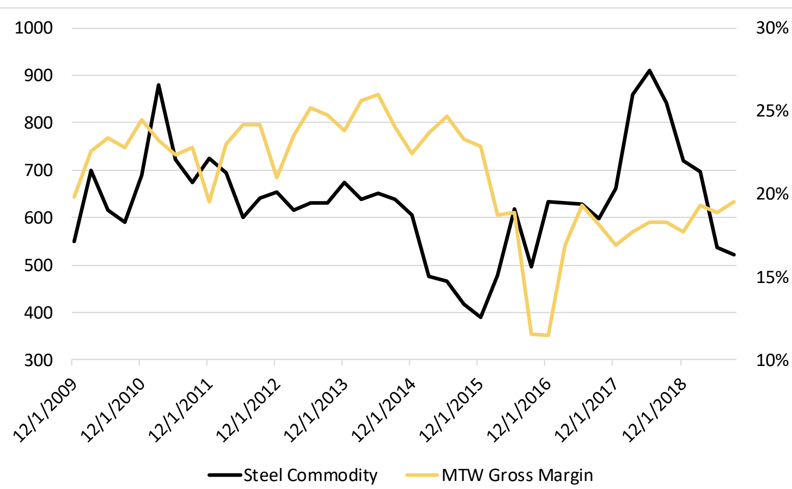
Increase in costs of Raw Materials

MTW uses large amounts of steel in the manufacturing of its products, and tariffs significantly impact the price of steel. On March 1, 2018, the Trump Administration announced steel tariffs of 25% and aluminum tariffs of 10%. The price of raw steel ranges between $700-800 per ton. By implementing 25% tariffs, the price of raw steel increases by $175-200 per ton.

This directly impacts gross margin negatively. Although, tariffs are less of a concern for MTW as very few of its suppliers operate in China, and its leading supplier (DAN) operates in the US. MTW operates ten manufacturing facilities which involves the fabrication and machining of raw materials, primarily steel, which are then manufactured into sub-assemblies. Historical evidence from the 2002 steel tariffs shows that tariffs raise prices and reduce available quantities of goods and services for US businesses and consumers, which causes lower income, reduced employment, and lower economic output. Thus, MTW's topline also slows as a result of tariffs.

For the first half of 2019, MTW saw orders drop 16% to 813 million. The trade war is correlated with slowing US and European construction markets. Despite the tariffs, steel prices are down in 2018 because of the slowing economy. Steel prices rose 69% from 2015 to 2017. Following the implementation of tariffs, steel prices have decreased 16% due to the slowing economy.

Figures 7: Steel commodity index price compare to MTW gross margin

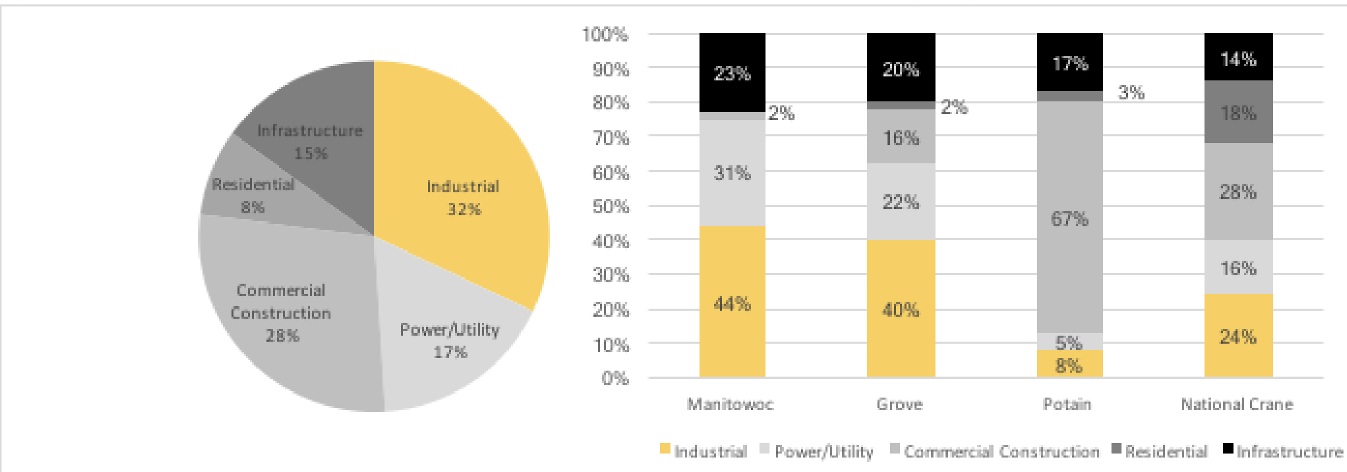


More than 2,500 companies have asked the Trump administration for tariff exclusions on Chinese imports. From 2016 to 2018 the cost of raw material for MTW has risen 46%. Although in 2018, raw material costs only increased 30% from 2017.

Competitor Analysis

The Manitowoc Company sells its products in a highly competitive industry where customers select based on product design and aftermarket product sales and support services. The Manitowoc Company operates in multiple end markets. One of its primary markets is mobile telescopic cranes, which have the versatility to lift materials and equipment on rough or uneven terrains and can be transported at highway speeds. MTW also has tower cranes that are primarily utilized in energy, building, and construction industries. Lattice-boom cranes are another specialized end market product which are utilized for heavy construction, particularly on bridge and highway duties. With these products, MTW operates in all crane segments, which is a competitive advantage.

Figure 8 & 9: MTW end market percentage (left); MTW brand end market percentage (right)



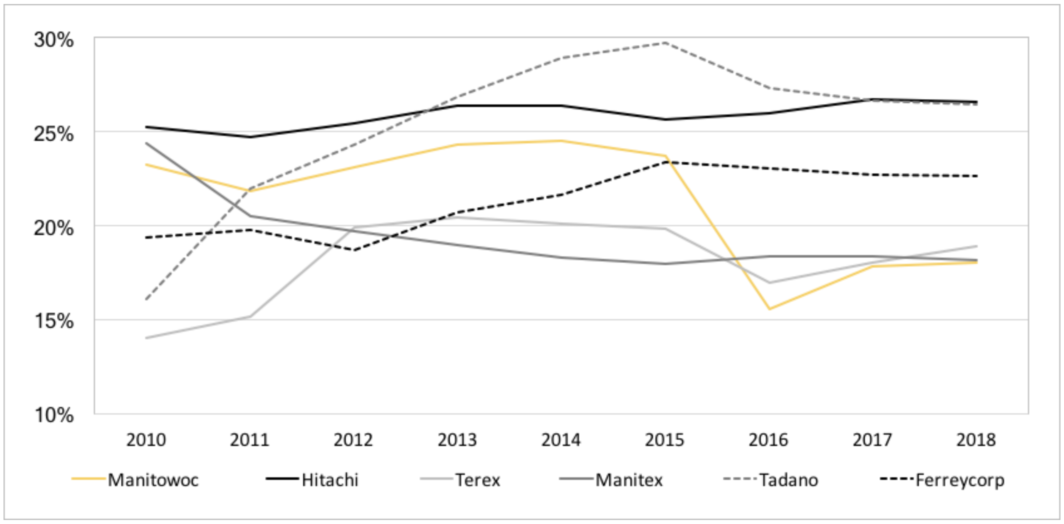
Source: Company reports

The firm has four recognized brands: Grove Shuttlelift, Potain, Manitowoc, and National Crane. MTW operates in six key industries consisting of industrial factories, petrochemical energy sources, commercial construction, power and utilities for energy and building construction, infrastructure, and residential. Manitowoc and Grove specialize in industrial, infrastructure, and power and utilities industries. Potain focuses on commercial construction industries, while National Crane targets all five of the industries.

MTW's low margins are highly attributable due to change of management in 2015. When Barry Pennypacker took over, MTW was required to restructure in order to survive the cyclical bottom. MTW shed almost 1,400 works and closed numerous plants. There was a deterioration in its reputation, quality and reliability, which allowed its competition to take some of its market share. Since taking over, Pennypacker has attributed the company's recent gains as a result of an accelerated product development program. MTW has changed its product plan allowing for them to spend less on research and development than they had in previous recession cycles.

MTW gross margin decreased from 23.7% in 2015 to 15.6% in 2016 following separation of company segments

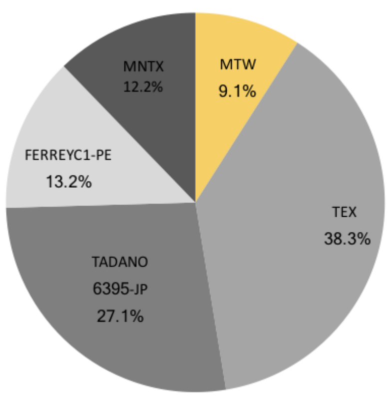
Figure 10: Gross Margin among MTW and Comps

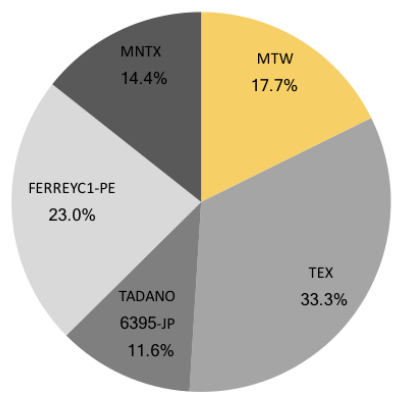


Source: FactSet

Figure 8 shows MTW and its competitors' gross margin. In 2016, MTW's gross margin fell to 8% due to the separation of the foodservice industry. Since 2016, gross margin rose to 10% but it is low versus the industry. Investors recognize this, as is reflected in the fact that its share of market cap (figure 10) is much less than its share of sales (figure 11). Hitachi was left out of this comparison due to its large market cap compared to the industry.

Figures 11 and 12: Industry concentration by market cap (left) vs. sales (right)





Source: FactSet, Analyst Computations

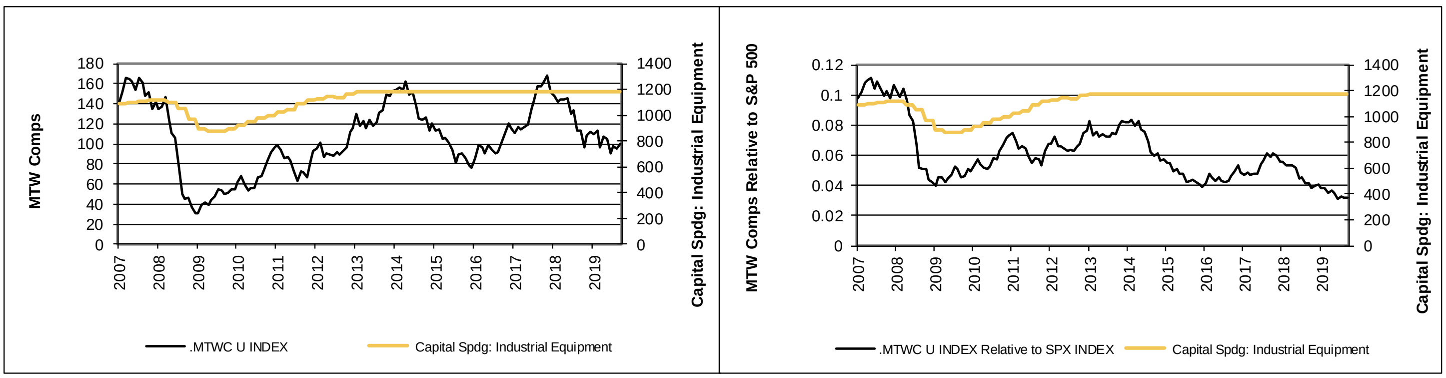
<u>Macroeconomic Trends</u>

The Manitowoc Company operates in a very cyclical sector which is very dependent on construction spending. From October 2007 to March 2009, the sector lost 62% while the S&P 500 lost 55%. Although, from the depth of the recession to today, the comps returned 164% compared to 132% for the S&P 500. Demand for construction equipment for infrastructure build-out in emerging market nations is rapidly rising.

Demand for its products are highly dependent on economic conditions. MTW also depends on federal, state, and local foreign governmental spending and appropriations including infrastructure, security, and defense. Sales are dependent on replacement and repair cycles for customers. Adverse economic conditions may cause customers to forego or postpone new products in favor of repairing existing machinery.

Over the last year as the economy slowed, MTW reached a 52-week low of $11.18. I expect MTW to continue to struggle, until the economy recovers. Throughout 2019, the global PMI has recorded five months' below 50.0. This year has led to reduced job growth in the manufacturing sector, adding an average of 6,000 jobs per month in 2019, compared to an average of 22,000 jobs per month in 2018. Another constraint to continuing manufacturing's momentum has been the uncertainty in tariffs and their impact on trade flows. I expect this uncertainty involving tariffs to continue into 2020.

Figures 13 and 14: Industrial equipment compared to MTW comps (left) and industrial equipment compared to MTW comps relative to the S&P 500 index (right)



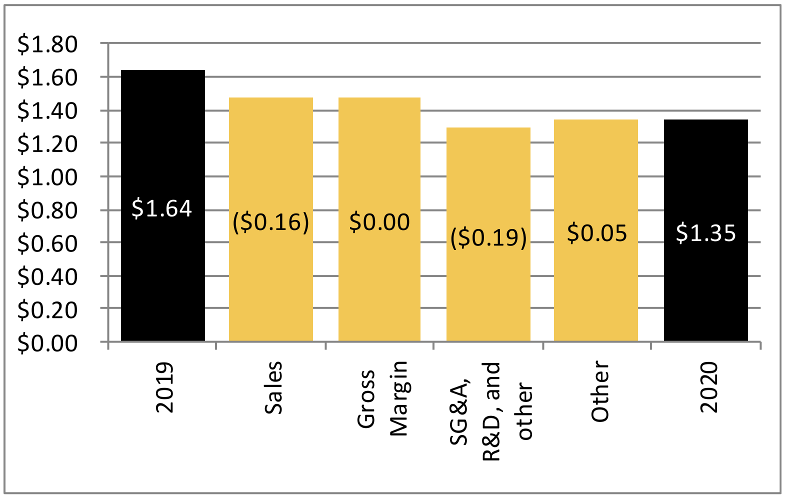
Source: Bloomberg, IMCP

Financial Analysis

<u>Quantification of Drivers</u>

I anticipate EPS to decrease to $1.35 in FY 2020. Declining economic conditions and the slowing construction market should decrease sales and SG&A should rise as a percent of sales, causing $0.16 and $0.19 drops to EPS. Global economic growth has slowed considerably this year and I expect the same for 2020. Tariffs have affected raw materials specifically steel and aluminum. Finally, I forecast that a decrease in interest expense will add $0.05 to EPS.

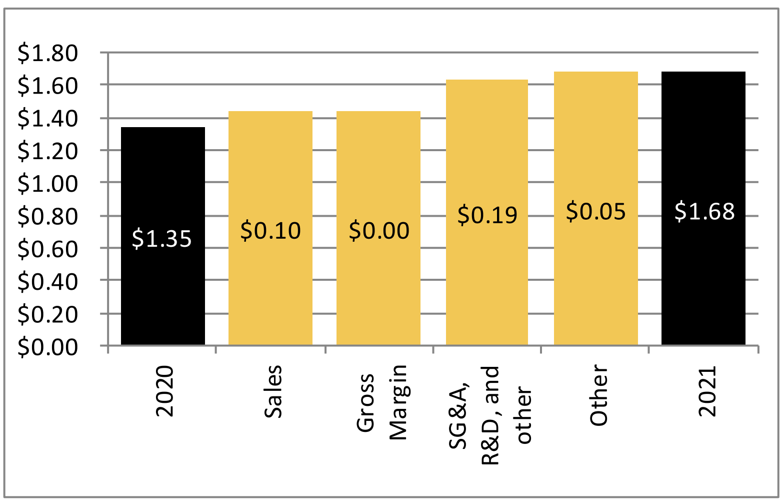
Figure 15: Quantification of 2020 EPS Drivers



Source: Company Reports, IMCP

I expect 2021 EPS to increase $0.33 to $1.68. MTW will gain $0.10 of earnings from increased sales. I anticipate further expansion in Europe and developing expansion in the Asia Pacific leading to increased sales internationally. I expect SG&A to rise less than sales, so lower SG&A as a percent of sales bumps up EPS by $0.19.

Figure 16: Quantification of 2021 EPS Drivers



Source: Company Reports, IMCP

I am slightly more optimistic than consensus estimates for 2020 and 2021. In 2020, I expect EPS to drop 18.1% and sales to drop 5.5%, versus -21.0% and -7.2% for consensus. However, I anticipate stronger growth in 2021, but not as high as consensus, driven primarily by MTW's introduction of crane models, and its continued emphasis of international expansion. Sales for 2020 and 2021 are highly dependent on the economic factors.

Figure 17: Model vs. Consensus

My Estimates	2020E	2021E	Consensus	2020E	2021E
EPS	$1.35	$1.68	EPS	$ 1.47	1.77
Growth	-18.1%	24.9%	Growth	-21.0%	20.4%
Sales	$1,761	$1,827	Sales	1729	1813
Growth	-5.5%	3.8%	Growth	-7.2%	4.9%

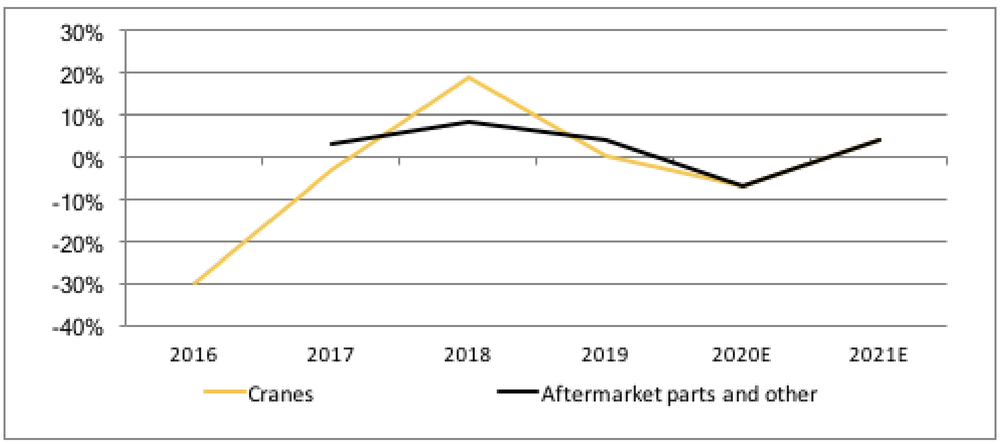
Source: Company Reports, IMCP

Sales Forecast

MTW plans to release five new cranes in February 2020.

MTW's revenue has increased 17% over 2018 to approximately $1.85 billion. 2018 was the first annual increase since splitting from the food division. While I expect better growth ahead, I expect the rate of growth to flatten based on the slowing economy. Aftermarket parts and services rose to 8.4% of total revenue. Aftermarket parts and services are normally a more stable production of revenue. International expansion helped boost sales as EURAF sales increased 8.2% and MEAP sales 9.5%. In 2020 and beyond, MTW sales should rise significantly with the introduction of five new crane models, to increase its total models up to 150. However, due to economic uncertainty, I expect sales to fall from $1.862 billion to $1.749 billion in 2020 for a 5.5% decrease. Then, I expect a 3.8% recovery in 2021.

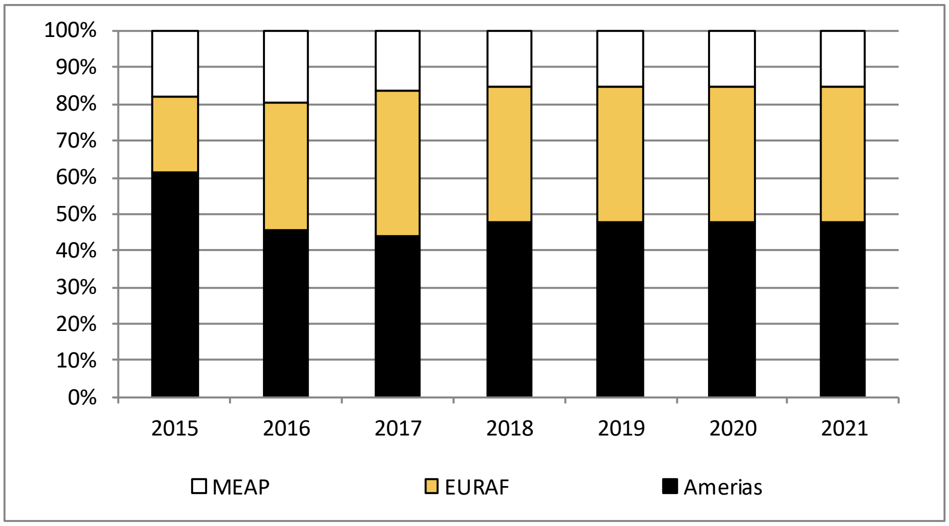
Figure 18: MTW segment percent sales, 2016-2021E



Source: Company Reports, IMCP

International revenue, specifically in the MEAP markets, is expected to decline 7.6% in 2020. Chinese are coming to the Middle East with products that are selling at prices below MTW's material cost. Germany is the world's largest tower crane market. MTW currently has no presence in Germany but is making an effort to build rental fleet in Germany. I expect EURAF to be down 4.3% overall. I expect America's revenue to 5.7% and forecast MEAP to decrease 7.6% in 2020.

Figure 19: Percentage of revenue by region, 2015-2021E



Source: Company Reports, IMCP

Return on Equity

MTW's ROE has been very volatile since 2016. This is primarily because of losses that have recovered. Since 2016, MTW has addressed areas of concern and has more effectively utilized assets. Asset turnover has risen significantly from 0.64 in 2016 to 1.19 in 2019. Going forward in 2020-21, I expect margin changes to be essentially flat, a slight drop in asset utilization, and declining leverage to come down a lot since 2016.

Figure 20: ROE Breakdown, 2016-2021E

5-stage DuPont	2016	2017	2018	2019	2020E	2021E
EBIT / sales	-8.9%	0.5%	-1.0%	6.2%	5.8%	6.2%
Sales / avg assets	0.64	1.01	1.17	1.19	1.11	1.14
EBT / EBIT	187.5%	-470.2%	371.5%	55.0%	51.1%	57.4%
Net income /EBT	140.2%	-23.8%	93.6%	77.5%	77.4%	77.5%
ROA	-14.8%	0.6%	-4.3%	3.1%	2.5%	3.1%
Avg assets / avg equity	3.55	2.46	2.46	2.55	2.46	2.32
ROE	-52.5%	1.5%	-10.5%	8.0%	6.3%	7.3%

Source: Company Reports

Free Cash Flow

NOPAT rose to $90 million in 2019, the first positive NOPAT since the separation of the foodservice business. FCFF per share grew 33.6% to $1.63, as total net operating capital increased 8.2% in 2019. From 2015 to 2016, NFA fell by $1.7 billion or 71%. This is due to the restructuring of the company to focus on improvements to cost to quality to fix issues MTW encountered in the past. My forecast is that NOPAT will remain positive in 2020-21 with about 0% growth. Capital investments are forecasted at $10 million for the two years FCF will be used to pay down about $60 million in debt in 2020 and increase the cash balance by $50 million by 2021.

Figure 21: Free cash flows 2015-2021E

Free Cash Flow	Dec-15	Dec-16	Dec-17	Dec-18	Sep-19	Dec-20	Dec-21
NOPAT	$148	-$197	-$2	-$18	$90	$79	$88
Growth		*-232.7%*	*-98.9%*	*746.8%*	*-599.6%*	*-11.7%*	*10.9%*
NWC*	698	680	647	686	772	731	758
Net fixed assets	2,521	768	817	699	727	734	731
Total net operating capital*	$3,219	$1,448	$1,464	$1,385	$1,499	$1,464	$1,489
Growth		*-55.0%*	*1.1%*	*-5.4%*	*8.2%*	*-2.3%*	*1.7%*
- Change in NWC*		(18)	(33)	40	86	(42)	28
- Change in NFA		(1,753)	49	(118)	28	7	(3)
FCFF*		$1,574	($18)	$61	($24)	$114	$63
Growth			*-101.2%*	*-433.0%*	*-139.3%*	*-579.2%*	*-44.5%*
- After-tax interest expense	85	172	(12)	49	41	39	38
FCFE**		$1,403	($6)	$12	($64)	$75	$26
Growth			*-100.4%*	*293.4%*	*-645.2%*	*217.1%*	*-65.7%*
FCFF per share		$44.60	($2.03)	$1.22	$1.63	$2.97	$1.26
Growth			-104.6%	-160.1%	33.6%	81.9%	-57.7%
FCFE per share		$4.18	($1.20)	$1.20	($0.05)	$0.01	$0.01
Growth			-128.7%	-199.8%	-104.3%	-113.0%	0.0%
* NWC excludes cash							
** No adjustment is made for debt							

Source: Company Reports, IMCP

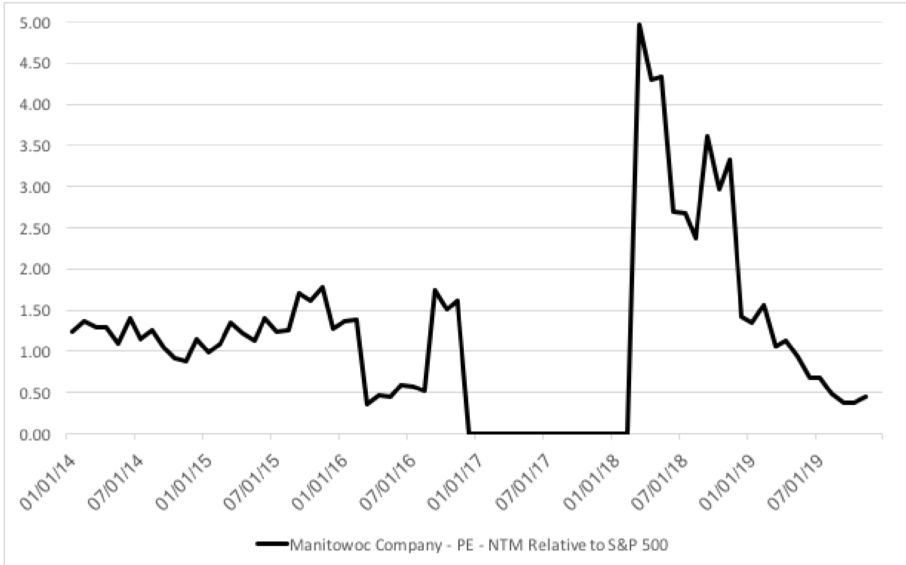
Valuation

MTW was valued using multiples and a 3-stage discounting cash flow model. Based on P/E, the stock is worth $19. Another valuation approach shows MTW to be slightly overvalued based on its fundamentals versus those of its peers in the construction industry. A DCF analysis values MTW at $17. I give the DCF analysis more weight as it considers continued changes to the company. Because of these valuations, I value the stock at $17.

<u>Trading History</u>

MTW's current P/E relative to the S&P 500 has fluctuated considerably over the last decade. Due to negative earnings, its P/E was negative multiple occurrences. MTW had negative earnings following the separation of the foodservice industry. MTW appointed Barry Pennypacker CEO in 2016 after numerous complaints regarding reliability of products. MTW's five-year average P/E is 21, which is much higher than the NTM P/E of 12.2. The higher P/E over the five years reflected the assumption that earnings would recover. The low current NTM P/E reflects the relatively high sales and earnings.

Figure 22: MTW NTM P/E relative to S&P 500



Source: Factset

Assuming the firm maintains a 13 NTM P/E at the end of 2021, it should trade at $17.55 by the end of the year.

- Price = P/E x EPS = 13 x $1.68 = $21.84

Discounting $21.84 back to today at 14.1% cost of equity (explained in Discounted Cash Flow section) yields a price of $18.76. Given economic uncertainty and MTW's low margins, this seems to be a relatively high valuation, possessing bearish anticipations.

<u>Relative Valuation</u>

MTW is currently trading in line with the P/E of its peers, with a 2020 P/E of 11.9 compared to an average of 12.2 for peers. MTW's P/B and P/S ratio is lower than the average of its peers which reflects its lower ROE and net margin. MTW's beta is higher than its peers indicating that the company is very volatile. The average industry expected EPS growth rate is negative in 2020 and positive in 2021, like it is for MTW.

Figure 23: MTW comparable companies

Ticker	Name	Current Market Price	Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
MTW	MANITOWOC CO	$16.02	$566	(1.1)	(1.2)	22.0	5.6	(0.7)	8.5	10.0	-221.3%	-805.8%	-186.9%	-18.1%	24.9%		2.67	54.6%	C	0.00%	
TEX	TEREX CORP	$29.06	$2,072	0.3	(4.1)	10.8	2.8	2.5	5.4	8.5	1815.7%	100.7%	14.0%	-24.6%	15.5%	-6.0%	1.90	146.5%	B	1.57%	377.9%
MNTX	MANITEX INTERNATIONAL INC	$5.33	$105	0.6	(7.3)	(9.2)	(2.7)	(22.6)	(6.2)	10.0	-121.7%	65.0%	-215.2%	-173.7%	82.1%		1.65	63.2%	C	0.00%	
6501-JP	HITACHI	$39.52	$38,186	1.7	0.6	8.3	11.9	33.2	46.2		115.1%	-40.3%	83.0%	21.0%	10.5%	-3.4%	1.23	25.1%		2.09%	39.7%
6395-JP	TADANO LTD	$9.83	$1,245	1.0	1.9	7.8	0.4	(7.9)	6.9	0.0		19.1%	-46.9%	23.3%	17.0%	-4.5%	2.22	14.2%		2.52%	27.5%
FERREYC1-PE	FERREYCORP S.A.A.	$0.61	$598	(2.4)	(2.4)	(1.4)	(5.9)	(10.4)	(18.5)	3.5		-6.9%	3.7%	-3.6%	3.7%	18.5%	1.36	40.3%		5.82%	46.8%
Average			$7,129	0.0	(2.1)	6.4	2.0	(1.0)	7.1	6.4	397.0%	-111.3%	-58.0%	-29.3%	25.6%	1.1%	1.84	57.3%		2.00%	123.0%
Median			$921	0.4	(1.8)	8.0	1.6	(4.3)	6.2	8.5	-3.3%	6.1%	-21.6%	-10.8%	16.2%	-3.9%	1.78	47.5%		1.83%	43.3%
SPX	S&P 500 INDEX	$3,136		(0.3)	1.4	5.3	9.1	19.1	25.1			-23.9%	12.8%	-8.8%	-9.5%						

Ticker	Website	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	NM	OM	ROIC	EV/ EBIT	P/CF Curren	Sales Growth NTM	STM	Pst 5yr	Book Equity
MTW	http://www.manitowoc.com	9.3%	0.91	146.9	-7.8	9.8	-13.9	11.5	11.9	9.5	3.1%	0.30	-3.6%	4.4%	-7.4%	8.1		-7.5%	0.8%		$17.68
TEX	http://www.terex.com	25.3%	2.38	35.7	10.2	9.4	255.4	13.3	12.5	10.8	4.3%	0.40	2.2%	5.7%	5.2%	9.7	9.9	-15.7%	1.5%	-6.3%	$12.22
MNTX	http://www.manitexinternational.com	-8.1%	1.14	48.0	17.2	-14.5	-5.6	26.0	19.0	10.5	-3.1%	0.43	-5.4%	2.3%	-9.6%	27.8		-1.4%	4.3%	-0.2%	$4.68
6501-JP	http://www.hitachi.co.jp	12.1%	1.27	11.3	12.9	10.5	19.2	8.9	8.7	7.8	4.3%	0.45	2.4%	8.0%	5.7%	6.4	6.3	1.3%	17.6%	-0.3%	$31.08
6395-JP	http://www.tadano.co.jp	3.9%	0.90	24.4	11.2	22.9	11.0		18.6	15.9	3.2%	0.73	6.1%	8.4%	6.8%	6.2	145.8			0.7%	$10.98
FERREYC1-PE	http://www.ferreyros.com.pe	42.6%	0.93	2.7	2.8	2.2	7.7		2.3	2.2	17.3%	0.38	4.3%	8.0%	7.3%	10.6				0.7%	$0.66
Average		14.2%	1.25	44.8	7.7	6.7	45.6	14.9	12.2	9.4	4.8%	0.45	1.0%	6.1%	1.3%	11.5	54.0	-5.8%	6.0%	-1.1%	
Median		10.7%	1.04	30.1	10.7	9.6	9.3	12.4	12.2	10.0	3.7%	0.42	2.3%	6.8%	5.5%	8.9	9.9	-4.4%	2.9%	-0.2%	
spx	S&P 500 INDEX			22.7	17.3	19.5			17.8	16.1											

Source: Factset

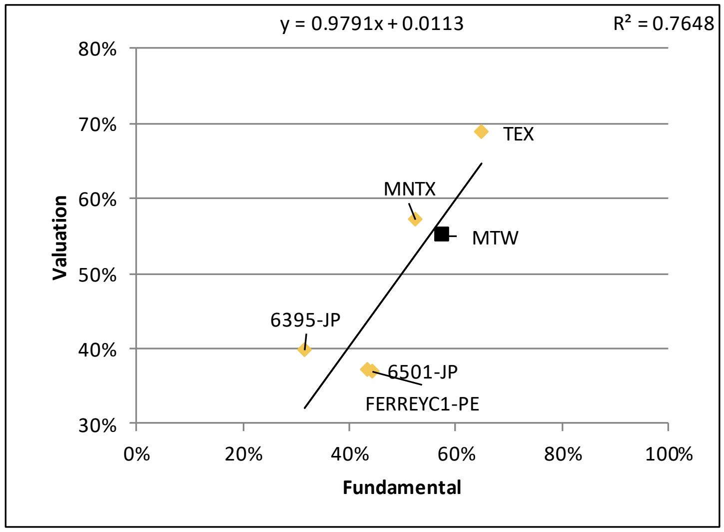
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A weighting of long-term growth estimates, NTM earnings growth, 1/(LTD/Equity), and 2019 ROE was compared to a 25% weighting of 2020 P/E and NTM P/E, and 50% for P/B. The R-squared resulting this analysis was over 75%. MTW is slightly under the line, so it is undervalued compared to its peers.

Figure 25: Composite value, % of range

		Weight		Fundamental Percent of Max 50.0%	12.5%	25.0%	12.5%	Valuation Percent of Max 25.0%	25.0%	50.0%
		Weighted		Earnings Growth		1/(LTD/	2019	P/E		
Ticker	Name	Fund	Value	LTG	NTM	Equity)	ROE	2020	NTM	P/B
MTW	MANITOWOC CO	58%	55%	100%	-12%	26%	22%	100%	44%	38%
TEX	TEREX CORP	65%	69%	85%	100%	10%	59%	24%	51%	100%
MNTX	MANITEX INTERNATIONAL INC	52%	57%	100%	-7%	22%	-19%	33%	100%	48%
6501-JP	HITACHI	43%	37%	50%	6%	56%	28%	8%	34%	53%
6395-JP	TADANO LTD	32%	40%	0%	44%	100%	9%	17%	67%	38%
FERREYC1-PE	FERREYCORP S.A.A.	44%	37%	35%	44%	35%	100%	2%	67%	39%

Source: IMCP

Figure 26: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was used to value MTW.

For the purpose of this analysis, the cost of equity for the company was calculated to be 14.1% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury Bond Yield, is 1.82%.
- A ten-year beta of 1.50 was used as the company has higher risk than the market.
- A long-term market rate of return of 10%, since historically the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 14.1% (1.82+1.50 (10.0 – 1.82)).

Stage One – The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $0.84 and $0.86, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $1.40 per share. Thus, stage one of this discounted cash flow analysis contributes $1.40 to value.

Stage Two – Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 14.1% cost of equity. I assume 3% sales growth in 2022, -1% in 2023, and 2% in 2024, 2025, and 2026. While I am not forecasting recession-level growth in 2020-26, I am also not forecasting a booming market. Thus, 2026 sales are "normal-like". The ratio of NWC to sales and NFA turnover will remain at the 2021 levels. The NOPAT margin is expected to slightly increase from 4.8% in 2021 to 6.0% in 2026 as this adds 25% to earnings. Share growth is expected to be flat each year from 2022 to 2026 as I don't expect the company to buy back shares.

Figure 27: FCFE and discounted FCFE, 2020-2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$0.84	$0.86	$1.08	$2.29	$1.66	$1.84	$2.03
Discounted FCFE	$0.74	$0.66	$0.73	$1.35	$0.86	$0.84	$0.81

Added together, stage two discounted cash flows total $4.58.

Stage Three – Net income for the years 2020-2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $1.68 in 2021 to $2.60 in 2026.

Figure 28: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$1.35	$1.68	$1.88	$2.01	$2.20	$2.40	$2.60

Stage three of the models requires an assumption regarding the company's terminal price-to-earnings ratio. A P/E ratio of 11 is assumed at the end of MTW's 2026 terminal year. This is a little lower than the current 2020 P/E (11.9), with 2020 EPS growth expected to be negative as well. Compared to the S&P 500 long-term average (15-17) this seems reasonable given the firm's cyclicality.

Given the assumed terminal earnings per share of $2.60 and a price to earnings ratio of 11, a terminal value of $28.61 per share is calculated. Using the 14.1% cost of equity, this number is discounted back to a present value of $11.37.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $17.35 is calculated (1.40 + 4.58 + 11.37). Given MTW's current price of $16.02, this model indicates that the stock is undervalued.

Scenario Analysis

MTW is difficult to value with certainty because it is cyclical and operates in a competitive industry. Furthermore, it will be important to see how CEO Barry Pennypacker will be able to develop international growth, specifically Asia Pacific and Europe. Given this uncertainty, a bull and bear case provides a solid demonstration for quantifying all likely scenarios.

Bull Case: Assuming MTW's focus on international expansion goes well and its new cranes in 2020 sell well, I expect the value of the stock to substantially increase. I expect sales will grow at a constant 3% per year from 2022-2026 and shares to decrease consistently by 1% per year as there is enough FCF to buy shares. I predicted for beta to drop to 1.20 correlated closer with some of MTW's peers, but I kept P/E at 11. As a result, I anticipate a target price of $20.67, which is 19.4% higher than base case.

Figure 29: Bull case estimated value for 2020

Summary			
First stage	$1.45	Present value of first 2 year cash flow	
Second stage	$4.30	Present value of year 3-7 cash flow	
Third stage	$14.92	Present value of terminal value P/E	
Value (P/E)	**$20.67**	= value at beg of fiscal yr	2020

Bear Case: Assuming MTW's focus on international expansion does not go well and its new cranes don not perform as well as expected, I expect the value of the stock to substantially decrease. I expect the sales growth to fall from 2% growth in 2020 to -1% starting in 2022 through 2026. I anticipate beta to increase from 1.5 to 1.8 due to the company becoming riskier despite its efforts to grow. My target price is $14.49, which is 16.5% lower than the base case.

Figure 30: Bear case estimated value for 2020

Summary			
First stage	$1.36	Present value of first 2 year cash flow	
Second stage	$4.90	Present value of year 3-7 cash flow	
Third stage	$8.23	Present value of terminal value P/E	
Value (P/E)	**$14.49**	= value at beg of fiscal yr	2020

Business Risks

Economic Downturns:

Sales of products that MTW manufactures and sells are dependent on changes in general economic conditions. Demand for products also depends on federal, state, local and foreign governmental spending and appropriations, including infrastructure, security and defense outlays. Reduction in government spending can reduce demand for products. Adverse economic conditions may cause customers to forego or postpone new purchases in favor of repairing existing machinery.

Large or rapid increases in the cost of raw materials:

MTW uses large amounts of steel, in the manufacture of its products. Market prices of key raw materials may increase significantly as a result of tariffs or other trade barriers. If MTW cannot offset these costs, its margins could be adversely affected. The company purchases certain branded cranes and parts under strategic alliances from third-party suppliers. If MTW is not able to effectively manage pricing from suppliers, the firm could be adversely impacted.

Competition:

MTW sells most of its products in highly competitive end markets. Some of its competitors may have greater financial, marketing, manufacturing, and distribution resources. Competitors may have greater name recognition, adapt more quickly to changes in customer requirements, and devote greater resources to the development of products, among others.

International Risks

Approximately 60% of MTW's net sales are attributable to products sold outside of the United States. International operations across many different jurisdictions may be subject to a number of risks. These risks include labor unrest, political and economic instability, health concerns, adverse changes in tax rates, export duties, tariffs, among others.

Customer Satisfaction:

Product quality and reliability are significant factors influencing customers' decisions to purchase products. Inability to maintain high quality products could result in loss of market share, loss of revenue, reduced profitability, and damage to reputation.

Appendix 1: SWOT Analysis

Strengths	Weaknesses
Brand loyalty Entering new markets New product development	Susceptable to economic downturns Research and development Cash flow problems
Opportunites	**Threats**
International expansion Technological developments Growth in consumer spending	Tariffs China Political uncertainties

Appendix 2: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Economies of scale is difficult to achieve in MTW's industry where product differentiation is important. Capital requirements are high; therefore, it is difficult for new entrants to set up businesses.

Threat of Substitutes – Low

There are very few substitutes for cranes; however, customers don't have to buy from MTW. The few substitutes are high quality and high price. Buyers are not likely to switch to substitutes as long as current products are reliable.

Supplier Power – Relatively Low

Suppliers to MTW have little control over prices. The product suppliers provide are fairly standardized and there is low switching costs.

Buyer Power – Relatively High

The product differentiation is high, which means that buyers may not able to find alternatives. Buyer margins may be low, which means that there is always pressure on prices.

Intensity of Competition – High

MTW operates in a small industry with few competitors; however, they compete strongly. Fixed costs and exit barriers are high due to high investment required in capital to operate.

Appendix 3: Sales forecast

Sales Forecasts (in thousands)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Sales	$3,436	$1,613	1,581	$1,847	$1,862	$1,761	$1,827
Growth		*-53.1%*	*-2.0%*	*16.8%*	*0.8%*	*-5.5%*	*3.8%*
Cranes	1,866	1,311	1,271	1,510	1,511	1409	1,466
Growth		*-29.7%*	*-3.1%*	*18.8%*	*0.1%*	*-6.7%*	*4.1%*
% of sales	*54.3%*	*81.3%*	*80.3%*	*81.8%*	*81.1%*	*80.0%*	*80.3%*
Aftermarket parts and other		302	311	337	351	351	361
Growth			*2.9%*	*8.4%*	*4.3%*	*-6.7%*	*4.1%*
% of sales	*0.0%*	*18.7%*	*19.7%*	*18.2%*	*18.9%*	*20.0%*	*19.7%*
Foodservice (discontinued)	1,570	-	-	-	-	-	-
Growth		*-100.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
% of sales	*45.7%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*6.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Amerias	2,115	736	694	883	890	840	871
Growth		*-65.2%*	*-5.8%*	*27.3%*	*0.8%*	*-5.7%*	*3.8%*
% of sales	*61.6%*	*45.6%*	*43.9%*	*47.8%*	*47.8%*	*47.7%*	*47.7%*
EURAF	709	560	629	681	686	657	681
Growth		*-20.9%*	*12.2%*	*8.2%*	*0.8%*	*-4.3%*	*3.8%*
% of sales	*20.6%*	*34.7%*	*39.8%*	*36.9%*	*36.9%*	*37.3%*	*37.3%*
MEAP	612	316	259	284	286	264	274
Growth		*-48.3%*	*-18.2%*	*9.5%*	*0.8%*	*-7.6%*	*3.8%*
% of sales	*17.8%*	*19.6%*	*16.4%*	*15.4%*	*15.4%*	*15.0%*	*15.0%*

Appendix 4: Income Statement

Income Statement (in thousands)							
Items	**Dec-15**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Sales	$3,436	$1,613	$1,581	$1,847	$1,862	$1,761	$1,827
Direct costs	2,603	1,360	1,299	1,519	1,511	1,428	1,482
Gross Margin	$833	253	282	328	352	332	345
SG&A, and other	701	396	274	274	236	230	232
EBIT	133	(143)	8	(19)	116	102	113
Interest	76	125	48	52	52	50	48
EBT	57	(268)	(40)	(72)	64	52	65
Taxes	(7)	101	(50)	(5)	14	12	14
Income	63	(369)	10	(67)	49	41	51
Other	0	7	1	0	0	0	0
Net income	63	(376)	9	(67)	49	40	50
Basic Shares	34.0	34.4	35.1	35.5	30.0	30.0	30.0
Fully Diluted Shares	34.0	34.4	35.9	35.5	30.2	30.2	30.2
EPS	$1.86	($10.91)	$0.27	($1.89)	$1.64	$1.35	$1.68
EPS Fully Diluted	$1.86	($10.91)	$0.26	($1.89)	$1.63	$1.34	$1.67

Appendix 5: Balance Sheet

Balance Sheet (in thousands)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Cash	32	70	123	140	68	93	118
Operating assets ex cash	1,010	680	667	703	797	754	782
Operating assets	1,042	750	790	843	864	846	900
Operating liabilities	312	-	21	16	24	23	24
NOWC	730	750	770	827	840	823	877
NOWC ex cash (NWC)	698	680	647	686	772	731	758
NFA	2,521	768	817	699	727	734	731
Invested capital	*$3,251*	*$1,518*	*$1,587*	*$1,526*	*$1,567*	*$1,557*	*$1,607*
Total assets	*$3,563*	*$1,518*	*$1,608*	*$1,542*	*$1,591*	*$1,580*	*$1,631*
Short-term and long-term debt	$1,902	$682	$699	$747	$737	$687	$687
Other liabilities	506	245	211	177	205	205	205
Debt/equity-like securities	-	-	-	-	-		-
Equity	842	591	678	601	625	665	716
Total supplied capital	*$3,251*	*$1,518*	*$1,587*	*$1,526*	*$1,567*	*$1,557*	*$1,607*
Total liabilities and equity	*$3,563*	*$1,518*	*$1,608*	*$1,542*	*$1,591*	*$1,580*	*$1,631*

Appendix 6: Ratios

Ratios							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Profitability							
Gross margin	24.3%	15.7%	17.8%	17.8%	18.9%	18.9%	18.9%
Operating (EBIT) margin	3.9%	-8.9%	0.5%	-1.0%	6.2%	5.8%	6.2%
Net profit margin	1.8%	-23.3%	0.6%	-3.6%	2.6%	2.3%	2.8%
Activity							
NFA (gross) turnover		0.98	1.99	2.44	2.61	2.41	2.50
Total asset turnover		0.64	1.01	1.17	1.19	1.11	1.14
Liquidity							
Op asset / op liab	3.34	#DIV/0!	38.00	51.71	35.85	37.14	38.08
NOWC Percent of sales		45.9%	48.0%	43.2%	44.7%	47.2%	46.5%
Solvency							
Debt to assets	53.4%	44.9%	43.5%	48.4%	46.3%	43.5%	42.1%
Debt to equity	225.8%	115.5%	103.2%	124.2%	117.9%	103.2%	96.0%
Other liab to assets	14.2%	16.2%	13.1%	11.5%	12.9%	12.9%	12.5%
Total debt to assets	67.6%	61.1%	56.6%	59.9%	59.2%	56.4%	54.7%
Total liabilities to assets	76.4%	61.1%	57.9%	61.0%	60.7%	57.9%	56.1%
Debt to EBIT	14.35	(4.77)	83.20	(38.70)	6.37	6.73	6.07
EBIT/interest	1.75	(1.14)	0.18	(0.37)	2.22	2.04	2.35
Debt to total net op capital	58.5%	44.9%	44.0%	49.0%	47.0%	44.1%	42.7%
ROIC							
NOPAT to sales	4.3%	-12.2%	-0.1%	-1.0%	4.8%	4.5%	4.8%
Sales to NWC		2.34	2.38	2.77	2.55	2.34	2.45
Sales to NFA		0.98	1.99	2.44	2.61	2.41	2.50
Sales to IC ex cash		0.69	1.09	1.30	1.29	1.19	1.24
Total ROIC ex cash		-8.4%	-0.1%	-1.3%	6.2%	5.4%	6.0%
NOPAT to sales	4.3%	-12.2%	-0.1%	-1.0%	4.8%	4.5%	4.8%
Sales to NOWC		2.18	2.08	2.31	2.23	2.12	2.15
Sales to NFA		0.98	1.99	2.44	2.61	2.41	2.50
Sales to IC		0.68	1.02	1.19	1.20	1.13	1.15
Total ROIC		-8.2%	-0.1%	-1.2%	5.8%	5.1%	5.6%
NOPAT to sales	4.3%	-12.2%	-0.1%	-1.0%	4.8%	4.5%	4.8%
Sales to EOY NWC	4.92	2.37	2.45	2.69	2.41	2.41	2.41
Sales to EOY NFA	1.36	2.10	1.93	2.64	2.56	2.40	2.50
Sales to EOY IC ex cash	1.07	1.11	1.08	1.33	1.24	1.20	1.23
Total ROIC using EOY IC ex cash	4.6%	-13.6%	-0.1%	-1.3%	6.0%	5.4%	5.9%
NOPAT to sales	4.3%	-12.2%	-0.1%	-1.0%	4.8%	4.5%	4.8%
Sales to EOY NOWC	4.71	2.15	2.05	2.23	2.22	2.14	2.08
Sales to EOY NFA	1.36	2.10	1.93	2.64	2.56	2.40	2.50
Sales to EOY IC	1.06	1.06	1.00	1.21	1.19	1.13	1.14
Total ROIC using EOY IC	4.6%	-13.0%	-0.1%	-1.2%	5.7%	5.1%	5.5%
ROE							
5-stage							
EBIT / sales		-8.9%	0.5%	-1.0%	6.2%	5.8%	6.2%
Sales / avg assets		0.64	1.01	1.17	1.19	1.11	1.14
EBT / EBIT		187.5%	-470.2%	371.5%	55.0%	51.1%	57.4%
Net income /EBT		140.2%	-23.8%	93.6%	77.5%	77.4%	77.5%
ROA		-14.8%	0.6%	-4.3%	3.1%	2.5%	3.1%
Avg assets / avg equity		3.55	2.46	2.46	2.55	2.46	2.32
ROE		-52.5%	1.5%	-10.5%	8.0%	6.3%	7.3%
3-stage							
Net income / sales		-23.3%	0.6%	-3.6%	2.6%	2.3%	2.8%
Sales / avg assets		0.64	1.01	1.17	1.19	1.11	1.14
ROA		-14.8%	0.6%	-4.3%	3.1%	2.5%	3.1%
Avg assets / avg equity		3.55	2.46	2.46	2.55	2.46	2.32
ROE		-52.5%	1.5%	-10.5%	8.0%	6.3%	7.3%
Payout Ratio		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Retention Ratio		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sustainable Growth Rate		-52.5%	1.5%	-10.5%	8.0%	6.3%	7.3%

Appendix 7: Comp Sheet

		Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
MTW	MANITOWOC CO	$16.02	$566	(1.1)	(1.2)	22.0	5.6	(0.7)	8.5	10.0	-221.3%	-805.8%	-186.9%	-18.1%	24.9%		2.67	54.6%	C	0.00%	
TEX	TEREX CORP	$29.06	$2,072	0.3	(4.1)	10.8	2.8	2.5	5.4	8.5	1815.7%	100.7%	14.0%	-24.6%	15.5%	-6.0%	1.90	146.5%	B	1.57%	377.9%
MNTX	MANITEX INTERNATIONAL INC	$5.33	$105	0.6	(7.3)	(9.2)	(2.7)	(22.6)	(6.2)	10.0	-121.7%	65.0%	-215.2%	-173.7%	82.1%		1.65	63.2%	C	0.00%	
6501-JP	HITACHI	$39.52	$38,186	1.7	0.6	8.3	11.9	33.2	46.2		115.1%	-40.3%	83.0%	21.0%	10.5%	-3.4%	1.23	25.1%		2.09%	39.7%
6395-JP	TADANO LTD	$9.83	$1,245	1.0	1.9	7.8	0.4	(7.9)	6.9	0.0		19.1%	-46.9%	23.3%	17.0%	-4.5%	2.22	14.2%		2.52%	27.5%
FERREYC:	FERREYCORP S.A.A.	$0.61	$598	(2.4)	(2.4)	(1.4)	(5.9)	(10.4)	(18.5)	3.5		-6.9%	3.7%	-3.6%	3.7%	18.5%	1.36	40.3%		5.82%	46.8%
Average			$7,129	0.0	(2.1)	6.4	2.0	(1.0)	7.1	6.4	397.0%	-111.3%	-58.0%	-29.3%	25.6%	1.1%	1.84	57.3%		2.00%	123.0%
Median			$921	0.4	(1.8)	8.0	1.6	(4.3)	6.2	8.5	-3.3%	6.1%	-21.6%	-10.8%	16.2%	-3.9%	1.78	47.5%		1.83%	43.3%
SPX	S&P 500 INDEX	$3,136		(0.3)	1.4	5.3	9.1	19.1	25.1			-23.9%	12.8%	-8.8%	-9.5%						

		2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
MTW	http://www.manitowoc.com	9.3%	0.91	146.9	-7.8	9.8	-13.9	11.5	11.9	9.5	3.1%	0.30	-3.6%	4.4%	-7.4%	8.1		-7.5%	0.8%		$17.68
TEX	http://www.terex.com	25.3%	2.38	35.7	10.2	9.4	255.4	13.3	12.5	10.8	4.3%	0.40	2.2%	5.7%	5.2%	9.7	9.9	-15.7%	1.5%	-6.3%	$12.22
MNTX	http://www.manitexinternational.co	-8.1%	1.14	48.0	17.2	-14.5	-5.6	26.0	19.0	10.5	-3.1%	0.43	-5.4%	2.3%	-9.6%	27.8		-1.4%	4.3%	-0.2%	$4.68
6501-JP	http://www.hitachi.co.jp	12.1%	1.27	11.3	12.9	10.5	19.2	8.9	8.7	7.8	4.3%	0.45	2.4%	8.0%	5.7%	6.4	6.3	1.3%	17.6%	-0.3%	$31.08
6395-JP	http://www.tadano.co.jp	3.9%	0.90	24.4	11.2	22.9	11.0		18.6	15.9	3.2%	0.73	6.1%	8.4%	6.8%	6.2	145.8			0.7%	$10.98
FERREYC1	http://www.ferreyros.com.pe	42.6%	0.93	2.7	2.8	2.2	7.7		2.3	2.2	17.3%	0.38	4.3%	8.0%	7.3%	10.6				0.7%	$0.66
Average		14.2%	1.25	44.8	7.7	6.7	45.6	14.9	12.2	9.4	4.8%	0.45	1.0%	6.1%	1.3%	11.5	54.0	-5.8%	6.0%	-1.1%	
Median		10.7%	1.04	30.1	10.7	9.6	9.3	12.4	12.2	10.0	3.7%	0.42	2.3%	6.8%	5.5%	8.9	9.9	-4.4%	2.9%	-0.2%	
spx	S&P 500 INDEX			118.0	145.3	161.0			176.7	195.1											

Appendix 8: 3-stage DCF Model

First Stage	2020E	2021E	Second Stage 2022E	2023E	2024E	2025E	2026E
Sales Growth	*-5.5%*	*3.8%*	*3.0%*	*-1.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*4.5%*	*4.8%*	*5.1%*	*5.3%*	*5.5%*	*5.8%*	*6.0%*
S / NWC	*2.41*	*2.41*	*2.41*	*2.41*	*2.41*	*2.41*	*2.41*
S / NFA (EOY)	*2.40*	*2.50*	*2.50*	*2.50*	*2.50*	*2.50*	*2.50*
S / IC (EOY)	*1.20*	*1.23*	*1.23*	*1.23*	*1.23*	*1.23*	*1.23*
ROIC (EOY)	*5.4%*	*5.9%*	*6.2%*	*6.5%*	*6.8%*	*7.1%*	*7.4%*
ROIC (BOY)		*6.0%*	*6.4%*	*6.4%*	*6.9%*	*7.2%*	*7.5%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$1,761	$1,827	$1,882	$1,863	$1,900	$1,938	$1,977
NOPAT	$79	$88	$95	$99	$105	$112	$119
Growth		*10.9%*	*8.0%*	*3.6%*	*6.5%*	*6.3%*	*6.2%*
- Change in NWC	-42	28	23	-8	15	16	16
NWC EOY	*731*	*758*	*781*	*773*	*789*	*804*	*821*
Growth NWC		*3.8%*	*3.0%*	*-1.0%*	*2.0%*	*2.0%*	*2.0%*
- Chg NFA	7	-3	22	-8	15	15	16
NFA EOY	*734*	*731*	*753*	*745*	*760*	*775*	*791*
Growth NFA		*-0.4%*	*3.0%*	*-1.0%*	*2.0%*	*2.0%*	*2.0%*
Total inv in op cap	-35	25	45	-15	30	31	32
Total net op cap	1464	1489	1534	1518	1549	1580	1611
FCFF	$114	$63	$51	$114	$75	$81	$87
% of sales	*6.5%*	*3.5%*	*2.7%*	*6.1%*	*3.9%*	*4.2%*	*4.4%*
Growth		*-44.5%*	*-20.3%*	*125.6%*	*-34.5%*	*8.1%*	*7.8%*
- Interest (1-tax rate)	39	38	39	38	39	40	41
Growth		*-3.5%*	*3.0%*	*-1.0%*	*2.0%*	*2.0%*	*2.0%*
+ Net new debt	-50	0	21	-7	14	14	15
Debt	687	687	708	701	715	729	743
Debt / tot net op capital	*46.9%*	*46.1%*	*46.1%*	*46.1%*	*46.1%*	*46.1%*	*46.1%*
FCFE w debt	$25	$26	$32	$69	$50	$55	$61
% of sales	*1.4%*	*1.4%*	*1.7%*	*3.7%*	*2.6%*	*2.9%*	*3.1%*
Growth		*2.0%*	*25.7%*	*111.3%*	*-27.6%*	*11.2%*	*10.4%*
/ No Shares	30.0	30.0	30.0	30.0	30.0	30.0	30.0
FCFE	$0.84	$0.86	$1.08	$2.29	$1.66	$1.84	$2.03
Growth		*2.0%*	*25.7%*	*111.3%*	*-27.6%*	*11.2%*	*10.4%*
* Discount factor	0.88	0.77	0.67	0.59	0.52	0.45	0.40
Discounted FCFE	$0.74	$0.66	$0.73	$1.35	$0.86	$0.83	$0.81

Summary		
Value (P/S)	**$13.94**	= value at beg of fiscal yr 2020
Value (P/B)	**$18.56**	= value at beg of fiscal yr 2020
First stage	$1.40	Present value of first 2 year cash flow
Second stage	$4.58	Present value of year 3-7 cash flow
Third stage	$11.37	Present value of terminal value P/E
Value (P/E)	**$17.35**	= value at beg of fiscal yr 2020
Value (CG)	**$12.21**	=value at beg of fiscal yr 2020

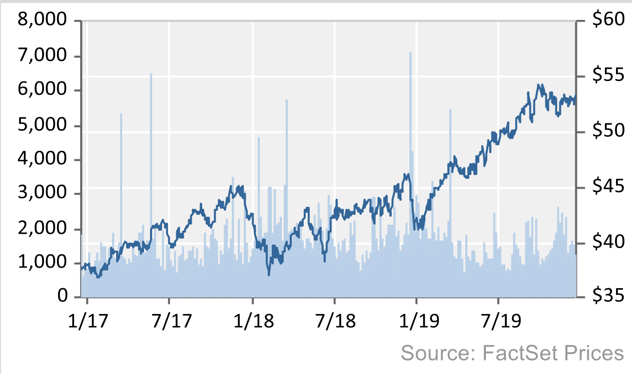
Utilities, Electric Utilities

Alliant Energy

Recommendation: Hold

Current Price	**$52.92**	---	Ticker	LNT
1 Year Bear	$30	*-18%*	Sh. Out. (M)	244.6
1 Year Base	**$46.03**	***-13%***	M.Cap. ($B)	12.9
1 Year Bull	$59	*23%*	EV ($B)	19.7

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	70%	42%	20%	18%	26%	3%	1%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**3.25**	**3.32**	**3.38**	**3.54**	**3.68**	**3.76**	**3.85**
Gr. %	*-2.9%*	*2.0X%*	*1.8%*	*4.5%*	*4.2%*	*2.0%*	*2.5%*
Cons.	-	-	-	-	-	*5.0%*	*4.4%*
Ind.	*-4.6%*	*0.7%*	*2.9%*	*4.2%*	*4.3%*	*3.1%*	
EPS	**$1.68**	**$1.90**	**$1.99**	**$2.19**	**$2.31**	**$2.40**	**$2.53**
Gr. %	*-4.5%*	*13.4%*	*4.7%*	*10.1%*	*5.5%*	*3.9%*	*5.2%*
Cons.	-	-	-	-	-	*4.8%*	*6.2%*
Ind.	*-8.6%*	*-9.9%*	*17.5%*	*9.35%*	*6.26%*	*5.0%*	*4.09%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**11.6%**	**13.0%**	**13.5%**	**14.5%**	**14.7%**	**15.2%**	**15.6%**
Ind.	*9.37%*	*8.97%*	*10.1%*	*13.7%*	*13.2%*		
ROE	*10.7%*	*10.8%*	*10.8%*	*11.2%*	*11.1%*	*11.0%*	*10.9%*
Ind.	*9.1%*	*7.9%*	*9.1%*	*12.0%*	*10.2%*		
ROA	*3.1%*	*3.3%*	*3.3%*	*3.5%*	*3.4%*	*3.4%*	*3.4%*
Ind.	*2.5%*	*2.1%*	*2.4%*	*3.3%*	*3.3%*		
A T/O	0.26	0.26	0.25	0.24	0.23	0.22	0.22
A/E	3.34	3.24	3.26	3.23	3.36	3.25	3.22

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	18.61	23.16	21.41	19.29	22.91	22.05	20.92
Ind.	17.74	22.32	20.62	15.16	23.31		
P/S	2.16	2.59	2.89	2.79	3.52		
P/B	1.90	2.23	2.35	2.17	2.67	2.63	
P/CF	8.08	10.01	9.95	18.70	11.10		
EV/EBITDA	11.38	12.99	13.45	13.27			
D/P	*3.5%*	*3.1%*	*2.9%*	*3.2%*	*2.7%*		

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Summary

I recommend a hold rating with a target of $46.03. Although LNT has an opportunity to increase regulatory asset base through renewable energy initiatives, declining authorized rates of return and fully valued multiples represent significant headwinds. This uncertainty seriously offsets my optimism that the core business can continue delivering higher than average sales growth. The stock is overvalued based on relative and DCF analysis.

Key Drivers

- Capital Spending: Investments in the core utility business raise the regulatory asset base, which drives EPS growth. In the near term, above average capital spending should support earnings growth, but be should offset by the forecasted downtrend set to begin in 2020
- Favorable Regulation: LNT operates in a favorable regulatory environment. Support from legislature and commissions should continue to drive earnings growth, but declining allowed rates of return may impact future performance
- Renewable Energy Initiatives: Alliant's renewable MW capacity as a percent of total MW capacity is significantly higher than its peers. Rising RPS requirements may drive growth; however, rapid depreciation of these assets could affect earnings
- Competition: LNT is well positioned to capture increased sales as a result of growing industrial usage. However, significant exposure to industrials could lead to more volatility in a weakening economy given the industrial's cyclical nature

Valuation

Using a relative valuation approach, Alliant Energy appears to be overvalued in comparison to the utility industry. DCF analysis implies that the stock is worth $42.69. A combination of the approaches suggests that Alliant is overvalued, as the stock's value is about $46.03 and the shares trade at $52.92.

Risks

- Regulatory lag may impact LNT's ability to achieve authorized ROE
- Operating results may fluctuate in abnormal weather conditions
- Inability to maintain dividend growth in economic downturns

Company Overview

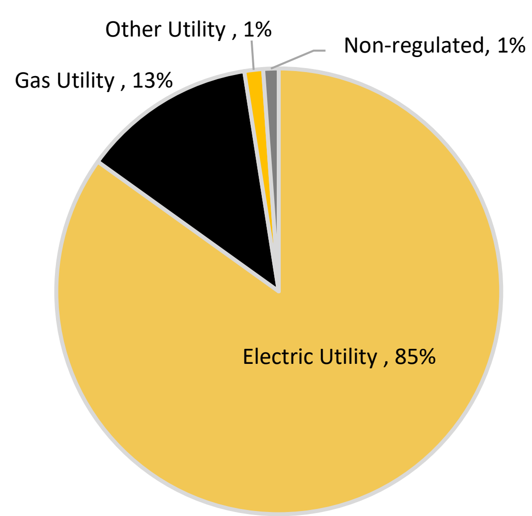
Alliant Energy Corp. (NYSE: LNT) is an investor-owned public utility holding company headquartered in Madison, WI. Through its two principal subsidiaries, Alliant engages in the generation and distribution of electricity and the distribution and transportation of natural gas to customers in the Midwest. Interstate Power & Light Co. (IPL) and Wisconsin Power & Light Co. (WPL) conduct business in 54,000 square miles across Iowa and Wisconsin. Alliant Energy Corp. operates 42,600 miles of electric distribution lines and 9,700 miles of natural gas main lines. LNT also owns approximately 16% equity interest in American Transmissions Company (ATC), holds naming rights to the Alliant Energy Center in Madison, WI, and is the parent company of other relatively small subsidiaries.

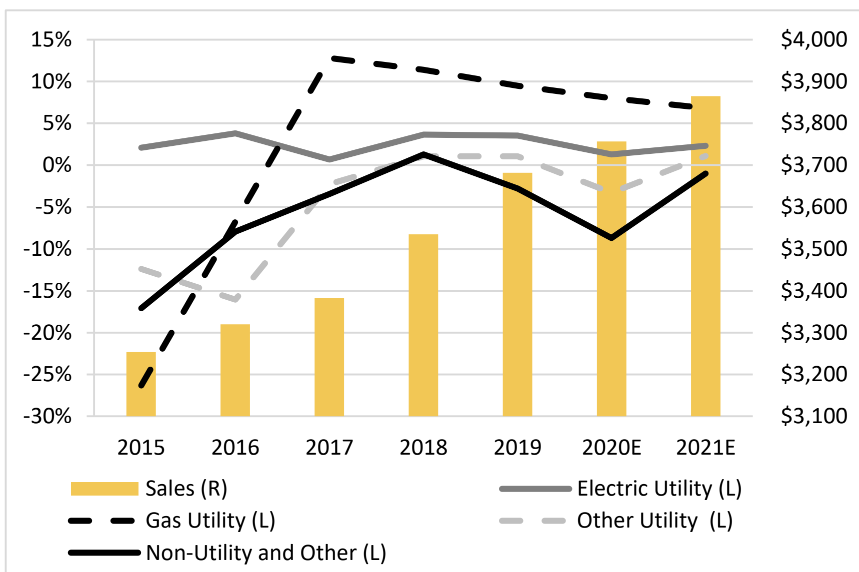
LNT delivers energy solutions to more than 1.3 million customers through its utilities and corporate services segment. Revenue is also generated from various other segments describe below.

Utilities and Corporate Services earnings increased 16.6% YoY

1) Utilities and Corporate Services: The utility business is Alliant's primary source of earnings. IPL and WPL own various energy generating units located in Iowa, Wisconsin, and Minnesota. Alliant's EGU's are fueled with a mix of natural gas, coal, and renewable resources. In addition to its electricity services, LNT procures natural gas from suppliers to provide natural gas to its customers. IPL mainly serves the Iowa market, but also sells wholesale electricity to customers in Illinois and southern Minnesota. WPL mainly serves the Wisconsin market.
    - From 2017 through 2018, earnings in this segment increased by 16.6%, primarily due to IPL's and WPL's rising rate base.
2) ATC Holdings: American Transmission Company (ATC) operates transmissions systems in the upper Midwest. This segment reports Alliant's 16% equity interest in ATC.
    - From 2017 through 2018, earnings in this segment increase by 11.8%.
3) Non-utility Business and Parent: LNT's other holdings such as Alliant Energy Finance LLC and Alliant Energy Transportation, among others, report operations under this segment.
    - From 2017 through 2018, earnings in this segment decreased by 14.5%.

Figures 1 and 2: Revenue sources for LNT, year-end 2018 (left); Revenue history since 2014 and forecasts (right)





Source: FactSet

Business/Industry Drivers

Though several factors may contribute to Alliant's future success, the following are the most important business drivers:

1) Capital Spending
2) Favorable Regulation
3) Renewable Energy Initiatives
4) Competitor Analysis
5) Macroeconomic Trends

Capital Spending

Total capital spending over the next four years may increase EPS by $0.88, all else equal

Investments in the core utility business have been long time catalysts for growth in Alliant's base rate, which ultimately drives EPS. Regulated utility revenue is determined by the revenue requirement formula, which consists of net fixed assets times the regulated return on equity, plus all other expenses. To generate higher earnings, regulated utiliies must make investments. The company's capital expenditures are estimated to exceed $5 billion from 2019 through 2022.

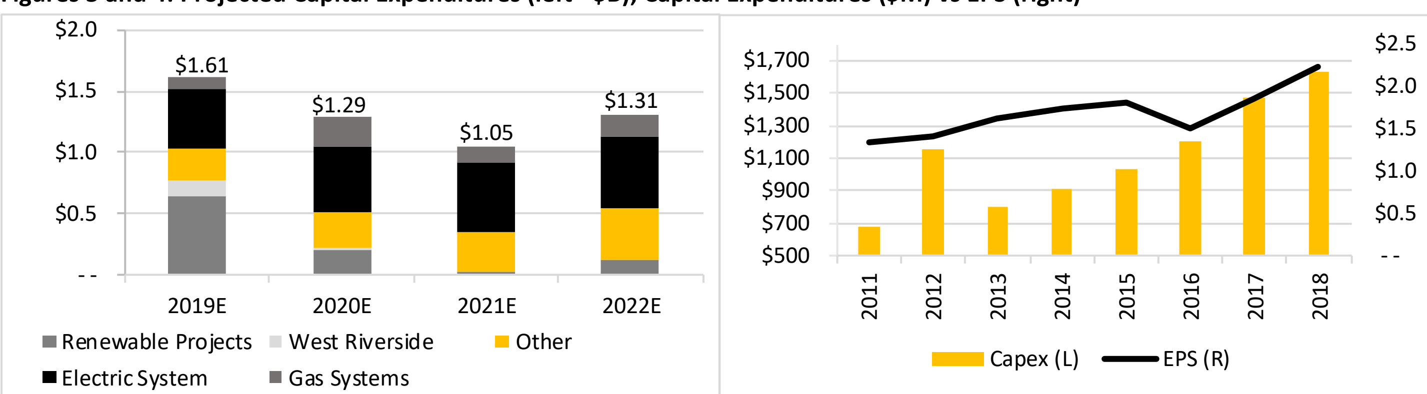
- ($5.1 billion capex * 51.0% equity * 9.5% ROE * (1-15% tax rate) = (210,030,750 / 237,521,000 current shares = $0.88 EPS increase

By 2022, LNT plans to spend a total of $2.2 billion in electric distribution system upgrades to enhance operational efficiency and add capacity to areas of growth potential. With 41% of capital spending in the next four years focused on electric distribution, this investment is the largest contributor to future EPS growth.

In the near term, above average levels of capital spending will support EPS growth

The expansion of Iowa wind farms is expected to generate energy for 430,000 homes and contribute to its renewable enegy intitiatives. In addition to the investments in electric distribution upgrades, LNT is currently investing $1.8 billion to increase wind generation capacity. This investment will add 1,000 MW of renewable energy capacity and is expected to be completed by early 2020. An additional $0.2 billion investment in the west riverside project is expected through its completion by early 2020. It is important to note that all projects have received regulatory approval. In the past few years, capex growth has supported EPS growth, but is expected to peak in 2019. EPS may be affected by the forecasted capex downtrend, set to begin in 2020.

Figures 3 and 4: Projected Capital Expenditures (left - $B); Capital Expenditures ($M) vs EPS (right)



Source: FactSet, Company reports

2019 capital expenditures should boost earnings per share by $0.29. Though, this is not discounting for future equity issuance, changes in allowed ROE, and the expiration of wind tax credit this year.

- ($1.6 billion capex * 51.0% equity * 9.5% ROE * (1-11% tax rate) = (68,992,000 earnings / 237,521,000 current shares = $0.29 EPS increase

Capital spending in 2019 is projected to increase EPS by $0.29, all else equal

Figure 5: Projected Capital Expenditures Breakdown ($B)

	2019E	*2020E*	*2021E*	*2022E*
Renewable Projects	$0.6	$0.2	$0.0	$0.1
West Riverside	$0.1	$0.0	$0.0	$0.0
Other	$0.3	$0.3	$0.3	$0.4
Electric System	$0.5	$0.5	$0.6	$0.6
Gas Systems	$0.1	$0.2	$0.1	$0.2
Total	**$1.6**	**$1.3**	**$1.1**	**$1.3**

Source: Company Reports

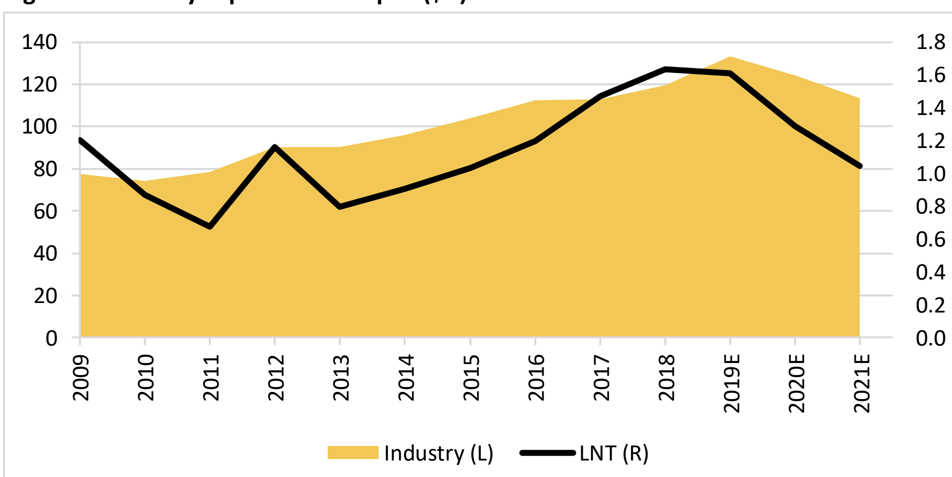
Solely based on projected capital expenditures through 2022, Alliant has the potential to increase EPS by $0.88. Again, this is not discounting for future equity issuance and changes in regulated ROE. I adjusted the tax rate to reflect the expiration of wind tax credits, a 4% tax benefit ending year end 2019.

To finance its 2019 capital expenditures, Alliant has issued $950 million in long-term debt-securities and may issue up to $400 million in common equity (3.25% of market cap). This will make the debt to equity ratio 138.2%, versus 124.2% in 2018. An increase in debt securities indicates higher interest expense in the coming years; however, the current low rate environment should limit the impact**.** Recently, LNT announced that it plans to make a public offering of $195 million in equity, a total of 3.7 million shares. Management intends to use proceeds for general corporate purposes. As a result, I estimate the equity issuance to improve working capital and decrease long-term debt (see forecasts in appendix).

The EEI Institute projects industry capex to peak in 2019, marking an end to the extended building cycle that began in 2009. I anticipate long term growth rates to contract as a result of the capex slowdown.

The EEI Institute projects industry capex to peak in 2019

Figure 6: Industry capex vs LNT capex ($B)



Source: FactSet, EEI Institute

<u>Favorable Regulation</u>

Sustained regulatory support drives earnings growth

Alliant's utility business is 100% regulated; however, the company operates in a favorable regulatory environment. Sustained support from legislature and commissions will continue to drive earnings growth. The IUB (Iowa Utilities Board) and PSCW (Public Service Commissions of Wisconsin) both allow the use of forward test years. Through revenue decoupling, Alliant's forward test year rates hedge against risk of declining demand and sales lost due to energy efficiency mandates; thus, reducing operating risk. Historical test year rates create regulatory lag, as revenue requirement growth is dependent on historical costs and current growth in billing determinants. Growth in revenue is achieved through growth in usage

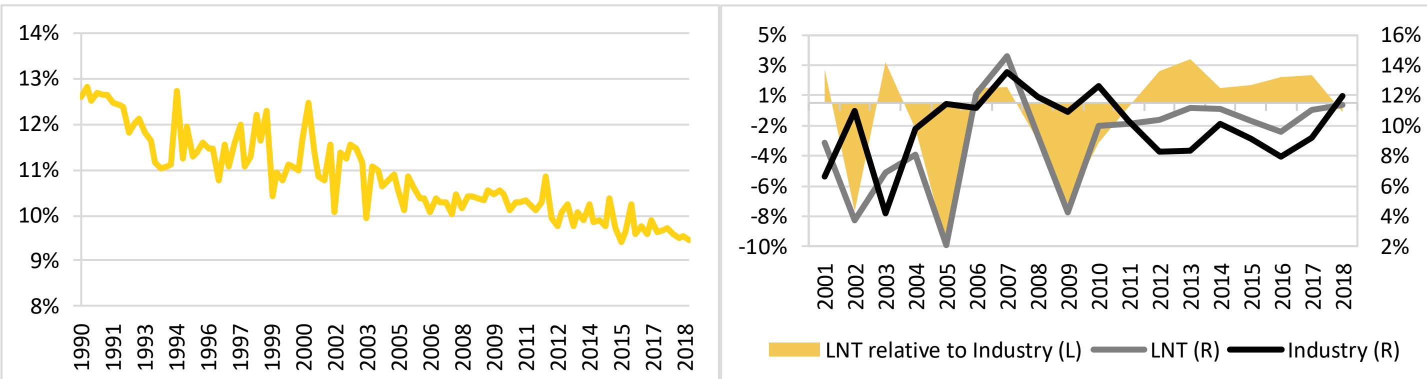
Authorized ROE is calculated in one of three ways:

- CAPM
- Cost of Debt + Equity Premium
- Solving for r in Gordon Growth Model

when applying historical test year rates. Utilities forced to use historical years are at a disadvantage if growth in costs exceed growth in revenue.

About 1/2 of all investor-owned utilities are still required to use historical test years but increasing popularity in forward test periods over the past 20 years has compressed authorized ROE levels; a change regulatory authority made to reflect lower levels of risk. Regulators set ROE by calculating cost of capital in one of three ways: the capital asset pricing model, cost of debt + equity premium, or backing out “r” from the Gordon Growth Model. There is a positive correlation between authorized ROE and cost of debt, as well as an inverse correlation between authorized ROE and prices. Short term and long-term interest rates have been in a downward trend since the 1990’s and market prices have appreciated, resulting in the downward trend of authorized ROE’s. I expect regulators will continue to decrease authorized ROE levels as cost of debt falls and prices rise over time.

Figures 7 & 8: Industry Authorized ROE (left); Actual ROE Relative to industry (right)

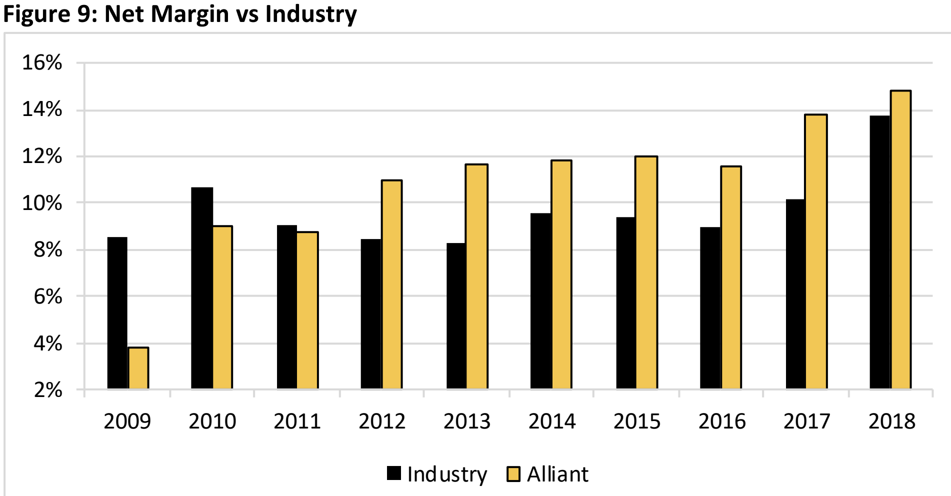


Source: EEI Institute, FactSet

In 2002 and 2005, actual ROE deteriorated due to losses from LNT’s deregulated businesses. Since 2011, Alliant has maintained an elevated actual ROE relative to the industry, benefitting from business-friendly conditions. The most recent average authorized ROE for the industry is 9.45%, meanwhile Alliant’s weighted average authorized ROE is 10.02% (9.5% for most recent investments). LNT’s higher authorized ROE has supported higher net margins versus the industry. A higher ROE ensures that investors earn enough to encourage them to grow the business, too low does the opposite.

LNT’s net margin has benefitted from operating in a business-friendly environment over the past 8 years

Figure 9: Net Margin vs Industry



Source: FactSet

LNT is awaiting final approval of its rate case filed with the IUB in May 2019. IPL subsidiaries seek to increase annual electric rate base by $204 million utilizing a forward test year and increase the equity component of capital structure to 53% from 50%. In a recent development, a unanimous settlement signed by Alliant only includes $127 million increase in electric revenue and 51% equity capital structure. The company is also seeking to add $21 million in revenue through an increase in natural gas rate base. In Wisconsin, WPL and the WPSC agreed to freeze rates at 10% ROE through 2020. Investments in the west riverside project were offset by lower fuel-related costs and federal reform tax credits.

In 2018, approved legislature significantly reduced energy efficiency mandates, thus reducing costs Alliant incurs through these programs. The electric utility industry has collected $3 billion since 1990 in energy efficiency costs levied to customers but incurred $600 million in expenses to administer the programs. Cutting energy efficiency costs means customers will pay less to help finance rebates and other incentives for consumer purchase of energy efficiency appliances. As a result, utilities can now cut down this cost and focus on preferred capital expenditures to drive rate base growth.

Renewable Energy Initiatives

LNT's $1.8 billion investment in Iowa wind farms will raise EPS by $0.37

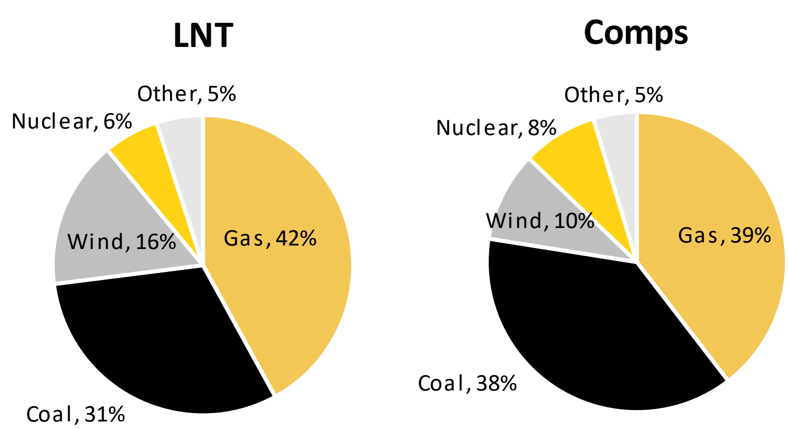
Ownership of renewable energy assets have shown economic benefit. Though renewable assets require significant up-front costs, operating costs are relatively immaterial. In times of weakening demand, renewable assets help maintain margins. The expansion of Iowa wind farms and a recent PPA buyout agreement reflects Alliant's commitment to renewable energy. In September 2020, the company will pay $110 million to end its power purchase agreement with DAEC; costs will be recovered from IPL retail customers over 5 years.

As LNT moves away from coal, exposure to market price volatility is reduced. Alliant's wind capacity consists of 2,269 MWs, or 16% of generation. Comps wind capacity is 10% of total capacity. Over the next five years, I expect LNT's aggressive renewable energy initiatives to benefit earnings, as large upfront windmill costs will raise the rate base. Alliant's $1.8 billion investment in Iowa wind farms will raise EPS by $0.37, all else equal.

- ($1.8 billion capex * 51.0% equity * 11.4% ROE * (1-15% tax rate) = ($104,652,000 earnings / 237,521,000 currents shares) = **$0.37 EPS increase**

Company management has stressed the importance of continuously improving Alliant's ESG profile. LNT has permanently retired 1,000 MWs of coal since 2005. Management plans to reach 30% renewable MW capacity by 2030 and eliminate coal from its energy mix by 2050. Over the past three years, LNT has increased wind MW capacity by 9.2% compared to only 2.6% from comps.

Figures 10 & 11: LNT MW Capacity (left) & Comps Avg. MW Capacity (right)



Source: Company reports, Bloomberg

The company is strategically positioned to take advantage of favorable renewable energy climate in Iowa through the IPL subsidiary, while focusing on natural gas generation in Wisconsin through the WPL subsidiary. The state of Iowa is currently meeting its renewable portfolio standard (rps). The state of Wisconsin is also meeting its rps of 10% renewable energy, sitting at 10.77% in 2018. However, Wisconsin's rps renewable energy is expected to rise 12%, or 354 GWh. WPL's earnings could significantly rise since it would have to increase renewable generation and earn a regulated return on the investment.

In the long term, renewable energy initiatives could negatively influence earnings. After renewable assets are fully depreciated, power is essentially free. The regulatory authority does not allow a return on fully depreciated assets. However, it is difficult to estimate how long wind farms and solar panels will last and when improvements in technology could mandate new investments.

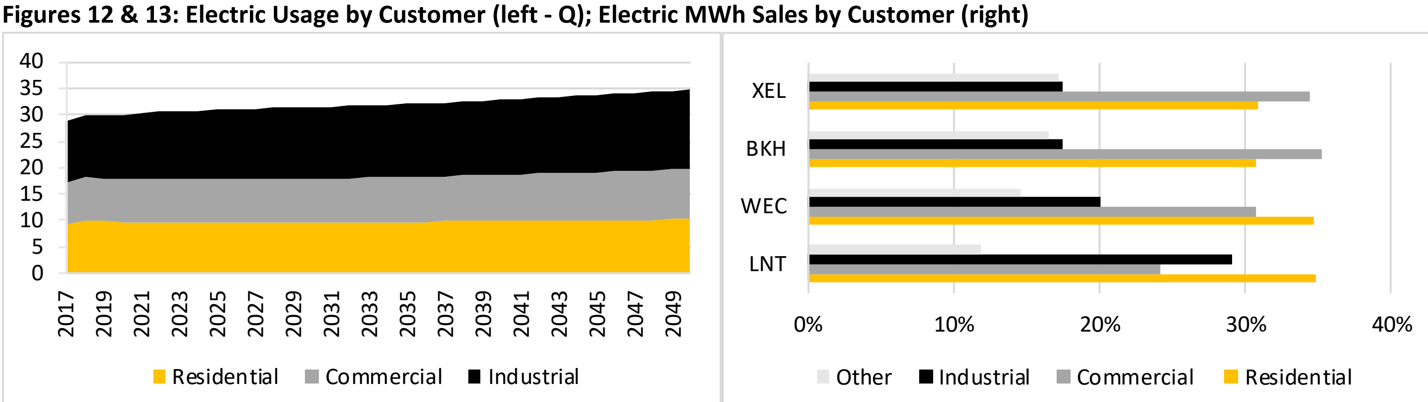
<u>Competitive Positioning</u>

Alliant operates in a regulated geographic monopoly. In Iowa and Wisconsin, customers are unable to choose their electric and natural gas provider. Thus, barrier to entry and competition for customers is relatively non-existent. To achieve higher growth and greater market share, utilities must expand through acquisitions or capital growth. Alliant Energy is growing its portfolio of holdings through relatively small non-utility acquisitions but has lagged in any recent material acquisitions.

In a regulated monopoly, companies gain market share through acquisitions

LNT relies heavily on electric usage of retail and industrial customers; peers dominate wholesale and municipals market. Alliant is well positioned to capture increased sales as a result of growing industrial usage, estimated to rise 16% over the next 30 years. However, significant exposure to the industrial customer segment could lead to more volatility in economic downturns. Earnings could be impacted by the industrial's cyclical nature, which may be why ROE fell drastically in 2008 recession.

Figures 12 & 13: Electric Usage by Customer (left - Q); Electric MWh Sales by Customer (right)

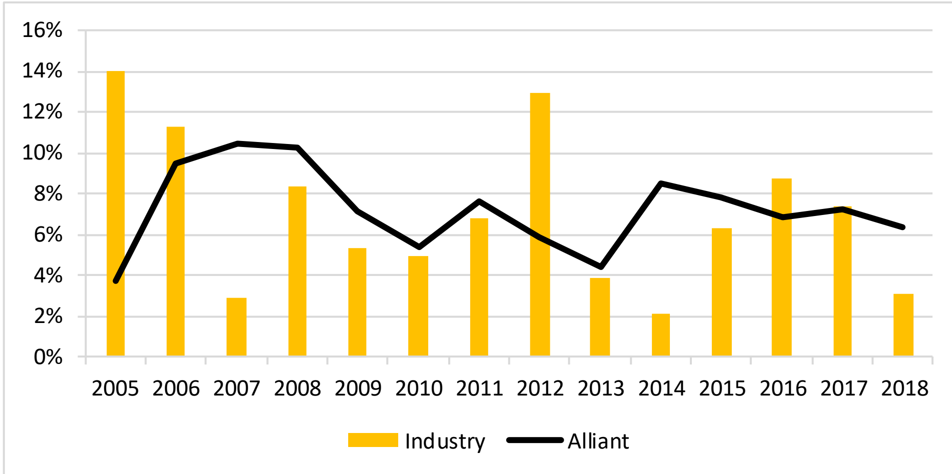


Source: EEI Institute, FactSet

The company has grown dividends faster than the industry. Dividends per share have increased at a 7% CAGR since 2010. Earlier this year, LNT announced a $1.42 target dividend per share, or a 6% increase from 2018's dividend. Maintaining a high dividend growth rate provides a preferred investment to high net worth individuals seeking steady inflows and an alternative to low yielding notes. However, LNT's dividend rose less than the industry during the last recession. Perhaps this could be due to the firm's higher exposure to the industrial sector (note that ROE dipped at the time versus the industry, as shown in figure 7). I suspect Alliant's strong dividend growth may slow in the coming years given we are in the late stages of this cycle.

Dividends per share have increased at a 7% CAGR since 2010

Figure 14: Dividend Growth Rate vs Industry



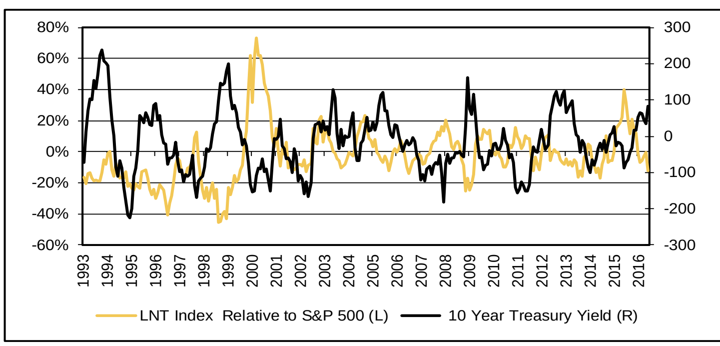
Source: FactSet

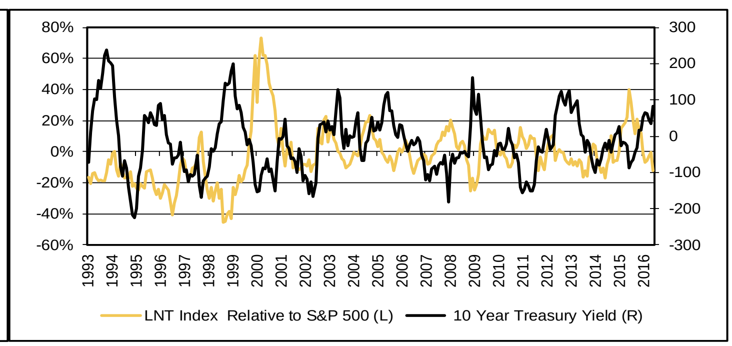
Macroeconomic Trends

LNT dividend yield and payout ratio sit just above 2.6% and 61.1%, respectively

The utility industry is negatively correlated to Treasury yields. High dividend yields make utilities an attractive investment in periods of decreasing interest rates. Alliant's dividend yield and payout ratio currently sit at 2.6% and 61.1% respectively. The company's dividend yield is slightly lower than the industry (3.0%), but payout ratio is right on par, suggesting the stock may be overpriced. I anticipate the utility industry to continue generating superior returns relative to the market given current market volatility and suppressed Treasury yields driven by the Fed. The Fed's guidance appears to remain dovish, as three rate cuts have been implemented so far this year.

Figures 15 & 16: LNT Index vs 10 Year Treasury Yield (left-bps); LNT Index Relative to S&P 500 versus 10 Year Treasury Yield (right)



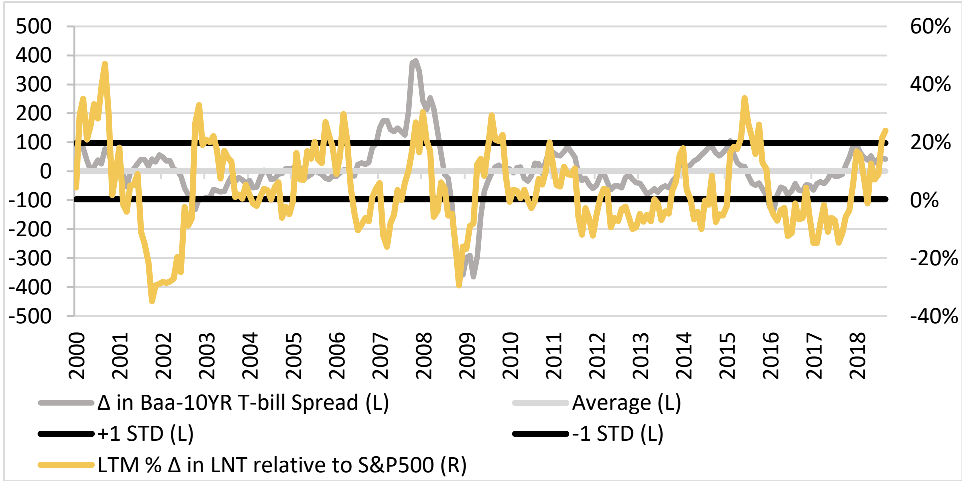


Source: Bloomberg

LNT's Index correlation to 10-year Treasury Yields is -0.24

With historically low treasury yields, a contrarian's point of view would argue that LNT will underperform the market as the 10-year treasury yield reverts to its long-term average. The correlation of LNT Index relative to S&P 500 and 10-year treasury yields is -0.24

Figure 17: LTM percent change in LNT vs LMT change in Baa vs 10-year T-bill spreads (Bps)



Source: FactSet

Alliant's last twelve-month percent change in price relative to the S&P 500 has a correlation of 0.23 against the last twelve-month change in Baa vs 10-year T-bill spreads. Tightening spreads means we are in a risk on market, so utilities should underperform. However, research shows all stocks rise in a risk on market; it is a matter of which stocks outperform on a relative basis.

Financial Analysis

2020E EPS:

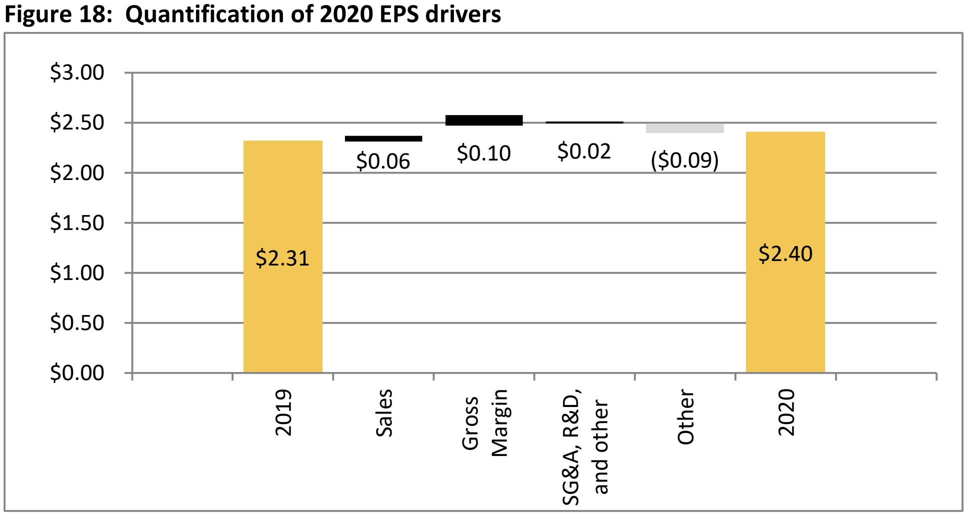
- *$2.40*

2021E EPS:

- *$2.53*

I anticipate EPS to grow to $2.40 in FY 2020. Since 2018, LNT has sustained above average revenue growth as a result of rising capital expenditures. With capex expected to peak in 2019, I forecast a reversion of the growth trend starting in 2020. Revenue growth should decrease from 4.2% to 2.0%, increasing earnings only by $0.06 as shown in Figure 18. Improvements in electric and gas distribution systems, such as increased monitoring and operational efficiency, should deliver a higher gross margin. I expect gross margin to rise from 52.2% to 55.9%, contributing a further $0.10 to earnings. This is followed by a 0.01% decrease in SG&A/sales, adding $0.02 to EPS. Wind tax credits expire are set to expire year end 2019, which I project to increase Alliant's tax rate from 10.7% to 15.7% in 2020, and years forward. Combined with a slight increase in interest expense and an additional 3.7 million shares issued, much of the gross margin improvement should be offset, reducing EPS by $0.09.

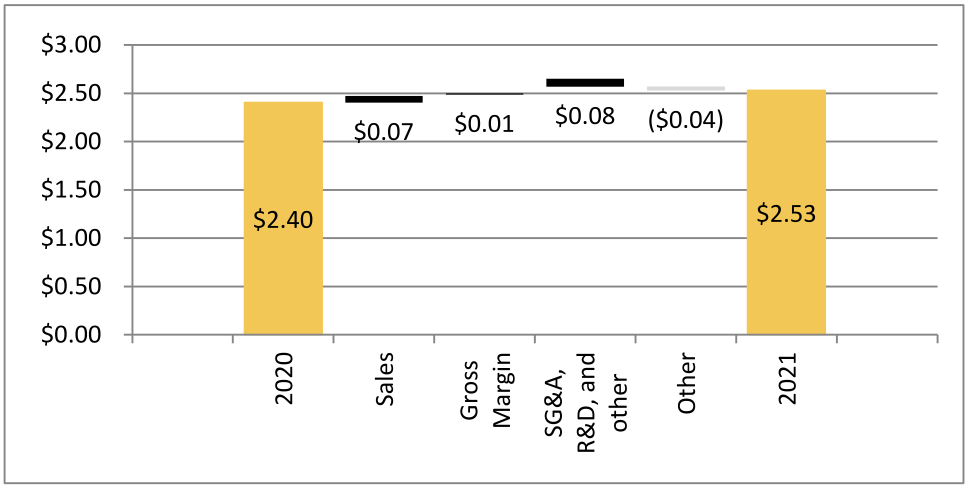
Figure 18: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

I expect EPS to grow from $2.40 to $2.53 in FY 2021. Revenue growth should slightly improve upon completion of renewable energy projects, contributing $0.07 to earnings. With natural gas system upgrades complete in 2020 and electric system upgrades still underway, I anticipate essentially zero gross margin growth in 2021. As a result, I project gross margin to only add $0.01 to EPS. Higher revenue growth should continue to decrease SG&A/sales, causing EBIT margins to rise to 21.7% from about 21.0%. I anticipate the further $0.08 contribution to be partially offset by the rise in interest expense. Lower capital expenditures and recent equity issues should slow long-term debt growth, thus limiting interest expense negative impact to EPS by $0.04.

Figure 19: Quantification of 2021 EPS drivers

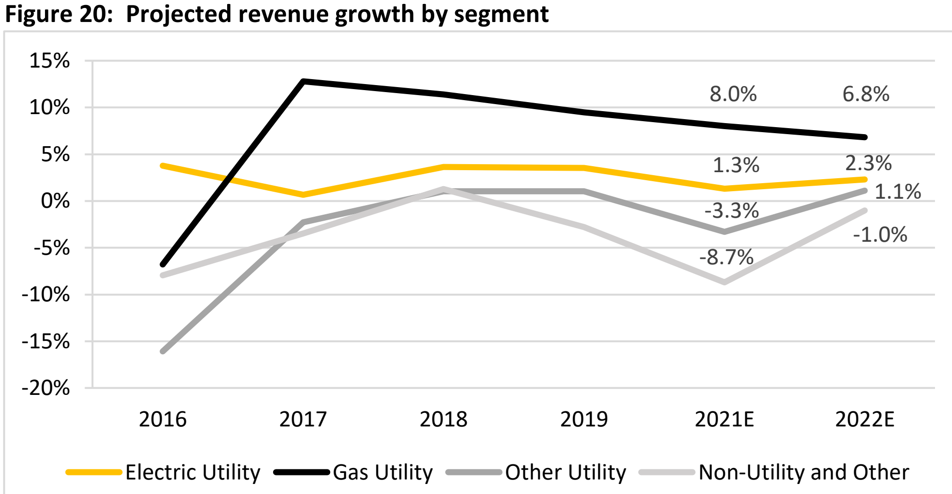


Source: Company Reports, IMCP

<u>Revenues</u>

LNT grows revenue through ambitious customer-focused capital investments. The firm is now spending on renewable capacity and electric system upgrades. Alliant's revenue has averaged 1.8% growth year over year since 2009. In 2017 and 2018, the gas utility segment maintained higher growth levels as a result of rate case approvals, greater sales volume from temperature changes, and upward revisions to costs recovered from energy efficiency programs through the energy efficiency rider. In 2017 and 2018, the electric utility segment experienced modest growth after receiving regulatory approval for higher electric margins due to the construction of several EGU's (Marshall and West riverside).

Figure 20: Projected revenue growth by segment



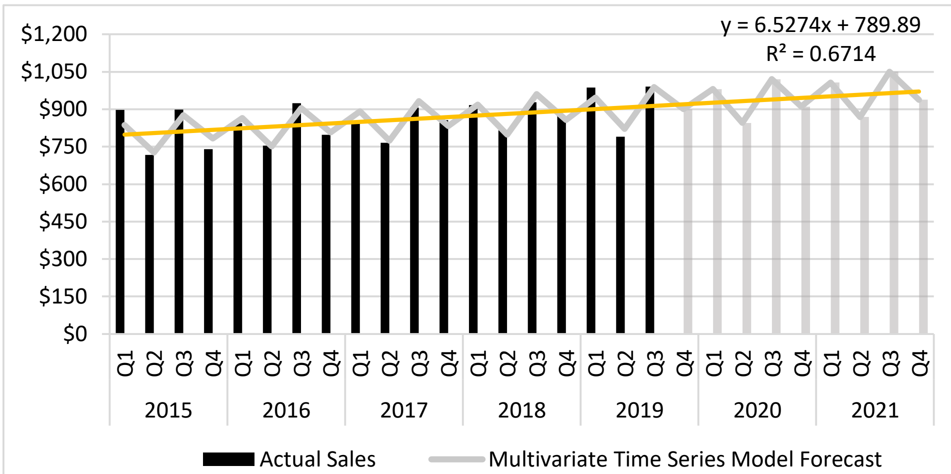
Source: Company Reports, IMCP

I project all revenue segments to continue its downward trajectory through 2020, with a slight rebound in 2021

The company will continue to earn a return on the early retirement of several EGU's, providing a hedge against falling authorized ROE's for new projects. Investments in utility system upgrades and renewables capacity should benefit the electric utility segment moving forward. Shown in figure 20, I project all revenue segments to continue its downward trajectory through 2020, with a slight rebound in 2021.

Given quarterly revenue fluctuates due to climate conditions, I created a multivariate time series model to forecast LNT's revenue over the next two years. The multivariate time series model consists of three components: seasonality, irregularity, and trend. Using quarterly sales dating back to Q1 2015, I extracted seasonality and irregularities from each sales figure to create a regression. I then multiplied the trend by the seasonality component to add back the forecasted fluctuations from quarter to quarter. Lastly, I slightly adjusted down FY 2020 revenue figure to reflect my more bearish outlook versus consensus. I anticipate slower capital expenditures and decreasing authorized ROE's to revert sales growth to just above its long-term average. Zero adjustments were made to FY 2021 forecasts.

Figure 21: Actual Sales vs Forecast ($M)



Source: Company Reports, IMCP

<u>Revenue and EPS Estimate</u>

Figure 22 highlights my less optimistic view on LNT's revenue and EPS growth relative to consensus. Consensus is projecting higher than average revenue growth to continue through 2021, a trend that I project to revert. I believe Alliant will experience slower revenue growth in 2020 and slightly rise in 2021. I am more optimistic on some operating improvements, but less optimistic on revenue. Overall, I expect EPS to grow in line with consensus, though I am more optimistic on some operating improvements noted earlier.

Figure 22: Revenue and EPS Estimates

	2019E	2020E	2021E
Revenue Estimate*	$3,682	$3,757	$3,850
YoY Growth	4.2%	2.0%	2.5%
Revenue Consensus*	$3,645	$3,828	$3,997
YoY Growth		5.0%	4.4%
*in millions			
EPS Estimate	$2.31	$2.40	$2.53
YoY Growth		3.9%	5.2%
EPS Consensus Growth	$2.30	$2.41	$2.56
YoY Growth		4.8%	6.2%
EPS Guidance High	$2.33	$2.48	-
EPS Guidance Low	$2.27	$2.34	-

Source: Factset

Return on Equity

Historically, Alliant has generated greater return on equity relative to comps. Since 2016, profit margins have steadily risen due to approved rate cases and improvements in operational efficiency, but this was largely offset by the decreasing asset utilization ratio. Asset utilization for LNT and peers has experienced negative growth due to the industry's extended building cycle. The construction of several EGU's and wind farms has constricted ROA from improving, except for the small increase in 2018. In February 2018, the IPL subsidiary was authorized a $130 million annual revenue increase. This drove ROA to 3.5 percent, and caused ROE to increase from 10.8 percent in 2017 to 11.2 percent in 2018. Utility commissions partially influence the equity multiplier through regulation of the company's capital structure. In 2018, the equity multiplier dipped as Alliant made two public offerings, raising a combined $500 million in equity. Figure 23 reveals LNT has maintained an ROE above comps mainly through profit margin improvements.

DuPont analysis suggests LNT's ROE is driven by profit margins

Figure 23: 3-stage ROE Breakdown[1]

3-stage DuPont	2016	2017	2018	2019	2020E	2021E
Net income / sales	13.0%	13.5%	14.5%	14.7%	15.2%	15.6%
Sales / avg assets	0.26	0.25	0.24	0.23	0.22	0.22
ROA	3.3%	3.3%	3.5%	3.4%	3.4%	3.4%
Avg assets / avg equity	3.24	3.26	3.23	3.26	3.25	3.22
ROE	10.8%	10.8%	11.2%	11.1%	11.0%	10.9%

Source: Company Reports, IMCP

I expect profit margins to continue rising as LNT drives down direct costs by building a smarter grid, according to management's guidance. Asset utilization will dip in 2019 but remain flat through 2021 as slower sales growth is offset by decreasing capital expenditures. I anticipate ROA to remain at historical levels and the equity multiplier to decrease over the next two years. ROE is directly influenced by regulators, thus reducing the risk of large variances year over year. I project a slight decrease in ROE over the next two years due to the dip in equity multiplier, but favorable regulation in Iowa and Wisconsin should continue to maintain Alliant's ROE above the industry average.

Free Cash Flow

The utility industry generally produces negative free cash flows, not counting increases in debt, because of its significant capital investments required to grow the business. LNT's cash flow has been fairly volatile due to sharp changes in NOWC and NFA, producing negative free cash flow to firm (FCFF) over the last four years. Since 2016, LNT's annual rise in capital spending has driven NFA growth at a faster pace than NOPAT. NFA nearly doubled from 2017 to 2018, plunging FCFF in FY 2018.

Per management's guidance, I also expect NOWC improvement to be offset by increasing net fixed assets. FCFF should see a modest increase in FY 2020 as total invested capital growth shrinks; however, the firm will still generate negative free cash flow to firm. I anticipate FCFF to turn positive in 2021 as LNT significantly reduces capex.

[1] See appendix 6 for 5-stage ROE breakdown

The utility industry is extremely capital intensive, which explains LNT's negative FCFF

Figure 24: FCF Analysis FY 2013 – FY 2021E

Free Cash Flow	2015	2016	2017	2018	2019E	2020E	2021E
NOPAT	$473	$462	$573	$620	$662	$665	$704
Growth		*-2.3%*	*24.0%*	*8.3%*	*6.8%*	*0.4%*	*5.9%*
NOWC	(59)	(36)	27	(161)	(33)	(8)	79
Net fixed assets	11,668	12,497	13,283	14,641	15,489	16,404	16,962
Total net operating capital	$11,609	$12,461	$13,310	$14,480	$15,456	$16,396	$17,042
Growth		*7.3%*	*6.8%*	*8.8%*	*6.7%*	*6.1%*	*3.9%*
- Change in NOWC		23	63	(188)	128	25	87
- Change in NFA		828	786	1,358	848	915	558
FCFF		-$389	-$276	-$550	-$314	-$275	$59
Growth			*-29.0%*	*98.9%*	*-42.9%*	*-12.2%*	*-121.5%*
- After-tax interest expense		164	184	221	243	256	273
+ Net new short-term and long-term debt		569	717	663	950	700	620
FCFE		$16	$257	-$108	$393	$168	$406
Growth			*1505.6%*	*-141.9%*	*-464.6%*	*-57.2%*	*141.6%*
FCFF per share		($1.71)	($1.20)	($2.35)	($1.34)	($1.16)	$0.25
Growth			*-29.8%*	*95.6%*	*-43.0%*	*-13.6%*	*-121.5%*
FCFE per share		$0.07	$1.12	($0.46)	$1.68	$0.71	$1.71
Growth			*1487.5%*	*-141.2%*	*-464.0%*	*-57.9%*	*141.6%*

Source: Company Reports, IMCP

Outside of 2018, Alliant's free cash flow to equity (FCFE) has remained positive largely due to significant net new short-term and long-term borrowings over the last four years as well as slower after-tax interest expense growth. My analysis shows FCFE declining in 2020 caused by lower cash from net new borrowings. I anticipate a significant rise in 2021 as FCFF turns positive.

Valuation

Target Price:

- *$46.03*

Recommendation:

- *Hold*

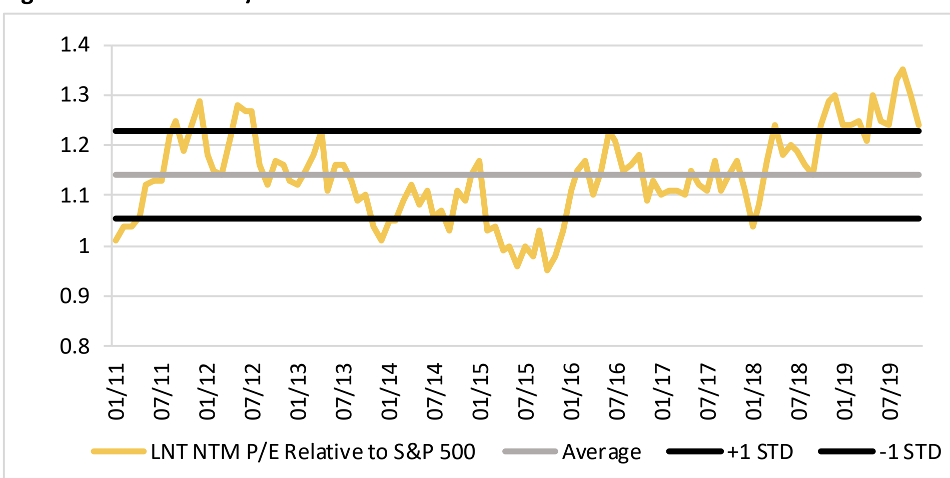
LNT was valued using a one year EPS outlook, detailed 3-stage DCF model, and relative valuation analysis. Overall, my valuation approach focuses on industry relevant multiples such as P/B, P/E, and dividend yield. I also use ROE and EPS weights in the relative valuation section to reflect the influence of regulated earnings. NTM P/E and 2021E EPS reveal a one-year discounted price of $47.89, a ˜9.6 discount to today's price. Using a 2.05 P/B terminal value, I calculated an absolute valuation within the 3-stage DCF pricing LNT at $42.69, a ˜11.8% discount to today's price. A P/B relative valuation regression based on ROE points towards downside potential, pricing the stock today at $50.86. Finally, I determined a final target price weighting EPS outlook, P/B regression, and 3-stage DCF model at 25%, 25%, and 50% weights, respectively. The weighted average of these valuation methods leads to a target price of $46.03 by FY 2020.

Trading History

LNT is currently trading well above its ten-year average NTM PE relative to the S&P 500. As the market reaches late stages of the cycle, investors seek safety in defensive stocks such as Alliant. The stock has greatly benefitted from the market's PE expansion in 2019. The company's absolute PE peaked at 23.36 in late 2019. However, PE's are likely fully valued and will remain flat through 2020. Mean reversion theory suggests a pessimistic outlook for LNT's PE, highlighted in figure 25. Alliant's current NTM PE is 21.99, compared to its five-year average of 19.13. While I expect modest earnings growth in 2020, I forecast LNT's PE to remain the same as markets have already priced in next year's growth.

Alliant has greatly benefitted from the market's PE expansion in 2019

Figure 25: LNT NTM P/E Relative to S&P 500



Source: Factset

Assuming the company's NTM PE lowers to 19.9 through the end of 2020, it should trade at $50.35 by the end of the year based on my 2021 EPS estimate:

- Price 2020E = NTM P/E x EPS 2021E = 19.9 x $2.53 = $50.35

Discounting this one-year price estimate back to today would yield a current price expectation of $50.65 assuming a cost of equity of 5.14% (explained in Discounted Cash Flow section). Given

- Price(Today) = Price(2020E) / (1+Cost of Equity)^1 = $50.35 / (1+0.0514) = $47.89

Relative Valuation

In today's low interest rate environment, investors are pursuing utilities as a proxy for income, pushing up prices in the broader sector

Figure 26 provides an illustration of Alliant's past performance within its peer group. LNT is currently trading at a slightly higher TTM P/E than its peer group average, with a TTM P/E of 23.7 compared to an average of 23.3. Utilities' strong performance this year is partially credited to the aggressive P/E expansion across the market. Though Alliant's P/E may not be overvalued relative to peers, the P/E of the utility sector is currently far above historical averages. Alliant's P/B ratio is currently trading in the upper range of its peer group, indicating limited room for expansion. However, bulls would argue P/B will continue to be supported by LNT's highest ROE within its peer group, but a high ROE because of temporarily low tax rate.

In today's turmoil markets, investors are willing to pay a premium for the safety utilities provide. LNT's dividend yield and payout ratio are at about the industry average. Alliant's dividend growth rate plunged relative to peers in the last recession[2], posing a risk to future performance.

LNT's net profit margin and operating margin are the highest in its peer group, suggesting the company's high P/S ratio is justified. Alliant's P/S ratio is currently trading at 3.52, compared to an average of 3.07.

Figure 26: LNT comparable companies as of 12/15/2019[3]

Comp Sheet (12/15/2019)																	
	Current	Market	Price Change				Earnings Growth								LT Debt/	LTM Dividend	
Ticker	Price	Value	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Yield	Payout
LNT	$52.93	$12,947	2.5	7.5	14.8	25.3	5.2	10.9%	10.1%	5.5%	3.9%	5.4%	6.3%	0.21	111.7%	2.68%	62.8%
WEC	$89.18	$28,131	(2.2)	6.7	19.0	28.8	6.6	-3.1%	-11.9%	5.7%	5.9%	7.0%	5.9%	0.13	108.4%	2.66%	67.1%
XEL	$62.26	$32,648	(0.6)	4.7	16.0	26.4	5.4	9.3%	9.8%	6.1%	6.1%	6.5%	5.3%	0.21	140.1%	2.59%	63.8%
ALE	$79.36	$4,100	(8.9)	(6.3)	(2.0)	4.1	7.0	-5.8%	0.0%	5.6%	4.8%	10.7%	5.2%	0.22	64.7%	2.93%	61.0%
BKH	$77.15	$4,741	1.7	(0.7)	14.2	22.9	3.9	-1.1%	45.2%	-25.1%	5.7%	6.2%	12.4%	0.11	131.1%	2.68%	55.4%
Average		$16,513	(1.5)	2.4	12.4	21.5	5.6	2.0%	10.6%	-0.4%	5.3%	7.2%	7.0%	0.18	111.2%	2.71%	62.0%
Median		$12,947	(0.6)	4.7	14.8	25.3	5.4	-1.1%	9.8%	5.6%	5.7%	6.5%	5.9%	0.21	111.7%	2.68%	62.8%
SPX	$3,169		5.4	9.6	19.6	26.4			23.6%	1.3%	7.2%	7.7%					
	2019		P/E							2019			Current			Sales Growth	
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	OM	ROIC	EV/EBIT	P/CF	NTM	Pst 5yr
LNT	11.7%	2.67	21.4	19.3	22.9	23.7	21.4	22.1	20.9	15.3%	3.52	19.6%	5.7%	23.0	11.1		1.5%
WEC	11.2%	2.82	17.5	20.7	25.3	25.8	26.6	23.8	22.3	13.6%	3.44	18.6%	5.6%	23.6	13.2	3.8%	11.2%
XEL	10.5%	2.48	21.4	19.9	23.8	24.9	22.8	22.4	21.0	11.6%	2.75	17.0%	4.7%	21.6	10.5	3.2%	1.1%
ALE	8.4%	1.86	22.0	22.6	22.2	20.8	22.1	21.2	19.2	14.1%	3.13	13.3%	4.9%	26.8		-13.7%	8.0%
BKH	9.2%	2.03	18.7	13.5	22.1	21.2	21.4	20.9	19.7	11.4%	2.53	22.6%	5.3%	16.9	10.9		6.6%
Average	10.2%	2.37	20.2	19.2	23.3	23.3	22.9	22.1	20.6	13.2%	3.07	18.2%	5.2%	22.4	11.4	-2.2%	5.7%
Median	10.5%	2.48	21.4	19.9	22.9	23.7	22.1	22.1	20.9	13.6%	3.13	18.6%	5.3%	23.0	11.0	3.2%	6.6%
SPX			20.6	15.6	19.5			18.2	16.9								

Source: IMCP, Factset

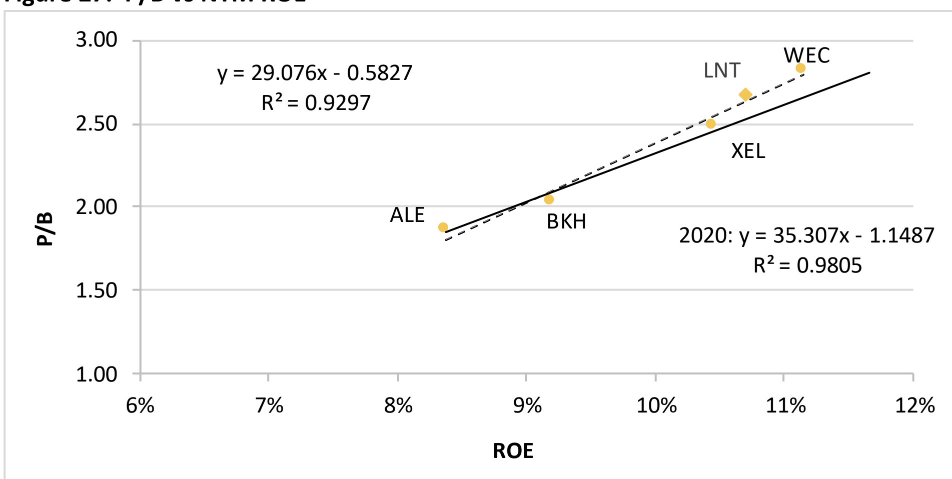
[2] Refer to Figure 14, [3] Refer to Appendix 8 for full comp sheet

A more thorough analysis of P/B and ROE is shown in figure 27. The calculated R-squared of the regression indicates that over 92.9% of a sampled firm's P/B is explained by its 2019 ROE. LNT has the highest ROE and second highest P/B of this grouping. The regression implies LNT's P/B is slightly overvalued, indicating downside risk. However, if the curve steepens, as fears of recession increase and investors pay up for more safety, LNT's high ROE looks to be more appropriately valued. I steepened the slope of the regression line, yielding a new equation for finding P/B.

- Target P/B = Estimated 2020 ROE (11.01*%) x 35.307 - 1.1487 = 2.74
- P/B Appreciation = Target P/B (2.74) / Current P/B (2.67) = 1.03%
- Target Price = Estimated P/B Appreciation (1.03%) x Current Price ($52.93) = $53.48

Discounting back to the present at a 5.14% cost of equity leads to a target price of $50.86 using this metric.

Figure 27: P/B vs NTM ROE



Source: IMCP, Factset

For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A 75% weight was applied into 2020 earnings to reflect the impact of earnings regulation on fundamentals; the other 25% was applied to 2019 ROE. I applied the greatest valuation weight to P/B because it is theoretically tied to ROE and relevant to asset intensive firms such as Alliant. The remaining 30% was distributed into 2020 P/E and 1/Yield, at 25% and 5% respectively. 1/Yield implies that low yield is high value.

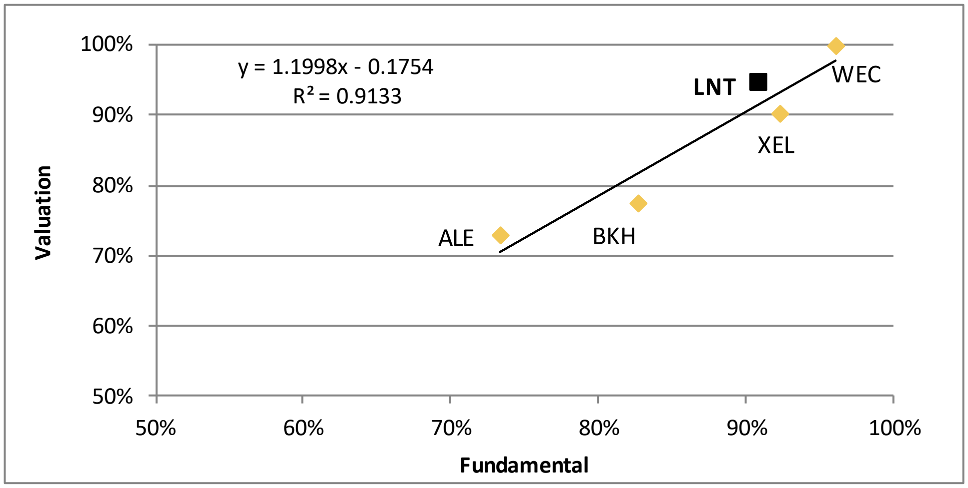
Figure 28: Composite valuation, percentage of range

							Fundamentals		Valuation		
						Weight	25.0%	75.0%	25.0%	70.0%	5.0%
		Rank		Target	Weighted		2020	2019	2020		
Ticker	Name	Diff	Diff	Value	Fund	Value	Earnings	ROE	PE	P/B	1/Yield
LNT	ALLIANT ENERGY CORP	1	-3%	92%	91%	94%	64%	100%	92%	95%	97%
WEC	WEC ENERGY GROUP INC	3	-2%	98%	96%	100%	97%	96%	100%	100%	97%
XEL	XCEL ENERGY INC	4	3%	93%	92%	90%	100%	90%	94%	88%	100%
ALE	ALLETE INC	2	-2%	70%	73%	73%	78%	72%	89%	66%	88%
BKH	BLACK HILLS CORP	5	4%	82%	83%	77%	94%	79%	88%	72%	97%

Source: IMCP, Factset

Composite relative valuation conclude LNT's multiples are fully valued as a function of fundamentals

Figure 29: Composite Relative Valuation



Source: Factset

Based on fundamentals, figure 29 reveals LNT is somewhat expensive relative to peers.

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was also used to value LNT.

For the purpose of this analysis, the company's cost of equity was calculated to be 5.14% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk free rate, as represented by the ten year Treasury bond yield, is 1.90%.
- A ten-year beta of 0.40 was utilized since the company has lower risk than the market.
- A long term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 5.14% (1.90 + 0.40 (10.0 – 1.92)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $0.71 and $1.71, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $2.22 per share. Thus, stage one of this discounted cash flow analysis contributes $2.22 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 5.14% cost of equity.

I assume 2.2% sales growth in 2022, decreasing to 2.1% through 2026. NOPAT margin is expected to rise to 23.0% in 2026 from 20.3% in 2022. NFA turnover should shrink to 0.20 in 2026 from 0.22 in 2022 as a result of slower sales growth and capital-intensive wind investments, offset by slower capex growth in other segments. Finally, I anticipate after-tax interest to continue rising but at a slower rate as LNT reduces net new debt.[4]

[4] Refer to Appendix 7 for detailed DCF analysis

Figure 30: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$ 0.71	$ 1.71	$ 0.05	$ 0.56	$ 0.54	$ 0.47	$ 0.64
Discounted FCFE	$ 0.67	$ 1.55	$ 0.04	$ 0.45	$ 0.42	$ 0.35	$ 0.45

Added together, these discounted cash flows for stage 2 total $1.71.

Stage Three – Book value equity for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. BVPS is expected to grow from $22.67 in 2020 to $26.21 in 2026. Dividends should see slower growth in the near future as net income decreases from slower sales and expiring tax credits, slightly offset by an increase in payout ratio.

Figure 31: BVPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
BVPS	$22.67	$23.54	$23.98	$24.45	$24.93	$25.52	$26.21
Growth		3.8%	1.9%	1.9%	2.0%	2.4%	2.7%

Stage three of the model requires an assumption regarding the company's terminal price-to-book ratio. For the purpose of this analysis, price to book was determined as the best valuation multiple because it normalizes negative CF/NI, common in most utilities due to its capital-intensive nature. Also, it is generally assumed that as a utility's regulated capital growth slows, its P/B will decline. LNT's current P/B is 2.67 and the 10-yr average is 1.83. Moving for the average suggests a P/B of 2.10 is appropriate in 2026.

Factors such as expected payout ratio, risk, growth, and ROE were considered in determining Alliant's P/B terminal value. As markets rattled from a global economic slowdown in 2019, utilities were rewarded by investors' appetite for dividend income in a market with historically low interest rates. I believe this inflated valuation multiples across the sector, including price to book. Investors are currently not pricing in the risk of Alliant's weak dividend growth relative to peers in recessionary periods[5], thus reducing payout ratio, which ultimately reduces P/B. The market is projecting LNT's strong revenue growth to continue, well above its historical and industry average. While favorable regulation should support LNT's high ROE relative to peers in the future, I forecast growth rates to revert as regulated capital growth diminishes due decreasing capex. The market will be quick to price in this reversion, justifying my low P/B terminal value to calculate its fair value.

Given the assumed terminal book value per share of $26.21 and a price to book ratio of 2.10, a terminal value of $55.05 is calculated. Using the 5.14% cost of equity, this number is discounted back to a present value of $38.76.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $42.69 is calculated (2.22 + 1.71 + 38.76). Given LNT's current price of $52.93, this model indicates that the stock is overvalued.

Figure 32: DCF Summary

Summary (using P/B multiple for terminal value)		
First stage	$2.22	Present value of first 2 year cash flow
Second stage	$1.71	Present value of year 3-7 cash flow
Third stage	$38.76	Present value of terminal value P/B
Value (P/B)	**$42.69**	

Source: Factset

[5] Refer to Figure 14

Scenario Analysis

Bull Scenario:

- *$59.43*

Bear Scenario:

- *$30.20*

Defensive companies such as Alliant Energy generally do not diverge as much from long term trends. However, LNT has historically shown greater volatility versus its peers relative to the market. Changes in the economic cycle, regulatory body, or future price of natural gas are difficult to predict. Therefore, I valued LNT under bull and bear case scenario by changing combinations of five key factors: sales growth, gross margin, S/NFA ratio, terminal P/B, and beta.

Bull: Assuming a lower beta of 0.22 in my CAPM equation reduces the cost of equity to 3.68%, yielding a $0.05 increase to first stage present value. Sustaining strong sales growth assumes that the regulatory body will continue to support capital investments and reverse to above average sales growth by 2023, with sales increasing 3.0%-3.5% through 2026. My base scenario projects NOPAT margin to rise 0.5%-2.0% per year as a result of LNT's investments in operational efficiency, rising to 23.0% in 2026. In contrast, my bull scenario forecasts a 25.0% NOPAT margin by 2026, predicting greater benefit from LNT's electric system upgrades and high margin growth to be supported by above average sales growth. The bull scenario also assumes a constant 0.23 S/NFA ratio through 2023 and dips to 0.22 in 2026, compared to 0.20 S/NFA by 2026 in the base scenario. The combination of these assumptions results in a $6.21 second stage present value. Lastly, a higher terminal P/B assumes investors will be slower to price in highly probable growth slowdown, only decreasing to 2.35 versus 2.10 by 2026 in base scenario. A 2.35 terminal P/B yields $50.94 third stage present value. The combination of these variables gives LNT a *bullish* fair value of $59.43.

Figure 33: Bull Scenario

Summary (using P/B multiple for terminal value)		
First stage	$2.27	Present value of first 2 year cash flow
Second stage	$6.21	Present value of year 3-7 cash flow
Third stage	$50.94	Present value of terminal value P/B
Value (P/B)	**$59.43**	

Bear: Assuming a higher beta of 0.70 in my CAPM equation increases the cost of equity to 7.57%, yielding a $2.13 first stage present value, or $0.09 less than base scenario. Lower than average sales growth assumes that the political landscape in which Alliant operates will turn unfavorable to business growth, and earnings to deteriorate as a result. The bear scenario projects NOPAT margins to remain flat at 18% through 2026 versus 22.1% in base scenario, justified by potential increase in price of natural gas and little to no improvement in operational efficiency. Though, this may be pessimistic given Alliant's significant investments in system upgrades. I expect S/NFA to decrease to 0.20 by 2026 in both bear and base case. I also expect net new debt to remain flat at $500 million annually, versus a general downtrend in base case. The combination of these assumptions yields a $1.11 second stage present value. Lastly, a lower terminal P/B assumes investors will highly value the downward trend in growth in the coming years, decreasing to 1.90 versus 2.10 by 2026 in base scenario. A 1.95 terminal P/B yields $26.95 third stage present value. The combination of these variables gives LNT a *bearish* fair value of $30.20.

Figure 34: Bear Scenario

Summary (using P/B multiple for terminal value)		
First stage	$2.13	Present value of first 2 year cash flow
Second stage	$1.11	Present value of year 3-7 cash flow
Third stage	$26.95	Present value of terminal value P/B
Value (P/B)	**$30.20**	

Business Risks

Regulation:

Financial condition of the regulated investor-owned utility sector is influenced by how regulatory authorities establish the rates companies can charge to customers, authorized rates of return, and common equity levels. My analysis suggest regulatory lag should be reduced using forward test years, but I may be wrong as an unfavorable regulatory body could reverse this practice. As a result, Alliant may experience adverse impacts on their financial condition[6].

Growth strategy based on large capex:

Alliant is pursuing growth through the construction of renewable generating facilities, natural gas-fired generating facility, and other large-scale improvements to generating facilities. Construction of these projects are subject to various risks, including the inability to recover all costs for the projects[6].

Demand for energy may decrease:

Alliant may be affected by the demand for energy in its service territories. Energy demand may decrease due to many things, including economic conditions, loss of service territory or franchises, energy efficiency mandates, and technological advances that increase energy efficiency[6]. My analysis suggests Alliant should not be impacted by decreasing demand for energy given industrial customers are forecasted to grow quickest, which is the company's largest customer segment by electric MWh sales[7]. The EEI Institute predicts a gloomy future for energy demand, thus my analysis could be incorrect. Furthermore, industrial businesses may suffer more during a recession.

Weather

The electric and gas utility businesses are highly seasonal. Alliant is subject to generate less revenues and income when temperatures are warmer in the winter and/ or cooler in the summer, a pattern which can be seen on figure 21. As a result, LNT's operating results in the future may fluctuate substantially on a seasonal basis.

Limitations to LNT's ability to pay dividends

The primary sources of funds for Alliant Energy to pay dividends to its shareowners are dividends and distributions from its subsidiaries. The IPL and WPL subsidiaries have no obligation to pay any amounts to Alliant Energy shareowners, whether by dividends, distributions, loans or other payments. The ability of Alliant's two main subsidiaries to pay dividends will depend on regulatory limitations, earnings, cash flows, capital requirements, and general financial condition of its subsidiaries.

[6] Alliant Energy Corp. 2018 Annual Report, [7] Refer to Figure 13

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Very Low

The regulated utility industry possesses significant barriers to entry. Operating as a natural monopoly, Alliant thrives on substantial capital and regulatory requirements to satisfy its service territory. I do not foresee LNT losing customers as favorable regulation should secure the customer base.

Threat of Substitutes – Low

The regulation authorities of Iowa and Wisconsin support renewable energy solutions through the utility's capital investments. Although government subsidies have decreased price points for self-generating solutions, LNT's customers are unlikely to go off grid given the unfavorable climate condition for solar generation.

Supplier Power - Medium to Low

After technological advancements and a prolonged building cycle, the cost of generating electricity by solar, wind, or natural gas energy has finally reached cost parity[8]. Alliant and its peers now have more control over prices paid for the highly commoditized resource. Looking at the performance of the largest suppliers in the market over the last two years, one can see the markets have punished suppliers for this shift in pricing power.

Buyer Power – Medium

As a natural monopoly, the industry is heavily regulated. The regulatory body enacts strict profitability measures to protect the customer. In Iowa and Wisconsin, customers do not have the choice to switch service providers, but regulators limit what companies charge.

Intensity of Competition – Low

Alliant does not face competition by the nature of its operations. Due to geographical and regulatory limitations, the utility sector does not fight for market share. Low competition should continue, but potential M&A activity could significantly impact the industry.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High ROE Relative to Peers Favorable Regulation High Net Margin	Negative Cash Flows Falling Demand Overvalued Multiples
Opportunities	**Threats**
ESG Profile Potential Acquisitions EGU Upgrades	Falling Allowed ROE Rising Interest Rates Demand Volatility

[8] Morningstar Equity Research, 18 October 2019

Appendix 3: Income Statement

Income Statement	2015	2016	2017	2018	2019	2020	2021
Sales	$3,254	$3,320	$3,382	$3,535	$3,682	$3,757	$3,850
Direct costs	1,542	1,576	1,510	1,583	1,650	1,657	1,694
Gross Margin	1,712	1,744	1,872	1,952	2,032	2,100	2,156
SG&A, R&D, and other	1,135	1,190	1,201	1,257	1,290	1,311	1,321
EBIT	577	554	671	694	742	789	836
Interest	187	196	216	247	273	304	324
EBT	390	358	456	447	469	485	511
Taxes	70	59	67	48	50	76	80
Income	320	299	389	400	419	409	431
Other	(59)	(133)	(68)	(112)	(122)	(162)	(169)
Net income	378	432	457	512	541	571	601
Basic Shares	225.4	227.1	229.7	233.6	234.0	237.7	237.7
Fully Diluted Shares	225.4	227.1	229.7	233.6	234.0	237.7	237.7
EPS	$1.68	$1.90	$1.99	$2.19	$2.31	$2.40	$2.53
EPS Fully Diluted	$1.68	$1.90	$1.99	$2.19	$2.31	$2.40	$2.53
DPS	$1.10	$1.17	$1.26	$1.34	$1.44	$1.54	$1.66

Appendix 4: Sales Forecast

Sales Forecast						Base Case		Bull Case		Base Case	
Sales	$3,254	$3,320	3,382	$3,535	$3,682	$3,757	$3,865	$3,830	$3,977	$3,739	$3,788
Growth		*2.0%*	*1.9%*	*4.5%*	*4.2%*	*2.0%*	*2.9%*	*4.0%*	*3.8%*	*1.5%*	*1.3%*
Electric Utility	2,771	2,876	2,895	3,000	3,106	3,146	3,219	3,208	3,308	3,134	3,156
Growth		*3.8%*	*0.7%*	*3.6%*	*3.5%*	*1.3%*	*2.3%*	*3.3%*	*3.1%*	*0.9%*	*0.7%*
% of sales	*85.2%*	*86.6%*	*85.6%*	*84.9%*	*84.4%*	*83.8%*	*83.3%*	*83.8%*	*83.2%*	*83.8%*	*83.3%*
Gas Utility	381	355	401	447	489	528	564	534	580	523	554
Growth		*-6.8%*	*12.8%*	*11.4%*	*9.5%*	*8.0%*	*6.8%*	*9.2%*	*8.7%*	*6.9%*	*6.0%*
% of sales	*11.7%*	*10.7%*	*11.9%*	*12.6%*	*13.3%*	*14.1%*	*14.6%*	*13.9%*	*14.6%*	*14.0%*	*14.6%*
Other Utility	58	49	48	48	49	47	47	49	50	47	45
Growth		*-16.1%*	*-2.3%*	*1.1%*	*1.0%*	*-3.3%*	*1.1%*	*1.2%*	*1.2%*	*-3.0%*	*-4.0%*
% of sales	*1.8%*	*1.5%*	*1.4%*	*1.4%*	*1.3%*	*1.2%*	*6.0%*	*1.3%*	*1.2%*	*1.3%*	*1.2%*
Non-Utility and Other	44	41	39	40	39	35	35	39	39	35	33
Growth		*-8.0%*	*-3.5%*	*1.3%*	*-2.8%*	*-8.7%*	*-1.0%*	*1.0%*	*1.0%*	*-9.0%*	*-7.0%*
% of sales	*1.4%*	*1.2%*	*1.2%*	*1.1%*	*1.0%*	*0.9%*	*0.9%*	*1.0%*	*1.0%*	*0.9%*	*0.9%*

Appendix 5: Balance Sheet

Balance Sheet							
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Cash	6	8	28	21	44	22	41
Operating assets ex cash	821	869	877	764	870	947	1,001
Operating assets	827	877	905	785	914	969	1,042
Operating liabilities	886	913	878	946	947	977	963
NOWC	(59)	(36)	27	(161)	(33)	(8)	79
NOWC ex cash (NWC)	(65)	(44)	(1)	(182)	(77)	(30)	39
NFA	11,668	12,497	13,283	14,641	15,489	16,404	16,962
Invested capital	*$11,609*	*$12,461*	*$13,310*	*$14,480*	*$15,456*	*$16,396*	*$17,042*
Markteable Securities	-	-	-	-	-	-	-
Total assets	*$12,495*	*$13,374*	*$14,188*	*$15,426*	*$16,403*	*$17,373*	*$18,004*
Short-term and long-term debt	3,995	4,564	5,282	5,944	6,894	$7,594	$8,214
Other liabilities	3,690	3,834	3,646	3,750	3,573	3,413	3,233
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	3,924	4,062	4,382	4,786	4,989	5,389	5,595
Total supplied capital	*$11,609*	*$12,461*	*$13,310*	*$14,480*	*$15,456*	*$16,396*	*$17,042*
Total liabilities and equity	*$12,495*	*$13,374*	*$14,188*	*$15,426*	*$16,403*	*$17,373*	*$18,004*

Appendix 6: Ratios

	2015	2016	2017	2018	2019	2020	2021
Profitability							
Gross margin	52.6%	52.5%	55.3%	55.2%	55.2%	55.9%	56.0%
Operating (EBIT) margin	17.7%	16.7%	19.8%	19.6%	20.1%	21.0%	21.7%
Net profit margin	11.6%	13.0%	13.5%	14.5%	14.7%	15.2%	15.6%
Activity							
NFA (gross) turnover		0.27	0.26	0.25	0.24	0.24	0.23
Total asset turnover		0.26	0.25	0.24	0.23	0.22	0.22
Liquidity							
Op asset / op liab	0.93	0.96	1.03	0.83	0.97	0.99	1.08
NOWC Percent of sales		-1.4%	-0.1%	-1.9%	-2.6%	-0.5%	0.9%
Solvency							
Debt to assets	32.0%	34.1%	37.2%	38.5%	42.0%	43.7%	45.6%
Debt to equity	101.8%	112.4%	120.5%	124.2%	138.2%	140.9%	146.8%
Total debt to assets	61.5%	62.8%	62.9%	62.8%	63.8%	63.4%	63.6%
Total liabilities to assets	68.6%	69.6%	69.1%	69.0%	69.6%	69.0%	68.9%
Debt to EBIT	6.92	8.24	7.87	8.56	9.30	9.63	9.83
EBIT/interest	3.08	2.82	3.11	2.81	2.72	2.59	2.58
Debt to total net op capital	34.4%	36.6%	39.7%	41.1%	44.6%	46.3%	48.2%
ROIC							
NOPAT to sales	14.5%	13.9%	16.9%	17.6%	18.0%	17.7%	18.3%
Sales to NWC		(60.64)	(149.32)	(38.61)	(28.41)	(70.18)	911.11
Sales to NFA		0.27	0.26	0.25	0.24	0.24	0.23
Sales to IC ex cash		0.28	0.26	0.25	0.25	0.24	0.23
Total ROIC ex cash		3.8%	4.5%	4.5%	4.4%	4.2%	4.2%
Sales to NOWC		(69.53)	(735.26)	(52.64)	(37.90)	(184.40)	107.76
Sales to IC		0.28	0.26	0.25	0.25	0.24	0.23
Total ROIC		3.8%	4.4%	4.5%	4.4%	4.2%	4.2%
Sales to EOY NWC	(49.98)	(74.77)	(3,758.00)	(19.40)	(47.82)	(125.00)	100.00
Sales to EOY NFA	0.28	0.27	0.25	0.24	0.24	0.23	0.23
Sales to EOY IC ex cash	0.28	0.27	0.25	0.24	0.24	0.23	0.23
Total ROIC using EOY IC ex cash	4.1%	3.7%	4.3%	4.3%	4.3%	4.1%	4.1%
Sales to EOY NOWC	(54.87)	(91.71)	125.27	(21.91)	(111.58)	(485.06)	48.61
Sales to EOY IC	0.28	0.27	0.25	0.24	0.24	0.23	0.23
Total ROIC using EOY IC	4.1%	3.7%	4.3%	4.3%	4.3%	4.1%	4.1%
ROE							
5-stage							
EBIT / sales		16.7%	19.8%	19.6%	20.1%	21.0%	21.7%
Sales / avg assets		0.26	0.25	0.24	0.23	0.22	0.22
EBT / EBIT		64.6%	67.9%	64.4%	63.3%	61.4%	61.2%
Net income /EBT		120.7%	100.4%	114.5%	115.4%	117.8%	117.4%
ROA		3.3%	3.3%	3.5%	3.4%	3.4%	3.4%
Avg assets / avg equity		3.24	3.26	3.23	3.26	3.25	3.22
ROE		10.8%	10.8%	11.2%	11.1%	11.0%	10.9%
3-stage							
Net income / sales		13.0%	13.5%	14.5%	14.7%	15.2%	15.6%
Sales / avg assets		0.26	0.25	0.24	0.23	0.22	0.22
ROA		3.3%	3.3%	3.5%	3.4%	3.4%	3.4%
Avg assets / avg equity		3.24	3.26	3.23	3.26	3.25	3.22
ROE		10.8%	10.8%	11.2%	11.1%	11.0%	10.9%
Payout Ratio		61.7%	63.0%	61.0%	62.4%	64.0%	65.8%
Retention Ratio		38.3%	37.0%	39.0%	37.6%	36.0%	34.2%
Sustainable Growth Rate		4.1%	4.0%	4.4%	4.2%	4.0%	3.7%

Appendix 7: 3-stage DCF Model

First Stage			Second Stage				
Year:	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Sales Growth	*2.0%*	*2.5%*	*2.2%*	*1.9%*	*1.8%*	*2.0%*	*2.1%*
NOPAT / S	*17.7%*	*18.3%*	*20.3%*	*20.7%*	*21.0%*	*22.0%*	*23.0%*
S / NOWC	*(485.06)*	*48.61*	*(50.00)*	*(60.00)*	*(60.00)*	*(70.00)*	*(80.00)*
S / NFA (EOY)	*0.2290*	*0.2270*	*0.2178*	*0.2127*	*0.2095*	*0.2055*	*0.2001*
S / IC (EOY)	*0.23*	*0.23*	*0.22*	*0.22*	*0.21*	*0.21*	*0.20*
ROIC (EOY)	*4.1%*	*4.1%*	*4.4%*	*4.4%*	*4.4%*	*4.5%*	*4.6%*
ROIC (BOY)		*4.3%*	*4.7%*	*4.6%*	*4.6%*	*4.7%*	*4.8%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$3,757	$3,850	$3,935	$4,010	$4,082	$4,164	$4,251
NOPAT	$665	$704	$797	$830	$857	$916	$978
Growth		*5.9%*	*13.1%*	*4.2%*	*3.3%*	*6.9%*	*6.7%*
- Change in NOWC	25	87	-158	12	-1	9	6
NOWC EOY	*-8*	*79*	*-79*	*-67*	*-68*	*-59*	*-53*
Growth NOWC		*-1122.8%*	*-199.4%*	*-15.1%*	*1.8%*	*-12.6%*	*-10.7%*
- Chg NFA	915	558	1105	785	632	777	984
NFA EOY	16,404	16,962	18,068	18,853	19,485	20,262	21,245
Growth NFA		3.4%	6.5%	4.3%	3.4%	4.0%	4.9%
Total inv in op cap	*940*	*645*	*948*	*797*	*631*	*785*	*990*
Total net op cap	*16396*	*17042*	*17989*	*18786*	*19417*	*20202*	*21192*
FCFF	($275)	$59	($151)	$33	$226	$131	($12)
% of sales	*-7.3%*	*1.5%*	*-3.8%*	*0.8%*	*5.5%*	*3.1%*	*-0.3%*
Growth		-121.5%	-354.6%	-122.2%	575.6%	-42.1%	-109.4%
- Interest (1-tax rate)	256	273	288	301	308	318	335
Growth		*6.5%*	*5.5%*	*4.6%*	*2.3%*	*3.2%*	*5.2%*
+ Net new debt	700	620	450	400	210	300	500
Debt	*7594*	*8214*	*8664*	*9064*	*9274*	*9574*	*10074*
Debt / tot net op capital	*46.3%*	*48.2%*	*48.2%*	*48.2%*	*47.8%*	*47.4%*	*47.5%*
FCFE w debt	$168	$406	$11	$132	$128	$112	$153
% of sales	4.5%	10.5%	0.3%	3.3%	3.1%	2.7%	3.6%
Growth		*141.6%*	*-97.2%*	*1078.8%*	*-3.4%*	*-11.8%*	*35.7%*
/ No Shares	237.7	237.7	237.7	237.7	237.7	237.7	237.7
FCFE	$0.71	$1.71	$0.05	$0.56	$0.54	$0.47	$0.64
Third Stage							
Terminal value P/B							
Book value	$5,389	$5,595	$5,700	$5,811	$5,926	$6,067	$6,231
Growth		*3.8%*	*1.9%*	*1.9%*	*2.0%*	*2.4%*	*2.7%*
ROE (EOY book)	*10.6%*	*10.7%*	*8.9%*	*9.1%*	*9.3%*	*9.8%*	*10.3%*
Net income	$571	$601	$509	$529	$549	$598	$643
Dividends	$366	$395	$403	$417	$434	$456	$479
Growth		*8.2%*	*2.0%*	*3.5%*	*4.0%*	*5.0%*	*5.0%*
Shares	237.7	237.7	237.7	237.7	237.7	237.7	237.7
Price		$52.63	$44.57	$46.32	$48.09	$52.36	$56.31
Growth			*-15.3%*	*3.9%*	*3.8%*	*8.9%*	*7.5%*
Terminal P/B							2.10
* Terminal BPS							$26.21
Terminal value							$55.05
* Discount factor							0.70
Discounted terminal value							$38.76

Summary (using P/B multiple for terminal value)		
First stage	$2.22	Present value of first 2 year cash flow
Second stage	$1.71	Present value of year 3-7 cash flow
Third stage	$38.76	Present value of terminal value P/B
Value (P/B)	**$42.69**	

Appendix 8: Comp Sheet

Comp Sheet (12/15/2019)

	Current	Market	Price Change				Earnings Growth					
Ticker	**Price**	**Value**	**3 Mo**	**6 Mo**	**52 Wk**	**YTD**	**LTG**	**2018**	**2019**	**2020**	**2021**	**Pst 5yr**
LNT	$52.93	$12,947	2.5	7.5	14.8	25.3	5.2	10.1%	5.5%	3.9%	5.4%	6.3%
WEC	$89.18	$28,131	(2.2)	6.7	19.0	28.8	6.6	-11.9%	5.7%	5.9%	7.0%	5.9%
XEL	$62.26	$32,648	(0.6)	4.7	16.0	26.4	5.4	9.8%	6.1%	6.1%	6.5%	5.3%
ALE	$79.36	$4,100	(8.9)	(6.3)	(2.0)	4.1	7.0	0.0%	5.6%	4.8%	10.7%	5.2%
BKH	$77.15	$4,741	1.7	(0.7)	14.2	22.9	3.9	45.2%	-25.1%	5.7%	6.2%	12.4%
Average		$16,513	(1.5)	2.4	12.4	21.5	5.6	10.6%	-0.4%	5.3%	7.2%	7.0%
Median		$12,947	(0.6)	4.7	14.8	25.3	5.4	9.8%	5.6%	5.7%	6.5%	5.9%
SPX	$3,169		5.4	9.6	19.6	26.4		23.6%	1.3%	7.2%	7.7%	

	2019		P/E							2019		
Ticker	**ROE**	**P/B**	**2017**	**2018**	**2019**	**TTM**	**NTM**	**2020**	**2021**	**NPM**	**P/S**	**NM**
LNT	11.7%	2.67	21.4	19.3	22.9	23.7	21.4	22.1	20.9	15.3%	3.52	14.8%
WEC	11.2%	2.82	17.5	20.7	25.3	25.8	26.6	23.8	22.3	13.6%	3.44	13.8%
XEL	10.5%	2.48	21.4	19.9	23.8	24.9	22.8	22.4	21.0	11.6%	2.75	10.9%
ALE	8.4%	1.86	22.0	22.6	22.2	20.8	22.1	21.2	19.2	14.1%	3.13	11.6%
BKH	9.2%	2.03	18.7	13.5	22.1	21.2	21.4	20.9	19.7	11.4%	2.53	15.1%
Average	10.2%	2.37	20.2	19.2	23.3	23.3	22.9	22.1	20.6	13.2%	3.07	13.3%
Median	10.5%	2.48	21.4	19.9	22.9	23.7	22.1	22.1	20.9	13.6%	3.13	13.8%
spx			20.6	15.6	19.5			18.2	16.9			

		LT Debt/	S&P	LTM Dividend		P/CF	Sales Growth			Book		EV/
Ticker	**Beta**	**Equity**	**Rating**	**Yield**	**Payout**	**Current**	**NTM**	**STM**	**Pst 5yr**	**Equity**	**ROIC**	**EBIT**
LNT	0.21	111.7%	A-	2.68%	62.8%	11.1			1.5%	$19.82	5.7%	23.0
WEC	0.13	108.4%	A	2.66%	67.1%	13.2	3.8%		11.2%	$31.65	5.6%	23.6
XEL	0.21	140.1%	A-	2.59%	63.8%	10.5	3.2%	2.8%	1.1%	$25.06	4.7%	21.6
ALE	0.22	64.7%	A-	2.93%	61.0%		-13.7%	6.8%	8.0%	$42.65	4.9%	26.8
BKH	0.11	131.1%	B	2.68%	55.4%	10.9			6.6%	$37.94	5.3%	16.9
Average	0.18	111.2%		2.71%	62.0%	11.4	-2.2%	4.8%	5.7%		5.2%	22.4
Median	0.21	111.7%		2.68%	62.8%	11.0	3.2%	4.8%	6.6%		5.3%	23.0
SPX												

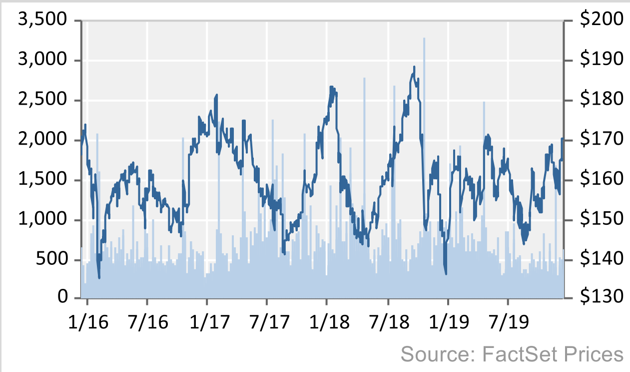
	Earnings							Sales				1/
Ticker	**2017**	**2018**	**2019**	**TTM**	**NTM**	**2020**	**2021**	**2018**	**2019**	**TTM**	**NTM**	**Beta**
LNT	$1.99	$2.19	$2.31	$2.23	$2.47	$2.40	$2.53	$3,535	$3,682	$3,641		4.7
WEC	$3.79	$3.34	$3.53	$3.46	$3.35	$3.74	$4.00	$7,680	$8,168	$7,652	$7,943	7.8
XEL	$2.25	$2.47	$2.62	$2.50	$2.73	$2.78	$2.96	$11,537	$11,877	$11,604	$11,980	4.7
ALE	$3.38	$3.38	$3.57	$3.81	$3.59	$3.74	$4.14	$1,499	$1,309	$1,384	$1,194	4.6
BKH	$3.21	$4.66	$3.49	$3.65	$3.61	$3.69	$3.92	$1,754	$1,873	$1,758		8.9
Average												
Median												
SPX	$130.00	$160.64	$162.75			$174.39	$187.85					

Recommendation: Buy				
Current Price	**$170.38**	---	Ticker	SNA
1 Year Bear	$157	*-8%*	Sh. Out. (M)	56
1 Year Base	**$205**	***20%***	M.Cap. ($B)	9.34
1 Year Bull	$312	*83%*	EV ($B)	10.7

Industrial, Tools & Hardware

Snap-On Inc.

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	28%	-1.7%	.1%	14%	17%	5%	4%

Financials

	2015	2016	2017	2018	2019	2020E	2021E
Sales($M)	**3,353**	**3,430**	**3,687**	**3,741**	**3,734**	**3,854**	**3,968**
Gr. %	*7.2%*	*2.3%*	*7.5%*	*1.5%*	*-0.2%*	*3.2%*	*3.0%*
Cons.	-	-	-	-	-	*0.2%*	*2.1%*
Ind.	-	*3.9%*	*7.9%*	*8.6%*	*4.7%*	*5.3%*	*4.0%*
EPS	**8.24**	**9.40**	**9.72**	**12.08**	**12.53**	**13.19**	**13.98**
Gr. %	*13.1%*	*14.1%*	*3.3%*	*24.3%*	*3.7%*	*5.3%*	*5.9%*
Cons.	-	-	-	-	-	*3.8%*	*3.8%*
Ind.	7.1%	10.3%	15.7%	3.7%	4.8%	6.9%	7.1%

Ratios

	2015	2016	2017	2018	2019	2020E	2021E
NPM	**14.3**	**15.9**	**15.1**	**18.2%**	**18.7%**	**18.5%**	**18.6%**
Ind.	*12.1%*	*12.8%*	*13.0%*	*12.4%*	*12.5%*	*12.9%*	*13.3%*
ROE	*20.7%*	*21.7%*	*20.2%*	*22.4%*	*21.6%*	*20.8%*	*20.2%*
Ind.	*16.9%*	*13.5%*	*14.3%*	*13.66*	*13.2%*	*13.3%*	*13.8%*
ROA	*10.8%*	*12.1%*	*11.2%*	*12.8%*	*12.7%*	*12.5%*	*12.5%*
Ind.	*6.7%*	*7.2%*	*7.3%*	*7.4%*	*7.0%*	*7.3%*	*7.8%*
A T/O	0.82	0.81	0.75	0.73	0.73	0.70	0.69
A/E	1.9	1.83	1.79	1.75	1.7	1.66	1.62

Valuation

	2015	2016	2017	2018	2019	2020E	2021E
P/E	21.0	20.0	17.2	12.3	13.9	13.5	13.2
Ind.	17.4	17.9	18.7	18.6	17.9	24.1	19.5
P/S	2.82	2.74	2.55	1.43	1.67		
P/B	4.13	3.9	3.35	2.7	3.2		
P/CF	20.4	17.66	16.79	19.9	16.0		
EV/EBITDA	12.8	11.59	11.3	15.9	12.0		
D/P	*26.7*	*27%*	*30.4%*	*28.2%*	*29.7%*		

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Summary

I recommend a buy rating with a target of $205. Snap-On has a very high ROE on all existing product lines, and continues to move into new high-margin spaces. SNA has also been capturing growth in international markets, and been boosted by the financial services divison. Relative valuation compared to peers shows that Snap-On is under-valued, and a 3-stage DCF model also supports this. Investors are not pricing in high growth for Snap-On, as many of the firm's investments may take a while longer to pay off. This is leading to a very low P/E which should increase in the future.

Key Drivers

- Expansion of mobile van fleet: The mobile van fleet is the key to Snap-On's tool sales. The vans provide direct-to-customer contact and SNA provides financing for expensive tools. The firm is increasing fleet efficiencies; however, the fleet has not expanded for years.
- International expansion: Snap-On is beginning its move into emerging markets by establishing distribution infrastructure. This will be vital to grow. International sales growth averaged 4%.
- Automobile sales: Much of SNA's tool sales rely on repair shops, which rely on customers needing repairs. Electric vehicles require fewer tools to fix, and this threatens the firm's main division. It is beneficial if consumers keep their cars for longer.
- Raw materials pricing: Snap-On manufactures a large amount of its products in house, and raw materials price increases will directly hit margins. In 2019, raw material prices have come down.
- Macroeconomic trend: Due to the high prices and specialized tools, Snap-On is more cyclical than its competitors.

Valuation

Using a relative valuation approach, Snap-On is undervalued in comparison to other tools & hardware companies. DCF analysis also implies that the stock is undervalued. A combination of the approaches suggests that Snap-On stock's value is $205, with the shares currently trading at $170.

Risks

- The move to electric vehicles may severely impact Snap-On's main product line
- High tool price may cause Snap-On to fail growing into emerging markets

Company Overview

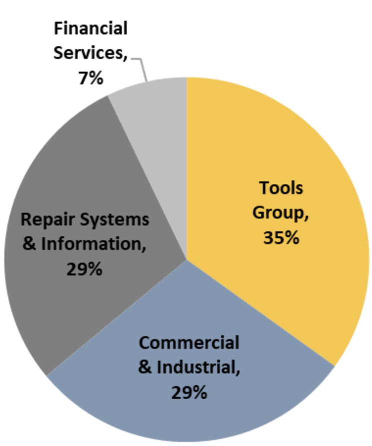
Snap-On Incorporated (SNA) makes high quality hand and power tools for vehicle technicians and other industry experts. Snap-On is known for quality, durability, and a broad range of specialized tools. SNA operates worldwide with a product line of over 65,000 SKUs. Products range from small ratchets, socket sets, and wrenches to large items such as power tools, diagnostics equipment, and tool storage solutions. Given the reputation and brand power that Snap-On carries, it can charge a premium for its products which yields higher profit margins. SNA primarily distributes through its franchise vans which operate routes in the United States and other countries, going to vehicle repair shops to sell directly to consumers. Many of Snap-On's customers choose to finance their purchases, which allows for SNA to operate a large financing department.

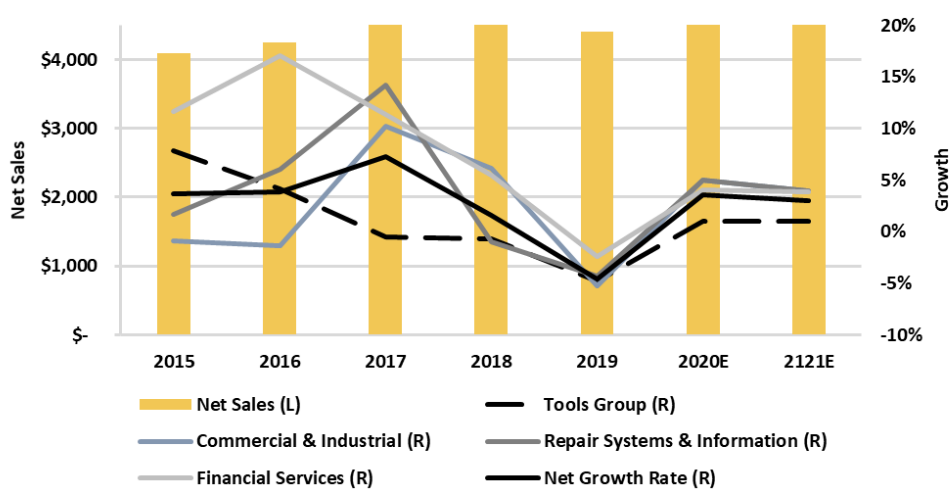
Snap-On Inc. owns a variety of brands, but revenues are sectioned into four different divisions:

Snap-On has had steady sales growth in past years, mainly driven by the company's smaller divisions

- **Snap-On Tools Group (35% of Sales)**: The largest sector that SNA operates. The main customer segment is professional technicians who use the products in their work. Other customers include repair shop owners and OEMs. Growth in this division has been on a slight decline in the past two years, with -1% in 2018.
- **Commercial & Industrial Group (29% of Sales)**: SNA creates specialized tools for various industrial sectors. The main requirements for these customers are reliability and repeatability. Customers range from infrastructure, agriculture, oil and gas production, to aviation and aerospace. C&I has seen a hike in sales recently, with 6% growth in 2018.
- **Repair Systems & Information Group (29% of Sales)**: This group mainly services the same customers as the Snap-On Tools Group: repair shops, professionals, and OEMS. These products are designed mainly to integrate software solutions, increase productivity of workers, and expand to specialized product offerings. The repair systems & information division has seen outstanding growth in the past few years, but lagged in 2018 with a decline of 1%
- **Financial Services (7% of Sales)**: While the financial services division is much smaller than the other divisions, it provides a notable stream of revenue and is an integral part of Snap-On's business model. Customers can choose to finance large purchases quickly and easily through Snap-On, allowing them to get the tools they require while being easier on their budget. Snap-On's financial services grew a modest 5% in 2018.

Figures 1 & 2: 2018 revenue by segment (left); segment growth since 2014 ($M - right)





Source: Company reports

Business/Industry Drivers

Many factors contribute to the future success or failure of Snap-On, but the most important drivers of business are as follows:

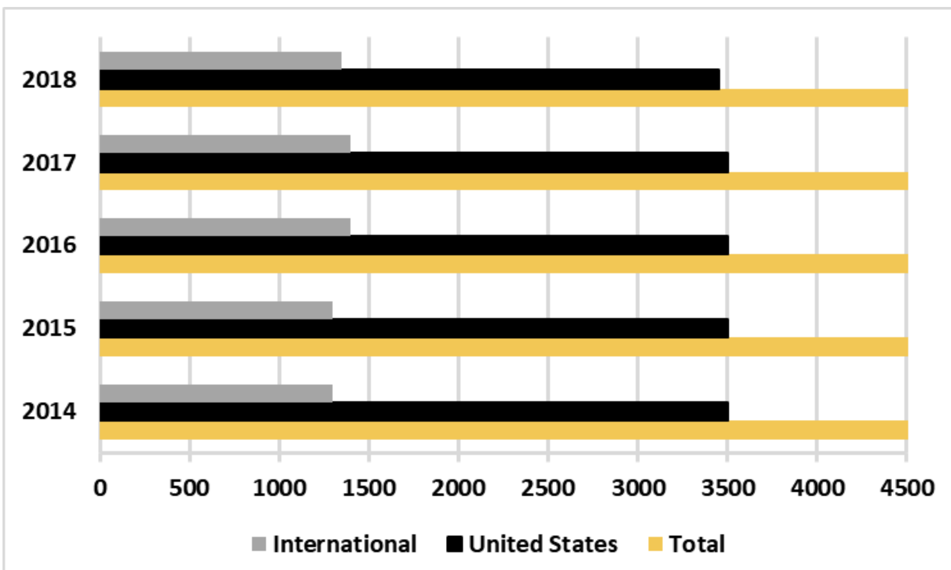
1) Expansion of the Snap-On mobile van fleet
2) International expansion
3) Automobile sales
4) Raw materials pricing
5) Macroeconomic trends

Snap-On's current business model prioritizes the mobile van fleet, but these routes have not expanded significantly in years

Expansion of the Snap-On Mobile Van Fleet

The largest segment of Snap-On's sales comes from the van fleet, known to the company as the 'mobile van channel'. These mobile vans provide direct contact to customers on a weekly basis, delivering the necessary tools and hardware, as well as support for financing, warranties, and other customer service needs. The owners of the vans will generally create a personal connection with the shops they service, which is helpful in creating lasting business relationships and repeat sales. At the end of 2018, SNA operated 4,800 routes, approximately 3,450 of which were in the United States. With this, Snap-On also has a company owned route program, which comprises less than 3% of total routes. The goal of this rather small program is to reach underserved customers that a franchise operator would not be able to profit on. These routes may also be a precursor to a franchise route if they prove successful.

Figure 3: Number of mobile van routes by geographic location

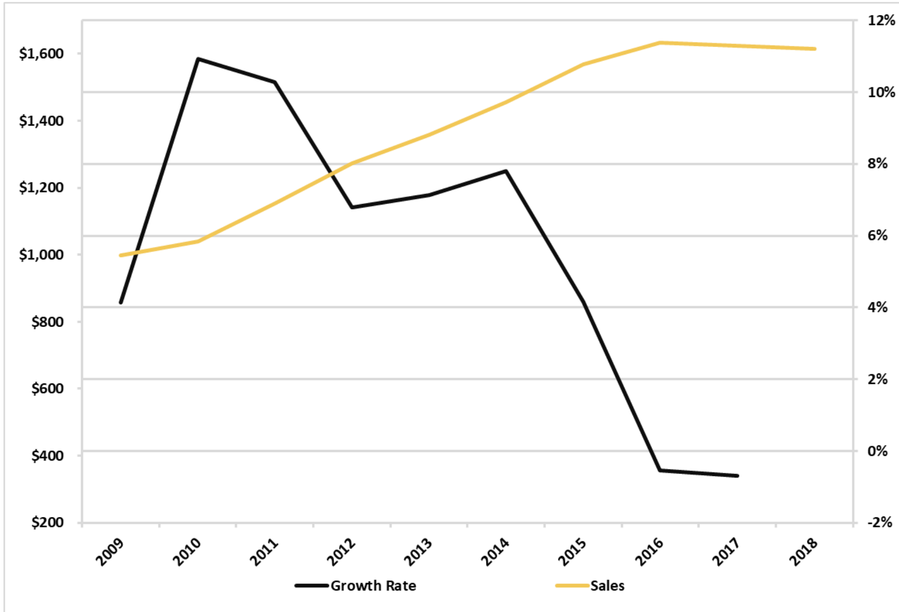


Source: Company reports

CAPEX in recent years has been going to acquisitions and development of the smaller segments rather than mobile van expansion. This means less sales for the Tools Group, and more for the other divisions.

SNA has not increased the number of mobile van routes in recent years. Management states that its current goal is to enhance the current routes with new and innovative practices. This will be important in continuing growth in the United States, as growth is largely tapped out. Management states is focused on emerging markets, where the firm establishing manufacturing capacity, product lines, and distribution capabilities.

Figures 4: Growth rate (R) and sales (L, $M) of the Tools Group



Source: Company reports

Tools Group sales have flat lined the mobile van fleet has not expanded

International Expansion

Commercial and Industrial (C&I) is Snap-On's largest international business. The C&I division is taking advantage of the international growth in industries such as oil & gas, natural resources, power generation, and government.

Snap-On currently has no Tools Group distribution centers in China

Snap-On is looking to create mobile van routes in emerging markets to replicate its success in America. China's new car registrations grew from 19 million to 24 million in just four years. This is the opposite of new car registrations in the United States, which has steadily declined in recent years; however, both trends are good opportunities for the firm. In the US, this means that cars are aging. In China, this trend implies that there are more cars even though vehicle sales growth has slowed. At the end of 2018, 21% of sales came from countries outside of the United States and Europe.

China currently holds the third largest fleet of cars at a sizeable 250 million. This is only 13 million below that of the United States, despite China having over 3x the population. This large new market is a good opportunity for Snap-On to implement its tried and true mobile van sales structure. Given that the Chinese population has, per household, less wealth than the United States, it is reasonable to believe that servicing those vehicles as they age is more likely than replacing them with new models. Snap-On currently has no Snap-On Tools Group distribution centers in China, though the firm has stated that establishing distribution in emerging markets is one of its main priorities.

The Financial Services division puts Snap-On in a good position to move into emerging markets.

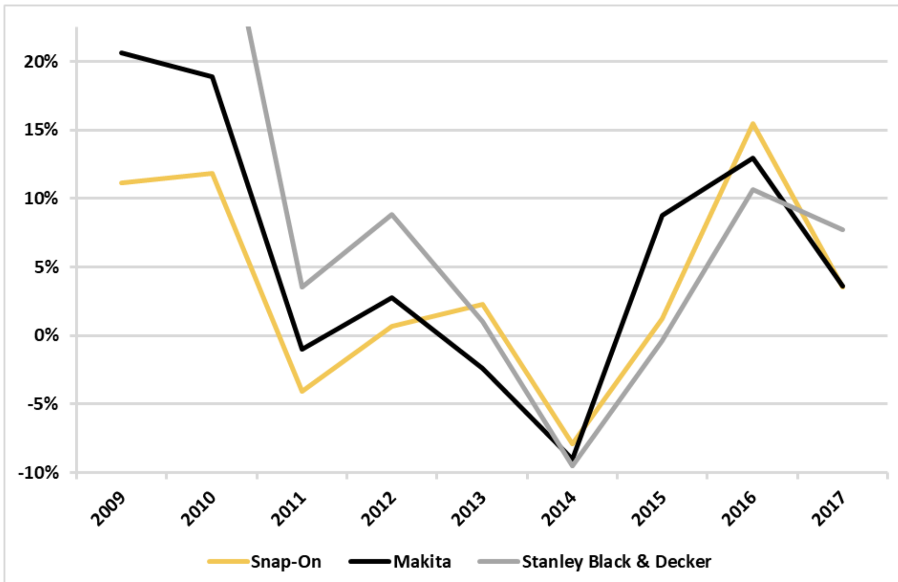
The average wealth of a Chinese citizen is far below that of a citizen in the United States, which does not align well with SNA's high-priced tools. The solution to this may be Snap-On's financial services. Chinese wealth per household has steadily risen as its middle class grows through the success of industrial manufacturing, much like the United States had done back in the early and mid-19th century. This offers more security and confidence when it comes to taking on debt, and repair shops may be more willing to finance expensive tools for their business if they have a positive outlook on the economic future.

Snap-On has also moved into other countries such as the United Kingdom, Canada, Japan, Australia, Germany and more. In these countries, management is replicating the same mobile van structure as is in the United States. These lines have typically done well but do not have the same capacity as the United States due to small populations and less reliance on cars in many European countries.

Despite lacking established distribution centers for the tools group, Snap-On international sales growth is comparable to the competition. The following graph shows sales growth rates in all countries excluding the United States. SNA, SWB, and MKEWF have all had lower sales with the recent manufacturing slow down.

Snap-On's international growth rate is in line with that of the competition

Figure 5: Organic sales growth in international markets



Source: FactSet

On the European front, Stanley Black & Decker leads the group in growth. However, it is important to note that Makita has had nearly 50% its of sales from Europe since 2009, and thus the lower growth rate. The CAGR of sales in Europe since 2009 is as follows:

- **Snap-On Inc. (SNA)**
  - 17%
- **Stanley Black & Decker (SWK)**
  - 22%
- **Makita (MKEWF)**
  - 6%

It is important to note that these CAGR numbers are coming off the global slowdown in 2008 and may be skewed slightly high. In recent years sales growth has slowed in Europe, though it remains positive. The market is likely getting crowded and the GDP growth in Europe has slowed as well, from 2.6% in 2017, to 2% in 2018.

Automobile Sales

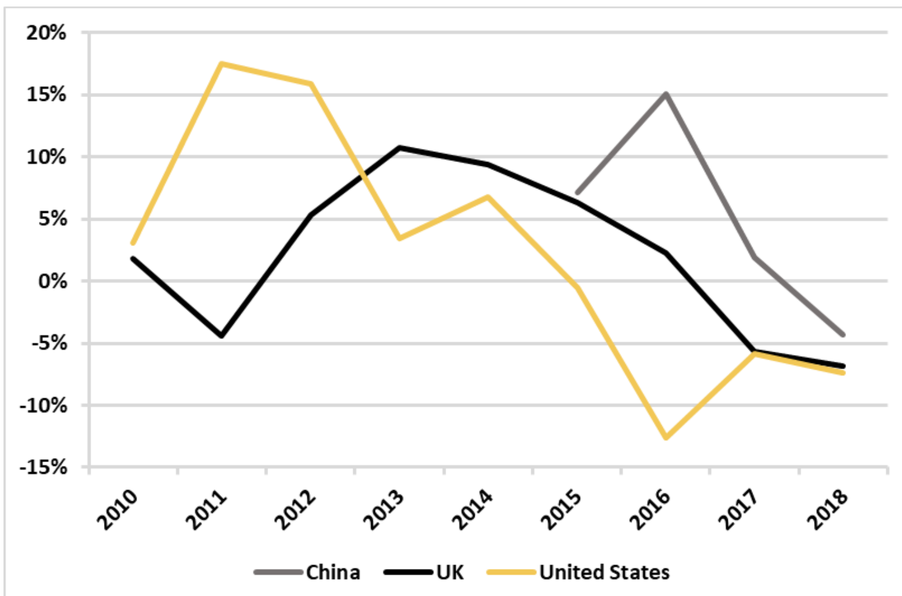
Consumers have been buying fewer new cars and have been keeping their current cars on the road for longer. This is good news for the company

In the United States, automotive sales have been largely stagnant over the past 15 years. This may be due to a few factors including the increased price of new cars, less reliance on household owned vehicles (due to companies such as Uber and Lyft), and a more environmentally conscious population. The lack of vehicle sales is a positive trend for SNA. As vehicles age, they require more maintenance which will boost the revenue of repair shops. Along with this, modern vehicles can last hundreds of thousands of miles with proper servicing along the way. With recession indicators regularly in the news, consumers may also be far less likely to buy a new vehicle and instead choose the cost-effective route of servicing their existing vehicles.

As opposed to the United States, expanding countries like China are increasing their vehicle purchases. Due to growing economies and some cheap vehicle alternatives (as opposed to most cars sold in the United States), having one or two cars per household is becoming more commonplace in countries such as China.

China still outpaces most of the world in new car registrations despite the slowing economy and trade war

Figure 6: Growth in new vehicle registrations in the United States, China, & the UK



Source: FactSet

On January 1st of 2018, China raised its small car purchase tax back to 10%. This contributed to the decline in vehicle registrations as seen above. If registrations continue to decline, they may reverse the tax cut.

Potentially the greatest threat to the Tools Group is the change to electric vehicles. An EV can have as little as half a dozen moving parts, whereas a traditional combustion engine driven vehicle may have around 10,000. When these moving parts are removed, specialized tools and hardware are no longer required. Snap-On is making a move into computerized tools to combat this with the Repair Systems & Information Group. Snap-On has also made acquisitions in this space including BTC Global Limited in 2018, which creates vehicle inspection and management software for OEM repair shops. The benefit of the move to EVs is that these product lines have boosted Snap-On's EBIT margin and will continue to in the future. The CAGR of the RS&I division has been 5% over the last four years, trailing only behind the Financial Services.

At the end of 2018, the United States saw about one-million electric vehicles on the road. As the infrastructure for charging stations grows, the Edison Electric Institute estimates that in 2030 there will be around 18.7 million EVs on the road.

Raw Materials Pricing

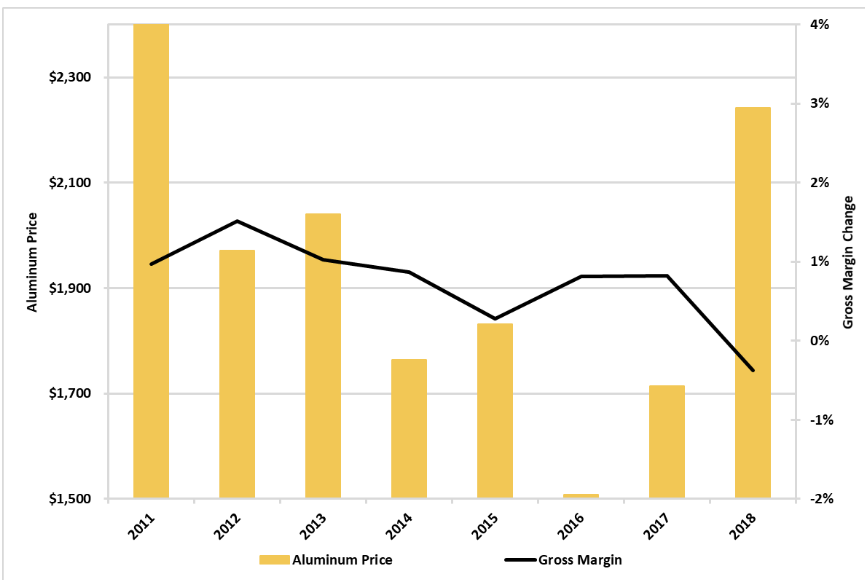
Changes in raw materials pricing will highly affect the Tools Group and C&I, but not largely affect the Repair Systems & Info. Group

Snap-On manufactures 70% of the product line offered; this means that raw materials pricing has a direct correlation with gross margin. Though materials and commodities prices have generally remained low in the past ten years (aside from 2012 and 2017), changes in price will still impact gross margin to some extent.

At the end of 2018, the firm's gross margin was 51.56%. This high margin is due mainly to its Financial Services Group and Repair Systems & Information Group; both of which would not be directly impacted by an increase in prices for raw materials and have been growing faster than other divisions. The Snap-On Tools Group had a lower margin of 43%. This division has far more susceptibility to increases in raw materials pricing. The C&I division has the lowest margins at 38%. This division is also at high risk of an increased price of commodities. Snap-On has also noted that risk is being effectively hedged with futures and forwards.

Gross margin has been increasing steadily due to the new focus on high margin product lines. However, when aluminum prices rose in years such as 2010 and 2017, margin was significantly impacted

Figure 7: Gross margin compared to aluminum prices ($/mt)



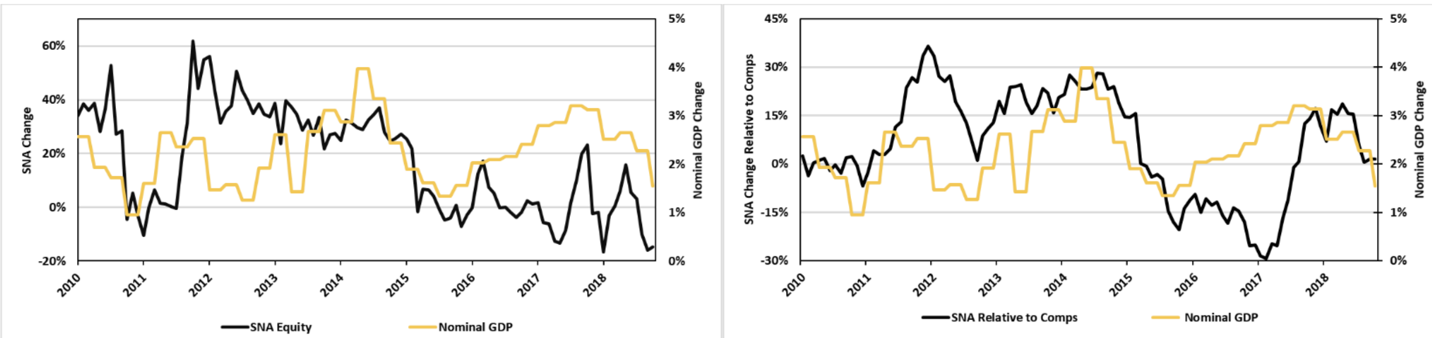
Source: FactSet

<u>Macroeconomic Trends</u>

Despite the cyclicality of industrial products, the C&I group does have some protection from economic cycles. Two customer segments include governments and power generation.

Figure 9 shows that SNA is more cyclical than its competitors. This may be because of its C&I exposure, which is very cyclical, and it's high priced products which consumers likely will not choose in economic downturns.

Figures 8 and 9: Nominal GDP compared to SNA (left) and nominal GDP compared to SNA relative to SNA comps (right)

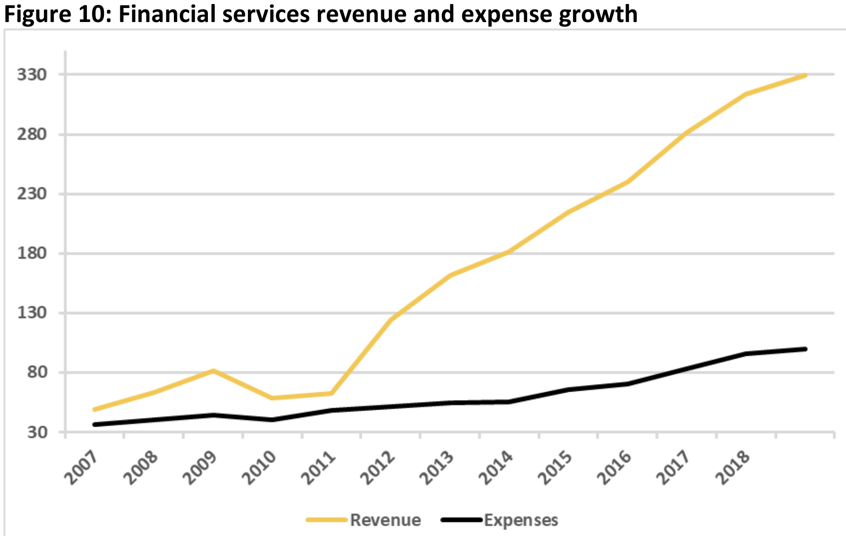


Source: Bloomberg, IMCP

Snap-On is more cyclical than competitors due to its C&I group and high prices

In 2009, when the stock market crashed in the US, the financial services division of Snap-On was the most heavily affected, with nearly a 30% drop in revenue. Since then, Snap-On has nearly tripled the financial services revenue, while expenses have not quite doubled. Given that the financial services expenses are mostly low borrowing costs, this increase in revenue should provide plenty of buffer in case of another recession. Along with this, Snap-On has become stricter on lending practices. This division will enable customers to buy tools they need for their careers, even during economic hardships. All these factors combined will make the financial services division a key buffer in economic downtimes.

Figure 10: Financial services revenue and expense growth

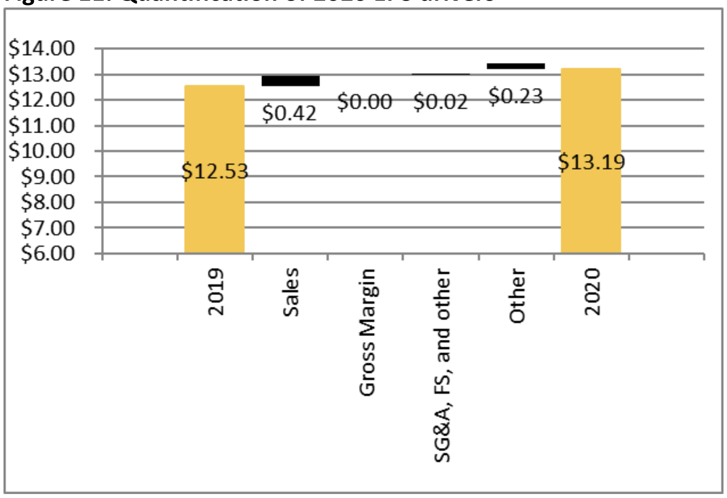


Source: Company reports

Financial Analysis

I anticipate EPS to grow to $13.19 in FY 2020, with solid sales growth estimated at 3.2% (largely driven by international markets) contributing $0.42. I do not expect gross margin to change as it has remained steady for years and there is not enough growth in the high margin product areas to impact it. Finally I expect consistent share buybacks, at $250 million in buybacks, contributing $0.23. I also estimate that $0.02 will be added by the financial services (listed under SG&A & other).

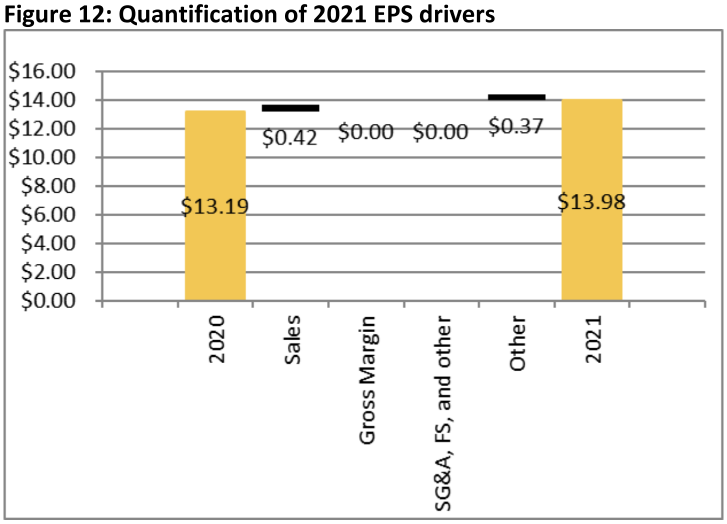
Figure 11: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

I expect 2021 EPS to increase to $13.98. Snap-On will increase sales at 3% contributing $0.42 to EPS. Gross margin will again remain unchanged. In 2021 I expect growth in the financial division to be offset as SG&A increases as a percent of sales. Finally, I expect another $250 million in share buybacks to increase EPS by $0.37.

Figure 12: Quantification of 2021 EPS drivers



Source: Company Reports, IMCP

I am slightly more optimistic than consensus estimates for both 2020 and 2021, although not the highest estimate. I believe Snap-On will generate more sales from the smaller divisions, and experience higher international growth, which will contribute to a higher EPS.

Figure 13: EPS and YoY growth by year

Items	2015A	2016A	2017A	2018A	2019A	2020E	2021E
Sales	$3,353	$3,430	$3,687	$3,741	$3,734	**$3,854**	**$3,968**
Growth		2.3%	7.5%	1.5%	-0.2%	3.2%	3.0%
Sales - Consensus						**$3,818**	**$3,922**
Growth						2.2%	1.8%
EPS	$8.24	$9.40	$9.72	$12.08	$12.53	**$13.19**	**$13.98**
Growth		14.1%	3.3%	24.3%	3.7%	5.3%	5.9%
EPS - Consensus						**$12.73**	**$12.86**
Growth						-1.6%	2.6%

Source: Factset, IMCP

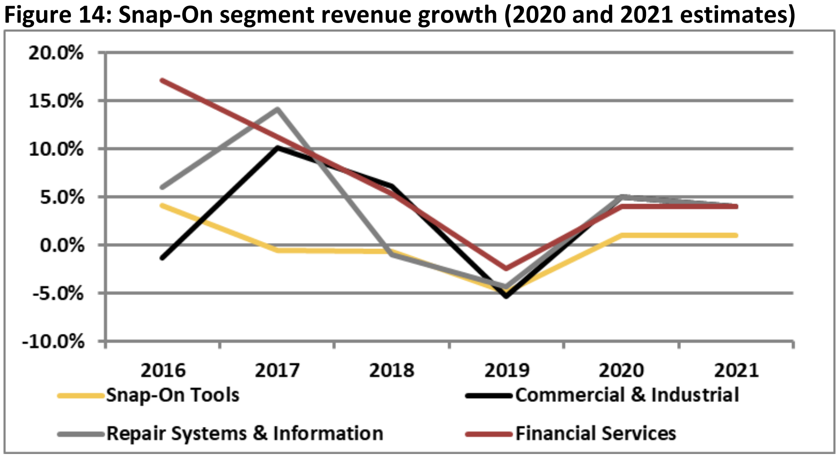
Revenues

SNA sales growth has slowed in the past few years, but with the investment in international markets this should rebound

Snap-On has had decent sales growth in the past 10 years, with a minor downturn in 2019. Given that SNA is establishing distribution centers in new geographic locations, I expect these investments to pay off in the next two years and through higher sales. I assume the tools group will decline until then. Financial services growth will mirror that of the tools group. The Repair Systems and Information Group will become more relevant with the change to EVs and will generate good growth of 5%. C&I will continue at a steady but slowing pace, given the slowing GDP growth around the world.

Many of these estimates depend heavily on steady economic growth, which I fully expect given current Fed policy, and the progression of the trade deal with China.

Figure 14: Snap-On segment revenue growth (2020 and 2021 estimates)



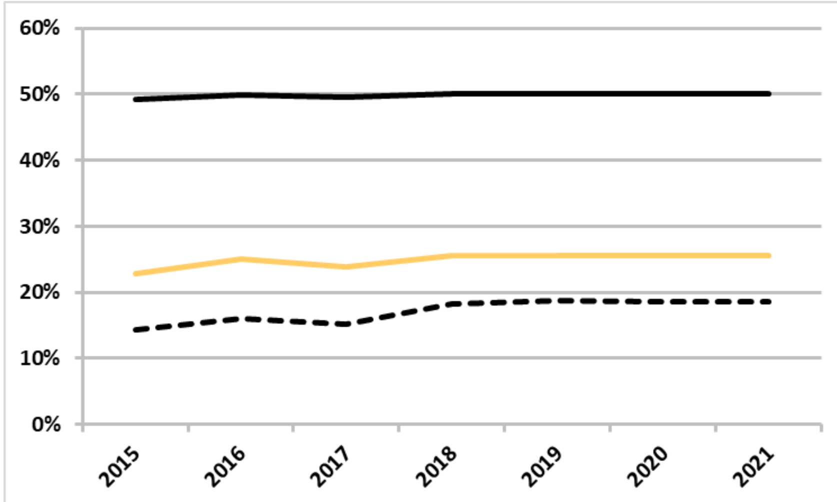
Source: Company Reports, IMCP

Operating Income and Margins

Operating expenses are comprised largely of selling, general, and administration costs. Operating expenses also include all expenses related to the financial division.

Snap-on generally has a gross margin near 50%, and an EBIT margin of about 25%. I do not expect either of these numbers to change significantly as the product lines will remain balanced in the near future.

Figure 15: Snap-On's gross margin, operating margin, and net margin



Source: Company Reports

Snap-On is taking steps to improve margins, through new product lines and efficiency improvements

Snap-On is continuing to expand its product lines into high profit industries, which should increase net margin in the long run, though in the near term I do not foresee any large changes in margin. Rather than expanding mobile van routes, the firm has set its sights on increasing productivity and outreach on existing routes. This should increase the operating margin as very little additional SG&A will be required. Snap-On is also employing RCI ("Rapid Continuous Improvement") initiatives in order to decrease waste, improve efficiency, and increase productivity. These initiatives should yield cost savings to improve margins. My estimates conservatively do not include these improvements as they have been in place for a while and likely will not continue margin improvement.

Figure 16: SNA operating margins, 2015 – 2021E

Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Sales	$3,353	$3,430	$3,687	$3,741	$3,734	$3,854	$3,968
Direct costs	1,705	1,720	1,861	1,871	1,867	1,927	1,985
Gross margin	1,648	1,710	1,826	1,870	1,867	1,926	1,984
Gross margin %	49.2%	49.9%	49.5%	50.0%	50.0%	50.0%	50.0%
SG&A, Financial Services, and other	884	849	944	914	912	940	968
Growth		-4%	11%	-3%	0%	3%	3%
Operating margin	22.8%	25.1%	23.9%	25.6%	25.6%	25.6%	25.6%

Source: Company Reports

Return on Equity

Snap-On has a high ROE compared to the industry (see Appendix 8), generally around 20% versus the industry average of 13%. ROE has been stable over time. While margins have grown, this was offset by a decline in asset utilization. This is due to the investments being made in the RS&I group as well as emerging markets. Going forward, I expect stable margins and asset turnover, but declining leverage. ROE should decline modestly by 2021 but stay above 20%.

Figure 17: ROE breakdown, 2015-2021E

3-stage	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Net income / sales		15.9%	15.1%	18.2%	18.7%	18.5%	18.6%
Sales / avg assets		0.76	0.74	0.70	0.68	0.68	0.67
ROA		12.1%	11.2%	12.8%	12.7%	12.5%	12.5%
Avg assets / avg equity		1.79	1.78	1.74	1.70	1.66	1.62
ROE		**21.6%**	**19.9%**	**22.3%**	**21.6%**	**20.8%**	**20.2%**

Source: Company Reports

Snap-On has maintained a ROE far above the industry average at 20%

Free Cash Flow

Figure 18: Free cash flow calculations

Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
NOPAT	$527	$599	$613	$731	$730	$754	$777
Growth		*13.7%*	*2.4%*	*19.3%*	*-0.2%*	*3.4%*	*3.0%*
NOWC	1,137	1,196	1,359	1,451	1,590	1,677	1,769
Net fixed assets	2,542	2,839	3,130	3,156	3,249	3,352	3,452
Total net operating capital	$3,679	$4,035	$4,489	$4,607	$4,839	$5,030	$5,222
Growth		*9.7%*	*11.2%*	*2.6%*	*5.0%*	*3.9%*	*3.8%*
- Change in NOWC		59	163	92	139	87	92
- Change in NFA		297	291	26	92	104	100
FCFF		**$243**	**$159**	**$612**	**$498**	**$563**	**$584**
Growth			*-34.5%*	*285.4%*	*-18.6%*	*13.0%*	*3.8%*
- After-tax interest expense		42	42	35	39	40	39
+ Net new short-term and long-term debt		130	177	(55)	48	(20)	(25)
FCFE		**$331**	**$294**	**$523**	**$507**	**$503**	**$520**
Growth			*-11.4%*	*77.9%*	*-3.0%*	*-0.8%*	*3.4%*
Uses of cash							
Other expense		$11	$13	$16	($7)	$0	$0
Increase mkt sec		-	-	-	-	-	-
Dividends		148	169	192	207	223	240
Change in other equity		194	51	341	284	280	280
		$353	$234	$549	$484	$503	$520
FCFF per share		$4.18	$2.77	$10.88	$8.95	$10.41	$11.08
Growth			*-33.7%*	*292.9%*	*-17.7%*	*16.2%*	*6.5%*
FCFE per share		$5.70	$5.12	$9.28	$9.11	$9.29	$9.86
Growth			*-10.3%*	*81.4%*	*-1.9%*	*2.0%*	*6.1%*

Source: Company Reports, IMCP

Snap-On's free cash flow has grown overtime. FCF was lower in 2016 and 2017 due to very large increases in net fixed assets from acquisitions. Since then FCF has been on a steady incline, providing plenty of FCFE to distribute as dividends and buybacks. Snap-On also has very low debt, which I expect to continue being slowly paid off. I forecast large changes in NFA for 2020 and 2021 as Snap-On establishes distribution centers in emerging markets, so this limits FCF despite rising NOPAT.

Based on a combination of 3-stage DCF, historic multiples, and relative valuation; Snap-On's value is $205

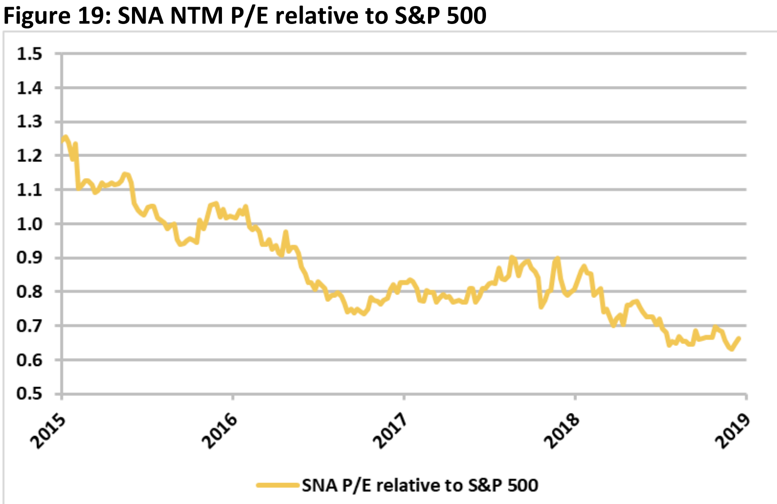
Valuation

SNA was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is cheap relative to other firms and is worth $183. Relative valuation shows SNA to be slightly undervalued based on its fundamentals versus those of its peers in the industry. Price to sales valuation yielded a price of $201. A detailed DCF analysis values the company at a higher $224; I gave this value a high weight because it takes into account changing margins and NFA turnover. Combining these values in a weighted average (25% DCF, 40% relative, 35% P/S), I value Snap-On at $205.

Trading History

SNA is currently trading at a very low P/E of 13.5, compared to a five year high of 23 and a low of 12. This is due to the markets shift towards growth stocks in recent years, SNA slowing sales growth, and possible fears of EV risks. As investments begin to pay off, I am expecting SNA should move to a P/E closer should the market at 16.

Figure 19: SNA NTM P/E relative to S&P 500



Source: FactSet

Assuming the firm maintains a 13.5 NTM P/E at the end of 2020, it should trade at $189 by the end of the year:

- Price = P/E x EPS = 13.5 x $13.98 = $189

Discounting back to today at a 10.7% cost of equity (explained in Discounted Cash Flow section) yields a price of $171.

Relative Valuation

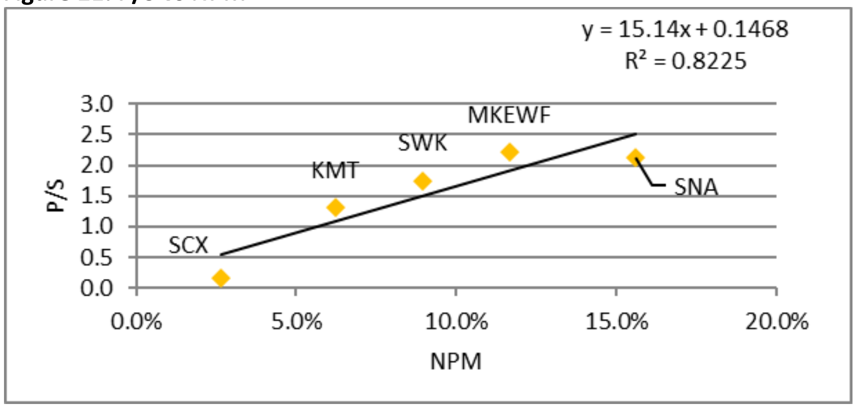
Investors are not expecting much growth in SNA, given the low P/E compared to

SNA is currently trading at a P/E much lower than its peers, with a TTM P/E of 13.7 compared to an average of 18.5. Investors don't expect much growth for Snap-On and are instead going with more established brands such as Stanley Black & Decker and international brands such as Makita. A table of comparable companies is in the Appendix.

Figure 21 shows a regression of P/S vs NPM. The regression indicates that 82% of the P/S is determined by NPM. SNA falls below the regression so it appears to be undervalued.

- Target 2019 P/S = 2019 NPM (15.6%) x 15.139 + 0.147 = 2.51
- Target Price = Target P/S (2.5) / Current P/S (2.15) x Current Price ($170) = $197

Figure 21: P/S vs NPM



Source: Factset, IMCP

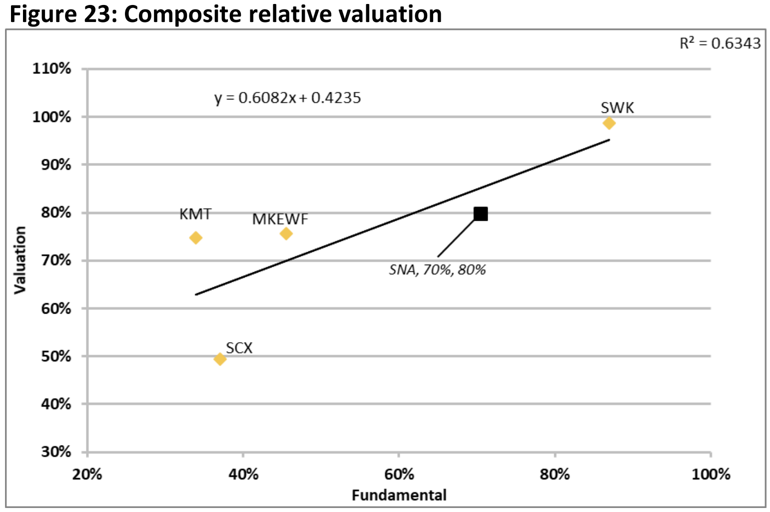
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. Various weightings of earnings growth, ROE, P/E, P/B, P/S, and P/CF were used (see below). The regression line had an R-squared of 0.8225. SNA falls below the regression, so it is relatively cheap.

Figure 22: Composite valuation, % of range

		33.0%	70.0%	15.0%	50.0%	35.0%
		Earnings Growth	2019	P/E		
Ticker	Name	NTM	ROE	NTM	P/B	P/CF
SNA	SNAP-ON INC	2%	100%	72%	85%	75%
SWK	STANLEY BLACK & DECKER IN	100%	81%	100%	100%	96%
SCX	STARRETT (L.S.) CO -CL A	43%	35%	86%	14%	84%
KMT	KENNAMETAL INC	-14%	55%	100%	72%	68%
MKEWF	MAKITA CORP	43%	47%	86%	55%	100%

Source: IMCP

Figure 23: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value SNA.

For the purpose of this analysis, the company's cost of equity is 10.7%, calculated using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.90%.
- A ten-year beta of 1.1 was utilized since the company has similar risk to the market.
- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 10.7% ((10% - 1.9%) * 1.09 + 1.9%).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $10.43 and $11.25, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $18.60 per share. Thus, stage one of this discounted cash flow analysis contributes $18.60 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 10.7% cost of equity. I assume 2.5% sales growth in 2022, falling to 2.3% through 2026. The ratio of sales to NWC will decrease to 2.1 by 2026, and NFA turnover will fall from 1.15 in 2019 to 1.05 in 2026 as a result of improvements in operations. Also, the NOPAT margin is expected to increase to 25% as the high margin product lines begin to grow as investments pay off.

Figure 24: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$10.43	$11.25	$10.51	$11.63	$12.78	$13.87	$14.98
Discounted FCFE	$9.42	$9.18	$7.74	$7.73	$7.68	$7.52	$7.34

Added together, these discounted cash flows total $56.61.

Stage Three – Net income for the years 2020 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. I expect EPS to grow from $13.19 in 2020 to $21.34 in 2026.

Figure 25: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$13.19	$13.98	$15.32	$16.72	$18.18	$19.72	$21.34

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. The P/E is currently low as a result of the aforementioned risks. By 2026, the firm should be transitioned and closer to the S&P500 P/E, as well as average historical P/E. Therefore, a P/E ratio of 16 is assumed at the end of SNA's terminal year. This P/E is also much closer to the industry average, in which Snap-On is a heavy outlier.

Given the assumed terminal earnings per share of $21.34 and a price to earnings ratio of 16, a terminal value of $341.51 per share is calculated. Using the 10.7% cost of equity, I discounted this number back to a present value of $167.33.

The 3-stage DCF model returned the highest present value of all the valuations, at $223.94

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $223.94 is calculated (18.6+38.02+167.33). Given Snap-On's current price of $170, the model shows that the stock is highly undervalued.

Scenario Analysis

I also conducted a bull and bear case analysis. P/E and margin are adjusted in the 3-stage DCF model to get the final valuation. Sales change is based on two factors, international growth and the threat of EVs.

Bear Case: In this scenario, terminal P/E has lowered to 13, and margin (NOPAT/S) has lowered to 20%. The basis for these assumptions is that SNA is not able to realize its full potential in emerging markets, the market is not pricing in growth, SNA is unable to navigate the expansion of EVs, and the expenses for expansion are outpacing the return.

The new valuation based on a 3-stage DCF model is $157

Bull Case: This scenario changes P/E to 19 (nearer to the five year high of 23) and margin was increased to 30%. This model is based on the possibility that Snap-On captures large portions of emerging markets, the high margin product lines accelerate as SNA adapts to new electric vehicles, and the market realizes this growth.

The new current valuation based on a 3-stage DCF model is $312

Business Risks

Snap-On is in an industry that is soon to experience substantial changes, and while these changes could bring benefits, they also bring risk. Below are the largest factors that could cause Snap-On to underperform.

Credit risk:

Snap-On relies heavily on its financial services to provide customers with the products they need at a rate they can afford. If interest rates begin to increase again, it is reasonable to assume fewer customers will choose to finance and credit defaults could become more likely. *(Source: Company reports)*

Commodity risk:

Snap-On purchases commodities such as steel, natural gas, and electricity. Should any of these commodities significantly increase in price, margins will be affected. *(Source: Company reports)*

Economic risk:

Given that Snap-On operates worldwide, both in established and emerging markets, significant economic instability will directly impact the ability to make sales in certain areas. Snap-On has noted that it is monitoring the potential economic risks of the United Kingdom exiting the European union.
(Source: Company reports)

Competitive marketplace:

Snap-On operates in a niche in the tools & hardware industry, providing premium products that are a grade above average. Competitors may take market share away if customers choose lower priced alternatives.

Electric vehicles:

The tools group of Snap-On targets customers who are working on complex internal combustion vehicles. Should the market accelerate towards EVs, the tools group will lose sales as fewer tools are required by repair shops.

Reliance on personal vehicles:

The general public is becoming ever more concerned with sustainability. Public transportation, ride sharing, and alternative transportation methods are becoming more popular. If these trends begin to replace personal vehicles, Snap-On sales will decline.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Moderate

While the amount of proprietary technology in the tools & hardware industry is relatively low, it would require significant capital to create a tool & hardware brand that could disrupt the industry. The most significant threat is brands that are already established and growing, including in the private market.

Threat of Substitutes – Moderate

Snap-On has incredible brand power in the tools market, and technicians are very loyal to the brand due to the quality. However, should customer tastes change, they can easily switch to a different tool brand at no cost.

Supplier Power - Relatively Low

Most Snap-On tools are manufactured in-house and require the purchasing of raw materials. There are many different sources to obtain raw materials; although, it may cause distribution in SNA's supply line if the change is abrupt.

Buyer Power – High

Repair shops need tools in a timely manner, but there is nothing stopping them from switching to an alternate brand. Snap-On is not the only company using the mobile van structure (it is also used by companies such as Cornwell Tools), and generally competitors visit the same shops.

Intensity of Competition – High

There are numerous local, national, and international tool brands that supply similar products as Snap-On's. Although Snap-On has established a niche, there is little stopping competitors from moving in other than the brand power of Snap-On and the tool quality.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High margins Brand recognition Mobile van business model Financial services division	Mature mobile van market Expensive distribution
Opportunities	**Threats**
International markets Computer diagnostics	Electric vehicles Recession

Appendix 3: Income Statement

Income Statement	Fiscal Year Ending On Month,						
Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Sales	$3,353	$3,430	$3,687	$3,741	$3,734	$3,854	$3,968
Direct costs	1,705	1,720	1,861	1,871	1,867	1,927	1,985
Gross Margin	1,648	1,710	1,826	1,870	1,867	1,926	1,984
SG&A, Financial Services, and other	884	849	944	914	912	940	968
EBIT	765	861	882	956	954	987	1,016
Interest	54	60	60	46	51	53	52
EBT	711	801	822	910	904	934	964
Taxes	221	244	251	214	213	220	227
Income	489	557	571	696	691	714	737
Other	11	11	13	16	(7)	-	-
Net income	479	546	558	680	697	714	737
Basic Shares	58.1	58.1	57.4	56.3	55.7	54.1	52.7
Fully Diluted Shares	59.1	59.4	58.6	57.3	55.6	54.0	52.7
EPS	$8.24	$9.40	$9.72	$12.08	$12.53	$13.19	$13.98
EPS Fully Diluted	$8.10	$9.20	$9.52	$11.87	$12.54	$13.21	$13.99
DPS	$2.20	$2.54	$2.95	$3.41	$3.72	$4.12	$4.55

Appendix 4: Balance Sheets

Capital Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Cash	93	78	92	141	168	209	257
Operating assets ex cash	1,696	1,806	2,027	2,076	2,180	2,250	2,317
Operating assets	1,789	1,884	2,119	2,217	2,348	2,459	2,575
Operating liabilities	652	688	760	766	758	782	805
NOWC	1,137	1,196	1,359	1,451	1,590	1,677	1,769
NOWC ex cash (NWC)	1,044	1,118	1,267	1,310	1,423	1,468	1,512
NFA	2,542	2,839	3,130	3,156	3,249	3,352	3,452
Invested capital	*$3,679*	*$4,035*	*$4,489*	*$4,607*	*$4,839*	*$5,030*	*$5,222*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$4,331*	*$4,723*	*$5,249*	*$5,373*	*$5,596*	*$5,812*	*$6,027*
Short-term and long-term debt	$880	$1,010	$1,187	$1,132	$1,180	$1,160	$1,135
Other liabilities	369	390	330	357	334	334	334
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	2,431	2,635	2,972	3,119	3,325	3,536	3,753
Total supplied capital	*$3,679*	*$4,035*	*$4,489*	*$4,607*	*$4,838*	*$5,029*	*$5,222*
Total liabilities and equity	*$4,331*	*$4,723*	*$5,249*	*$5,373*	*$5,596*	*$5,811*	*$6,027*

Appendix 5: Sales Forecast

Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Sales	$4,086	$4,244	$4,550	$4,621	$4,407	$4,562	$4,698
Growth		*3.9%*	*7.2%*	*1.6%*	*-4.6%*	*3.2%*	*3.0%*
Snap-On Tools	1,569	1,634	1,625	1,614	1,536	1,551	1,567
Growth		*4.2%*	*-0.5%*	*-0.7%*	*-4.8%*	*1.0%*	*1.0%*
% of sales	*38.4%*	*38.5%*	*35.7%*	*34.9%*	*34.9%*	*34.0%*	*33.4%*
Commercial & Industrial	1,164	1,148	1,265	1,343	1,272	1,336	1,389
Growth		*-1.3%*	*10.2%*	*6.2%*	*-5.3%*	*5.0%*	*4.0%*
% of sales	*28.5%*	*27.1%*	*27.8%*	*29.1%*	*28.9%*	*2.0%*	*29.6%*
Repair Systems & Information	1,113	1,180	1,347	1,334	1,277	1,341	1,394
Growth		*6.0%*	*14.2%*	*-0.9%*	*-4.3%*	*5.0%*	*4.0%*
% of sales	*27.2%*	*27.8%*	*29.6%*	*28.9%*	*29.0%*	*29.4%*	*6.0%*
Financial Services	240	281	313	330	322	335	348
Growth		*17.1%*	*11.2%*	*5.3%*	*-2.4%*	*4.0%*	*4.0%*
% of sales	*5.9%*	*6.6%*	*6.9%*	*7.1%*	*7.3%*	*7.3%*	*7.4%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	2,823	2,962	3,076	3,096	2,935	3,011	3,101
Growth		*4.9%*	*3.8%*	*0.7%*	*-5.2%*	*2.6%*	*3.0%*
% of sales	*69.1%*	*69.8%*	*67.6%*	*67.0%*	*66.6%*	*66.0%*	*66.0%*
Europe	723	747	851	892	859	894	921
Growth		*3.3%*	*13.9%*	*4.8%*	*-3.7%*	*4.1%*	*3.0%*
% of sales	*17.7%*	*17.6%*	*18.7%*	*19.3%*	*19.5%*	*19.6%*	*19.6%*
All Other	539	535	623	633	613	657	677
Growth		*-0.9%*	*16.6%*	*1.6%*	*-3.3%*	*7.3%*	*3.0%*
% of sales	*13.2%*	*12.6%*	*13.7%*	*13.7%*	*13.9%*	*14.4%*	*14.4%*

Appendix 6: Ratios

Items	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21
Profitability							
Gross margin	49.2%	49.9%	49.5%	50.0%	50.0%	50.0%	50.0%
Operating (EBIT) margin	22.8%	25.1%	23.9%	25.6%	25.6%	25.6%	25.6%
Net profit margin	14.3%	15.9%	15.1%	18.2%	18.7%	18.5%	18.6%
Activity							
NFA (gross) turnover		1.27	1.24	1.19	1.17	1.17	1.17
Total asset turnover		0.76	0.74	0.70	0.68	0.68	0.67
Liquidity							
Op asset / op liab	2.74	2.74	2.79	2.90	3.10	3.14	3.20
NOWC Percent of sales		34.0%	34.7%	37.6%	40.7%	42.4%	43.4%
Solvency							
Debt to assets	20.3%	21.4%	22.6%	21.1%	21.1%	20.0%	18.8%
Debt to equity	36.2%	38.3%	39.9%	36.3%	35.5%	32.8%	30.2%
Other liab to assets	8.5%	8.3%	6.3%	6.6%	6.0%	5.7%	5.5%
Total debt to assets	28.8%	29.6%	28.9%	27.7%	27.0%	25.7%	24.4%
Total liabilities to assets	43.9%	44.2%	43.4%	42.0%	40.6%	39.2%	37.7%
Debt to EBIT	1.15	1.17	1.35	1.18	1.24	1.18	1.12
EBIT/interest	14.08	14.42	14.65	20.69	18.82	18.74	19.68
Debt to total net op capital	23.9%	25.0%	26.4%	24.6%	24.4%	23.1%	21.7%
ROIC							
NOPAT to sales	15.7%	17.4%	16.6%	19.5%	19.5%	19.6%	19.6%
Sales to NWC		3.17	3.09	2.90	2.73	2.67	2.66
Sales to NFA		1.27	1.24	1.19	1.17	1.17	1.17
Sales to IC ex cash		0.91	0.88	0.84	0.82	0.81	0.81
Total ROIC ex cash		15.9%	14.7%	16.5%	16.0%	15.9%	15.9%
NOPAT to sales	15.7%	17.4%	16.6%	19.5%	19.5%	19.6%	19.6%
Sales to NOWC		2.94	2.89	2.66	2.46	2.36	2.30
Sales to NFA		1.27	1.24	1.19	1.17	1.17	1.17
Sales to IC		0.89	0.87	0.82	0.79	0.78	0.77
Total ROIC		15.5%	14.4%	16.1%	15.4%	15.3%	15.2%
NOPAT to sales	15.7%	17.4%	16.6%	19.5%	19.5%	19.6%	19.6%
Sales to EOY NWC	3.21	3.07	2.91	2.85	2.62	2.62	2.62
Sales to EOY NFA	1.32	1.21	1.18	1.19	1.15	1.15	1.15
Sales to EOY IC ex cash	0.93	0.87	0.84	0.84	0.80	0.80	0.80
Total ROIC using EOY IC ex cash	14.7%	15.1%	13.9%	16.4%	15.6%	15.6%	15.6%
NOPAT to sales	15.7%	17.4%	16.6%	19.5%	19.5%	19.6%	19.6%
Sales to EOY NOWC	2.95	2.87	2.71	2.58	2.35	2.30	2.24
Sales to EOY NFA	1.32	1.21	1.18	1.19	1.15	1.15	1.15
Sales to EOY IC	0.91	0.85	0.82	0.81	0.77	0.77	0.76
Total ROIC using EOY IC	14.3%	14.8%	13.7%	15.9%	15.1%	15.0%	14.9%
ROE							
5-stage							
EBIT / sales		25.1%	23.9%	25.6%	25.6%	25.6%	25.6%
Sales / avg assets		0.76	0.74	0.70	0.68	0.68	0.67
EBT / EBIT		93.1%	93.2%	95.2%	94.7%	94.7%	94.9%
Net income /EBT		68.2%	67.9%	74.7%	77.2%	76.4%	76.4%
ROA		12.1%	11.2%	12.8%	12.7%	12.5%	12.5%
Avg assets / avg equity		1.79	1.78	1.74	1.70	1.66	1.62
ROE		21.6%	19.9%	22.3%	21.6%	20.8%	20.2%
3-stage							
Net income / sales		15.9%	15.1%	18.2%	18.7%	18.5%	18.6%
Sales / avg assets		0.76	0.74	0.70	0.68	0.68	0.67
ROA		12.1%	11.2%	12.8%	12.7%	12.5%	12.5%
Avg assets / avg equity		1.79	1.78	1.74	1.70	1.66	1.62
ROE		21.6%	19.9%	22.3%	21.6%	20.8%	20.2%
Payout Ratio		27.0%	30.4%	28.2%	29.7%	31.2%	32.6%
Retention Ratio		73.0%	69.6%	71.8%	70.3%	68.8%	67.4%
Sustainable Growth Rate		15.7%	13.9%	16.0%	15.2%	14.3%	13.6%

Appendix 7: Cash Flow Statement

Sources and uses of cash						
Items	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Cash from Operatings (understated - depr'n added to net assets)						
Net income	$546	$558	$680	$697	$714	$737
Change in Net Working Capital ex cash	(74)	(149)	(43)	(112)	(46)	(44)
Cash from operations	$472	$409	$637	$585	$668	$693
Cash from Investing (understated - depr'n added to net assets)						
Change in NFA	($297)	($291)	($26)	($92)	($104)	($100)
Change in Marketable Securities	$0	$0	$0	$0	$0	$0
Cash from investing	($297)	($291)	($26)	($92)	($104)	($100)
Cash from Financing						
Change in Short-Term and Long-Term Debt	$130	$177	($55)	$48	($20)	($25)
Change in Other liabilities	21	(60)	27	(23)	0	0
Change in Debt/Equity-Like Securities	0	0	0	0	0	0
Dividends	(148)	(169)	(192)	(207)	(223)	(240)
Change in Equity ex NI and Dividends	(194)	(51)	(341)	(284)	(280)	(280)
Cash from financing	($191)	($104)	($561)	($466)	($523)	($545)
Change in Cash	(15)	14	49	26	42	48
Beginning Cash	93	78	92	141	168	209
Ending Cash	$78	$92	$141	$167	$209	$257

Appendix 8: Comparable Companies

		Current	Market	Price Change						Earnings Growth								LT Debt	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
SNA	SNAP-ON INC	$170.38	$9,345	(0.0)	3.7	4.9	3.2	13.6	17.3	6.7	1.4%	24.3%	3.7%	5.3%	5.9%	14.9%	1.32	30.0%	A+	2.45%	30.6%
SWK	STANLEY BLACK & DECKER INC	$164.54	$25,012	(1.9)	5.9	12.5	15.1	39.6	37.4	8.1	90.8%	9.4%	3.2%	7.1%	3.8%	6.8%	1.49	52.0%	A-	1.71%	58.3%
SCX	STARRETT (L.S.) CO -CL A	$5.67	$39	0.5	(3.2)	0.2	(20.4)	(0.5)	8.4			260.7%	72.3%	14.9%	50.0%		0.39	28.5%	C	0.00%	0.0%
KMT	KENNAMETAL INC	$37.40	$3,099	(1.3)	11.6	15.3	12.0	4.4	12.4	5.0	-13.2%	14.0%	-41.1%	37.6%	8.2%		2.44	48.0%	B-	2.30%	34.8%
MKEWF	MAKITA CORP	$35.00	$9,503	0.0	0.0	19.7	0.1	(7.0)	(7.0)			19.7%	1.6%	2.7%	1.1%	7.7%	0.30	0.0%		1.71%	33.1%
Average			$9,400	(0.5)	3.6	10.5	2.0	10.0	13.7	6.6	26.4%	65.6%	8.0%	13.5%	13.8%	9.8%	1.19	31.7%		1.63%	31.4%
Median			$9,345	(0.0)	3.7	12.5	3.2	4.4	12.4	6.7	1.4%	19.7%	3.2%	7.1%	5.9%	7.7%	1.32	30.0%		1.71%	33.1%
SPX	S&P 500 INDEX	$3,169		0.0	2.4	5.4	9.6	19.6	26.4			23.1%	8.0%	8.0%	8.0%						

		2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Curre	NTM	STM	Pst 5yr	Equity
SNA	http://www.snapon.com	20.8%	2.83	17.9	12.0	13.6	13.7	13.5	12.9	12.2	15.6%	2.12	16.7%	23.5%	17.5%	9.7	12.5	4.8%		4.7%	$60.24
SWK	http://www.stanleyblackanddecker.com	16.9%	3.31	22.8	14.7	19.6	35.9	18.8	18.3	17.6	9.0%	1.75	4.3%	13.5%	5.3%	12.0	15.9	3.7%	3.3%	4.9%	$49.68
SCX	http://www.starrett.com	7.2%	0.47	61.4	10.4	6.5	6.3		5.7	3.8	2.7%	0.17	2.7%	4.9%	5.9%	4.7				-1.6%	$12.09
KMT	http://www.kennametal.com	11.4%	2.39	18.3	11.0	21.0	16.3	18.7	15.3	14.1	6.2%	1.31	10.2%	14.6%	13.0%	10.2	11.3	-4.8%	3.9%	-3.5%	$15.68
MKEWF	http://www.makita.co.jp	9.7%	1.83	27.1	20.7	18.9	20.5		18.4	18.2	11.7%	2.21	11.4%	16.0%	9.7%	11.7	16.6	1.4%		5.1%	$19.08
Average		13.2%	2.17	29.5	13.8	15.9	18.5	17.0	14.1	13.2	9.0%	1.51	9.0%	14.5%	10.3%	9.7	14.1	1.3%	3.6%	1.9%	
Median		11.4%	2.39	22.8	12.0	18.9	16.3	18.7	15.3	14.1	9.0%	1.75	10.2%	14.6%	9.7%	10.2	14.2	2.5%	3.6%	4.7%	
spx	S&P 500 INDEX			22.7	17.3	20.2			18.7	17.3											

Appendix 9: 3-stage DCF Model

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*3.2%*	*3.0%*	*2.5%*	*2.4%*	*2.3%*	*2.3%*	*2.3%*
NOPAT / S	*19.6%*	*19.6%*	*20.7%*	*21.7%*	*22.8%*	*23.9%*	*25.0%*
S / NWC	*2.62*	*2.62*	*2.52*	*2.41*	*2.31*	*2.20*	*2.10*
S / NFA (EOY)	*1.15*	*1.15*	*1.13*	*1.11*	*1.09*	*1.07*	*1.05*
S / IC (EOY)	*0.80*	*0.80*	*0.78*	*0.76*	*0.74*	*0.72*	*0.70*
ROIC (EOY)	*15.6%*	*15.6%*	*16.1%*	*16.5%*	*16.9%*	*17.2%*	*17.5%*
ROIC (BOY)		*16.1%*	*16.9%*	*17.4%*	*17.8%*	*18.1%*	*18.4%*
Share Growth		*-2.5%*	*-1.0%*	*-1.0%*	*-1.0%*	*-1.0%*	*-1.0%*
Sales	$3,854	$3,968	$4,068	$4,165	$4,261	$4,359	$4,459
NOPAT	$754	$777	$840	$906	$973	$1,042	$1,115
Growth		*3.0%*	*8.2%*	*7.8%*	*7.4%*	*7.2%*	*6.9%*
- Change in NWC	46	44	102	111	120	132	147
NWC EOY	*1468*	*1512*	*1614*	*1725*	*1845*	*1977*	*2124*
Growth NWC		*3.0%*	*6.8%*	*6.9%*	*6.9%*	*7.2%*	*7.4%*
- Chg NFA	104	100	149	153	156	164	173
NFA EOY	*3,352*	*3,452*	*3,601*	*3,754*	*3,910*	*4,074*	*4,247*
Growth NFA		*3.0%*	*4.3%*	*4.2%*	*4.2%*	*4.2%*	*4.2%*
Total inv in op cap	149	144	251	263	276	297	319
Total net op cap	4821	4964	5215	5478	5755	6051	6371
FCFF	$605	$633	$589	$642	$696	$746	$796
% of sales	*15.7%*	*15.9%*	*14.5%*	*15.4%*	*16.3%*	*17.1%*	*17.8%*
Growth		*4.7%*	*-6.9%*	*9.0%*	*8.4%*	*7.1%*	*6.7%*
- Interest (1-tax rate)	40	39	40	41	42	43	44
Growth		*-1.9%*	*2.5%*	*2.4%*	*2.3%*	*2.3%*	*2.3%*
FCFE w/o debt	$564	$593	$549	$601	$654	$702	$751
% of sales	*14.6%*	*15.0%*	*13.5%*	*14.4%*	*15.3%*	*16.1%*	*16.8%*
Growth		*5.2%*	*-7.5%*	*9.5%*	*8.8%*	*7.4%*	*6.9%*
/ No Shares	54.1	52.7	52.2	51.7	51.2	50.7	50.2
FCFE	$10.43	$11.25	$10.51	$11.63	$12.78	$13.87	$14.98
Growth		*7.9%*	*-6.6%*	*10.6%*	*9.9%*	*8.5%*	*8.0%*
* Discount factor	0.90	0.82	0.74	0.67	0.60	0.54	0.49
Discounted FCFE	$9.42	$9.18	$7.74	$7.73	$7.68	$7.52	$7.34
Third Stage							
Terminal value P/E							
Net income	$714	$737	$800	$864	$930	$999	$1,070
% of sales	*18.5%*	*18.6%*	*19.7%*	*20.7%*	*21.8%*	*22.9%*	*24.0%*
EPS	$13.19	$13.98	$15.32	$16.72	$18.18	$19.72	$21.34
Growth		*5.9%*	*9.6%*	*9.2%*	*8.7%*	*8.5%*	*8.2%*
Terminal P/E							16.00
* Terminal EPS							$21.34
Terminal value							$341.51
* Discount factor							0.49
Discounted terminal value							**$167.33**

Summary (using P/E multiple for terminal value)

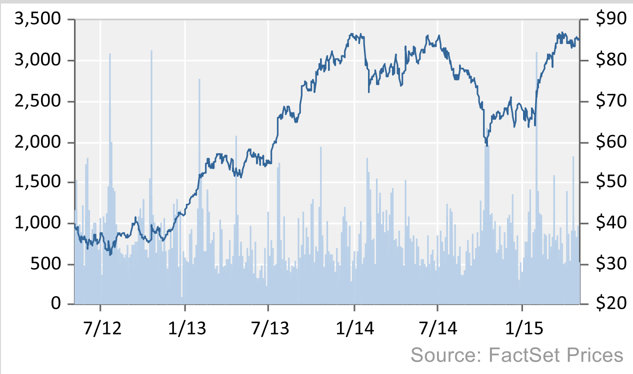
First stage	$18.60	Present value of first 2 year cash flow
Second stage	$38.02	Present value of year 3-7 cash flow
Third stage	$167.33	Present value of terminal value P/E
Value (P/E)	**$223.94**	

Recommendation: Hold				
Current Price	**$96.51**	---	Ticker	MAN
1 Year Bear	$90	*-20%*	Sh. Out. (M)	60
1 Year Base	**$93**	***-6.7%***	M.Cap. ($B)	5.6
1 Year Bull	$99	*27%*	EV ($M)	6.1

Industrials, Human Resources & Employment Services

Manpower Group Inc.

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	8.06%	2.14%	-12%	42.9%	48.7%	12.3%	3.31%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**20.7**	**19.3**	**19.6**	**21.0**	**21.9**	**21.2**	**21.2**
Gr. %	*4.2%*	*-6.7%*	*0.2%*	*7.1%*	*4.2%*	*0.6%*	*0.3%*
v. Cons.	-	-	-	-	-	*20.9*	*20.7*
Ind.	*5.1%*	*-7.1%*	*0.7%*	*3.1%*	*2.1%*	*0.0%*	*1.7%*
EPS	**$5.46**	**$6.33**	**$8.13**	**$8.62**	**$8.14**	**$7.90**	**$8.37**
Gr. %	*7.0%*	*15%*	*28%*	*6.0%*	*-5.5%*	*-2.9%*	*5.9%*
v. Cons.	-	-	-	-	-	**7.71**	**8.28**
Ind.	*6.3%*	*9.1%*	*19.2%*	*1.3%*	*-7.1%*	*1.0%*	*0.5%*

Ratios

	2015	2016	2076	2018	2019	2020F	2021F
NPM	**2.2 %**	**2.3%**	**2.6%**	**2.5%**	**2.5%**	**2.6%**	**2.6%**
Ind.	*2.1%*	*2.1%*	*2.1%*	*2.3%*	*2.3%*	-	-
ROE	18.1%	17.8%	21.2%	20.6%	19.6%	19.5%	19.6%
Ind.	*17.8%*	*17.9%*	*20.1%*	*20.0%*	*19.8%*	-	-
ROA	5.1%	5.9%	6.6%	6.4%	6.1%	6.2%	6.4%
Ind.	*5.5%*	*5.7%*	*6.1%*	*6.3%*	*6.3%*	-	-
A T/O	2.71	2.60	2.56	2.53	2.45	2.43	2.42
A/E	3.10	3.03	3.20	3.22	3.21	3.14	3.07

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
PE	15.6	14.2	17.6	7.2	13.0	12.5	11.6
Ind.	14.6	13.6	17.6	8.3	12.7	12.7	13.0
P/S	0.3	0.3	0.4	0.2	0.3	-	-
P/B	2.1	2.6	3.1	1.6	2.0	-	-
P/CF	14.3	11.3	24.7	10.1	9.7	-	-
EV/EBITDA	9.1	8.4	10.4	5.5	8.6	-	-
D/P	*1.9*	*1.9*	*1.5*	*30.*	*2.3*	-	-

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Summary

I recommend a neutral rating with a target of $96. Manpower appears to be poised to experience steady growth but much of this is already priced in. The company should face expanding business in key geographic segments but also faces significant macroeconomic risks. I believe the stock is farily valued based on relative and discounted cash flow analysis.

Key Drivers

- European labor market: much of Manpower's business comes from Europe and it has significant exposure to their labor market. Signs of strength could list growth for the firm.
- Secular trends in the workforce: over the past few decades employer have favored increasingly flexible labor. This has worked in Manpower's advantage and is expected to continue.
- Policy uncertainty: Firms are unlikely to invest when they are facing uncertain future environments. We are in an era of economic and political uncertainty and this can be a cause for concern for Manpower.
- Global economic growth: Manpower has significant exposure to the global market. Late cycle dynamics, trade wars, and US politics all affect the labor market and will drive MAN's performance.

Valuation

Using a relative valuation approach, Manpower appears to be fairly valued in comparison to the staffing industry. DCF analysis implies that the stock is worth $94.50. A combination of the approaches suggests that Manpower is fairly valued, as the stock's value is about $93 and the shares trade at $96.51.

Risks

- Continued uncertainty in global trade can contribute to slow economic growth
- Political leaders have signaled a willingness of governments to get involved in the sector to incentivize a substitute

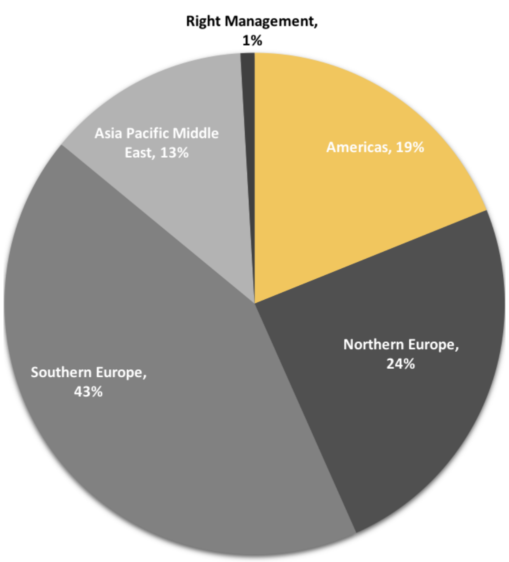
Company Overview

Manpower Group Inc. (MAN) is a provider of workplace and staffing solutions. The company offers recruitment services for permanent, temporary, and contract employment for professional, administrative, and industrial positions. MAN has been able to capitalize on recent trends in the labor market towards increased workforce flexibility. The firm has significant exposure to global economic conditions, especially in its primary markets. MAN has nearly 3000 offices in over 80 countries. The firm organizes its segments into Americas, Southern Europe, Northern Europe, Asia Pacific Middle East, and Right Management. Roughly two-thirds of MAN's business comes from Europe. The largest share of MAN's revenue is generated in France which accounted for 27% of the firm's revenue in 2018.

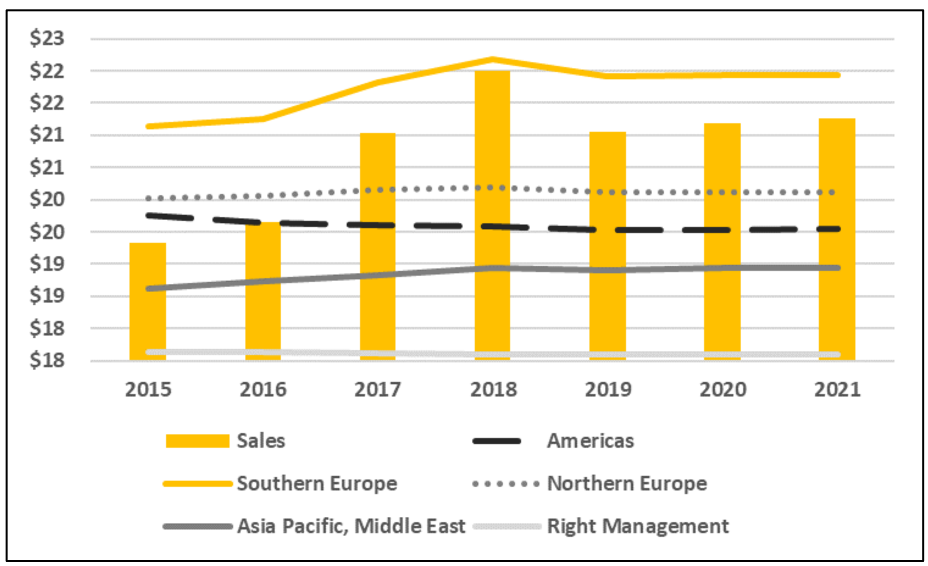
Manpower's portfolio of brands includes ManpowerGroup, Experis, Manpower, and Right Management:

1) ManpowerGroup: Strategic workforce consulting including recruitment process outsourcing and managed services programs.
2) Experis: Professional resource solutions for; information technology, finance, and engineering positions.
3) Manpower: Staffing services for contingent, permanent placement, and contract-to-permanent administrative and industrial positions.
4) Right Management: Outplacement services, leadership development, and career management solutions.

Figures 1 & 2: Revenue (in percent) by segment in 2018 (left) and revenue history (in billions) since 2015 (right)



Source: Company reports



Source: Company reports

Business/Industry Drivers

Though several factors may contribute to Manpower's future success, the following are the most important business drivers:

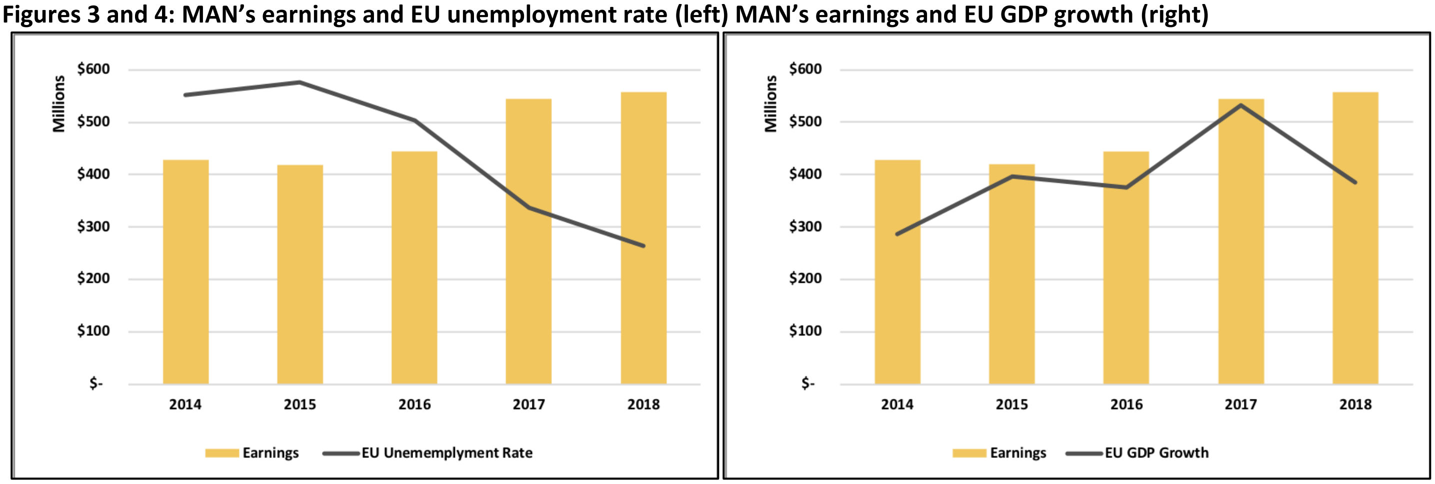
1) Labor market conditions in Europe
2) Secular trends in the workforce
3) Public policy uncertainty
4) Competitive Position

> MAN's earnings have a negative correlation coefficient of -0.99 to the unemployment rate in Europe since 2014

Slow growth, negative interest rates, and extreme policy uncertainty has led investors to be wary of exposure to the European economy. In Manpower's case, their exposure is more related to the labor market specifically and less to broad economic conditions. Since 2014, the correlation coefficient of Manpower's earnings and the unemployment rate in Europe is -0.991, implying an incredibly strong correlation between the two. The positive correlation of MAN's earnings to growth in gross domestic product in Europe does exists, at 0.60 it is less significant than the correlation of earnings to unemployment.

The strength of the labor market is, of course, especially critical in key markets like Europe which makes up nearly two-thirds of its revenue. The unemployment levels peaked in 2015 at just over 12%, followed by a steady decline coming down to a current level of 7.5%. In France, which makes up 27% of Manpower's revenue, the unemployment trends have mirrored those of Europe as a whole. France experienced a peak of unemployment slightly later than Europe, reaching 10.6% in 2015. In line with the rest of Europe, France has since experienced a trend of reductions in the unemployment rate settling at post-recession low of 8.5%.

Figures 3 and 4: MAN's earnings and EU unemployment rate (left) MAN's earnings and EU GDP growth (right)



Source: Company reports, OECD

Europe has relatively stable labor force participation rates. Over the past ten years the European Union countries experienced a low of 57.2% and high of 57.6%. The stability in the labor force participation rate demonstrates that the decreases in unemployment rates across Europe are due to new hires.

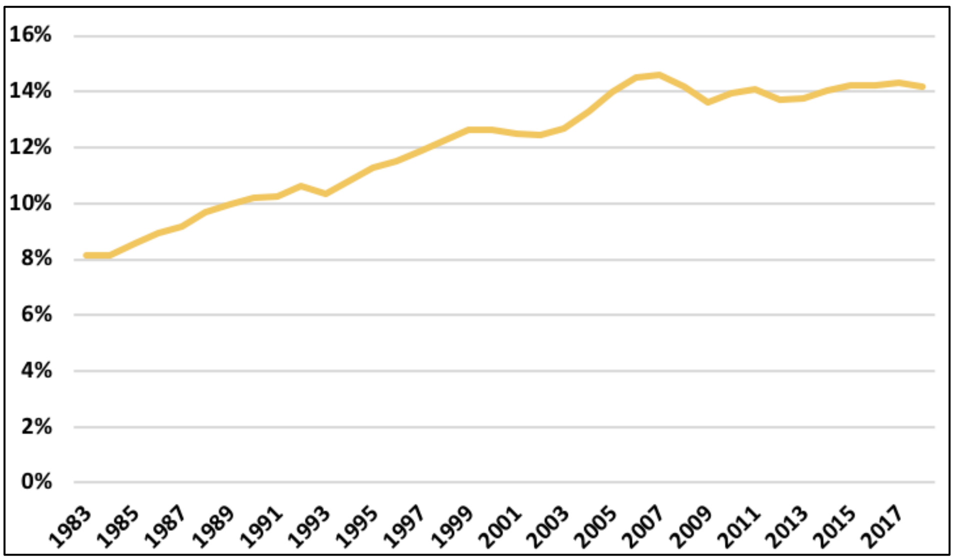
Secular Trends in the Workforce

Shifting trends in the workforce play a significant role in Manpower's business. The composition of the population, institutional set-up, macroeconomic trends, and cultural backgrounds all impact the workforce in unique ways. With roughly 90% of Manpower's business coming from their temporary staffing services, they are particularly exposed to certain segments of the labor market.

Since the mid-1980s, there has been an increasing emphasis on workforce flexibility. By utilizing temporary employees, firms are able to lower fixed costs and optimize their workforce for their immediate needs. In the European Union, the proportion of temporary employees in the workforce has increased by 74% since the mid-1980s. This trend offers continued opportunity for MAN.

Figure 5: Proportion of Temporary Workers in the Workforce in the European Union

The proportion of temporary works in the European Union has increased by 74% since 1983



Source: OECD

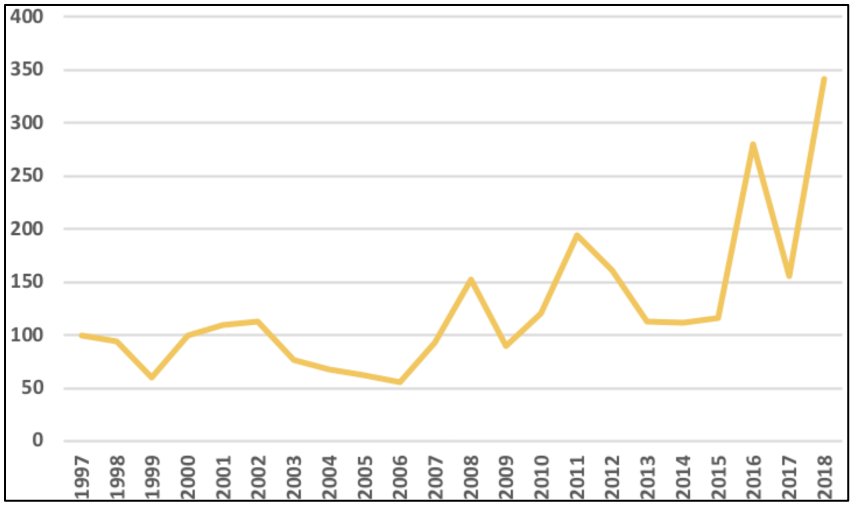
Public Policy Uncertainty

Uncertainty surrounding public policy has engulfed Europe in recent years. From Brexit to minor regulatory changes, businesses in Europe are bracing for drastic shocks to their economy. Manpower is no exception to this. MAN is particularly exposed to changes in employment policy, especially in regard to taxation and subsidies of labor. In 2018, MAN saw a reduction in gross profit margin largely due to the reduction in a prominent payroll tax credit in France. Changes in public policy will continue to have significant effects on the firm's earnings.

Of course, significant policy changes like Brexit will have substantial effects on the macroeconomic climate in Europe and the world at large. The extent of these effects are not yet fully known and are far from being totally quantified. This has created extreme uncertainty in public policy around the world. The Global Economic Policy Uncertainty Index has seen historic highs in recent years. The index is currently over 200% higher than in 2009.

The Global Economic Uncertainty Index has increased substantially in

Figure 6: Global Economic Uncertainty Index

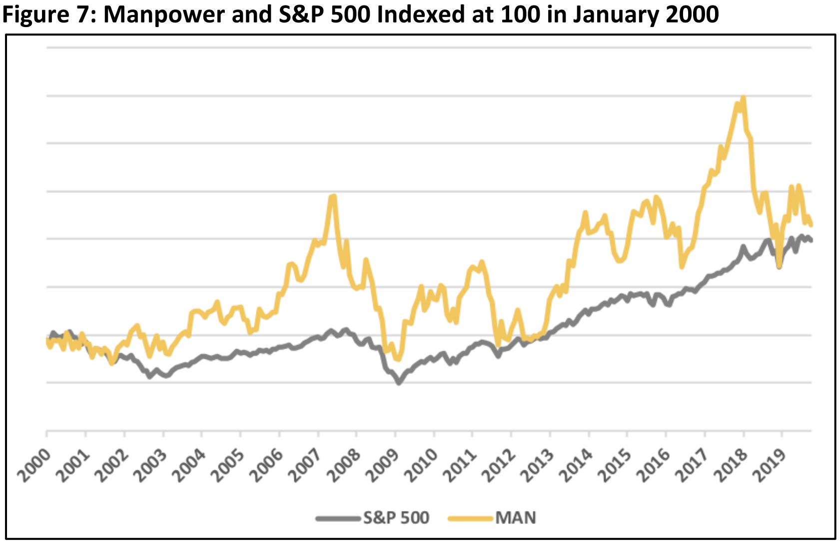


Source: Economic Policy Uncertainty

While the downsides of policy uncertainty are more readily apparent than the positives, I believe that this uncertainty provides Manpower with a unique opportunity, especially in Europe. While firms are uncertain about the near-term future economic conditions, they will prefer to build flexible business expansions rather than those with higher fixed costs. One method of attempting to grow while still positioning your business to be agile in turbulent times is to utilize temporary workers rather than full time employment.

Manpower experienced more volatility and has outperformed the S&P 500 since 2000

Figure 7: Manpower and S&P 500 Indexed at 100 in January 2000

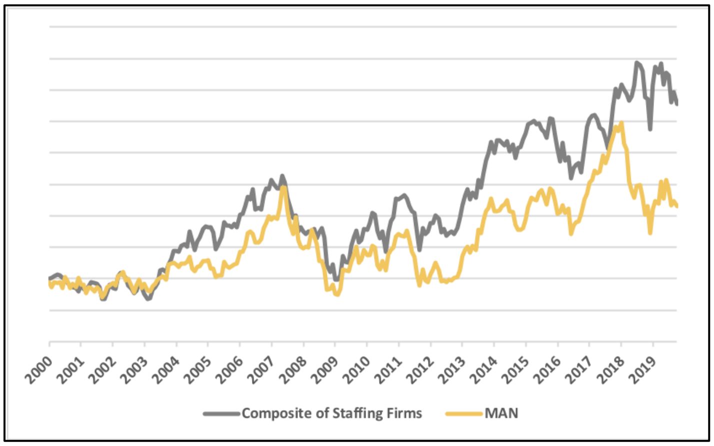


Source: Factset

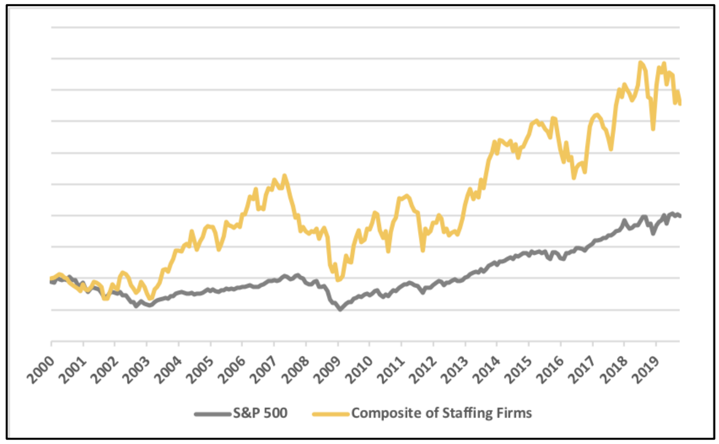
Competitive Position

Manpower operates in a hypercompetitive industry with relatively low barriers to entry. Man makes up 31% of the market cap and 55% of sales versus its peers. Investors are less bullish on MAN versus its peers. The sector faces significant exposure to the broad economic climate. Manpower has made efforts to hedge this risk with their Right Management segment. Right Management offers outplacement services that is negatively correlated with economic growth. This provides MAN with the ability to better weather turbulent economic climates than their competitors. In the event of an economic slowdown, look for Manpower to outperform its competitors due to these operations.

Figures 8 & 9: Manpower and Composite of Staffing Firms (Left) and Staffing Firms and S&P 500 (Right)

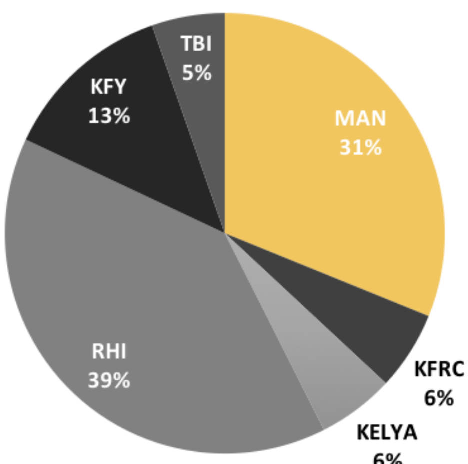


Source: Factset

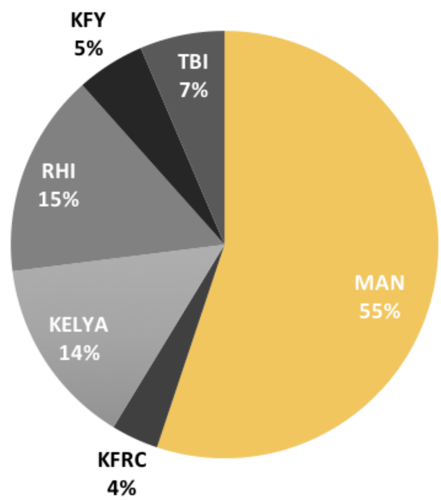


Source: Factset

Figures 10 & 11: Staffing Firms Market Share (Left) and Staffing Firms by Sales (Right)



Source: Company reports



Financial Analysis

I expect EPS to rise to $7.90 in FY 2020

I expect EPS to rise from $7.51 in FY 2019 to $7.90 in FY 2020. Modest gains in revenue from key geographic segments should contribute an increase of $0.05 in earnings per share. The firm's fixed costs should remain constant leading to modest improvements to SG&A expense contributing to $0.34 of the increase in EPS.

Figure 12: Quantification of 2020 EPS drivers

	Base	End	Down	Up	Start
	$7.51				
2019					$7.51
Sales	$7.51			$0.05	
Gross Margin	$7.56				
SG&A and other	$7.90			$0.34	
Other	$7.90				
2020		$7.90			
	$7.90				

Source: Company Reports, IMCP

In fiscal year 2021, I forecast EPS to continue to grow to $8.37. Continued modest sales growth should contribute $0.03 growth in EPS. Gross margin should remain stable again in 2021. Relative to sales, SG&A should decrease to 12.2% leading to $0.45 increase in EPS.

Figure 13: Quantification of 2021 EPS drivers

	Base	End	Down	Up	Start
	$7.90				
2020					$7.90
Sales	$7.90			$0.03	
Gross Margin	$7.92				
SG&A and other	$8.37			$0.45	
Other	$8.37				
2021		$8.37			
	$8.37				

Source: Company Reports, IMCP

I am more optimistic than the consensus estimates, especially in 2020. I anticipate stronger sales growth in 2020 resulting in a larger year over year growth in earnings per share. The consensus estimate shows a strong recovery in sales in 2021 bringing sales closer inline to my estimate of modest growth over 2020 and 2021.

Figure 14: EPS and YoY growth estimates by quarter

	2020E	2021E
Revenue	$ 21,189	$ 21,254
YoY Growth	0.61%	0.31%
Revenue Consenus	$ 20,644	$ 21,168
YoY Growth	-1.05%	2.54%
EPS	$ 7.90	$ 8.37
YoY Growth	5.20%	6.00%
EPS Consensus	$ 7.64	$ 8.27
YoY Growth	2.55%	8.25%

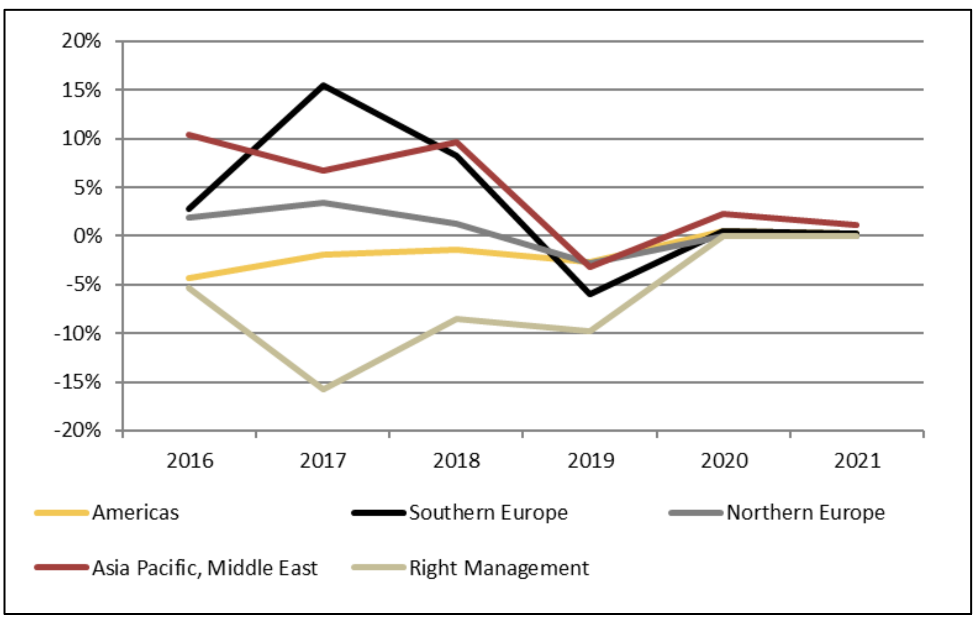
Source: Factset, IMCP

Revenues

Revenues should grow steadily in the coming years

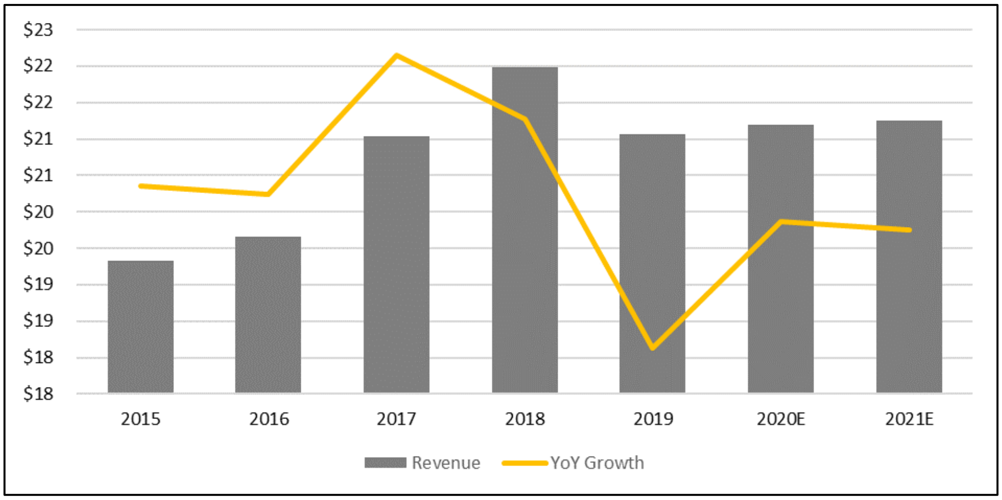
Manpower's revenues are largely tied to the macroeconomic conditions in the geographic segments that the firm operates. As economic uncertainty has persisted in Europe, the firm's revenues have fluctuated as employers have been hesitant to invest in a larger workforce. I expect the level of uncertainty to diminish and for the demand for labor to increase in the coming years. This should result in sales growth in Europe, which makes up the majority of MAN's revenue. Another area that has faced significant uncertainty is in their Asian markets. Trade disputes have led to slowed growth, or declines in sales in Manpower's Asia Pacific & Middle East segment. Trade negotiations appear to have hit an inflection point that should reverse this trend. For these reasons, I forecast sales growth to continue into the 2020 and 2021 fiscal years.

Figure 15: Manpower segment revenues



Source: Company Reports, IMCP

16: Revenue (Billions)



Source: Company Reports

Return on Equity

Manpower has experienced steady return on equity in recent years. Return on assets have been consistent near 6.0%. A slight drop in margins and asset turnover were offset by lower taxes. In 2020-2021, I expect slightly higher margins but this offset by lower leverage, so ROE reduces to 17.3% in 2020 and 16.2% in 2021.

Figures 17: 5 Stage Dupont Analysis

5-Stage Dupont	2016	2018	2018	2019	2020E	2021E
EBIT / sales	3.8%	3.9%	3.8%	3.5%	3.7%	3.9%
Sales / avg assets	2.60	2.56	2.53	2.44	2.37	2.27
EBT / EBIT	93.5%	89.6%	90.3%	95.6%	95.8%	96.0%
Net income /EBT	63.2%	73.9%	73.8%	67.9%	67.9%	67.9%
ROA	5.9%	6.6%	6.4%	5.6%	5.7%	5.8%
Avg assets / avg equity	3.03	3.20	3.22	3.21	3.03	2.80
ROE	17.8%	21.2%	20.6%	18.0%	17.3%	16.2%

Return on Invested Capital

ROIC has followed the same general trend as ROE. NOPAT margins are up since 2016, but sales to investment capital, like sales to average assets, has been declining.

Figures 18: Manpower's Return on Invested Capital

ROIC	2016	2017	2018	2019	2020E	2021E
NOPAT to sales	2.4%	2.9%	2.8%	2.4%	2.5%	2.6%
Sales to NWC	22.00	27.19	23.14	16.09	15.21	15.19
Sales to NFA	8.08	8.16	8.40	8.11	7.91	7.90
Sales to IC ex cash	5.91	6.28	6.16	5.39	5.20	5.20
Total ROIC ex cash	14.3%	18.2%	17.3%	13.0%	13.1%	13.8%

Cash Flow

Figure 19: Free cash flows 2015-2021E

Free Cash Flow	2015	2016	2017	2018	2019	2020	2021
NOPAT	$449	$475	$609	$617	$507	$533	$563
Growth		*5.7%*	*28.1%*	*1.3%*	*-17.7%*	*5.0%*	*5.7%*
NWC*	911	876	672	1,229	1,389	1,397	1,402
Net fixed assets	2,425	2,441	2,712	2,523	2,671	2,687	2,696
Total net operating capital*	$3,336	$3,317	$3,384	$3,752	$4,060	$4,085	$4,097
Growth		*-0.6%*	*2.0%*	*10.9%*	*8.2%*	*0.6%*	*0.3%*
- Change in NWC*		(35)	(204)	558	160	8	4
- Change in NFA		16	271	(190)	148	16	8
FCFF*		$494	$541	$249	$199	$508	$550
Growth			*9.6%*	*-54.0%*	*-19.9%*	*154.6%*	*8.4%*
- After-tax interest expense	30	31	64	60	22	22	22
FCFE**		$463	$478	$189	$177	$485	$528
Growth			*3.2%*	*-60.4%*	*-6.4%*	*174.2%*	*8.8%*
+ Net new debt/other cap		(30)	122	128	41	-	-
Sources of cash		$433	$600	$317	$218	$485	$528
Uses of cash							
Other expense		-	-	-	-	-	-
Increase cash and mkt sec		(132)	91	(97)	78	355	398
Dividends		118	124	127	130	130	130
Change in other equity		588	8	580	220	(0)	0
		$575	$223	$610	$428	$485	$528
Change in other liab		141	(377)	293	210	-	-
Total		$434	$600	$317	$218	$485	$528

While NOPAT has been rising over time, FCFF has been reasonably volatile. In 2017, the firm invested only $67 million in capital, but in 2018 this grew to $368 million as the firm invested more into operations in the firm's Asia Pacific and Middle East divisions. FCFE follows similar trends and has been used to repurchase shares (over $500mil in 2018) and pay a rising dividend. In 2020-2021 I expect FCFE to continue to be used for dividends.

Valuation

Manpower was valued using multiples and a 3-stage discounting cash flow model. Based on NTM P/E analysis and expected 2021 EPS, the stock is worth $92.61. Relative multiples versus peers indicate the stock is moderately inexpensive. A discounted cash flow analysis values the stock at $94.50. As a result of these valuations, I value the stock at $93.

Trading History

MAN's TTM P/E has fallen to 7.6 in 2018 from 15.7 in 2017. Relative to the S&P 500 the ratio moved from roughly 0.9 to 0.4. The TTM P/E ratio has since recovered to near 0.6. The company's 5-year P/E ratio is currently 13.2. As international trade tensions settle, positively impacting key geographic regions for MAN, I expect the firms P/E ratio to return to its five year average.

Figure 20: MAN NTM P/E relative to S&P 500

Source: FactSet

Assuming the firm maintains a 13.2 NTM P/E at the end of 2020, it should trade at $109.11 by the end of the year:

- Price = P/E x EPS = 13.2 x $7.90 = $104.28

Discounting $109.11 back to today at a 12.6% cost of equity (explained in Discounted Cash Flow section) yields a price of $92.61. Given MAN's potential for earnings growth and continued profitability, this appears to be valued fairly.

Relative Valuation

Manpower trades at a NTM P/E multiple very close to its peer group. The average NTM P/E ratio of its comparable group is 12.7 and MAN's NTM P/E is currently 12.5. As these companies are driven by similar macroeconomic drivers, a tight P/E range is expected. The range of P/S and P/B for its peer group is wide, with MAN near the average of the peer group in both measures.

Figure 21: MAN comparable companies

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
MAN	$93.35	$5,504	(1.0)	(3.8)	0.6	1.6	25.6	(3.9)	1.5	-5.0%	11.4%	33.7%	8.0%	3.6%	18.9%	1.97	48.1%	B+	2.25%	26.4%
KFRC	$37.99	$864	(0.9)	(4.8)	(5.0)	4.1	18.1	(4.3)		24.9%	-6.0%	14.4%	8.0%	7.2%	48.2%	1.07	42.4%	B	1.81%	33.6%
KELYA	$18.75	$733	(4.5)	(15.6)	(22.5)	(32.9)	(16.0)	(17.0)		4.9%	12.4%	23.1%	6.5%	9.6%	-18.0%	0.66	3.8%	B	1.33%	16.6%
RHI	$61.05	$7,177	0.0	(2.2)	3.9	1.1	0.5	(3.3)	7.1	4.4%	175.0%	-527.3%	-18.1%	-33.8%	14.3%	1.34	18.1%	B+	1.96%	31.3%
KFY	$42.45	$2,348	(0.5)	1.1	14.5	7.3	(3.8)	0.1		3.6%	21.2%	10.9%	-25.8%	-5.5%		1.15	37.7%	B	0.94%	12.4%
RAND-NL	$59.17	$10,845	0.6	(1.7)	7.6	14.8	23.9	(1.2)	-4.0	15.4%	-7.6%	24.1%	4.2%	6.7%	24.7%	1.09	21.6%		4.17%	67.1%
TBI	$22.66	$883	(1.7)	(4.1)	(4.3)	0.7	(5.1)	(5.8)		10.3%	-5.0%	27.5%	-9.8%	-7.1%	8.0%	1.21	11.1%	B	0.00%	0.0%
Average		$4,051	(1.1)	(4.4)	(0.8)	(0.5)	6.2	(5.0)	1.5	8.4%	28.8%	-56.2%	-3.9%	-2.7%	16.0%	1.21	26.1%		1.78%	26.8%
Median		$2,348	(0.9)	(3.8)	0.6	1.6	0.5	(3.9)	1.5	4.9%	11.4%	23.1%	4.2%	3.6%	16.6%	1.15	21.6%		1.81%	26.4%
SPX	$3,273		(0.1)	1.0	7.8	8.4	24.0	1.3			11.5%	22.1%	4.2%	11.2%						

	2018		P/E							2018	2018				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
MAN	12.3%	2.05	23.6	30.1	11.6	11.7	12.4	15.4	14.9	1.7%	0.29	2.5%	3.8%	16.1%	5.7	9.2	-2.0%	2.1%	1.7%	$45.55
KFRC	67.2%	4.73	4.6	5.4	5.7	17.7	14.2	6.5	6.1	0.2%	0.01	4.1%	5.8%	23.4%	10.5	51.2	2.3%		4.2%	$8.03
KELYA	7.6%	0.58	12.9	13.7	8.4	10.4	9.9	7.2	6.6	0.2%	0.02	0.4%	1.6%	2.0%	8.7		-2.5%		0.4%	$32.43
RHI	-10.0%	6.47	609.8	252.5	-60.9	15.8	15.1	-79.3	-119.7	-0.9%	0.62	7.5%	10.1%	40.0%	11.4	11.0	4.2%	4.0%	6.4%	$9.44
KFY	18.4%	1.87	9.5	11.0	9.5	13.2	12.7	13.7	14.5	0.9%	0.09	5.1%	12.6%	7.0%	9.0	16.3	4.7%			$22.71
RAND-NL	13.6%	2.23	17.3	21.2	12.7	15.5	13.4	15.8	14.8	4.2%	0.68	3.0%	3.9%	14.3%	9.1	9.1	-3.6%		7.5%	$26.55
TBI	38.4%	1.42	4.9	5.7	3.6	12.9	11.7	4.1	4.4	3.7%	0.14	2.6%	3.1%	9.8%	11.9	10.5	-4.6%	-0.8%	8.4%	$15.94
Average	21.1%	2.76	97.5	48.5	-1.3	13.9	12.8	-2.4	-8.4	1.4%	0.26	3.6%	5.8%	16.1%	9.5	17.9	-0.2%	1.7%	4.8%	
Median	13.6%	2.05	12.9	13.7	8.4	13.2	12.7	7.2	6.6	0.9%	0.14	3.0%	3.9%	14.3%	9.1	10.7	-2.0%	2.1%	5.3%	
spx			19.0	20.3	15.6			19.5	17.6											

Source: FactSet, IMCP

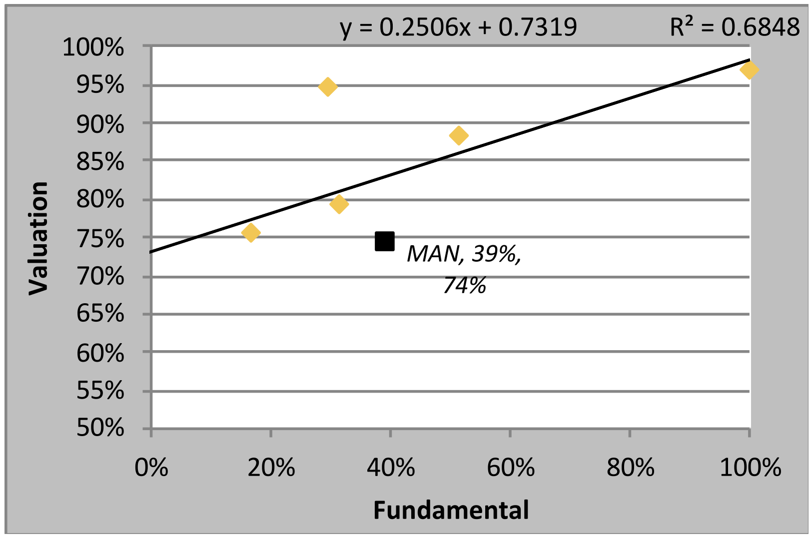
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. Growth rate of the past five years, and an equal weighting of TTM and NTM P/E ratio composite. The resulting regression line had an R-squared of 0.69. MAN is just below the line, indicating it is slightly undervalued based on its fundamentals.

Figure 22: Fundamentals vs Valuation

					Weight	100.0%	50.0%	50.0%
	Rank		Target	Weighted		Fundemental	Valuation	
Ticker	Diff	Diff	Value	Fund	Value	Pst 5yr	TTM	NTM
MAN	5	-54%	20%	39%	74%	39%	66%	82%
KFRC	7	27%	124%	100%	97%	100%	100%	94%
KELYA	1	-174%	-112%	-37%	62%	-37%	59%	66%
RHI	3	-91%	3%	30%	95%	30%	89%	100%
KFY	4	-73%	6%	31%	79%	31%	74%	84%
RAND-NL	6	-48%	40%	51%	88%	51%	87%	89%
TBI	2	-94%	-19%	17%	75%	17%	73%	78%

Source: Factset, IMCP

Figure 23: Composite relative valuation



Source: FactSet, IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value MAN.

For the purpose of this analysis, the company's cost of equity was calculated to be 12.6% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk free rate, as represented by the ten year Treasury bond yield, is 1.59%.
- A ten year beta of 1.49 was utilized since the company has higher risk than the market.
- A long term market rate of return of 9% was assumed, since historically, the market has generated an annual return of about 9%.

Given the above assumptions, the cost of equity is 12.60% (1.59 + 1.49 (9.00 – 1.59)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $7.51 and $7.17, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $13.11 per share. Thus, stage one of this discounted cash flow analysis contributes $13.11 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 12.60% cost of equity. I assume 1% sales growth in 2022 raising to 3.0% in 2026. The ratio of NWC and NFA to sales will remain at 2020 levels Also, the NOPAT margin is expected to rise to 3.0% in 2021 from 2.7% in 2022.

Figure 24: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$ 7.51	$ 8.17	$ 8.05	$ 8.09	$ 7.76	$ 8.22	$ 8.56
Discounted FCFE	$ 6.67	$ 6.44	$ 5.64	$ 5.03	$ 4.28	$ 4.03	$ 3.72

Added together, first and second stage discounted cash flows total $35.80.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $7.07 in 2020 to $8.56 in 2026.

Figure 25: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$ 7.90	$ 8.37	$ 8.69	$ 9.05	$ 9.54	$ 10.06	$ 10.62

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. Manpower's average P/E ratio over the past 5 years is roughly 13. This aligns closely with the P/E ratio of the company's peer group. Over the long-term, sales should grow with the economy, but EPS is more volatile. This multiple is relatively stable Therefore, a P/E of 13, somewhat lower than the S&P 500 P/E of 15-17 is expected.

Given the assumed terminal earnings per share of $10.62 and a price to earnings ratio of 13, a terminal value of $140.13 per share is calculated. Using the 12.60% cost of equity, this number is discounted back to a present value of $60.94.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $96.75 is calculated (13.11 + 22.69 + 60.94). Given MAN's current price of $96.51, this model indicates that the stock is fairly valued.

Scenario Analysis

If MAN is able to raise sales growth to 5 percent, increasing 1% year over year from 2020 to 2026, a DCF analysis would then price the stock at $98.16 per share.

Figure 26: Bull Case DCF

Summary (using P/E multiple for terminal value)		
First stage	$13.11	Present value of first 2 year cash flow
Second stage	$21.70	Present value of year 3-7 cash flow
Third stage	$63.35	Present value of terminal value P/E
Value (P/E)	**$98.16**	

If MAN fails to increase sales growth beyond 1% year over year through 20216, a DCF analysis values the stock at $94.68 per share.

Figure 27: Bear Case DCF

Summary (using P/E multiple for terminal value)		
First stage	$13.11	Present value of first 2 year cash flow
Second stage	$24.11	Present value of year 3-7 cash flow
Third stage	$57.46	Present value of terminal value P/E
Value (P/E)	**$94.68**	

Business Risks

Manpower faces significant exposure to macroeconomic conditions. This results in some of the following risks to the firm:

<u>Labor market conditions:</u>

It appears that economic conditions are improving for Manpower's areas, but if conditions change in segments like Europe and Asia, Manpower will likely be negatively affected.

<u>Trends in the labor market:</u>

Workforce trends have been moving toward temporary labor for decades. If firms begin to seek long term investment in human capital, opposed to the flexibility that staffing firms such as Manpower provides, MAN will struggle to grow in this environment.

<u>Regulatory environment:</u>

Recent legislative action that would harm staffing agencies have been isolated thus far. California recently passed into law measures in an effort to incentivize hiring employees rather than contractors. If these political goals spread into more legislative measures, Manpower's profitability could be affected.

<u>Policy uncertainty:</u>

Policy uncertainty seems to have reached a high point during the Brexit fight. We are constantly reminded that significant turmoil is never more than a single election away, turmoil could lead firms to delay investing in more manpower.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Staffing firms rely heavily on the relationships the firms have built over time. While there is low regulatory and investment barriers, the market for staffing firms is relatively saturated already. New entrants into the market appear to be unlikely at this time.

Threat of Substitutes – Medium

Hiring employees is a direct substitute to using staffing firms. If firms are more confident in their long run prospects they may lean towards hiring employees rather than hiring a staffing firm.

Supplier Power - Low

Wages are usually taken as a market price for staffing firms. While buyers are unlikely to have any influence over the pricing, the firm is exposed to the broader market setting prices.

Buyer Power – Low

Similar to supplier power, the labor market dictates the rates that staffing agencies provide and receive from corporate clients. It is unlikely that firm, regardless of size, are able to wield influence over customers in this sector.

Intensity of Competition – High

There is significant competition among firms in this sector. Since they are largely price takers, they compete on the relationships they have with firms.

Appendix 2: SWOT Analysis

Strenghts	Weaknesses
Well positioned in key markets Strong client base Hedged business segments	Low market power Compressing margins Low growth potention
Opportunities	**Threats**
Expansion in Asia Labor market trends Strong labor market	Macro trends Regulatory environment Currency fluxuations

Appendix 3: Income Statement

Income Statement (In millions)							
Items	**Jan-15**	**Jan-16**	**Jan-17**	**Jan-18**	**Jan-19**	**Jan-20**	**Jan-21**
Sales	$19,330	$19,654	$21,034	$21,991	$21,060	$21,189	$21,254
Direct costs	16,034	16,320	17,549	18,412	17,664	17,772	17,827
Gross Margin	3,296	3,334	3,485	3,579	3,396	3,417	3,427
SG&A, R&D, and other	2,587	2,583	2,662	2,743	2,649	2,633	2,598
EBIT	709	751	823	836	747	784	829
Interest	48	49	86	81	33	33	33
EBT	661	702	737	755	714	751	796
Taxes	242	258	192	198	229	241	255
Income	419	444	545	557	485	510	541
Other	-	-	-	-	-	-	-
Net income	419	444	545	557	485	510	541
Basic Shares	76.8	70.1	67.1	64.6	64.6	64.6	64.6
Fully Diluted Shares	77.7	70.8	67.9	65.1	65.1	65.1	65.1
EPS	$5.46	$6.33	$8.12	$8.62	$7.51	$7.90	$8.37
EPS Fully Diluted	$5.39	$6.27	$8.03	$8.56	$7.45	$7.84	$8.30
DPS	$1.58	$1.69	$1.84	$1.97	$2.01	$2.01	$2.01

Appendix 4: Balance Sheets

Balance Sheet (in millions)							
Items	**Jan-15**	**Jan-16**	**Jan-17**	**Jan-18**	**Jan-19**	**Jan-20**	**Jan-21**
Cash	731	599	689	592	670	1,025	1,423
Operating assets ex cash	4,362	4,534	5,482	5,405	5,400	5,433	5,450
Operating assets	5,093	5,133	6,171	5,997	6,070	6,458	6,873
Operating liabilities	3,451	3,659	4,810	4,176	4,011	4,036	4,048
NOWC	1,642	1,474	1,361	1,821	2,059	2,423	2,825
NOWC ex cash (NWC)	911	876	672	1,229	1,389	1,397	1,402
NFA	2,425	2,441	2,712	2,523	2,671	2,687	2,696
Invested capital	*$4,067*	*$3,915*	*$4,073*	*$4,344*	*$4,730*	*$5,110*	*$5,521*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$7,518*	*$7,574*	*$8,884*	*$8,520*	*$8,741*	*$9,146*	*$9,569*
Short-term and long-term debt	$855	$825	$948	$1,075	$1,116	$1,116	$1,116
Other liabilities	587	728	351	644	854	854	854
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	2,625	2,362	2,775	2,625	2,760	3,140	3,551
Total supplied capital	*$4,067*	*$3,915*	*$4,073*	*$4,344*	*$4,730*	*$5,110*	*$5,521*
Total liabilities and equity	*$7,518*	*$7,574*	*$8,884*	*$8,520*	*$8,741*	*$9,146*	*$9,569*

Appendix 5: Sales Forecast

Sales							
Items	**Jan-15**	**Jan-16**	**Jan-17**	**Jan-18**	**Jan-19**	**Jan-20**	**Jan-21**
Sales	$19,330	$19,654	21,034	$21,991	$21,060	$21,189	$21,254
Growth		*1.7%*	*7.0%*	*4.5%*	*-4.2%*	*0.6%*	*0.3%*
Americas	4,492	4,297	4,216	4,159	4,050	4,070	4,080
Growth		*-4.3%*	*-1.9%*	*-1.4%*	*-2.6%*	*0.5%*	*0.3%*
% of sales	*23.2%*	*21.9%*	*20.0%*	*18.9%*	*19.2%*	*19.2%*	*19.2%*
Southern Europe	7,292	7,498	8,657	9,372	8,811	8,855	8,877
Growth		*2.8%*	*15.5%*	*8.3%*	*-6.0%*	*0.5%*	*0.3%*
% of sales	*37.7%*	*38.1%*	*41.2%*	*42.6%*	*41.8%*	*2.0%*	*41.8%*
Northern Europe	5,034	5,129	5,306	5,371	5,219	5,219	5,219
Growth		*1.9%*	*3.5%*	*1.2%*	*-2.8%*	*0.0%*	*0.0%*
% of sales	*26.0%*	*26.1%*	*25.2%*	*24.4%*	*24.8%*	*24.6%*	*6.0%*
Asia Pacific, Middle East	2,239	2,471	2,636	2,890	2,800	2,864	2,897
Growth		*10.4%*	*6.7%*	*9.6%*	*-3.1%*	*2.3%*	*1.2%*
% of sales	*11.6%*	*12.6%*	*12.5%*	*13.1%*	*13.3%*	*13.5%*	*13.6%*
Right Management	274	259	218	200	180	180	180
Growth		*-5.4%*	*-15.8%*	*-8.5%*	*-9.8%*	*0.0%*	*0.0%*
% of sales	*1.4%*	*1.3%*	*1.0%*	*0.9%*	*0.9%*	*0.8%*	*0.8%*

Appendix 6: Ratios

Ratios							
Items	**Jan-15**	**Jan-16**	**Jan-17**	**Jan-18**	**Jan-19**	**Jan-20**	**Jan-21**
Profitability							
Gross margin	17.1%	17.0%	16.6%	16.3%	16.1%	16.1%	16.1%
Operating (EBIT) margin	3.7%	3.8%	3.9%	3.8%	3.5%	3.7%	3.9%
Net profit margin	2.2%	2.3%	2.6%	2.5%	2.3%	2.4%	2.5%
Activity							
NFA (gross) turnover		8.08	8.16	8.40	8.11	7.91	7.90
Total asset turnover		2.60	2.56	2.53	2.44	2.37	2.27
Liquidity							
Op asset / op liab	1.48	1.40	1.28	1.44	1.51	1.60	1.70
NOWC Percent of sales		7.9%	6.7%	7.2%	9.2%	10.6%	12.3%
Solvency							
Debt to assets	11.4%	10.9%	10.7%	12.6%	12.8%	12.2%	11.7%
Debt to equity	32.6%	34.9%	34.1%	41.0%	40.4%	35.5%	31.4%
Other liab to assets	7.8%	9.6%	4.0%	7.6%	9.8%	9.3%	8.9%
Total debt to assets	19.2%	20.5%	14.6%	20.2%	22.5%	21.5%	20.6%
Total liabilities to assets	65.1%	68.8%	68.8%	69.2%	68.4%	65.7%	62.9%
Debt to EBIT	1.21	1.10	1.15	1.29	1.49	1.42	1.35
EBIT/interest	14.77	15.33	9.57	10.32	22.64	23.76	25.12
Debt to total net op capital	21.0%	21.1%	23.3%	24.8%	23.6%	21.8%	20.2%
ROIC							
NOPAT to sales	2.3%	2.4%	2.9%	2.8%	2.4%	2.5%	2.6%
Sales to NWC		22.00	27.19	23.14	16.09	15.21	15.19
Sales to NFA		8.08	8.16	8.40	8.11	7.91	7.90
Sales to IC ex cash		5.91	6.28	6.16	5.39	5.20	5.20
Total ROIC ex cash		14.3%	18.2%	17.3%	13.0%	13.1%	13.8%
NOPAT to sales	2.3%	2.4%	2.9%	2.8%	2.4%	2.5%	2.6%
Sales to NOWC		12.62	14.84	13.82	10.86	9.46	8.10
Sales to NFA		8.08	8.16	8.40	8.11	7.91	7.90
Sales to IC		4.92	5.27	5.23	4.64	4.31	4.00
Total ROIC		11.9%	15.2%	14.7%	11.2%	10.8%	10.6%
NOPAT to sales	2.3%	2.4%	2.9%	2.8%	2.4%	2.5%	2.6%
Sales to EOY NWC	21.22	22.45	31.31	17.89	15.16	15.16	15.16
Sales to EOY NFA	7.97	8.05	7.75	8.72	7.88	7.88	7.88
Sales to EOY IC ex cash	5.79	5.93	6.22	5.86	5.19	5.19	5.19
Total ROIC using EOY IC ex cash	13.5%	14.3%	18.0%	16.4%	12.5%	13.0%	13.7%
NOPAT to sales	2.3%	2.4%	2.9%	2.8%	2.4%	2.5%	2.6%
Sales to EOY NOWC	11.78	13.33	15.46	12.08	10.23	8.75	7.52
Sales to EOY NFA	7.97	8.05	7.75	8.72	7.88	7.88	7.88
Sales to EOY IC	4.75	5.02	5.16	5.06	4.45	4.15	3.85
Total ROIC using EOY IC	11.1%	12.1%	14.9%	14.2%	10.7%	10.4%	10.2%
ROE							
5-stage							
EBIT / sales		3.8%	3.9%	3.8%	3.5%	3.7%	3.9%
Sales / avg assets		2.60	2.56	2.53	2.44	2.37	2.27
EBT / EBIT		93.5%	89.6%	90.3%	95.6%	95.8%	96.0%
Net income /EBT		63.2%	73.9%	73.8%	67.9%	67.9%	67.9%
ROA		5.9%	6.6%	6.4%	5.6%	5.7%	5.8%
Avg assets / avg equity		3.03	3.20	3.22	3.21	3.03	2.80
ROE		17.8%	21.2%	20.6%	18.0%	17.3%	16.2%
3-stage							
Net income / sales		2.3%	2.6%	2.5%	2.3%	2.4%	2.5%
Sales / avg assets		2.60	2.56	2.53	2.44	2.37	2.27
ROA		5.9%	6.6%	6.4%	5.6%	5.7%	5.8%
Avg assets / avg equity		3.03	3.20	3.22	3.21	3.03	2.80
ROE		17.8%	21.2%	20.6%	18.0%	17.3%	16.2%
Payout Ratio		26.7%	22.7%	22.9%	26.8%	25.5%	24.0%
Retention Ratio		73.3%	77.3%	77.1%	73.2%	74.5%	76.0%
Sustainable Growth Rate		13.1%	16.4%	15.9%	13.2%	12.9%	12.3%

Appendix 7: Cash Flow Statement

Cash Flow Statement						
Items	**Jan-16**	**Jan-17**	**Jan-18**	**Jan-19**	**Jan-20**	**Jan-21**
Cash from Operatings (understated - depr'n added to net assets)						
Net income	$444	$545	$557	$485	$510	$541
Change in Net Working Capital ex cash	35	204	(558)	(160)	(8)	(4)
Cash from operations	$479	$749	($1)	$325	$502	$536
Cash from Investing (understated - depr'n added to net assets)						
Change in NFA	($16)	($271)	$190	($148)	($16)	($8)
Change in Marketable Securities	$0	$0	$0	$0	$0	$0
Cash from investing	($16)	($271)	$190	($148)	($16)	($8)
Cash from Financing						
Change in Short-Term and Long-Term Debt	($30)	$122	$128	$41	$0	$0
Change in Other liabilities	141	(377)	293	210	0	0
Change in Debt/Equity-Like Securities	0	0	0	0	0	0
Dividends	(118)	(124)	(127)	(130)	(130)	(130)
Change in Equity ex NI and Dividends	(588)	(8)	(580)	(220)	0	0
Cash from financing	($596)	($387)	($286)	($99)	($130)	($130)
Change in Cash	(132)	91	(97)	78	355	398
Beginning Cash	731	599	689	592	670	1025
Ending Cash	$598	$689	$592	$670	$1,025	$1,423

Appendix 8: 3-stage DCF Model

	Year						
	1	2	3	4	5	6	7
First Stage							
Year ending January	2020	2021	2022	2023	2024	2024	2026
Sales Growth	*0.6%*	*0.3%*	*1.0%*	*1.5%*	*2.8%*	*2.8%*	*3.0%*
NOPAT / S	*2.5%*	*2.6%*	*2.7%*	*2.8%*	*2.9%*	*2.9%*	*3.0%*
S / NWC	*15.16*	*15.16*	*15.16*	*15.16*	*15.16*	*15.16*	*15.16*
S / NFA (EOY)	*7.88*	*7.88*	*7.88*	*7.88*	*7.88*	*7.88*	*7.88*
S / IC (EOY)	*5.19*	*5.19*	*5.19*	*5.19*	*5.19*	*5.19*	*5.19*
ROIC (EOY)	*13.0%*	*13.7%*	*14.1%*	*14.5%*	*14.8%*	*15.2%*	*15.6%*
ROIC (BOY)		*13.8%*	*14.2%*	*14.7%*	*15.2%*	*15.6%*	*16.0%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$21,189	$21,254	$21,466	$21,788	$22,388	$23,003	$23,693
NOPAT	$533	$563	$584	$608	$640	$674	$711
Growth		*5.7%*	*3.7%*	*4.1%*	*5.3%*	*5.3%*	*5.5%*
- Change in NWC	8	4	14	21	40	41	46
NWC EOY	*1397*	*1402*	*1416*	*1437*	*1477*	*1517*	*1563*
Growth NWC		*0.3%*	*1.0%*	*1.5%*	*2.8%*	*2.8%*	*3.0%*
- Chg NFA	16	8	27	41	76	78	88
NFA EOY	*2,687*	*2,696*	*2,723*	*2,763*	*2,839*	*2,917*	*3,005*
Growth NFA		*0.3%*	*1.0%*	*1.5%*	*2.8%*	*2.8%*	*3.0%*
Total inv in op cap	25	13	41	62	116	119	133
Total net op cap	4085	4097	4138	4200	4316	4435	4568
FCFF	$508	$550	$543	$546	$525	$555	$578
% of sales	*2.4%*	*2.6%*	*2.5%*	*2.5%*	*2.3%*	*2.4%*	*2.4%*
Growth		*8.4%*	*-1.4%*	*0.5%*	*-3.9%*	*5.8%*	*4.1%*
- Interest (1-tax rate)	22	22	23	23	24	24	25
Growth		*0.0%*	*1.0%*	*1.5%*	*2.8%*	*2.8%*	*3.0%*
FCFE w/o debt	$485	$528	$520	$523	$501	$531	$553
% of sales	*2.3%*	*2.5%*	*2.4%*	*2.4%*	*2.2%*	*2.3%*	*2.3%*
Growth		*8.8%*	*-1.5%*	*0.5%*	*-4.1%*	*6.0%*	*4.1%*
/ No Shares	64.6	64.6	64.6	64.6	64.6	64.6	64.6
FCFE	$7.51	$8.17	$8.05	$8.09	$7.76	$8.22	$8.56
Growth		*8.8%*	*-1.5%*	*0.5%*	*-4.1%*	*6.0%*	*4.1%*
* Discount factor	0.89	0.79	0.70	0.62	0.55	0.49	0.43
Discounted FCFE	$6.67	$6.44	$5.64	$5.03	$4.28	$4.03	$3.72
Third Stage							
Terminal value P/E							
Net income	$510	$541	$561	$585	$617	$650	$686
% of sales	*2.4%*	*2.5%*	*2.6%*	*2.7%*	*2.8%*	*2.8%*	*2.9%*
EPS	$7.90	$8.37	$8.69	$9.05	$9.54	$10.06	$10.62
Growth		*6.0%*	*3.8%*	*4.2%*	*5.4%*	*5.4%*	*5.6%*
Terminal P/E							13.20
* Terminal EPS							$10.62
Terminal value							$140.14
* Discount factor							0.43
Discounted terminal value							$60.95

Summary (using P/E multiple for terminal value)

First stage	$13.11	Present value of first 2 year cash flow
Second stage	$22.69	Present value of year 3-7 cash flow
Third stage	$60.95	Present value of terminal value P/E
Value (P/E)	**$96.75**	

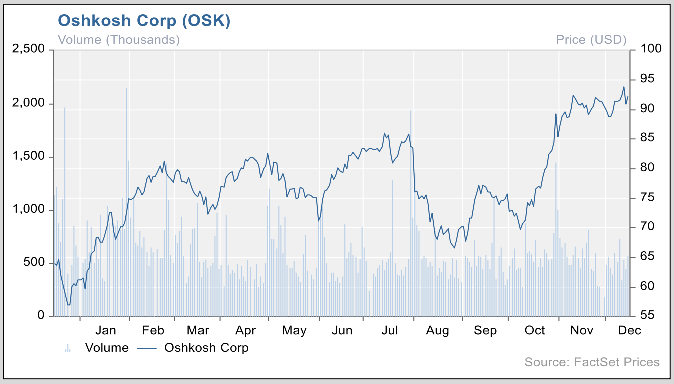
Industrial, Trucks

Oshkosh Corporation

Recommendation: Buy

Current Price	**$89.62**	---	Ticker	OSK
1 Year Bear	$134	*49%*	Sh. Out. ($M)	68.1
1 Year Base	**$156**	***74%***	M.Cap. ($M)	6,274
1 Year Bull	$171	*90%*	EV ($M)	6,860

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	96%	38%	4%	44%	50%	19%	1%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**6,098**	**6,279**	**6,830**	**7,706**	**8,382**	**9,225**	**9,993**
Gr. %	*-10.4%*	*3.0%*	*8.8%*	*12.8%*	*8.8%*	*10.1%*	*8.3%*
v. Cons.	-10.5%	*3.0%*	*8.8%*	*12.8%*	*8.8%*	*-3.9%*	*1.8%*
v. Ind.	*-8.2%*	*-12.7%*	*4.7%*	*19.9%*	*4.8%*	*-4.3%*	*0.2%*
EPS	**$2.95**	**$2.94**	**$3.83**	**$6.38**	**$8.30**	**$9.69**	**$11.19**
Gr. %	*-20.7%*	*11.1%*	*30.0%*	*66.6%*	*30.2*	*16.7%*	*15.5%*
v. Cons.	*-16.6%*	*4.0%*	*35.4%*	*49.6%*	*30.7*	*-7.1%*	*4.0%*
v. Ind.	*-21.0%*	*-22.0%*	*29.9%*	*46.7%*	*4.1%*	*-4.5%*	*9.7%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**3.8%**	**3.4%**	**4.2%**	**6.1%**	**6.9%**	**7.8%**	**7.8%**
v. Ind.	*3.8%*	*3.4%*	*4.2%*	*6.1%*	*6.9%*		
ROE	*11.8%*	*11.1%*	*13.3%*	*19.6%*	*22.7*	*25.9%*	*24.8%*
v. Ind.	*12.5%*	*11.8%*	*14.0%*	*18.7%*	*22.3*		
ROA	*4.9%*	*4.8%*	*5.9%*	*9.1%*	*10.7*	*12.3%*	*12.2%*
v. Ind.	*5.0%*	*4.8%*	*5.6%*	*8.9%*	*10.4*		
A T/O	1.33	1.38	1.42	1.48	1.54	1.59	1.64
A/E	2.41	2.33	2.24	2.16	2.12	2.10	2.03

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	12.53	19.24	21.89	11.32	9.23	11.1	12.1
v. Ind.	13.57	23.82	26.37	14.55	13.11	14.63	13.34
P/S	0.47	0.66	0.92	0.69	0.64		
P/B	1.43	2.09	2.68	2.05	1.98		
P/CF	34.78	7.22	25.38	12.24	9.41		
EV/EBITDA	6.95	9.01	10.50	7.30	6.08		
D/P	*1.9%*	*1.4%*	*1.0%*	*1.4%*	*1.4%*		

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Summary

I recommend a buy rating with a target of $156. OSK has an opportunity to dramatically improve efficiency and increase margins, along with the prospect of reliable sales in the near future. Fundamental valuations and the DCF values are nearly identical.

Key Drivers

- Construction: Over 60% of OSK's revenue is related to construction including commercial, and residential real estate along with infrastructure.
- Department of Defense Spending: Oshkosh's defense segment is almost 90% reliant on the spending of the DoD. This segment represents roughly a quarter of OSK revenue through government contracts.
- Material Prices: Steel and aluminum are significant expenses that are in nearly every product produced by Oshkosh Corporation. Changes in the prices of these materials highly affect the revenue and in many cases the profitability of sales.

Valuation

Using a relative valuation approach, Oshkosh appears to be slightly overvalued in relation to Its group of competitors. Although, DCF analysis implies the Company is greatly undervalued. A combination of the approaches suggests that Oshkosh is undervalued, as the base case valuation is at $156 and the shares currently trade at $89.62.

Risks

- Currency exchange fluctuations affecting material prices
- Government regulations and spending variations
- High exposure to potential negative economic environment

Company Overview

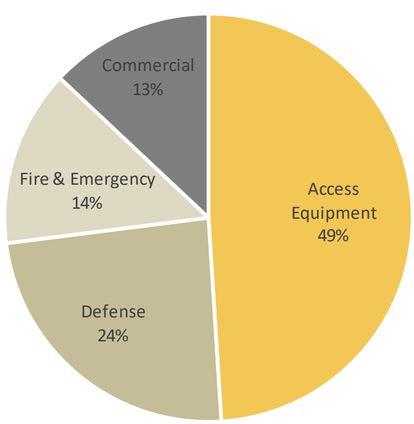
The firm has cyclical access and commercial sales while fire and emergency remain stable. Defense sales are largely affected by policy changes

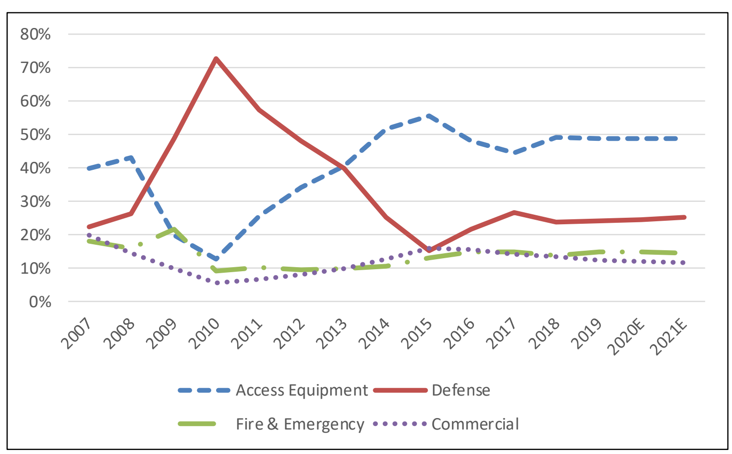
Oshkosh Corporation (OSK, Oshkosh Corp.) is a designer, manufacturer, and marketer of specialty vehicles and vehicle bodies. The company is comprised of four different product divisions including: access equipment, defense, fire & emergency, and commercial. The divisions are responsible for 49%, 24%, 14%, and 13% of the Company's sales revenue for fiscal 2018. Oshkosh Corporation was founded in 1917 and is headquartered in Oshkosh, WI.

OSK product segments are comprised of multiple subsidiaries:

1) Access equipment: Access equipment manufactures aerial work platforms and telehandlers which are commonly used for construction, industrial manufacturing, and maintenance purposes. JLG was acquired by Oshkosh in 2007 and represents its access segment. JLG products are marketed across six continents through independent companies that purchase JLG products to sell and rent to customers. I used the timeframe of 2007 to 2019 to calculate the CAGR for each segment. The access segment has a 12-year CAGR of 104%.
2) Defense: The defense division manufactures tactical military vehicles which are sold under contract to government militaries; replacement parts and services are also essential to this division. OSK defense products are designed, manufactured, and sold by Oshkosh Defense. Tactical vehicles, parts, and services are directly sold to the United States Department of Defense; foreign sales are through U.S. government channels to approved international governments. The defense segment has a 12-year CAGR of 103%.
3) Fire & emergency: The fire and emergency division designs and manufactures firefighting vehicles and equipment, snow removal vehicles, and various other emergency vehicles. Pierce is responsible for the majority of fire and emergency apparatus sales. Customers are fire departments of municipal governments. The defense segment has a 12-year CAGR of 101%.
4) Commercial: Commercial segment sales are largely comprised of concrete mixer vehicles and concrete batch plants, and refuse collection vehicles. Subsidiaries include McNeilus, CON-E-CO, London, Iowa Mold Tooling Co., and Oshkosh Commercial. The commercial segment is mostly known for its concrete mixer vehicles and equipment and refuse collection vehicles. The defense segment has a 12-year CAGR of 98%.

Figures 1 & 2: Revenue (in millions) by brand in 2014 (left); revenue history (in millions) since 2010 (right)





Source: Company reports

The access equipment segment of OSK is by far the largest in terms of percent of company sales, but has potential for even more growth.

As of 2018, access equipment accounted for half of OSK sales revenue, and over the years has been in line with the industrial sector's cyclical return patterns. Only three percent of these sales are contributable to the Chinese market, which is largely untapped by foreign competition for access equipment. As the overall access equipment industry increasingly enters the Chinese market, it is reasonable to assume that OSK's access equipment segment will also grow.

The defense segment usually stays around 25% of OSK's revenue with occasional large spikes that can be accounted for by military contracts. I expect this segment to maintain its current size or even shrink in relative revenue to other OSK segments.

The fire and emergency segment and commercial segments have historically been about the same size. These two segments are similar in that the vehicles produced are split between private sales and government contracts or bids. For example, fire trucks are almost exclusively sold to municipal governments, and ambulances are largely bought by private companies. Similarly, the commercial segment's main products are refuse collection vehicles and cement mixing vehicles. Refuse collection is a government-provided service, or the service is contracted out by the government to private companies; cement mixing vehicles and equipment are largely purchased privately. As overall construction and municipal government spending increases, which are largely due to macro factors, the segment grows as well.

There is substantial growth opportunity for the fire and emergency and commercial segments. Access equipment's growth depends on expanding into the Chinese market as the entire industry is looking to do the same thing. The defense segment should have stable sales for the foreseeable future, but I do not expect much growth.

Business/Industry Drivers

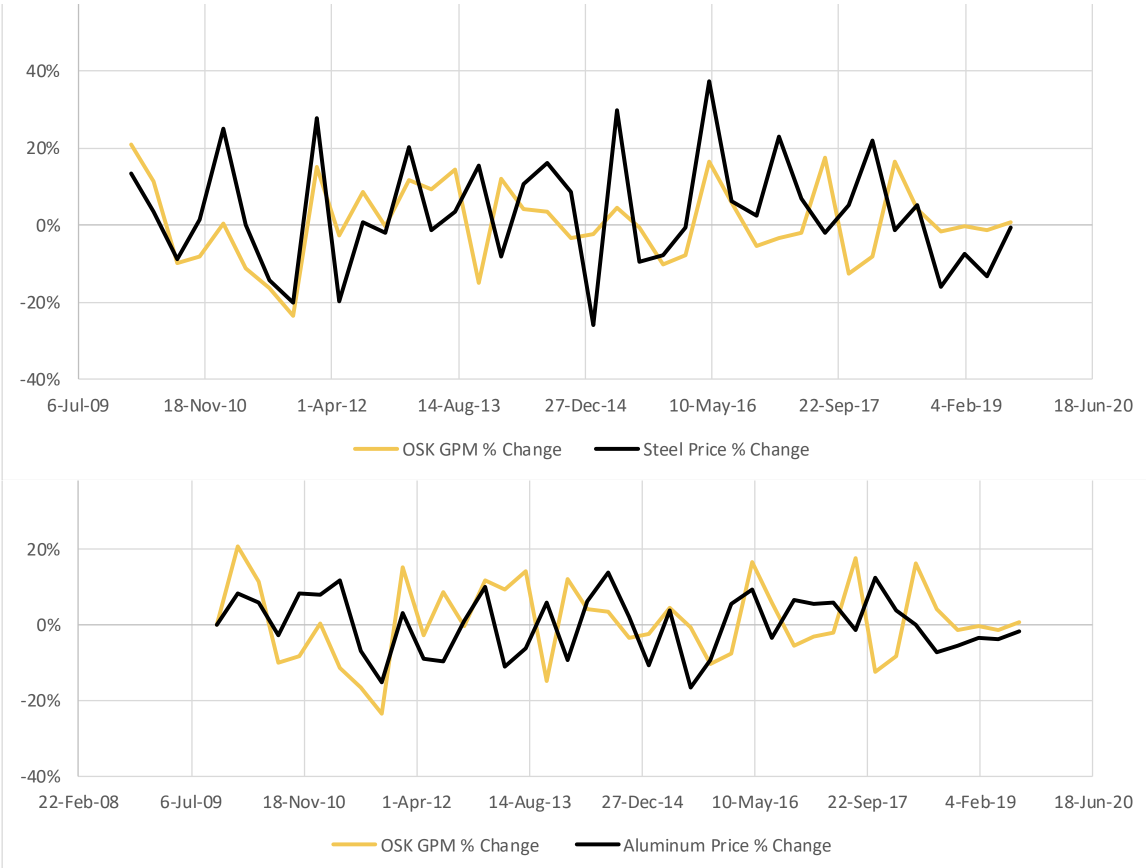
Though several factors may contribute to Oshkosh Corporation's future success, the following are the most important business drivers:

1) Material prices
2) Department of Defense spending
3) Real estate construction
4) Competitor analysis
5) Macroeconomic trends

Material Prices

The price of the materials that go into the vehicles and products made by Oshkosh Corp. are instrumental to profit margins as materials are the main components of goods sold. Across all of the segments, the main materials used are steel and aluminum. Most of the materials that go into OSK products come from third party vendors (chassis, frames, transmissions, engines...etc.) and these suppliers price in the material costs. For both steel and aluminum, I compared the quarterly change of gross profit margin (GPM) to the percent change in the material prices. It can be seen in figure 3 how the change in steel prices nearly mirror the shape of GPM changes. The main discrepancy to the relationship is scale of the changes; as steel prices spike, OSK GPM goes up at a lesser rate.

Figures 3 and 4: % Change in material price versus % change in gross profit, steel (top) and aluminum (bottom)



Source: Company reports and FactSet

OSK does not use materials derivatives to hedge price fluctuations. The U.S. Trade war seems to be calming down, which is important to OSK COGS.

OSK manufactures proprietary equipment for the independent suspension of the JLTV truck sold to the U.S. Military, but outside of this, almost all the components of its products are bought from suppliers. Plus, OSK business is dependent on to the contract revenue. Usually contracts are a major competitive advantage for OSK, but material price fluctuations disrupt margins. For example, Oshkosh's recent Joint Tactical Light Vehicle, which replaces the "Hummer," is a fixed-price contract for eight years. If material prices increase, OSK suffers the loss.

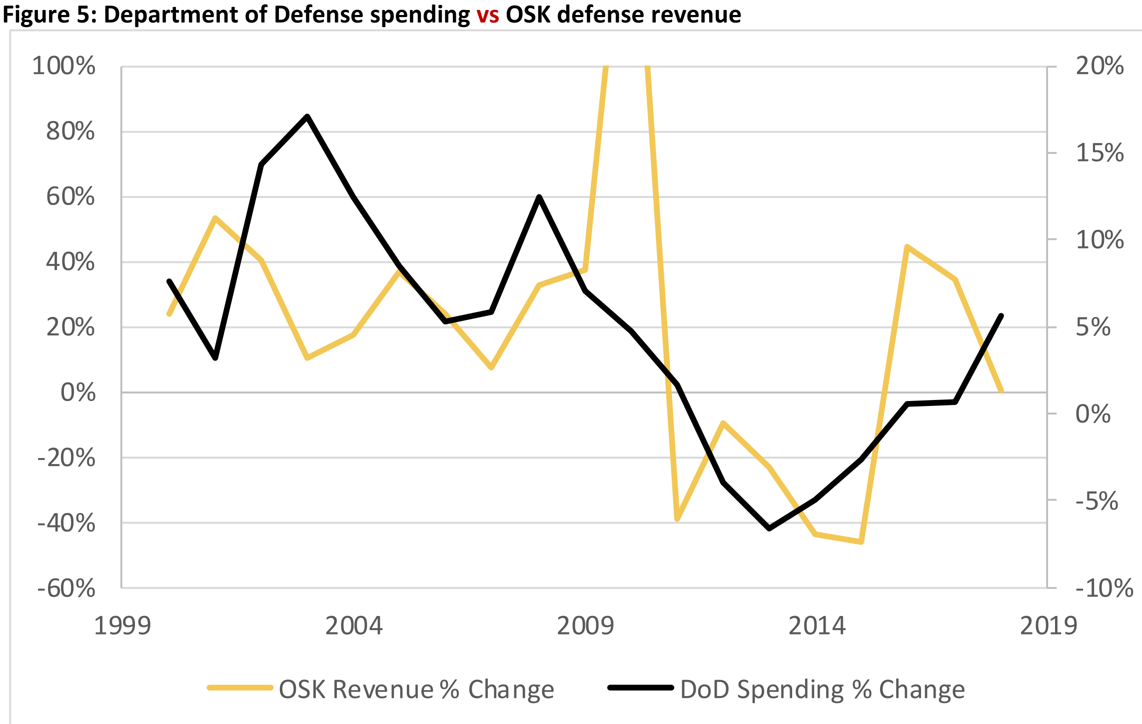
Tensions in the U.S. – China trade war have seemed to calm as of late. In the midst of this trade war, the U.S., Canada, and Mexico formed a trade agreement (USMCA). In this deal, steel tariffs have been eliminated between the three countries. Unfortunately, per OSK 10K, tariffs between U.S. and China are the bigger threat as most of its suppliers use Chinese steel. Current trade relations with China, including the tariff war, have been a large factor for production as steel tariffs have increased up to 25%. On the other hand, I believe any international trade deal is good headway in terms of future trade relations with China. Ultimately, tariffs have too much of a global impact to continue this feud for a long time.

Department of Defense spending

As of fiscal year 2018, roughly 22% of OSK total revenue was derived from its defense segment. Most of the sales are from the U.S., but Oshkosh Defense does sell to foreign governments, even though there are extra hoops to jump through for this to be possible. The U.S. government decides whether a foreign government is approved to buy tactical war-time equipment from American companies. Foreign relations can change over time, meaning previous foreign buyers may not be eligible to buy from OSK; this creates uncertainty for OSK's foreign sales. Government contracts provide OSK a competitive advantage for the term of the contract, since competition is essentially blocked. America by far spends the most on defense, which is an advantage for U.S. defense vehicle manufacturers such as OSK. Even if government administrations change and DoD spending decreases, revenue is fixed due to contracts. Figure 5 shows that OSK defense sales and DoD spending fell from 2010-2015, but growth has been positive since then.

OSK's revenue mostly coincides with Department of Defense spending with exception to contracts

Figure 5: Department of Defense spending vs OSK defense revenue



Source: FactSet, www.govinfo.gov

The JLTV (Joint Light Tactical Vehicle) contract won in 2015 has an eight-year term with a current order of 18,000 JLTV vehicles. Even after the contract is finished, there is often a longer period when the military and army request more vehicles and replacement parts with service. During this time, prices are not fixed so OSK can pass along the whole share of any increases in material costs, but purchase requests are not guaranteed. Overall, this post-contract relationship can last much longer and produce far more sales than the initial contract. For example, the eight-year term provides $6.7 billion in revenue, but the post contract sales are estimated to last for 20 years and are valued at $30 billion. The revenue provided under this contract, if production is equal each year, is about $800 million per year. Assuming estimates will hold for post-contract purchases, revenue will be $1.33 billion per year for 20 years.

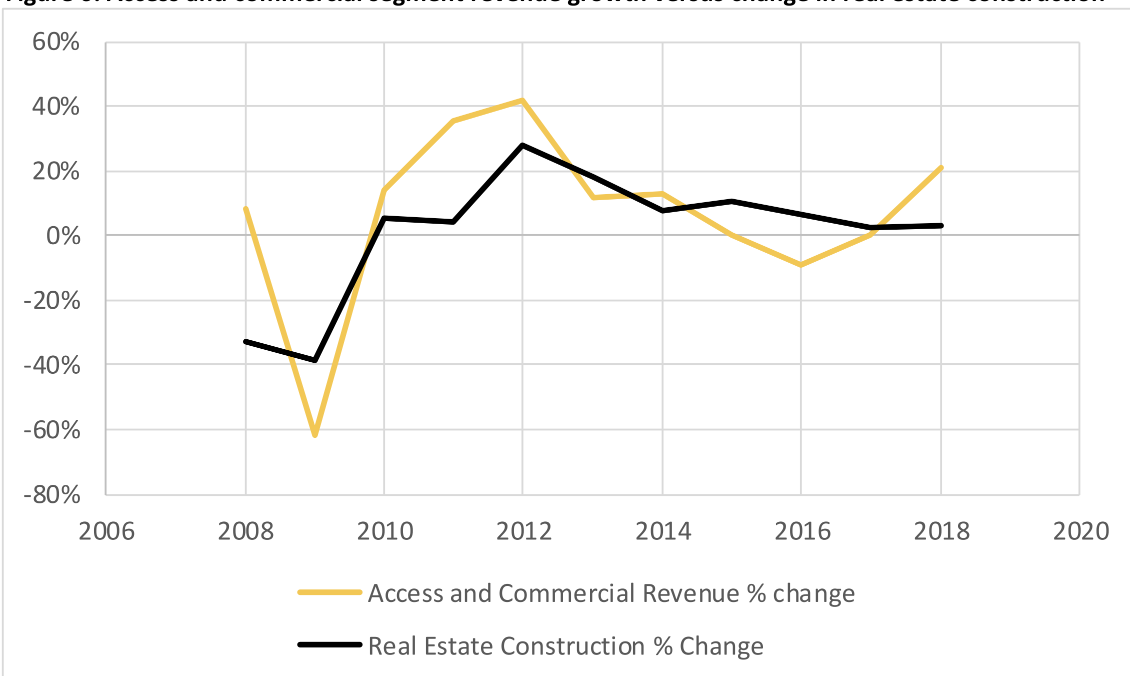
The United States seems to always be in some type of international conflict, but as of late, there are no legitimate threats that would drive up demand. For this reason, I believe the post-contract relationship with the U.S. Military projections are slightly optimistic. For the next ten years, I believe revenues will be stable or slightly drop.

Real estate construction

Access equipment and the commercial segment of OSK contributed cumulatively to almost 65% of sales for fiscal year 2018. Both of these segments have products which are largely used in real estate construction and maintenance, so there is high correlation between growth and residential real estate construction. This means revenues in these sectors are very cyclical. The access equipment division of OSK was acquired in 2007, and figure 6 shows that timing could not have been worse as revenues immediately fell..

Real estate construction largely impacts over 60% of OSK revenue. Real estate construction is also largely dependent on the economic health, therefore, OSK is very cyclical.

Figure 6: Access and commercial segment revenue growth versus change in real estate construction



Source: Company Reports and FactSet

The FOMC has recently become more accommodative to growth by lowering rates which usually inversely correlates with overall construction spending. This applies to residential construction and commercial construction. This rate cut was done in response to a slowing economy. The FOMC may be trying to help the economy, but a recession is still inevitable within the next few years.

Competitor Analysis

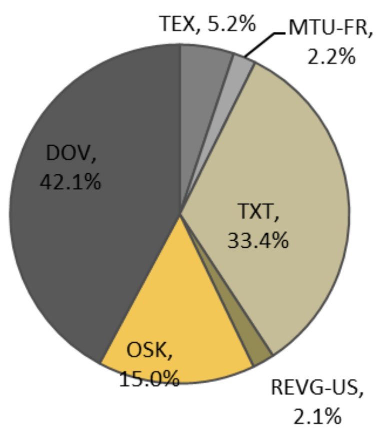
Oshkosh Corp. has a wide product line including tactical military vehicles, municipal government fire trucks and garbage trucks, concrete mixers, and aerial access equipment and lifts.
The defense contracts are as all-or-none, so growth can fluctuate widely. As military needs are made known, defense companies such as OSK and Navistar, compete to win the bid. If the bid is won, the military usually works with that company for often over twenty years. AM General started supplying the "Hummer" to the U.S. Military in the mid 1980's as it won the defense contract in 1983. Oshkosh won the contract to replace the "Hummer," and cornered this market for the foreseeable future.

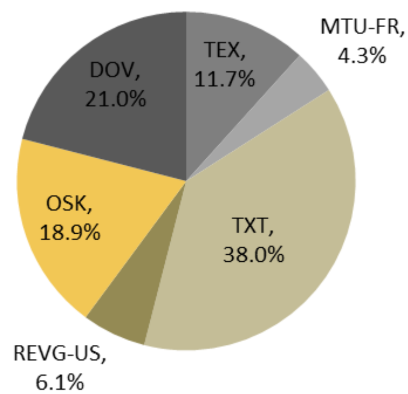
Per OSK yearly filings, Dover (DOV) and Textron Inc. (TXT) are two of Its main competitors in the defense segment. Although, these companies produce aeronautics instruments and aircraft for the U.S. Military, which OSK has little to do with. These competitors are still a threat to overall DoD spending. Usually aeronautics manufacturer products are much more expensive than the vehicles OSK manufactures. Thus, more expenditures that go to DOV and TXT may mean less for OSK.

As seen in the graphs below, Oshkosh Corp. is slightly cheaper on P/S than its competitors. Industry sales of OSK are slightly higher than its share of the market cap. This suggests that it may be underpriced. Dover dominates market cap.

OSK is cheaper than the competitors based on percent of sales versus percent of market cap.

Figures 7 and 8: Industry concentration by market cap (left) vs. sales (right)



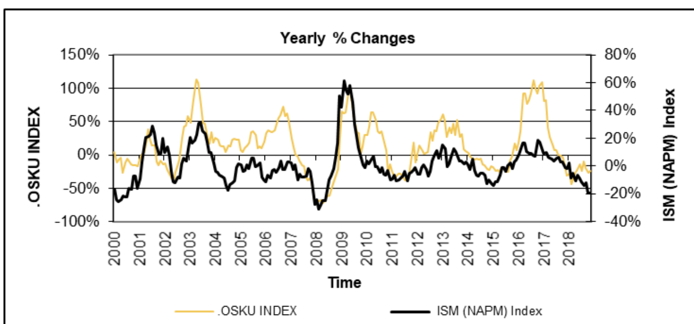


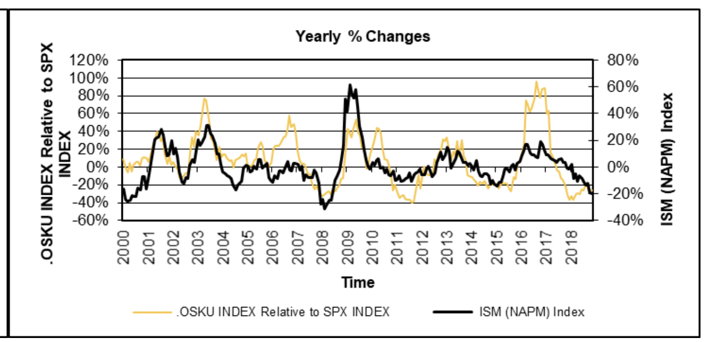
Source: FactSet, Analyst Computations

Macroeconomic Trends

Most all of OSK's product segments are very cyclical in sales, and are positively correlated to the ISM NAPM index. OSK and Its competitors that produce construction and municipal government-related vehicles are particularly sensitive to the economy.

Figures 9 and 10: ISM (NAPM) Index compared to OSK comps (left) and ISM (NAPM) Index compared to OSK comps relative to the S&P 500 index (right)





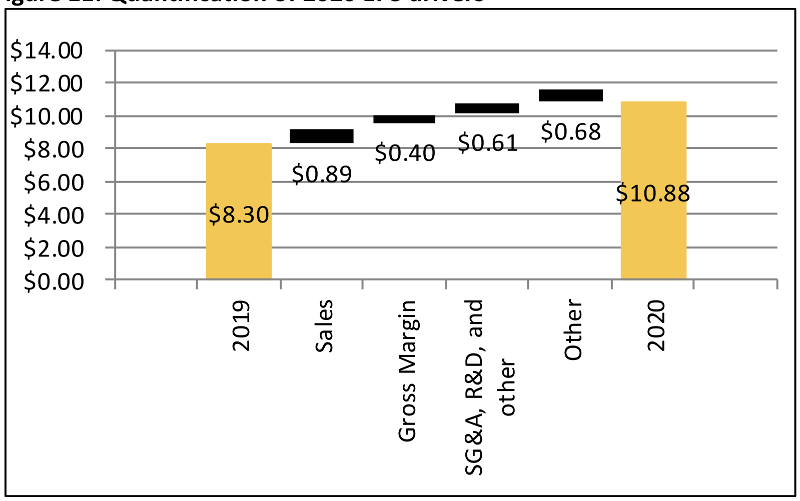
Source: Bloomberg, IMCP

Financial Analysis

Increasing sales with improving margins and heavy, consistent share repurchases create strong EPS growth

I anticipate EPS to grow to $10.88 in FY 2020 due to increasing revenues internationally and a steady share repurchase plan. Production and fulfillment of tactical vehicle orders along with low interest rates encourages construction, and revenue recognition of backlogged sales suggests this growth is sustainable for the following year. Higher gross margins in 2019 are courtesy of increased prices and decreased inefficiencies in the access and commercial division while this is slightly offset by higher material prices. SG&A as a percent of sale increased in 2019 which should be contained to that year, which implies a decrease for SG&A as a percent of sales in 2020.

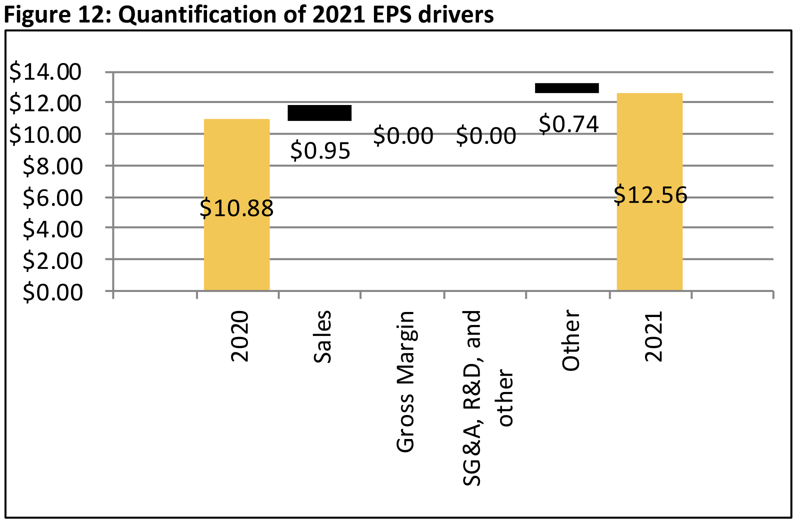
Figure 11: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

From 2020 to 2021 I expect EPS to grow $1.68 to $12.56. The reasons for this increase are the same as for 2019 to 2020 but slightly discounted for the uncertainty of the future. Increasing sales, decreasing operating expenses, and continued share repurchases lend to this value.

Figure 12: Quantification of 2021 EPS drivers

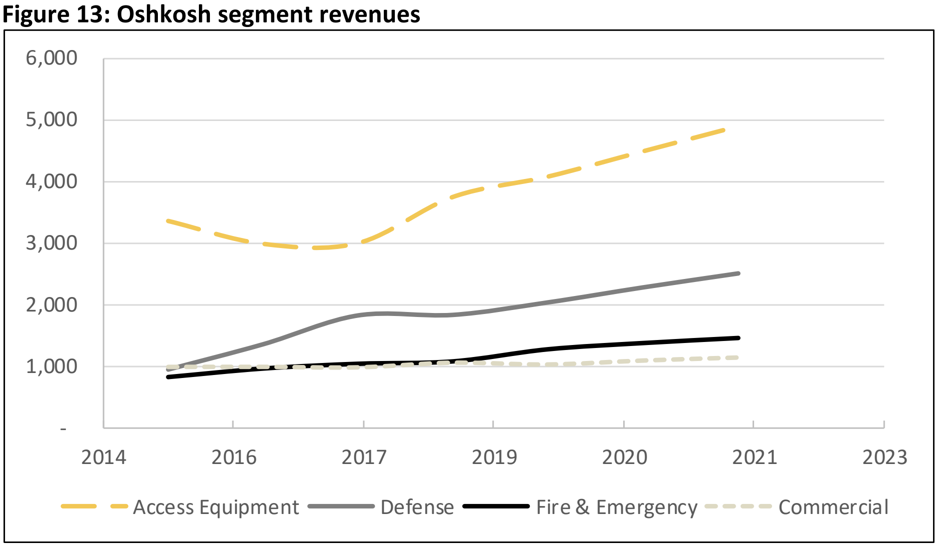


Source: Company Reports, IMCP

Revenues

Oshkosh's revenue growth accelerated from 2015–18, but slowed to 8.85% in 2019 with the economy. In 2020-21, I expect the economy to continue at a steady rate so my sales are forecasted to rise 8-10%. The U.S. Army has proposed reprogramming approximately $33 billion in funding to its top modernization and readiness priorities over the years 2020 through 2024, of which approximately $800 million is proposed to come from the Company's JLTV program. The Family of Medium Tactical Vehicles and Family of Heavy tactical vehicles contracts that were awarded to OSK in 2009 and 2015, respectively, will be fulfilling vehicle orders starting in 2020, which boosts sales projections for at least FY 2020. Unfortunately, the defense segment is not OSK's largest share of revenue. 2019 economic uncertainty caused customers of access equipment and the commercial segment to pull back. The Fed being more accommodative and the Trade War resolving may make them more confident over the next two years.

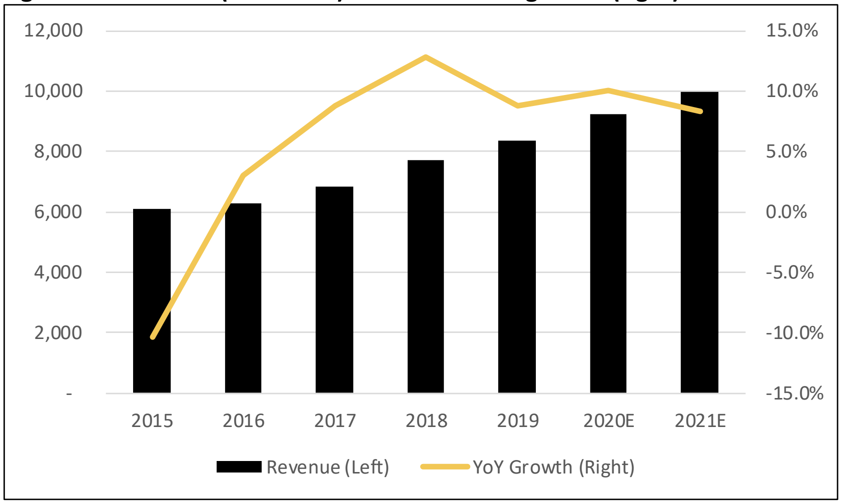
Figure 13: Oshkosh segment revenues



Source: Company Reports, IMCP

In addition to the economy's impact, access equipment sales benefited from increased production rates and increased price due to higher material prices. As mentioned before, the fulfillment of previously won defense contracts will begin in 2020 and full production rates for the JLTV program should promote defense sales. Most of the slowing in commercial vehicle sales in 2019 was due to the partial roof collapse in the manufacturing facility, which will be recovered by insurance and is considered extraordinary. The resolution of this issue should counteract the slight decrease in sales in 2019 for this segment.

Figure 14: Revenue (000s - left) vs YoY revenue growth (right)

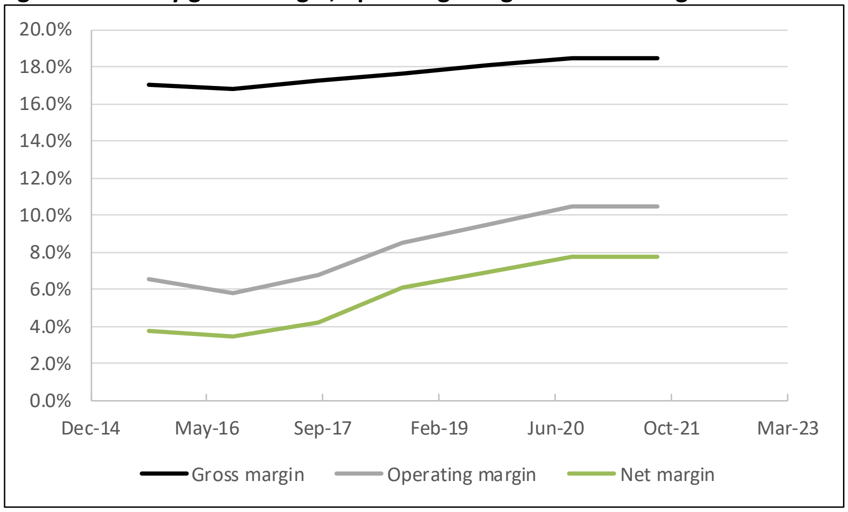


Source: Company Reports

<u>Operating Income and Margins</u>

Operating expenses are composed of selling, general and administrative expense and amortization of purchased intangibles. Advertising expense is broken out of SG&A and recognized as they are incurred. Operating expenses are stable year to year and generally decrease as a percent of sales. Amortization of purchased intangibles decrease slightly every year and are expected to be immaterial to overall operating expenses within five years.

Figure 15: Yearly gross margin, operating margin and net margin from 2015 to E 2021



Source: IMCP

As part of OSK's MOVE business strategy, the firm expects to increase efficiencies in manufacturing to decrease overhead expenses. These initiatives have produced good results in at least the access equipment segment. Unfortunately, these initiatives were stymied by the court settlement ($19 million) and roof collapse ($30 million) which were tagged onto overall operating expenses. These situations are considered extraordinary, which is promising for the 2020 operating margins.

Aside from the extraordinary events, which are somewhat unavoidable, OSK is doing a great job with operational costs. It is impossible to have no operational expenses, but there is room for improvement. Ideally, these efficiencies would carry through the remainder of the segments creating as low of operating expenses and higher margins as possible. This opportunity should be attainable as Management has discussed the sharing of production technology and flexible warehouses, where different vehicles and products can be manufactured.

Figure 16: OSK operating margins, 2018 – 2021E

	2018	2019	2020E	2021E
Sales	7,706	8,382	9,225	9,993
COGS	6,347	6,865	7,518	8,144
Gross Income	1,359	1,517	1,707	1,849
Gross Margin	*17.6%*	*18.1%*	*18.5%*	*18.5%*
Operating Expense				
SG&A	705	720	738	799
% of Sales	*9.2%*	*8.6%*	*8.0%*	*8.0%*
Operating Income	654	797	969	1,049
operaing Margin	*8.5%*	*9.5%*	*10.5%*	*10.5%*

Source: Company Reports

Return on Equity

ROE has been rising. It was 11.1% in 2016 and 22.7% in 2019. Higher margins, higher asset returns, lower interest burden, and lower taxes all contribute to a rise in ROE. The detractor was lower leverage.

Figure 17: ROE breakdown, 2016 – 2021E

Items	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21
ROE						
5-stage						
EBIT / sales	5.8%	6.8%	8.5%	9.5%	10.5%	10.5%
Sales / avg assets	1.38	1.42	1.48	1.54	1.58	1.57
EBT / EBIT	84.3%	88.8%	91.0%	94.2%	95.7%	95.9%
Net income /EBT	70.5%	69.4%	79.4%	77.2%	77.2%	77.2%
ROA	4.8%	5.9%	9.1%	10.7%	12.3%	12.2%
Avg assets / avg equity	2.33	2.24	2.16	2.12	2.10	2.03
ROE	11.1%	13.3%	19.6%	22.7%	25.9%	24.8%

Source: Company Reports

ROE should continue to rise over time given my forecast for higher margins. However, I expect leverage to continue to decline which will limit ROE expansion.

Free Cash Flow

Figure 18: Free cash flow calculations

Items	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21
NOPAT	$277	$254	$320	$517	$615	$748	$810
Growth		*-8.3%*	*25.7%*	*61.8%*	*18.9%*	*21.5%*	*8.3%*
NWC*	1,422	1,195	1,561	1,902	2,013	2,216	2,400
Net fixed assets	2,184	2,096	2,059	2,024	2,158	2,306	2,443
Total net operating capital*	$3,605	$3,291	$3,620	$3,926	$4,171	$4,522	$4,843
Growth		*-8.7%*	*10.0%*	*8.5%*	*6.2%*	*8.4%*	*7.1%*
- Change in NWC*		(227)	366	341	111	202	185
- Change in NFA		(88)	(37)	(35)	134	148	137
FCFF*		$569	($10)	$211	$370	$397	$488
Growth			*-101.7%*	*-2281.2%*	*75.1%*	*7.3%*	*23.0%*
- After-tax interest expense	50	40	36	47	36	32	33
FCFE**		$530	($45)	$165	$334	$365	$455
Growth			*-108.6%*	*-462.8%*	*103.0%*	*9.2%*	*24.6%*
+ Net new debt/other cap		(105)	166	136	19	80	80
Sources of cash		$425	$121	$301	$353	$445	$535
Uses of cash							
Other expense		(2)	(2)	(1)	-	-	-
Increase cash and mkt sec		279	125	8	(6)	65	150
Dividends		56	63	71	76	80	85
Change in other equity		95	(108)	195	418	300	300
		$428	$78	$272	$487	$445	$535

Source: Company Reports, IMCP

FCFE has declined since 2016. In 2016, the firm reduced capital which boosted FCFE. By 2019, the firm's NOPAT more than doubled, but capital expenditures and working capital investments rose to $245 million from negative $315 Million in 2016.

Going forward, I expect FCFE to rise from $334 mil in 2019 to $455 mil in 2021. The firm will also grow debt modestly, so total source of cash is over $500 mil in 2021. The firm will use this for dividends and share buybacks ($300 mil).

Valuation

OSK was valued using valuation multiples and a 3-stage discounting cash flow model. Using a P/E multiple of 12 for the terminal value gives a stock value at $152. The strong projected revenues along with increasing efficiencies and large amounts of stock repurchases are influential to this price target. Seeing as the YTD change of the stock at December 2019 was nearly 50% and the evidence that performance and management will be on par or get better for 2020. As the stock price has been steadily climbing, I believe that consensus estimates are a bit too conservative. Managerial economic concerns may be holding back growth and profitability estimates going into market projections for OSK.

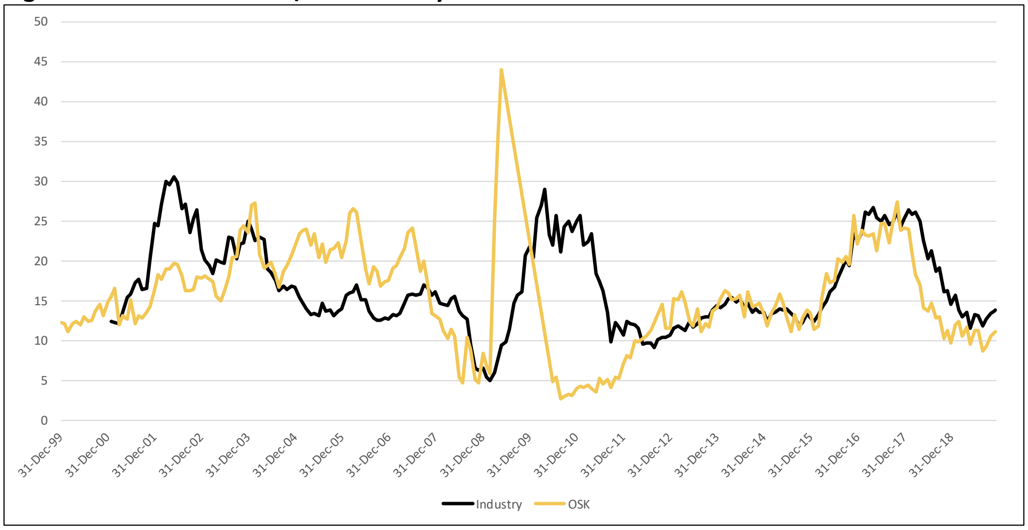
My target is based on 70% weight to DCF and 30% to multiples. My DCF value is $152 and multiples is $166, so my target price is $156.

Trading History

OSK's current NTM P/E is at 11.1 compared to its five-year average of 15.2. While I expect some regression towards the mean in the future, I do not think that is likely to be the case in the near term.

The last time the stock was trading at or around $90 was at the end of 2017 and the beginning of 2018 it was at a high of $100.26. OSK has outperformed the Dow Jones 30 by almost 30% for 2019. Over the past 20 years, compared to an industrial trucks index, has been trading on average at a 15 P/E multiple.

Figure 19: Historical OSK P/E vs Industry



Source: FactSet

Assuming the firm reverts back to the mean trading multiple of 15 NTM P/E at the end of 2020, it should trade at $188.40 by the end of the year:

- Price = P/E x EPS = 15 x $12.56 = $188.40.

Discounting $188.40 back to today at a 12.5% cost of equity (explained in Discounted Cash Flow section) yields a price of $167.46. Given OSK's potential for earnings growth and continued profitability, this seems to be a reasonable valuation. Versus consensus, this estimate is quite a lot more bullish as most estimates are coming in around $100.00.

Relative Valuation

Oshkosh is currently trading at around the median P/E compared to its peers, with a P/E TTM of 10.9 compared to a median of 13.3, about in line with the historical P/E of the Industry. Looking at historical P/E of OSK, it is near an all-time low right now and earnings are performing great. This suggests that earnings are peaking, and I do not agree.

Figure 20: OSK comparable companies

Ticker	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
OSK	$89.62	$6,117	(0.1)	(6.0)	12.3	7.2	31.6	(5.3)	13.9	-6.5%	54.1%	31.1%	32.4%	15.4%		2.09	31.5%	B	1.17%	13.1%
TEX	$26.80	$1,911	0.1	(12.6)	(5.6)	(16.0)	(5.3)	(10.0)	11.6	1757.6%	71.4%	98.1%	-25.2%	13.9%	-6.0%	1.91	146.5%	B	1.48%	377.9%
MTU-FR	$20.06	$767	(0.7)	(14.1)	3.7	(30.3)	(20.4)	(15.3)	-3.7		45.6%	6.1%	-2.5%	4.4%	156.0%	2.01			3.64%	
DOV	$118.65	$17,236	0.7	2.4	14.9	20.9	50.5	2.9	10.8	38.5%	2.9%	17.7%	7.9%	7.0%	-8.3%	1.69	100.6%	B+	1.68%	43.6%
TXT	$45.10	$10,295	1.2	(1.0)	(3.6)	(11.7)	(8.3)	1.1	10.9	-1.1%	36.3%	9.9%	1.6%	8.0%	22.7%	1.82	70.4%	B	0.18%	2.2%
REVG-US	$10.65	$664	0.8	(17.8)	(17.1)	(24.3)	35.5	(12.9)	-7.2	-427.8%	-9.0%	-56.8%	31.3%	54.0%		2.90	74.6%		1.64%	
Average		$6,165	0.3	(8.2)	0.8	(9.0)	13.9	(6.6)	6.1	272.1%	33.5%	17.7%	7.6%	17.1%	41.1%	2.07	84.7%		1.63%	109.2%
Median		$4,014	0.4	(9.3)	0.0	(13.8)	13.1	(7.7)	10.8	-1.1%	40.9%	13.8%	4.7%	10.9%	8.3%	1.96	74.6%		1.56%	28.4%
SPX	$3,326		0.1	3.1	10.7	10.6	26.0	2.9			8.3%	22.9%	6.9%	3.2%						

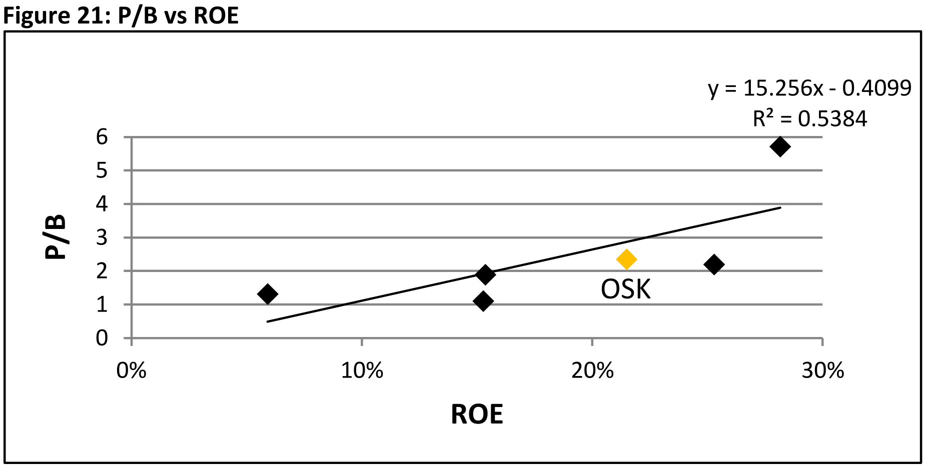
Ticker	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	NM	OM	ROIC	EV/ EBIT	P/CF Current	Sales Growth NTM	STM	Pst 5yr	Book Equity
OSK	21.5%	2.34	22.3	9.8	11.5	10.9	11.7	8.2	7.1	6.7%	0.73	6.9%	9.5%	17.2%	7.2	9.5	-4.2%	2.7%	4.2%	$38.24
TEX	25.3%	2.19	53.0	17.7	9.6	235.5	12.7	11.6	10.2	4.7%	0.41	2.2%	6.0%	5.2%	9.7	9.2	-16.4%	0.8%	-6.3%	$12.22
MTU-FR	15.3%	1.10	20.3	9.8	8.7			7.4	7.1	4.6%	0.33	4.5%	6.8%	13.9%	7.8	5.5			9.9%	$18.20
DOV	28.2%	5.71	16.9	14.3	19.7	26.8	19.4	18.8	17.6	11.9%	2.41	8.5%	13.6%	9.0%	14.3	16.8	1.1%	2.8%	-4.3%	$20.77
TXT	15.4%	1.89	23.1	13.8	12.2	12.3	12.5	12.1	11.2	6.2%	0.76	8.7%	7.9%	13.4%	12.9	11.5	4.7%		2.9%	$23.89
REVG-US	5.9%	1.31	26.7	6.8	25.5	-53.5	16.3	16.9	11.0	1.2%	0.28	-0.5%	1.3%	-1.3%	38.0	9.2	2.8%	4.8%	6.9%	$8.12
Average	18.6%	2.43	27.1	12.0	14.5	46.4	14.5	12.5	10.7	5.9%	0.82	5.0%	7.5%	9.6%	15.0	10.3	-2.4%	2.8%	2.2%	
Median	18.4%	2.04	22.7	11.8	11.8	12.3	12.7	11.8	10.6	5.4%	0.57	5.7%	7.4%	11.2%	11.3	9.4	1.1%	2.7%	3.6%	
spx			24.5	21.2	22.3			21.5	20.8											

Source: Factset, IMCP

An analysis of P/B and ROE is shown in figure 29. The calculated R-squared of the regression indicates that over 53% of a sampled firm's P/B is explained by its NTM ROE. OSK has an average P/B and ROE of this grouping, and according to this measure is quite undervalued.

- Target P/B = Estimated 2020 ROE (25.9%) x 15.256 + .4099 = 4.36
- Appreciation = Target P/B (4.36) / Current P/B (2.34) – 1 = 86.3%
- Target Price = Current Price (89.62) x Appreciation (86.3%) = $166.96

Figure 21: P/B vs ROE



Source: Factset

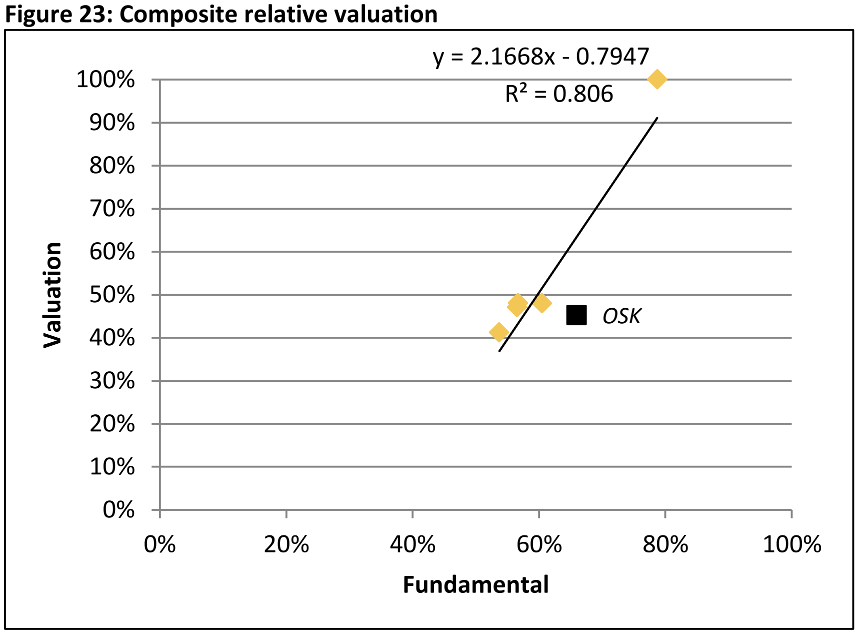
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. An equal weighting of STM sales growth and 2019 ROE was compared to an equal weight composite of NTM P/E and current P/S, the regression line had an R-squared of 0.73. One can see that OSK is on the regression line indicating that it is accurately priced using fundamental valuation.

Figure 22: Composite valuation, % of range

			Weight	50.0%	50.0%	50.0%	50.0%
		Weighted		2019	Sales Growth	P/E	
Ticker	Name	Fund	Value	ROE	STM	NTM	P/S
OSK	OSHKOSH CORP	66%	45%	76%	56%	60%	30%
TEX	TEREX CORP	54%	41%	90%	18%	65%	17%
MTU-FR	MANITOU	57%	47%	54%	59%	80%	14%
DOV	DOVER CORP	79%	100%	100%	57%	100%	100%
TXT	TEXTRON INC	57%	48%	55%	59%	64%	32%
REVG-US	REV GROUP INC	60%	48%	21%	100%	84%	11%

Source: IMCP

Figure 23: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was also used to value OSK.

For the purpose of this analysis, the company's cost of equity was calculated to be 12.54% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.82%.
- A three-year adjusted beta of 1.31 was utilized since the company has higher risk than the market.
- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 12.54% (1.82 + 1.31 (10.0 – 1.82)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $5.55 and $7.36, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $10.74 per share. Thus, stage one of this discounted cash flow analysis contributes $10.74 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 12.54% cost of equity. I assume 8% sales growth in 2022, lowering to 7% through 2026. The ratio of sales to NWC and NFA will remain at 2020 levels, and NOPAT margin is expected to stay about flat as well. I also assume 4% share buybacks (down from 6% in 2021).

Figure 24: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$5.55	$7.36	$7.56	$8.47	$10.35	$11.48	$12.74
Discounted FCFE	$4.93	$5.81	$5.31	$5.28	$5.73	$5.65	$5.57

Stage Three – Net income for the years 2020 – 2026 is calculated based upon the NOPAT minus interest net tax from stage one. EPS is expected to grow from $10.88 in 2020 to $21.72 in 2026.

Figure 25: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$10.88	$12.56	$14.10	$15.81	$17.58	$19.54	$21.72

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. By 2026, the firm should trade at a similar P/E as in the past. The 20 year average is 13.16. However, the market may be slow to price in the rise, so I assume a 12 P/E for the terminal value. Also, I have not forecasted a recession by 2026, so a more conservative P/E may be appropriate.

Given the assumed terminal earnings per share of $21.72 and a price to earnings ratio of 12, a terminal value of $260.65 per share is calculated. Using the 12.54% cost of equity, this number is discounted back to a present value of $114.03.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $152.31 is calculated (10.74 + 27.54 + 114.03). Given OSK's current price of $91.02, this model indicates that the stock is quite undervalued.

<u>Scenario Analysis</u>

To account for the volatility of the markets, especially since Oshkosh is on the higher reactivity side to the market, a bull and bear case is made for the discounted cash flow. To manipulate the projected values for the bull case I increased the sales across the first two stages of the DCF, decreased operating expenses by a larger amount for the first stage, and used a P/E multiple that is more near the historical industry average.

Figure 26: Bull Case

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*10.0%*	*9.0%*	*8.0%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*
Terminal value P/E							
Net income	$715	$781	$841	$906	$976	$1,041	$1,111
% of sales	*7.8%*	*7.8%*	*7.8%*	*7.7%*	*7.7%*	*7.7%*	*7.7%*
EPS	$10.87	$12.64	$14.18	$15.91	$17.85	$19.84	$22.05
Growth		*16.3%*	*12.2%*	*12.2%*	*12.2%*	*11.2%*	*11.2%*
Terminal P/E							14.00
* Terminal EPS							$22.05
Terminal value							$308.76
* Discount factor							0.44
Discounted terminal value							$135.08
Summary (using P/E multiple for terminal value)							
First stage	$10.44	Present value of first 2 year cash flow					
Second stage	$27.33	Present value of year 3-7 cash flow					
Third stage	$135.08	Present value of terminal value P/E					
Value (P/E)	**$172.86**						

For the bull case, the projected years 2020 and 2021, I increased the sales growth by about 1% in 2021. For the second stage years 2022 through 2026, I only extended the years that the 8% sales growth was achieved. Lastly, I increased the P/E multiple from 12 to 14, which is closer to the industry average P/E and historical P/E of the firm.

Figure 27: Bear Case

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*8.5%*	*7.5%*	*7.0%*	*7.0%*	*7.0%*	*6.5%*	*6.5%*
Terminal value P/E							
Net income	$705	$759	$810	$864	$922	$979	$1,040
% of sales	*7.8%*	*7.8%*	*7.7%*	*7.7%*	*7.7%*	*7.7%*	*7.7%*
EPS	$10.72	$12.28	$13.65	$15.17	$16.87	$18.66	$20.64
Growth		*14.6%*	*11.2%*	*11.2%*	*11.2%*	*10.6%*	*10.6%*
Terminal P/E							9.00
* Terminal EPS							$20.64
Terminal value							$185.80
* Discount factor							0.44
Discounted terminal value							$81.28
Summary (using P/E multiple for terminal value)							
First stage	$11.76	Present value of first 2 year cash flow					
Second stage	$27.92	Present value of year 3-7 cash flow					
Third stage	$81.28	Present value of terminal value P/E					
Value (P/E)	**$120.96**						

For the bear case first stage, growth rates were decreased about 1% year to year from the base rates. Similar decreases were made from year 2022 through 2026. The P/E multiple of 9 was used, which represents roughly the lowest multiple seen by OSK within the last ten years. This value, compared to other analyst target values is still quite bullish.

Business Risks

Cyclical/volatile nature of OSK sales:

As nearly 60% of OSK revenues are strongly affected construction and real estate development, this leaves the company vulnerable to negative changes of the U.S. economy.

Dependence on contracts:

While contracts are mostly considered an economic moat and a barrier to competition for Oshkosh, the firm may not always win these contracts. The United States government imposed the new ruling on defense contracts, where there must be competition for every new contract; this means that even as relations are good between OSK and the DoD, there is now greater risk of competition. In my opinion, this will become a lesser risk over time, especially given the amount of contracts that have been won and currently starting to be used by the U.S. Military. This is with the assumption that OSK products perform well for the Military.

Raw material price fluctuations:

Price fluctuations in material markets are a huge risk, OSK worries about the ability to price in these risks. As OSK usually shares the loss in profitability of material price increases through in their contracts, customers may not always be willing to share these expenses, leaving the Company vulnerable to the entire risk of increases in the largest expense to OSK. Unfavorable foreign currency exchange rates could also create losses in purchasing materials.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Oshkosh's business is extremely capital intensive. Large manufacturing and storage facilities is necessary. Engineering or research and design are essential to every segment, most notably the defense segment. Contracts are a means to a large share of OSK revenue, which are very hard to win.

Threat of Substitutes – High

There are many substitutes for access equipment, concrete vehicles, and fire and rescue products. For the defense segment, vehicles are tailored to the customer (militaries), meaning there are very few other competitors, especially as OSK has sales contracts on the vehicles it has developed

Supplier Power - Medium

Supplier power can be high. The firm is a price taker with raw materials since going to a new supplier probably does not help as all raw materials suppliers may raise prices at the same time. But for other inputs, like engines, there may be more supplier power as OSK would have to find a new engine to fit the specific needs of the vehicle.

Buyer Power – Low

The products sold by OSK are usually very specific or customized for each customer. Contracts can make it nearly impossible to switch to a different manufacturer. Specialized trucks are very expensive, which means that customers are not going to be switching often.

Intensity of Competition – Medium

Oshkosh Corporation is unique because of its product mix. Most of the comparable companies only compete in one or two of OSK's segments. For access equipment, OSK has the market leading brands and competition is low. On the other hand, there are defense companies that are much larger than OSK and could potentially pose a risk in the future.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Strong revenue growth increasing efficiencies Diverse products	Exposure to raw materials Lacking international markets
Opportunities	**Threats**
Emerging market expansion Universal production technology Material price hedging	Currency exchange fluctuations Exposure to economy Government reguation/spending

Appendix 3: Income Statement

Items	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Sep-20	Sep-21	Sep-20	Sep-21
Sales	$6,098	$6,279	$6,830	$7,706	$8,382	$9,225	$9,993	$9,596	$10,745	$8,721	$8,912
Direct costs	5,058	5,223	5,649	6,347	6,865	7,518	8,144	7,773	8,704	7,325	7,486
Gross Margin	1,039	1,056	1,181	1,359	1,517	1,707	1,849	1,823	2,042	1,395	1,426
SG&A and other	641	692	718	705	720	738	799	768	860	610	624
EBIT	399	364	463	654	797	969	1,049	1,056	1,182	785	802
Interest	73	57	52	59	46	41	43	41	43	41	43
EBT	326	307	411	595	751	927	1,006	1,014	1,139	744	759
Taxes	99	92	127	124	171	212	230	231	260	170	173
Income	227	215	284	471	579	716	776	783	879	574	586
Other	(3)	(2)	(2)	(1)	-	-	-	-	-	-	-
Net income	230	216	286	472	579	716	776	783	879	574	586
Basic Shares	77.9	73.5	74.6	74.0	69.8	65.8	61.8	66.1	62.3	65.5	61.2
Fully Diluted Shares	78.9	74.4	75.7	74.9	70.5	66.5	62.5	66.8	63.0	66.2	61.9
EPS	$2.95	$2.94	$3.83	$6.38	$8.30	$10.88	$12.56	$11.85	$14.11	$8.76	$9.56
EPS Fully Diluted	$2.91	$2.91	$3.77	$6.30	$8.22	$10.76	$12.42	$11.73	$13.95	$8.67	$9.46
DPS	$0.68	$0.76	$0.84	$0.96	$1.08	$1.22	$1.38	$1.21	$1.36	$1.22	$1.39
Growth Statistics											
Sales		*3.0%*	*8.8%*	*12.8%*	*8.8%*	*10.1%*	*8.3%*	*14.5%*	*12.0%*	*4.0%*	*2.2%*
Direct Costs		*3.3%*	*8.1%*	*12.4%*	*8.2%*	*9.5%*	*8.3%*	*13.2%*	*12.0%*	*6.7%*	*2.2%*
Gross Margin		*1.6%*	*11.8%*	*15.1%*	*11.7%*	*12.5%*	*8.3%*	*20.2%*	*12.0%*	*-8.0%*	*2.2%*
SG&A, R&D, and other		*8.0%*	*3.8%*	*-1.8%*	*2.2%*	*2.4%*	*8.3%*	*6.6%*	*12.0%*	*-15.3%*	*2.2%*
EBIT		*-8.7%*	*27.2%*	*41.1%*	*22.0%*	*21.5%*	*8.3%*	*32.4%*	*12.0%*	*-1.5%*	*2.2%*
Interest		*-21.4%*	*-9.3%*	*13.9%*	*-21.4%*	*-10.7%*	*4.8%*	*-10.7%*	*4.8%*	*-10.7%*	*4.8%*
EBT		*-5.9%*	*34.0%*	*44.6%*	*26.3%*	*23.5%*	*8.5%*	*35.1%*	*12.3%*	*-1.0%*	*2.0%*
Taxes		*-6.9%*	*37.7%*	*-2.7%*	*38.4%*	*23.5%*	*8.5%*	*35.1%*	*12.3%*	*-1.0%*	*2.0%*
Continuing income		*-5.4%*	*32.4%*	*65.7%*	*23.1%*	*23.5%*	*8.5%*	*35.1%*	*12.3%*	*-1.0%*	*2.0%*
Other		*-30.8%*	*-16.7%*	*-26.7%*	*-100.0%*						
Net income		*-5.7%*	*32.0%*	*65.2%*	*22.8%*	*23.5%*	*8.5%*	*35.1%*	*12.3%*	*-1.0%*	*2.0%*
Basic Shares		*-5.6%*	*1.5%*	*-0.8%*	*-5.7%*	*-5.7%*	*-6.1%*	*-5.4%*	*-5.7%*	*-6.1%*	*-6.5%*
EPS		*-0.1%*	*30.0%*	*66.6%*	*30.2%*	*31.0%*	*15.5%*	*42.8%*	*19.0%*	*5.5%*	*9.2%*
EPS Fully Diluted		*0.0%*	*29.7%*	*67.0%*	*30.4%*	*30.9%*	*15.4%*	*42.7%*	*18.9%*	*5.5%*	*9.1%*
DPS		*11.6%*	*10.7%*	*14.3%*	*12.4%*	*12.4%*	*13.1%*	*12.0%*	*12.6%*	*12.9%*	*13.7%*

Appendix 4: Balance Sheet

Items	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Sep-20	Sep-21	Sep-20	Sep-21
Cash	43	322	447	455	448	513	663	398	468	619	855
Operating assets ex cash	2,327	2,096	2,593	2,815	2,960	3,257	3,528	3,388	3,794	3,079	3,147
Operating assets	2,370	2,418	3,040	3,270	3,408	3,771	4,192	3,787	4,262	3,698	4,001
Operating liabilities	905	902	1,032	913	946	1,042	1,128	1,084	1,213	985	1,006
NOWC	1,465	1,516	2,008	2,356	2,462	2,729	3,063	2,703	3,049	2,713	2,995
NOWC ex cash (NWC)	1,422	1,195	1,561	1,902	2,013	2,216	2,400	2,305	2,581	2,094	2,140
NFA	2,184	2,096	2,059	2,024	2,158	2,306	2,443	2,399	2,627	2,180	2,179
Invested capital	*$3,648*	*$3,612*	*$4,067*	*$4,381*	*$4,620*	*$5,035*	*$5,507*	*$5,102*	*$5,676*	*$4,893*	*$5,174*
Marketable securities	-	-	-	-	-	-	-	-	-	-	-
Total assets	*$4,554*	*$4,514*	*$5,099*	*$5,294*	*$5,566*	*$6,077*	*$6,635*	*$6,186*	*$6,889*	*$5,878*	*$6,180*
Short-term and long-term d	$1,398	$1,293	$1,459	$1,595	$1,614	$1,694	$1,774	$1,694	$1,774	$1,694	$1,774
Other liabilities	339	344	301	273	406	406	406	406	406	406	406
Debt/equity-like securities	-	-	-	-	-	-	-	-	-	-	-
Equity	1,911	1,977	2,307	2,514	2,600	2,935	3,327	3,003	3,496	2,794	2,994
Total supplied capital	*$3,648*	*$3,613*	*$4,067*	*$4,381*	*$4,619*	*$5,035*	*$5,506*	*$5,102*	*$5,676*	*$4,893*	*$5,174*
Total liabilities and equity	*$4,554*	*$4,515*	*$5,099*	*$5,294*	*$5,566*	*$6,077*	*$6,635*	*$6,186*	*$6,889*	*$5,878*	*$6,180*
Growth Statistics											
Cash		*650.3%*	*38.9%*	*1.7%*	*-1.4%*	*14.5%*	*29.2%*	*-11.2%*	*17.5%*	*38.0%*	*38.1%*
Operating assets ex cash		*-9.9%*	*23.7%*	*8.6%*	*5.1%*	*10.1%*	*8.3%*	*14.5%*	*12.0%*	*4.0%*	*2.2%*
Operating assets		*2.0%*	*25.7%*	*7.6%*	*4.2%*	*10.6%*	*11.2%*	*11.1%*	*12.6%*	*8.5%*	*8.2%*
Operating liabilities		*-0.4%*	*14.5%*	*-11.5%*	*3.6%*	*10.1%*	*8.3%*	*14.5%*	*12.0%*	*4.0%*	*2.2%*
NOWC		*3.5%*	*32.4%*	*17.4%*	*4.5%*	*10.9%*	*12.2%*	*9.8%*	*12.8%*	*10.2%*	*10.4%*
NOWC ex cash (NWC)		*-16.0%*	*30.7%*	*21.8%*	*5.9%*	*10.1%*	*8.3%*	*14.5%*	*12.0%*	*4.0%*	*2.2%*
NFA		*-4.0%*	*-1.8%*	*-1.7%*	*6.6%*	*6.9%*	*5.9%*	*11.2%*	*9.5%*	*1.0%*	*-0.1%*
Invested capital		*-1.0%*	*12.6%*	*7.7%*	*5.5%*	*9.0%*	*9.4%*	*10.4%*	*11.2%*	*5.9%*	*5.7%*

Appendix 5: Sales Forecast

Items	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Sep-20	Sep-21	Sep-20	Sep-21
Sales	$6,098	$6,279	6,830	$7,706	$8,382	$9,225	$9,993	$9,596	$10,745	$8,721	$8,912
Growth		*3.0%*	*8.8%*	*12.8%*	*8.8%*	*10.1%*	*8.3%*	*14.5%*	*12.0%*	*4.0%*	*2.2%*
Access Equipment	3,365	2,996	3,008	3,752	4,080	4,488	4,892	4,651	5,209	4,243	4,328
Growth		*-11.0%*	*0.4%*	*24.7%*	*8.7%*	*10.0%*	*9.0%*	*14.0%*	*12.0%*	*4.0%*	*2.0%*
% of sales	*55.2%*	*47.7%*	*44.0%*	*48.7%*	*48.7%*	*48.6%*	*48.9%*	*48.5%*	*48.5%*	*48.7%*	*48.6%*
Defense	940	1,351	1,820	1,829	2,032	2,276	2,504	2,439	2,829	2,073	2,093
Growth		*43.8%*	*34.7%*	*0.5%*	*11.1%*	*12.0%*	*10.0%*	*20.0%*	*16.0%*	*2.0%*	*1.0%*
% of sales	*15.4%*	*21.5%*	*26.7%*	*23.7%*	*24.2%*	*24.7%*	*25.1%*	*25.4%*	*26.3%*	*23.8%*	*23.5%*
Fire & Emergency	815	953	1,031	1,070	1,266	1,367	1,449	1,393	1,504	1,342	1,396
Growth		*17.0%*	*8.1%*	*3.8%*	*18.4%*	*8.0%*	*6.0%*	*10.0%*	*8.0%*	*6.0%*	*4.0%*
% of sales	*13.4%*	*15.2%*	*15.1%*	*13.9%*	*15.1%*	*14.8%*	*14.5%*	*14.5%*	*14.0%*	*15.4%*	*15.7%*
Commercial	978	979	970	1,055	1,022	1,094	1,148	1,114	1,203	1,063	1,095
Growth		*0.1%*	*-0.9%*	*8.7%*	*-3.1%*	*7.0%*	*5.0%*	*9.0%*	*8.0%*	*4.0%*	*3.0%*
% of sales	*16.0%*	*15.6%*	*14.2%*	*13.7%*	*12.2%*	*11.9%*	*11.5%*	*11.6%*	*11.2%*	*12.2%*	*12.3%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	4,789	4,757	5,095	6,178	7,217	7,380	7,994	7,677	8,596	6,977	7,130
Growth		*-0.7%*	*7.1%*	*21.3%*	*16.8%*	*2.3%*	*8.3%*	*6.4%*	*12.0%*	*-3.3%*	*2.2%*
% of sales	*78.5%*	*75.8%*	*74.6%*	*80.2%*	*86.1%*	*80.0%*	*80.0%*	*80.0%*	*80.0%*	*80.0%*	*80.0%*
Other North America	303	220	192	312	-	-	-	-	-	-	-
Growth		*-27.5%*	*-12.7%*	*62.8%*	*-100.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
% of sales	*5.0%*	*3.5%*	*2.8%*	*4.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Europe, Africa, and Middle East	564	906	1,147	852	664	1,291	1,399	1,343	1,504	1,221	1,248
Growth		*60.4%*	*26.7%*	*-25.7%*	*-22.0%*	*94.4%*	*8.3%*	*102.3%*	*12.0%*	*83.8%*	*2.2%*
% of sales	*9.3%*	*14.4%*	*16.8%*	*11.1%*	*7.9%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*	*14.0%*
Rest of World	442	398	396	364	501	552	598	576	645	521	533
Growth		*-10.0%*	*-0.3%*	*-8.1%*	*37.7%*	*10.1%*	*8.3%*	*14.9%*	*12.0%*	*4.0%*	*2.2%*
% of sales	*7.2%*	*6.3%*	*5.8%*	*4.7%*	*6.0%*	*6.0%*	*6.0%*	*6.0%*	*6.0%*	*6.0%*	*6.0%*

** "Other North America" was consolidated to "Rest of World" in 2019*

Appendix 6: Ratios

Items	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21
Profitability							
Gross margin	17.0%	16.8%	17.3%	17.6%	18.1%	18.5%	18.5%
Operating (EBIT) margin	6.5%	5.8%	6.8%	8.5%	9.5%	10.5%	10.5%
Net profit margin	3.8%	3.4%	4.2%	6.1%	6.9%	7.8%	7.8%
Activity							
NFA (gross) turnover		2.93	3.29	3.77	4.01	4.13	4.21
Total asset turnover		1.38	1.42	1.48	1.54	1.58	1.57
Liquidity							
Op asset / op liab	2.62	2.68	2.95	3.58	3.60	3.62	3.71
NOWC Percent of sales		23.7%	25.8%	28.3%	28.7%	28.1%	29.0%
Solvency							
Debt to assets	30.7%	28.6%	28.6%	30.1%	29.0%	27.9%	26.7%
Debt to equity	73.2%	65.4%	63.2%	63.5%	62.1%	57.7%	53.3%
Other liab to assets	7.4%	7.6%	5.9%	5.1%	7.3%	6.7%	6.1%
Total debt to assets	38.2%	36.3%	34.5%	35.3%	36.3%	34.6%	32.9%
Total liabilities to assets	58.0%	56.2%	54.7%	52.5%	53.3%	51.7%	49.9%
Debt to EBIT	3.51	3.55	3.15	2.44	2.03	1.75	1.69
EBIT/interest	5.50	6.39	8.96	11.10	17.21	23.42	24.20
Debt to total net op capital	38.3%	35.8%	35.9%	36.4%	34.9%	33.6%	32.2%
ROIC							
NOPAT to sales	4.5%	4.1%	4.7%	6.7%	7.3%	8.1%	8.1%
Sales to NWC		4.80	4.96	4.45	4.28	4.36	4.33
Sales to NFA		2.93	3.29	3.77	4.01	4.13	4.21
Sales to IC ex cash		1.82	1.98	2.04	2.07	2.12	2.13
Total ROIC ex cash		7.4%	9.3%	13.7%	15.2%	17.2%	17.3%
NOPAT to sales	4.5%	4.1%	4.7%	6.7%	7.3%	8.1%	8.1%
Sales to NOWC		4.21	3.88	3.53	3.48	3.55	3.45
Sales to NFA		2.93	3.29	3.77	4.01	4.13	4.21
Sales to IC		1.73	1.78	1.82	1.86	1.91	1.90
Total ROIC		7.0%	8.3%	12.3%	13.7%	15.5%	15.4%
NOPAT to sales	4.5%	4.1%	4.7%	6.7%	7.3%	8.1%	8.1%
Sales to EOY NWC	4.29	5.26	4.38	4.05	4.16	4.16	4.16
Sales to EOY NFA	2.79	3.00	3.32	3.81	3.88	4.00	4.09
Sales to EOY IC ex cash	1.69	1.91	1.89	1.96	2.01	2.04	2.06
Total ROIC using EOY IC ex cash	7.7%	7.7%	8.8%	13.2%	14.7%	16.5%	16.7%
NOPAT to sales	4.5%	4.1%	4.7%	6.7%	7.3%	8.1%	8.1%
Sales to EOY NOWC	4.16	4.14	3.40	3.27	3.41	3.38	3.26
Sales to EOY NFA	2.79	3.00	3.32	3.81	3.88	4.00	4.09
Sales to EOY IC	1.67	1.74	1.68	1.76	1.81	1.83	1.81
Total ROIC using EOY IC	7.6%	7.0%	7.9%	11.8%	13.3%	14.8%	14.7%
ROE							
5-stage							
EBIT / sales		5.8%	6.8%	8.5%	9.5%	10.5%	10.5%
Sales / avg assets		1.38	1.42	1.48	1.54	1.58	1.57
EBT / EBIT		84.3%	88.8%	91.0%	94.2%	95.7%	95.9%
Net income /EBT		70.5%	69.4%	79.4%	77.2%	77.2%	77.2%
ROA		4.8%	5.9%	9.1%	10.7%	12.3%	12.2%
Avg assets / avg equity		2.33	2.24	2.16	2.12	2.10	2.03
ROE		11.1%	13.3%	19.6%	22.7%	25.9%	24.8%
3-stage							
Net income / sales		3.4%	4.2%	6.1%	6.9%	7.8%	7.8%
Sales / avg assets		1.38	1.42	1.48	1.54	1.58	1.57
ROA		4.8%	5.9%	9.1%	10.7%	12.3%	12.2%
Avg assets / avg equity		2.33	2.24	2.16	2.12	2.10	2.03
ROE		11.1%	13.3%	19.6%	22.7%	25.9%	24.8%
Payout Ratio		25.8%	22.0%	15.1%	13.0%	11.2%	10.9%
Retention Ratio		74.2%	78.0%	84.9%	87.0%	88.8%	89.1%
Sustainable Growth Rate		8.3%	10.4%	16.6%	19.7%	23.0%	22.1%

Appendix 7: Cash Flow Statement

Cash Flow Statement						
Items	**Sep-16**	**Sep-17**	**Sep-18**	**Sep-19**	**Sep-20**	**Sep-21**
Cash from Operatings (understated - depr'n added to net assets)						
Net income	$216	$286	$472	$579	$716	$776
Change in Net Working Capital ex cash	227	(366)	(341)	(111)	(202)	(185)
Cash from operations	$444	($81)	$131	$468	$513	$592
Cash from Investing (understated - depr'n added to net assets)						
Change in NFA	$88	$37	$35	($134)	($148)	($137)
Change in Marketable Securities	$0	$0	$0	$0	$0	$0
Cash from investing	$88	$37	$35	($134)	($148)	($137)
Cash from Financing						
Change in Short-Term and Long-Term Debt	($105)	$166	$136	$19	$80	$80
Change in Other liabilities	4	(43)	(28)	133	0	0
Change in Debt/Equity-Like Securities	0	0	0	0	0	0
Dividends	(56)	(63)	(71)	(76)	(80)	(85)
Change in Equity ex NI and Dividends	(95)	108	(195)	(418)	(300)	(300)
Cash from financing	($252)	$168	($158)	($341)	($300)	($305)
Change in Cash	280	124	8	(7)	65	150
Beginning Cash	43	322	447	455	448	513
Ending Cash	$323	$446	$455	$448	$513	$663

Appendix 8: 3-stage DCF Model

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*10.1%*	*8.3%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*7.0%*
NOPAT / S	*8.1%*	*8.1%*	*8.1%*	*8.1%*	*8.0%*	*8.0%*	*8.0%*
S / NWC	*4.16*	*4.16*	*4.16*	*4.16*	*4.16*	*4.16*	*4.16*
S / NFA (EOY)	*4.00*	*4.09*	*4.09*	*4.09*	*4.09*	*4.09*	*4.09*
S / IC (EOY)	*2.04*	*2.06*	*2.06*	*2.06*	*2.06*	*2.06*	*2.06*
ROIC (EOY)	*16.5%*	*16.7%*	*16.7%*	*16.6%*	*16.6%*	*16.5%*	*16.5%*
ROIC (BOY)		*17.9%*	*18.0%*	*18.0%*	*17.8%*	*17.7%*	*17.7%*
Share Growth		*-6.1%*	*-4.0%*	*-4.0%*	*-4.0%*	*-4.0%*	*-4.0%*
Sales	$9,225	$9,993	$10,792	$11,656	$12,472	$13,345	$14,279
NOPAT	$748	$810	$872	$940	$1,003	$1,070	$1,142
Growth		*8.3%*	*7.7%*	*7.7%*	*6.7%*	*6.7%*	*6.7%*
- Change in NWC	202	185	192	207	196	210	224
NWC EOY	*2216*	*2400*	*2592*	*2799*	*2995*	*3205*	*3429*
Growth NWC		*8.3%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*7.0%*
- Chg NFA	148	137	195	211	199	213	228
NFA EOY	*2,306*	*2,443*	*2,639*	*2,850*	*3,049*	*3,263*	*3,491*
Growth NFA		*5.9%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*7.0%*
Total inv in op cap	351	322	387	418	395	423	453
Total net op cap	4522	4843	5231	5649	6045	6468	6921
FCFF	$397	$488	$485	$521	$607	$647	$690
% of sales	*4.3%*	*4.9%*	*4.5%*	*4.5%*	*4.9%*	*4.9%*	*4.8%*
Growth		*23.0%*	*-0.7%*	*7.5%*	*16.5%*	*6.5%*	*6.5%*
- Interest (1-tax rate)	32	33	36	39	42	45	48
Growth		*4.8%*	*8.0%*	*8.0%*	*7.0%*	*7.0%*	*7.0%*
+ Net new debt	80	80	142	153	145	155	166
Debt	1694	1774	1916	2069	2214	2369	2535
Debt / tot net op capital	37.5%	36.6%	36.6%	36.6%	36.6%	36.6%	36.6%
FCFE w/o debt	$365	$455	$449	$482	$566	$603	$642
% of sales	*4.0%*	*4.6%*	*4.2%*	*4.1%*	*4.5%*	*4.5%*	*4.5%*
Growth		*24.6%*	*-1.3%*	*7.5%*	*17.3%*	*6.5%*	*6.5%*
/ No Shares	65.8	61.8	59.3	57.0	54.7	52.5	50.4
FCFE	$5.55	$7.36	$7.56	$8.47	$10.35	$11.48	$12.74
Growth		*32.6%*	*2.8%*	*11.9%*	*22.2%*	*10.9%*	*10.9%*
* Discount factor	0.89	0.79	0.70	0.62	0.55	0.49	0.44
Discounted FCFE	$4.93	$5.81	$5.31	$5.28	$5.73	$5.65	$5.57
Third Stage							
Terminal value P/E							
Net income	$716	$776	$836	$901	$961	$1,026	$1,095
% of sales	*7.8%*	*7.8%*	*7.7%*	*7.7%*	*7.7%*	*7.7%*	*7.7%*
EPS	$10.88	$12.56	$14.10	$15.81	$17.58	$19.54	$21.72
Growth		*15.5%*	*12.2%*	*12.2%*	*11.2%*	*11.2%*	*11.2%*
Terminal P/E							12.00
* Terminal EPS							$21.72
Terminal value							$260.65
* Discount factor							0.44
Discounted terminal value							$114.03
Summary (using P/E multiple for terminal value)							
Value (P/E)	**$152.31**						

Appendix 9: Comparable Companies

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
OSK	$91.52	$6,229	0.1	1.6	22.4	18.5	37.4	49.3	14.2	-5.2%	57.7%	-21.8%	8.7%	13.0%		2.08	31.5%	B	1.23%	13.1%
TEX	$29.06	$2,072	0.3	(4.1)	10.8	2.8	2.5	5.4	8.5	1815.7%	31.9%	71.4%	51.3%	25.8%	-6.0%	1.90	146.5%	B	1.57%	377.9%
MTU-FR	$21.16	$810	(1.7)	(0.4)	1.0	(27.2)	(17.9)	(14.6)	-3.7		41.7%	45.6%	43.5%	21.8%	156.0%	2.01			4.03%	
DOV	$112.50	$16,342	(0.1)	2.9	17.8	17.1	41.5	58.6	11.5	38.7%	25.6%	54.1%	31.1%	9.5%	-8.3%	1.69	100.6%	B+	1.74%	43.6%
TXT	$44.41	$10,137	(1.7)	(4.7)	(7.4)	(9.6)	(13.3)	(3.4)	10.9	1.0%	-61.6%	239.9%	30.8%	14.0%	22.7%	1.86	70.4%	B	0.17%	2.2%
REVG-US	$12.89	$802	(1.2)	(10.2)	42.9	5.5	9.5	71.6	-2.8	-258.8%	-98.6%	-4.3%	6.1%	7.1%		2.94	80.7%		1.54%	
Average		$6,065	(0.7)	(2.5)	14.6	1.2	9.9	27.8	6.4	318.3%	-0.5%	64.1%	28.6%	15.2%	41.1%	2.08	85.9%		1.71%	109.2%
Median		$4,150	(0.6)	(2.2)	14.3	4.1	6.0	27.3	9.7	1.0%	28.8%	49.8%	31.0%	13.5%	8.3%	1.96	80.7%		1.55%	28.4%
SPX	$3,136		(0.3)	1.4	5.3	9.1	19.1	25.1			8.3%	22.9%	6.9%	3.2%						

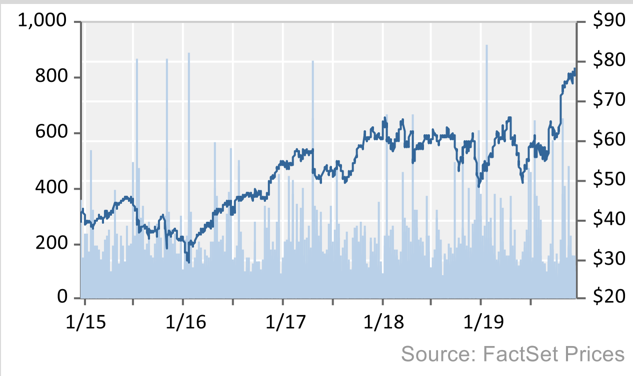
	2018		P/E							2018	2018				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
OSK	11.1%	2.39	19.9	22.3	9.8	11.1	11.7	11.1	10.2	5.5%	0.81	6.9%	9.5%	17.2%	7.2	9.9	-3.8%	2.5%	4.2%	$38.24
TEX	12.8%	2.38	45.7	53.0	17.7	255.4	13.3	12.3	9.8	2.2%	0.40	2.2%	5.7%	5.2%	9.7	9.9	-15.7%	1.5%	-6.3%	$12.22
MTU-FR	14.7%	1.18	15.5	20.3	9.8			5.6	4.6	4.5%	0.36	4.5%	6.8%	13.9%	7.8	5.8			9.9%	$17.88
DOV	30.2%	5.42	17.6	15.1	16.8	25.4	18.3	24.5	21.6	8.8%	2.34	8.5%	13.6%	9.0%	14.3	15.9	1.3%	4.5%	-4.3%	$20.77
TXT	21.1%	1.86	12.6	38.2	9.1	12.2	12.0	6.7	5.9	8.2%	0.73	8.7%	7.9%	13.4%	12.9	10.9	4.9%		2.9%	$23.89
REVG-US	7.9%	1.55		47.1	11.4	-31.9	20.1	18.4	17.2	1.7%	0.34	0.5%	3.0%	1.5%	15.9	10.8	-0.2%		15.2%	$8.30
			0.4																	
Average	16.3%	2.46	18.6	32.7	12.4	54.4	15.1	13.1	11.6	5.2%	0.83	5.2%	7.7%	10.0%	11.3	10.5	-2.7%	2.9%	3.6%	
Median	13.7%	2.12	17.6	30.3	10.6	12.2	13.3	11.7	10.0	5.0%	0.56	5.7%	7.4%	11.2%	11.3	10.4	-0.2%	2.5%	3.6%	
spx			20.5	22.7	17.3			20.2	19.6											

Electronic Manufacturing Services

Plexus Corporation

Recommendation: Hold				
Current Price	**$79**	---	Ticker	PLXS
1 Year Bear	$37	*-53%*	Sh. Out. ($M)	31
1 Year Base	**$76**	***-4%***	M.Cap. ($M)	2,300
1 Year Bull	$95	*20%*	EV ($M)	2,452

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	108%	45.3%	26.8%	40.1%	51.7%	20.1%	3.5%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($M)	**2,654**	**2,556**	**2,528**	**2,874**	**3,164**	**3,477**	**3,878**
Gr. %	*11.6%*	*-3.7%*	*-1.1%*	*13.7%*	*10.1%*	*9.9%*	*11.5%*
Cons.	-	-	-	-	-	*5.6%*	*8.3%*
Ind.	*2.2%*	*-0.8%*	*6.1%*	*11.9%*	*6.9%*	*0.91%*	*-4.2%*
EPS	**$2.74**	**$2.24**	***$3.33***	**$0.40**	**$3.59**	**$4.42**	**$5.51**
Gr. %	*8.7%*	*-18%*	*44.6%*	*-88%*	*808%*	*23.2%*	*24.7%*
Cons.	-	-	-	-	-	*17.9%*	*15.2%*
Ind.	*2.4%*	*26.9%*	*-26%*	*-35%*	*3.52%*	*2.2%*	*15.8%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**3.6%**	**3%**	**4.4%**	**0.5%**	**3.4%**	**3.6%**	**3.7%**
Ind.	*6.15%*	*9.03%*	*8.1%*	*8.5%*	*8.7%*	-	-
ROE	*11.6%*	*8.7%*	*11.5%*	*1.3%*	*12.2%*	*13.4%*	*13.5%*
Ind.	*14.2%*	*22.4%*	*17.5%*	*13.8%*	*15.7%*	-	-
ROA	*5.7%*	*4.4%*	*5.9%*	*0.7%*	*5.5%*	*5.8%*	*6.1%*
Ind.	*6.4%*	*10%*	*8.0%*	*7.2%*	*7.9%*	-	-
A T/O	1.6	1.47	1.34	1.46	1.61	1.60	1.64
A/E	2.02	1.93	1.93	2.1	2.31	2.14	2.09

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	13.9	20.9	18.9	15.8	22.6	18.9	16.6
Ind.	15.6	10.9	18.6	22.8	15.5	19.9	13.3
P/S	0.49	0.62	0.77	0.69	0.61	-	-
P/B	1.5	1.7	1.8	2.3	2.0	-	-
P/CF	17	12.5	11.3	23.3	54.1	-	-
EV/EBITDA	9.8	12.7	12.2	12.6	16.7	-	-
D/P	-	-	-	-	-	-	-

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Summary

I recommend a neutral rating with a target of $76. Plexus is very diversified in both the geographic regions and market segements it serves, retains a competent team of managers, and is currently poised to capture significant growth in the 2020s. But, many of Plexus's fundamentals are below the industry average while its valuation puts PLXS at a premium over the industry. Although it is well-run company with great growth prospects, Plexus needs time for its fundamentals to improve and match its current valuation.

Key Drivers

- Emerging markets exposure: The EMS industry has overexposed itself to China and, in turn, the U.S. – China trade war, leaving Plexus able to capture some of its competitors market share.
- U.S. macro-economic trends: Plexus's competition is more dependent on industries that are cyclical with the U.S. economy and may not see much growth going into the future.
- Healthcare equipment sales: PLXS's largest segment in terms of sales has grown significantly over the last decade. Pent-up demand in electromedical devices and its regulatory expertise should drive even more growth over the near future.
- Aerospace/defense growth: The increase in funding for the U.S. DoD's F-35 program and introduction of the Space Corps gives PLXS the unique opportunity to capture growth without any threat from its competition.

Valuation

Using a relative valuation approach, Plexus appears to be fairly valued in comparison to the EMS industry. DCF analysis implies that the stock is worth $79. A scenario analysis suggests that Plexus is overvalued, with a target price of $66. Overall, Plexus is currently fairly valued as the stock's value is about $75 and the shares trade at $78.

Risks

- Every geographic region PLXS operates in is fraught with political uncertainty.
- Overly dependent on a relatively small group of customers.
- Shifts in the value of the currencies PLXS does business in.

Company Overview

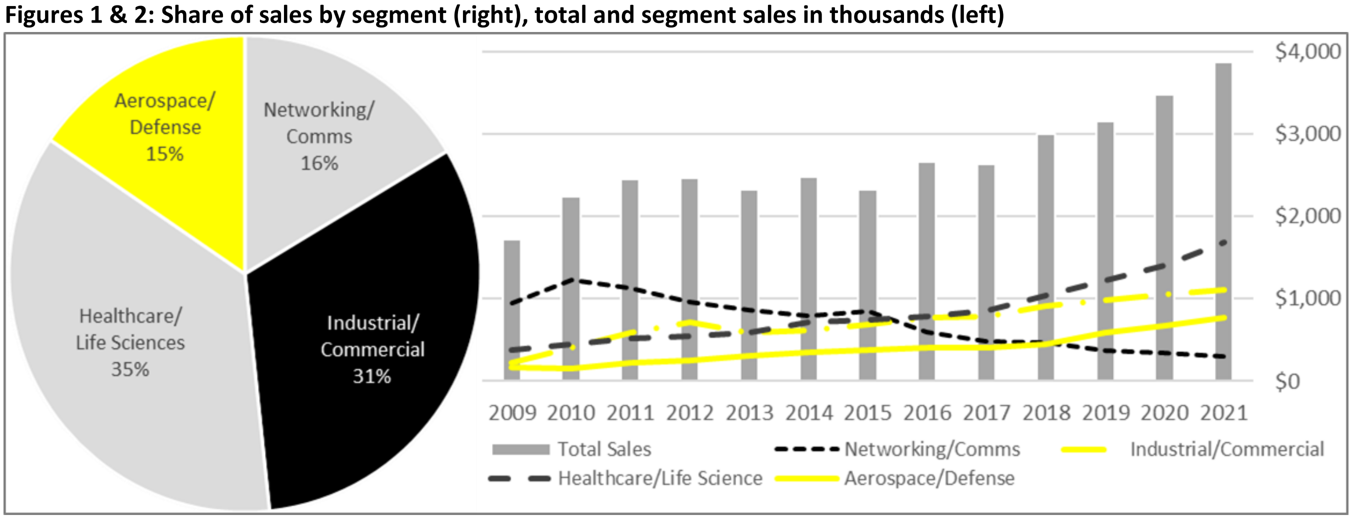
Plexus Corporation (PLXS, Plexus Corp, or Plexus) is an electronic manufacturing services (EMS) company based in Neenah, Wisconsin and was founded in 1979. Plexus is focused on the design and manufacture of low- to mid-volume/high-margin and high-complexity products. It works with around 140 customers in the healthcare/life sciences, industrial/commercial, communications, and aerospace/defense markets. Examples of Plexus's products and services in these markets are as follows:

1) Healthcare/life sciences: surgical devices, hospital and in-home monitoring, diagnostic imaging, pharmaceutical solutions, and DNA sequencing.
2) Industrial/commercial: semiconductor equipment, industrial equipment, computing and self-service retail kiosks.
3) Communications: wireless infrastructure, network management, cellular communications, and data center management.
4) Aerospace/defense: unmanned aircraft systems, ballistic and munition systems, engine and power controls, cockpit/flight instrumentation, lighting systems, and radar.

Although it is smaller and more regional than some of its larger competitors, Plexus's manufacturing footprint is still consistent in size relative to other low-volume/high-margin EMS companies. There are 23 active facilities located across the world, totaling roughly 4M square feet. There five manufacturing and 3 engineering facilities totaling 1.3M sq. ft. in the United States, and one mixed-use (e.g. manufacturing and engineering) facility totaling 265,000 sq. ft. in Mexico. Malaysia contains a 1.48M sq. ft. mixed-use facility, there are also three manufacturing facilities in China totaling 489,000 sq. ft., and a 12,000 sq. ft. manufacturing facility in Singapore. Romania is home to a 296,000 sq. ft. mixed-use facility, along with a manufacturing and a mixed-use facility in Scotland, equal to 119,000 sq. ft. when combined, and a 21,000 sq. ft. engineering facility in Germany.

Plexus's strategy to differentiate its business from its EMS competitors is by avoiding commodity-oriented, high-volume EMS products in market sectors such as consumer electronics and automotive, and instead focused on low- to mid-volume production runs that require the use of specialized processes and/or capabilities such as technology, quality, and regulatory certifications.

Figures 1 & 2: Share of sales by segment (right), total and segment sales in thousands (left)



Source: Company reports

The decade between 2009 and 2019 saw impressive growth for Plexus. Total sales grew by 83% from $1.7 to nearly $3 billion, its industrial/commercial segment grew by 337% from $224 to $918 million in sales, aerospace/defense grew by 241% from $173 to $445 million, healthcare/life sciences grew by 241% from $380 million to $1 billion, and networking/communications shrank by 61% from $950 to $471 million. The shrinking of Plexus's networking/communications segment's sales over this time period shouldn't be alarming as the margins in this segment, according to management, started to drop around 2010 and management decided the segment would be slowly phased out by accepting no new design and/or manufacturing contracts from new customers. Since Plexus's total sales growth for the past decade has came from its other three segments, it is anticipated that this will continue over the next two years with sales growth of 8% in 2020 and 10% in 2021 for its industrial/commercial segment, 15% in 2020 and 2021 for its aerospace/defense segment, and 15% in 2020 and 20% in 2021 for its healthcare/life sciences segment. Networking/communications will have a moderate negative growth of -10% in both 2020 and 2021, and total sales will grow by approximately 10% in 2020 and 12% in 2021. Geographically, sales growth between 2009 and 2019 was mainly driven by the APAC region with its sales increasing by 160% from $0.59 to $1.55 billion, sales to the EMEA region grew by 460% from $56 to $310 million, and sales to the AMER region grew by roughly 30% from $1.1 to $1.4 billion. Over the next two years, it is expected that sales growth in the APAC region will become more moderate with 8% in 2020 and 9% in 2021, growth in the AMER region will be better than average with 11% in 2020 and 12% in 2021, and finally growth in the EMEA region will grow quicker than total sales with 12% in 2020 and 19% in 2021.

Business/Industry Drivers

Plexus Corporation is a very well diversified company with many factors contributing to its success, yet the following are the drivers that hold the most potential to provide growth into the future:

1) Exposure to emerging markets
2) U.S. macroeconomic trends
3) Healthcare equipment spending
4) Aerospace/defense growth

Exposure to Emerging Markets

The EMS industry, specifically its constituents based in developed markets, have witnessed the rise of Asia-based competitors such as Hon Hai Precision and Foxconn Technology over the last 20 years. Luckily, these Asia-based competitors carved out a niche in the high-volume/low-margin products of the EMS industry, while many of those outside of Asia no longer compete in this product space. This has left the low- to mid-volume/high-margin and high-complexity product space relatively underserviced in these markets. Yet, there are still countries outside of Asia that can be considered emerging and two of them, Mexico and Romania, have been of interest for Plexus.

The EMS industry has over-exposed itself to the political uncertainty between China and the U.S.

The U.S. based EMS industry was relatively successful in growing its revenue in emerging markets between 2018 and 2019. Revenues from Mexico grew by 15.5%, Singapore by 16.6%, and Malaysia by 3.9%, while also shrinking exposure to the United States, Germany, Japan by 0.1%, 3.6%, and 0.9% respectively. Paradoxically, industry revenue exposure to developed markets grew from 61.7% to 62.2% while emerging markets exposure shrank from 34.4% to 34.1%, chiefly due to the industry's revenue share per country. The top eight countries in terms of share for the U.S. based EMS industry are: United states at 26%, China at 20%, Switzerland at 14.9%, Singapore at 3.5%, Mexico at 3.4%, Germany and Japan at 3.2%, and Malaysia at 2.7%.

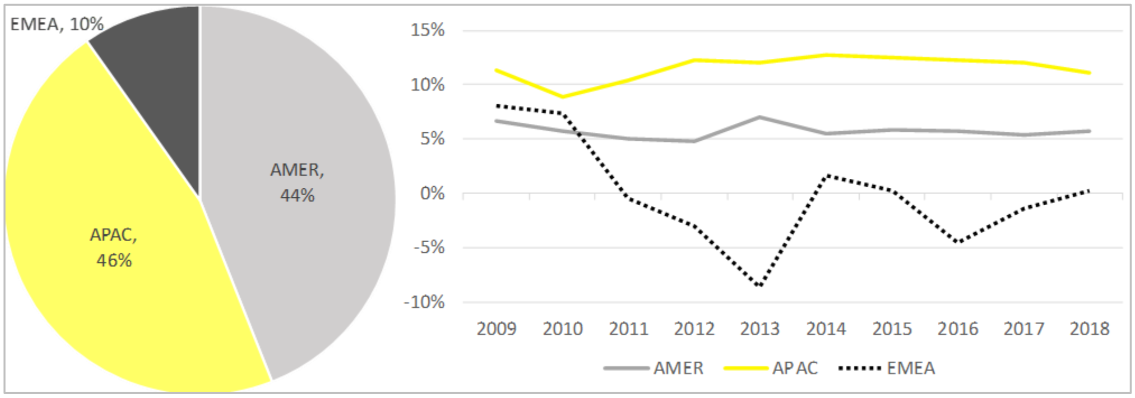
Figure 3: PLXS Share of Sales and Growth of Sales by Reported Country

Share of Sales													
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020E	2021E
United States	58.3%	51.3%	48.5%	47.0%	43.1%	47.8%	46.3%	42.6%	37.3%	33.4%	36.3%	36.7%	36.8%
Malaysia	29.7%	35.1%	34.0%	35.5%	37.6%	32.1%	32.9%	31.7%	35.6%	37.3%	34.5%	34.0%	33.3%
China	4.4%	6.1%	9.2%	9.7%	11.5%	13.4%	12.8%	11.9%	12.9%	12.7%	12.7%	12.5%	12.3%
United Kingdom	3.2%	3.2%	3.1%	2.5%	3.5%	2.9%	2.5%	3.1%	2.7%	3.0%	3.0%	3.1%	3.3%
Mexico	4.5%	4.2%	4.6%	4.0%	2.5%	2.0%	3.1%	7.3%	6.9%	7.3%	7.0%	7.1%	7.1%
Romania	0.0%	0.0%	0.7%	1.4%	1.6%	1.6%	2.3%	3.1%	4.3%	5.9%	5.9%	6.1%	6.5%
Germany	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.2%	0.2%	0.3%	0.4%	0.4%	0.4%	0.5%
Emerging	38.5%	45.5%	48.5%	50.5%	53.3%	49.1%	51.0%	54.1%	59.7%	63.1%	60.2%	59.7%	59.2%
Developed	61.5%	54.5%	51.5%	49.5%	46.7%	50.9%	49.0%	45.9%	40.3%	36.9%	39.8%	40.2%	40.6%
Growth of Sales													
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020E	2021E
United States		14.2%	3.7%	-3.0%	-13.2%	18.3%	9.7%	-13.0%	-13.2%	1.6%	8.9%	0.9%	0.4%
Malaysia		53.7%	6.2%	4.3%	0.6%	-9.0%	16.0%	-8.8%	11.3%	18.9%	-7.4%	-1.5%	-2.1%
China		81.8%	64.9%	5.0%	13.0%	24.4%	7.7%	-11.8%	6.9%	12.0%	0.3%	-1.5%	-2.1%
United Kingdom		28.7%	5.9%	-20.4%	35.4%	-11.3%	-2.9%	16.4%	-14.3%	30.3%	-0.5%	2.1%	7.1%
Mexico		22.3%	19.0%	-11.5%	-41.1%	-14.4%	71.3%	126.3%	-6.6%	20.2%	-3.3%	0.9%	0.4%
Romania		10980.0%	1389.0%	105.1%	12.7%	2.4%	67.4%	28.1%	36.6%	54.9%	0.7%	2.1%	7.1%
Germany		0.0%	0.0%	0.0%	130.4%	58.3%	4.5%	4.9%	71.4%	56.0%	-1.7%	2.1%	7.1%
Emerging		18.2%	6.4%	4.3%	5.5%	-7.8%	3.9%	6.0%	10.3%	5.8%	-4.6%	-0.8%	-0.8%
Developed		-11.4%	-5.4%	-4.0%	-5.6%	9.0%	-3.8%	-6.3%	-12.2%	-8.5%	8.0%	1.0%	1.0%

Source: Company reports

Compared to Plexus Corporation, the EMS industry is more exposed to China (20% vs PLXS' 12.7%), but less exposed to Mexico (3.8 % vs 7%), Malaysia (2.5% vs. 34.5%), Romania (<2% vs. 5.9%) , and emerging markets overall (33.4% vs 53.9%). While many see exposure to China as a sure-fire way to ensure future growth, the current geopolitical reality is far less certain. The U.S.-China trade war has been ongoing since June 2018 and while there has been a phase one deal, that is no guarantee that it will be over any time soon. I believe that due to Plexus's exposure to China being 8% less than the industry average, it is in a relatively enviable position to be relatively more sheltered from this political uncertainty. Industry revenue from China has already started to slip, with a -4.1% change between 2018 and 2019 versus Plexus's -1.1%. Looking at comparable EMS companies, I don't believe that the difference in performance is due to non-Plexus EMS companies having a greater manufacturing/design footprint in China compared to its overall presence in Asia. Instead, I believe it's due to the end-markets of its products as the EMS industry average exposure to the semiconductor industry is 29.73% of revenues. While PLXS is also exposed to this industry, it falls under its industrial/commercial segment and according to management, the company's exposure to semiconductors has waned in the last few years. The three-month moving average of worldwide semiconductor shipments has dropped roughly 20% since its peak in October of 2018, with China exporting approximately 25% of the world's semiconductors. All of this leads me to believe that Plexus can weather the storm and possibly gain market share in China, despite the current tensions and softness is the semiconductor space, due to its unique product mix and lack of revenue exposure to the country when compared to the industry.

Figure 4: PLXS revenue share in 2018 (left) and gross margin (right) by region



Source: Company reports

Moving to Mexico, Malaysia, and Romania, I believe that these countries hold much better opportunities in the short term when compared to China. Looking at figure 4, it may seem odd to suggest that Romania could spark growth when the gross margin in the EMEA region is often negative. But I believe that margins are lackluster in this market is because Plexus doesn't have a large manufacturing footprint in EMEA, it has a large design footprint and the margins in this industry come from manufacturing products. There is a silver lining though, as design work can be turned over into manufacturing contracts at a rate of 20% for new customers and 80% for existing customers. This means the current margins in the EMEA are forgivable because the design work done in this region can support manufacturing work done in the Americas and APAC which in turn, keeps margins in those regions relatively high. I believe that the recent uptick of margins in the EMEA region is indicative of a return of manufacturing activity to Europe for Plexus; granted that EMEA margins aren't likely to be as high as APAC's due to the difference in labor costs. If, for instance, margins were to rise to be 2% versus the 1% average margin PLXS has had so far in 2019, then that would double operating income for the region. This is not out of the realm of possibility for 2020, if the current trend of rising margins since 2016 holds.

On the other hand, Mexico and Malaysia are currently more geared towards manufacturing as seen by the gross margin of their respective regions. Plexus has it invested heavily into upgrading and expanding facilities in these countries between 2018 and 2019. Sales to Malaysia, despite growing to become Plexus's largest market, grew at an average of about 10% a year for the last decade while sales to Mexico grew 20% a year. While over the same period, Mexico's GDP grew at an average of 2.5% a year and Malaysia's grew at 6.4%. I believe that this shows Plexus can consistently outgrow, and in turn penetrate, many of the markets it enters. Overall, I am convinced that Plexus is better situated to capture the growth in emerging markets when compared to its rivals.

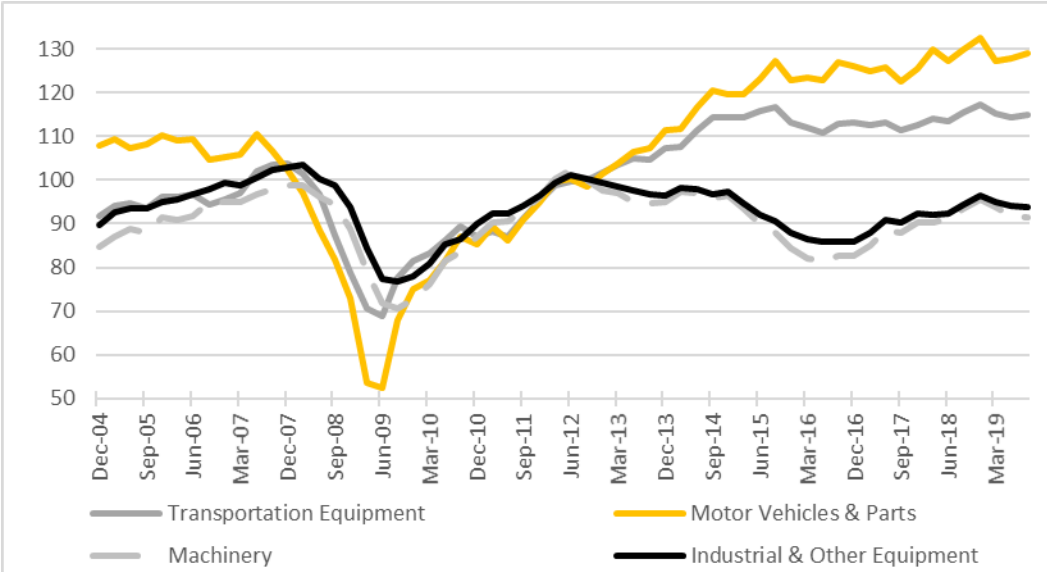
<u>United States Macroeconomic Trends</u>

The United States has always been an important market for Plexus despite its share of sales steadily declining by approximately 2.5% a year since 2009 and finally losing its place as Plexus's largest source of sales to Malaysia in 2018. The U.S. maintains its importance because many customers, suppliers, partners, etc. to Plexus and its competitors do business and are headquartered there. Various correlations were run between Plexus and its competitors' performance against the U.S. nominal GDP over the last ten years, a 15 month (approximately 5 fiscal quarters) lagged GDP provides the highest correlation and R^2 for both Plexus and its competitors' at approximately 0.6 and 0.4. Statistically speaking, the performance of Plexus and its competitors is semi-independent of the U.S. GDP. Plexus has 33.4% share of sales to the U.S. versus the EMS industry average of 26%, the reason behind Plexus and its peers having the same correlation and R^2 is likely due to their product segments. Appendix 10 shows that Plexus has more exposure to healthcare/life sciences and aerospace/defense markets, which tend to grow independently

PLXS's competitors are more dependent on cyclical industries that have showed little opportunities to grow, while PLXS is dependent upon industries that grow independent of the economic cycle.

of the economy, while its average competitor has more exposure to industrials and automotive/transportation which is more cyclical and dependent on the economy.

Figure 5: U.S. Industrial Production (Levels, March 2012 = 100)



Source: FactSet/Federal Reserve System

Figure 5 plots 15 years of the industrial production levels for transportation, industrial and other equipment, durable machinery and, motor vehicles and parts. If one assumes that the Great Recession lasted from December 2007 to June 2009, then it can be said that June 2012 marks when production recovered to pre-recession levels. Since that point, production levels of machinery, along with industrial and other equipment, have continued to decline, and even though there was a slight increase between roughly December 2016 and September 2018, neither have hit their pre-recession levels. On the other hand, production levels for transportation equipment and, motor vehicles and parts, continued to increase after June 2012 until about June 2015. After that point, production levels for both categories have relatively stagnated. I believe that this paints a rather bleak picture. While it's obvious that transportation industry has recovered since the recession, the relative stagnation of production over the last four years, in conjunction with the decrease in production levels for machinery and industrial equipment, could be indicative of a weakening in demand.

Looking into the near future, there are essentially three possible states for the U.S. economy: continued growth, stagnation, or it could decline. I believe that if the economy continues to grow, then industrial production for these products should stay on its sideways trend. If economic growth stagnates, then industrial production may either stay on trend or pull back. If the economy shrinks, then industrial production could see a drop like what was seen during the Great Recession. This leads me to believe Plexus's competitors that serve the industrial and automotive/transportation markets have little potential upside and a very large downside. Also, even though Plexus is also exposed to the industrial market, it is smaller than its competitors, and the growth in its healthcare/life sciences and aerospace/defense segments should be able to make up for any lost sales. Overall, I believe that future performance in the U.S. for EMS companies is dependent upon what product markets it serves and, in relation to its competitors, Plexus is far better suited to grow sales in the U.S. irrespective of what point in the economic cycle the country is at.

Healthcare Equipment Spending

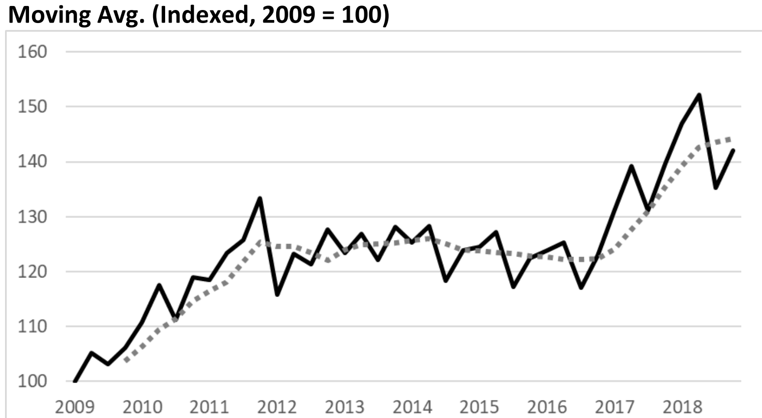
Much like emerging markets in the geographical sense, healthcare is one of the quickly growing sectors in which the EMS industry has been attempting to break into. So far, there are currently only four U.S. based EMS companies have reported exposure to this sector. Those companies are Methode Electronics, Benchmark Electronics, CTS Corporation and Plexus with 0.1%, 15%, 8.6%, and 36.2% share of sales respectively. This gives Plexus 11.2% more exposure than its closest competitor and 28.3% more than the average (0.362 - [(0.001 + 0.15 + 0.086) / 3]).

PLXS can bring new healthcare equipment to market in as little 18 months versus the average of 3-7 years.

Compared to its competitors, only Methode Electronics has had sales in this industry for as long as Plexus. The difference is that Plexus has kept its share of total sales in healthcare above 20% over the last ten years while Methode Electronics peaked at 3.2% in 2013 and subsequently dropped since then to its current 0.1% share of sales. The other two companies in this space are relative newcomers with Benchmark Services entering in 2013 and CTS Corporation in 2018. Yet, both have been more successful than Methode Electronics, with healthcare representing 15% of sales for Benchmark Electronics and 8.6% for CTS Corporation.

While the healthcare industry is very diverse in the services and products they provide to consumers, Plexus's products in this space, I believe, can be represented by electromedical equipment. Looking at figure 6, the growth of new orders over the last ten years averaged approximately 4% per year, but between 2009 and 2016, growth averaged about 2.8% a year, and then new order growth averaged about 8.3% a year until 2019. I believe that the recent acceleration in growth of instruments is due to a build up of demand which could have occurred between 2012 and 2016 where new orders stayed relatively flat. If growth stayed on trend from 2012 until 2019, then the index would have ended 2016 with a value of 146 and would now approximately be around 160. Instead, the index is currently sitting at 142, which would mean that there is still a 12.7% upside that has yet to be realized as there haven't been any shifts in the population distribution of the United States that could explain why there would be decreased demand than projected.

Figure 6: New Orders of Electromedical Instruments and Four-Year Moving Avg. (Indexed, 2009 = 100)



Source: FactSet

The last way that Plexus can capture growth in this market space, is that Plexus has the regulatory certifications and experience to bring products to market with FDA approval in as little as 18 months. In the fast-paced world of innovation and introduction of new technologies into the healthcare equipment and the healthcare industry in general, this fast track towards FDA approval is enticing for current and would-be Plexus customers as bringing a new medical device to market takes an average of three to seven years. I believe that this is one of Plexus's biggest competitive advantage in healthcare. Being able to bring products to life and pass FDA approval in at least half the time of the average, I believe, signals to potential customers that Plexus is one of, if not the, best EMS company serving the healthcare industry. There are many opportunities in healthcare and medicine over the next decade, from dealing with an aging population to the widespread adoption of robotic surgery to the breakthroughs that people haven't thought of yet, there will always be a need for inventing and improving healthcare technology and Plexus will be there to serve those needs.

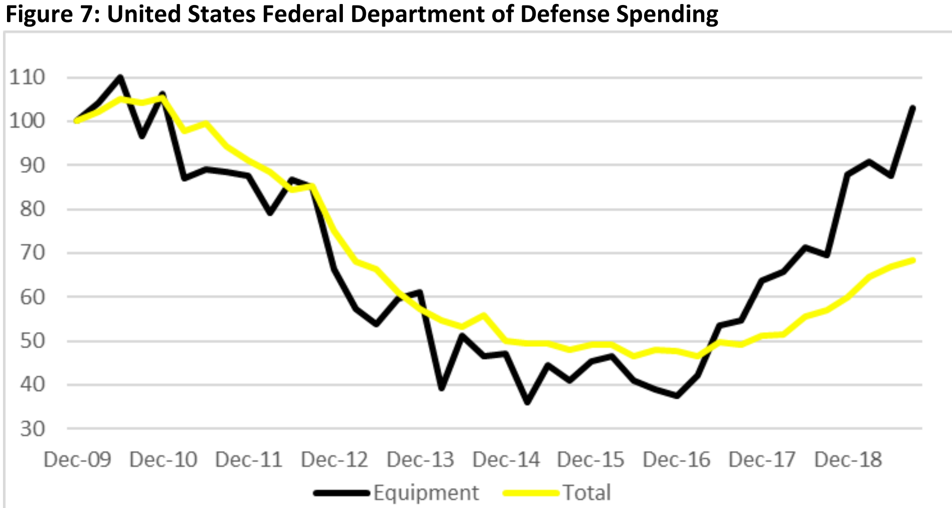
Aerospace/Defense

PLXS is deeply entrenched in the aerospace/defense industry with its customers being among the largest.

This market represents a significant opportunity for the EMS industry. Asia-based EMS companies are unable to penetrate this market in western countries for two reasons. As mentioned earlier, Asia-based EMS companies are focused on non-complex products with high volume. The other reason is due to fears from western governments that Chinese companies have been reproducing/stealing foreign technology and, as seen in the recent case of Huawei and the U.S. government, possibly letting its products be used by its own government to commit acts of espionage. This has forced the western aerospace/defense industry to work nearly exclusively with suppliers from trusted countries and fortunately for Plexus, only two other competitors are in this sector. Benchmark Services' and CTS Corporation's aerospace/defense segments share of sales equal 16% and 5%, compared to 15.5% with Plexus. Benchmark's known customers are small, and more satellite communication focused. On the other hand, Plexus serves large firms such as, General Electric United Technologies, Lockheed Martin and Boeing. Overall, Plexus is more diversified in its products and has stronger ties towards working with the Department of Defense.

Plexus is one of the only EMS companies in this market and its customers are some of the largest players in the industry, so it has a widely varied service and product space. Its parts and services are found on a majority of active commercial and military aircraft today. Every Boeing 700 series and Airbus A300 series airplane (except the A340), various Gulfstream jet models, Comac's C919, Lockheed's C-5, C-17, and C-130, the F-16, -18, and -35, Rockwell's B-1 Lancer, the P-8 Poseidon, and the UH-60, AH-64, and CH-47 helicopters all contain Plexus's mark in one way or another.

Figure 7: United States Federal Department of Defense Spending



Source: Dept. of Defense, FactSet

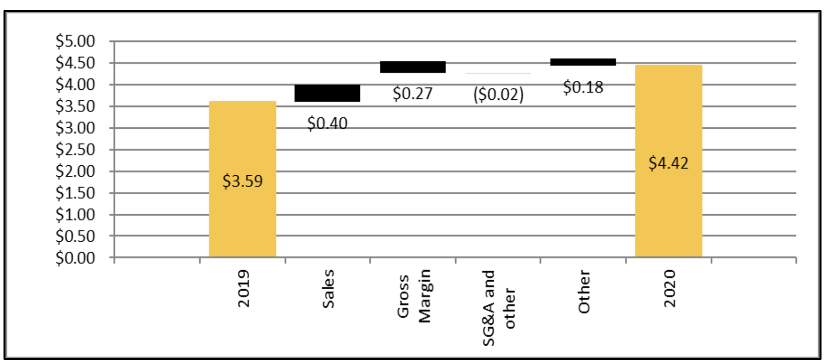
The 2019 and 2020 National Defense Authorization Acts and Department of Defense budgets suggests that new orders for the AH-64, UH-60, and P-8 Poseidon will remain flat. However, orders for the CH-47 helicopters will increase by 29%, and funding for the ongoing F-35 testing and procurement program will get a roughly 20%, or $1.5B, increase. As seen in figure 7, federal defense spending overall and on equipment (i.e. non-structural spending) has risen significantly since seeing sharp cuts of funding during the Obama Presidency. Spending on equipment has risen roughly 175% since December of 2016, but that only brought it back to early 2010 levels. Considering that Plexus's sales to the aerospace/defense industry has grown 126% since 2009, this implies that Plexus has grown in the commercial aerospace/defense industry. While growth in the DoD's budget/spending levels can help Plexus achieve greater than average growth in this segment over the short term, there is also another opportunity on the horizon that can propel growth throughout the 2020's and beyond.

Although NASA's budget no longer at the forefront of government spending, the military's budget certainly is, and with the United States Space Corps soon to become the sixth branch of the U.S. Armed Forces, this presents a fantastic opportunity for PLXS. Currently there is a five-year plan to transfer assets and build up the capabilities of the Space Corps with further congressional funding to be awarded in the 2021 National Defense Authorization Act. Granted it is unknown what level of funding this branch will receive, it is not out of the realm of possibility to conclude that this will become one of the, if not the, biggest branches of the military over the coming decades. With China investing heavily in its own space-based technologies whether they be for exploration, commercial, or military applications, I firmly believe that the United States government will respond in kind, possibly leading to a second space race. Considering that Plexus's products are found in products manufactured by General Electric, United Technologies, Lockheed Martin, and Boeing, I believe that the U.S. Space Corps can provide steady growth opportunities for Plexus throughout the 2020s and beyond.

Financial Analysis

I believe that over the next two years, Plexus's EPS will grow to $4.42 by the fiscal year-end of 2020 and to $5.51 by 2021. In 2020, I expect the $0.83 increase in EPS to come from two main sources: sales and gross margin. Sales should contribute a little under half of total growth at $0.40. Gross margin improvements should contribute an additional $0.27, or about 31.8% of total growth. SG&A and other expenses, as a percent of sales, are set to grow as well, which translates to a $0.02 decrease in EPS. While miscellaneous (interest and tax expenses along with PLXS's share count) will contribute the rest of the expected EPS growth with an $0.18 increase.

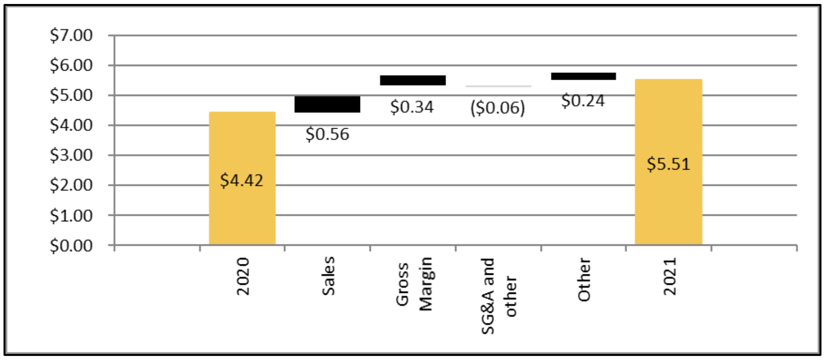
Figure 8: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

In 2021, I expect that there will be a $1.09 increase in EPS to $5.51. Much like in 2020, sales and improving gross margin will still contribute the most towards this growth with $0.56 and $0.34, or approx. 50% and 30% of growth, respectively. SG&A and other expenses should continue to rise, this time providing a $0.06 decrease to EPS. Miscellaneous should play a larger role during 2021, growing to contribute $0.24, or roughly 21% of EPS growth.

Figure 9: Quantification of 2021 EPS drivers



Source: Company Reports, IMCP

Over both years, sales are expected to grow as Plexus continues to expand in the healthcare/life sciences and aerospace/defense markets, and the EMEA region. Gross margin is set to grow as the company continues to shrink its less profitable communications segment. I believe miscellaneous will grow in its contribution due to a slight reduction in its interest and tax burden, along with the assumption that Plexus continues to buy back $50 million worth of stock per year in 2020 and 2021, as the firm did in 2019.

According to FactSet Earnings Insight, in 3Q19, 76% of S&P 500 companies beat EPS estimates with an average of 3.8% above estimates, while 61% beat sales estimates with an average of 0.9% above, all of which are above the five-year average. Over the last five years, PLXS beat EPS estimates 75% of the time with an average of being 2.48% above estimates, and sales estimates were beaten 70% of the time with an average of being 0.49% above estimates. If we take the S&P 500 to be representative of an "average public company," then I believe that the estimates for Plexus are slightly pessimistic relative to an average company.

Plexus's 2020 EPS estimates had a mean of $4.09 with a low of $4.04 and high $4.16. For 2021, the mean is $4.66 with a low of $4.45 and high of $4.92. It does seem that I am being overly optimistic relative to the brokers' estimates; but, according to FactSet's estimate history for Plexus, there seems to be a trend of brokers upgrading their estimates in the months leading up to Plexus's earnings release dates. This leads me to conclude that brokers' estimates tend to start overly pessimistic and considering that their estimates end up being slightly pessimistic come PLXS's earnings release date, I believe that my estimates, as optimistic as they are, aren't out of the realm of possibility.

Figure 10: EPS and YoY growth estimates by quarter

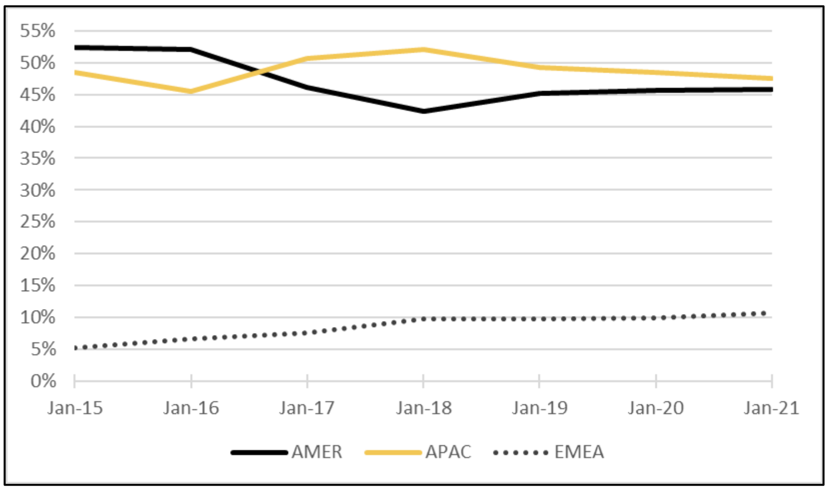
Fiscal Year	2015	2016	2017	2018	2019
Sales - Quarters Beat	3	3	2	3	3
Avg Quarterly Sales Surprise	0.90%	0.28%	-1.10%	0.50%	1.85%
EPS - Quarters Beat	3	4	4	2	2
Avg Quarterly EPS Surprise	0.70%	5.08%	5.68%	0.03%	0.93%
				Sales	EPS
	% of Quarters Beat over Period			70%	75%
	Avg Surprise over Period			0.49%	2.48%

Source: FactSet

Sales/Revenues

Plexus's total sales seem to have hit speedbumps in 2016 and 2017, while growth rapidly picked up in 2018 and 2019. However, this can be misleading as Plexus has been working on shrinking its lower-margin communications segment, which posted a 29.7% decline in 2016 and 20% decline in 2017. Controlling for that segment, combined sales to the other three segments grew by roughly 8.5% and 4.7% in 2016 and 2017 respectively, with the slower growth in 2017 attributed to sluggish demand in its industrial products and service. Considering that its communications segment was 32% of total sales in 2015 and 11.8% in 2019, I believe that this segment will see more modest declines over the next two years, equating to roughly 10% per year, which should have a relatively negligible impact on total sales growth growing forward.

Figure 11: PLXS Geographic Share of Total Sales



Source: Company Reports, IMCP

Geographically, as seen in figure 11, the share of sales for the AMER region decreased by nearly 10% between 2015 and 2018 as APAC and EMEA grew by 3.7% and 4.5% respectively. 2018 is an important year as the U.S. – China trade war was initiated on July 6th. Due to this, growth of sales in the APAC region decreased from 17.1% growth in 2018 to a modest 4% in 2019. Luckily, Plexus saw excellent sales growth of 17.3% in 2019 for the AMER region along with the continuation of double-digit growth in the EMEA region. While the AMER and APAC regions have been vying to be PLXS' largest geographic segment, the EMEA region has steadily grown its sales, a little over doubling it by 2018 and ending with a share of sales equal to 9.8%. Lastly, the elimination of inter-segment sales has had a relatively small impact on total sales. Its share of sales has stayed in the -4% to -4.5% range over the past four years after falling from -6.1% in 2015. This rises from companies with multi-national sales naturally transferring products between locations as needed and this category essentially falls under the materiality and full disclosure accounting conventions.

Figure 12: Disaggregated Revenues (Percent of Sales to Region)

	1Q19			2Q19			3Q19			4Q19		
	AMER	APAC	EMEA	AMER	APAC	EMEA	AMER	APAC	EMEA	AMER	APAC	EMEA
Healthcare/Life Sciences	33%	45%	46%	35%	40%	44%	35%	42%	40%	35%	41%	39%
Industrial/Commercial	24%	34%	27%	26%	38%	32%	25%	37%	29%	26%	40%	26%
Aerospace/Defense	18%	12%	25%	21%	14%	23%	22%	13%	30%	21%	16%	53%
Communications	26%	9%	3%	19%	9%	1%	18%	7%	1%	18%	4%	2%

Source: Company Reports

Starting in the first quarter for fiscal year 2019, Plexus reported disaggregated revenues by geographic and market segment, which is shown in figure 12. Although this isn't a long enough time period to be able to extrapolate the trends seen into the future, it does give a rough look at what market segments its geographic regions depend on most. Overall, the healthcare/life sciences segment are the biggest source of sales across all regions, APAC is more dependent on sales to the industrial/commercial segment relative to AMER and EMEA, and AMER has a strong, albeit weakening, dependence on the communications segment. It is important to note that total sales in the EMEA region is roughly between a fifth to a fourth of the total sales relative to the AMER and APAC regions, which is why one sees rapid growth in the aerospace/defense segment's share of sales between the third and fourth quarters. Taking that into account, I believe that it is reasonable to conclude that sales in the AMER and EMEA regions are relatively diversified, while the APAC region is dependent on the healthcare/life sciences and industrial/commercial segments.

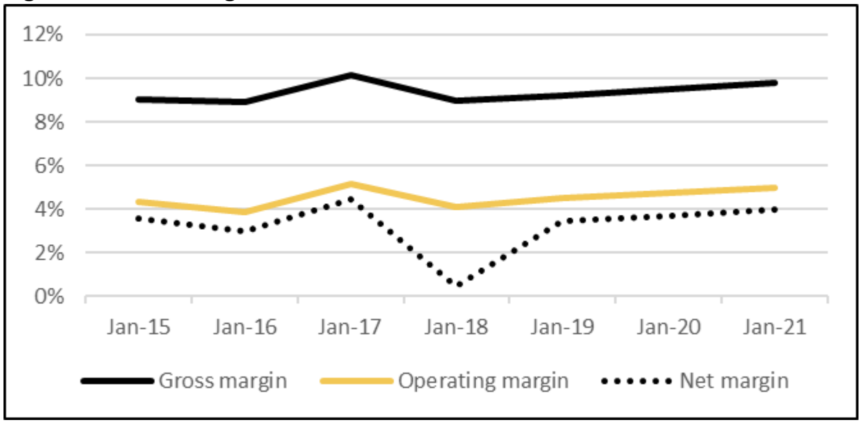
Growth in the AMER region will come mainly from an increase in the DoD's budget and the funding for its F-35 program, with the rest being made up of a mix between commercial aerospace along with its industrial/commercial and healthcare/life science segments. The APAC region will see some growth in the next two years, although I believe it will be hampered by a lack of sales growth in China, whether the trade war is fully resolved or not, as Plexus plans to continue to shift some of its current manufacturing capacity out of China and into Malaysia and Mexico according to the 2019 analyst day transcript. The EMEA region has seen the most growth in the last five years as Plexus has steadily built up its capabilities and manufacturing wins. I expect this trend to continue as its Romania facility is currently slated to add on a large manufacturing program for its industrial/commercial segment, which I believe is a good indicator of an increase in opportunities for the region.

Operating Income and Margins

Due to having a variety of products and limited facilities, this means a significant portion of Plexus's costs are associated with having to ramp up/prepare manufacturing space in order to make a product (i.e. change production line layouts, get equipment ready, purchase and move raw materials into place, etc.). As seen in figure 13, over the past five years gross margin has stayed relatively stable around 9%, except for 2017 when it was 10.1%.

While margins are expected to increase for PLXS, they are limited by having a diverse product space.

Figure 13: PLXS Margins



Source: Company Reports, IMCP

Operating margins fell in 2018 due to the drop in gross margin. The company's 'SG&A and other' expense category stayed relatively flat between 2015 and 2017 before growing by 10.6% in 2018 and 7.5% in 2019, which lagged sales growth by roughly 3% for both years. Net margins move nearly in lockstep with operating margins as Plexus's interest and tax expenses have each stayed between 0.3% and 0.5% of total sales. The exception to this is in 2018, and this is because Plexus had a black swan event and its tax expense increase by approx. 850% from a combination of changes in U.S. tax law, repatriation of cash, and expiration of deferred tax credits.

Figure 14: PLXS Operating Margins, 2015 – 2021E

	2015	2016	2017	2018	2019	2020E	2021E
Sales	$ 2,654,200	2,556,000	2,528,100	2,873,500	3,164,434	3,476,760	3,878,163
Sales Growth		-3.7%	-1.1%	13.7%	10.1%	9.9%	11.5%
Direct costs	$ 2,414,650	2,328,641	2,272,245	2,615,900	2,872,596	3,146,468	3,498,103
Gross Income	$ 239,550	227,359	255,855	257,600	291,838	330,292	380,060
Gross Margin	*9.0%*	*8.9%*	*10.1%*	*9.0%*	*9.2%*	*9.5%*	*9.8%*
Operating Expenses							
SG&A and Other	$ 124,114	127,920	125,947	139,317	149,783	165,146	186,152
Growth		*3.1%*	*-1.5%*	*10.6%*	*7.5%*	*10.3%*	*12.7%*
Operating Income	$ 115,436	99,439	129,908	118,283	142,055	165,146	193,908
Operating Margin	4.3%	3.9%	5.1%	4.1%	4.5%	4.8%	5.0%

Source: Company Reports, IMCP

Looking to the future, I foresee Plexus will increase its gross margins by 0.3% a year to 9.5% in 2020 and 9.8% in 2021, which will come mainly from a decrease in sales to its communications segment and increase in sales in its higher margin healthcare/life science and aerospace/defense segments. I believe that operating and net margins will move in a similar fashion over the next two years as I expect Plexus's SG&A and other expenses to stay at 4.8% of sales, interest at 0.5% of sales in 2020 and 0.4% in 2021, and taxes should stay at roughly 14%, or 0.6% of sales.

Return on Equity

The 3-stage DuPont analysis in figure 15 shows, apart from 2018 due to the tax expense discussed earlier, that Plexus has been able to grow its return on equity by roughly 40% from 8.7% in 2016 to 12.2% in 2019. There was a dip in sales / average assets and average assets / equity ratios in 2017, but the ratios grew by roughly 9.5% and 12% respectively, between 2016 and 2019.

Figure 15: ROE breakdown, 2016 – 2021E

3-stage DuPont	2016	2017	2018	2019	2020E	2021E
Net income / sales	3.0%	4.4%	0.5%	3.4%	3.7%	4.0%
Sales / avg assets	1.47	1.35	1.47	1.61	1.69	1.77
ROA	4.4%	6.0%	0.7%	5.5%	6.2%	7.1%
Avg assets / avg equity	1.97	1.93	2.01	2.20	2.27	2.20
ROE	8.7%	11.5%	1.3%	12.2%	14.2%	15.5%

Source: Company Reports, IMCP

Over the entire time period, this shows that Plexus has been successful in increasing the efficiency of its assets to produce sales, and in increasing its assets while buying back shares. Looking forward, I expect Plexus to continue to find ways to use its assets to produce more sales, which will translate to a higher return on assets. I also expect average assets / equity to increase to 2.27 in 2020 before decreasing to 2.20 in 2021 mainly due to equity growing slightly more than assets and share buybacks being reduced to $50 million from $100-150 million in 2018-19. This combination should allow continued growth in Plexus's return on equity, reaching 14.2% in 2020 and 15.5% in 2021.

Free Cash Flow

Figure 16: Free cash flow calculations

Free Cash Flow	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	102,444	86,960	119,499	14,333	122,500	143,677	168,700
Growth		-15.1%	37.4%	-88.0%	754.6%	17.3%	17.4%
NWC*	452,146	428,454	427,938	487,751	549,739	608,433	698,069
Net fixed assets	317,351	332,472	358,727	415,481	462,592	409,031	445,766
Total net operating capital*	769,497	760,926	786,665	903,232	1,012,331	1,017,464	1,143,835
Growth		-1.1%	3.4%	14.8%	12.1%	0.5%	12.4%
- Change in NWC*		(23,692)	(516)	59,813	61,988	58,694	89,636
- Change in NFA		15,121	26,255	56,754	47,111	(53,561)	36,735
FCFF*		95,531	93,760	(102,234)	13,401	138,545	42,328
Growth			-1.9%	-209.0%	-113.1%	933.9%	-69.4%
- After-tax interest expense	8,112	10,533	7,437	1,293	13,884	13,392	10,408
FCFE**		84,998	86,323	(103,527)	(483)	125,153	31,920
Growth			1.6%	-219.9%	-99.5%	-26011.6%	-74.5%
+ Net new debt/other cap		(9,925)	50,598	(53,984)	93,734	(90,000)	6,000
Sources of cash		75,073	136,921	(157,511)	93,251	35,153	37,920
Uses of cash							
Increase cash and mkt sec		75,858	135,896	*(271,591)*	*(73,508)*	*(12,347)*	*(10,080)*
Change in other equity		1,902	2,920	117,836	164,183	50,000	50,000
		77,760	138,816	(153,755)	90,675	37,653	39,920
Change in other liab		2,687	1,895	3,756	(2,586)	2,500	2,000
Total		75,073	136,921	*(157,511)*	*93,261*	*35,153*	*37,920*
* NWC excludes cash ** No adjustment is made for debt							

Source: Company Reports, IMCP

Plexus's historical free cash flow has a few anomalies that makes it volatile. In 2016 sales to its communications segment contracted quicker than its other segments could grow, and in 2018 Plexus had a relatively large tax expense, both causing NOPAT to decline those years.

Going into 2018, the company was holding nearly $570 million in cash, and due to the unforeseen tax expense and buying back $117 million in stock, this was reduced to $297 million by the year end. Besides investing back into the company, Plexus's main uses of its cash has been to buy back shares.

Using 2015 and 2019's NOPAT figures, Plexus was still able to achieve a simple straight-line growth rate of approx. 4% per year. I predict that NOPAT should be less volatile over the next two years and grow at a much quicker rate of over 17% mostly due to growth of sales in its higher margin segments.

FCFF and FCFE should increase in 2020 is because of a decrease in net fixed assets. I am assuming NFA investment will be less because major projects to expand and update facilities were completed in the last year, and there is little indication that any more are currently scheduled to start in the next year. I believe that this will mean 2020 will act as a sort of buffer year where Plexus's facilities will be allowed reach near manufacturing capacity before management will have to increase investments in NFA in 2021. This means that an increase in spending on NFA and NWC in 2021 should be reflected in a sharp decrease in FCFF and FCFE.

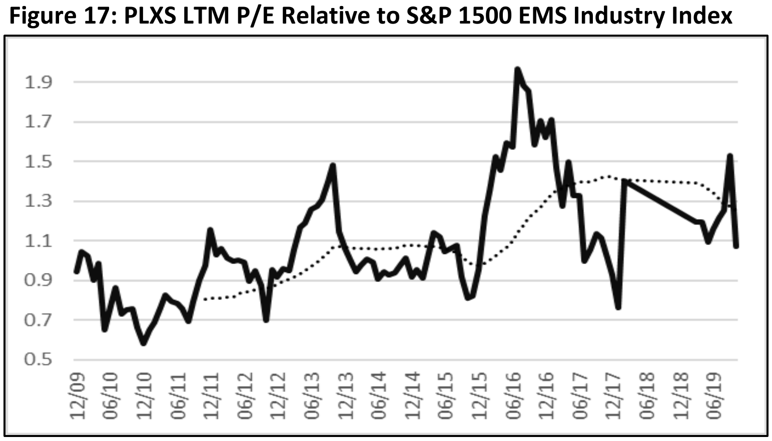
Valuation

PLXS was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is slightly expensive relative to the EMS industry benchmark and is worth $76. Relative valuation shows that PLXS trades at a slight premium relative to the industry average based on P/B and fairly valued based on P/E, however largely undervalued based on its P/S, although this is for a good reason as margins are below average. Using a price to earnings valuation yielded a price of $77. A detailed DCF analysis values Plexus at $79. And finally, a scenario analysis yields a price of $66. As a result of these valuations, I concluded that value the stock is $75.

Trading History

PLXS is currently at a P/E of 1.07 relative to the S&P 1500 EMS index (SPT45 on FactSet). I discard the data between March 2018 and February 2019, due to PLXS reporting negative earnings for the two quarters between March 2018 and September 2018, and lower earnings than usual in the two quarters between October 2018 and February 2019. Taking out these outliers and adding a 24-month moving average to show longer-term trends, provides a more accurate representation of how the market values PLXS relative to the industry. Calculating the average P/E from January 2014 to November 2019 (I add 11 months onto the back end to compensate for the outlier months in 2018 and 2019), I get a value of 1.2.

Figure 17: PLXS LTM P/E Relative to S&P 1500 EMS Industry Index



Source: FactSet

PLXS consistently commands a premium for its P/E relative to the EMS industry

Following the trendline, one can see that Plexus has gone through two periods of growth in relative P/E followed by periods of stagnation and all spikes in relative P/E were during economic slowdowns. The most recent period of stagnation in P/E growth had PLXS pegged at relative P/E of 1.4. Interestingly, since about February of 2019, the trend has started to reverse course and shrink, equal to a roughly 23.6% decrease, which is a sharper contraction than seen in 2015 before it saw another period of growth. This leads me to believe that the market was overly optimistic in PLXS's future growth prospects between late 2015 and early 2017, and the market is now correcting itself. Assuming the market brings Plexus's relative P/E back to its five-year average of 1.2 by the end of 2020 and the EMS industry's P/E stays at its current value of 16.16 at the end of 2020, this gives Plexus a P/E of 19.4.

Assuming Plexus arrives at a P/E equal to 19.4 by the end of 2020, it should trade at $85.75.

- Price = P/E x EPS = 19.4 x $4.42 = $85.75

Discounting $85.75 back to today at a 13.3% cost of equity (explained in the Discounted Cash Flow section) yields a price of $75.68. Given that PLXS has come to command a premium relative to the industry over the last 10 years, due to more exposure to healthcare and less to cyclical industries, I believe that this is an accurate price point as Plexus's valuation should normalize over the near future.

Relative Valuation

Compared to the average EMS company (turn to appendix 3 for a detailed table), Plexus trades at a 9.8% premium for NTM P/E, 17% premium for 2020, and a 21% premium for 2021, while its NTM earnings growth is 9% lower than the average, 2020 earnings growth is 115% above average, and 3% lower than average for 2021. Plexus's P/B is at an 8.6% premium, even though it has a ROE 35% lower than industry average. The only metric that has PLXS at a discount is P/S, which is almost 52% lower than average. As seen in figure 18, Plexus has roughly 5.4% lower net profit and operating margins than average, warranting such a discount for its P/S ratio. Also, I believe it is relatively safe to conclude that PLXS's ROE will grow in the future, and the P/B premium reflects that the market's expectations are in line with my own. This has led me to conclude that the best ratio to use when trying to estimate Plexus's future stock price is P/E.

Figure 18: PLXS Valuation Relative to Industry Average

	P/E			Earnings Growth							
	NTM	2020	2021	NTM	2020	2021	P/B	ROE	P/S	Net Margin	Op. Margin
PLXS	18.9	18.9	16.6	16.4%	19.2%	13.9%	2.65	11.7%	0.72	3.4%	4.60%
Industry Avg.	17.23	16.16	13.67	25.0%	8.0%	17.0%	2.44	15.0%	1.49	8.8%	11.10%
Difference (PLXS - Ind. Avg.)	1.67	2.74	2.93	-8.6%	11.2%	-3.1%	0.21	-3.3%	-0.77	-5.4%	-6.5%
Premium/Discount*	9.7%	17.0%	21.4%	-34.4%	140.0%	-18.2%	8.6%	-22.0%	-51.7%	-61.4%	-58.6%
*(PLXS/Industry Avg.) - 1											

Source: FactSet, Company Reports

I will assume that Plexus keeps its 9.7% P/E premium, the industry's P/E decreases to 16.16 in 2020, and that PLXS's EPS grows to $4.42 over 2020. With a TTM P/E of 17.73, this translates to a target price of $78 at the end of 2020.

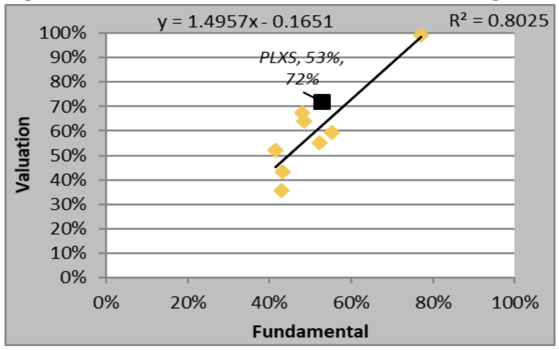
Composite Valuation

For a final comparison, I created a composite ranking of a couple valuation and fundamental metrics. Each metric was converted to a percentile of the max so we can include all of the firms in a composite. After much tinkering and tweaking, I have arrived at a composition that provides a regression of the fundamental versus valuation metrics, that is reasonably accurate according to the R^2. The market appears to be overwhelmingly growth focused. I weighted TTM and 2020 P/E at 37.5% each and P/B at

25% for the valuation metrics, and I weighted 2021 earnings growth at 30%, 1/Beta and 1 – (LTD/Equity) at 10% each, both 2019 ROE and NPM at 15%, and finally second twelve-month sales at 20% for the fundamental metrics. The regression between the fundamental versus valuation gives an R^2 of 0.8025.

> Many companies in the U.S. based EMS industry are overvalued based on their fundamentals.

Figure 19: Fundamental versus Valuation Regression for EMS Industry



Source: IMCP

While this is only an estimate for how EMS companies are valued, if we take it at face value, figures 19 and 20 show that Plexus is overvalued based on its fundamentals relative to its current valuation.

Figure 20: Composite valuation, % of range

			Fundamental						Valuation		
		Weight	30.0%	10.0%	10.0%	15.0%	15.0%	20.0%	37.5%	37.5%	25.0%
	Weighted		Earn Grow	1/	1-(LTD/	2019	2019	Sales	P/E		
Name	Fund	Value	-th 2021	Beta	Equity)	ROE	NPM	STM	TTM	2020	P/B
PLEXUS CORP	53%	72%	28%	78%	12%	37%	83%	88%	70%	67%	83%
BENCHMARK ELECTRONICS INC	54%	67%	55%	83%	12%	16%	40%	100%	77%	75%	40%
CTS CORP	49%	64%	30%	78%	7%	37%	71%	75%	60%	64%	71%
FABRINET	55%	59%	26%	100%	42%	51%	80%	67%	48%	57%	80%
IPG PHOTONICS CORP	77%	99%	100%	45%	100%	30%	97%	67%	100%	100%	97%
JABIL INC	52%	55%	31%	91%	2%	77%	100%	35%	40%	40%	100%
METHODE ELECTRONICS INC	43%	43%	-13%	66%	5%	100%	76%	67%	24%	41%	76%
SANMINA CORP	41%	52%	17%	62%	7%	39%	66%	67%	52%	44%	66%
TE CONNECTIVITY LTD	43%	36%	25%	76%	12%	45%	42%	67%	29%	38%	42%
TTM TECHNOLOGIES INC	48%	67%	26%	91%	8%	59%	97%	35%	51%	64%	97%

Source: FactSet, IMCP

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was used to value PLXS.

Using CAPM, Plexus's cost of equity was calculated to be 13.3%. To reach this calculation I used the following assumptions:

- The risk free rate, as represented by the ten year Treasury bond yield, is 1.75%.
- A ten year beta of 1.4 was utilized since the company has higher risk than the market.
- A long term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Using these assumptions, the cost of equity is 13.3% (1.75 + 1.4 (10 – 1.75)).

Stage One – The model's first stage discounts fiscal years 2020 and 2021 free cash flow to equity. These per share cash flows are forecasted to be \$1.61 and \$1.67, respectively. Using the cost of equity from above to discount these cash flows, results in a total value of \$2.72 per share.

Stage Two - The second stage focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 13.3% cost of equity. I assume that sales will grow at a rate of 10% per year, NOPAT margin will grow to be 5% in 2026 from 4.4% in 2021. Also, I assume sales to NOWC, NFA turnover, and shares will remain at 2021 levels, equating to 0% growth. I expect no new debt to be issued with the exception of $100M in 2025, as $100M in long-term debt matures that year and PLXS's management has a track record of only issuing long-term debt when its other long-term debt matures. This equates to a total present value of $8.16 in the second stage.

Figure 21: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$ 1.61	$ 1.67	$ 1.61	$ 2.02	$ 2.49	$ 6.38	$ 3.52
Discounted FCFE	$ 1.42	$ 1.30	$ 1.11	$ 1.23	$ 1.33	$ 3.02	$ 1.47

Source: IMCP

Stage Three – Net income for the years 2022-2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $4.42 in 2020 to $10.38 in 2026.

Figure 22: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$4.42	$5.51	$6.30	$7.17	$8.16	$9.14	$10.38

Source: IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this analysis, I took the average of the average industry P/E for the period between 2017 and 2021, and I will assume that Plexus's P/E ratio will converge to that value over the long term. Therefore, a P/E ratio of 15.81 ((19.14 + 12.47 + 17.59 + 16.17 + 13.66) / 5) will be used as PLXS's terminal P/E. While this is lower than the current P/E, by 2026 some of Plexus's growth opportunities may be exhausted, so a lower P/E is likely appropriate. Using the assumed terminal earnings-per-share of $10.38 and price-to-earnings ratio of slightly less than 16, a terminal value of $164.14 per share is calculated. Using the 13.3% cost of equity, this number is discounted back to a present value of $68.48.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $79.36 is calculated (2.72 + 8.16 + 68.48). Given PLXS's current price of roughly $79, this model indicates that the stock is fairly valued.

Scenario Analysis

Plexus, along with many companies in the EMS industry, is difficult to value because much of its sales come from open-ended manufacturing contracts that highly depend on the conditions surrounding its customers' business and end-market demand for the its products. Luckily, Plexus serves two of the fastest growing industries in the U.S. and abroad, along with customers that are leaders in its marketplace, and the firm has very competent and long-standing management. I have valued Plexus under two scenarios. The first is my bull case, the second is my bear case, and the difference between the two stems from assumptions in sales growth, operating profit margin, operating efficiency, and terminal long-term growth. Also, for both scenarios I continue to assume that management continues to stay disciplined when it comes to only issuing new debt when old debt matures and pays off its revolving line of credit before the end of the year, which will translate to no new net debt, and that PLXS's share count stays flat in the second stage.

Sales Growth – For my bull scenario, I foresee sales to grow to $4.1 billion by 2021, and then double to $8.2 billion by 2026. This assumes that Plexus has greater than average sales in the healthcare/life sciences and aerospace/defense product segments. Geographically, it assumes that sales growth in its APAC region return to its pre-U.S. – China trade war levels, mid-teens sales growth in its AMER region is fueled by growth in its aerospace/defense product segment, and average growth in its EMEA region. For my bear scenario, I peg sales to grow to $3.2 billion by 2021 and $4.2 billion by 2026. This assumes that sales in the APAC region stagnate due to a poor outcome or continuation of the trade war, demand in EMEA weakens due to a regional economic contraction following Brexit, and modest growth in the AMER region mainly due to healthcare/life sciences and aerospace/defense sectors still growing albeit at a reduced rate.

Operating Profit Margin – Both my bull and bear scenarios assume that PLXS's OPM reaches 4.4% in 2021 due to the elimination of sales to its communications segment. In the bull scenario, I assume that the OPM further increases to 6% by 2026 and for the bear scenario, I assume that the OPM increase is short-lived and it reverts to 4% in 2026.

Operating Efficiency – Defined as sales/net fixed assets, I assume for both scenarios that it hits 8.7 in 2021. In the bear scenario I assume that it is short lived and decreases back to a pre-2020 level of 8 and in the bull scenario I assume Plexus's management continues to increase its efficiency and reaches a S/NFA of 9 in 2026.

A valuation of PLXS stock was reached using the same discounted cash flow method outlined in the previous section, along with using the same technique to arrive at a terminal P/E ratio for Plexus. This gives us a value of $37.05 and $94.95 per share of PLXS stock for the bear and bull scenarios respectively.

Figure 23: Scenario analysis

	Bull Case	Bear Case
Stage One	$2.85	$2.85
Stage Two	$5.43	$7.07
Stage Three	$86.66	$27.12
Total Value	$94.95	$37.05

Source: IMCP

I believe that neither valuation nor scenario are out of the realm of possibility for Plexus. All the values used for sales growth, OPM, and operating efficiency are within the normal range that Plexus has operated in over the last ten years. I do acknowledge that in my bull scenario, doubling sales over 5 years for an overwhelmingly manufacturing based company may be overly optimistic as it would require explosive growth in its NFA to keep pace. But I posit that as operating efficiency increases, along with sales to higher margin product segments, this would mean that Plexus would have to invest less in NFA than one would think. I acknowledge that it is very difficult to predict events that are so far into the future, and because of this, I will assume that both scenarios are equally likely to happen. Taking the average of the values the scenarios give, I arrive at a price of $66.

I recommend paying attention to PLXS's gross margin and operating efficiency metrics as time progresses. As PLXS's gross margin is already low, roughly between 9% and 10%, any increase in gross margins could have a great impact on EPS. For example, if PLXS's gross margin increases by 2% and all costs stay the same, then it will increase earnings by approx. 20%. The same logic holds true if margins decrease. I would keep an eye on the trends for PLXS's gross margin and if it starts to slip, look towards management to see if they discuss any reasons why and if they have any solutions to fix it. I also recommend keeping track of operating efficiency because if PLXS is able to permanently increase it, then it will have to invest less into expanding its manufacturing capacity. This, in turn, will enable the company to expand its business in other ways, buy back more shares, pay down debt, etc. and improve its overall position.

Business Risks

Although I have many reasons to be optimistic about Plexus there are several good reasons why I find the stock to be fairly, if not slight overvalued at its current price of $78.

Political Risk:

I believe that this is Plexus's biggest risk going forward. First off, even though Plexus has been able to weather the U.S. – China trade war so far, I believe that its impact hasn't had enough time to take its full effect. As discussed earlier, management has started to shift manufacturing capacity out of China. If the trade war comes to an amiable conclusion after the signing of the phase one trade deal, then Plexus could lose customers to its competitors who kept capacity in China. But, if the trade war isn't fully resolved in the next two years or if the deal sours relations, Plexus could still lose customers and/or face additional regulatory hurdles to stay there. There is a similar situation going on with Brexit and Plexus. With Boris Johnson and his Conservative Party winning the general election and a majority in parliament, Brexit is almost certainly going to happen. The only problem is that the type of Brexit and the effects of which, are heretofore unknown. One thing is nearly certain though. Until the UK works out trade deals with the rest of the countries that occupy Europe, Plexus may have pay more in taxes/tariffs for that time period. Lastly, the renegotiation of NAFTA between the U.S., Canada and Mexico could mean that Plexus will either move its current facilities in Mexico elsewhere, or pay more in taxes/duties to import its products to the United States.

Exposure to currency fluctuations:

According to PLXS's quarterly and yearly SEC filings, approximately 63.7% of PLXS's revenues come from countries outside of the United States, and the firm's policy towards foreign exchange risk is, "to selectively hedge our foreign currency denominated transactions in a manner that partially offsets the effects of changes in foreign currency exchange rates." Although the firm is proactive in hedging its risk, it deals with a variety of currencies to receive and send payments. The major risks come from the possibility that one or more currencies becoming extremely volatile, and from Malaysia, where 34.5% of revenues come from. Overall, changes in the strength of the dollar against the Euro, Ringgit, Peso, and Yuan could have a serious impact on gross margins.

Dependence on Major Customers:

According to PLXS's 10-K for FY 2019, its top 10 customers accounted for 54.6% of total sales. On top of that, its largest customer, General Electric, represents 10% or more of total sales. While there is something to say about customer loyalty, if Plexus loses any of its biggest non-GE customers it could lead to approx. 5% drop in total sales.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

In order to successfully break into the EMS industry, new companies require high amounts of capital, technological expertise, regulatory expertise, in addition to securing contracts from companies willing to take on the risk of working with a company with no track record.

Threat of Substitutes – Low to Moderate

The only tangible alternative to working with EMS companies is for its customers to design, manufacture and service products in-house. In order to do so, companies would have to significantly invest in personnel and infrastructure if they don't already have those and many companies would rather outsource this process to cut costs. Lower volume products are relatively safe from this threat, while higher volume products are more exposed as companies may find that producing such products in-house more cost-effective.

Supplier Power – Moderate

Overall, there is a plethora of electronic component suppliers and relatively few EMS companies. But, as EMS companies specialize in certain products, electronic component suppliers do so as well. Switching suppliers can cause delays that can lose EMS companies money and even customers if the new supplier is subpar compared to the previous supplier. Even though EMS companies could transition to a new supplier, it could be difficult to successfully execute, giving suppliers a moderate amount of leverage over its EMS customers.

Buyer Power – Moderate to High

Customers to the EMS industry appear to have a substantial amount of power. Considering that EMS companies have little to no overlap in the industries/product segments they serve, this can whittle down the buyer's power to switch to a competitor. The real source of buyer power comes from using an EMS company to design its product, and since there is no guarantee that the buyer will use the EMS company to manufacture that product, it may have to provide concessions to the buyer in order to secure the manufacturing contract.

Rivalry Among Existing Firms – Low to Moderate

While some EMS companies serve overlapping product segments, compared to the number of potential customers there is a relatively low number of EMS companies. This has equated to many EMS companies finding and serving a specified niche of products and industries. While there is a history of EMS companies pivoting from one product segment to another, I believe that customers tend to stay loyal which protects EMS companies over the short term. But, as time goes on the EMS industry evolves to serve the industries with the most demand for its services, which means that over the mid to long term rivalry can increase to moderate levels.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Excellent reputation Regulation/technical expertise Established in high growth markets	Low margins Dependence on Asia as a manufacturing base and source of sales Competitors encroaching on its market space
Opportunities	**Threats**
Continued penetration into high growth markets Automation of its manufacturing proces Expansion into the EMEA Region	Improving technical capabilities from rivals in Asia Foreign currency and political risk Rapidly changing technological landscape

Appendix 3: Plexus Corps. Comparable Companies

Ticker	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
PLXS	$77.51	$2,262	1.5	2.9	27.0	48.5	30.8	51.7		16.4%	0.3%	6.2%	19.2%	13.9%		1.40	21.6%	B	0.00%	0.0%
BHE	$35.26	$1,327	1.4	3.7	28.4	54.0	55.1	66.5		9.5%	11.5%	-2.1%	17.6%	27.5%	-23.1%	1.32	20.5%	B	1.74%	42.5%
CTS	$27.77	$905	2.2	3.9	(4.3)	1.9	(1.0)	7.3		12.6%	57.7%	-6.5%	7.7%	14.9%		1.40	34.8%	B	0.58%	12.2%
FN	$60.38	$2,234	1.1	5.5	12.2	30.7	24.0	17.7		21.4%	-11.6%	27.9%	-1.6%	13.3%	4.6%	1.09	6.0%		0.00%	0.0%
IPGP	$141.98	$7,535	1.3	(4.4)	6.3	8.7	8.1	25.3	4.0	-12.5%	1.7%	-42.3%	15.5%	50.4%	19.9%	2.45	2.5%	B+	0.00%	
JBL	$39.24	$5,990	0.2	0.3	30.8	49.3	60.9	58.3	12.0	90.8%	24.2%	13.7%	15.8%	15.7%		1.20	112.4%	B	0.82%	17.8%
KEM	$26.81	$1,557	(0.4)	15.3	49.1	55.9	36.7	52.9		-37.5%	307.0%	102.3%	-33.6%	-6.4%		1.66	46.1%	B-	0.75%	7.4%
MEI	$40.96	$1,519	7.6	12.8	20.0	61.5	63.8	75.9	15.0	31.2%	19.0%	-17.6%	37.0%	8.7%		1.76	38.6%	B	1.18%	15.7%
SANM	$32.32	$2,262	2.0	0.7	8.2	15.2	24.9	34.3	12.0	49.5%	-23.0%	53.8%	-11.8%	12.7%		1.44	21.1%	B-	0.00%	0.0%
TEL	$92.15	$30,822	1.1	(1.9)	(2.8)	2.8	21.7	21.8	10.9	-10.4%	16.1%	-1.1%	-7.4%	13.2%		1.20	32.1%		1.96%	31.7%
TTMI	$13.80	$1,456	1.9	10.8	20.3	52.0	27.7	41.8		98.8%	12.1%	-43.2%	25.0%	19.2%	38.5%	2.74	119.4%	B-	0.00%	0.0%
Average	$53	$5,261	1.8	4.5	17.7	34.6	32.1	41.2	10.8	25%	38%	8%	8%	17%	10%	1.61	41%		0.64%	12.7%
Median	$39	$2,234	1.4	3.7	20.0	48.5	27.7	41.8	12.0	16%	12%	-1%	15%	14%	12%	1.40	32%		0.58%	9.8%
SPT45	$282		1.2	(0.1)	5.4	13.9	25.6	29.4			12.5%	-2.4%	2.2%	15.8%						

Ticker	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	NM	OM	ROIC	EV/ EBIT	P/CF Current	Sales Growth NTM	STM	Pst 5yr	Book Equity
PLXS	11.7%	2.65	18.9	15.8	22.6	22.1	18.9	18.9	16.6	3.2%	0.71	3.4%	4.6%	10.1%	13.8		5.6%	9.5%		$29.19
BHE	5.1%	1.27	22.4	14.6	24.8	25.0	22.8	21.1	16.6	2.3%	0.58	0.9%	2.6%	1.6%	10.1		-7.3%	10.8%	0.5%	$27.74
CTS	11.8%	2.29	26.5	16.9	19.4	21.2	18.8	18.0	15.7	10.1%	1.96	9.9%	14.9%	11.0%	11.7		-4.2%	8.1%	2.8%	$12.12
FN	16.3%	2.58	8.5	17.2	15.8	18.7	15.4	16.1	14.2	8.9%	1.41	7.6%	7.8%	14.0%	11.9		6.6%		18.5%	$23.43
IPGP	9.6%	3.19	29.5	15.4	33.3	29.4	33.6	28.9	19.2	17.4%	5.81	27.7%	35.4%	18.7%	10.1	28.6	-6.3%		17.6%	$44.50
JBL	24.6%	3.24	12.4	9.5	13.2	21.8	11.4	11.4	9.8	1.8%	0.24	1.1%	3.0%	6.8%	7.7	4.6	3.5%	3.8%		$12.13
KEM	32.0%	2.42	35.0	10.0	7.6	9.9	15.9	11.4	12.2	14.9%	1.13	14.9%	15.3%	24.7%	5.1		-12.6%		10.7%	$11.06
MEI	12.3%	2.07	16.2	7.9	16.9	14.6	11.2	12.3	11.3	9.0%	1.52	9.2%	12.6%	11.1%	10.5		12.3%		5.3%	$19.75
SANM	14.4%	1.37	11.5	10.9	9.5	16.3	10.9	10.8	9.6	2.9%	0.27	1.7%	3.6%	8.1%	7.4	7.4	-11.8%			$23.56
TEL	18.7%	3.11	19.7	13.5	16.6	16.2	18.1	17.9	15.8	13.8%	2.29	14.5%	16.3%	14.0%	15.8	12.6	-3.3%	3.8%		$29.63
TTMI	8.6%	1.18	10.0	5.5	13.8	25.1	12.6	11.0	9.3	4.0%	0.55	6.1%	6.3%	7.4%	14.3	5.4	-1.8%		15.8%	$11.65
Average	0.15	2.31	19.14	12.47	17.59	20.04	17.25	16.17	13.66	8.0%	1.50	8.8%	11.1%	0.12	10.76	11.72	-1.8%	7.2%	10.2%	22.25
Median	0.12	2.42	18.86	13.48	16.60	21.22	15.90	16.10	14.21	8.9%	1.13	7.6%	7.8%	0.11	10.46	7.36	-3.3%	8.1%	10.7%	23.43
SPT45			17.8	12.4	16.3			16.1	13.9											

Appendix 4: Income Statement

Income Statement (in thousands)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Sales	2,654,200	2,556,000	2,528,100	2,873,500	3,164,434	$3,476,760	$3,878,163
Direct Costs	2,414,650	2,328,641	2,272,245	2,615,900	2,872,596	3,146,468	3,498,103
Gross Profit	239,550	227,359	255,855	257,600	291,838	330,292	380,060
SG&A and other expenses	124,114	127,920	125,947	139,317	149,783	165,146	186,152
Earnings before Interest & Tax	115,436	99,439	129,908	118,283	142,055	165,146	193,908
Interest expense	9,141	12,045	8,085	10,673	16,100	17,643	15,879
Earnings Before Tax	106,295	87,394	121,823	107,610	125,955	147,503	178,030
Taxes	11,963	10,967	9,761	94,570	17,339	19,175	23,144
Net Operating Profit After Tax	94,332	76,427	112,062	13,040	108,616	128,328	154,886
Net Income	94,332	76,427	112,062	13,040	108,616	128,328	154,886
Basic Shares	33,618.0	33,374.0	33,612.0	33,003.0	30,271.0	29,464.5	28,705.2
Fully Diluted Shares	34,379.0	34,098.0	34,553.0	33,919.0	31,074.0	30,267.5	29,508.2
EPS	$2.81	$2.29	$3.33	$0.40	$3.59	$4.36	$5.40
EPS Fully Diluted	$2.74	$2.24	$3.24	$0.38	$3.50	$4.24	$5.25

Appendix 5: Cash Flow Statement

Cash Flow Statement (in thousands)	2016	2017	2018	2019	2020E	2021E
Cash from Operatings (understated - depr'n added to net assets)						
Net income	76,427	112,062	13,040	108,616	130,285	158,292
Change in Net Working Capital ex cash	23,692	516	(59,813)	(61,988)	(58,694)	(89,636)
Cash from operations	$ 100,119	$ 112,578	$ (46,773)	$ 46,628	$ 71,591	$ 68,655
Cash from Investing (understated - depr'n added to net assets)						
Change in NFA	(15,121)	(26,255)	(56,754)	(47,111)	53,561	(36,735)
Cash from investing	$ (15,121)	$ (26,255)	$ (56,754)	$ (47,111)	$ 53,561	$ (36,735)
Cash from Financing						
Change in Short-Term and Long-Term Debt	(9,925)	50,598	(53,984)	93,734	(90,000)	6,000
Change in Other liabilities	2,687	1,895	3,756	(2,586)	2,500	2,000
Change in Equity ex NI and Dividends	(1,902)	(2,920)	(117,836)	(164,183)	(50,000)	(50,000)
Cash from financing	$ (9,140)	$ 49,573	$ (168,064)	$ (73,035)	$ (187,500)	$ (42,000)
Change in Cash	75,858	135,896	(271,591)	(73,518)	(12,347)	(10,080)
Beginning Cash	357,106	432,964	568,860	297,269	223,761	296,956
Ending Cash	$ 432,964	$ 568,860	$ 297,269	$ 223,751	$ 211,414	$ 201,334

Appendix 6: Balance Sheets

Balance Sheets (In Thousands)								
Items	2014	2015	2016	2017	2018	2019	2020E	2021E
ASSETS								
Current Assets								
Cash and Cash Equivalents	346,591	357,106	432,964	568,860	297,269	223,761	211,414	201,334
Account Receivable, Net of Allowances	324,072	384,680	416,888	365,513	394,827	488,284	522,952	576,293
Inventories	525,970	569,371	564,131	654,642	794,346	700,938	750,705	827,276
Deferred Tax Income	6,449	10,686	-	-	-	-	-	-
Contract Assets	-	-	-	-	-	90,841	97,291	107,214
Prepaid Expenses and Other	27,757	22,882	19,364	28,440	30,719	34,467	36,914	40,679
Total Current Assets	$ 1,230,839	$ 1,344,725	$ 1,433,347	$ 1,617,455	$ 1,517,161	$ 1,538,291	$ 1,619,276	$ 1,752,798
Property, Plant and Equipment, Net	334,926	317,351	291,225	314,665	341,306	384,224	339,737	370,249
Deferred Income Tax	3,675	3,635	4,834	5,292	10,825	13,654	12,073	13,157
Other	39,586	36,677	36,413	38,770	63,350	64,714	57,221	62,360
Total Non-Current Assets	378,187	357,663	332,472	358,727	415,481	462,592	409,031	445,766
Total Assets	$ 1,609,026	$ 1,702,388	$ 1,765,819	$ 1,976,182	$ 1,932,642	$ 2,000,883	$ 2,028,307	$ 2,198,564
LIABILITIES AND SHAREHOLDERS' EQUITY								
Current Liabilities								
Current Portion, L-T Debt & Cap. Lease Obligations	4,368	3,513	78,507	286,934	5,532	100,702	75,023	76,749
Accounts Payable	396,363	400,710	397,200	413,999	506,322	444,944	465,411	496,594
Customer Deposits	56,155	81,359	84,637	107,837	90,782	139,841	146,274	156,074
Deferred Income Tax	647	-	-	-	-	-	-	-
Accrued Liabilites								
Salaries and Wages	52,043	49,270	41,806	49,376	66,874	73,555	76,939	82,093
Other	37,739	44,446	48,286	49,445	68,163	106,461	111,358	118,819
Total Current Liabilities	547,315	579,298	650,436	907,591	737,673	865,503	875,005	930,329
Long-Term Debt and Cap. Lease Obligation, Net	262,046	259,257	184,002	26,173	183,085	187,278	139,522	142,731
Deferred Income Tax	5,191	9,664	-	-	70,506	64,877	47,770	49,202
Other Liabilities	13,341	11,897	14,584	16,479	20,235	17,649	20,149	22,149
Total Non-Current Liabilities	280,578	280,818	198,586	42,652	273,826	269,804	207,441	214,082
Total Liabilities	827,893	860,116	849,022	950,243	1,011,499	1,135,307	1,082,446	1,144,411
Shareholder's Equity								
Common Stock	500	506	513	519	526	529	578	644
Additional Paid-in Captial	475,634	497,488	530,647	555,297	581,488	597,401	652,812	727,553
Common Stock Held in Treasury (At Cost)	(479,968)	(509,968)	(539,968)	(574,104)	(711,138)	(893,247)	(976,099)	(1,087,852)
Retained Earnings	766,385	860,717	937,144	1,049,206	1,062,246	1,178,677	1,288,003	1,435,467
Accumulated Other Comprehensive Income	18,582	(6,471)	(11,539)	(4,979)	(11,979)	(17,784)	(19,434)	(21,658)
Total Shareholders' Equity	781,133	842,272	916,797	1,025,939	921,143	865,576	945,861	1,054,153
Total Liabilities and Shareholders' Equity	$ 1,609,026	$ 1,702,388	$ 1,765,819	$ 1,976,182	$ 1,932,642	$ 2,000,883	$ 2,028,307	$ 2,198,564

Appendix 7: Ratios

Ratios Items	2015	2016	2017	2018	2019	2020E	2021E
Profitability							
Gross margin	9.0%	8.9%	10.1%	9.0%	9.2%	9.5%	9.8%
Operating (EBIT) margin	4.3%	3.9%	5.1%	4.1%	4.5%	4.8%	5.0%
Net profit margin	3.6%	3.0%	4.4%	0.5%	3.4%	3.7%	4.0%
Activity							
NFA (gross) turnover		7.87	7.32	7.42	7.21	7.98	9.07
Total asset turnover		1.47	1.35	1.47	1.61	1.69	1.77
Liquidity							
Op asset / op liab	2.41	2.51	2.61	2.07	2.01	2.13	2.14
NOWC Percent of sales		0.33	0.37	0.31	0.25	0.24	0.24
Solvency							
Debt to assets	16.0%	14.9%	15.8%	13.4%	17.6%	16.7%	15.5%
Debt to equity	32.3%	28.6%	30.5%	28.1%	40.8%	37.4%	33.6%
Other liab to assets	0.7%	0.8%	0.8%	1.0%	0.9%	0.8%	0.8%
Total debt to assets	16.7%	15.7%	16.7%	14.5%	18.5%	17.5%	16.3%
Total liabilities to assets	50.5%	48.1%	48.1%	52.3%	56.7%	55.4%	53.8%
Debt to EBIT	2.36	2.64	2.41	2.19	2.48	2.14	1.82
EBIT/interest	12.63	8.26	16.07	11.08	8.82	9.36	12.21
Debt to total net op capital	24.2%	22.0%	23.1%	21.6%	28.5%	26.8%	24.9%
ROIC							
NOPAT to sales	3.9%	3.4%	4.7%	0.5%	3.9%	4.1%	4.4%
Sales to NWC		5.81	5.90	6.28	6.10	6.00	5.94
Sales to NFA		7.87	7.32	7.42	7.21	7.98	9.07
Sales to IC ex cash		3.34	3.27	3.40	3.30	3.43	3.59
Total ROIC ex cash		11.4%	15.4%	1.7%	12.8%	14.2%	15.6%
NOPAT to sales	3.9%	3.4%	4.7%	0.5%	3.9%	4.1%	4.4%
Sales to NOWC		3.06	2.72	3.23	4.06	4.14	4.13
Sales to NFA		7.87	7.32	7.42	7.21	7.98	9.07
Sales to IC		2.20	1.98	2.25	2.60	2.73	2.84
Total ROIC		7.5%	9.4%	1.1%	10.1%	11.3%	12.3%
NOPAT to sales	3.9%	3.4%	4.7%	0.5%	3.9%	4.1%	4.4%
Sales to EOY NWC	5.87	5.97	5.91	5.89	5.76	5.71	5.56
Sales to EOY NFA	8.36	7.69	7.05	6.92	6.84	8.50	8.70
Sales to EOY IC ex cash	3.45	3.36	3.21	3.18	3.13	3.42	3.39
Total ROIC using EOY IC ex	13.3%	11.4%	15.2%	1.6%	12.1%	14.1%	14.7%
NOPAT to sales	3.9%	3.4%	4.7%	0.5%	3.9%	4.1%	4.4%
Sales to EOY NOWC	3.28	2.97	2.54	3.66	4.09	3.84	3.98
Sales to EOY NFA	8.36	7.69	7.05	6.92	6.84	8.50	8.70
Sales to EOY IC	2.36	2.14	1.87	2.39	2.56	2.65	2.73
Total ROIC using EOY IC	9.1%	7.3%	8.8%	1.2%	9.9%	10.9%	11.9%
ROE							
5-stage							
EBIT / sales		3.9%	5.1%	4.1%	4.5%	4.8%	5.0%
Sales / avg assets		1.47	1.35	1.47	1.61	1.69	1.77
EBT / EBIT		87.9%	93.8%	91.0%	88.7%	89.3%	91.8%
Net income /EBT		87.5%	92.0%	12.1%	86.2%	87.0%	87.0%
ROA		4.4%	6.0%	0.7%	5.5%	6.2%	7.1%
Avg assets / avg equity		1.97	1.93	2.01	2.20	2.27	2.20
ROE		8.7%	11.5%	1.3%	12.2%	14.2%	15.5%
3-stage							
Net income / sales		3.0%	4.4%	0.5%	3.4%	3.7%	4.0%
Sales / avg assets		1.47	1.35	1.47	1.61	1.69	1.77
ROA		4.4%	6.0%	0.7%	5.5%	6.2%	7.1%
Avg assets / avg equity		1.97	1.93	2.01	2.20	2.27	2.20
ROE		8.7%	11.5%	1.3%	12.2%	14.2%	15.5%
Retention Ratio		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Sustainable Growth Rate		8.7%	11.5%	1.3%	12.2%	14.2%	15.5%

Appendix 8: Cash Flow Statement

Cash Flow Statement	2011	2012	2013	2014	2015E	2016E
Cash from Operatings (understated - depr'n added to net assets)						
Net income	143,138	237,011	54,628	51,821	52,793	76,832
Change in Net Working Capital ex cash	(67,213)	141,759	(193,710)	6,818	25,272	7,859
Cash from operations	$75,925	$378,770	($139,082)	$58,639	$78,066	$84,691
Cash from Investing (understated - depr'n added to net assets)						
Change in Net PP&E	(130,420)	(135,057)	149,146	190,236	(43,561)	164,613
Change in Marketable Securities	1,026	99,508	0	0	0	0
Cash from investing	($129,394)	($35,549)	$149,146	$190,236	($43,561)	$164,613
Cash from Financing						
Change in Debt	(10,715)	(57,851)	135,000	158,412	160,000	(40,000)
Change in Other liabilities	2,389	70,464	(17,452)	(60,676)	0	0
Change in Par and Paid in Capital	19,913	34,100	30,349	517	0	0
Change in Other Equity	12,971	(19,743)	(7,629)	(62,663)	0	0
Share Buyback	(109,466)	(305,235)	(100,504)	(272,049)	(150,000)	(90,000)
Dividends	(60,956)	(57,634)	(61,923)	(57,362)	(51,973)	(49,093)
Change in RE ex NI and Dividends	(33,928)	67,313	(3,696)	(56)	0	(0)
Cash from financing	($179,792)	($268,586)	($25,855)	($293,877)	($41,973)	($179,093)
Change in Cash	(233,261)	74,635	(15,791)	(45,002)	(7,469)	70,210
Beginning Cash	826,353	583,495	643,505	600,116	520,708	513,239
Ending Cash	$593,092	$658,130	$627,714	$555,114	$513,239	$583,450

Appendix 9: 3-stage DCF Model

3 Stage Discounted Cash Flow							
	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	9.87%	11.55%	10.00%	10.00%	10.00%	10.00%	10.00%
NOPAT / S	4.13%	4.35%	4.48%	4.61%	4.74%	4.87%	5.00%
S / NOWC	4.24	4.31	4.31	4.31	4.31	4.31	4.31
S / NFA (EOY)	8.50	8.70	8.70	8.70	8.70	8.70	8.70
S / IC (EOY)	2.83	2.88	2.88	2.88	2.88	2.88	2.88
ROIC (EOY)	11.69%	12.54%	12.92%	13.29%	13.67%	14.04%	14.42%
ROIC (BOY)		13.73%	14.21%	14.62%	15.03%	15.44%	15.86%
Sales	$ 3,476,760	$ 3,878,163	$ 4,265,979	$ 4,692,577	$ 5,161,835	$ 5,678,019	$ 6,245,821
Sales Growth	*9.9%*	*11.5%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*	*10.0%*
NOPAT	143,677	168,700	191,116	216,328	244,671	276,520	312,291
Growth		17.4%	13.3%	13.2%	13.1%	13.0%	12.9%
- Change in NOWC	46,347	79,556	89,940	98,934	108,828	119,711	131,682
NOWC EOY	819,847	899,403	989,344	1,088,278	1,197,106	1,316,816	1,448,498
Growth NOWC		9.7%	10.0%	10.0%	10.0%	10.0%	10.0%
- Chg NFA	(53,561)	36,735	44,577	49,034	53,938	59,331	65,265
NFA EOY	409,031	445,766	490,342	539,377	593,314	652,646	717,910
Growth NFA		9.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Total inv in op cap	(7,215)	116,292	134,517	147,969	162,765	179,042	196,946
Total net op cap	1,228,877	1,345,169	1,479,686	1,627,655	1,790,420	1,969,462	2,166,408
FCFF	150,892	52,408	56,599	68,359	81,906	97,478	115,345
% of sales	4.34%	1.4%	1.3%	1.5%	1.6%	1.7%	1.8%
Growth		-65.3%	8.0%	20.8%	19.8%	19.0%	18.3%
- Interest (1-tax rate)	13,392	10,408	10,408	10,408	10,408	14,280	14,280
Growth		-22.3%	0.0%	0.0%	0.0%	37.2%	0.0%
+ Net new debt	(90,000)	6,000	-	-	-	100,000	-
Debt	262,857	268,857	268,857	268,857	268,857	368,857	368,857
Debt / tot net op capital	0.21	0.20	0.18	0.17	0.15	0.19	0.17
FCFE w debt	47,500	48,000	46,191	57,951	71,497	183,198	101,065
% of sales	1.4%	1.2%	1.1%	1.2%	1.4%	3.2%	1.6%
Growth		1.1%	-3.8%	25.5%	23.4%	156.2%	-44.8%
/ No Shares	29,465	28,705	28,705	28,705	28,705	28,705	28,705
FCFE	1.61	1.67	1.61	2.02	2.49	6.38	3.52
Growth		3.7%	-3.8%	25.5%	23.4%	156.2%	-44.8%
* Discount factor	88.3%	77.9%	68.8%	60.7%	53.6%	47.3%	41.7%
Discounted FCFE	1.42	1.30	1.11	1.23	1.33	3.02	1.47
Third Stage							
Terminal value P/E							
Net income	130,285	158,292	180,708	205,920	234,263	262,240	298,011
% of sales	3.7%	4.1%	4.2%	4.4%	4.5%	4.6%	4.8%
EPS	4.42	5.51	6.30	7.17	8.16	9.14	10.38
Growth		24.7%	14.2%	14.0%	13.8%	11.9%	13.6%
Terminal P/E							15.81
* Terminal EPS							10.38
Terminal value							164.14
* Discount factor							0.42
Discounted terminal value							68.48

Summary (using P/E multiple for terminal value)		
First stage	$2.73	Present value of first 2 year cash flow
Second stage	$8.15	Present value of year 3-7 cash flow
Third stage	$68.48	Present value of terminal value P/E
Value (P/E)	**$79.36**	

Appendix 10: EMS Industry Margins, Geographic and Market Segments

	TEL	IPGP	JBL	SANM	FN	KEM	MEI	BHE	TTMI	CTS	PLXS
Market cap	31.8B	5.1B	5.1B	2.2B	2B	1.28B	1.3B	1.2B	1.3B	0.8B	2.2B
Gross Margin	33.0%	55.5%	7.6%	7.2%	11.5%	35.1%	26.3%	9.5%	11.6%	31.8%	9.6%
EBITDA Margin	22.3%	40.9%	6.1%	6.1%	9.9%	21.9%	19.0%	5.0%	11.1%	15.8%	6.5%
EBIT Margin	17.5%	35.4%	3.0%	3.7%	8.1%	17.7%	14.6%	2.8%	2.7%	10.5%	4.8%
Net Margin	18.5%	27.7%	1.1%	1.7%	8.1%	11.7%	10.5%	1.3%	0.5%	2.4%	4.6%
Geographic Sources of Sales											
AMER	28.4%	14.0%	31.8%	51.1%	47.1%	24.4%	65.3%	69.5%	49.5%	67.1%	40.7%
APAC	34.0%	57.8%	57.0%	34.0%	38.4%	52.7%	14.3%	17.3%	30.0%	23.5%	50.0%
EMEA	37.6%	28.2%	11.2%	14.9%	13.9%	22.8%	20.4%	13.2%	20.5%	9.4%	9.4%

	TEL	IPGP	JBL *	SANM **	FN	KEM	MEI	BHE	TTMI	CTS	PLXS
Segment 1	Transport Solutions (59%)	Laser production and solutions (100%)	EMS lower-margin high volume (61%)	Integrated MFG solutions (80%)	Optical Communi-cations (75%)	Solid Capacitors (67.7%)	Automo-tive (73.4%)	Other (42%)	Printed Circuit Board (92%)	Transpor-tation (63.8%)	Healtcare/ Life Sciences (36%)
Segment 2	Industrial (25%)		Diversified MS lower-volume high margin (39%)	Componen ts, products and services (20%)	Lasers, Sensors, and Other (25%)	Electro-magnetic sensors, and actuators (17.4%)	Industrial (20.8%)	Computing (23%)	Electro-mechanical Solutions (8%)	Industrial (18.5%)	Industrial/ Commeric al (32%)
Segment 3	Communi-cations (13%)					Film and Electrolyti c (14.9%)	Interface (5.7%)	Industrials (19%)		Medical (8.6%)	Communi-cations (16%)
Segment 4							Medical (0.1%)	Aerospace and Defense (16%)		Other (9.1%)	Defense/ Aerospace (15%)

*Major industries served according to website: Automotive/ Transportation, Defense/ Aerospace, Networking/ Communications, Healthcare

**Major industries served according to website: Medical Systems, Communications, Defense/ Aerospace, Industrial, Energy, Computing, Automotive, Oil and Gas.

Source: Company Reports, FactSet

Recommendation: Sell				
Current Price	**$53.85**	---	Ticker	PLOW
1 Year Bear	$41.00	*-23.9%*	Sh. Out. (M)	22.8
1 Year Base	**$46.00**	***-14.6%***	M.Cap. ($M)	1,228
1 Year Bull	$54.00	*0.0%*	EV ($M)	1,535

Industrial, Work-Truck Attachments & Solutions

Douglas Dynamics

Price History

	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	161%	58.8%	41.5%	48.9%	52.2%	21.0%	1.7%

Financials

	2015	2016	2017	2018	2019	2020E	2021E
Sales($M)	**400**	**416**	**474**	**524**	**560**	**603**	**634**
Gr.%	*31.9%*	*4.0%*	*14.1%*	*10.4%*	*6.9%*	*7.7%*	*5.1%*
Cons.	-	-	-	-	-	*4.0%*	*4.0%*
Ind.	*8.3%*	*6.4%*	*6.0%*	*2.3%*	*6.3%*	*7.0%*	*4.2%*
EPS	**$1.95**	**$1.50**	**$2.33**	**$1.88**	**$2.22**	**$2.38**	**$2.50**
Gr.%	*3.2%*	*(12%)*	*55.3%*	*(19%)*	*18.1%*	*7.2%*	*5.0%*
Cons.	-	-	-	-	-	*6.5%*	*9.0%*
Ind.	*4.0%*	*3.3%*	*4.6%*	*2.1%*	*5.3%*	*4.7%*	*4.2%*

Ratios

	2015	2016	2017	2018	2019	2020E	2021E
NPM	**10.9%**	**9.24%**	**11.5%**	**8.7%**	**9.1%**	**10.1%**	**10.5%**
v. Ind.	*8.2%*	*7.8%*	*8.1%*	*6.2%*	*6.9%*	*7.4%*	*7.5%*
ROE	*23.3%*	*18.2%*	*22.8%*	*16.6%*	*17.8%*	*16.8%*	*16.2%*
v. Ind.	*15.2%*	*16.1%*	*18.4%*	*13.6%*	*14.1%*	*13.3%*	*14.1%*
ROA	*8.5%*	*6.5%*	*8.1%*	*6.4%*	*7.7%*	*7.1%*	*6.6%*
v. Ind.	*6.8%*	*5.9%*	*6.7%*	*5.4%*	*6.2%*	*5.9%*	*5.4%*
A T/O	0.81	0.71	0.70	0.77	0.76	0.83	0.85
A/E	2.51	3.02	2.67	2.39	2.18	2.08	2.00

Valuation

	2015	2016	2017	2018	2019	2020E	2021E
P/E	10.80	19.66	15.64	18.81	19.68	22.91	21.85
v. Ind.	15.4	17.2	12.8	16.1	17.3	18.1	17.9
P/S	1.18	1.82	1.80	1.55	1.81	-	-
P/B	2.35	3.43	3.33	2.88	3.39	-	-
P/CF	8.34	10.82	12.87	14.01	18.53	-	-
EV/EBITDA	6.93	11.78	12.98	11.64	12.97	-	-
D/P	*44.8%*	*40.2%*	*40.2%*	*56.3%*	*49.1*	-	-

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Summary

I recommend a sell rating based. Although PLOW has developed a concentration in a profitable business segment and has a loyal customer base, I believe the stock's price is inflated beyond its intrinsic value. The stock has reached an all-time high, driven by solid sales growth, although EPS is only up 10% since 2015. PLOW has improved its operations and competitive advantages over the last few years, but it is fully reflecting its intrinsic valuation.

Key Drivers

- Average annual snowfall: PLOW's performance is reliant on the sale of snow and ice control equipment. Changes to yearly snowfall levels and climate can drastically affect the repurchasing cycle of its products.
- Capturing North American markets: PLOWs ability to fully capture North American markets in its Work-Truck Attachments and Solutions segments will substantially improve its overall sales.
- Organic Growth: The development of urban cities and societies within the snow-belt region states will expand the market for work truck attachments.
- Acquisitions and revenue diversification: PLOW's revenue is heavily reliant on the performance of snow and ice-related attachments. Diversifying products and growing the customer base through acquisitions will improve overall sales through cross-selling and reduce the risk of underperformance from uncontrollable factors.

Valuation

Based on a relative valuation approach, PLOW is overvalued in comparison to similar comps. DCF analysis yields a price of $46.28. A combination of these approaches suggests that PLOW is over-valued, as the stock is currently trading at $53.85.

Risks

- An adverse swing in snowfall levels could be detrimental to debt coverage, but the firm is actively paying down debt.
- Few public competitors make relative valuations less insightful.

Company Overview

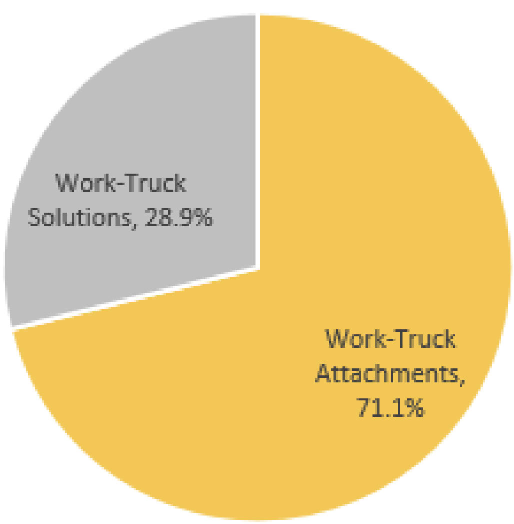
Douglas Dynamics (PLOW) is a manufacturer headquartered in Milwaukee, WI. PLOW's product portfolio consists of two segments: Work-Truck Attachments and Work-Truck Solutions. The attachments segment specializes in the production of snow and ice control attachments for light-duty and heavy-duty trucks. The Work-Truck Solutions segment produces work-truck up fitters and storage solutions, including truck bodies, shelving, and spreaders. PLOW's end-user base comprises of service businesses, municipalities, and direct consumers. Currently, PLOW has the most extensive distribution network in its segments, consisting of over 2,100 points of sale within the snow-belt region of the United States and Canada.

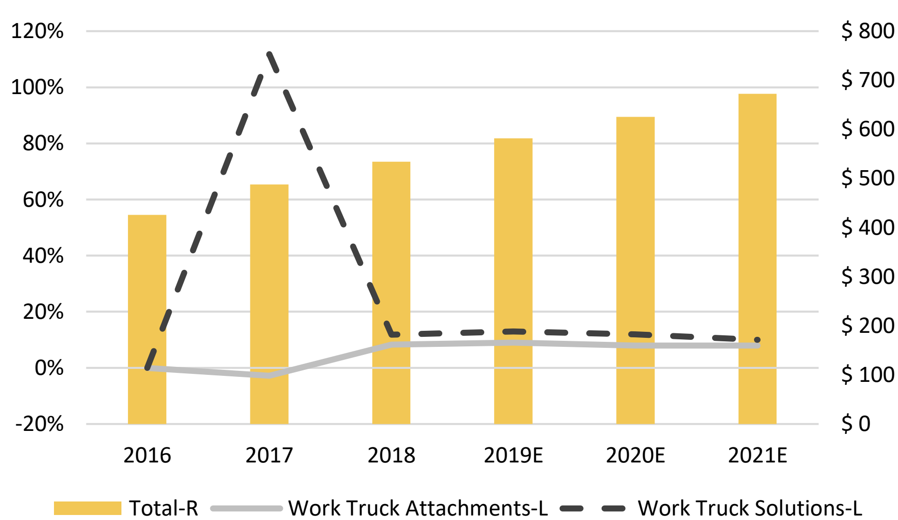
PLOW's revenue growth has been stable for the past three years. An acquisition of DEJANA in 2016 created new growth opportunities.

Douglas Dynamics generates revenue solely from its manufacturing operations in the Work-Truck Attachments and solutions segments, which makes up 71.1% and 28.9% of revenue, respectively. PLOW's manufacturing cost structure compliments this revenue distribution. PLOW's cost structure consists of a vertically integrated, high variable cost system. This structure reduces the downside risk of an underperforming work-truck attachment season-its primary revenue source. In addition, PLOW's workforce comprises primarily of seasonal employees, allowing management to staff production plants as the manufacturing season begins. PLOW's manufacturing plants can withstand a sudden influx of customer demand from underestimated or unexpected snowfall levels. The Company's average growth rates through the prior ten years was 11% and, over the last five years was 21%. PLOW's sales performance is the main driver of EPS growth.

- The work-truck attachment products are under the Fisher, Henderson, Snowex, and Western brands. This segment is subdivided into light-duty and heavy-duty truck attachments. The heavy truck sub-section is specialized in snowplows used by municipalities. These products are sold primarily to professional snow plowers with contracts to control snow and ice on commercial, residential, and municipal property. Furthermore, this segment's long-term sales are predictable since the end-user repurchases equipment once their current equipment has reached its useful life.
- The work-truck solution products are under the DEJANA brand, a recently acquired truck and utility equipment company. The solutions segment consists of complementary products that are relevant to consumers in the Work-Truck Attachments segment. This segment's sales are divided into two customer types, dealers and over-the-counter stores. PLOW is recognizing long-term growth opportunities in this market due to technological advances.

Figures 1 & 2: 2018 segment revenue (% sales - left); segment revenue ($M) and YoY change in segment revenue (right)





Source: Company reports

Business/Industry Drivers

Though several factors may contribute to Douglas Dynamic's future success, the following are the most critical business drivers:

1) Annual snowfall levels
2) Capturing the North America market
3) Organic growth
4) Acquisitions and revenue diversification

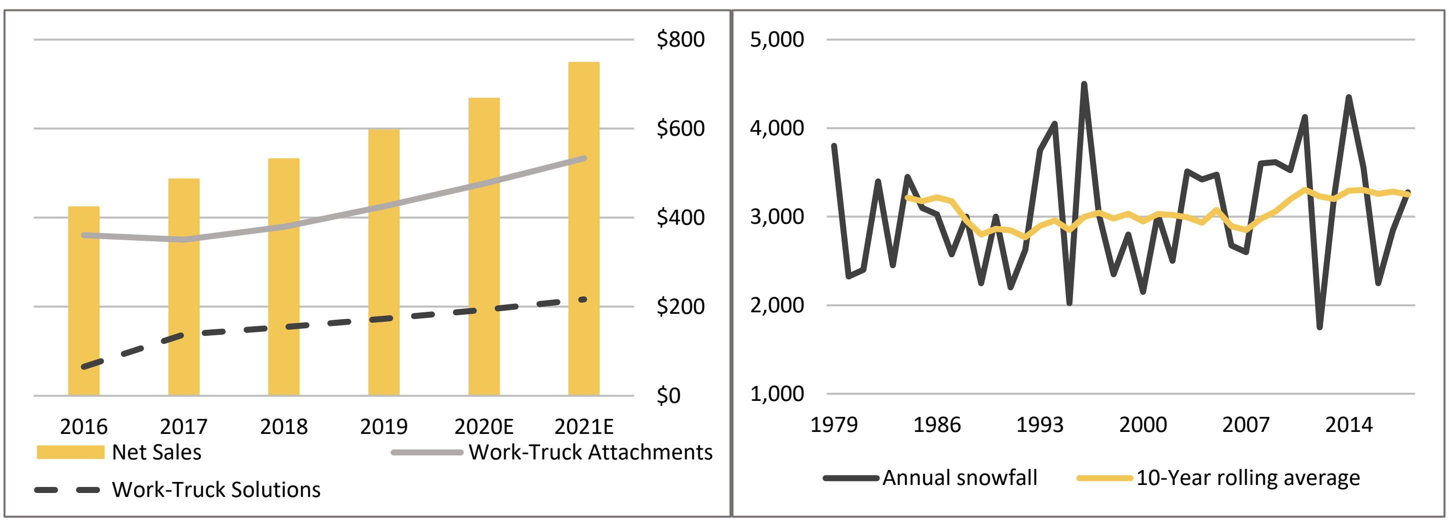
<u>Annual snowfall levels</u>

The level, timing, and location of snowfall influences the replacement cycle of work-truck attachment products.

Work-truck attachment products are repurchased on a predictable pattern that follows a nine to twelve-year useful life span. Snowfall levels inversely influence this replacement cycle. A season consisting of above-average snowfall throughout the United States increases the usage of snow-plows, which accelerates the equipment's replacement rate. A season consisting of below-average snowfall levels ultimately delays the replacement of equipment. Overall, abnormal snowfall levels have a short-term influence on sales. As now-fall levels return to the historical averages of 2,782 inches – 3,345 inches per year, attachment sales return to its typical replacement schedule.

While snowfall levels are important for sales PLOW's municipal consumers, consumers of the Henderson brand, repurchase heavy-duty truck attachments on a specific replacement cycle. The predictability of municipal replacement schedules creates stable cash flow even in consecutive seasons of low snowfall levels. Figure 4 shows that the ten-year rolling snowfall levels have rebounded since 2007 and have oscillated around the 3,200 inches level.

Figure 3 & 4: Annual sales by segment ($M - left), Annual snowfall levels (Inches - right)



Source: Company reports, National Oceanic and Atmospheric Administration's National Weather Service

Sales performance driven by snowfall levels affect sales in the subsequent year

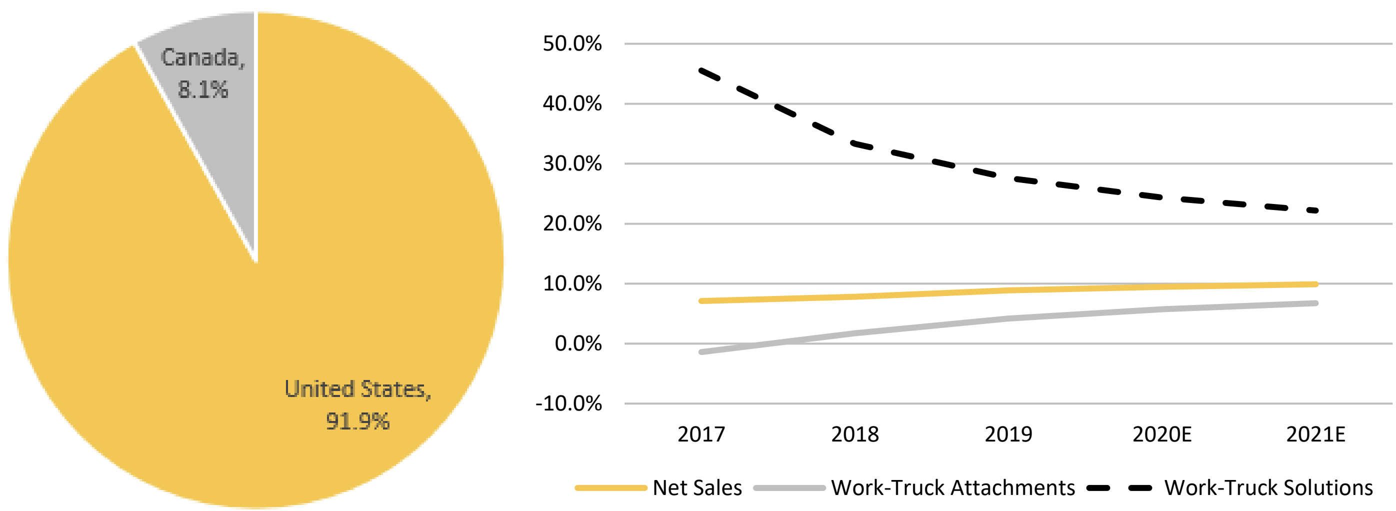
While high snowfall boosts sales, increased sales are recognized in the subsequent year. This delay is due to the increased wear and usage of equipment during the period of increased snowfall. As climate change affects the snow-belt region states, snowfall levels have adjusted more unpredictably. Average temperatures have risen over 100 years, but snowfall levels have not fallen. Precipitation levels have incidentally increased while temperatures have risen. This climate adjustment is causing an increased number of snowfalls and is recognized after 2007 in figure 4. This information makes long-term growth of PLOW's sales from increased snowfall levels incrementally noticeable.

Capturing North American markets

PLOW leads the U.S market in Work-Truck Attachments, more specifically snow and ice control attachments

Currently, PLOW generates 91.9% of its operating income within the United States. PLOW dominates the North American snowplow market with its best-in-class equipment, low operating leverage, and customer-orientated service model. Management wants to grow its market share in certain cities of North America that PLOW holds less than 50% share. Increasing market share will provide PLOW with increased opportunity to cross-sell products from its complementary segments. Based on PLOW's extensive distribution network, PLOW can retain a significant proportion of the North American market while expanding its presence in areas of increased competition.

Figure 5 & 6: 2018 Annual sales by region (left); 5-year sales CAGR (right)



Source: Company reports

In addition to the US markets, PLOW has recently developed an interest in the Canadian market. 8.1% of PLOW's revenue is attributed to the Canadian market. This could grow significantly, as it is based on only one year of operations. Canada's historical climate and lower temperatures match PLOW's typical market characteristics. Expanding points of sale into this market has significant upside potential.

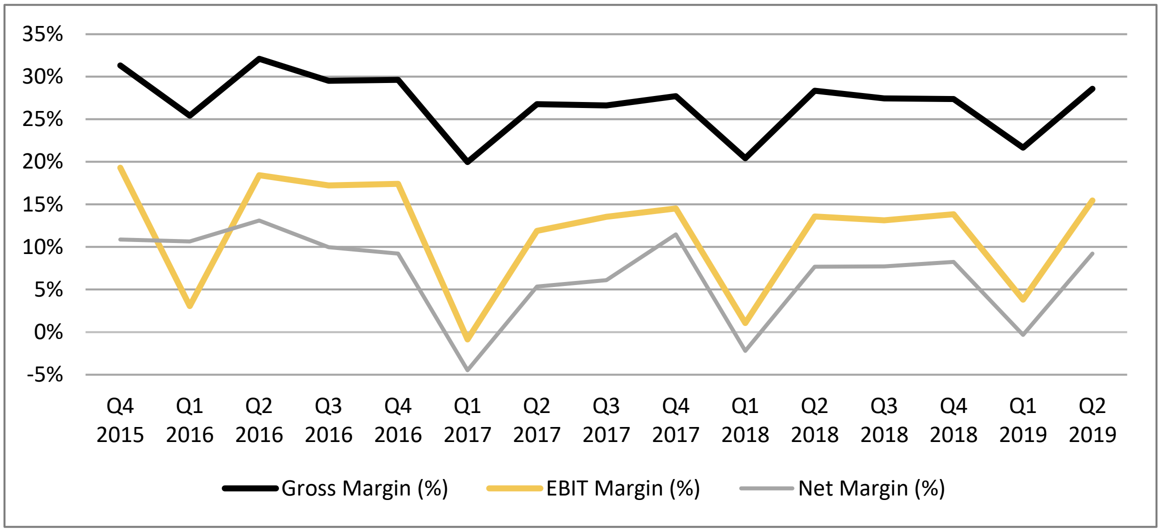
PLOW's net sales growth is close to 10% in recent and forecasted years

PLOW's main operating segment, Work-Truck Attachments, has a shortlist of direct, notable competitors. As of today, PLOW's direct competition in this segment includes three privately-owned companies. These direct competitors have an average revenue of $9.4 million. PLOW's annual revenue in the work-truck attachment segment dwarfs the competition's captured market as its sales are near $700 million.

PLOW's lean manufacturing cost structure and seasonal workforce has proven to be optimal for the seasonality of snow equipment manufacturing. A focus on decreasing the downside risk has made PLOW able to compete within this market on a large scale. Also, when material prices such as steel or petroleum increase, PLOW has had a successful history of maintaining margins by adjusting market prices of products to match or cut below the competition. This strategy provides a strategy for low snowfall years, material price increases, and poor macroeconomic climates. Overall, PLOW's cost structure and revenue strategy keep it strong by mitigating the downside risks associated with its main operating segment.

Q1 of PLOW's operating cycle is the worst performing quarter due to the timing of customer orders

Figure 7: Gross margins, EBIT margins, and net margins seasonality



Source: Company reports

Organic Growth

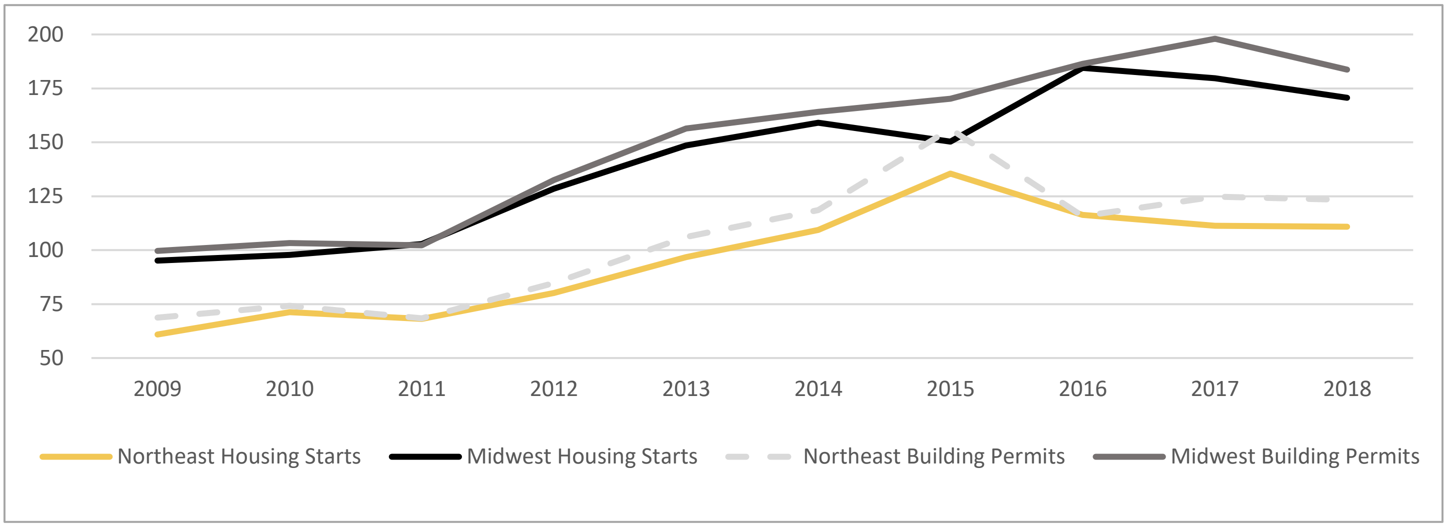
Expansion of suburban and urban areas increases the need for service companies, such as plumbing, electrical, and snow removal, which are consumers of PLOW's products

The key driver to organic sales growth within North America is the expansion of urban development and population growth. As cities develop into urban classifications, infrastructural development increases the demand for snow and ice control equipment. The increase in organic demand is divided between residential, contractual, and municipal consumers.

The population in the Midwest and Northeast are growing at 0.1% and 0.3% respectively. Although this is low growth in comparison to the south/west, there is still development of the urban and suburban areas in these regions. The development of suburban roads will increase the need for snow and ice removal services, which ultimately increases the rate of replacement and demand of PLOW's work-truck attachments.

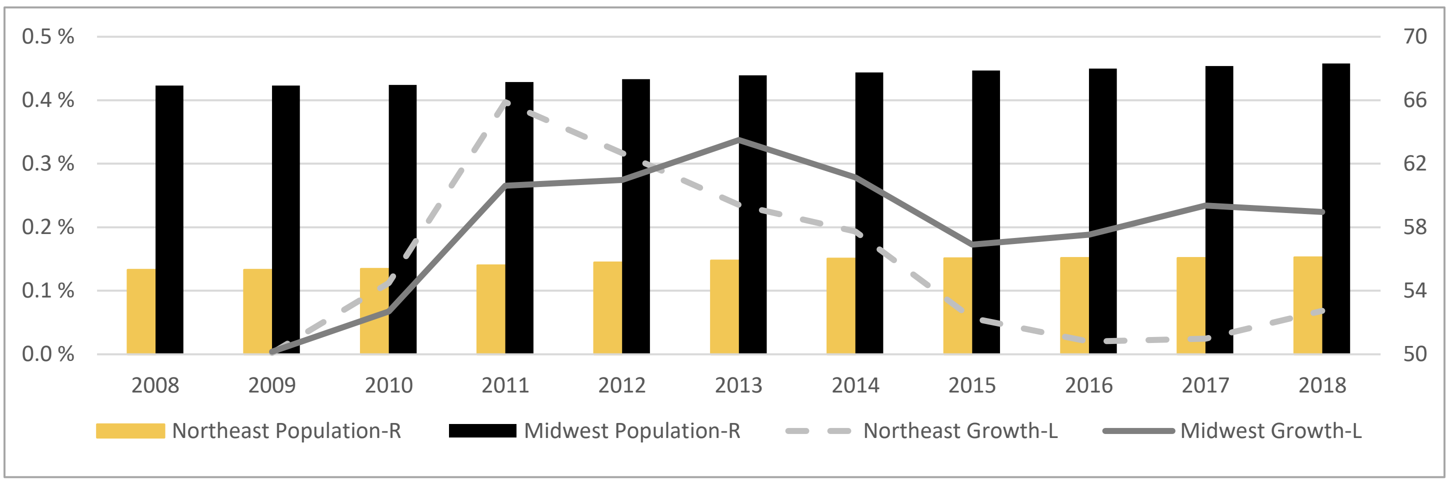
Also, the Work-Truck Solutions segment will grow from increased demand for contractual services needed in renovated and newly constructed areas. Construction necessities that are part of PLOW's Work-Truck Solutions segment, which was acquired in 2016, incudes dump bodies, electrical service trucks, and plumbing service vehicles. This segment benefits from a growth in sales by the increased development in all regions of the U.S., not just snow-belt regions. Contractual services are needed for renovations and new construction.

Figure 8: Building Permits and Housing Starts (000s) by Region



Source: US Census, IMCP

Figure 9: Population (Millions) and absolute population growth per year



Source: US Census, IMCP

Acquisitions & revenue diversification

PLOW's recent acquisitions are a major EBITDA and revenue growth driver

Over the past decade, PLOW has utilized acquisitions to accelerate revenue growth beyond its slow organic rate and to diversify revenue from uncontrollable factors. The most recent, relevant acquisitions include Henderson Products LLC in 2014 and Dejana Truck and Utility Equipment, Inc. in 2016. Each of these acquisitions improved PLOWs valuation by either reducing risk or providing growth opportunities for both segments.

Henderson acquisition introduced PLOW to the municipal market; market cyclicality or snowfall levels do not adversely affect these products' replacement cycle as significantly as the light-duty truck sub-sector. Its products focus on heavy to medium-duty trucks. As noted earlier, municipalities repurchase snow and ice control equipment and vehicles on a specified replacement cycle. This acquisition diversifies PLOW revenue from economic trends, but also annual snowfall. New acquisition targets that contain similar traits to Henderson will improve PLOW's revenue growth and lower its volatility.

Figure 10: Recent Acquisitions

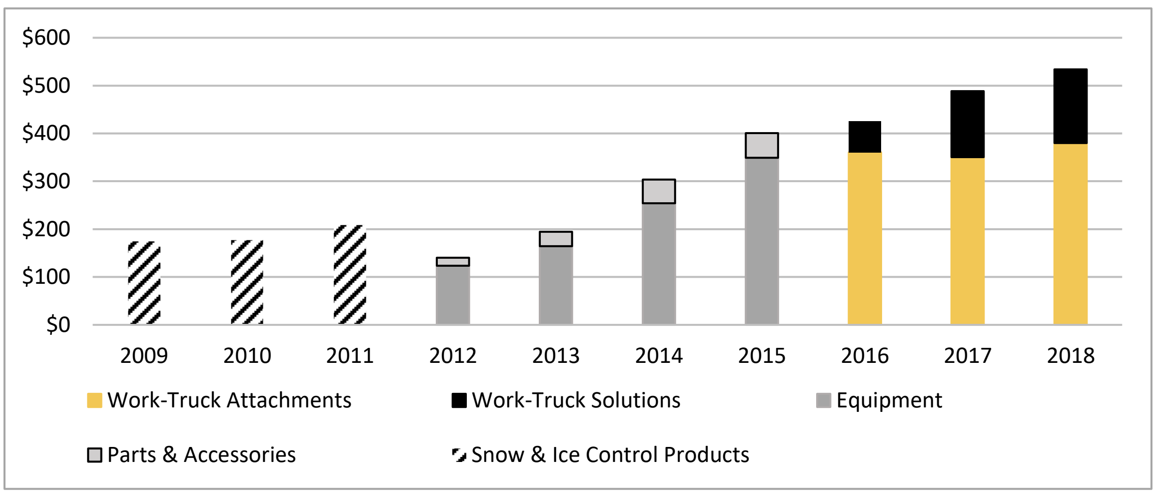
Close Date	Target	Price (Millions)	EV/Sales
May 1st, 2017	Arrowhead Equipment, Inc.	$7	-
July 18th, 2016	Dejana Truck & Utility Equipment Co., Inc.	$206	-
December 31st, 2014	Henderson Products, Inc.	$95	1.3
May 6th, 2013	Trynex, Inc.	$33	-

Source: Factset

In addition to Henderson, PLOW's acquisition of Dejana improved the company's risk. Dejana specializes in work-truck equipment manufacturing that improves the efficiency and production of service companies by innovating work-truck storage areas and equipment usage. Since the acquisition, the solutions segment has outpaced the attachments segment in annual growth. PLOW's diversification into sub-sectors of work-truck improvement manufacturing could lead to additional long-term customer acquisitions. PLOW's current customer base has proven loyal to brands under PLOW. A typical customer repurchases products from the Work-Truck Attachments and Work-Truck Solutions segment. Overall, venturing deeper into the solutions segment could prove promising for short-term free cash flow and EBITDA, but also develop a more extensive, reliable customer base.

Each of PLOW's acquisitions contained unique synergies with PLOW's operations that have improved revenue year to year

Figure 11: Sales by operating segment, including discontinued segments (Millions)



Source: Factset

<u>Competitor Analysis</u>

PLOW's main segment, Work-Truck Attachments, is a niche market with little competition from both privately owned and publicly traded companies. In this segment, PLOW mainly competes with BOSS's snowplows, a Michigan based, private snowplow manufacturer. BOSS and PLOW compete for a majority of the snowplow market for snowplows meant for class D sized vehicles (trucks, SUVs, Etc.). PLOW is the leading manufacturer in municipal snowplows. The company captures this municipal market under its "Henderson" brand, which focuses solely on the manufacturing of snowplows for medium to large trucks. Within Work-Truck

Attachments, snow & ice control attachments such as salt spreaders compete against a similar mix of manufacturers. BOSS is the primary competitor and shares a majority of the niche market with PLOW

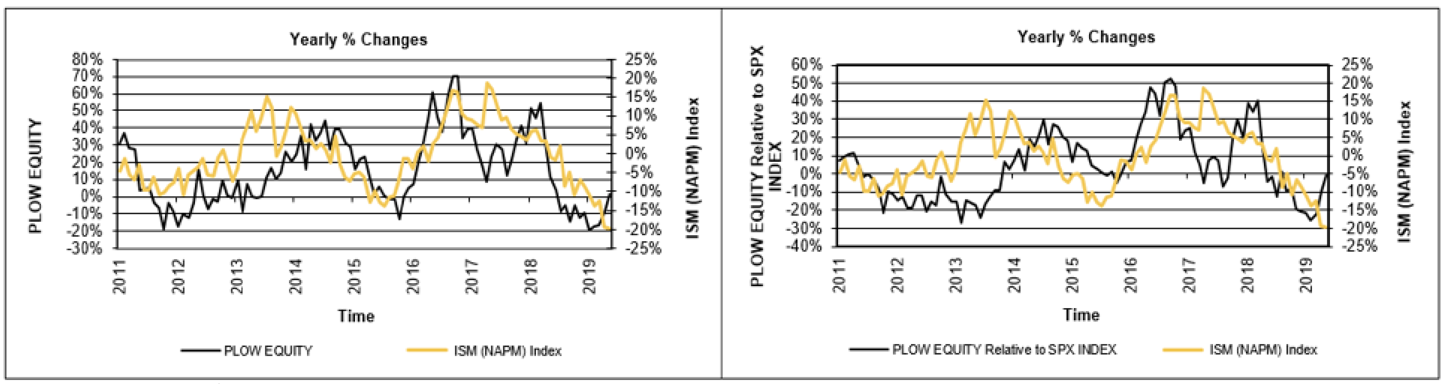
In PLOW's other segment, Work-Truck Solutions, the Company competes against a more diverse group of companies. This segment ranges from interior storage solutions to truck bodies capable of transporting and hoisting over 1,000 lbs. of materials. Again, most of this segment is comprised of privately held companies.

Palfinger AG is an Australian based manufacturer of hydraulic lifts, dump bodies, and handling cranes. These products are in direct competition with a portion of PLOW's Work-Truck Solutions segment. Palfinger leads PLOW in this market with $381MM in revenue in the U.S. compared to roughly $200MM for PLOW

Macroeconomic Trends

In comparison to the broad market, PLOW is unique in its price-performance relative to certain market trends. In comparison to the market, PLOW has a five-year beta of 0.92, but a beta of 1.42 to the ISM manufacturing survey. While demand should be based on replacement needs and snowfall levels, it appears the stock still trades with ebbs and flows of macroeconomic manufacturing trends. There is a slight deviation between the impact of the ISM and PLOW's price change, but the stock is relatively correlated to the survey's score.

Figure 12 & 13: ISM Compared to PLOW (Left) & ISM Compared to PLOW Relative to SP500 (Right)

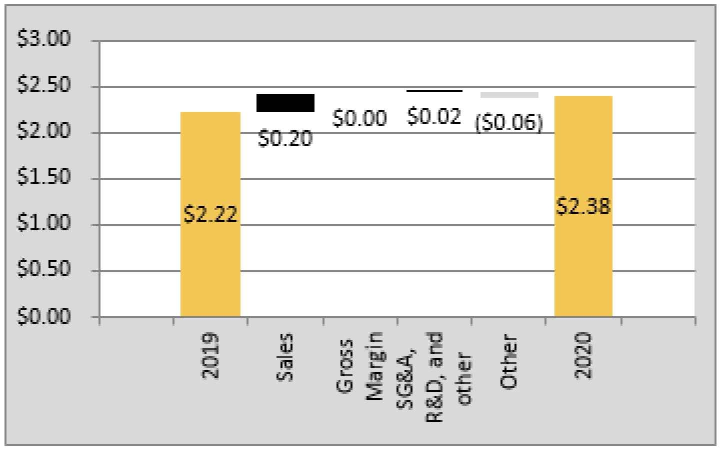


Source: IMCP, ISM Index

Financial Analysis

I estimate that PLOW's EPS will grow to $2.38 per share in 2020. EPS will grow $0.20 due to sales growth. Increased preorders in Q2 and increased sales in Q3 2019 will be the main periods for earning growth. This revenue will be recognized in early 2020. The Company's market and market share is expanding favorably in its direction due to adjustments in the U.S's climate and brand loyalty in its niche market. Q1 of 2019 provided PLOW ideal climate conditions and increased snow and ice presence in snow-belt region states. Consumers of PLOW's equipment had higher than expected usage, which increased preorders through Q2 of 2019. It will then flow into Q4 revenue recognition. I anticipate gross margins remaining consistent with revenue growth. PLOW's variable cost structure is unlikely to increase on a per-unit basis. SG&A & R&D will increase EPS by $0.02 in 2020 as the company repays debt. Other income/expenses will decrease earnings by $0.06 per share. PLOW is persistent with paying down long-term debt in years with increased free cash flow. 2019 has already proved to be a successful year for PLOW and should lead to leftover cash to be used on outstanding debt.

Figure 14: Quantification of 2020 EPS Driver



Source: Company Reports, IMCP

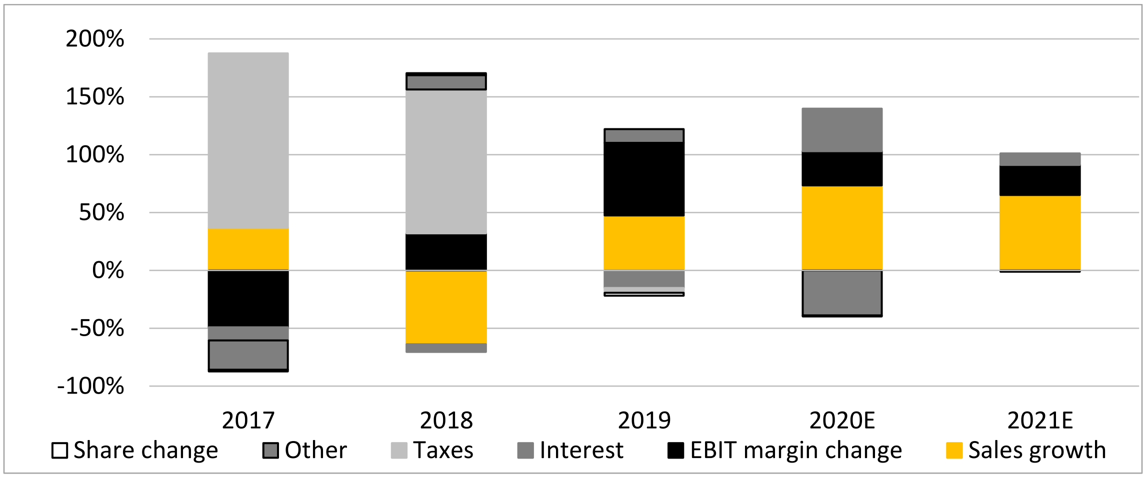
I expect 2021 earnings to grow by $0.12 to $2.50 a share. PLOW will increase revenue through further market penetration in the U.S and Canada markets. Management states that it is putting an emphasis on capturing a majority share of any urbanized cities of the U.S. where PLOW holds less than 50% of the market share. I also predict little change to gross margins as the cost structure of Douglas Dynamics will remain a variable cost centric structure. SG&A will remain constant as a percent of sales as it continues its 2020 operations and expense structure.

Figure 15: Quantification of 2021 EPS Drivers

Source: Company Reports, IMCP

Sales is the main driver in EPS growth in 2020 and 2021.

Figure 16: EPS Percent Impact



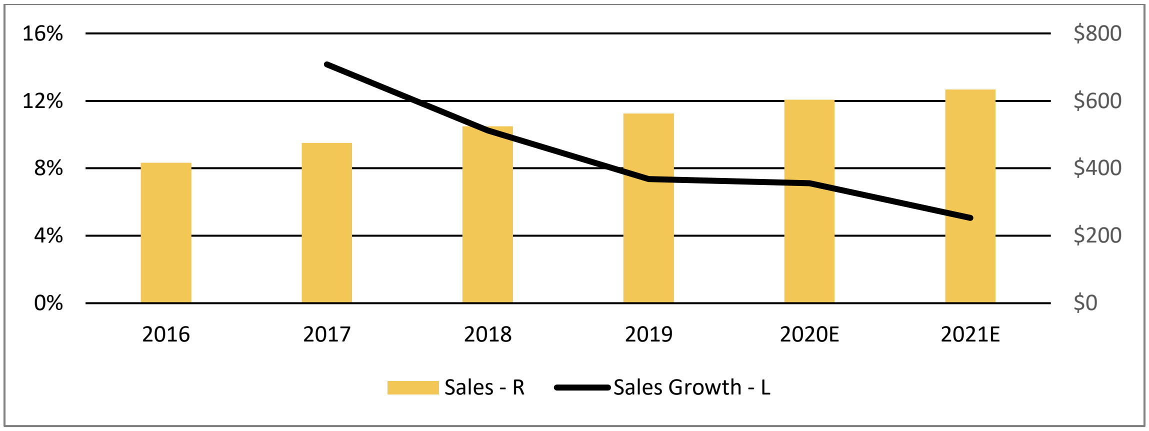
Source: Company Reports, IMCP

Revenues

Douglas Dynamics has increased sales revenue consistently from 2016-2019. However, growth is slowing in 2019. Consumers have persistent purchasing habits, and PLOW has expanded its customer base. Growth will continue, but at a slightly reduced rate. Organic sales growth is dependent on PLOW's ability to enter new markets and urban development in snow-belt regions. PLOW leads the snow and ice control market with products and brands that are well recognized and respected amongst the end-users. Beyond the company's expansion in North America, it is currently developing a strategy to penetrate foreign markets, primarily Europe. As of now, management has not stated a direct plan of action for international expansion but will be expected beyond 2021.

PLOW's sales grow by roughly $50MM annually.

Figure 17: Sales ($Millions - Right) & Sales Growth (% - Left)



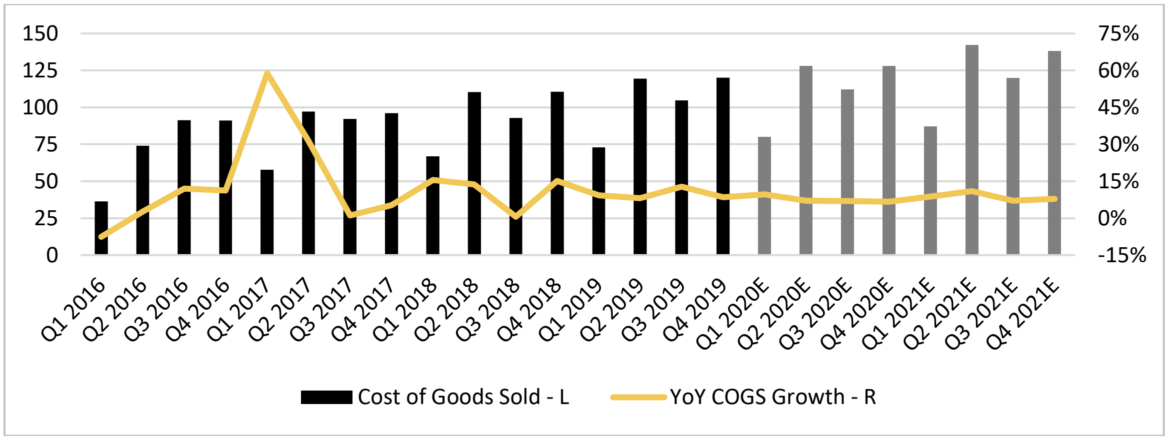
Source: Company Reports, IMCP

In 2019, PLOW's primary driver for revenue was enhanced pre-season orders and was the result of shortened replacement times on snowplows. Q4 2018- Q1 2019 snow season affected snow-belt region states more significantly than PLOW initially anticipated. Snowplow consumers increased usage of their equipment during this period and had to replace it earlier than they initially expected. Organic sales growth will rise to nearly 4%, depending on the amount of snowfall. However, PLOW's primary revenue segment is not mature. Although, after 2021, the firm's revenue growth will begin to flatten.

Cost of Sales and Gross Margins

PLOW operations have a variable cost structure focus. The company intentionally has low operating leverage to mitigate the risk of consecutive low snowfall levels. To do this, PLOW has seasonal employees and hires contracted employees for the busier times of production. Q1 of every fiscal year is the least active quarter. The firm witnesses declines of up to 50% of total revenues and cost of sales from the last quarter. In high sales quarters, Q2-Q4, PLOW sees a substantial increase in variable expenses. PLOW's YoY COGS growth stabilized within the 0.0 -10.0% range since Q3 2017 – Q4 2017. COGS mirror the firm's consistent sales growth. In projected years, I maintain PLOW's business cycle on a quarterly basis to reflect the industries fluctuating sales. I also anticipate YoY COGS growth to normalize around 6.0%, which is equal to my projected revenue growth rate throughout 2020-2021.

Figure 18: Cost of Sales ($Millions – Left) & YoY Cost of Sales Growth (% - Right)



Source: Company Reports, IMCP

2018 and beyond has a higher average cost of sales due to the increase in variable expenses from the company's Work-Truck Solutions segment. This segment requires more expenses per dollar and equates to a higher percentage of revenue. The cost of sales as a percent of revenue is roughly 67.8-70.4%.

Selling, General, & Administrative Expenses

As noted earlier, PLOW has low operating leverage. Management deliberating chose a high variable cost structure to reduce the risk of seasonal ordering. Since the company's orders are primarily in the Fall and Winter, there is immense performance pressure on those two seasons. The firm has actively worked to reduce fixed expenses by paying off debt prematurely. In previous years, PLOW prepaid large portions of long-term debt prematurely, and routinely does so in prosperous years. The SG&A expenses as a percent of revenue are typically 13.0%. In many cases, higher SG&A is attributed to increased labor expenses as a result of improved operations.

Figure 19: PLOW Operating Margin, 2018-2021E

	2018	2019	2020E	2021E
Sales	524,067	563,000	603,010	633,514
Cost of Sales	380,649	407,000	435,924	457,975
Gross Profit	$143,418	$156,000	$67,086	$75,539
Gross Margin	*27.4%*	*27.7%*	*27.7%*	*27.7%*
Operating Expenses				
Selling, General, & Administrative	70,858	71,000	73,620	75,443
Earnings Before Interest & Tax	$2,560	$5,000	$93,467	$ 100,095
Operating Margin	*13.8%*	*15.1%*	*15.5%*	*15.8%*

Source: Company Reports, IMCP

I expected gross margins to maintain their most recent trend. Management has made no inferences on changing its current expense structure. This expectation of consistent profitability flows into the Company's net income and EBITDA margins.

Return on Equity

PLOW has maintained a solid return on assets and equity in previous years. While sales rose quickly in 2017-2018, margins declined in 2018. Paying off debt prematurely is also causing ROE to decline, but it is a less risky ROE. The firm paid off $33MM in debt in 2018 and I expect it to payoff $43MM in 2019.

Figure 20: ROE Breakdown 2016-2021E

3-stage	2016	2017	2018	2019	2020E	2021E
Net income / sales	9.2%	11.5%	8.3%	9.3%	9.0%	9.0%
Sales / avg assets	0.71	0.70	0.77	0.82	0.79	0.74
ROA	6.6%	8.1%	6.4%	7.7%	7.1%	6.6%
Avg assets / avg equity	2.78	2.83	2.52	2.30	2.36	2.44
ROE	18.3%	22.9%	16.1%	17.8%	16.8%	16.2%

Source: Company Reports

Sales are the main driver in this Company's ROE. The products it manufacturers have a higher base sale price and are repurchased consistently. The Company is also exceptional at utilizing its assets to produce high levels of ROA.

PLOW's acquired HENDERSON brand focuses on large trucks primarily for municipalities and improved the firm's asset turnover.

While margins fell following its acquisition of the HENDERSON brand, PLOW's large truck snowplows, asset turnover has risen.

Free Cash Flow

PLOW has produced excellent free cash flow to the firm and equity in previous years. The Company's operating diligence has allowed the company to build its balance sheet and not take on additional debt for operating necessities. Net-working capital has maintained a stable position of roughly $130MM, which I project to increase slightly as sales revenue increase in 2020/2021. Net fixed assets are projected to rise slightly as the firm purchases new equipment or acquires new complementary products or companies. I distribute this increase in NFA between 2020 and 2021 to normalize any adjustments for the company's valuation. PLOW issued debt to complete the acquisition of Dejana, its Work-Truck Solutions segment, in 2016, which increased its NFA by $156MM and interest expense to $17MM in 2017. Since then, the company has reduced debt via prepayment following years of strong performance, such as 2018. I project more debt prepayment in subsequent years and have divided it between 2020 and 2021.

Figure 21: FCFF & FCFE

FCFF/FCFE						
Items	2016	2017	2018	2019	2020	2021
NOPAT	$44	$72	$57	$66	$71	$74
Growth	*-13.9%*	*62.4%*	*-20.8%*	*14.8%*	*7.8%*	*5.1%*
NWC*	113	121	129	135	139	146
Net fixed assets	490	487	477	490	511	537
Total net operating capital*	$603	$608	$606	$625	$650	$683
Growth	*41.5%*	*0.8%*	*-0.3%*	*3.1%*	*4.0%*	*5.1%*
- Change in NWC*	21	8	8	6	4	7
- Change in NFA	156	(3)	(10)	13	21	26
FCFF*	($132)	$67	$59	$47	$46	$41
Growth		*-150.7%*	*-12.3%*	*-20.4%*	*-1.8%*	*-9.9%*
- After-tax interest expense	5	17	13	14	14	15
FCFE**	($138)	$50	$46	$33	$32	$27
Growth		*-136.5%*	*-9.3%*	*-28.0%*	*-3.0%*	*-16.6%*
+ Net new debt/other cap	129	2	(35)	(5)	(12)	(12)
Sources of cash	($8)	$52	$10	$28	$20	$15

Source: Company Reports, IMCP

Overall, PLOW is projected to improve its financial stability, but FCFF/FCFE will not rise over the next two years as assets are expected to grow faster than NOPAT.

Valuation

PLOW was valued using multiples and a 3-stage discounting cash flow model.

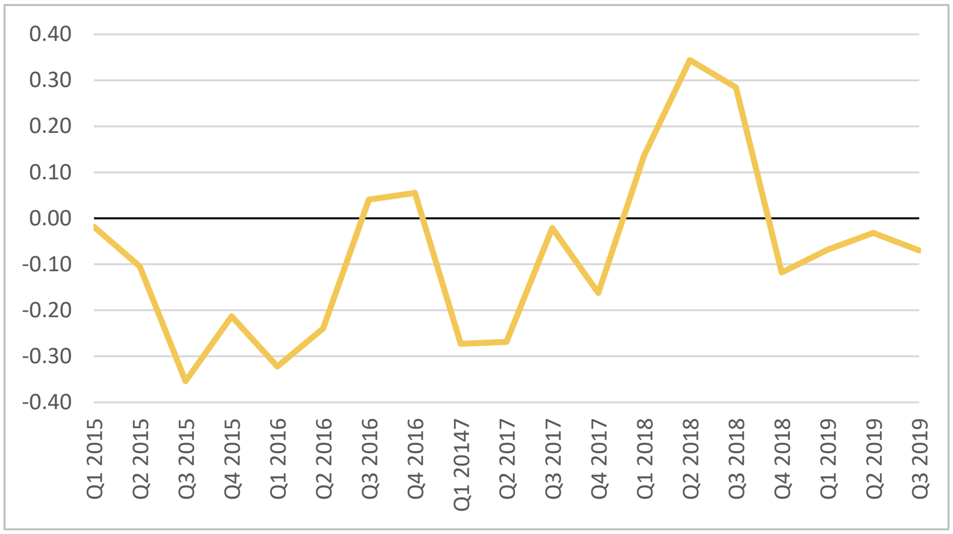
Trading History

Figure22 shows that PLOW normally trades at a discount to the S&P 500. An exception was in 2018, when it moved to a premium. The relative multiple generally follows a similar trend as relative margins.

The company's multiple is justified. Q1 & Q2 in 2016 and 2018 were two of the worst performing years in terms of sales revenue and sales growth. The stock factored in the added risk of the company not performing up to expectations, which occurred due to short-term volatility in the prior year snowfall levels and subsequent sales.

PLOW's Q1 & Q2 of 2016 and 2018 were the some of the worst performing quarters in company history in terms of sales revenue.

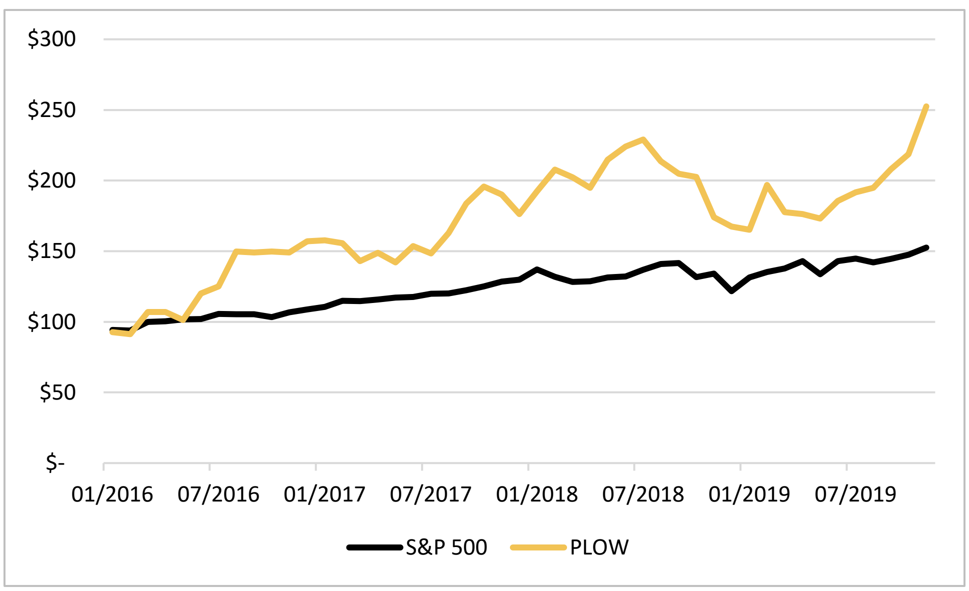
Figure 22: PLOW NTM Price/Sales Relative to S&P 500



Source: Factset

PLOW outperformed the S&P 500 by 100% since 2016. PLOW's stock recently moved higher due to Q2 and Q3 sales exceeding expectations from increase preorder sales. It is also trading at a 5-year and overall high. While sales are up 40% since 2015 through 2019, EPS has only risen 10%. The P/E nearly doubled to 20 in 2019 from 11 in 2015. While a 11 P/E multiple may have been low, a 20 P/E appears to fully reflect the firm's prospects.

Figure 23: PLOW and SP500 Index



Source: Factset

PLOW's current momentum boost has shifted the stock's price into a less favorable purchasing price. I expect it to reverse downwards in the upcoming months.

Public Comps

PLOW's valuation is difficult to calculate based on publicly traded peers. The company has a limited set of comparable companies. PLOW's main competitor, BOSS, is a privately owned company, so evaluating PLOW's main operating segment, Work-Truck Attachments, in relation to peers is not a viable source of analysis. As a result, I based PLOW's comparable companies on public traded companies that compete in specific products vs. in aggregate. This evaluation will prove to compare PLOW to other specialty manufacturers instead of comparing it to direct competitors.

Figure 24: Public Comps

		Current	Market	Price Change						Earnings Growth						
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr
PLOW	DOUGLAS DYNAMICS INC	$54.62	$1,245	2.2	2.4	24.1	45.5	51.3	52.2	15.0	7.8%	40.7%	15.2%	12.0%	9.5%	30.2%
DAN	DANA INC	$17.99	$2,589	3.0	1.8	21.4	7.6	28.4	32.0	4.0	84.8%	-78.6%	227.3%	-6.8%	14.2%	
PAL-AT	PALFINGER AG	$31.09	$1,169	2.2	2.4	9.1	2.2	20.6	26.4	19.9	1.8%	-8.6%	39.1%	-16.4%	2.1%	4.4%
TTC	TORO CO	$80.19	$8,548	1.3	3.2	8.6	16.8	38.6	43.5	10.0	29.9%	14.1%	2.5%	8.4%	0.7%	14.0%
Average			$3,388	$2	$2	$16	$18	$35	$39	12.2	31.1%	-3.4%	49.5%	-4.9%	3.0%	16.2%
Median			$1,917	$2	$2	$15	$12	$34	$38	12.5	18.8%	-5.0%	24.1%	-6.8%	2.1%	14.0%
sp50	S&P 500 STOCK INDEX	$3,142		0.3	1.8	4.7	8.9	19.1	25.3			-16.9%	17.6%			

		2019		P/E							2019	2019				EV/
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT
PLOW	http://www.douglasdynamics.com	18.2%	4.23	26.1	17.6	23.2	24.1	22.4	20.8	19.0	10.2%	2.38	8.3%	13.8%	8.2%	14.7
DAN	http://www.dana.com	26.0%	1.45	6.9	13.8	5.8	10.9	5.9	6.0	5.2	5.7%	0.32	5.2%	8.0%	14.5%	5.3
PAL-AT	http://www.palfinger.ag	17.6%	1.94	18.5	12.6	11.5	15.4	15.2	13.2	13.0	5.6%	0.61	3.6%	9.6%	5.7%	9.1
TTC	http://www.thetorocompany.com	31.4%	10.13	30.6	23.0	32.7	31.5	24.3	29.7	29.5	10.1%	3.26	10.4%	14.3%	28.6%	16.4
Average		23.3%	443.6%	20.53	16.73	18.30	20.49	16.92	17.41	16.65	7.9%	1.64	6.9%	11.5%	14.3%	11.4
Median		22.1%	308.6%	22.28	15.68	17.34	19.78	18.78	17.00	15.96	7.9%	1.50	6.8%	11.7%	11.4%	11.9
spx	S&P 500 INDEX			113.3	127.9	137.5										

Source: Factset, IMCP

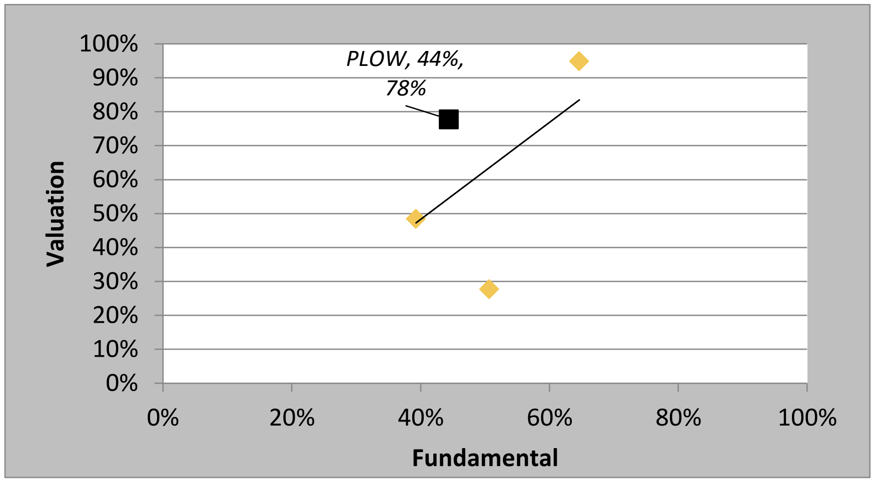
In comparison to other stocks, PLOW's price change was the most significant in the last year. The Company's price has seen tremendous momentum. PLOW's earnings growth potential has been a major diver in its price increase. Over the last five years, the Company's earnings growth has reached 30.2%. Amongst comparable companies, the next largest earnings growth is 14.4%. A significant portion of the Company's earnings growth has been due to its sales growth and gross margins of 27.7%%.

Figure 25: Comps Fundamental vs Valuation

					Fundamental Percent of Max				Valuation Percent of Max		
				Weight	25.0%	25.0%	25.0%	25.0%	50.0%	25.0%	25.0%
		Rank	Weighted			2019	Sales Growth				EV/
Ticker	Name	Diff	Fund	Value	NTM	ROE	NTM	Pst 5yr	P/S	P/CF	EBIT
PLOW	DOUGLAS DYNAMICS INC	1	44%	79%	9%	58%	11%	100%	73%	79%	90%
DAN	DANA INC	4	51%	28%	100%	83%	3%	17%	10%	59%	32%
PAL-AT	PALFINGER AG	3	39%	48%	2%	56%	51%	48%	19%	100%	56%
TTC	TORO CO	2	65%	95%	35%	100%	100%	23%	100%	79%	100%

Source: Factset, IMCP

Figure 25: Comps Fundamental vs Valuation (cont.)



Source: IMCP

As noted earlier, PLOW's public comparable stocks are not an accurate indication of its operating efficiencies compared to the market. In comparison to its most identical competitors, PLOW exceeded the standard in growth metrics such as sales growth and price to sales. Figure 25 indicates that positive operating performance graciously improves the company's valuation. When comparing the output of P/S, P/CF, and EV/EBIT based on the performance of NTM earning, ROE, and sales growth, valuation metrics exceeded the valuation improvements of PLOW comparable companies.

<u>Discounted Cash Flow Analysis</u>

A three-stage discounted cash flow model was also used to value PLOW.

For this analysis, the company's cost of equity was calculated to be 5.5% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.90%.
- A ten-year beta of 0.90 was utilized since the company has a lower risk than the market.
- A long-term market rate of return of 8% was assumed since, historically, the market has generated an annual return of about 8%.

Given the above assumptions, the cost of equity is 5.5% (1.92 + 0.90 (8.0 – 1.90)).

Stage One - The model's first stage discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $1.09 and $1.17, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $2.03 per share. Thus, stage one of this discounted cash flow analysis contributes $2.03 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin, and capital growth assumptions. The resulting cash flows are then discounted using the company's 5.5% cost of equity. I assume a 5.0% sales growth in 2022 through 2026. The ratio of NWC to sales will remain at 2021 levels, and NFA turnover will remain at 1.18. Also, the NOPAT margin is expected to decline from 11.75-10.05% as the market further develops competitors and squeezes PLOW's early stage leading position. Finally, after-tax interest is expected to maintain its current levels.

Figure 26: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	1.09	1.17	1.17	1.16	1.14	1.11	1.07
Discounted FCFE	*$1.02*	*$1.01*	*$0.95*	*$0.87*	*$0.80*	*$0.72*	*$0.65*

Source: IMCP

Added together, these discounted cash flows total $3.99.

Stage Three – Net income for the years 2017 – 2021 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $2.38 in 2020 to $2.89 in 2026.

Figure 27: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$2.38	$2.50	$2.67	$2.73	$2.79	$2.84	$2.89

Source: IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For this analysis, it is generally assumed that as a company grows larger and matures, it's P/E ratio will converge near to the historical average of the S&P 500. Therefore, a P/E ratio of 22.91 is assumed at the end of PLOW's terminal year. While this may be a high multiple at the end of 2026, one must consider what the market will price in today. A lower multiple may be better to calculate a fair value, but the stock will likely trade above this value because the market will be slow to price in PLOW's future earning potential

Given the assumed terminal earnings per share of $2.89 and a price to earnings ratio of 22.91, a terminal value of $66.32 per share is calculated. Using the 5.5% cost of equity, this number is discounted back to a present value of $40.27.

Total Present Value – given the above assumptions and utilizing a three-stage discounted cash flow model, an intrinsic value of $46.28 is calculated (2.03 + 3.99 + 40.27). Given PLOW's current price of $53.85, this model indicates that the stock is overvalued.

<u>Scenario Analysis</u>

Since PLOW's stock performance is dependent on sales growth, I established a bull, base, and bear case scenario to evaluate the best/worst-case scenario for the stock's performance.

The bull case reflects 10% sales growth in the years 2022-2026. This scenario resulted in EPS equaling $3.82 and yields a terminal value of $87.61. Using a discount factor of 0.61, the same as the base case discounted cash flow analysis, PLOW's third stage discounted terminal value is $53.19. Added together with stage 1 and 2, PLOW's final terminal value equals $54.34.

Figure 28: Scenario Analysis (Bull Case)

Bull Case: 10% sales growth

	2020	2021	2022	2023	2024	2025	2026
Terminal value P/E							
Net income	$54	$57	$64	$70	$75	$81	$87
% of sales	*9.0%*	*9.0%*	*9.3%*	*9.1%*	*8.9%*	*8.7%*	*8.5%*
EPS	$2.38	$2.50	$2.83	$3.06	$3.30	$3.56	$3.82
Growth		*5.1%*	*13.1%*	*8.2%*	*7.9%*	*7.7%*	*7.5%*
Terminal P/E							22.91
* Terminal EPS							$3.82
Terminal value							$87.61
* Discount factor							0.61
Discounted terminal value							$53.19

Summary (using P/E multiple for terminal value)		
First stage	$2.31	Present value of first 2 year cash flow
Second stage	($1.15)	Present value of year 3-7 cash flow
Third stage	$53.19	Present value of terminal value P/E
Value (P/E)	**$54.34**	

To calculate a bear case scenario for PLOW, I adjusted the company's sales growth to 0.0% or 1.0% in 2022-2026. Ultimately, terminal EPS equals $2.21. PLOW's terminal value is $50.66. After discounting, the third stage terminal value is $30.76. Adding the first and second stage terminal value provides a total value of $40.80.

Figure 29: Scenario Analysis (Bear Case)

Bear case: 0-1% sales growth

	2020	2021	2022	2023	2024	2025	2026
Terminal value P/E							
Net income	$54	$57	$57	$55	$54	$52	$50
% of sales	*9.0%*	*9.0%*	*9.0%*	*8.7%*	*8.4%*	*8.0%*	*7.7%*
EPS	$2.38	$2.50	$2.51	$2.42	$2.35	$2.28	$2.21
Growth		*5.1%*	*0.4%*	*-3.8%*	*-2.8%*	*-2.9%*	*-3.1%*
Terminal P/E							22.91
* Terminal EPS							$2.21
Terminal value							$50.66
* Discount factor							0.61
Discounted terminal value							$30.76

Summary (using P/E multiple for terminal value)		
First stage	$2.31	Present value of first 2 year cash flow
Second stage	$7.73	Present value of year 3-7 cash flow
Third stage	$30.76	Present value of terminal value P/E
Value (P/E)	**$40.80**	

Business Risks

Although Douglas Dynamics has many operating efficiencies, there are several reasons why this stock could hold more risk than expected.

Commodity Prices

PLOW's production uses steel and petroleum. Decreases to the supply or adjustments to PLOW's main materials could adversely affect its profitability.

Macroeconomic

Adverse macroeconomic conditions could delay customer purchases. The Company's products are typically repurchased on a consistent cycle, but old equipment could be used for additional years in times of poor macroeconomic conditions.

Limited Geographic Growth

The Company's main operating segment is limited geographically to areas affected by snow. This will limit growth if it does expand internationally in the upcoming years. The company completed acquisitions to increase its Work-Truck Solutions segment, but that segment produces less than 25.0% of revenue.

Municipality Replacement Cycle Change

Although municipalities purchase PLOW's large-truck snowplows consistently, adjustments to the overall replacement cycle would hurt PLOW's sales revenue.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

The work-truck attachment and solutions industries are a niche market. The market is not large enough for a multitude of competitors. Also, significant levels of investment are needed to design and manufacture the products PLOW creates. PLOW also has recognizable brands within the industry and a substantial share of municipal customers.

Threat of Substitutes – Low

The products are not easily substituted since they solve a specific solution.

Supplier Power - Low

PLOW's suppliers do not hold negotiating leverage.

Buyer Power – Average

Customers of PLOWs products do not have larger economies of scale as PLOW, besides municipalities. Municipalities will repurchase equipment from PLOW on a consistent schedule. As a result, any price changes to materials will be shifted to the customer. PLOW stated that customers are not reluctant to purchase new equipment when additional costs of production are added to the overall price.

Intensity of Competition – Average

PLOW's main competitor is BOSS. This Company is the only recognizable brand within the snow & ice control products that can compete with PLOW's size and pricing.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Leads market High margin products Municipal customers	Seasonal sales Limited geographically
Opportunities	**Threats**
International markets Increased snowfall	Sustained low snowfall

Appendix 3: Income Statement

Income Statement
($ in Thousands)

Items	2016	2017	2018	2019	2020E	2021E
Sales	416,268	474,927	524,067	563,000	603,010	633,514
Cost of Sales	292,890	343,242	380,649	407,000	435,924	457,975
Gross Profit	$ 123,378	$ 131,685	$ 143,418	$ 156,000	$ 167,086	$ 175,539
Gross Margin	*29.6%*	*27.7%*	*27.4%*	*27.7%*	*27.7%*	*27.7%*
Operating Expenses						
Selling, General, & Administrative	50,838	62,663	70,858	71,000	73,620	75,443
Earnings Before Interest & Tax	$ 72,540	$ 69,022	$ 72,560	$ 85,000	$ 93,467	$ 100,095
Operating Margin	*17.4%*	*14.5%*	*13.8%*	*15.1%*	*15.5%*	*15.8%*
Interest Expense	14,805	18,006	17,271	19000	15240	14520
Earning Before Tax	$ 57,735	$ 51,016	$ 55,289	$ 66,000	$ 78,227	$ 85,575
Taxes	24,687	(2,409)	11,854	14,500	17,186	18,801
Net Operating Profit After Tax	$ 33,048.00	$ 53,425.00	$ 43,435.00	$ 51,500.00	$ 61,040.41	$ 66,774.60
Other After-Tax income (Expenses)	5,421	1,184	(114)	(1,500)	1,000	1,000
Net Income	$ 38,469.00	$ 54,609.00	$ 43,321.00	$ 51,500.00	$ 61,040.41	$ 66,774.60
Dividends	21,451	21,974	24,383	25,400	25,000	26,000
Basic Shares	22,481	22,576	22,682	22,800	22,819	22,837
Earnings Per Share	1.73	2.45	1.93	2.32	2.63	2.88
Dividends Per Share	$ 0.95	$ 0.97	$ 1.07	$ 1.11	$ 1.10	$ 1.14

Appendix 4: Balance Sheet

($ in Thousands)						
Items	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Assets						
Current Assets						
Cash & Short-Term Investments	18,609	36,875	27,820	37,643	40,319	42,358
Short-Term Receivables	80,130	79,120	81,485	97,932	104,891	110,197
Inventories	74,810	79,235	86,200	90,061	96,461	101,341
Other Current Assets	2,886	2,883	3,590	5,697	6,102	6,411
Total Current Assets	$ 176,435	$ 198,113	$ 199,095	$ 231,333	$ 247,773	$ 60,307
Net Fixed Assets	52,141	53,962	55,195	56,456	57,746	59,066
Intangible Assets	433,137	427,156	415,684	420,000	425,000	430,000
Other Assets	4,460	5,945	6,219	-	-	-
Total Assets	$ 666,173	$ 685,176	$ 676,193	$ 707,789	$ 30,519	$ 49,372
Liabilities & Shareholder Equity						
Current Liabilities						
ST Debt & Curr. Portion LT Debt	6,768	40,460	36,953	42,125	45,118	47,400
Accounts Payable	17,299	16,323	18,703	21,235	22,744	23,895
Income Tax Payable	-	2,996	106	500	500	500
Other Current Liabilities	27,325	21,004	23,306	24,919	26,690	28,040
Total Current Liabilities	$ 51,392	$ 80,783	$ 9,068	$ 8,779	$ 95,053	$ 99,836
Long-Term Debt	306,726	274,872	242,946	220,000	210,000	200,000
Deferred Tax Liabilities	54,563	39,269	48,198	45,000	45,000	45,000
Other Liabilities	33,029	33,574	23,225	30,000	30,000	30,000
Total Liabilities	$ 445,710	$ 428,498	$ 393,437	$ 83,779	$ 380,053	$ 74,836
Shareholders' Equity						
Common Stock	225	226	227	228	229	230
Retained Earnings	82,387	115,737	136,765	162,865	198,905	239,680
Other	137,851	140,715	145,764	$ 60,917	$ 51,332	$ 34,627
Total Shareholders' Equity	$ 220,463	$ 256,678	$ 282,756	$ 24,010	$ 50,466	$ 74,537
Total Liabilities & Shareholders' Equity	$ 666,173	$ 685,176	$ 676,193	$ 707,789	$ 730,519	$ 49,372

Appendix 5: Sales Forecast

Sales ($Millions)	2016	2017	2018	2019	2020E	2021E
Sales	$417	476	$524	563	$603	$634
Growth		*14.2%*	*10.3%*	*7.4%*	*7.1%*	*5.1%*
Work-Truck Attachments	361	351	380	405	433	455
Growth		*-2.8%*	*8.3%*	*6.6%*	*7.0%*	*5.0%*
% of sales	*86.7%*	*73.8%*	*72.5%*	*71.9%*	*71.9%*	*71.8%*
Work-Truck Solutions	65	138	154	168	180	189
Growth		*112.3%*	*11.6%*	*9.1%*	*7.0%*	*5.0%*
% of sales	*15.6%*	*29.0%*	*29.4%*	*29.8%*	*2.0%*	*29.8%*
Corporate & Eliminations	(9)	(13)	(10)	(10)	(10)	(10)
Growth		*42.6%*	*-28.1%*	*3.8%*	*1.0%*	*1.5%*
% of sales	*-2.3%*	*-2.8%*	*-1.8%*	*-1.8%*	*2.0%*	*-1.6%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	417	437	482	518	554	582
Growth		*4.8%*	*10.3%*	*7.5%*	*7.1%*	*5.1%*
% of sales	*100.0%*	*91.8%*	*91.9%*	*91.9%*	*91.9%*	*91.9%*
Canada	-	39	43	45	49	51
Growth			*9.5%*	*6.2%*	*7.7%*	*5.1%*
% of sales	*0.0%*	*8.2%*	*8.1%*	*8.1%*	*8.1%*	*8.1%*

Appendix 6: Ratios

Ratios						
Items	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Profitability						
Gross margin	29.6%	27.7%	27.4%	29.8%	30.0%	30.0%
Operating (EBIT) margin	17.4%	14.5%	13.8%	14.9%	15.0%	15.0%
Net profit margin	9.2%	11.5%	8.3%	9.3%	9.0%	9.0%
Activity						
NFA (gross) turnover	1.01	0.97	1.09	1.16	1.20	1.21
Total asset turnover	0.71	0.70	0.77	0.82	0.79	0.74
Liquidity						
Op asset / op liab	3.95	4.91	4.73	4.56	6.77	6.77
NOWC Percent of sales	31.3%	30.5%	30.0%	28.2%	36.3%	45.0%
Solvency						
Debt to assets	47.1%	46.0%	41.4%	39.9%	31.4%	28.5%
Debt to equity	142.2%	122.9%	99.0%	88.7%	78.0%	68.5%
Other liab to assets	13.1%	10.6%	10.6%	9.4%	22.6%	24.1%
Total debt to assets	60.2%	56.7%	52.0%	49.3%	54.0%	52.6%
Total liabilities to assets	66.9%	62.5%	58.2%	55.8%	59.7%	58.4%
Debt to EBIT	4.32	4.57	3.86	3.28	2.91	2.64
EBIT/interest	8.20	4.29	4.32	4.69	5.00	5.00
Debt to total net op capital	50.4%	48.9%	44.1%	42.3%	33.3%	30.3%
ROIC						
NOPAT to sales	10.7%	15.2%	10.9%	11.7%	11.7%	11.7%
Sales to NWC	4.05	4.06	4.19	4.38	4.52	4.46
Sales to NFA	1.01	0.97	1.09	1.16	1.20	1.21
Sales to IC ex cash	0.81	0.78	0.86	0.92	0.95	0.95
Total ROIC ex cash	8.6%	11.9%	9.4%	10.7%	11.2%	11.2%
NOPAT to sales	10.7%	15.2%	10.9%	11.7%	11.7%	11.7%
Sales to NOWC	3.19	3.28	3.33	3.55	2.75	2.22
Sales to NFA	1.01	0.97	1.09	1.16	1.20	1.21
Sales to IC	0.77	0.75	0.82	0.88	0.84	0.78
Total ROIC	8.2%	11.4%	8.9%	10.2%	9.8%	9.2%
NOPAT to sales	10.7%	15.2%	10.9%	11.7%	11.7%	11.7%
Sales to EOY NWC	3.68	3.93	4.06	4.40	4.35	4.35
Sales to EOY NFA	0.85	0.98	1.10	1.15	1.18	1.18
Sales to EOY IC ex cash	0.69	0.78	0.86	0.91	0.93	0.93
Total ROIC using EOY IC ex cash	7.4%	11.9%	9.4%	10.6%	10.9%	10.9%
NOPAT to sales	10.7%	15.2%	10.9%	11.7%	11.7%	11.7%
Sales to EOY NOWC	3.16	3.01	3.34	3.52	2.17	2.17
Sales to EOY NFA	0.85	0.98	1.10	1.15	1.18	1.18
Sales to EOY IC	0.67	0.74	0.83	0.87	0.76	0.76
Total ROIC using EOY IC	7.1%	11.2%	9.0%	10.1%	9.0%	9.0%

Appendix 6: Ratios (cont.)

Ratios						
Items	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
ROE						
5-stage						
EBIT / sales	17.4%	14.5%	13.8%	14.9%	15.0%	15.0%
Sales / avg assets	0.71	0.70	0.77	0.82	0.79	0.74
EBT / EBIT	87.8%	76.7%	76.8%	78.7%	80.0%	80.0%
Net income /EBT	60.4%	103.2%	77.7%	79.7%	75.0%	75.0%
ROA	6.6%	8.1%	6.4%	7.7%	7.1%	6.6%
Avg assets / avg equity	2.78	2.83	2.52	2.30	2.36	2.44
ROE	18.3%	22.9%	16.1%	17.8%	16.8%	16.2%
3-stage						
Net income / sales	9.2%	11.5%	8.3%	9.3%	9.0%	9.0%
Sales / avg assets	0.71	0.70	0.77	0.82	0.79	0.74
ROA	6.6%	8.1%	6.4%	7.7%	7.1%	6.6%
Avg assets / avg equity	2.78	2.83	2.52	2.30	2.36	2.44
ROE	18.3%	22.9%	16.1%	17.8%	16.8%	16.2%
Payout Ratio	55.8%	40.2%	56.3%	49.4%	49.8%	49.1%
Retention Ratio	44.2%	59.8%	43.7%	50.6%	50.2%	50.9%
Sustainable Growth Rate	8.1%	13.7%	7.0%	9.0%	8.4%	8.2%

Appendix 7: 3-Stage DCF Model

	Year						
	1	2	3	4	5	6	7
	First Stage		Second Stage				
Cash flows	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*7.1%*	*5.1%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
NOPAT / S	*11.7%*	*11.7%*	*11.4%*	*11.0%*	*10.7%*	*10.3%*	*10.0%*
S / NWC	*4.35*	*4.35*	*4.35*	*4.35*	*4.35*	*4.35*	*4.35*
S / NFA (EOY)	*1.18*	*1.18*	*1.18*	*1.18*	*1.18*	*1.18*	*1.18*
S / IC (EOY)	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
ROIC (EOY)	*10.9%*	*10.9%*	*10.6%*	*10.2%*	*9.9%*	*9.6%*	*9.3%*
ROIC (BOY)		*11.4%*	*11.1%*	*10.8%*	*10.4%*	*10.1%*	*9.7%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$603	$634	$665	$698	$733	$770	$809
NOPAT	$71	$74	$76	$77	$78	$80	$81
Growth		*5.1%*	*1.9%*	*1.8%*	*1.7%*	*1.6%*	*1.5%*
- Change in NWC	11	7	7	8	8	8	9
NWC EOY	*139*	*146*	*153*	*161*	*169*	*177*	*186*
Growth NWC		*5.1%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
- Chg NFA	21	26	27	28	30	31	33
NFA EOY	*511*	*537*	*564*	*592*	*622*	*653*	*685*
Growth NFA		*5.1%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Total inv in op cap	32	33	34	36	38	40	41
Total net op cap	650	683	717	753	790	830	871
FCFF	$39	$41	$42	$41	$41	$40	$39
% of sales	*6.5%*	*6.5%*	*6.3%*	*5.9%*	*5.6%*	*5.2%*	*4.9%*
Growth		*6.2%*	*0.4%*	*-0.8%*	*-1.2%*	*-1.5%*	*-2.0%*
- Interest (1-tax rate)	14	15	15	15	15	15	15
Growth		*5.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w/o debt	$25	$27	$27	$26	$26	$25	$25
% of sales	*4.1%*	*4.2%*	*4.0%*	*3.8%*	*3.5%*	*3.3%*	*3.0%*
Growth		*6.9%*	*0.6%*	*-1.3%*	*-1.8%*	*-2.4%*	*-3.1%*
/ No Shares	22.8	22.8	22.8	22.8	22.8	22.8	22.8
FCFE	$1.09	$1.17	$1.17	$1.16	$1.14	$1.11	$1.07
Growth		*6.9%*	*0.6%*	*-1.3%*	*-1.8%*	*-2.4%*	*-3.1%*
* Discount factor	0.93	0.87	0.81	0.75	0.70	0.65	0.61
Discounted FCFE	$1.02	$1.01	$0.95	$0.87	$0.80	$0.72	$0.65

Third Stage

Summary (using P/E multiple for terminal value)

First stage	$2.03	Present value of first 2 year cash flow
Second stage	$3.99	Present value of year 3-7 cash flow
Third stage	$40.27	Present value of terminal value P/E
Value (P/E)	**$46.28**	

Terminal value P/E							
Net income	$54	$57	$61	$62	$64	$65	$66
% of sales	*9.0%*	*9.0%*	*9.1%*	*8.9%*	*8.7%*	*8.4%*	*8.2%*
EPS	$2.38	$2.50	$2.67	$2.73	$2.79	$2.84	$2.89
Growth		*5.1%*	*6.7%*	*2.3%*	*2.1%*	*2.0%*	*1.8%*
Terminal P/E							22.91
* Terminal EPS							$2.89
Terminal value							$66.32
* Discount factor							0.61
Discounted terminal value							$40.27

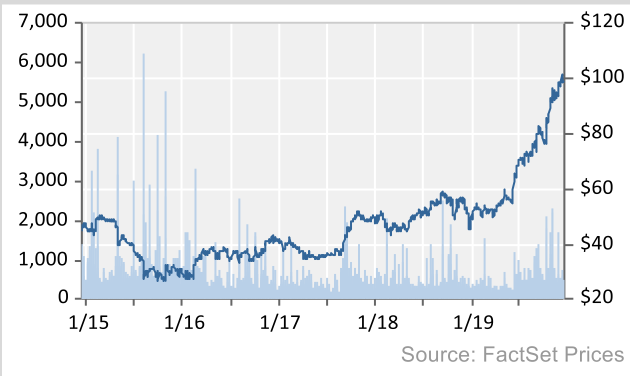
Terminal value constant growth							
FCFE	$1.09	$1.17	$1.17	$1.16	$1.14	$1.11	$1.07
Growth		*6.9%*	*0.6%*	*-1.3%*	*-1.8%*	*-2.4%*	*-3.1%*
Long-term growth							1.0%
Cost of equity							7.4%
Cost of equity - growth rate							6.4%
Terminal value (FCFE (1+g) / (r-g))							$16.99
* Discount factor							0.61
Discounted terminal value							$10.32

Industrial, Electrical Products

Generac Holdings Inc.

Recommendation: Neutral				
Current Price	**$100.81**	*$100*	Ticker	GNRC
1 Year Bear	$79	*-22%*	Sh. Out. (M)	62.5
1 Year Base	**$94**	***-6%***	M.Cap. ($M)	6,195
1 Year Bull	$121	*20%*	EV ($M)	7,134

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	17.4%	34.6%	43.8%	94.2%	104%	23.0%	8.5%

Financials

	2015	2016	2017	2018	2019E	2020E	2021E
Sales($B)	**1.3**	**1.4**	**1.7**	**2.0**	**2.2**	**2.5**	**2.8**
Gr. %	*-9.8%*	*9.9%*	*16.0%*	*20.5%*	*9.4%*	*12.2%*	*11.6%*
Cons.	-	-	-	-	-	*6.3%*	*7.6%*
Ind.	*-2.9%*	*-10%*	*2.7%*	*13%*	*-0.0%*	*-11%*	*-11%*
EPS	**$1.14**	**$1.50**	**$2.57**	**$3.91**	**$4.18**	**$5.16**	**$6.17**
Gr. %	*-55%*	*31.1%*	*71.8%*	*52.1%*	*6.8%*	*23.4%*	*19.6%*
Cons.	-	-	-	-	-	*6.2%*	*7.0%*
Ind.	*0.0%*	*-17%*	*9.6%*	*27%*	*-5.3%*	*13%*	*26%*

Ratios

	2015	2016	2017	2018	2019E	2020E	2021E
NPM	**5.9%**	**6.7%**	**9.5%**	**11.9%**	**11.5%**	**12.5%**	**13.2%**
Ind.	*9.2%*	*8.27%*	*8.69%*	*10.18*	*NA*		
ROE	*16.3%*	*22.5%*	*33.4%*	*33.4%*	*29.8%*	*29.2%*	*28.0%*
Ind.	*17.8%*	*14.4%*	*14.6%*	*18.7%*	*NA*		
ROA	*4.2%*	*5.4%*	*8.3%*	*9.9%*	*10.0%*	*10.9%*	*11.7%*
Ind.	*7.1%*	*5.5%*	*5.9%*	*7.5%*	*NA*		
A T/O	0.72	0.79	0.86	0.91	0.87	0.88	0.89
A/E	3.85	4.22	4.04	3.37	2.82	2.56	2.30

Valuation

	2015	2016	2017	2018	2019E	2020E	2021E
P/E	10.4	13.4	14.6	10.6	20.9	19.6	18.4
Ind.	15.1	20.6	21.2	14.4	46.5	16.8	14.2
P/S	1.5	1.8	1.8	1.5	2.9	-	-
P/B	4.4	6.1	5.1	6.7	7.7	-	-
P/CF	10.9	10.5	11.2	12.5	19.7	-	-
EV/EBITD	11.1	13.2	12.6	9.2	16.1	-	-
D/P	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	-	-

Summary

I recommend a neutral rating with a target of $100. Although GNRC has the potential for significant growth, I believe the market has already priced in much of this opportunity. The market has certainly shown excitement about the stock, as it has grown 104% YTD. Generac has the potential to grow in the future through the implementation of its new solar battery technology as well as expansion through international acquisitions. Increasing frequencies of natural disasters and 5G technology will also help GNRC continue to grow.

Key Drivers

- Acquisitions and international expansion: Generac has financed 94% of its acquisitions with cash on hand. International sales are a growing business segment; it was 22% of total sales in 2018.
- Power disruptions and natural disaster: Increasing number and severity of natural disasters have driven sales growth for GNRC. Historically, sales spike each year in the third and fourth fiscal quarters due to hurricane season.
- Commodity pricing: GNRC derives 77% of its cost of goods sold from raw materials and component parts, so spikes in commodity prices hurt earnings. Lower commodity prices were part of the reason for the 1% bump in gross margin in 2018.
- Macroeconomic trends: When consumers are confident, they are more likely to invest in their homes. Housing starts increases the potential market for GNRC. Starting in 2020, California will require all new home builds to be solar-powered, which will help drive sales for Generac's new solar

Valuation

Using a relative valuation approach, GNRC is slightly overvalued based on its fundamentals versus those of its peers in the electric product industry. DCF analysis, which considers Generac's ongoing growth assumptions, implies that the stock is worth $94. A combination of the approaches suggests that Generac is slightly overvalued, as the stock's value is about $100 and the shares currently trade at $100.81.

Risks

- Inability to predict power outages
- Increasing raw material pricing
- Distributors and dealers that also sell competitors' products
- Products are subject to regulation

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Company Overview

Generac Holdings Inc. (GNRC) is a leading designer and manufacturer of an extensive range of power generation equipment and other power products serving the residential, commercial, and industrial markets. Power generation is the primary segment of Generac, which sets it apart from main competitors that only feature a small portfolio of power generation equipment. Generac has attained a leading position in the power generation market within North America and is continuing to expand its presence globally, with 21.9% of its total sales in 2018 coming from international markets. In addition to residential and industrial standby generators, GNRC also offers mobile generators, light towers, commercial and industrial mobile heaters and pumps, and a broad product line of outdoor power equipment for residential and commercial use. Generac's products are available globally through a broad network of independent dealers, distributors, retailers, wholesalers, and equipment rental companies, as well as directly to certain national and regional account customers. It currently has operations in North America, South America, Europe, Asia, and Australia. Generac is headquartered in Waukesha, Wisconsin.

Residential Products- (55% of revenue)
Residential product sales is the largest division of GNRC. Generac currently holds a 77% market share in the home standby generator market. Residential products have a five-year compounded annual growth rate (CAGR) of 7.6%.

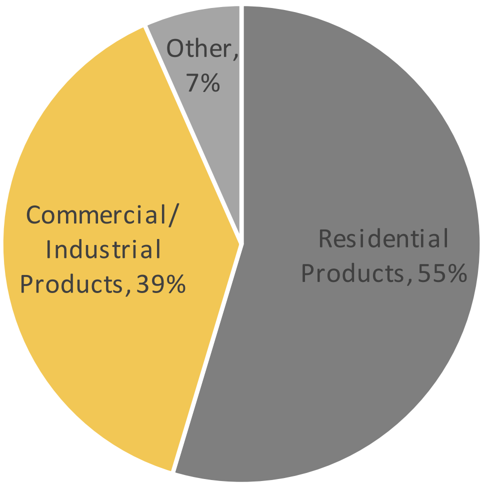
- Includes home standby generators, portable generators, pressure washers, clean energy storage systems, brush mowers, wood chippers, stump grinders, log splitters, power graders, and trash pumps.

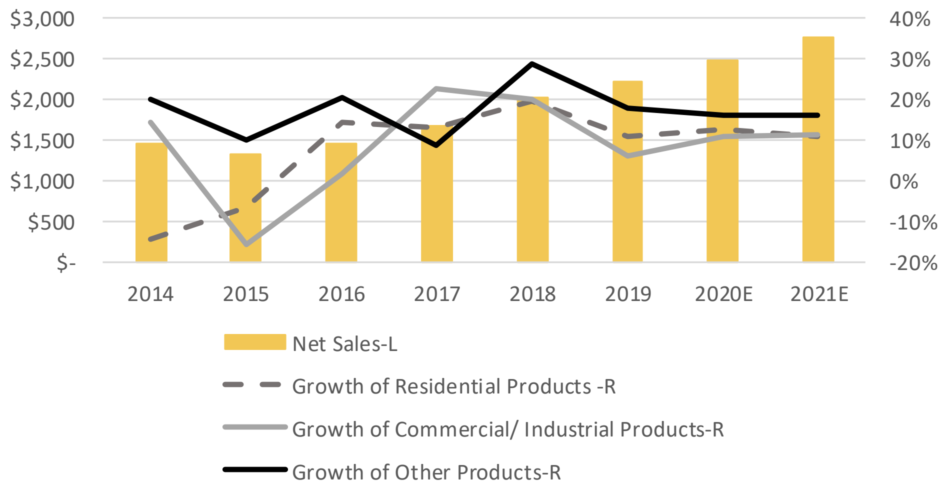
Commercial and Industrial Products- (39% of revenue)
Commercial and industrial products also provide a significant portion of revenue for GNRC. This division has a five-year CAGR of 4.7%.

- Includes business and industrial generators, mobile generators, light towers, heaters, and pumps.

Other Products- (7% of revenue)
Other products include various parts and accessories as well as customer service that Generac provides. This division has a five-year CAGR of 13.2%.

Figures 1 & 2: Revenue sources for GNRC, year-end 2018 (left) and revenue history (in millions) since 2014 (right)





Source: Company reports

Business/Industry Drivers

Though several factors may contribute to Generac's future success, the following are the most important business drivers:

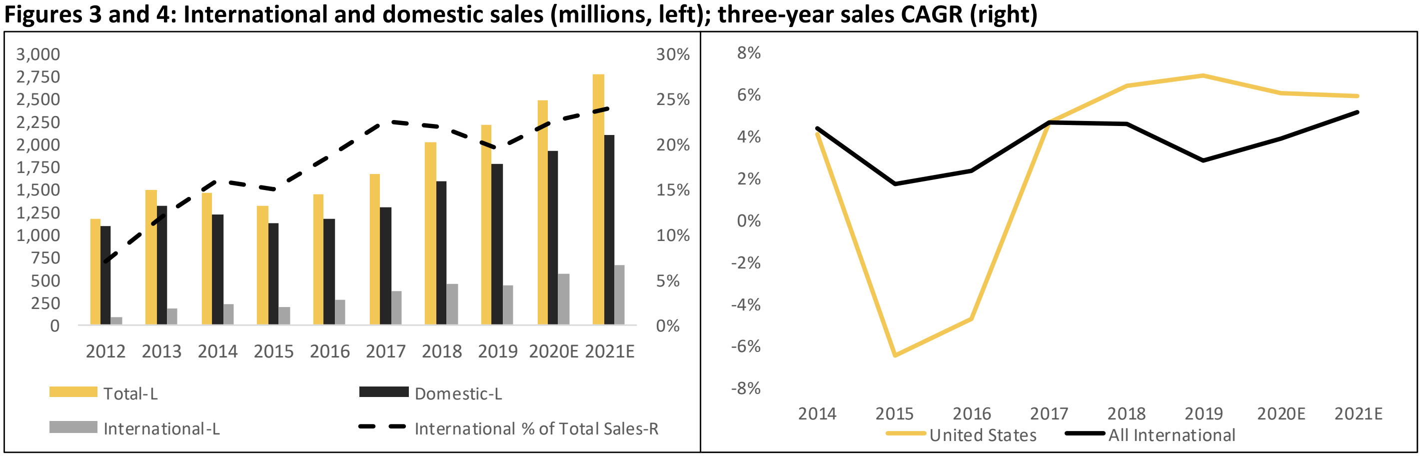
1) Acquisitions and international expansion
2) Power disruptions and natural disaster
3) Commodity pricing
4) Competitor analysis
5) Macroeconomic trends

Acquisitions and international expansion

In 2018, 21.9% of revenue was generated from international sales

Since Generac went public in 2010, it has significantly expanded internationally. Before the public offering, GNRC consisted of three manufacturing plants and one distribution center in Eagle, Wisconsin, Waukesha, Wisconsin, and Whitewater, Wisconsin. Revenue at this point was almost entirely domestic-based, despite the fact that the international market represents 67% of the backup power generation market. In 2012, international sales only represented 7% of total sales, and is now 21.9% of sales. Generac now has operations across the United States, Mexico, Europe, Asia, and Australia. Furthermore, expanding business internationally hedges Generac against domestic recession. As shown in figure four, domestic growth was hurt by a recession in the commodity market in 2015, while international operations continued to grow.

Figures 3 and 4: International and domestic sales (millions, left); three-year sales CAGR (right)



Source: Company reports

Generac has recently targeted developing areas through acquisitions. In February of 2018, GNRC acquired Selmec, a Mexico-based company, as part of its Latin America strategy. This will enable Generac to offer Latin America a broader range of products and services in highly undeveloped areas. Generac has acquired 12 companies since going public, financing nearly 100% of them with cash. At the end of 2018, the Selmec acquisition generated $30.7 million in sales for Generac, which represents about 1.5% of total sales. In 2017, the acquisitions of Motortech and Pramac contributed $69.7 million, or about 4.2% of total sales. In 2019, Pika and Neurio were acquired using only cash on hand. In 2018, Selmec was acquired with using $91.9 million of cash on hand and $15.8 million in a contingent payout. Motortech and Pramac were both acquired using only cash on hand. The ability to finance acquisitions using cash on hand implies Generac has strong cash flow. Aside from Pika, all of the mentioned acquisitions are internationally-based, which has helped GNRC reach new markets and grow its international sales. I believe these international acquisitions have allowed Generac to maintain a steady three-year CAGR of 3-4% within its international sales division.

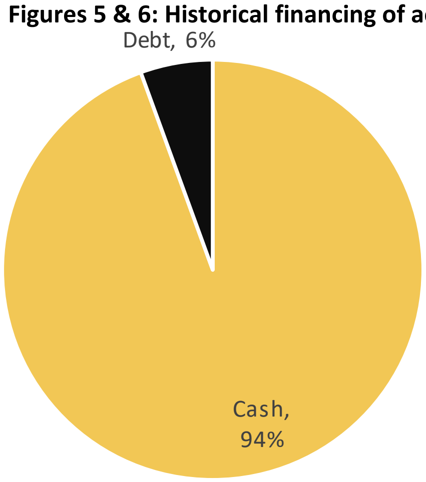
Every 1% of market penetration across all segments represents a $2 billion market

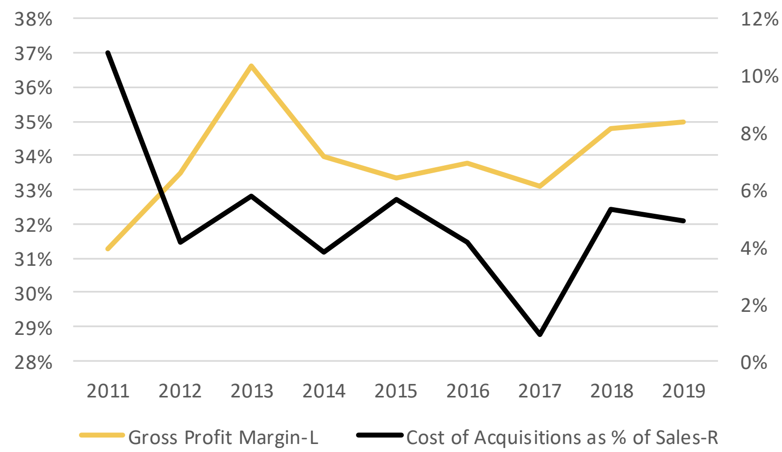
GNRC not only makes acquisitions to expand internationally, but it also acquires to expand its product line and technology. On April 26, 2019, Generac acquired Pika for $49 million, which represented 10.4% of sales YTD. On March 12, 2019, it acquired Neurio for $59 million, which represented 12.5% of sales YTD. These companies specialize in clean energy storage and energy data monitoring. These acquisitions launched Generac into the expanding market of clean solar energy. Through these acquisitions, Generac has developed a battery that has the capability to store energy from solar panels. Currently, 98% of home solar panels do not have storage capabilities, which presents great opportunity for this new product. Although solar batteries currently exist in the market, Generac is still early to the scene in home battery solutions. Generac's PWRcell battery protects homeowners in power outages and allows them to control and monitor energy use through the use of the PWRview app. New market penetration is key, as management believes every 1% of market penetration across all segments represents a $2 billion market.

The strength of the dollar and current trade policies with China present major macroeconomic risks

The success of international expansion and acquisitions will depend on Generac maintaining its high margins once it is established in international and clean energy markets. This strategy also exposes Generac to currency and political risks; the strength of the dollar and current trade policies with China present large macroeconomic risks to the company. Furthermore, Generac is new to the clean energy market, which poses another risk. Products from Pika and Neurio were released at the Solar Power International 2019 trade show in September, but the profitability of these products and acquisitions is still unclear.

Figures 5 & 6: Historical financing of acquisitions (left); gross profit margin following acquisitions (right)





Source: Company reports, Factset

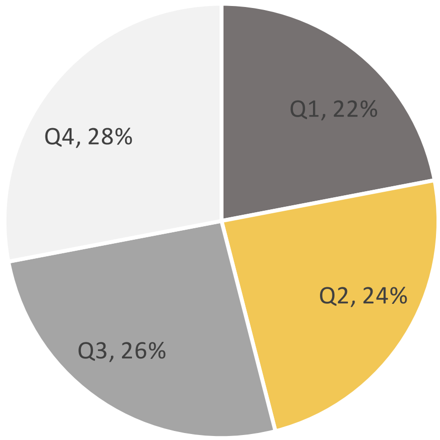
Power disruptions and natural disaster

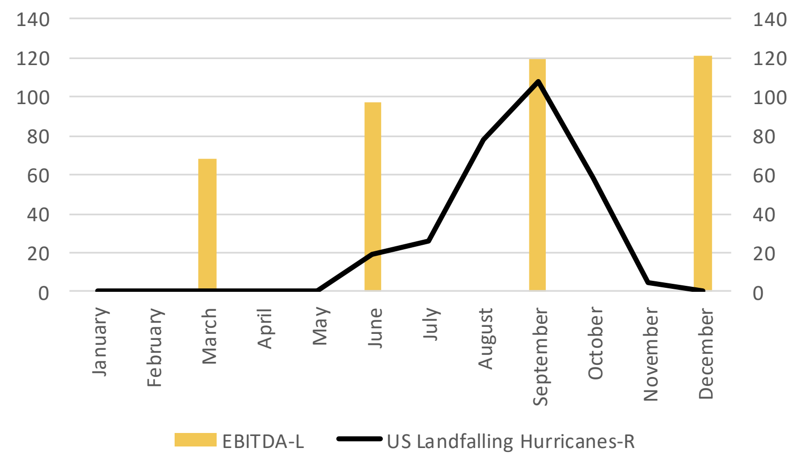
Generac must build its inventory early in the calendar year to account for the large increase in revenue late in the year

Being part of the backup power generation industry makes Generac extremely dependent upon disruptions in the power grid. A power disruption could be caused by various natural disasters or simply an internal failure in the system. Consumers invest in power generation products largely to combat the effect of these occurrences. An aging power grid combined with a growing population are key long-term drivers that will increase the need for backup power generation equipment.

The increasing number of seasonal natural disasters contributes to Generac's potential market growth. Peak hurricane season in the United States is from August to October each year, and this season is reflected sharply in Generac's income statements. Every year, revenue has increased during and immediately following the hurricane season. Generac must build its inventory early in the calendar year to account for the large increase in revenue late in the year.

Figure 7 and 8: 2014-2018 average sales by quarter left; historical number of hurricanes by month compared to quarterly EBITDA (millions, right)





Source: Company reports, NOAA, FactSet

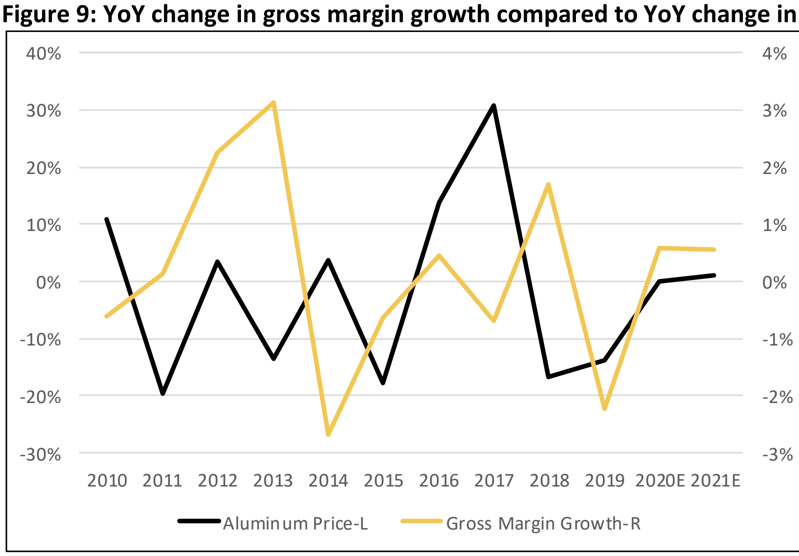
The frequency of these storms is increasing as global air and water temperatures continue to rise. Currently, only 4.25% of households in the United States have a generator, which presents great opportunity for growth. Scientists at the NOAA believe that destructive storms that once occurred every hundred years will now occur every five years. At the most recent investor meeting, Generac revealed that non-hurricane outages over the last three years have been above average. This can be partially attributed to an increasing number of outages in California due to wildfires. According to the EIA, the average electric customer in the United States experienced about 5 hours of outages in 2018, which is slightly down from 7.8 hours of outages in 2017, but still an increase from 4 hours in 2016.

Commodity pricing

GNRC derives 77% of its cost of goods sold from raw materials and component parts

As a manufacturing company, Generac has significant exposure to the commodity market. Materials such as copper, steel, and aluminum are key inputs for Generac's products. GNRC derives 77% of its cost of goods sold from raw materials and component parts. Changes in cost of materials impacts Generac's gross margin, as such a large portion of its business is dependent on raw materials.

Figure 9: YoY change in gross margin growth compared to YoY change in aluminum price



Source: Company reports, FactSet

There is an abundance of natural gas globally that will provide low and stable prices in the future

In addition to inputs, GNRC also benefits from the use of natural gas-powered products. The shift from diesel power to natural gas has reduced costs, thus increasing profit margins. Generac has been producing natural gas products since the 1980s, but the recent shift in clean energy trends has made natural gas a preference. GNRC is the largest provider of natural gas generator solutions in North America, and it seeks to capitalize on this growth opportunity. Management believes that the fracking revolution has only begun; there is an abundance of natural gas globally that will provide low and stable prices in the future. Moving forward, solar energy will continue to reduce costs and provide a stable power stream for Generac's products.

Figure 10: GNRC compared to oil pricing, relative to the S&P 500

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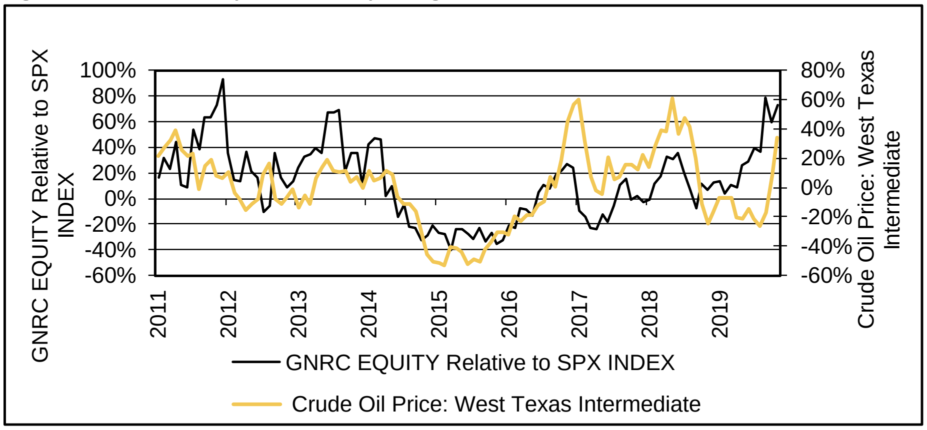


Source: Bloomberg, IMCP

Competitor Analysis

Customer retention is vital, as there is a potential $2 billion replacement market over the next decade

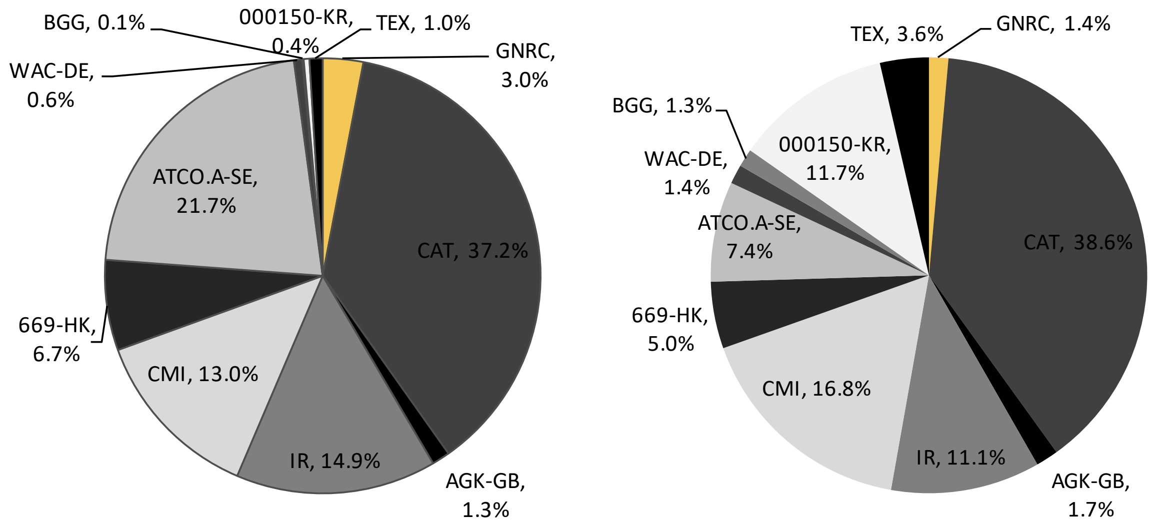
The electrical product industry features relatively high barriers to entry as manufacturing firms rely on advanced technology and significant capital. In order to be competitive, manufacturers must produce the most efficient, lowest cost products. Generac will continue to do this by producing products that are fueled with natural gas and solar energy. The transition to these fuels has led to much more stable and economical products, which is ideal in the eye of the consumer. Success is furthered by producing reliable products with brand names that consumers trust. There is typically a 15-year replacement cycle. Customer retention is a potential $2 billion replacement market over the next decade.

GNRC currently holds 77% of the residential standby generator market in North America and holds roughly 13% of the global revenue share in backup, emergency, and standby power products. While the firm is dominant in this space, it is important that it continues developing and improving upon its other products to grow and compete for market share with relevant competitors like CAT, IR, or CMI that have greater diversity and scale in their product lines.

While Generac holds 1.4% of the industry's sales, its share of market capitalization increases to 3.0%

The competitors chosen for this analysis were selected based on their similar product lines to GNRC. However, the competitors do not have as large of a focus on power generation as Generac; it is just one of their many segments. While Generac holds 1.4% of a selection of the manufacturing industry's sales, its share of market capitalization increases to 3.0%. This implies that the market is more optimistic about Generac. GNRC has achieved this position through its growing net margin, which has ultimately increased its P/S from 1.53 in 2018 to 2.87 in 2019.

Figures 11 and 12: Industry concentration by market cap (left) vs. sales (right)

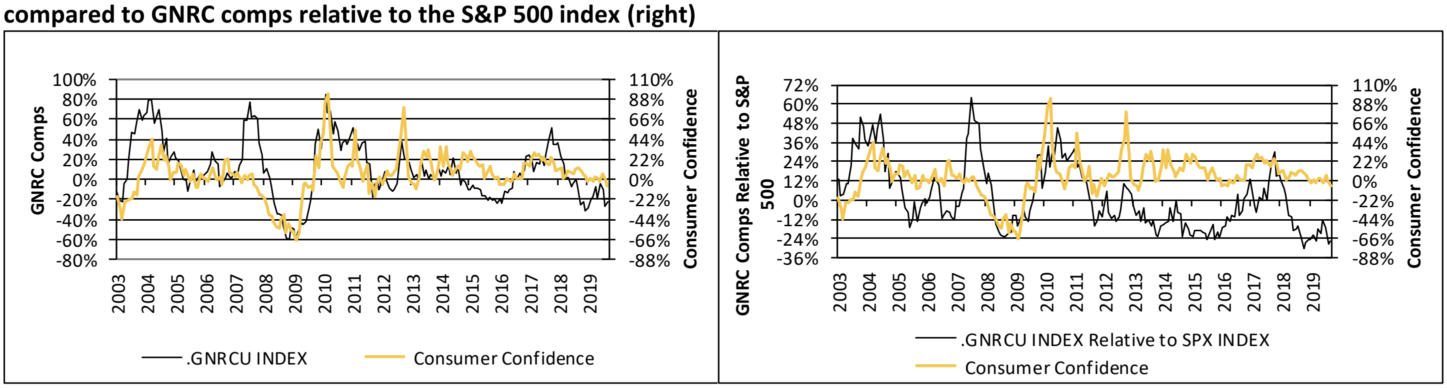


Source: FactSet, IMCP

<u>Macroeconomic trends</u>

The backup power generation industry is a cyclical business, and is strongly correlated to consumer confidence. GNRC and its competitors in power generation products are also particularly sensitive to the new housing market. The competitors used in the .GNRCU index are the same as the comps used above.

Figures 13 and 14: YOY % change in consumer confidence compared to GNRC comps (left); YOY % change in consumer confidence compared to GNRC comps relative to the S&P 500 index (right)



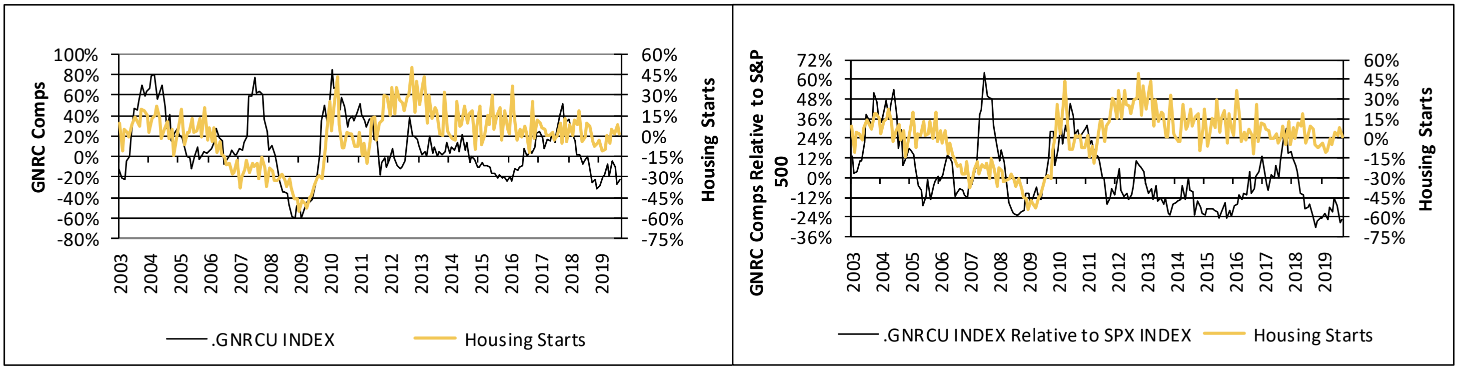
Source: Bloomberg, IMCP

The year-over-year performance of GNRC and its competitors has closely tracked rises and falls in consumer confidence since 2003, but has significantly underperformed relative to the S&P 500 since 2017.

> Starting in 2020, California will require all new home builds to be solar powered

Generac and its competitors have closely tracked rises and falls in housing starts from 2003 to 2011. GNRC and its competitors have underperformed housing starts since 2012. Housing starts is an important macroeconomic driver as the more homes constructed the more generators are needed. Starting in 2020, California will require all new home builds to be solar powered. Management believes that this policy has the potential to add $100 million in revenue by 2023. When consumers are confident in their household income, they are more likely to invest in their homes.

Figures 15 and 16: Housing starts compared to GNRC comps (left); housing starts compared to GNRC comps relative to the S&P 500 (right)

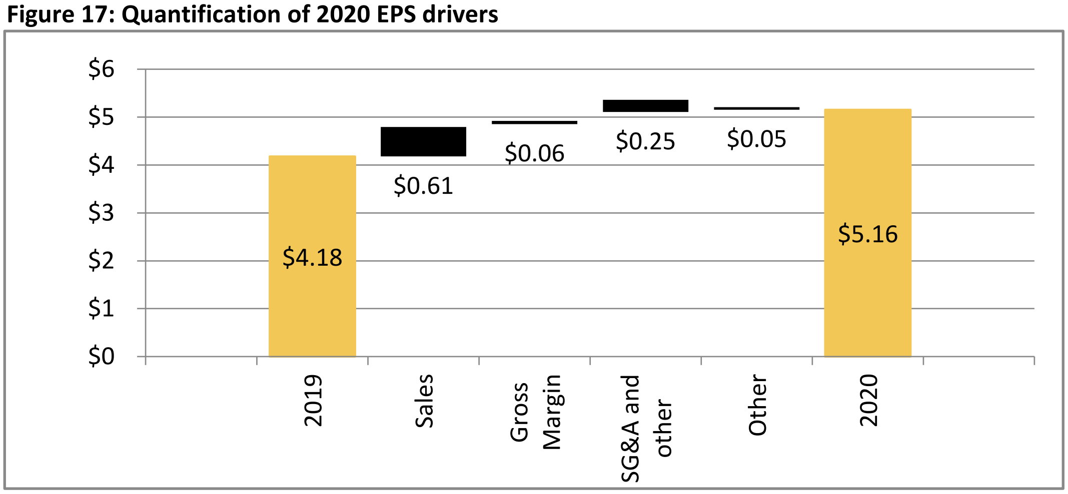


Source: Bloomberg, IMCP

Financial Analysis

I anticipate EPS to grow 23.4% from $4.18 to $5.16 in FY 2020. Revenues should increase earnings by $0.61, along with an expanding gross margin that will increase earnings by $0.06 per share. As Generac continues to grow internationally and develop new technology, I believe SG&A expenses will decline as a percent of sales and boost earnings by $0.25 per share. I forecast a decrease in interest expense and a repurchase of 900 thousand shares in 2020, which will add $0.05 to EPS.

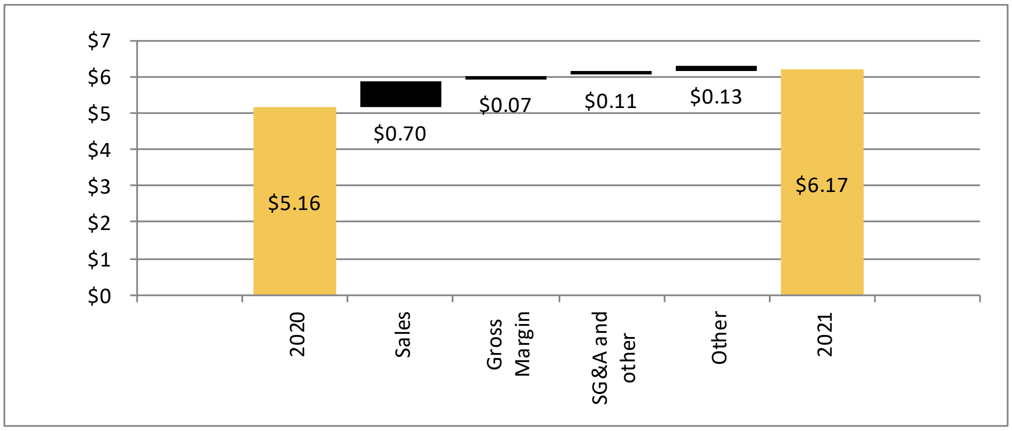
Figure 17: Quantification of 2020 EPS drivers



Source: Company reports, IMCP

I anticipate EPS to grow 19.6% from $5.16 to $6.17 in FY 2021. Continuing international expansion along with an increase in revenue from California will grow EPS by $0.70. SG&A expenses again will grow less than sales and fall as a percent of sales, which will add $0.11 to EPS. I believe the gross margin will continue to rise, which I forecast will add $.07 per share. A decreasing interest rate along with another one million share repurchase plan will raise EPS by $.13 in 2021.

Figure 18: Quantification of 2021 EPS drivers



Source: Company reports, IMCP

I am 4-6% more optimistic than consensus estimates for 2020 and 2021 on sales, and for EPS I am in line for 2020 and much higher in 2021. I anticipate strong growth moving forward through the introduction of Generac's new solar battery technology. Furthermore, the introduction of 5G technology will drive sales for its industrial business segment. These factors will build on Generac's already expanding international market and new developments in California.

Figure 19: EPS and YoY growth (thousands) estimates for FY 2020 and 2021

	2020E	2021E
Revenue Estimate	$ 2,484,052	$2,774,052
YoY Growth	12.2%	11.6%
Revenue Consensus	$2,344,100	$2,521,000
YoY Growth	6.3%	7.5%
EPS Estimate	$5.16	$6.17
YoY Growth	23.4%	19.6%
EPS Consensus	$5.15	$5.51
YoY Growth	6.2%	7.0%

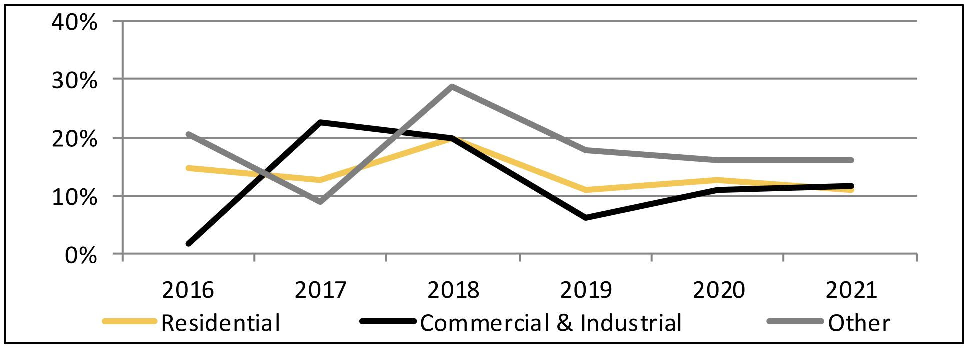
Source: Factset, IMCP

Revenues

Generac's revenue has increased steadily since it went public in 2010. While I expect that trend to continue in 2020 and 2021, the rate of incline should diminish slightly, as it already owns 77% of America's residential backup power market. With a growing threat of natural disaster facing the US, I believe Generac can attain another 1% of market penetration in the home standby generator market by the end of 2021. I forecast growth in sales within Generac's industrial segment through the widespread implementation of 5G technology.

I also believe that GNRC's new solar battery technology will support strong revenue growth moving forward. Since this technology will be heavily implemented in 2020, it has the potential to greatly increase revenues domestically and globally. Over the last decade, there have been about 80,000 homes built in California each year, and 1.3 million new homes are scheduled to be built in Southern California alone over the next ten years. The recent solar energy law passed in California will certainly encourage the use of Generac's new battery product. Currently, 98% of solar panels do not have any storage capabilities, which provides great opportunity for the battery technology.

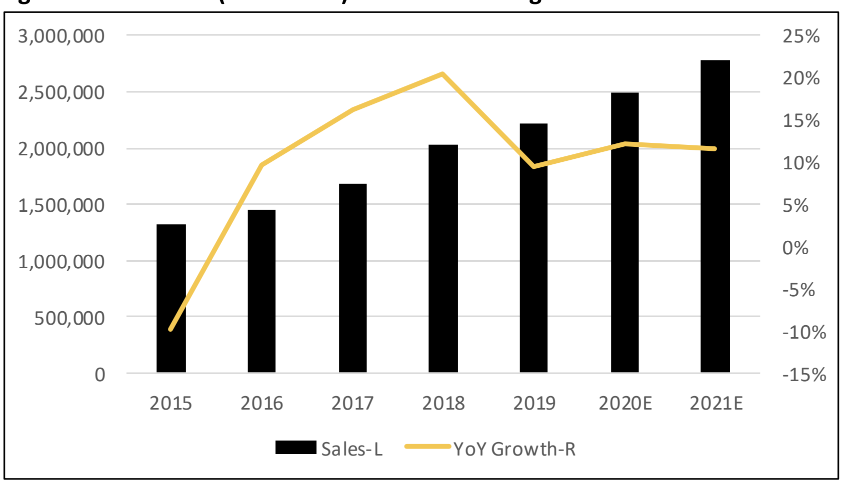
Figure 20: Generac segment revenue growth



Source: Company reports, IMCP

As Generac continues to grow, I forecast that international sales will grow to 24% of total revenue from 20% in 2019. International sales comprise 66% of the worldwide backup power generation market which presents great opportunity for GNRC. A focus on expanding internationally has proven to be successful for Generac, as international sales grew 140% in 2016 and about 40% in 2017. Domestic sales fell by 2.6% in 2016 and grew by 11.1% in 2017. This international growth is due largely to acquisitions that have helped reach new markets. For example, Pramac, headquartered in Mexico City, was acquired in February 2018 and has helped Generac expand into Latin America. I forecast international sales to grow 29.1% in 2020 and 19.1% in 2021. I believe that international expansion will be a driving force for growing GNRC's revenue moving forward, as it already has control of the majority of the domestic residential market.

Figure 21: Revenue (thousands) vs YoY revenue growth

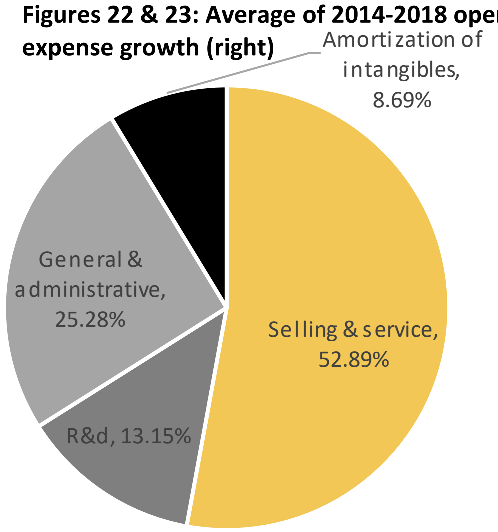


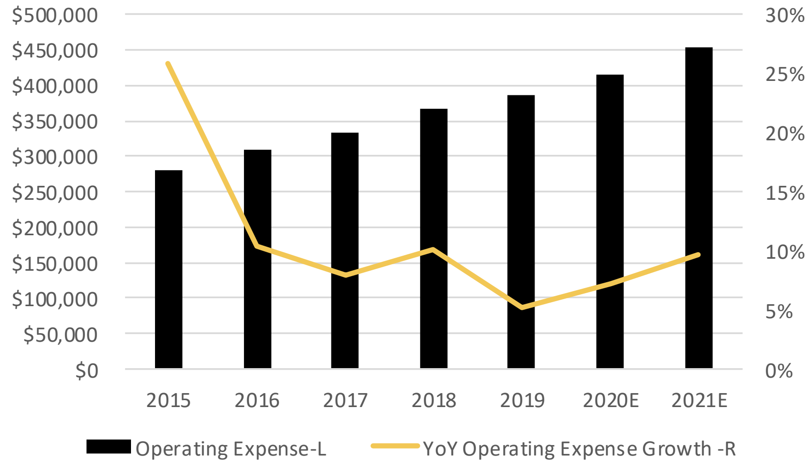
Source: Company reports, IMCP

Operating Income and Margins

Operating expenses are composed primarily of selling and service expenses, general, and administrative expenses and research and development expenses. Research and development costs have been steadily increasing over the last five years, as GNRC has been focusing on improving technology and developing new products to meet the needs of the world. Selling and service along with general and administrative expenses have also been rising over the last five years due to acquisitions. Generac is also growing existing infrastructure, as it hired roughly 300 people within the six Wisconsin locations in 2019. The amortization of intangibles expense includes the straight-line amortization of customer lists, patents, tradenames, and other finite-lived intangible assets. While expenses are rising, margins are as well. Gross margins are flattish, so the gain has been from sales growing faster than SG&A and other. This implies the firm has reasonable operating leverage.

Figures 22 & 23: Average of 2014-2018 operating expenses (left); Operating expenses (thousands) vs YoY operating expense growth (right)





Source: Company reports, IMCP

GNRC currently operates engineering facilities globally that employ over 400 people that are committed to innovation

While Generac's operating expense growth has been relatively volatile over the past five years, I project that operating expenses will to grow at a more stable rate of 7-10%. Entering the clean energy market will force GNRC to continue to invest more capital in research and development. Research and development is forecasted to become a greater portion of Generac's operating expenses, as it has plans to move forward with energy management technology from mobile devices as well as improving solar power capabilities. GNRC currently operates engineering facilities globally that employ over 400 people that are committed to new product development, product improvement, and cost containment. Generac will also continue to make acquisitions and expand internationally into Latin America and other emerging markets which will increase both its selling and service and general and administrative expenses. However, I expect these expenses will be leveraged to create even more sales.

Figure 24: GNRC operating margins, 2018 – 2021E

	2018	2019	2020E	2021E
Sales	$2,023,464	$2,214,539	$2,484,928	$2,774,052
Cost of goods sold	1,298,424	1,439,450	1,610,233	1,792,038
Gross income	725,040	775,089	874,695	982,014
Gross margin	*35.83%*	*35.00%*	*35.20%*	*35.40%*
Operating expenses	367,859	387,135	414,983	454,945
Growth	*10.09%*	*5.24%*	*7.19%*	*9.63%*
Operating Income	357,181	387,954	459,712	527,069
Operating margin	*17.65%*	*17.52%*	*18.50%*	*19.00%*

Source: Company reports, IMCP

<u>Return on Equity</u>

ROA has been driven by the firm's growth in profit margins and asset turnover

Generac has had a growing ROE from 2016 to 2018, but ROE should begin to decline slightly starting in 2019. I forecast that ROE will drop to 29.2% in 2020 and 28% in 2021. DuPont analysis for GNRC shows that ROA has been driven up by the firm's growth in profit margins and asset turnover. I expect both profit margins and asset turnover to continue to grow over the next two years. While ROA is rising, ROE is declining since the firm is paying down debt and reducing its debt to equity ratio.

Figure 25: ROE breakdown, 2016 – 2021E

5-stage DuPont	2016	2017	2018	2019	2020E	2021E
EBIT/sales	15.30%	15.80%	18.60%	17.50%	18.50%	19.00%
Sales/avg assets	0.80	0.86	0.91	0.87	0.88	0.89
EBT/EBIT	79.90%	83.90%	89.10%	89.80%	91.50%	93.00%
Net income/EBT	54.70%	71.70%	71.80%	73.20%	73.70%	74.40%
ROA	5.30%	8.20%	10.80%	10.00%	10.90%	11.70%
Avg assets/avg equity	4.20	4.07	3.38	2.98	2.67	2.40
ROE	**22.40%**	**33.40%**	**36.70%**	**29.80%**	**29.20%**	**28.00%**

Source: Company reports, IMCP

Free Cash Flow

Figure 26: Free cash flow calculations (*excludes cash, **no adjustment for debt)

Free Cash Flow	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	$174,918	$151,397	$212,711	$298,778	$306,096	$362,713	$415,858
Growth		*-13.4%*	*40.5%*	*40.5%*	*2.4%*	*18.5%*	*14.7%*
NWC*	302,936	274,298	289,662	335,581	465,053	571,533	721,254
Net fixed assets	1,146,618	1,178,175	1,201,408	1,305,545	1,384,087	1,461,722	1,499,488
Total net operating capital*	$1,449,554	$1,452,473	$1,491,070	$1,641,126	$1,849,140	$2,033,256	$2,220,741
Growth		*0.2%*	*2.7%*	*10.1%*	*12.7%*	*10.0%*	*9.2%*
- Change in NWC*		(28,638)	15,364	45,919	129,472	106,480	149,720
- Change in NFA		31,557	23,233	104,137	78,542	77,635	37,765
FCFF*		$148,478	$174,114	$148,722	$98,082	$178,597	$228,373
Growth			*17.3%*	*-14.6%*	*-34.1%*	*82.1%*	*27.9%*
- After-tax interest expense	32,514	30,380	34,208	32,446	31,257	30,865	28,912
FCFE**		$118,098	$139,906	$116,276	$66,825	$147,732	$199,461
Growth			*18.5%*	*-16.9%*	*-42.5%*	*121.1%*	*35.0%*
FCFF per share		*$2.29*	*$2.81*	*$2.41*	*$1.61*	*$2.97*	*$3.86*
Growth			*22.7%*	*-14.1%*	*-33.3%*	*84.8%*	*29.8%*
FCFE per share		*$1.82*	*$2.26*	*$1.89*	*$1.10*	*$2.46*	*$3.37*
Growth			*23.9%*	*-16.4%*	*-41.9%*	*124.4%*	*37.1%*

Source: Company reports, IMCP

GNRC's free cash flow has declined the last few years as the firm heavily invested in capital. GNRC's NFA will continue to grow as the business grows, but at a declining rate over the next two years. NOPAT will also continue to grow over the next two years, after halting to only 2.4% growth in 2019. NOPAT will grow at a much faster rate than NWC, which I forecast to grow at a stable rate of around 10% moving forward. Thus, I forecast that FCFF and FCFE as growth in NOPAT outpaces capital growth. Some of the free cash flow will be used to buy back about a million shares per year, and some will be used to pay down $30 million of debt per year.

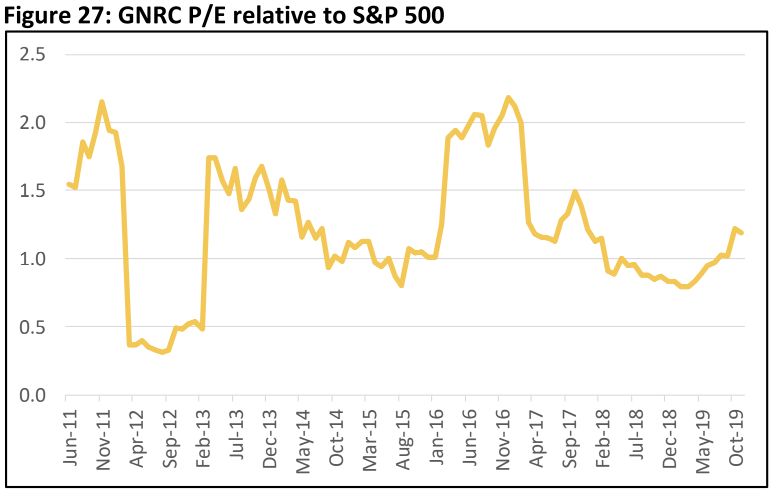
Valuation

GNRC was valued using multiples and a 3-stage discounting cash flow model. An analysis of the NTM P/E discounted back to today shows that GNRC is currently worth $130. Based on comp target P/B and ROE valuation, the stock is slightly expensive relative to other firms and is worth $101.01; however, due to the high growth of GNRC's earnings the past few years, this metric may be unreliable. Relative valuation shows GNRC to be slightly overvalued based on its fundamentals versus those of its peers in the electric product industry. A detailed DCF analysis values GNRC slightly lower, at $94.21; I give this value more weight because it incorporates assumptions that reflect Generac's ongoing growth. Finally, a scenario analysis yields a bear case price of $78.93 and a bull case price of $121.24. As a result of these valuations, I value the stock at $100.

Trading History

Generac's current P/E relative to the S&P 500 has moved between 1.00 and 2.25 since the start of 2016. GNRC is currently trading near its five-year average of 1.23, relative to the S&P 500. Its high in 2015 was due to a drop in EPS of 55% in 2015 due to a recession in the commodity market. In 2012, P/E was low as EPS rose due to the impact of Hurricane Sandy and the acquisition of Magnum at the end of 2011, GNRC's current NTM P/E is at 24.34 compared to its five-year average of 21.18.

Figure 27: GNRC P/E relative to S&P 500



Source: Factset, IMCP

Assuming the firm maintains a 24.34 NTM P/E at the end of 2020, it should trade at $150.18 by the end of the year:

- Price = P/E x EPS = 24.34 x $6.17 = $150.18.

Discounting $150.18 back to today at a 13.2% cost of equity (explained in discounted cash flow section) yields a price of $130.36. Factoring in GNRC's potential for earnings growth and continued profitability, this seems to be a high valuation compared to current price. I believe this is a reasonable valuation based on my forecasts, as I am more bullish than consensus about Generac's growth potential.

Relative Valuation

Generac is currently trading at a P/E much higher than its peers, with a 2020 P/E of 19.10 compared to an average of 15.90. Investors are willing to currently pay a premium for GNRC because it has the potential for greater growth than many of the other companies in its industry. Generac's P/B is also much higher at 7.65 than industry average of 3.66. P/S of 2.79 is also about double the average of 1.43. This may be justified by the growth, stability, and GNRC's 12.40% higher ROE and 4.10% higher net profit margin than the industry.

Figure 28: GNRC comparable companies

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
GNRC	$98.76	$6,177	0.4	5.5	23.0	70.0	88.4	98.7	6.5	23.4%	52.1%	6.9%	23.4%	15.9%	7.3%	1.15	97.9%		0.00%	0.0%
CAT	$141.05	$77,952	0.7	(3.6)	14.7	14.6	9.1	11.0	10.7	-1.3%	315.0%	1.2%	-1.6%	5.4%	12.2%	1.47	174.2%	B+	2.61%	34.3%
AGK-GB	$10.89	$2,783	0.5	2.1	5.9	5.6	12.2	13.0			-2.9%	0.0%	22.7%	-6.2%	-12.7%	0.63			3.27%	
IR	$129.02	$30,913	0.3	(1.3)	6.3	4.0	25.9	41.4	9.7	18.9%	12.5%	12.5%	8.6%	9.2%	23.6%	1.14	73.4%		1.62%	37.5%
CMI	$178.72	$27,381	0.4	(0.7)	15.6	12.0	22.1	33.7	4.5	-21.1%	120.1%	12.6%	-13.3%	5.9%		1.39	25.0%	B+	2.68%	29.4%
669-HK	$7.64	$13,968	2.3	(4.8)	3.6	15.6	35.3	43.8			15.4%	16.7%	14.3%	20.0%	17.4%	1.39			1.61%	
ATCO.A-$	$37.23	$45,286	0.4	(0.3)	19.2	34.8	63.8	67.9	5.1	-1.4%	14.7%	0.7%	4.7%	6.4%	9.7%	1.43	41.2%		1.80%	
WAC-DE	$18.15	$1,273	(2.3)	(0.4)	(2.3)	(23.3)	(8.6)	(1.0)	-7.1		67.6%	-24.0%	7.3%	10.0%	18.8%	1.72	35.2%		3.71%	
BGG	$5.12	$218	(2.3)	(35.4)	(3.9)	(47.3)	(64.8)	(60.9)		-127.0%	-215.7%	-45.8%	-168.8%	177.3%		1.84	158.2%	B	8.79%	
000150-K	$55.79	$923	(0.4)	(12.6)	(17.0)	(9.0)	(32.0)	(24.4)			-152.3%	-137.6%	267.1%	23.1%		1.20	355.6%		8.42%	
TEX	$28.27	$2,016	0.9	(2.0)	12.3	0.2	(5.5)	2.5	8.5	1815.7%	71.4%	98.1%	-24.6%	15.5%	-6.0%	1.90	146.5%	B	1.57%	377.9%
Average		$18,990	0.1	(4.9)	7.0	7.0	13.3	20.5	5.4	243.9%	27.1%	-5.3%	12.7%	25.7%	8.8%	1.39	123.0%		3.28%	95.8%
Median		$6,177	0.4	(1.3)	6.3	5.6	12.2	13.0	6.5	-1.3%	15.4%	1.2%	7.3%	10.0%	10.9%	1.39	97.9%		2.61%	34.3%
SPX	$3,117		0.2	1.4	4.8	10.3	15.5	24.4			20.8%	0.8%	9.7%	10.5%						

	2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
GNRC	32.4%	7.65	19.3	12.7	24.3	24.0	19.4	19.1	16.5	11.8%	2.79	10.9%	17.7%	14.2%	10.8	19.2	6.5%	6.5%	6.4%	$12.91
CAT	40.4%	5.21	60.6	11.8	13.1	13.4	13.6	13.1	12.4	11.1%	1.44	11.2%	15.8%	16.1%	12.1	9.9	-6.3%	-0.7%	-0.3%	$27.05
AGK-GB	9.5%	1.57	15.9	14.1	16.7			13.4	14.3	7.6%	1.26	7.1%	12.0%	6.4%	12.1	6.0			2.3%	$6.96
IR	21.2%	4.27	17.6	16.0	20.6	22.8	19.2	18.6	17.0	9.2%	1.86	8.7%	12.8%	13.0%	12.9	16.2	4.8%	4.1%	7.4%	$30.21
CMI	30.0%	3.60	29.4	10.1	12.1	11.1	14.1	13.8	13.1	9.8%	1.17	9.0%	10.0%	24.1%	9.9	9.4	-11.0%	-1.5%		$49.65
669-HK	20.9%	4.56	25.1	17.7	22.2			19.1	15.9	8.3%	1.82	7.9%	8.4%	16.0%	16.4	41.1			10.5%	$1.67
ATCO.A-SI	34.3%	8.58	24.9	15.8	25.4	24.2	24.5	23.9	22.4	16.6%	4.14	17.1%	21.9%	23.1%	12.4	23.9	5.1%	11.3%	2.6%	$4.34
WAC-DE	9.5%	0.97	26.0	8.1	10.5	10.9		9.6	8.7	6.1%	0.62	8.5%	8.6%	10.7%	9.3	37.5			8.0%	$18.67
BGG	-3.0%	0.48	49.7	-22.2	-16.1	-4.5	16.7	23.3	8.4	-0.7%	0.12	-3.0%	-2.8%	-7.7%	-14.7	5.3	2.6%	3.2%	-0.3%	$10.62
000150-KI	3.2%	1.04	9.4	-17.1	31.3	-6.5		8.8	7.1	0.2%	0.06	-0.5%	6.6%	-1.1%	14.2	2.0	-3.7%		-3.7%	$53.47
TEX	25.3%	2.31	53.0	17.7	9.4	248.4	13.0	12.1	10.5	5.0%	0.46	2.2%	5.7%	5.2%	9.7	9.7	-15.7%	1.5%	-6.3%	$12.22
Average	20.3%	3.66	30.1	7.7	15.4	38.2	17.2	15.9	13.3	7.7%	1.43	7.2%	10.6%	10.9%	9.6	16.4	-2.2%	3.5%	2.7%	
Median	21.2%	3.60	25.1	12.7	16.7	13.4	16.7	13.8	13.1	8.3%	1.26	8.5%	10.0%	13.0%	12.1	9.9	-0.5%	3.2%	2.4%	

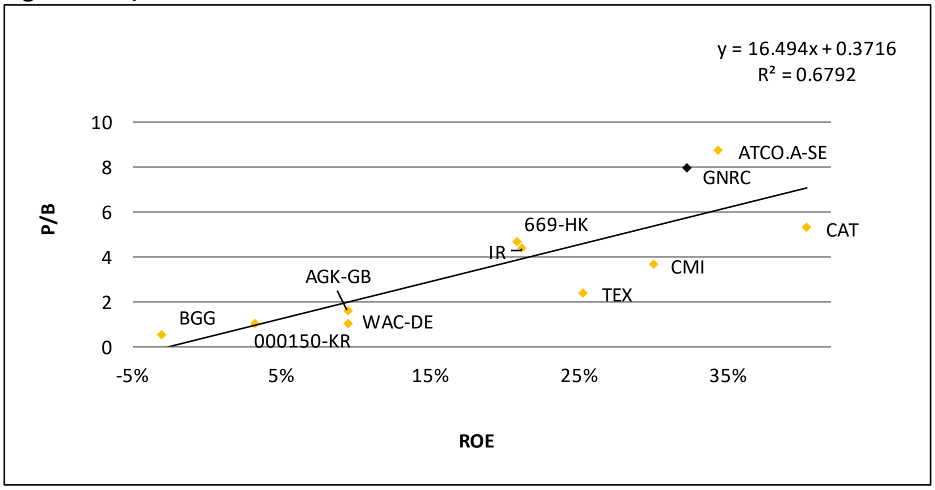
Source: FactSet, IMCP

A more thorough analysis of P/B and ROE is shown in figure 29. The calculated R-squared of the regression indicates that over 67% of a sampled firm's P/B is explained by its NTM ROE. GNRC has the second highest P/B and third highest ROE of this grouping, and according to this measure is overvalued.

- Estimated P/B = Estimated 2020 ROE (29.2%) x 16.494 + .3716 = 5.188
- Target Price = Estimated P/B (5.188) x 2020E BVPS (19.47) = $101.01

Given Generac's potential for earnings growth and continued profitability, $101.01 seems to be a low valuation.

Figure 29: P/B vs LTM ROE



Source: FactSet, IMCP

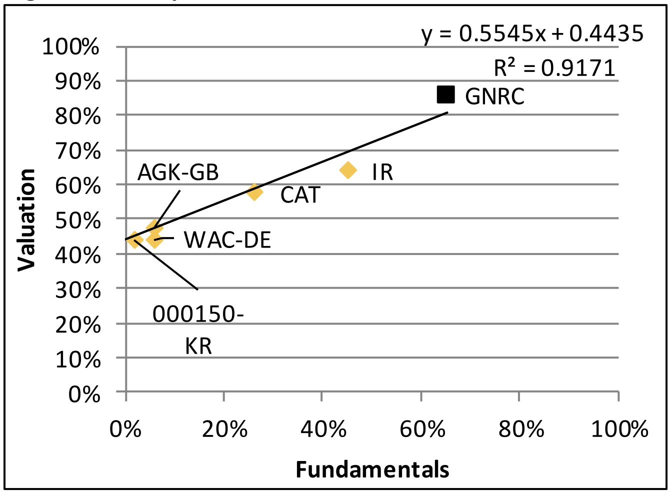
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. 25% weighting of NTM earnings growth, 50% weighting of 2019 ROE, and 25% weighting of NTM sales growth was compared to an equal weight composite of NTM P/E and 2019 P/B. After eliminating outliers BGG, 669-HK, and ATCO.A-SE, the regression line had an R-squared of 0.9171. One can see that GNRC is slightly above the line, so it is marginally expensive based on its fundamentals.

Figure 30: Composite valuation, % of range

			Fundamentals			Valuation	
	Weight		25.0%	50.0%	25.0%	50.0%	50.0%
	Weighted		Earnings Growth	2019	Sales Growth	P/E	2019
Ticker	Fund	Value	NTM	ROE	NTM	NTM	P/B
GNRC	65%	79%	1%	80%	100%	74%	83%
CAT	25%	56%	0%	100%	-99%	54%	58%
AGK-GB	6%	47%	47%	24%	-70%	76%	17%
IR	45%	62%	1%	52%	74%	76%	48%
CMI	-8%	47%	-1%	72%	-176%	55%	39%
669-HK	20%	65%	47%	52%	-70%	77%	53%
ATCO.A-SE	62%	100%	0%	85%	77%	100%	100%
WAC-DE	6%	44%	47%	23%	-70%	76%	11%
BGG	4%	37%	-7%	-7%	40%	68%	6%
000150-KR	7%	44%	47%	8%	-33%	76%	12%
TEX	-4%	39%	100%	63%	-241%	52%	26%

Source: Factset, IMCP

Figure 31: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

A three stage discounted cash flow model was also used to value GNRC.

For the purpose of this analysis, the company's cost of equity was calculated to be 13.2% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.90%.
- The industry average beta is 1.39
- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 13.2% (1.90 + 1.39 (10.0 – 1.90)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $2.46 and $3.37, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $4.81 per share. Thus, stage one of this discounted cash flow analysis contributes $4.81 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 13.2% cost of equity. I assume 11% sales growth in 2022, declining to 9% through 2026. The ratio of NWC to sales will increase slightly from 4.0 in 2022 to 4.1 in 2026. NFA turnover will rise from 1.93 in 2022 to 2.25 in 2026 as a result of improvements in operations. Also, the NOPAT margin is expected to decline to 12.0% in 2026 from 15.0% in 2021. Finally, after-tax interest is expected to decrease about 4.0% per year as the result of GNRC's ability to pay off debt, and shares are expected to decline 1.5% per year.

Figure 32: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$2.46	$3.37	$4.65	$4.63	$5.29	$5.35	$6.00
Discounted FCFE	$2.19	$2.69	$3.21	$2.82	$2.85	$2.55	$2.53

Added together, these discounted cash flows total $18.84.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $7.13 in 2022 to $9.43 in 2026.

Figure 33: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$5.16	$6.17	$7.13	$7.75	$8.32	$8.92	$9.43

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this analysis, it is generally assumed that as a company grows larger and matures, its P/E ratio will converge near to the historical average of the S&P 500. The S&P 500 is currently at 19.50, but this is higher than normal. Thus, I assume a 19.00 P/E.

Given the assumed terminal earnings per share of $9.43 and a price to earnings ratio of 19.00, a terminal value of $179.17 per share is calculated. Using the 13.2% cost of equity, this number is discounted back to a present value of $75.45.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $94.21 is calculated (4.81 + 13.96 + 75.45). Given GNRC's current price of $100.81, this model indicates that the stock is slightly overvalued.

Scenario Analysis

Generac is difficult to value because it is nearly impossible to predict with certainty the scale at which it will grow internally and through acquisitions. It is also difficult to predict how the market will react to its new solar battery technology, as well as its continuing efforts to expand internationally. Given the uncertainty that is to come, a bull and bear case provides a solid demonstration for quantifying all likely scenarios.

Figure 34 displays my assumptions for the bear and bull case scenario analysis. In the bull case, I am assuming a constant P/E of 21.00, as investors are excited about sales growth and expansion through acquisitions. A beta of 1.25 is assumed, but it is still above 1.00 because Generac is still exposed to cyclical macroeconomic risks. NOPAT/S and S/NFA would increase with higher sales growth. The value rises to $121.24 which is a 28.69% increase from the base case.

In the bear case scenario, I lowered sales growth by 2% from the base case scenario. In this particular analysis, I am assuming a weaker economy. This scenario has a P/E multiple of 18.00 and a beta of 1.50 to account for the increased risk with a weaker economy. I believe that NOPAT/S will decrease slightly from the base case and will remain constant at 12% moving forward. Since Generac has shown strength through acquisitions and a stable historical S/NFA ratio, I believe the ratio will remain the same as the base case. The value of the bear case decreases to $78.93, which is 16.22% less than the base case.

Figure 34: DCF Target price scenario analysis

Base Case Expectations	2020	2021	2022	2023	2024	2025	2026
Beta	1.39						
Sales Growth	12.2%	11.6%	11.0%	11.0%	10.0%	10.0%	9.0%
NOPAT/S	14.60%	15.00%	14.40%	13.80%	13.20%	12.60%	12.00%
S/NFA	1.70	1.85	1.93	2.01	2.09	2.17	2.25
Terminal Year P/E	19.00						
Bear Case Expectations	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Beta	1.50						
Sales Growth	12.20%	11.60%	9.00%	9.00%	8.00%	8.00%	7.00%
NOPAT/S	14.60%	15.00%	12.00%	12.00%	12.00%	12.00%	12.00%
S/NFA	1.70	1.85	1.93	2.01	2.09	2.17	2.25
Terminal Year P/E	18.00						
Bull Case Expectations	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Beta	1.25						
Sales Growth	12.2%	11.6%	12.0%	11.0%	11.0%	10.0%	10.0%
NOPAT/S	14.6%	15.0%	14.0%	13.0%	13.0%	13.0%	13.0%
S/NFA	1.7	1.85	1.98	2.11	2.24	2.37	2.5
Terminal Year P/E	21.00						

Base Case Epectations	
P/E	19.00
Target Price	$94.21
Bear Case Expectations	
P/E	18.00
Target Price	$78.93
Bull Case Expectations	
P/E	21.00
Target Price	$121.24

Source: Factset, IMCP

Business Risks

Although I have many reasons to be optimistic about Generac, there are several good reasons why I find the stock to be fairly priced.

Effect of unpredictable outages:

Sales are heavily impacted by the location, frequency, and severity of power outages. Generac relies on power outages to raise awareness and need for its products; when there are no outages, there is not a strong need for backup power generation.

Raw material pricing:

Raw materials make up 77% of the cost of goods sold for Generac. The primary materials used in its products are aluminum, copper, and steel. These materials are subject to changes in macroeconomic factors such as exchange rates, tariffs, supply and demand of the market, and transportation costs that have a large impact on direct costs for GNRC.

Improving technology:

As Generac continually invests more into research and development, there is a large risk of failure for new products or innovation among existing products. As new technology is developed, GNRC must assure that it will be accepted by its customer base. This means that it must account for changes in consumer trends and the improving technology of its competitors.

Independent dealers and distributors:

Generac relies upon independent distributors and dealers to sell its products and aftermarket services. In many cases, these dealers and distributors are also selling its competitors' products and services. Part of Generac's effective growth strategy is to identify distributors that will successfully promote its products and services. GNRC has the potential to lose sales through a poor distributor.

Products subject to government regulation:

Generac's products are constantly subject to restrictive requirements regarding emissions, noise, and standards implemented by the EPA, CARB, and other regulatory agencies. Changes in laws and regulations could force GNRC to redesign its products, which would bring increasing costs to the firm.
Source: Company 10Ks

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

The threat of new entrants to the backup power industry is fairly low, as the industry has extensive amounts of fixed assets and relies on always-improving technology. The most significant threat to Generac is from other firms already established within the industry.

Threat of Substitutes – Moderate

Generac operates in markets that are highly competitive. Some competitors like CAT, CMI, and IR are much larger in size and may be willing to cut prices and margins in order to compete with GNRC.

Supplier Power - High

Generac sources most of its raw material components from third party suppliers. The prices of these raw materials are constantly subject to changing macroeconomic factors and the firm is a price taker.

Buyer Power – Moderate

GNRC relies on independent dealers and distributors to sell its products. These dealers and distributors often also sell competitors' products which gives them some degree of power over Generac. Increasing power outages have also provided an urgency for consumers to purchase backup power products.

Intensity of Competition – High

There are numerous international and domestic power generation brands that occupy the same space as Generac's products. Some of these have much more powerful brand names, which could allow them to lower prices and margins in order to compete with Generac.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Strong FCF High gross margins Reliable products	Narrow product line Limited distributors Unpredictable natural disaster
Opportunities	**Threats**
International expansion Acquisitions Solar technology	Raw material pricing Environmental regulation Large competitors

Appendix 3: Income Statement

Income Statement (in thousands)							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	$1,317,299	$1,447,743	$1,679,373	$2,023,464	$2,214,539	$2,484,928	$2,774,052
Direct costs	857,349	935,322	1,094,587	1,298,424	1,439,450	1,610,233	1,792,038
Gross Margin	459,950	512,421	584,786	725,040	775,089	874,695	982,014
SG&A, R&D, and other	229,467	290,317	319,474	347,896	387,135	414,983	454,945
EBIT	230,483	222,104	265,312	377,144	387,954	459,712	527,070
Interest	42,843	44,568	42,667	40,956	39,616	39,119	36,644
EBT	187,640	177,536	222,645	336,188	348,338	420,592	490,426
Taxes	45,236	56,519	44,142	69,856	73,499	88,745	103,480
Income	142,404	121,017	178,503	266,332	274,839	331,847	386,946
Other	64,657	23,839	18,946	25,112	20,000	22,000	22,000
Net income	77,747	97,178	159,557	241,220	254,839	309,847	364,946
Basic Shares	68,096	64,906	62,041	61,662	60,984	60,084	59,175
Fully Diluted Shares	69,200	65,383	62,643	62,233	61,555	60,655	59,746
EPS	$1.14	$1.50	$2.57	$3.91	$4.18	$5.16	$6.17
EPS Fully Diluted	$1.12	$1.49	$2.55	$3.88	$4.14	$5.11	$6.11
DPS	$0.02	$0.00	$0.00	$0.01	$0.00	$0.00	$0.00
Growth Statistics							
Sales		*9.9%*	*16.0%*	*20.5%*	*9.4%*	*12.2%*	*11.6%*
Direct Costs		*9.1%*	*17.0%*	*18.6%*	*10.9%*	*11.9%*	*11.3%*
Gross Margin		*11.4%*	*14.1%*	*24.0%*	*6.9%*	*12.9%*	*12.3%*
SG&A and other		*26.5%*	*10.0%*	*8.9%*	*11.3%*	*7.2%*	*9.6%*
EBIT		*-3.6%*	*19.5%*	*42.2%*	*2.9%*	*18.5%*	*14.7%*
Interest		*4.0%*	*-4.3%*	*-4.0%*	*-3.3%*	*-1.3%*	*-6.3%*
EBT		*-5.4%*	*25.4%*	*51.0%*	*3.6%*	*20.7%*	*16.6%*
Taxes		*24.9%*	*-21.9%*	*58.3%*	*5.2%*	*20.7%*	*16.6%*
Continuing income		*-15.0%*	*47.5%*	*49.2%*	*3.2%*	*20.7%*	*16.6%*
Other		*-63.1%*	*-20.5%*	*32.5%*	*-20.4%*	*10.0%*	*0.0%*
Net income		*25.0%*	*64.2%*	*51.2%*	*5.6%*	*21.6%*	*17.8%*
Basic Shares		*-4.7%*	*-4.4%*	*-0.6%*	*-1.1%*	*-1.5%*	*-1.5%*
EPS		*31.1%*	*71.8%*	*52.1%*	*6.8%*	*23.4%*	*19.6%*
EPS Fully Diluted		*32.3%*	*71.4%*	*52.2%*	*6.8%*	*23.4%*	*19.6%*
DPS		*-94.4%*	*-100.0%*		*-100.0%*		
Common Size							
Sales	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*
Direct Costs	*65.1%*	*64.6%*	*65.2%*	*64.2%*	*65.0%*	*64.8%*	*64.6%*
Gross Margin	*34.9%*	*35.4%*	*34.8%*	*35.8%*	*35.0%*	*35.2%*	*35.4%*
SG&A, R&D, and other	*17.4%*	*20.1%*	*19.0%*	*17.2%*	*17.5%*	*16.7%*	*16.4%*
EBIT	*17.5%*	*15.3%*	*15.8%*	*18.6%*	*17.5%*	*18.5%*	*19.0%*
Interest	*3.3%*	*3.1%*	*2.5%*	*2.0%*	*1.8%*	*1.6%*	*1.3%*
EBT	*14.2%*	*12.3%*	*13.3%*	*16.6%*	*15.7%*	*16.9%*	*17.7%*
Taxes	*3.4%*	*3.9%*	*2.6%*	*3.5%*	*3.3%*	*3.6%*	*3.7%*
Continuing income	*10.8%*	*8.4%*	*10.6%*	*13.2%*	*12.4%*	*13.4%*	*13.9%*
Other	*4.9%*	*1.6%*	*1.1%*	*1.2%*	*0.9%*	*0.9%*	*0.8%*
Net income	*5.9%*	*6.7%*	*9.5%*	*11.9%*	*11.5%*	*12.5%*	*13.2%*

Appendix 4: Balance Sheets

Balance Sheet (in thousands)							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Cash	115,857	67,272	138,472	224,482	273,126	338,858	396,318
Operating assets ex cash	516,160	616,237	686,085	896,287	1,018,688	1,192,765	1,359,285
Operating assets	632,017	683,509	824,557	1,120,769	1,291,814	1,531,623	1,755,604
Operating liabilities	213,224	341,939	396,423	560,706	553,635	621,232	638,032
NOWC	418,793	341,570	428,134	560,063	738,179	910,391	1,117,572
NOWC ex cash (NWC)	302,936	274,298	289,662	335,581	465,053	571,533	721,254
NFA	1,146,618	1,178,175	1,201,408	1,305,545	1,384,087	1,461,722	1,499,488
Invested capital	*$1,565,411*	*$1,519,745*	*$1,629,542*	*$1,865,608*	*$2,122,266*	*$2,372,113*	*$2,617,059*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$1,778,635*	*$1,861,684*	*$2,025,965*	*$2,426,314*	*$2,675,901*	*$2,993,345*	*$3,255,091*
Short-term and long-term debt	$1,037,132	$1,006,758	$906,548	$876,396	$884,315	$854,315	$774,315
Other liabilities	62,408	111,875	168,674	227,951	287,951	347,951	407,951
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	465,871	401,112	554,320	761,261	950,000	1,169,847	1,434,793
Total supplied capital	*$1,565,411*	*$1,519,745*	*$1,629,542*	*$1,865,608*	*$2,122,266*	*$2,372,113*	*$2,617,059*
Total liabilities and equity	*$1,778,635*	*$1,861,684*	*$2,025,965*	*$2,426,314*	*$2,675,901*	*$2,993,345*	*$3,255,091*
Growth Statistics							
Cash		*-41.9%*	*105.8%*	*62.1%*	*21.7%*	*24.1%*	*17.0%*
Operating assets ex cash		*19.4%*	*11.3%*	*30.6%*	*13.7%*	*17.1%*	*14.0%*
Operating assets		*8.1%*	*20.6%*	*35.9%*	*15.3%*	*18.6%*	*14.6%*
Operating liabilities		*60.4%*	*15.9%*	*41.4%*	*-1.3%*	*12.2%*	*2.7%*
NOWC		*-18.4%*	*25.3%*	*30.8%*	*31.8%*	*23.3%*	*22.8%*
NOWC ex cash (NWC)		*-9.5%*	*5.6%*	*15.9%*	*38.6%*	*22.9%*	*26.2%*
NFA		*2.8%*	*2.0%*	*8.7%*	*6.0%*	*5.6%*	*2.6%*
Invested capital		*-2.9%*	*7.2%*	*14.5%*	*13.8%*	*11.8%*	*10.3%*
Marketable securities							
Total assets		*4.7%*	*8.8%*	*19.8%*	*10.3%*	*11.9%*	*8.7%*
Short-term and long-term debt		*-2.9%*	*-10.0%*	*-3.3%*	*0.9%*	*-3.4%*	*-9.4%*
Other liabilities		*79.3%*	*50.8%*	*35.1%*	*26.3%*	*20.8%*	*17.2%*
Debt/equity-like securities							
Equity		*-13.9%*	*38.2%*	*37.3%*	*24.8%*	*23.1%*	*22.6%*
Total supplied capital		*-2.9%*	*7.2%*	*14.5%*	*13.8%*	*11.8%*	*10.3%*
Total liabilities and equity		*4.7%*	*8.8%*	*19.8%*	*10.3%*	*11.9%*	*8.7%*

Appendix 5: Sales Forecast

Sales (in thousands)							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	$1,317,299	$1,444,453	1,679,373	$2,023,464	2,214,539	$2,484,928	$2,774,052
Growth		*9.7%*	*16.3%*	*20.5%*	*9.4%*	*12.2%*	*11.6%*
Residential	673,764	772,436	870,491	1,042,739	1,156,262	1,300,795	1,443,882
Growth		*14.6%*	*12.7%*	*19.8%*	*10.9%*	*12.5%*	*11.0%*
% of sales	*51.1%*	*53.5%*	*51.8%*	*51.5%*	*52.2%*	*52.3%*	*52.0%*
Commercial & Industrial	548,440	557,532	684,352	820,270	869,363	964,993	1,075,967
Growth		*1.7%*	*22.7%*	*19.9%*	*6.0%*	*11.0%*	*11.5%*
% of sales	*41.6%*	*38.6%*	*40.8%*	*40.5%*	*39.3%*	*2.0%*	*38.8%*
Other	95,095	114,485	124,530	160,455	188,914	219,140	254,203
Growth		*20.4%*	*8.8%*	*28.8%*	*17.7%*	*16.0%*	*16.0%*
% of sales	*7.2%*	*7.9%*	*7.4%*	*7.9%*	*8.5%*	*8.8%*	*6.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	1,204,589	1,173,559	1,303,506	1,580,325	1,781,511	1,925,819	2,108,279
Growth		*-2.6%*	*11.1%*	*21.2%*	*12.7%*	*8.1%*	*9.5%*
% of sales	*91.4%*	*81.2%*	*77.6%*	*78.1%*	*80.4%*	*77.5%*	*76.0%*
International	112,710	270,894	375,867	443,139	433,028	559,109	665,772
Growth		*140.3%*	*38.8%*	*17.9%*	*-2.3%*	*29.1%*	*19.1%*
% of sales	*8.6%*	*18.8%*	*22.4%*	*21.9%*	*19.6%*	*22.5%*	*24.0%*

Appendix 6: Ratios

Ratios							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Profitability							
Gross margin	34.9%	35.4%	34.8%	35.8%	35.0%	35.2%	35.4%
Operating (EBIT) margin	17.5%	15.3%	15.8%	18.6%	17.5%	18.5%	19.0%
Net profit margin	5.9%	6.7%	9.5%	11.9%	11.5%	12.5%	13.2%
Activity							
NFA (gross) turnover		1.25	1.41	1.61	1.65	1.75	1.87
Total asset turnover		0.80	0.86	0.91	0.87	0.88	0.89
Liquidity							
Op asset / op liab	2.96	2.00	2.08	2.00	2.33	2.47	2.75
NOWC Percent of sales		26.3%	22.9%	24.4%	29.3%	33.2%	36.6%
Solvency							
Debt to assets	58.3%	54.1%	44.7%	36.1%	33.0%	28.5%	23.8%
Debt to equity	222.6%	251.0%	163.5%	115.1%	93.1%	73.0%	54.0%
Other liab to assets	3.5%	6.0%	8.3%	9.4%	10.8%	11.6%	12.5%
Total debt to assets	61.8%	60.1%	53.1%	45.5%	43.8%	40.2%	36.3%
Total liabilities to assets	73.8%	78.5%	72.6%	68.6%	64.5%	60.9%	55.9%
Debt to EBIT	4.50	4.53	3.42	2.32	2.28	1.86	1.47
EBIT/interest	5.38	4.98	6.22	9.21	9.79	11.75	14.38
Debt to total net op capital	66.3%	66.2%	55.6%	47.0%	41.7%	36.0%	29.6%
ROIC							
NOPAT to sales	13.3%	10.5%	12.7%	14.8%	13.8%	14.6%	15.0%
Sales to NWC		5.02	5.96	6.47	5.53	4.79	4.29
Sales to NFA		1.25	1.41	1.61	1.65	1.75	1.87
Sales to IC ex cash		1.00	1.14	1.29	1.27	1.28	1.30
Total ROIC ex cash		10.4%	14.5%	19.1%	17.5%	18.7%	19.6%
NOPAT to sales	13.3%	10.5%	12.7%	14.8%	13.8%	14.6%	15.0%
Sales to EOY NWC	4.35	5.28	5.80	6.03	4.76	4.35	3.85
Sales to EOY NFA	1.15	1.23	1.40	1.55	1.60	1.70	1.85
Sales to EOY IC ex cash	0.91	1.00	1.13	1.23	1.20	1.22	1.25
Total ROIC using EOY IC ex cash	12.1%	10.4%	14.3%	18.2%	16.6%	17.8%	18.7%
NOPAT to sales	13.3%	10.5%	12.7%	14.8%	13.8%	14.6%	15.0%
Sales to EOY NOWC	3.15	4.24	3.92	3.61	3.00	2.73	2.48
Sales to EOY NFA	1.15	1.23	1.40	1.55	1.60	1.70	1.85
Sales to EOY IC	0.84	0.95	1.03	1.08	1.04	1.05	1.06
Total ROIC using EOY IC	11.2%	10.0%	13.1%	16.0%	14.4%	15.3%	15.9%
ROE							
5-stage							
EBIT / sales		15.3%	15.8%	18.6%	17.5%	18.5%	19.0%
Sales / avg assets		0.80	0.86	0.91	0.87	0.88	0.89
EBT / EBIT		79.9%	83.9%	89.1%	89.8%	91.5%	93.0%
Net income /EBT		54.7%	71.7%	71.8%	73.2%	73.7%	74.4%
ROA		5.3%	8.2%	10.8%	10.0%	10.9%	11.7%
Avg assets / avg equity		4.20	4.07	3.38	2.98	2.67	2.40
ROE		22.4%	33.4%	36.7%	29.8%	29.2%	28.0%
Payout Ratio		0.1%	0.0%	0.1%	0.0%	0.0%	0.0%
Retention Ratio		99.9%	100.0%	99.9%	100.0%	100.0%	100.0%
Sustainable Growth Rate		22.4%	33.4%	36.6%	29.8%	29.2%	28.0%

Appendix 7: 3-stage DCF Model

	First Stage		Second Stage				
Year ending December	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*12.2%*	*11.6%*	*11.0%*	*11.0%*	*10.0%*	*10.0%*	*9.0%*
NOPAT / S	*14.6%*	*15.0%*	*14.4%*	*13.8%*	*13.2%*	*12.6%*	*12.0%*
S / NWC	*4.35*	*3.85*	*4.00*	*4.05*	*4.10*	*4.10*	*4.10*
S / NFA (EOY)	*1.70*	*1.85*	*1.93*	*2.01*	*2.09*	*2.17*	*2.25*
S / IC (EOY)	*1.22*	*1.25*	*1.30*	*1.34*	*1.38*	*1.42*	*1.45*
ROIC (EOY)	*17.8%*	*18.7%*	*18.7%*	*18.5%*	*18.3%*	*17.9%*	*17.4%*
ROIC (BOY)		*20.5%*	*20.0%*	*19.9%*	*19.5%*	*19.2%*	*18.6%*
Share Growth		*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*
Sales	$2,484,928	$2,774,052	$3,079,198	$3,417,909	$3,759,700	$4,135,670	$4,507,881
NOPAT	$362,713	$415,858	$443,404	$471,672	$496,280	$521,094	$540,946
Growth		*14.7%*	*6.6%*	*6.4%*	*5.2%*	*5.0%*	*3.8%*
- Change in NWC	106480	149720	48546	74129	73072	91700	90783
NWC EOY	*571533*	*721254*	*769799*	*843928*	*917000*	*1008700*	*1099483*
Growth NWC		*26.2%*	*6.7%*	*9.6%*	*8.7%*	*10.0%*	*9.0%*
- Chg NFA	77635	37765	95952	105013	98447	106939	97664
NFA EOY	*1,461,722*	*1,499,488*	*1,595,439*	*1,700,452*	*1,798,900*	*1,905,839*	*2,003,503*
Growth NFA		*2.6%*	*6.4%*	*6.6%*	*5.8%*	*5.9%*	*5.1%*
Total inv in op cap	184116	187485	144498	179142	171519	198639	188447
Total net op cap	2033256	2220741	2365239	2544381	2715900	2914539	3102986
FCFF	$178,597	$228,373	$298,907	$292,529	$324,761	$322,455	$352,499
% of sales	*7.2%*	*8.2%*	*9.7%*	*8.6%*	*8.6%*	*7.8%*	*7.8%*
Growth		*27.9%*	*30.9%*	*-2.1%*	*11.0%*	*-0.7%*	*9.3%*
- Interest (1-tax rate)	30865	28912	27792	26672	25552	24432	23311
Growth		*-6.3%*	*-3.9%*	*-4.0%*	*-4.2%*	*-4.4%*	*-4.6%*
FCFE w/o debt	$147,732	$199,461	$271,115	$265,858	$299,210	$298,024	$329,188
% of sales	*5.9%*	*7.2%*	*8.8%*	*7.8%*	*8.0%*	*7.2%*	*7.3%*
Growth		*35.0%*	*35.9%*	*-1.9%*	*12.5%*	*-0.4%*	*10.5%*
/ No Shares	60084.1	59175.0	58,287.3	57,413.0	56,551.8	55,703.6	54,868.0
FCFE	$2.46	$3.37	$4.65	$4.63	$5.29	$5.35	$6.00
Growth		*37.1%*	*38.0%*	*-0.4%*	*14.3%*	*1.1%*	*12.1%*
* Discount factor	0.88	0.78	0.69	0.61	0.54	0.48	0.42
Discounted FCFE	$2.17	$2.63	$3.21	$2.82	$2.85	$2.55	$2.53
Third Stage							
Terminal value P/E							
Net income	$309,847	$364,946	$415,612	$445,000	$470,729	$496,663	$517,634
% of sales	*12.5%*	*13.2%*	*13.5%*	*13.0%*	*12.5%*	*12.0%*	*11.5%*
EPS	$5.16	$6.17	$7.13	$7.75	$8.32	$8.92	$9.43
Growth		*19.6%*	*15.6%*	*8.7%*	*7.4%*	*7.1%*	*5.8%*
Terminal P/E							19.00
* Terminal EPS							$9.43
Terminal value							$179.25
* Discount factor							0.42
Discounted terminal value							$75.45

Summary (using P/E multiple for terminal value)

First stage	$4.81	Present value of first 2 year cash flow	
Second stage	$13.96	Present value of year 3-7 cash flow	
Third stage	$75.45	Present value of terminal value P/E	
Value (P/E)	**$94.21**	Value at beg of fiscal year	2020

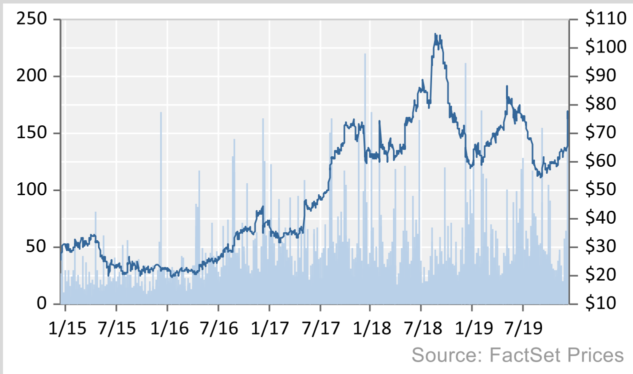
Consumer Discretionary

Johnson Outdoors Inc.

Recommendation: Neutral

Current Price	**$77.21**	---	Ticker	JOUT
1 Year Bear	$56	*-27%*	Sh. Out.(M)	10.0
1 Year Base	**$73**	***-5%***	M.Cap. ($M)	760.3
1 Year Bull	$104	*35%*	EV ($M)	592.4

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	22.6%	27.0%	10.4%	24.5%	30.9%	31.3%	19.0%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**0.43**	**0.43**	**0.49**	**0.54**	**0.56**	**0.59**	**0.63**
Gr. %	*1.2%*	*0.8%*	*13.1%*	*10.9%*	*3.3%*	*5.4%*	*6.0%*
Cons.	-	-	-	-	-	*1.3%*	*2.3%*
Ind.	*1.9%*	*9.8%*	*1.3%*	*8.2%*	*-1.9%*	*3.8%*	*1.8%*
EPS	**$1.08**	**$1.37**	**$3.56**	**$4.09**	**$5.14**	**$5.49**	**$5.81**
Gr. %	*17.8%*	*26.5%*	*159.1%*	*15.0%*	*25.8%*	*6.8%*	*5.8%*
Cons.	-	-	-	-	-	*-5.0%*	*1.5%*
Ind.	*20.5%*	*13.8%*	*-0.9%*	*6.4%*	*-7.9%*	*19.2%*	*23.0%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**2.5%**	**3.1%**	**7.2%**	**7.5%**	**9.1%**	**9.3%**	**9.2%**
Ind.	*5.4%*	*6.5%*	*4.6%*	*3.3%*	*3.1%*		
ROE	*5.4%*	*6.7%*	*15.6%*	*15.6%*	*17.0%*	*15.7%*	*14.6%*
Ind.	*18.2%*	*18.0%*	*17.4%*	*16.9%*	*14.3%*		
ROA	*3.1%*	*4.4%*	*10.6%*	*10.9%*	*12.4%*	*11.9%*	*11.2%*
Ind.	*4.0%*	*4.6%*	*3.2%*	*2.4%*	*2.7%*		
A T/O	1.46	1.42	1.48	1.45	1.35	1.28	1.22
A/E	1.44	1.50	1.47	1.44	1.38	1.33	1.30

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	20.13	27.14	17.70	15.50	14.90	12.20	10.90
v. Ind.	15.34	12.11	22.40	25.50	17.80	26.20	24.30
P/S	0.49	0.83	1.48	1.71	1.05		
P/B	1.09	1.75	3.01	3.30	1.80		
P/CF	11.62	8.25	15.68	16.20	13.80		
EV/EBITDA	5.04	6.80	10.60	10.10	4.74		
D/P	*1.4%*	*0.9%*	*0.5%*	*0.5%*	*1.0%*		

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Summary

I recommend a neutral rating with a target of $73. Although JOUT has potential for significant earnings growth, an opportunity to improve efficiency and increase margins, I believe the market has already priced in the majority of these opportunities. If JOUT misses its estimates, the stock could fall dramatically. The uncertainty and risk associated with growth outweigh its growth potential. Therefore, I do not believe the stock presents enough upside to advocate for a buy rating. The stock is fairly valued based on a three-stage DCF model and relative valuation.

Key Drivers

- Strategic position: JOUT has a cash balance of $172 million or 18.7% of its market cap. It has the ability to make acquisitions, but has been conservative in this area. Johnson Outdoors has been steadily increasing its domestic presence since 2012, benefiting from growth of Cabela's and Bass Pro Shops. JOUT's lack of international presence may hurt the firm in the future, but it plans to grow this by 10% of sales by 2021.
- Brands and innovation: Johnson Outdoors spends 3.9% and 21.1% as a percent of sales on R&D and marketing respectively. By committing significant resources to innovation and marketing it is establishing innovative products.
- Competitor analysis: The leisure industry is growing competitive and the firm has large competitors.
- Macroeconomic trends: Demand for discretionary products is driven by consumer preferences and the economy.

Valuation

Using a relative valuation approach, Johnson Outdoors appears to be fairly valued in comparison to the consumer discretionary industry. DCF analysis implies that the stock is worth $60. A combination of the approaches suggests that Johnson Outdoors is fairly valued, as the stock's value is about $73 and the shares trade at $76 currently.

Risks

- Uncertainty over global tariffs will continue to increase JOUT's costs of producing goods.
- The firm is largely dependent upon the state of the economy.

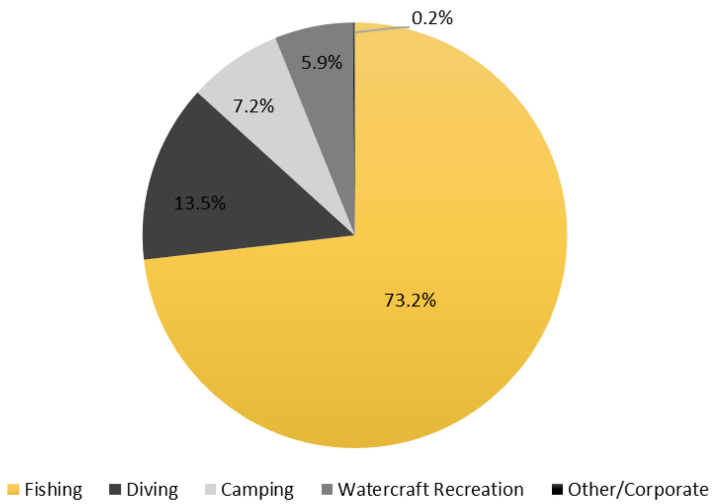
Company Overview

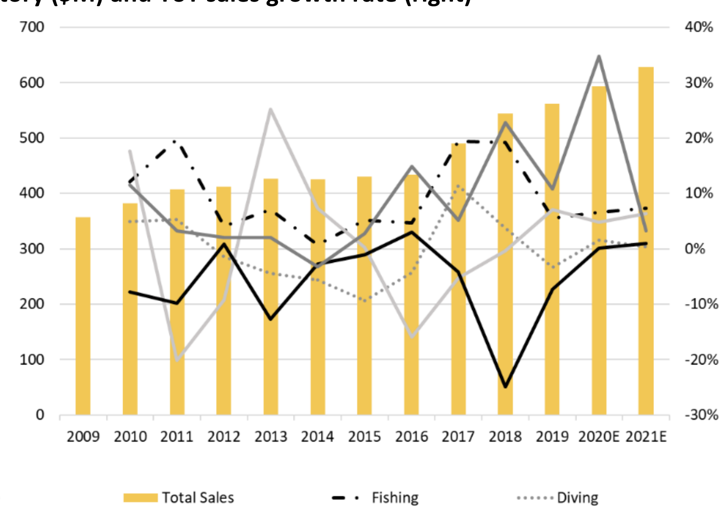
Johnson Outdoors Inc. (JOUT) manufactures and markets high quality seasonal outdoor recreation products for outdoor enthusiasts and is headquartered in Racine, WI. Through the combination of innovative products, strong marketing, and efficient distribution, Johnson Outdoors sets itself apart from its competition. The company's portfolio of well-known consumer brands operates through the following segments: fishing, camping, watercraft recreation, diving, and other. The fishing segment includes the brands Minn Kota electric motors, marine battery chargers, Humminbird sonar for fish-finding, and Cannon downriggers. The camping segment is primarily Eureka! consumer, commercial, and military tents along with accessories, sleeping bags, and other recreational camping products. The watercraft recreation segment designs and markets pedal-driven and Minn Kota motor-driven kayaks and canoes under the Ocean Kayaks and Old Town brand names for family recreation. Lastly, the diving segment sells and distributes the SCUBAPRO brand.

Johnson Outdoors Inc. generates 73.2% of its sales from its fishing segment, 13.5% from diving, 7.2% from camping, 5.9% from watercraft recreation, and 0.2% from other.

- Fishing: Net revenue increased 5.5% in fiscal 2019 from fiscal 2018. The increasing sales volume of the Hummingbird Helix fish finders has driven growth. Fishing brands and related accessories are sold across the globe with the majority of sales coming from North America through large outdoor specialty retailers such as Bass Pro Shops and Cabela's.
- Diving: Income generated decreased 3.3% in fiscal 2019 primarily due to tariffs that were implemented. SCUBAPRO diving equipment is marketed to the premium segment and high-performance technical diving market.
- Camping: Revenue increased 7.0% in fiscal 2019 from fiscal 2018 heavily driven by an increase in military tent sales as well as increased sales of Jetboil products. Commercial brands such as Eureka! are sold to general retail stores and directly to consumers.
- Watercraft Recreation: Income decreased 7.3% in fiscal 2019 due to a weakened kayak market along with lost distribution related to retail consolidations. The company's kayaks, canoes, and accessories are sold through multiple channels in the U.S. and Europe with an emphasis on independent specialty retailers and large outdoor retailers.

Figures 1 & 2: 2018 Revenue sources for JOUT (left); revenue history ($M) and YoY sales growth rate (right)





Business/Industry Drivers

Although there are several factors that may influence Johnson Outdoors future success, the following are the most significant business drivers:

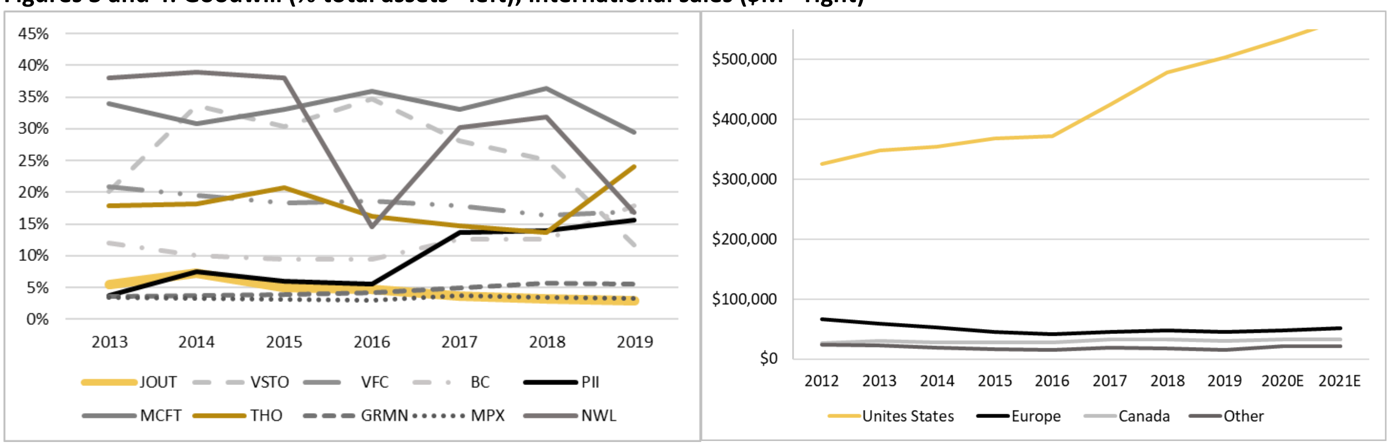
1) Strategic Positions
2) Brands and innovation
3) Competitor analysis
4) Macroeconomic trends

Johnson Outdoors has a cash balance of $172 million or 18.7% of its market cap

<u>Strategic Positions</u>

It is very important for leisure companies to stay at the forefront of innovation. While competitors have pursued growth by acquisitions, JOUT only made a couple in 2016 (Seabear and Northport for $9.2 million). The firm has ample cash if the opportunity arises - $172 million or 18.45% of market cap.

Figures 3 and 4: Goodwill (% total assets - left); international sales ($M - right)



Source: Company reports

84.8% of JOUT's total sales come from the United States

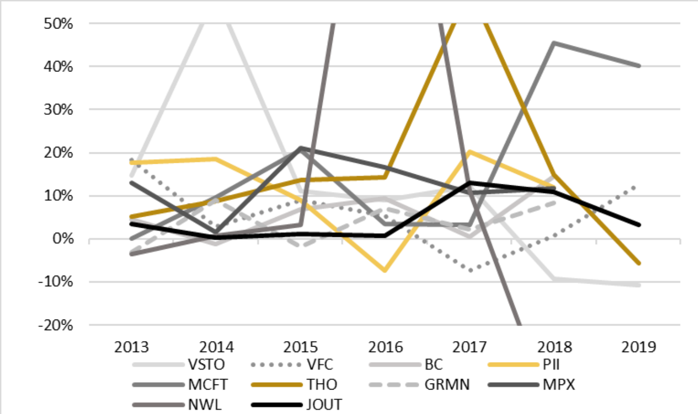
JOUT has steadily increasing its domestic presence since 2012. For the 2019 fiscal year, 84.8% of sales were from the U.S., 7.6% from Europe, 5.1% from Canada and 2.5% from other. The firm sells through high growth retailers such as Bass Pros Shops and Cabela's in the US, which is likely why US sales have been growing. Although, the rising focus on the US more exposes the firm to one market and could lead to fewer opportunities for growth. I suspect that international sales are difficult to receive because relationships with large specialty retailers are not established. The firm utilizes large specialty retailers such as Bass Pro Shops and Cabela's to distribute their products within the United States. This may become a risk as more leisure products arise and maintaining floor space becomes increasingly difficult. By decreasing international sales, JOUT is missing a huge opportunity for exponential growth.

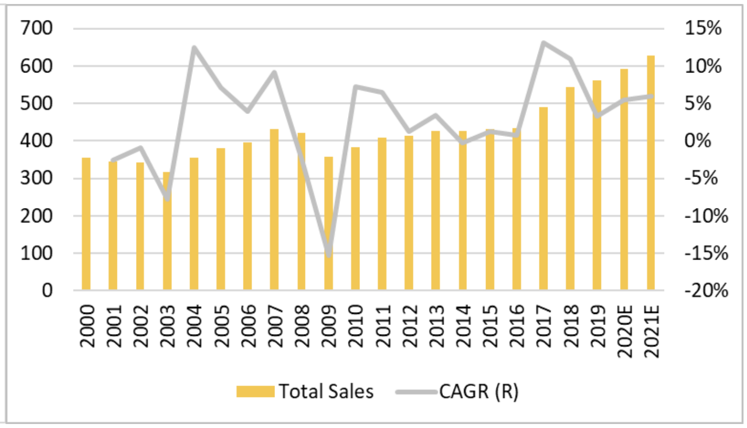
JOUT's sales growth has been positive since 2013 while nearly all of its competitors have had at least one negative year of growth

<u>Brands and innovation</u>

Johnson Outdoors success relies on its ability to conceive, design, manufacture, and market new products. Consumer preferences change rapidly and trends make it difficult to predict how long consumer demand for existing products will continue or how long new products will remain successful. The fishing segment has achieved market share gains by focusing on quality products, innovation, and effective marketing. The firm has many recognizable brands. Although brand image is not as important to millennials, one of the company's major goals is to increase millennial engagement. Millennials are less willing to spend on leisure, so the firm's ability to create low cost alternative leisure activates such as fishing puts the firm at an advantage.

Figures 5 and 6: YoY sales growth for industry (left); total sales for JOUT ($M - right)





Source: Company reports

2019 revenues increased by 3.3%, driven primarily by strong performance in the fishing segment

During the Financial Crisis of 2007-2009 JOUT's, sales dropped 17.4% over the three-year period. While this is more than the average firm, it is low versus other leisure activities like golf, aviation, travel, sailing and car collecting. Since 2013, JOUT's sales growth has been positive while some competitors have dropped on occasion to negative still. Fishing, diving, camping, and watercraft recreation are inexpensive activities, which people may still engage in during a recession.

Johnson Outdoors spent, on average, over the last five years 3.9% and 21.1% as a percent of sales on R&D and marketing, respectively. A focus on R&D and marketing should enable the firm to position innovative products.

Competitor Analysis

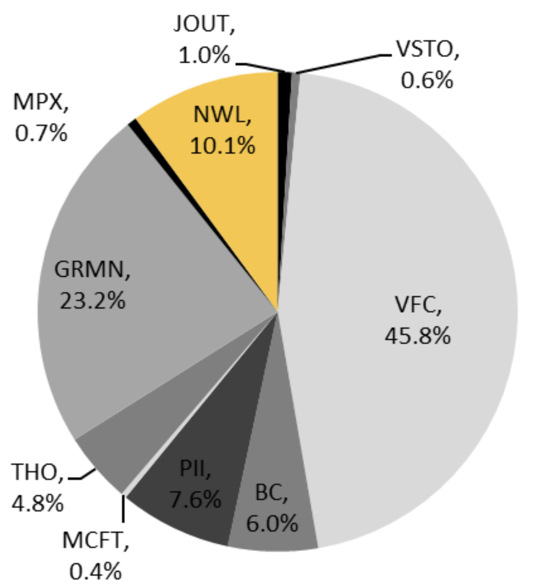
The consumer discretionary industry is highly fragmented and very competitive. With well-established brands gaining ground over other competitors in such a consumer-focused area is difficult. Consumers have significant power since there is no cost to switching. Leisure product manufacturers must convince customers of some unique feature regarding their products that increases their utility. JOUT is already established as a consumer friendly brand with superior quality products, and continuing to provide innovative products is a necessity. By branding itself this way, Johnson Outdoors has created a moat in a very competitive sector.

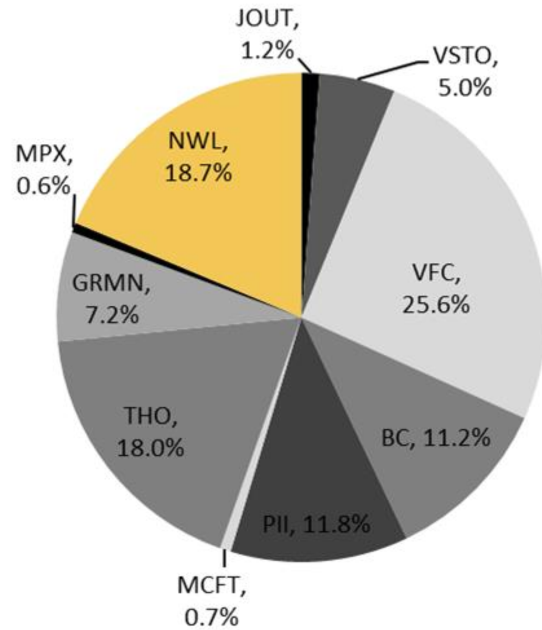
The leisure industry is highly fragmented and incredibly competitive

Johnson Outdoors's fishing segment competes directly with Garmin (GRMN) while Vista Outdoors (VSTO) competes with JOUT's camping segment. I believe Johnson Outdoors greatest opportunity is to challenge GRMN. JOUT's and GRMN's fishing/marine segments have grown 10.5% and 14.7%, respectively, over the last five fiscal years. Garmin is a much larger company with 7.2% of industry sales vs JOUT's 1.2%.

Figures 7 and 8 show that VFC, NWL, and GRMN have much higher market value than sales as a percent of the total. This implies that investors are more confident in the outlook for other firms. JOUT has 1.0% of the market capitalization when compared to competitors and 1.2% market share by sales, implying that investors are less bullish on growth and risk for JOUT given that the firm is more profitable than competitors (9.1% vs 7.4% for industry – see figure 21).

Figures 7 and 8: Market share by market capitalization (left); market share by sales (right)





Source: FactSet, IMCP, Analyst Computations

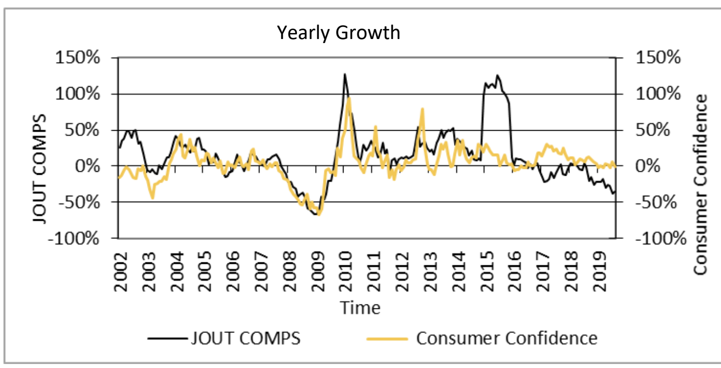
JOUT is extremely cyclical as consumers tend to defer expenditures for discretionary items during times of economic uncertainty

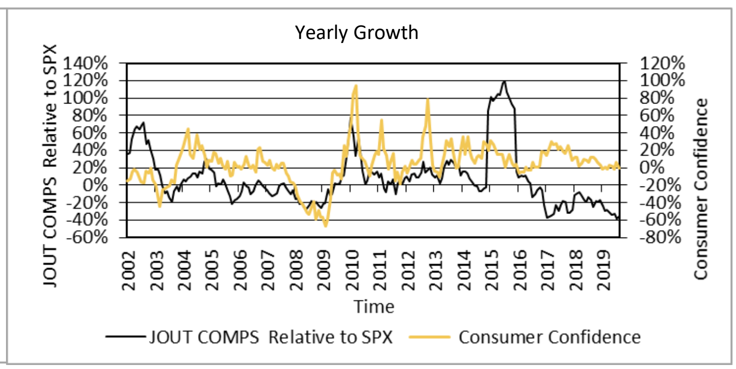
Macroeconomic Trends

Naturally, when consumers feel confident about the economy they are more likely to go out and spend money. In times of economic uncertainty, consumers tend to defer expenditures for discretionary items. The leisure industry is highly cyclical and positively correlated with consumer confidence Consumer confidence is currently high.

Figure 9 shows that Johnson Outdoors competitors have a .562 correlation with consumer confidence. However, the group's movement relative to the S&P 500 has a correlation of .264 when compared to consumer confidence (Figure 10), which means that the leisure industry is more cyclical than the S&P 500.

Figures 9 and 10: Consumer confidence compared to JOUT comps (left); consumer confidence compared to JOUT comps relative to the S&P 500 index (right)





Source: Bloomberg, IMCP

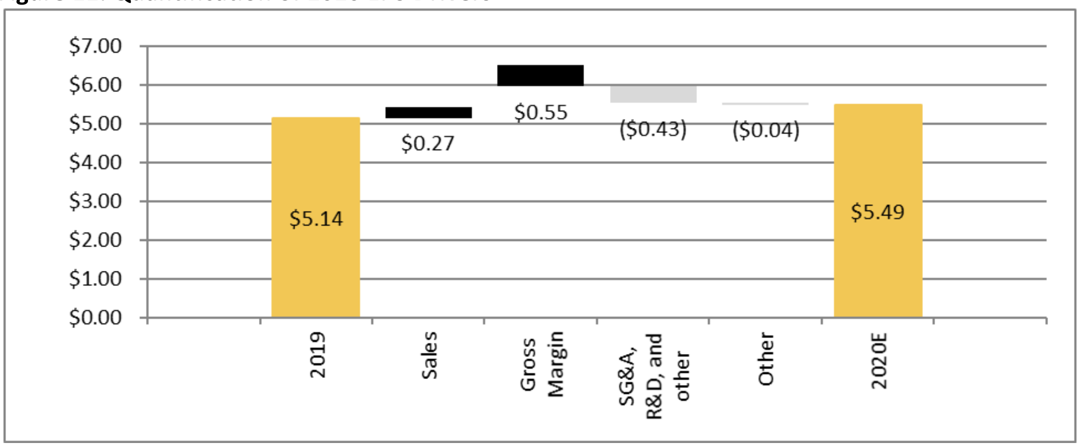
Financial Analysis

Quantification of Drivers

Gross Margin should add $0.55 to 2020 EPS, which is projected to grow by 6.8%

I anticipate EPS to grow 6.8% from $5.14 to $5.49 in FY 2020. Increased sales from the United States should boost to earnings $0.27. Furthermore, I expect higher gross margin to increase earnings by $0.55 per share. Forecasted SG&A is expected to increase as a percent of sales which will drive down EBIT margin resulting in a decrease to earnings of $0.43. Finally, I expect a decrease of $0.04 per share in other driven by an increase in interest expense and the tax rate.

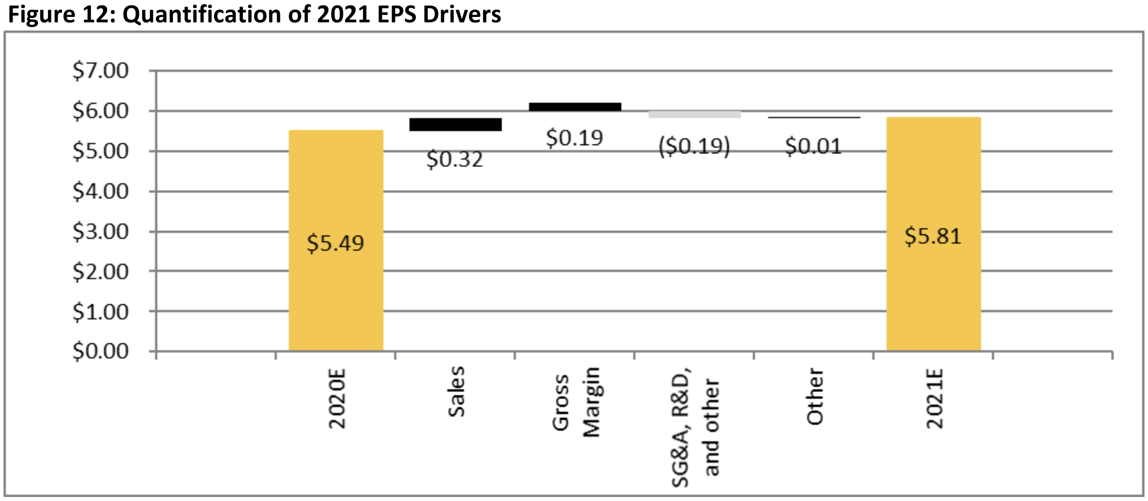
Figure 11: Quantification of 2020 EPS Drivers



Source: Company Reports, IMCP

I expect 2020 EPS to increase by 5.8% from $5.49 to $5.81 in FY 2021. Sales should increase 6.0%, boosting earnings by $0.32. Forecasted gross margin should rise and add $0.19 to EPS while SG&A rising as a percentage of sales will cost $0.19 in earnings. Share buybacks are expected to increase which will add $0.01 to EPS.

Figure 12: Quantification of 2021 EPS Drivers



Source: Company Reports, IMCP

Estimates versus Consensus

I am slightly more bullish than consensus estimates for FY 2020 and 2021. The FactSet consensus is comprised of two analysts that project EPS for FY 2020 and FY 2021 at $4.86 and $4.93, respectively. I am at $5.49 and $5.81. This variance between my estimates and consensus is because I anticipate that Johnson Outdoors will have stronger growth, driven by increasing revenues, brand recognition, and domestic presence, and much better margins.

I am $0.63 more optimistic than consensus for EPS in 2020 and $0.88 more optimistic in 2021

Figure 13: EPS, Revenues, and YoY Growth

	FY 2020	FY 2021
Revenue - Estimate	$592,787	$628,108
YoY Growth	5.4%	6.0%
Revenue - Consensus	$569,928	$583,367
YoY Growth	1.3%	2.3%
EPS - Estimate	$5.49	$5.81
YoY Growth	6.8%	5.8%
EPS - Consensus	$4.86	$4.93
YoY Growth	-5.0%	1.5%

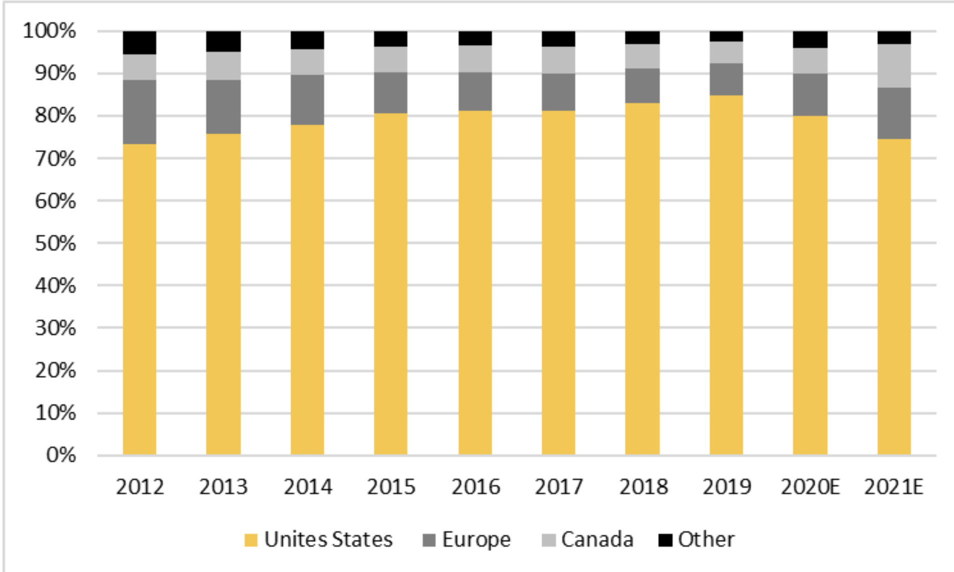
Source: Company Reports, FactSet, IMCP

Revenues

JOUT plans to focus on its international sales making it 25% of total sales by 2021

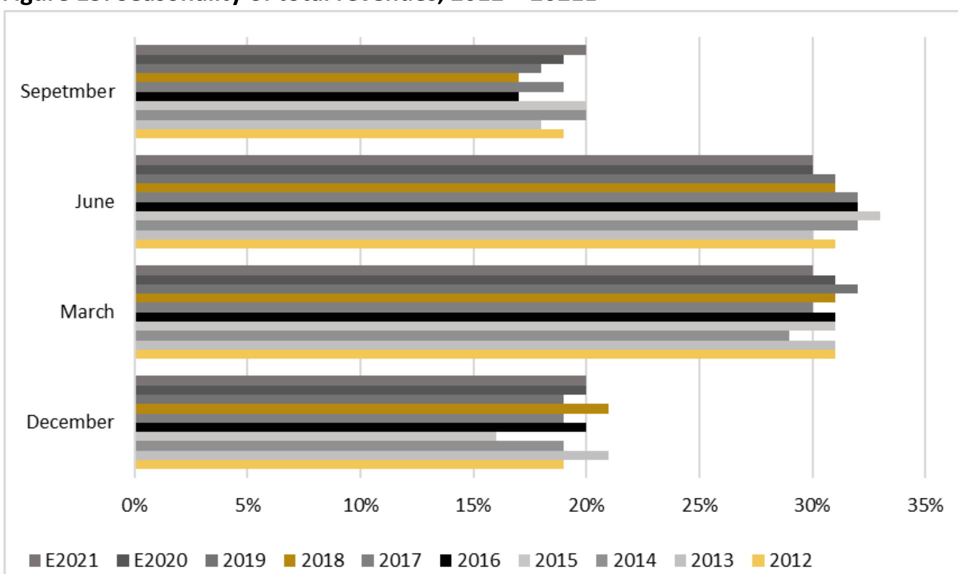
Johnson Outdoors's revenue has increased steadily since 2010. This trend should continue into 2020 and 2021, driven primarily by strong digital, international, and seasonal sales. Outdoor recreational activities rely heavily on weather. For example, 63% of JOUT's total sales come from the second and third quarter when the weather is favorable to be spending time outdoors. Plans to increase sales during the fall and winter months will aid overall growth of sales. Additionally, sales outside the United States are expected to rise from 15.2% of total sales for the fiscal year ended September 2019 to 25% of total sales by the year 2021.

Figure 14: Geographical revenue Growth Rates



Source: Company Reports, IMCP

Figure 15: Seasonality of total revenues, 2012 – 2021E

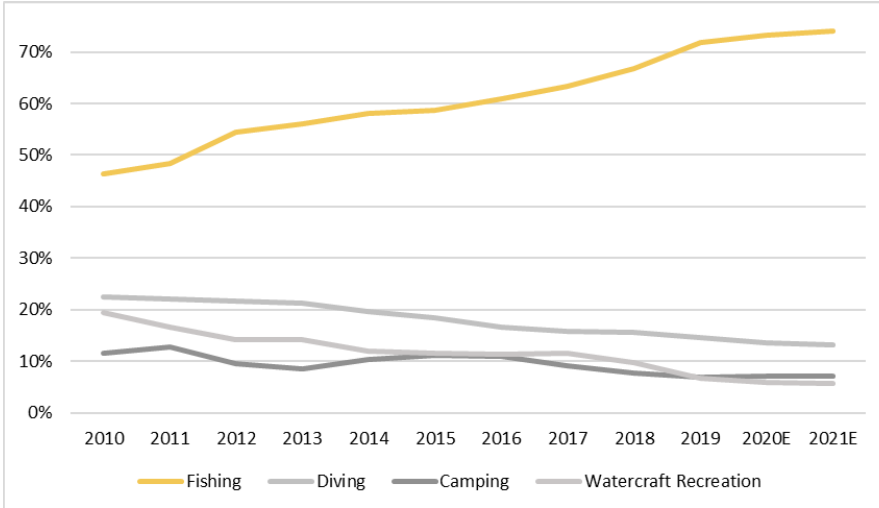


Source: Company Reports, IMCP

JOUT's sales are extremely seasonal, on average 63% of sales are from the second and third quarter

JOUT hopes to increase revenue from its fishing segment. The firm is committing a large amount of capital to improving its Minn Kota's electric trolling motors and general product research, design, engineering, and software development. Johnson Outdoors has seen results as fishing has grown since 2010. I expect these trends to continue throughout 2020 with the fishing segment sales comprising 73.3% of total sales and increasing to 74.1% by 2021.

Figure 16: JOUT Segment Revenue Growth Rates



Source: Company Reports, IMCP

I expect the fishing segment to comprise 73.3% of JOUTS total sales by 2020 and 74.1% by 2021

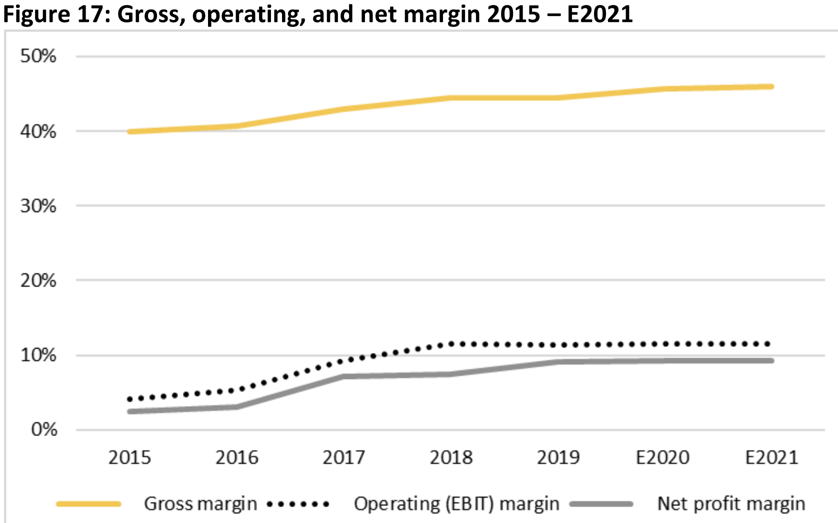
Operating Income and Margins

Tariffs are the primary diver for the decrease in gross and operating margin

U.S. tariffs on Chinese goods negatively affected 2019 operating profit by approximately $3 million or 0.53% as a percent of sales. To mitigate the impact of tariffs, JOUT applied for an exclusion. The firm was granted an exclusion that expires in March of 2020. The firm was able to recover $2.3 million in tariffs granted from the exclusion in the fourth quarter of fiscal 2019. However, JOUT paid roughly $2.9 million in tariffs during fiscal 2019 causing operating margin to fall by 0.2%, respectively. Johnson Outdoors estimates that the proposed tariffs will have a negative impact of $5 - $6 million in fiscal 2020. The firm plans to pursue all possibilities to mitigate the impact but the future remains uncertain.

Despite tariffs and flattish gross and operating margins, net margin rose from 7.5% to 9.5% in 2019. Net margin is up from 2.5% in 2015 as the focus on fishing and United States markets rose. The firm has achieved market share gains by focusing on innovative technology, quality products, and effective marketing. Going forward, I expect slightly improving operating, and net margin even as the firm pursues growing the international business.

Figure 17: Gross, operating, and net margin 2015 – E2021



Source: Company Reports, IMCP

I expect ROE to fall due to a decrease in asset turnover

Return on Equity

ROE has more than doubled to 17.0% in 2019 from 6.7% in 2016. Profit margins rose significantly more than doubling. However, asset turns have declined. Leverage is also down. On the other hand, taxes have declined, propping up ROE. Going forward, I expect asset turns to fall as the firm invests to expand internationally. However, the firm has cash flow necessary to expand and leverage will also decline. Overall, I expect ROE to decline to 14.6% by 2021.

Figure 18: ROE breakdown, 2016 – 2021E

5-stage DuPont	2016	2017	2018	2019	2020E	2021E
EBIT / sales	5.3%	9.3%	11.6%	11.3%	11.6%	11.6%
Sales / avg assets	1.42	1.48	1.45	1.35	1.28	1.22
EBT / EBIT	103.3%	105.7%	108.1%	104.3%	103.9%	103.7%
Net income /EBT	57.1%	72.9%	59.7%	77.3%	76.8%	76.8%
ROA	4.4%	10.6%	10.9%	12.4%	11.9%	11.2%
Avg assets / avg equi	1.50	1.47	1.44	1.38	1.33	1.30
ROE	**6.7%**	**15.6%**	**15.6%**	**17.0%**	**15.7%**	**14.6%**

Source: Company Reports, IMCP

Free Cash Flow

As shown in figure 19, Johnson Outdoors free cash flow has been volatile over the last several years; however, I see potential for growth. I expect NOPAT growth to normalize but still grow 7.1% and 6.0% in 2020 and 2021 to $55.957 million in 2021. I expect NFA to increase as the firm continues to grow domestically and internationally. Overall, I expect NFA to increase at a rate of 5.7% over the course of the next two years. FCFF and FCFE are lower in 2020-2021 than 2018-19 primarily because capital growth was negative in 2018-19.

Figure 19: JOUT Free Cash Flow 2015 – 2021E

Free Cash Flow	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	$12,031	$13,067	$33,247	$37,633	$49,300	$52,810	$55,957
Growth		*8.6%*	*154.4%*	*13.2%*	*31.0%*	*7.1%*	*6.0%*
NWC*	60,008	47,020	92,962	71,033	62,280	65,643	69,554
Net fixed assets	100,483	108,311	112,810	110,242	113,916	120,067	127,221
Total net operating capital*	$160,491	$155,331	$205,772	$181,275	$176,196	$185,710	$196,775
Growth		*-3.2%*	*32.5%*	*-11.9%*	*-2.8%*	*5.4%*	*6.0%*
- Change in NWC*		(12,988)	45,942	(21,929)	(8,753)	3,363	3,911
- Change in NFA		7,828	4,499	(2,568)	3,674	6,151	7,154
FCFF*		$18,227	($17,194)	$62,130	$54,379	$43,297	$44,891
Growth			*-194.3%*	*-461.3%*	*-12.5%*	*-20.4%*	*3.7%*
- After-tax interest expense	1,415	(434)	(1,910)	(3,036)	(2,113)	(2,038)	(2,052)
FCFE**		$18,661	($15,284)	$65,166	$56,492	$45,335	$46,943
Growth			*-181.9%*	*-526.4%*	*-13.3%*	*-19.8%*	*3.5%*
FCFF per share		*$1.85*	*-$1.74*	*$6.25*	*$5.44*	*$4.34*	*$4.50*
Growth			*-193.9%*	*-459.3%*	*-12.9%*	*-20.3%*	*3.8%*
FCFE per share		*$1.90*	*-$1.55*	*$6.55*	*$5.65*	*$4.54*	*$4.70*
Growth			*-181.5%*	*-524.0%*	*-13.8%*	*-19.7%*	*3.6%*
* NWC excludes cash							
** No adjustment is made for debt							

Source: Company Reports, IMCP

Valuation

Johnson Outdoors was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is overvalued relative to other firms and is worth $60 at the end of 2020; however, due to the volatility of EPS in a recession this metric may be unreliable. Another relative valuation shows JOUT is slightly undervalued based on its fundamentals versus those of its peers within the industry. A detailed DCF analysis values JOUT at $88. This value should carry more weight because it incorporates assumptions that reflect the firm's ongoing expansion and movement into new markets. As a result of these valuations, I have valued the stock at $73.

Trading History

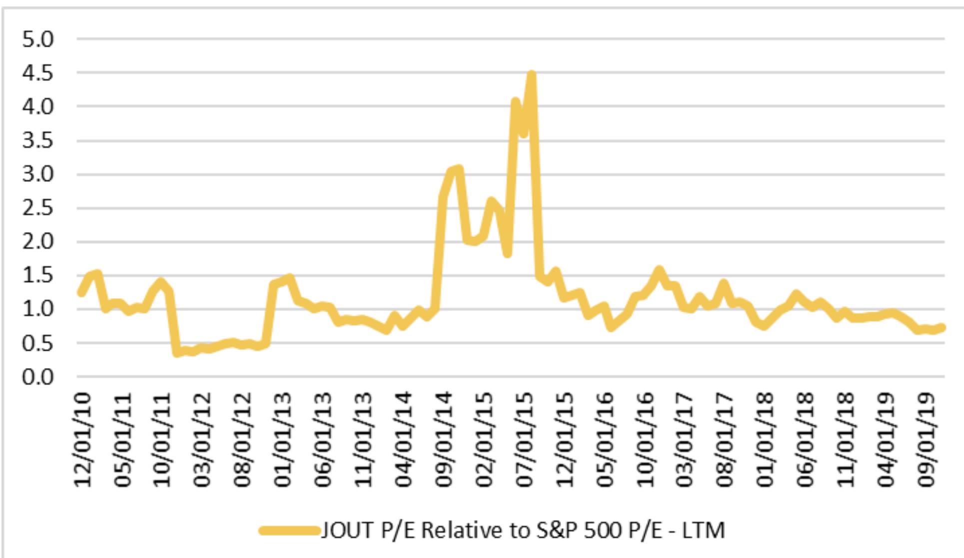
Johnson Outdoors' P/E has fallen relative to the S&P 500 since 2015 as EPS rebounded. The market appears to expect that the best growth is behind the firm. The firm's TTM P/E is at 14.6 while its current NTM P/E is at 15.7 compared to its five-year average of 20.39. I expect JOUT to maintain a relatively moderate P/E falling from the five-year average in 2020 and 2021.

Assuming the firm maintains a 15.7 NTM P/E at the end of 2020, it should trade at $91.21 by the end of the year:

- Price = P/E x EPS = 15.7 x $5.81 = $91.21.

JOUT P/E relative to the market is currently trading at 0.7 compared to the historical average of 1.06

Figure 20: JOUT NTM P/E Relative to S&P 500



Source: FactSet

Relative Valuation

Johnson Outdoors is currently trading at a discount versus peers, with a TTM P/E of 14.6 compared to an average of 17.5, excluding BC and NWL that had a TTM P/E of -44.0 and -10.0 respectively. Analysts expect EPS to fall 15.5% in 2020 and investors appear to agree. JOUT's P/B (2.17) is much lower than the industry median (3.72) but the firm's ROE also lags (14.6% vs 19.1%). It's P/S (1.35) is higher than the median (1.13) which may reflect the firm's superior net margin (9.1% vs 7.3%).

Figure 21: JOUT Comparable Companies

		Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
JOUT	JOHNSON OUTDOORS INC -CL A	$76.30	$760	(1.2)	18.9	25.9	(3.4)	26.1	29.9		-7.2%	15.4%	26.2%	22.5%	12.2%		1.22	0.0%	B	0.91%	11.3%
VSTO	VISTA OUTDOOR INC	$7.66	$443	2.1	(22.2)	15.0	(8.0)	(26.3)	(32.5)		-103.2%	184.4%	-682.4%	-102.0%	-5.7%		0.77	110.8%		0.00%	
VFC	VF CORP	$93.15	$37,202	(0.2)	8.6	3.2	7.3	29.8	38.7	10.8	12.8%	-20.1%	42.6%	31.0%	15.0%		1.49	67.1%	A-	2.21%	60.9%
BC	BRUNSWICK CORP	$59.70	$4,870	(1.9)	0.7	11.2	33.9	26.6	28.5	10.0	-465.0%	37.3%	-16.2%	12.0%	15.0%	-18.2%	1.74	81.3%	B	1.48%	
PII	POLARIS INC	$98.86	$6,048	(3.3)	(3.2)	8.6	9.5	23.4	28.9	9.7	30.8%	32.3%	-3.8%	17.2%	9.9%	-0.4%	1.55	177.0%	A	2.50%	47.7%
MCFT	MASTERCRAFT BOAT HLDNGS IN	$15.34	$289	(2.0)	(8.9)	5.7	(25.4)	(26.2)	(18.0)	10.0	129.0%	106.7%	8.3%	23.5%	9.9%		1.93	130.4%		0.00%	0.0%
THO	THOR INDUSTRIES INC	$68.84	$3,800	(0.5)	3.1	27.8	26.8	27.6	32.4	6.2	79.2%	15.6%	-51.4%	15.2%	15.8%		2.30	84.5%	A-	2.46%	50.9%
GRMN	GARMIN LTD	$97.43	$18,522	(0.4)	1.6	14.2	21.0	47.4	53.9	7.4	4.3%	-0.5%	14.8%	15.9%	-1.3%	3.2%	1.03	1.0%		2.25%	53.6%
MPX	MARINE PRODUCTS CORP	$16.01	$544	(1.8)	10.6	2.3	1.5	(6.8)	(5.3)		-2.2%	31.5%	35.2%	22.7%	78.4%	32.7%	1.12	0.1%	B+	3.17%	53.6%
NWL	NEWELL BRANDS INC	$19.21	$8,134	(1.2)	(4.4)	4.1	29.3	(15.7)	3.3	-2.0	-178.2%	-165.9%	-94.0%	-212.5%	12.5%		0.96	151.0%	B+	4.79%	
Average			$8,061	(1.0)	0.5	11.8	9.2	10.6	16.0	7.4	-50.0%	23.7%	-72.1%	-15.5%	16.2%	4.3%	1.41	80.3%		1.98%	39.7%
Median			$4,335	(1.2)	1.2	9.9	8.4	24.8	28.7	9.7	1.1%	23.6%	2.2%	16.6%	12.4%	1.4%	1.35	82.9%		2.23%	50.9%
SPX	S&P 500 INDEX	$3,169		0.0	2.4	5.4	9.6	19.6	26.4			20.5%	23.9%	10.4%	10.5%						

		2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
JOUT	http://www.johnsonoutdoors.com	14.6%	2.17	17.7	14.5	14.9	14.6	15.7	12.2	10.9	9.1%	1.35	9.1%	11.3%	17.0%	6.4		1.3%		5.7%	$35.12
VSTO	http://www.vistaoutdoor.com	-51.3%	0.74	45.5	12.5	-1.4	-0.7	23.3	72.3	76.6	-14.9%	0.22	-31.5%	0.5%	-38.2%	100.4		-5.1%		1.9%	$10.34
VFC	http://www.vfc.com	30.7%	7.99	22.2	26.8	26.0	29.0	25.7	19.9	17.3	10.3%	2.69	9.2%	13.1%	20.4%	20.7	29.2	-4.5%		2.0%	$11.65
BC	http://www.brunswick.com	19.0%	3.47	19.4	11.9	18.3	-44.0	12.0	16.3	14.2	5.5%	1.01	5.1%	9.3%	11.3%	10.4	11.4	-9.3%	6.3%	5.8%	$17.21
PII	http://www.polaris.com	32.4%	6.35	31.3	14.6	19.6	19.4	14.8	16.7	15.2	5.1%	0.99	5.5%	6.6%	14.7%	16.8	10.1	5.4%		10.0%	$15.57
MCFT	http://www.mastercraft.com	61.0%	3.98	21.2	8.6	6.5	13.4	5.9	5.3	4.8	19.3%	1.26	4.6%	14.1%	14.2%	7.2	5.1	-3.9%		21.3%	$3.85
THO	http://www.thorindustries.com	10.3%	1.80	21.4	6.4	17.4	22.3	12.5	15.1	13.0	3.0%	0.52	1.7%	4.6%	4.5%	13.1		6.7%			$38.29
GRMN	http://www.garmin.com	19.2%	4.46	16.2	17.3	23.2	23.7	22.8	20.0	20.3	25.6%	5.93	20.7%	23.3%	17.4%	13.5	21.1	5.6%		4.9%	$21.84
MPX	http://www.marineproductscorp.co	41.3%	6.89	23.6	23.8	16.7	18.6	19.1	13.6	7.6	12.2%	2.04	9.3%	12.0%	38.3%	15.9		3.8%	7.0%	12.2%	$2.32
NWL	http://www.newellbrands.com	-2.5%	1.97	5.1	-4.7	-80.0	-10.0	12.8	71.1	63.2	-1.1%	0.85	-78.7%	6.8%	-37.7%	26.2	24.3	11.9%	1.3%	8.7%	$9.77
Average		17.5%	3.98	22.4	13.2	6.1	8.6	16.5	26.2	24.3	7.4%	1.69	-4.5%	10.2%	6.2%	23.1	16.8	1.2%	4.9%	8.1%	
Median		19.1%	3.72	21.3	13.5	17.0	16.6	15.3	16.5	14.7	7.3%	1.13	5.3%	10.3%	14.5%	14.7	16.2	2.6%	6.3%	5.8%	

Source: FactSet, IMCP

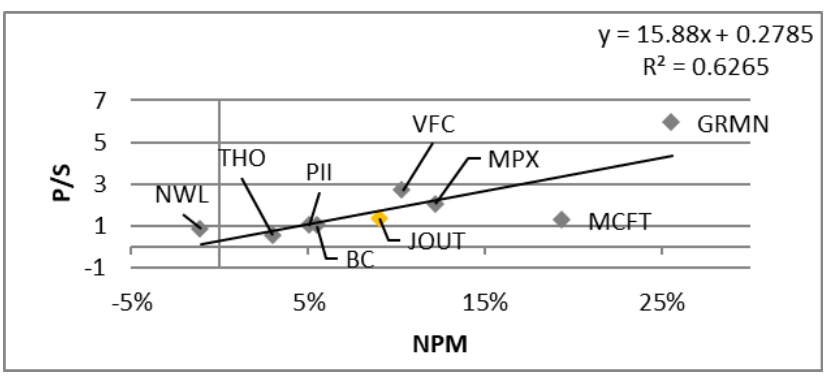
A more thorough analysis of P/S and net profit margin is shown in Figure 22. The calculated R-squared of the regression indicates that over 62% of a sampled firm's P/S can be explained by its net profit margin. Note that Vista Outdoors is excluded from this regression because the firm is an outlier with a NPM of negative 14.9%. JOUT has a P/S lower than the average, and net profit margin is slightly greater than the average. Johnson Outdoors has the opportunity to increase net profit margin with an increase in operating efficiencies and higher profitability; although, I expect improvement in margins for 2020 -2021.

- Estimated P/S = Estimated 2020 NPM (9.3%) x 15.88 + 0.2785 = 1.75534
- Target Price = Estimated P/S x expected sales per share = 1.77534 x 59.3 = $105.27

Based on NPM and P/S, JOUT appears to be undervalued. The estimated price at the end of 2020 is $105.27. Discounting the anticipated price at the end of 2020 back to today results at an 11.1% cost of equity in a price of $96.85. The stock currently trades for $76.30.

JOUT is undervalued according to a P/S to NPM valuation framework

Figure 22: JOUT P/S vs Competitors



Source: Factset, IMCP

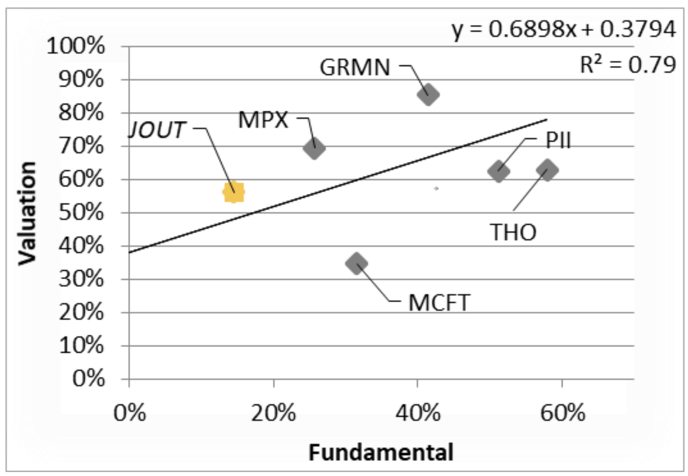
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. The long-term growth rate and NTM GPS growth rates were weighted of 25% each, and 50% weighting went NTM sales growth. This was compared to an equal weight composite of TTM P/E and NTM P/E. After eliminating VFC and NWL as extreme outliers, the regression line had an R-squared of 0.79. One can see that JOUT is above the line, so it is expensive relative to its peers based on its fundamentals.

Figure 23: Composite valuation, % of range

				Fundamental			Valuation	
			Weight	25.0%	25.0%	50.0%	50.0%	50.0%
				Earnings Growth		Sales Growth	P/E	
Ticker	Name	Fund	Value	LTG	NTM	NTM	TTM	NTM
JOUT	JOHNSON OUTDOORS INC -CL A	14%	56%	41%	-6%	11%	50%	61%
VSTO	VISTA OUTDOOR INC	-31%	44%	41%	-80%	-43%	-3%	91%
BC	BRUNSWICK CORP	-106%	-52%	92%	-360%	-78%	-152%	47%
PII	POLARIS INC	51%	62%	89%	24%	46%	67%	58%
MCFT	MASTERCRAFT BOAT HLDNGS IN	31%	35%	92%	100%	-33%	46%	23%
THO	THOR INDUSTRIES INC	58%	63%	57%	61%	57%	77%	49%
GRMN	GARMIN LTD	41%	85%	68%	3%	47%	82%	89%
MPX	MARINE PRODUCTS CORP	26%	69%	41%	-2%	32%	64%	74%

Source: IMCP

Figure 24: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value JOUT.

For the purpose of this analysis, the company's cost of equity was calculated to be 11.1% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk free rate, as represented by the ten year Treasury bond yield, is 1.90%.
- A ten year beta of 1.14 was utilized since the company has higher risk than the market.
- A long term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 11.1% (1.90 + 1.14 (10.0 – 1.90)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $4.54 and $4.70, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $7.89 per share. Thus, stage one of this discounted cash flow analysis contributes $7.89 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin, and capital growth assumptions. The resulting cash flows are then discounted using the company's 11.1% cost of equity. I assume 5.5% sales growth in 2022, falling to 2.0% by 2026. The ratio of sales to NWC will remain at 2021 levels of 9.03. Moreover, NFA turnover will remain constant at 4.94. Also, the NOPAT margin is expected to fall to 2.9% in 2026 to 6.0% from 8.9% in 2021. 6.0% reflects and average since 2015. Current margins may reflect a cyclical peak.

Figure 25: FCFE and discounted FCFE, 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$4.54	$4.70	$4.45	$4.37	$4.33	$4.07	$4.16
Discounted FCFE	$4.08	$3.81	$3.24	$2.86	$2.56	$2.16	$1.99

Source: FactSet, IMCP

Added together, stage one and two discounted cash flows total $20.70.

Stage Three – Net income for the years 2020 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $5.49 in 2020 to $5.53 in 2022 and then fall from $5.41 in 2023 to $4.64 in 2026 due mostly to the normalization of margins.

Figure 26: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$5.49	$5.81	$5.53	$5.41	$5.21	$4.98	$4.64

Source: FactSet, IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. As sales growth slows from 5.4% in 2020 to 2.0% in 2026 and as margins fall, I expect P/E to remain low and trade at a discount to the market and peers. The firm's current discount (14.9 TTM P/E vs 17/5 for the industry), seems reasonable.

Given the assumed terminal earnings per share of $4.64 and a price to earnings ratio of 17, a terminal value of $82.56 per share is calculated. Using the 11.1% cost of equity, this number is discounted back to a present value of $39.43.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $60.13 is calculated (7.89 + 12.81 + 39.43). Given JOUT's current price of $76.30, this model indicates that the stock is overvalued.

<u>Scenario Analysis</u>

Johnson Outdoors is difficult to value with certainty as it is small, consumers preferences change, e-commerce is growing, and the firm is changing target demographics. The current CEO Helen Johnson-Leipold may lead the firm to success or failure. Given the uncertainty that is to come, a bull and bear case is provided to quantify likely scenarios.

Figure 27 displays my assumptions for the bear and bull case scenario analysis. In the bull case, I am assume a P/E of 22 as investors are excited about sales growth and international expansion. I also lowered the beta from 1.14 in base case to 1.1 in bull case. NOPAT/S would remain stable and NFA would rise as higher sales growth pushing asset turnover. The value increased to $103.90, which is 73% higher than the base case.

In the bear case scenario, I lowered sales roughly 1% from the base case scenario. In this analysis, I am assuming a weaker economy and a struggling management team. This scenario has a P/E of 14, a beta of 1.4 as growth slows down and loss of traction follows. Additionally, NOPAT/S and S/NFA will also decrease as sales slow. The values decreased to $56.49, which is 7% lower than the base case.

Figure 27: DCF Target Price Scenario analysis

Base Case Expectations	2020	2021	2022	2023	2024	2025	2026
Beta	1.14						
Sales Growth	5.4%	6.0%	5.5%	5.0%	4.0%	4.0%	2.0%
NOPAT/S	8.9%	8.9%	8.3%	7.7%	7.2%	6.6%	6.0%
S/NFA	4.94	4.94	4.94	4.94	4.94	4.94	4.94
Terminal Year P/E	17.8						
Bear Case Expectations	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Beta	1.4						
Sales Growth	5.4%	6.0%	5.0%	4.5%	3.0%	2.3%	1.0%
NOPAT/S	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%	8.5%
S/NFA	4.94	4.94	4.1	4.1	4.1	4.1	4.1
Terminal Year P/E	14						
Bull Case Expectations	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Beta	1.1						
Sales Growth	5.4%	6.0%	6.5%	6.0%	5.5%	5.0%	3.0%
NOPAT/S	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
S/NFA	4.94	4.94	5.25	5.25	5.25	5.25	5.25
Terminal Year P/E	22						

Source: FactSet, IMCP

Figure 28: Values at beginning of fiscal 2020 under Bull/Bear scenarios

Base Case Expectations	
P/E	17.8
Target Price	$60.13
Bear Case Expectations	
P/E	14
Target Price	$56.49
Bull Case Expectations	
P/E	22
Target Price	$103.90

Source: FactSet, IMCP

Business Risks

Although I have many reasons to be optimistic about Johnson Outdoors Inc., there are also risks.
Competitive marketplace:

JOUT competes with several large domestic and foreign companies such as Brunswick, Garmin, and Confluence Outdoor. These competitors have longer operating histories, stronger brand recognition and greater financial, technical, and marketing resources. In addition, due to limited barriers to entry, the firm may face competition from new participants or from existing participants developing and introducing new products into market segments. Further, JOUT experiences price competition for products, and competition for shelf space at retailers, all of which may increase in the future. If the firm does not cannot compete successfully, net sales, profitability, and cash flows will likely decline.

General economic conditions:

Sales depend largely upon the state of the economy. In times of economic uncertainty, consumers tend to defer expenditures for discretionary items, which affects demand for products. Moreover, deteriorating economic conditions create the potential for future impairments of goodwill and other intangible and long-lived assets that may negatively impact the firm's financial condition and results of operations.

Seasonal sales:

Sales of Johnson Outdoors's products are seasonal. Historically, net sales and profitability have peaked in the second and third fiscal quarters. Seasonal variations in operating results may also cause the firm to increase debt levels and interest expense primarily in the second and third fiscal quarters as the firm funds working capital requirements.

Credit Facilities:

Historically, JOUT has relied upon existing credit facilities to provide adequate working capital to operate its business. If lenders reduce or terminate access these credit facilities, the firm may not have sufficient capital to fund the its working capital needs. However, the firm has 18.7% of its market cap in cash and low debt which mitigates this risk.

Effective tax rates:

Changes in tax laws or tax rulings could have a material impact on the firm's effective tax rate. Many countries in the European Union, as well as a number of other countries and organizations, are actively considering changes to existing tax laws. Certain proposals may include recommendations that could increase JOUT's tax obligations in many countries where the firm does business.

Uncertainty over global tariffs:

Recent changes in U.S. domestic and global tariff frameworks have increased JOUT's costs of producing goods and resulted in additional risks to the firm's supply chain. More tariff changes are also possible. Johnson Outdoors has developed strategies to mitigate, previously implemented and, in some cases, proposed tariff increases

Source: Company Reports, IMCP

Appendix 1: Porter's 5 Forces

Threat of New Entrants - Very High

Several large, established companies in the leisure industry have launched similar products in direct competition with Johnson Outdoors. Other firms are capitalizing on low entry barriers to introduce new product segments. Some of these companies are much larger with more resources and could earn a bigger share of the market and negatively impact Johnson Outdoors. Well-established brands have strong moats, as it would take a significant amount of capital to become a serious player; however, exclusive digital retailers may be able to bypass these moats.

Threat of Substitutes - High

Many of Johnson Outdoors products are branded as higher end. While operating in a heavily competitive environment, it is easy for consumer to switch between brands leaving Johnson Outdoors, like all of its competitors, at a disadvantage.

Supplier Power - Moderate

Because competitors are developing similar products, suppliers have less power to bargain. With a large pool of suppliers, switching suppliers is of little cost and time due to higher levels of technology and advanced methods of manufacturing.

Buyer Power - High

Consumers of leisure activities and products have a great degree of power over retailers. There is no cost of switching between brands and there are many substitutes. Consumers have little to no urgency to buy new leisure products, so they are willing to wait to get a better price if they are unwilling to pay what is asked.

Intensity of Competition – Very High

Johnson Outdoors operates in a highly competitive environment with both domestic and international brands that conduct similar businesses. However, some of the bigger more established companies have a broader customer range, more financial capabilities, and global brand recognition. JOUT faces great maintain to launch new and exciting products that will preserve existing and attract new customers in order to stay competitive.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Solid brands Low debt Innovation	Economic downturns High prices Product moat
Opportunities	**Threats**
Accquisitions International expansion New markets	Lack of innovation Tarriffs on imports Changing consumer trends

Appendix 3: Income Statement

Income Statement (in thousands)	2015	2016	2017	2018	2019	2020E	2021E
Sales	$430,489	$433,727	$490,565	$544,268	$562,419	$592,787	$628,108
Direct costs	258,756	257,265	279,625	302,408	312,663	322,476	339,178
Gross Margin	171,733	176,462	210,940	241,860	249,756	270,311	288,930
SG&A, R&D, and other	153,880	153,568	165,349	178,839	185,982	201,547	216,069
EBIT	17,853	22,894	45,591	63,021	63,774	68,763	72,860
Interest	2,100	(761)	(2,619)	(5,085)	(2,733)	(2,654)	(2,672)
EBT	15,753	23,655	48,210	68,106	66,507	71,417	75,532
Taxes	5,137	10,154	13,053	27,437	15,094	16,569	17,524
Income	10,616	13,501	35,157	40,669	51,413	54,848	58,009
Other	-	-	-	-	-	-	-
Net income	10,616	13,501	35,157	40,669	51,413	54,848	58,009
Basic Shares	9,789.0	9,839.0	9,887.0	9,942.0	9,994.0	9,987.1	9,980.1
Fully Diluted Shares	9,795.0	9,855.0	9,920.0	9,996.0	10,021.0	10,014.1	10,007.1
EPS	$1.08	$1.37	$3.56	$4.09	$5.14	$5.49	$5.81
EPS Fully Diluted	$1.08	$1.37	$3.54	$4.07	$5.13	$5.48	$5.80
DPS	$0.30	$0.32	$0.36	$0.44	$0.56	$0.67	$0.82
Growth Statistics							
Sales		*0.8%*	*13.1%*	*10.9%*	*3.3%*	*5.4%*	*6.0%*
Direct Costs		*-0.6%*	*8.7%*	*8.1%*	*3.4%*	*3.1%*	*5.2%*
Gross Margin		*2.8%*	*19.5%*	*14.7%*	*3.3%*	*8.2%*	*6.9%*
SG&A, R&D, and other		*-0.2%*	*7.7%*	*8.2%*	*4.0%*	*8.4%*	*7.2%*
EBIT		*28.2%*	*99.1%*	*38.2%*	*1.2%*	*7.8%*	*6.0%*
Interest		*-136.2%*	*244.2%*	*94.2%*	*-46.3%*	*-2.9%*	*0.7%*
EBT		*50.2%*	*103.8%*	*41.3%*	*-2.3%*	*7.4%*	*5.8%*
Taxes		*97.7%*	*28.6%*	*110.2%*	*-45.0%*	*9.8%*	*5.8%*
Continuing income		*27.2%*	*160.4%*	*15.7%*	*26.4%*	*6.7%*	*5.8%*
Other							
Net income		*27.2%*	*160.4%*	*15.7%*	*26.4%*	*6.7%*	*5.8%*
Basic Shares		*0.5%*	*0.5%*	*0.6%*	*0.5%*	*-0.1%*	*-0.1%*
EPS		*26.5%*	*159.1%*	*15.0%*	*25.8%*	*6.8%*	*5.8%*
EPS Fully Diluted		*26.4%*	*158.7%*	*14.8%*	*26.1%*	*6.8%*	*5.8%*
DPS		*6.3%*	*11.7%*	*21.5%*	*27.1%*	*20.1%*	*22.1%*
Common Size							
Sales	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*
Direct Costs	*60.1%*	*59.3%*	*57.0%*	*55.6%*	*55.6%*	*54.4%*	*54.0%*
Gross Margin	*39.9%*	*40.7%*	*43.0%*	*44.4%*	*44.4%*	*45.6%*	*46.0%*
SG&A, R&D, and other	*35.7%*	*35.4%*	*33.7%*	*32.9%*	*33.1%*	*34.0%*	*34.4%*
EBIT	*4.1%*	*5.3%*	*9.3%*	*11.6%*	*11.3%*	*11.6%*	*11.6%*
Interest	*0.5%*	*-0.2%*	*-0.5%*	*-0.9%*	*-0.5%*	*-0.4%*	*-0.4%*
EBT	*3.7%*	*5.5%*	*9.8%*	*12.5%*	*11.8%*	*12.0%*	*12.0%*
Taxes	*1.2%*	*2.3%*	*2.7%*	*5.0%*	*2.7%*	*2.8%*	*2.8%*
Continuing income	*2.5%*	*3.1%*	*7.2%*	*7.5%*	*9.1%*	*9.3%*	*9.2%*
Other	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Net income	*2.5%*	*3.1%*	*7.2%*	*7.5%*	*9.1%*	*9.3%*	*9.2%*

Appendix 4: Balance Sheets

Blance Sheet (in thousands)	2015	2016	2017	2018	2019	2020E	2021E
Cash	69,159	87,294	63,810	121,877	172,381	210,718	249,286
Operating assets ex cash	129,562	114,674	177,039	163,817	150,146	158,253	167,683
Operating assets	198,721	201,968	240,849	285,694	322,527	368,971	416,969
Operating liabilities	69,554	67,654	84,077	92,784	87,866	92,610	98,128
NOWC	129,167	134,314	156,772	192,910	234,661	276,361	318,840
NOWC ex cash (NWC)	60,008	47,020	92,962	71,033	62,280	65,643	69,554
NFA	100,483	108,311	112,810	110,242	113,916	120,067	127,221
Invested capital	*$229,650*	*$242,625*	*$269,582*	*$303,152*	*$348,577*	*$396,428*	*$446,061*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$299,204*	*$310,279*	*$353,659*	*$395,936*	*$436,444*	*$489,038*	*$544,190*
Short-term and long-term debt	$4,359	$7,389	$0	$0	$0	$0	$0
Other liabilities	27,323	27,740	26,578	23,955	24,044	24,244	24,544
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	197,968	207,496	243,004	279,197	324,534	372,185	421,518
Total supplied capital	*$229,650*	*$242,625*	*$269,582*	*$303,152*	*$348,578*	*$396,429*	*$446,062*
Total liabilities and equity	*$299,204*	*$310,279*	*$353,659*	*$395,936*	*$436,444*	*$489,039*	*$544,191*
Growth Statistics							
Cash		*26.2%*	*-26.9%*	*91.0%*	*41.4%*	*22.2%*	*18.3%*
Operating assets ex cash		*-11.5%*	*54.4%*	*-7.5%*	*-8.3%*	*5.4%*	*6.0%*
Operating assets		*1.6%*	*19.3%*	*18.6%*	*12.9%*	*14.4%*	*13.0%*
Operating liabilities		*-2.7%*	*24.3%*	*10.4%*	*-5.3%*	*5.4%*	*6.0%*
NOWC		*4.0%*	*16.7%*	*23.1%*	*21.6%*	*17.8%*	*15.4%*
NOWC ex cash (NWC)		*-21.6%*	*97.7%*	*-23.6%*	*-12.3%*	*5.4%*	*6.0%*
NFA		*7.8%*	*4.2%*	*-2.3%*	*3.3%*	*5.4%*	*6.0%*
Invested capital		*5.6%*	*11.1%*	*12.5%*	*15.0%*	*13.7%*	*12.5%*
Marketable securities							
Total assets		*3.7%*	*14.0%*	*12.0%*	*10.2%*	*12.1%*	*11.3%*
Short-term and long-term debt		*69.5%*	*-100.0%*				
Other liabilities		*1.5%*	*-4.2%*	*-9.9%*	*0.4%*	*0.8%*	*1.2%*
Debt/equity-like securities							
Equity		*4.8%*	*17.1%*	*14.9%*	*16.2%*	*14.7%*	*13.3%*
Total supplied capital		*5.6%*	*11.1%*	*12.5%*	*15.0%*	*13.7%*	*12.5%*
Total liabilities and equity		*3.7%*	*14.0%*	*12.0%*	*10.2%*	*12.1%*	*11.3%*

Appendix 5: Sales Forecast

Sales (in thousands)							
Sales	430,489	433,727	490,565	544,268	562,419	$592,787	$628,108
Growth		*0.8%*	*13.1%*	*10.9%*	*3.3%*	*5.4%*	*6.0%*
Fishing	262,518	274,872	328,138	391,110	412,121	439,321	471,391
Growth		*4.7%*	*19.4%*	*19.2%*	*5.4%*	*6.6%*	*7.3%*
% of sales	*61.0%*	*63.4%*	*66.9%*	*71.9%*	*73.3%*	*74.1%*	*75.0%*
Camping	47,573	40,018	37,920	37,770	40,379	42,317	44,983
Growth		*-15.9%*	*-5.2%*	*-0.4%*	*6.9%*	*4.8%*	*6.3%*
% of sales	*11.1%*	*9.2%*	*7.7%*	*6.9%*	*7.2%*	*2.0%*	*7.2%*
Watercraft Recreation	48,961	50,388	48,272	36,280	33,498	33,548	33,884
Growth		*2.9%*	*-4.2%*	*-24.8%*	*-7.7%*	*0.2%*	*1.0%*
% of sales	*11.4%*	*11.6%*	*9.8%*	*6.7%*	*6.0%*	*5.7%*	*6.0%*
Diving	72,125	69,137	76,732	78,932	76,306	77,524	77,817
Growth		*-4.1%*	*11.0%*	*2.9%*	*-3.3%*	*1.6%*	*0.4%*
% of sales	*16.8%*	*15.9%*	*15.6%*	*14.5%*	*13.6%*	*13.1%*	*12.4%*
Other/ Eliminations	(688)	(688)	(497)	176	115	76	32
Growth		*0.0%*	*-27.8%*	*-135.4%*	*-34.7%*	*-33.5%*	*-57.8%*
% of sales	*-0.2%*	*-0.2%*	*-0.1%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	368,212	372,264	423,798	477,702	503,317	532,864	565,297
Growth		*1.1%*	*13.8%*	*12.7%*	*5.4%*	*5.9%*	*6.1%*
% of sales	*85.5%*	*85.8%*	*86.4%*	*87.8%*	*89.5%*	*89.9%*	*90.0%*
Europe	44,918	41,893	45,504	47,452	44,906	48,016	52,133
Growth		*-6.7%*	*8.6%*	*4.3%*	*-5.4%*	*6.9%*	*8.6%*
% of sales	*10.4%*	*9.7%*	*9.3%*	*8.7%*	*8.0%*	*8.1%*	*8.3%*
Canada	28,166	28,324	32,555	33,383	30,039	33,196	32,662
Growth		*0.6%*	*14.9%*	*2.5%*	*-10.0%*	*10.5%*	*-1.6%*
% of sales	*6.5%*	*6.5%*	*6.6%*	*6.1%*	*5.3%*	*5.6%*	*5.2%*
Other	(10,807)	(8,754)	(11,292)	(14,269)	(15,843)	(21,340)	(21,984)
Growth		*-19.0%*	*29.0%*	*26.4%*	*11.0%*	*34.7%*	*3.0%*
% of sales	*-2.5%*	*-2.0%*	*-2.3%*	*-2.6%*	*-2.8%*	*-3.6%*	*-3.5%*

Appendix 6: Ratios

Ratios	2015	2016	2017	2018	2019	2020E	2021E
Profitability							
Gross margin	39.9%	40.7%	43.0%	44.4%	44.4%	45.6%	46.0%
Operating (EBIT) margin	4.1%	5.3%	9.3%	11.6%	11.3%	11.6%	11.6%
Net profit margin	2.5%	3.1%	7.2%	7.5%	9.1%	9.3%	9.2%
Activity							
NFA (gross) turnover		4.15	4.44	4.88	5.02	5.07	5.08
Total asset turnover		1.42	1.48	1.45	1.35	1.28	1.22
Liquidity							
Op asset / op liab	2.86	2.99	2.86	3.08	3.67	3.98	4.25
NOWC Percent of sales		30.4%	29.7%	32.1%	38.0%	43.1%	47.4%
Solvency							
Debt to assets	1.5%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%
Debt to equity	2.2%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Other liab to assets	9.1%	8.9%	7.5%	6.1%	5.5%	5.0%	4.5%
Total debt to assets	10.6%	11.3%	7.5%	6.1%	5.5%	5.0%	4.5%
Total liabilities to assets	33.8%	33.1%	31.3%	29.5%	25.6%	23.9%	22.5%
Debt to EBIT	0.24	0.32	-	-	-	-	-
EBIT/interest	8.50	(30.08)	(17.41)	(12.39)	(23.33)	(25.91)	(27.27)
Debt to total net op capital	1.9%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ROIC							
NOPAT to sales	2.8%	3.0%	6.8%	6.9%	8.8%	8.9%	8.9%
Sales to NWC		8.10	7.01	6.64	8.44	9.27	9.29
Sales to NFA		4.15	4.44	4.88	5.02	5.07	5.08
Sales to IC ex cash		2.75	2.72	2.81	3.15	3.28	3.28
Total ROIC ex cash		8.3%	18.4%	19.4%	27.6%	29.2%	29.3%
NOPAT to sales	2.8%	3.0%	6.8%	6.9%	8.8%	8.9%	8.9%
Sales to NOWC		3.29	3.37	3.11	2.63	2.32	2.11
Sales to NFA		4.15	4.44	4.88	5.02	5.07	5.08
Sales to IC		1.84	1.92	1.90	1.73	1.59	1.49
Total ROIC		5.5%	13.0%	13.1%	15.1%	14.2%	13.3%
NOPAT to sales	2.8%	3.0%	6.8%	6.9%	8.8%	8.9%	8.9%
Sales to EOY NWC	7.17	9.22	5.28	7.66	9.03	9.03	9.03
Sales to EOY NFA	4.28	4.00	4.35	4.94	4.94	4.94	4.94
Sales to EOY IC ex cash	2.68	2.79	2.38	3.00	3.19	3.19	3.19
Total ROIC using EOY IC ex cash	7.5%	8.4%	16.2%	20.8%	28.0%	28.4%	28.4%
NOPAT to sales	2.8%	3.0%	6.8%	6.9%	8.8%	8.9%	8.9%
Sales to EOY NOWC	3.33	3.23	3.13	2.82	2.40	2.14	1.97
Sales to EOY NFA	4.28	4.00	4.35	4.94	4.94	4.94	4.94
Sales to EOY IC	1.87	1.79	1.82	1.80	1.61	1.50	1.41
Total ROIC using EOY IC	5.2%	5.4%	12.3%	12.4%	14.1%	13.3%	12.5%
ROE							
5-stage							
EBIT / sales		5.3%	9.3%	11.6%	11.3%	11.6%	11.6%
Sales / avg assets		1.42	1.48	1.45	1.35	1.28	1.22
EBT / EBIT		103.3%	105.7%	108.1%	104.3%	103.9%	103.7%
Net income /EBT		57.1%	72.9%	59.7%	77.3%	76.8%	76.8%
ROA		4.4%	10.6%	10.9%	12.4%	11.9%	11.2%
Avg assets / avg equity		1.50	1.47	1.44	1.38	1.33	1.30
ROE		6.7%	15.6%	15.6%	17.0%	15.7%	14.6%
Payout Ratio		23.5%	10.1%	10.7%	10.8%	12.2%	14.0%
Retention Ratio		76.5%	89.9%	89.3%	89.2%	87.8%	86.0%
Sustainable Growth Rate		5.1%	14.0%	13.9%	15.2%	13.8%	12.6%

Appendix 8: 3-stage DCF Model

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*5.4%*	*6.0%*	*5.5%*	*5.0%*	*4.0%*	*4.0%*	*2.0%*
NOPAT / S	*8.9%*	*8.9%*	*8.3%*	*7.7%*	*7.2%*	*6.6%*	*6.0%*
S / NWC	*9.03*	*9.03*	*9.03*	*9.03*	*9.03*	*9.03*	*9.03*
S / NFA (EOY)	*4.94*	*4.94*	*4.94*	*4.94*	*4.94*	*4.94*	*4.94*
S / IC (EOY)	*3.19*	*3.19*	*3.19*	*3.19*	*3.19*	*3.19*	*3.19*
ROIC (EOY)	*28.4%*	*28.4%*	*26.6%*	*24.7%*	*22.9%*	*21.0%*	*19.2%*
ROIC (BOY)		*30.1%*	*28.0%*	*26.0%*	*23.8%*	*21.8%*	*19.5%*
Share Growth		*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*
Sales	$592,787	$628,108	$662,654	$695,786	$723,618	$752,562	$767,614
NOPAT	$52,810	$55,957	$55,179	$53,891	$51,837	$49,532	$46,057
Growth		*6.0%*	*-1.4%*	*-2.3%*	*-3.8%*	*-4.4%*	*-7.0%*
- Change in NWC	3363	3911	3825	3669	3082	3205	1667
NWC EOY	*65643*	*69554*	*73380*	*77049*	*80131*	*83336*	*85002*
Growth NWC		*6.0%*	*5.5%*	*5.0%*	*4.0%*	*4.0%*	*2.0%*
- Chg NFA	6151	7154	6997	6711	5637	5863	3049
NFA EOY	*120,067*	*127,221*	*134,218*	*140,929*	*146,566*	*152,429*	*155,477*
Growth NFA		*6.0%*	*5.5%*	*5.0%*	*4.0%*	*4.0%*	*2.0%*
Total inv in op cap	9514	11066	10823	10380	8719	9068	4715
Total net op cap	185710	196775	207598	217978	226697	235765	240480
FCFF	$43,297	$44,891	$44,357	$43,511	$43,117	$40,464	$41,342
% of sales	*7.3%*	*7.1%*	*6.7%*	*6.3%*	*6.0%*	*5.4%*	*5.4%*
Growth		*3.7%*	*-1.2%*	*-1.9%*	*-0.9%*	*-6.2%*	*2.2%*
- Interest (1-tax rate)	-2038	-2052	0	0	0	0	0
Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w/o debt	$45,335	$46,943	$44,357	$43,511	$43,117	$40,464	$41,342
% of sales	*7.6%*	*7.5%*	*6.7%*	*6.3%*	*6.0%*	*5.4%*	*5.4%*
Growth		*3.5%*	*-5.5%*	*-1.9%*	*-0.9%*	*-6.2%*	*2.2%*
/ No Shares	9987.1	9980.1	9,970.2	9,960.2	9,950.2	9,940.3	9,930.3
FCFE	$4.54	$4.70	$4.45	$4.37	$4.33	$4.07	$4.16
Growth		*3.6%*	*-5.4%*	*-1.8%*	*-0.8%*	*-6.1%*	*2.3%*
* Discount factor	0.90	0.81	0.73	0.66	0.59	0.53	0.48
Discounted FCFE	$4.08	$3.81	$3.24	$2.86	$2.56	$2.16	$1.99
Third Stage							
Terminal value P/E							
Net income	$54,848	$58,009	$55,179	$53,891	$51,837	$49,532	$46,057
% of sales	*9.3%*	*9.2%*	*8.3%*	*7.7%*	*7.2%*	*6.6%*	*6.0%*
EPS	$5.49	$5.81	$5.53	$5.41	$5.21	$4.98	$4.64
Growth		*5.8%*	*-4.8%*	*-2.2%*	*-3.7%*	*-4.4%*	*-6.9%*
Terminal P/E							17.80
* Terminal EPS							$4.64
Terminal value							$82.56
* Discount factor							0.48
Discounted terminal value							$39.43

Summary (using P/E multiple for terminal value)

First stage	$7.89	Present value of first 2 year cash flow
Second stage	$12.81	Present value of year 3-7 cash flow
Third stage	$39.43	Present value of terminal value P/E
Value (P/E)	**$60.13**	

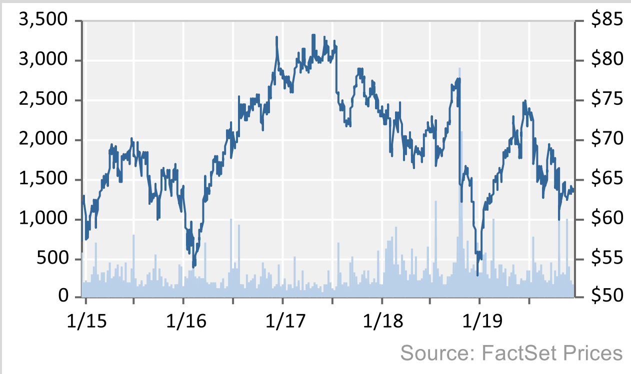
Basic Materials, Specialty Chemicals

Sensient Technologies Corp.

Recommendation: Hold

Current Price	**$63.89**	---	Ticker	SXT
1 Year Bear	$62	*-2%*	Sh. Out.(M)	4.23
1 Year Base	**$79**	***24%***	M.Cap.($M)	2704
1 Year Bull	$92	*44%*	EV ($M)	3,334

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	13%	-18%	-15%	12%	15%	-6%	3%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**1.38**	**1.38**	**1.36**	**1.39**	**1.31**	**1.33**	**1.31**
Gr. %	*-5.0%*	*0.5%*	*-1.5%*	*1.8%*	*-5.3%*	*1.0%*	*-1.0%*
Cons.	-	-	-	-	-	*-0.4%*	*6.8%*
Ind.	*-9.7%*	*-10.9%*	*16.8%*	*36.2%*	*-29.2%*	*1.7%*	*3.5%*
EPS	**$2.33**	**$2.84**	**$2.05**	**$3.71**	**$3.49**	**$3.61**	**$3.66**
Gr. %	*54.3%%*	*21.9%%*	*-27.8%*	*81.0%*	*-5.9%*	*3.4%*	*1.4%*
Cons.	-	-	-	-	-	*3.1%*	*3.4%*
Ind.	*-6.0%*	*15.6%*	*-32.6%*	*73.5%*	*-30.3%*	*12.3%*	*12.1%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**7.80%**	**9.10%**	**6.60%**	**11.30%**	**11.30%**	**11.30%**	**11.30%**
Ind.	*9.2%*	*11.8%*	*9.0%*	*11.3%*	*8.1%*		
ROE	*11.3%*	*15.0%*	*10.6%*	*18.4%*	*17.2%*	*17.2%*	*16.8%*
Ind.	*21.7%*	*23.5%*	*7.1%*	*12.1%*	*10.2%*		
ROA	*6.2%*	*7.50%*	*5.30%*	*8.90%*	*8.10%*	*8.20%*	*8.00%*
Ind.	*6.8%*	*7.1%*	*3.3%*	*6.0%*	*5.8%*		
A T/O	0.79	0.82	0.80	0.78	0.72	0.72	0.71
A/E	2.03	2.01	2.01	2.07	2.12	2.11	2.10

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	27.19	27.87	36.03	15.08	22.30	21.00	18.90
Ind.	14.97	14.46	27.30	11.82	15.30	13.62	12.15
P/S	2.11	2.55	2.36	1.71	2.10		
P/B	3.33	4.16	3.71	2.74	3.00		
P/CF	22.67	15.84	17.84	28.42	15.9		
EV/EBITDA	13.32	15.60	14.84	11.88	15.00		
D/P	*1.7%*	*1.4%*	*1.7%*	*2.4%*	*2.3%*		

Summary

I recommend a hold rating with a target of $79.30. While Sensient is positioning itself to take advantage of a sizable and increasing natural ingredients market, so are competing firms. Sales growth has been negative or flat in recent years and it is not clear when gains from acquired technologies and cost savings will be realized. The stock is slightly undervalued based on relative and DCF analysis.

Key Drivers

- Secular trends toward natural ingredients: Management recognizes potential in the rapidly growing demand for natural ingredients. Sensient seeks to capture more of this market by integrating technologies of its recent natural-focused acquisitions, such as in its "seed to shelf" initiative.
- Divestitures and restructuring: The firm incurred $189 million in restructuring costs between 2014-2017. Once planned efficiencies and synergies take effect, the firm hopes to realize $30 million in savings annually, or $0.71 in EPS.
- Exposure to international market concerns: Nearly half of SXT's revenue comes from customers outside of North America. This geographic diversification provides some benefit, but also exposes the company to international economic, political, and other risks.
- Competition: SXT is among the smallest players in its highly competitive industry. Companies such as IFF are employing similar acquisition strategies and are similarly poised to take advantage of trends towards natural ingredients.

Valuation

Using a relative valuation approach, Sensient appears to be undervalued in comparison to its industry/competitors. DCF analysis implies that the stock is worth $78. A combination of the approaches suggests that Sensient is somewhat undervalued, as the stock's value is about $79 and the shares trade at $63.89.

Risks

- Natural ingredient demand may not meet expectations
- Gains from acquisitions and restructuring may not be realized
- Company faces stiff competition

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Company Overview

Sensient Technologies Corporation (SXT) is an international maker of flavors, fragrances, and colors. Headquartered in Milwaukee, WI, Sensient operates in over 150 countries through its three divisions- the Flavors & Fragrances Group, the Color Group, and the Asia Pacific Group. The company started as a distillery and seller of yeast, but after decades of acquisitions and divestitures has evolved into a supplier of diversified ingredients to food and beverage companies around the world. In addition to having international customers, Sensient has a physical presence in and sources raw materials from many different countries.

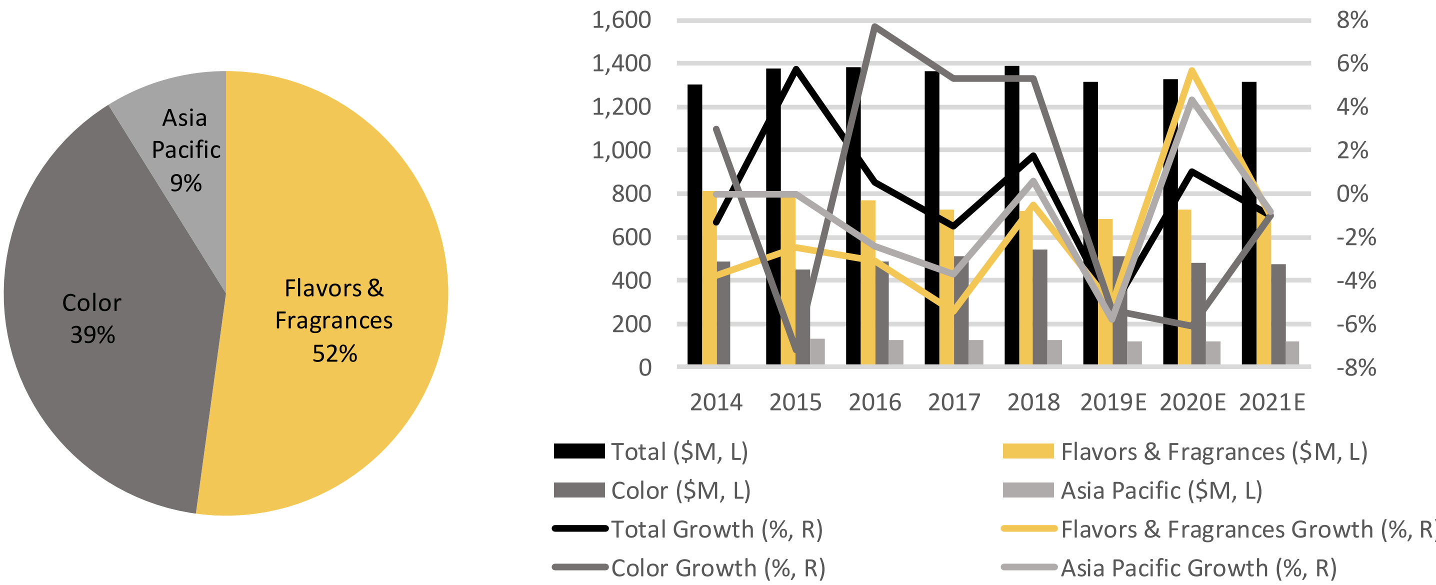
Sensient organizes its operations into three areas. Flavors & Fragrances and the Color Group are managed on a product basis. The Asia Pacific Group is managed on a geographic basis.

1) More than half of the company's revenue comes from the Flavors & Fragrances Group. Major product lines of this group include flavor enhancers, extracts, dehydrated vegetables, essential oils, and bionutrients. In 2018, the company broke down group sales into the following business divisions: 23 percent Sweet, 18 percent Savory, 8 percent Beverage, 30 percent Natural Ingredients, 14 percent Fragrance, and 7 percent Bionutrients. Such a food product-focused product mix contributes to SXT's position as a defensive stock. Over the past five years, Flavors & Fragrances revenue growth has been slightly negative to flat.
2) The Color Group manufactures both natural and synthetic food and beverage colors, industrial colors, inks, and products for pharmaceutical and cosmetic applications. The Food & Beverage business division accounted for 55 percent of 2018 Color Group revenue. The remaining sales were 28 percent Cosmetic, 12 percent Inks & Industrial, and 5 percent Pharmaceutical Excipients. The Color Group is responsible for 39 percent of Sensient's revenue and has had positive growth for the past three years. It is currently the company's fastest growing group in terms of revenue, growing at a rate of 5.3 percent from 2017 to 2018.
3) The Asia Pacific Group concentrates on promoting the firm's offerings from the Flavors & Fragrances and Color Groups in Asia. It accounts for nine percent of the firm's revenue. Sensient started reporting sales for this segment in 2015; its growth rate was negative for the first few years but is flat as of 2018.

The Flavors & Fragrances Group provides more than half of Sensient's revenue.

In an effort to increase efficiencies and cut costs, Sensient Technologies embarked on a restructuring plan in 2014. This has involved the company consolidating business operations where appropriate and divesting itself of businesses and facilities that are unprofitable or otherwise do not fit with the firm's longer-term visions. Management seeks to drive growth through innovation and shifting toward more specialized, proprietary offerings. As part of this movement, Sensient has continued to evolve by acquiring companies. Of particular note are the recent purchases of Mazza Innovation Ltd. and GlobeNatural in 2018. Relative to annual revenue and Sensient's market value, these purchases were not expensive. The acquisition of Mazza Innovation cost $19.8 million, which in 2018 was 1.43 percent of sales and 0.78 percent of the firm's market capitalization. GlobeNatural cost Sensient $10.8 million and was 0.84 percent of sales and 0.46 percent of the market cap. By incorporating technology from these companies, management plans to respond to changing consumer tastes by expanding the firm's presence as a supplier of natural ingredients. Plus, the purchases were made at a lower P/S than the existing business and accretive to sales per share right away.

Figures 1 & 2: 2018 Revenue by segment (left); revenue ($M) vs YoY revenue growth rate since 2014 (right)



Source: FactSet

Business/Industry Drivers

Though multiple factors may contribute to Sensient Technologies' future success, the following are the most important business drivers:

1) Secular trends toward natural ingredients
2) Divestitures and restructuring
3) Exposure to international market concerns
4) Competitor analysis
5) Macroeconomic trends

<u>Secular Trends Toward Natural Ingredients</u>

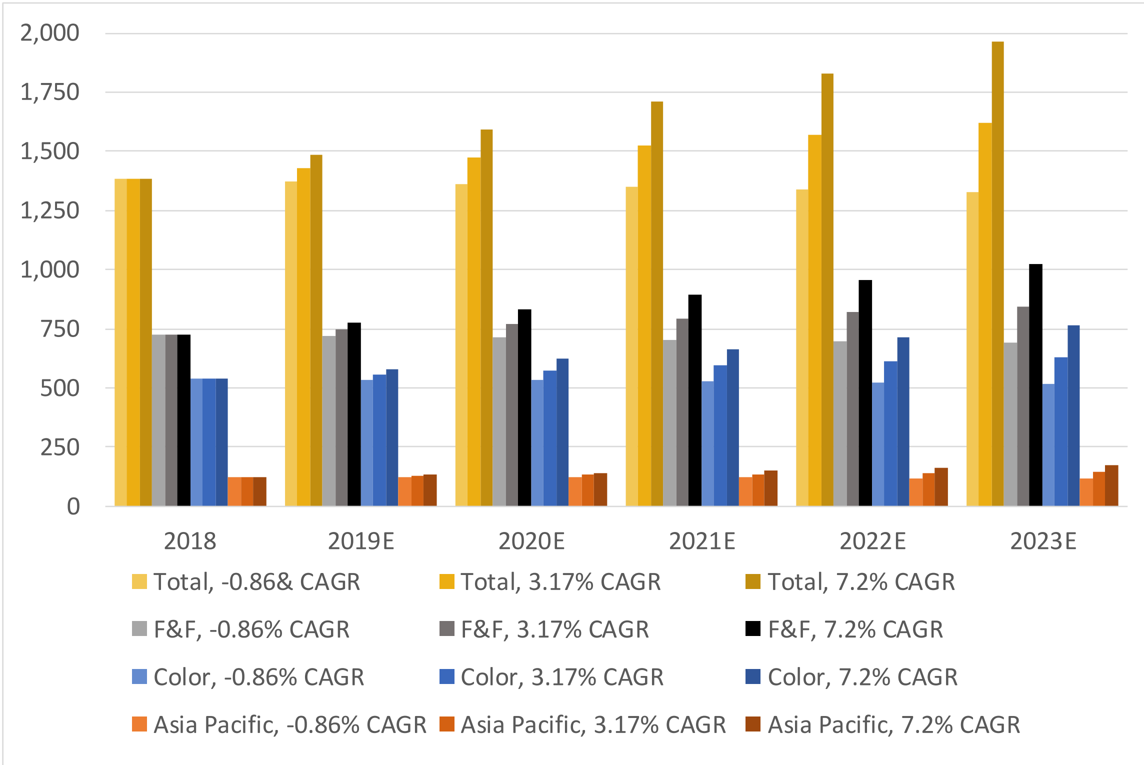
Sensient Technologies' history has been a story of growth by acquisition; this approach holds true today. Since the markets in which SXT sells its products are very competitive and can only grow so fast themselves, acquiring other companies and implementing their technology has been a key part of management's strategy for growth. In recent years, the firm has had a specific focus on acquiring natural-focused companies and integrating their competitive advantages into Sensient's existing businesses. However, it should be noted that the firm's revenue growth has been flat to negative in recent years, so gains from these acquisitions may have not yet been realized. Sensient's 2018 sales are down 5.3 percent from the prior year and down 5.5 percent from a peak of $1.47 billion in 2013.

SXT seeks to innovate by acquiring companies rather than only investing in R&D directly.

In 2018, Sensient paid $19.8 million to purchase Mazza Innovation Limited. Rather than planning to simply absorb its existing business and revenues, the company acquired Mazza largely for its clean extraction technology called "The PhytoClean™ Method." This technology promises to allow extraction of a wide range of compounds in an environmentally safe way, sometimes using only water. With recent secular trends towards customers seeking "natural" consumer goods, implementing this "clean" technology across its existing product segment lines could help Sensient Technologies to grow revenues and market share across the board. Proposed uses of The PhytoClean™ Method include extracting ingredients to sell to makers of cosmetics, food products, and even pharmaceuticals.

SXT made another natural-focused acquisition just several months prior to purchasing Mazza. It paid $10.8 million in cash for the natural color business and certain net assets of Lima, Peru based GlobeNatural. Similar to the acquisition of Mazza Innovation, Sensient made this purchase to further its involvement in the production of natural ingredients. CEO Paul Manning has stated that 80 percent of food products around the world will be made with natural food colorings and that management expects this market to continue to grow. Integrating the GlobeNatural purchase, now called Sensient Natural Colors Peru S.A.C., into existing operations is a strategic part of SXT's venture deeper into making natural ingredients, in this case specifically in what the firm calls its "seed to shelf" initiative.

Figure 3: Revenue growth ($M) by division and projected CAGR, 2018-2023E



Source: FactSet, Analyst Computations

Even if SXT is only able to realize a fraction of natural consumer goods market growth, the impact could help turn around recent stagnant overall sales growth.

Because SXT is already established in so many markets and geographic regions, it does not face the same barriers to entry as a new ingredient manufacturer hoping to start its business in making natural ingredients would. A report by Market Research Future proposed that the demand for natural consumer food products with "clean" ingredients is poised to continue to grow rapidly during 2017-2023 at a CAGR of 7.2 percent. While the firm may not realize that same rate of growth in its natural-focused businesses, it is positioning itself well to take advantage of this market trend in many segments. Sensient's overall sales CAGR from 2014-2018 was -0.86 percent.

The chart above shows projected sales growth by division given different assumed compound annual growth rates: -0.86 percent, the firm's current CAGR; 7.2 percent, the natural consumer food products market's proposed growth rate; and 3.17 percent, a growth rate between the two. Even if the company were to achieve the median CAGR instead of its recent relatively flat growth rate, SXT would significantly improve its sales figures. As a mature company in a stable industry, it is unsurprising that Sensient has not had tremendous growth in recent years, but it does still lag behind that of its competitors. For example, from 2014 to 2018, International Flavors and Fragrances (IFF) and Ingredion (INGR), two of Sensient

Technologies' direct US-based competitors, had sales CAGR of 5.19 percent and 0.95 percent, respectively.

The proposed doubling of Sensient Natural Extraction Inc. sales would result in a 2.8% increase in overall Color Group revenue.

Sensient's new technologies can be utilized in the cleaner extraction and manufacture of food and beverage flavors and colors, bio nutrients, extracts, cosmetic colors, essential oils, and more. David Rigg, former Director of Global Food Marketing of Sensient Food Colors, put forth that revenues for the Mazza Innovation acquisition, now known as Sensient Natural Extraction Inc., could double in the next few years. At the time of the acquisition in 2018, the segment was only responsible for less than 5 percent of Sensient Food Colors' revenue. Sensient Food Colors itself is a subdivision of the Color Group; it encompasses the manufacture of food and beverage colors. In 2018, the firm reported Food & Beverage Colors sales of $303.4 million. The Color Group's sales were $540 million, making the Food Colors subdivision responsible for 56.2 percent of the group's total sales. The Color Group had 39 percent of overall sales in 2018, so growth in the natural colors area may have a noticeable impact on the firm as a whole. Doubling Sensient Natural Extraction's sales alone would grow the Color Group's 2018 revenue by 2.8 percent and SXT's 2018 total revenue by 1.1 percent.

Sensient Natural Extraction Ltd. revenue as 5 percent of Food Colors revenue = $303.4M*5% = $15.17M
Color Group revenue growth with doubled Natural Extraction revenue = $15.17M/$540M = 2.8%
Total revenue growth with doubled Natural Extraction revenue = $15.17M/$1386.29M = 1.1%

However, rather than being limited to food product markets, this subdivision's potential applications and management's hopes reflect the overall firm's strategy for driving future growth. Over the longer term, I anticipate Sensient's investments into natural-related technology to be an integral part of the company's overall sales. In the next few years, it is reasonable to expect that the company could achieve overall sales growth similar to the 1.1 percent proposed above if acquired technology is successfully utilized and growth in demand for naturally derived ingredients continues. Still, the company faces stiff competition and pricing pressure, so these gains may be offset by declines elsewhere.

<u>Divestitures and Restructuring</u>

In addition to growing revenues by expanding into natural ingredient markets, Sensient Technologies has also sought to improve its financial position by undergoing restructuring from 2014 to 2017. Through this effort, Sensient hoped to increase efficiencies and cut its costs. Reported after tax restructuring costs, broken down by year, were as follows: in 2014, $65.5 million/$1.34 per share; in 2015, $33.5 million/$0.73 per share; in 2016, $21.1 million/$0.47 per share; and in 2017, $42.5 million/$0.96 per share. The company reported no restructuring costs in 2018.

Management projected savings from restructuring of $30M per year but has fallen short.

Management advises that the intended overall target savings of $30 million per year has not yet been realized. At the end of the program in 2017, only a total of $22 million, ($0.50 in 2017,) was saved since the program's inception in 2014. I believe company leadership is taking a long-term view regarding profitability. The recorded financial costs combined with the opportunity costs of carrying out this initiative may have caused profits to be suppressed in recent years. SXT reported no restructuring related costs in 2018. If the firm does not incur such costs going forward and proposed savings and synergies come to fruition, the company will be positioned to slightly increase profitability. At a time where overall sales have been down or flat, this improvement could at least mean a sustainable higher level of net margin.

While Sensient is notably active in and optimistic about acquisitions, management also realizes when benefit can be had from divesting business components that are sub-optimal, no longer profitable, or don't generally fit in with the company's future visions. As part of the restructuring plan, SXT closed facilities in several cities both in the United States and abroad. Of particular note is the 2017 sale of its unprofitable European Natural Ingredients business at a loss of $21.6 million, which is nearly as much as the $22 million the firm saved during implementation of its restructuring program. Sensient did not give a

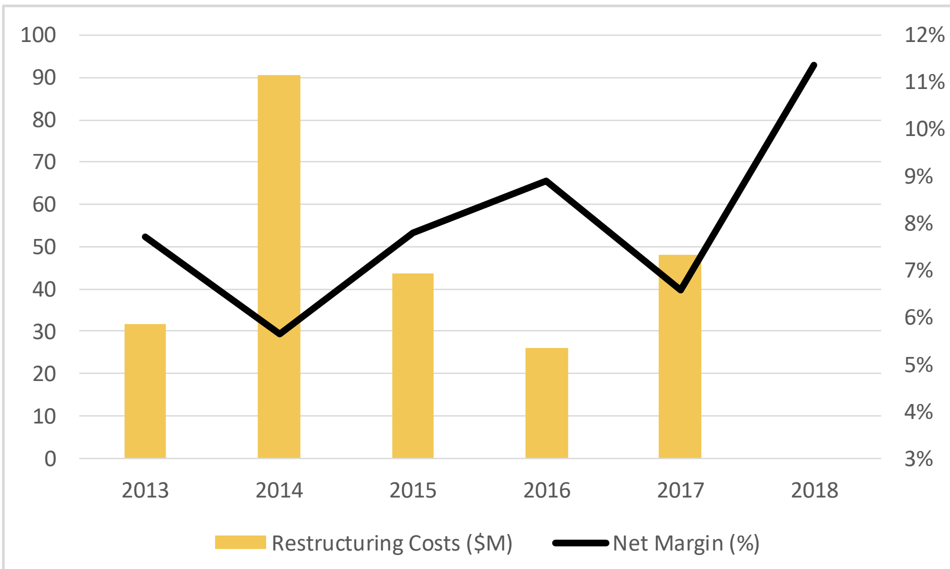
From 2014-2017, SXT incurred restructuring costs of $189M, exceeding the expected $120-$130M for that total program period.

breakdown of how little revenue the division generated, but in its 2017 10-K stated, "the Company had concluded that the European Natural Ingredients business had not generated significant profits for several years and did not fit with the Company's long-term strategic plan."

The restructuring program sought to save the company money through ridding itself of underperforming operations, consolidation, and other improved efficiencies. At the outset of the restructuring plan, the company expected the total plan cost to be between $120 and $130 million and annual operating costs to go down by $30 million per year upon plan completion, with the full savings benefit realized after 2016. Clearly, management was optimistic as total costs exceeded the estimate, savings have not achieved the proposed level, and the restructuring plan itself took longer to complete than stated. When SXT company started the restructuring program in 2014, net margin was at a low of 5.65 percent, coinciding with peak restructuring costs of $90.6 million. When there were no restructuring costs reported in 2018, net margin improved to 11.35 percent. While Sensient did not achieve the expectation that it set for itself, I believe this positions the firm to significantly change the perception of its financial health once restructuring savings start to take greater effect.

The company reported no restructuring costs in 2018.

Figure 4: Historical restructuring costs ($M) and net margin (%) by year, 2013-2018



Source: Company Reports, FactSet

The Asia Pacific region has been SXT's fastest growing area on a geographic basis.

<u>Exposure to International Market Concerns</u>

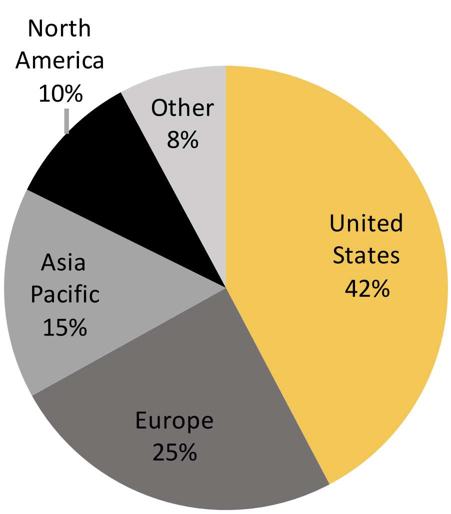
In addition to being distributed across several business segments, Sensient's revenue sources are spread out geographically, providing it with the advantage of lower exposure to cyclical forces of any one country.

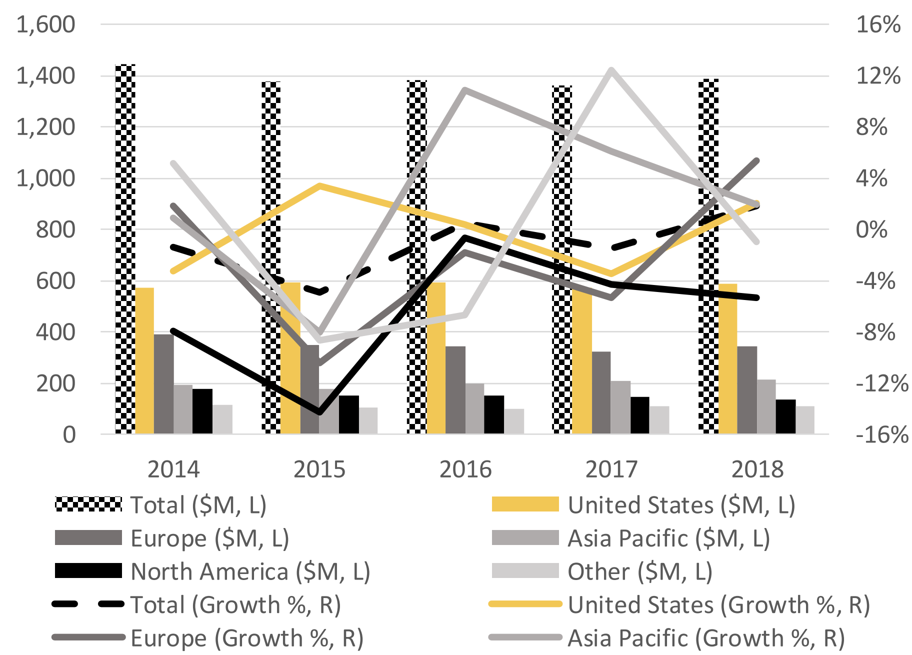
- In 2018, 42 percent of the firm's revenue was generated from customers in the United States. In recent years, sales growth has ranged from negative 3.4 percent to positive 3.4 percent.
- 10 percent of company revenue comes from the rest of North America. Growth in this region has been negative for the last five consecutive years.
- Operations in Europe were responsible for 25 percent of 2018 sales. Revenue growth was negative in three of the past five years but reached 5.4 percent in 2018.

- 15 percent of 2018 revenue was from the Asia Pacific region. This has been Sensient's fastest growing area, with 2 percent growth in 2018, but 6.1 percent growth in 2017 and 10.9 percent growth in 2016.
- The remaining 8 percent of revenue was generated elsewhere, with negative growth of 12 percent in 2017 and approximately negative 1 percent in 2018.

Business involvement in a wide range of countries exposes Sensient to international economic, political, and other factors. These can have a significant negative impact on gross margin when they cause increases in raw material and other costs, as such costs cannot always be passed on to consumers without risking losing market share to competitors. Recent concerns include the potential implications of the United Kingdom's planned exit from the European Union ("BREXIT") as well as trade wars and their associated tariffs. Additionally, Sensient is not a large firm, so managing a global business may be challenging.

Figures 5 & 6: 2018 Historic revenue by geographic area (left); segment revenue ($M); YoY segment revenue growth (right)





Source: FactSet

> The company has major manufacturing facilities in the UK for both its Flavors & Fragrances and Color Group.

Some of the possible outcomes of the United Kingdom's withdrawal from the European Union would have adverse effects on Sensient Technologies' business operations. The company has sales in the region tied to the movement of goods between the UK and the EU. If the United Kingdom is unable to come to agreements with other EU members before the withdrawal deadline, business activity between the UK and bordering countries will be impeded with far reaching consequences for residents and businesses alike. A "no-deal BREXIT" is likely to lead to delays in the movement of goods across UK borders and increased costs related to the movement of products and raw materials. As of the end of 2018, Sensient Technologies listed the United Kingdom as being a location for major manufacturing plants for both the Flavors & Fragrances and Color Groups. In 2018, $174 million (24 percent) of Flavors and Fragrances and $168 million (31.2 percent) of Color Group revenue were attributed to Europe. Given that Sensient has important physical presence in the area, the company could face increased costs and complications from multiple angles- as a consumer of raw materials, a business with facilities within and without the UK, and as a producer of products sold on both sides of the UK border. Additionally, the outcome of BREXIT is sure to have broader, but very substantial impact on the UK economy. If the United Kingdom were to enter a recession, this alone could hurt Sensient's business in this geographic area as demand for any discretionary consumer goods which SXT's business customers produce may tighten, in turn lowering demand for Sensient's ingredients. In a November 2019 Global Industrial Conference presentation, the firm broke down 2018 Color Group revenue as being 45 percent non-food and beverage and 2018 Flavors & Fragrances Group revenue as being 14 percent non-food and beverage. So, while recessionary periods may not hurt consumer food intake, they could be expected to cause sales declines in Sensient's other product areas unrelated to food and beverage products.

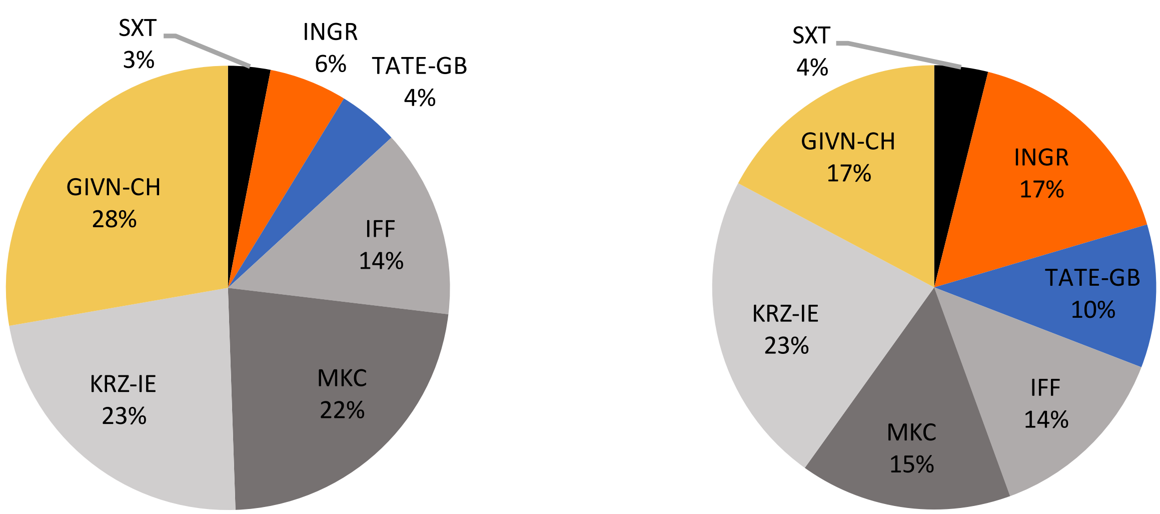
Competitor Analysis

Much like the company itself, Sensient's competitors operate internationally and generally have diversified product ranges.

Sensient's competitors often compete in a few of its business segments but do not have complete overlap.

- International Flavors & Fragrances (IFF) produces flavors and fragrances for a variety of consumer goods. Its business segments are broken up as Taste, Scent, and Frutarom (a recently acquired natural-focused company.)
- Givaudan (GIVN) also makes flavors and fragrances. This Swiss based company's business segments are Fine Fragrances, Consumer Products, and Fragrance and Active Cosmetic Ingredients.
- McCormick (MKC) is an international leader in the production of flavorful products such as spices and seasonings.
- Kerry Group (KRZ) is based in Ireland and manufactures finished food products in addition to ingredients. Its business is divided into Taste and Nutrition (80 percent of revenue) and Consumer Foods (20 percent.)
- Ingredion (INGR) focuses on providing ingredients for the food and beverage industry, but also supplies ingredients for pharmaceutical purposes.
- Tate & Lyle (TATE), based in the United Kingdom, makes and sells ingredients for the food, beverage, and other industries. It is broken up into the Food & Beverage Solutions, Sucralose, and Primary Products segments.

Figures 7 & 8: Industry concentration by market capitalization (left) vs. by sales (right)



Source: FactSet, Analyst Computations

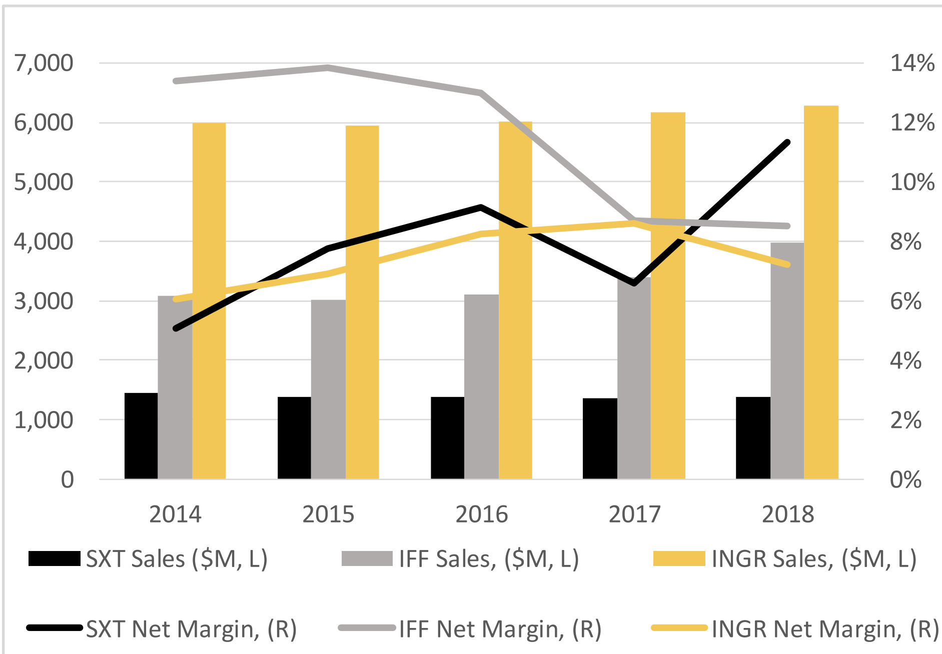
One of Sensient's largest competitors, International Flavors & Fragrances (IFF), has made a similar move of growing and diversifying its business via acquisition in the recent purchase of Frutarom in 2018. Frutarom was already established in the global marketplace as a supplier of natural products, which were

SXT is not alone in expanding into natural products; competitor IFF has followed a similar acquisition strategy.

responsible for 75 percent of its sales. With the purchase being recent, it is not yet clear how integrating Frutarom will impact IFF's business, but we can look to the company's success prior to being acquired. In its 2017 annual shareholder report, Frutarom reported an impressive annual average sales growth of 18 percent since 2000. Of particular note is IFF's recent December 2019 announcement of plans to merge with DuPont's Nutrition & Biosciences business. According to IFF, the proposed merger will result in 2019 pro forma revenue of over $11 billion. Pre-merger, IFF's business is broken into three reporting segments- Taste, whose products are sold to food and beverage companies; Scent, which comprises Fragrance Compounds and Fragrance Ingredients, and Frutarom, which focuses on natural ingredients for a mix of customer types. 2018 sales were 44 percent from Taste, 47 percent from Scent, and 9 percent Frutarom. Meanwhile, SXT's revenue is 68 percent from Flavors, Natural Ingredients, and Food & Beverage Colors, with the remaining coming from non-food related sources. If Sensient is able to achieve real growth in divisions that are impacted by the company's natural extraction technology acquisitions, it has an opportunity to turn around its recent negative-to-flat growth rates. With its competition already actively adapting to these significant trends toward natural or "clean" consumer goods, SXT must continue to innovate in the area to stay competitive.

Figure 9: SXT, IFF, and INGR historical Sales ($M) and net margin (%) by year, 2013-2018

SXT's Net Margin improved to 11.4% in 2018, higher than either IFF or INGR.



Source: FactSet, Analyst Computations

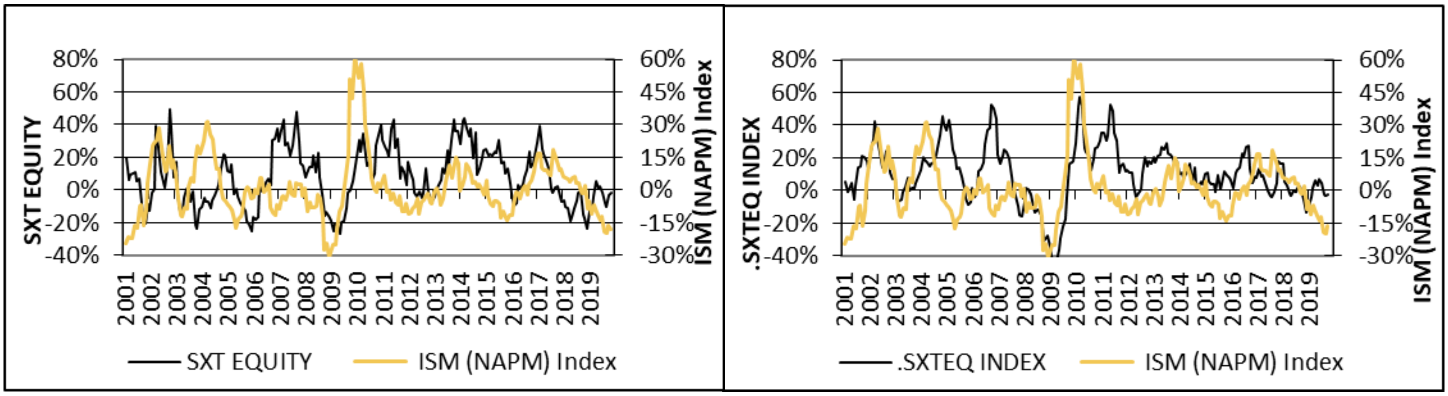
International Flavors & Fragrances and Ingredion are both US-based direct competitors to Sensient Technologies. Amongst this group, Sensient is the smallest by both market capitalization and sales. However, as shown above in figure 9, SXT has had the largest growth in net margin from a low of 5.1 percent in 2014 to a peak of 11.4 percent in 2018, while both IFF and INGR have seen their net margins decline and stay relatively flat, respectively. However, at the end of 2018, these differences in margins were not reflected in a high price to sales ratio for Sensient. SXT's 2018 price to sales was 1.71, IFF's 2.96, and INGR's 1.03. Considering its improved margins, these ratios might suggest the market considers SXT to have higher risk. More likely, though, is that the company's low or negative sales growth in recent years is expected to continue.

Macroeconomic Trends

SXT's stock has slightly led rises and falls in PMI.

Changes in Sensient Technologies' stock performance has slightly led rises and falls in the ISM's PMI, which is shown in figure 10. The relationship between SXT's competitor group and the PMI (figure 11) is not as strong. Since the PMI is highly correlated with the United States' economy and the S&P 500, this could be credited to an even stronger presence outside of North America on the part of some of the firm's much larger competitors.

Figures 10 & 11: SXT's performance vs. ISM PMI (left); Competitor index vs. ISM PMI (right)



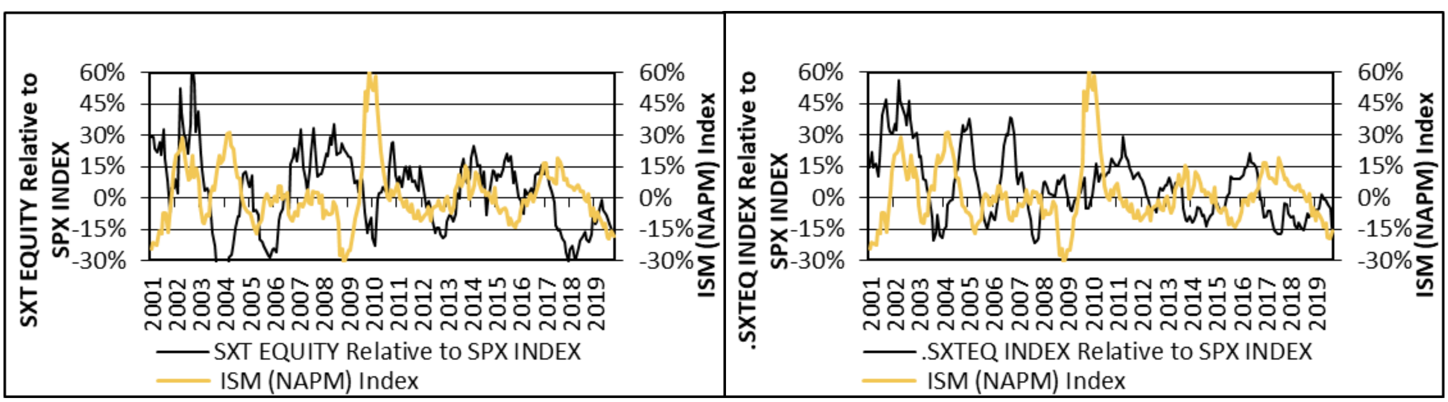
Source: Bloomberg, IMCP

SXT tends to outperform the S&P 500 ahead of or coincident with declines in the PMI.

Sensient's stock is a defensive position relative to the S&P 500. As shown in figure 12, SXT tends to outperform the S&P 500 ahead of or coincident with declines in the PMI. The inverse relationship appears to exist when the PMI increases as well. This performance may be attributable in part to Sensient's global diversification. Having significant business presence in regions outside of the United States may help cushion company performance in downturns, but also mean the firm does not realize the same gains when the American economy experiences growth. The fact that Sensient's products are used as components of finished goods that are not themselves very cyclical may also play a role in the stock's outperformance of the S&P 500 when the ISM PMI declines.

In figure 13, we can see that SXT's outperformance relative to the S&P 500 is outsize that of the company's competitor group. This could suggest Sensient has a stronger correlation with the US economy even though its competitors' businesses are also globally diversified.

Figures 12 & 13: SXT's stock performance relative to S&P 500 vs. ISM PMI (left); Competitor index relative to S&P 500 vs. ISM PMI (right)



Source: Bloomberg, IMCP

Financial Analysis

Quantification of Drivers

I forecast EPS to grow slightly by $0.12 in 2020.

Based on my forecasts, I expect EPS to grow slightly by $0.12 to $3.61 in 2020. A breakdown of this change is displayed below in figure 14. Given Sensient Technologies' underwhelming growth in recent years, I do not expect revenue to increase substantially next year and therefore predict it will contribute only $0.04 to an increase in EPS. The remaining $0.08 of growth would instead result from the firm's share buyback program. In 2017, the firm authorized the repurchase of up to 3 million shares. As of the end of 2018, just over 2.2 million of these shares remained. I predict that SXT will repurchase a majority of these shares in 2019, 2020, and 2021 with excess cash. I do not see reason for the company's gross margin or SG&A to change substantially enough to affect EPS in the near-term, so I am not giving the firm credit for more savings from its restructuring plan.

Figures 14 & 15: Quantification of 2020 EPS drivers (left) and 2021 EPS drivers (right)

Source: Company Reports, IMCP

As shown in figure 15, in 2021, I similarly do not anticipate much growth in EPS. My forecasts predict EPS to increase by $0.06 to $3.66. As in the prior year, improvement will come from the continuance of the firm's share repurchase program. Given the negative to flat nature of Sensient's recent years' sales growth, I forecast sales to stay relatively flat in the short-term, with a slight dip in 2021. This accounts for a negative impact of $0.04 to EPS. Again, gross margin and SG&A are unlikely to change substantially.

Review of Estimates

I am more optimistic than consensus in EPS predictions for both 2020 and 2021, with forecasts of $3.61 and $3.66, respectively. My 2020 sales forecast is slightly more optimistic than consensus- $1326 million versus $1302 million. However, I do not anticipate the same jump in sales to $1391 million in 2021; my forecasts see revenue decreasing from the small uptick in 2020. Sensient management has not yet provided guidance 2020 EPS.

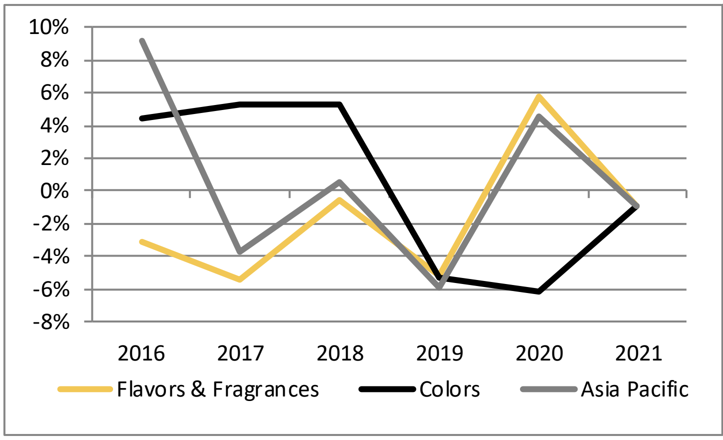
Sales Forecast

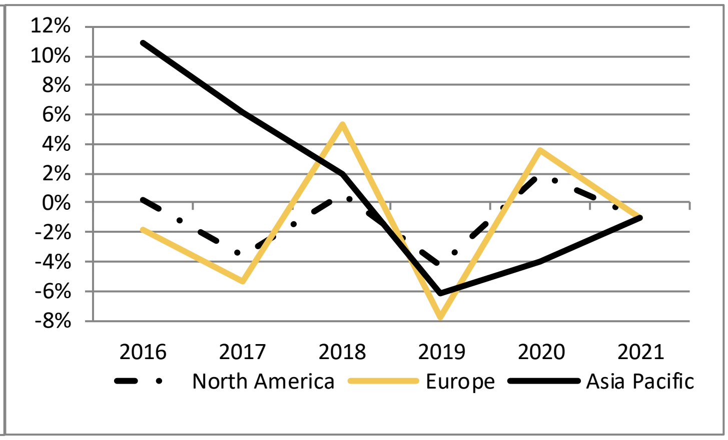
Overall revenue for Sensient Technologies has remained fairly flat in recent years, with a significant decrease of 5.3 percent in 2019. This year's drop is unlikely to be attributed to Sensient's divestiture of its European Natural Ingredients business. This sale was completed in 2017 and was recorded as a non-cash loss of about $21.6 million in that year. Additionally, while exact sales figures have not been provided in annual reports, the company has described the business as having "not generated significant profits for several years," so lost sales from the divestiture would not account for much of SXT's overall revenue

Sales will return to more flat growth rather than continue to decline.

decline. While I do not expect this sharp decline to continue, my forecast has total sales again remaining flat from its 2019 level of $1313 million. The past several years have seen stable growth in the Color Group, SXT's fastest growing group, and stabilization of both the Flavors & Fragrances and Asia Pacific groups. My forecast predicts all divisions to take a hit in 2019 from the firm's overall slowest recent year of growth in 2018, a rebound in 2020, and then reverse to flat to negative growth in 2021. If Sensient can capture some of the rapidly growing natural consumer goods market by supplying such ingredients, it could turn this pattern around. However, this is not a given as the firm's competitors are taking steps to do the same and are larger players in the market. Also, efforts in natural-focused areas could cause sales to decline in other existing businesses. Sales growth in the Asia Pacific geographic region has decreased the most sharply, as seen below in figure 17. My expectation is that it will rebound to be more in line with the company's projected growth rate as a whole.

Figures 16 & 17: Percent change in sales forecasts by reported segment (left) and by geographic region (right)





Source: Company Reports, IMCP

Return on Equity

Both Sensient's ROE and ROA have risen from 2016-2018. I expect that both will have peaked in 2018 and will decrease slightly for the next few years. The firm's EBIT margin was up 1.3 percent in 2018 from 2016, but asset turnover fell. Of course, taxes declining in 2018 had a major positive impact on ROA. Leverage was also higher in 2018 than 2016. Going forward, I expect margins to be flat from 2019-2021, but asset turnover will decline in 2019. The net impact is ROA declines in 2019-2021 to about 8.1 percent from 2018. This is just partially offset by rising leverage in 2019, so ROE declines to 17.25 in 2019 from 28.45 in 2018. By 2021, ROE is forecasted to be 16.85.

My financial forecast supposes that SXT's cash balance will increase in 2020 and 2021. While I anticipate the firm using a considerable amount of this cash to repurchase shares as part of their already announced stock buy-back program, I believe Sensient would be wise not to over-extend itself in terms of liquidity. Therefore, 2020 repurchases are such that the cash balance is left in line with 2019's and 2021 buy-backs simply bring the company close to finishing the repurchase of the remaining 2.2 million of shares of those announced in 2017.

Figure 18: Breakdown of return on equity, 2016-2021E

5-Stage DuPont	2016	2017	2018	2019	2020	2021
EBIT / sales	13.4%	12.3%	14.7%	14.7%	14.7%	14.7%
Sales / avg assets	0.82	0.80	0.78	0.72	0.72	0.71
EBT / EBIT	90.1%	88.4%	89.3%	88.6%	88.8%	88.7%
Net income /EBT	75.5%	60.4%	86.7%	86.7%	86.7%	86.7%
ROA	7.5%	5.3%	8.9%	8.1%	8.2%	8.0%
Avg assets / avg equity	2.01	2.01	2.07	2.12	2.11	2.10
ROE	15.0%	10.6%	18.4%	17.2%	17.2%	16.8%

Source: Company Reports, IMCP

Free Cash Flow

Figure 19: Free cash flow breakdown, 2015-2021E

Free Cash Flow - With Cash and Debt	2015	2016	2017	2018	2019	2020	2021
NOPAT	$119	$136	$101	$176	$167	$169	$167
Growth		14.2%	-25.7%	74.0%	-5.3%	1.0%	-1.0%
NOWC	537	524	537	628	628	637	648
Net fixed assets	975	951	991	1,002	1,002	1,012	1,002
Total net operating capital	$1,511	$1,475	$1,528	$1,630	$1,630	$1,649	$1,650
Growth		-2.4%	3.6%	6.7%	0.0%	1.1%	0.1%
- Change in NOWC		(13)	13	91	0	8	11
- Change in NFA		(24)	40	11	-	10	(10)
FCFF		$173	$48	$74	$167	$150	$165
Growth			-72.3%	54.8%	124.9%	-10.0%	10.0%
- After-tax interest expense		13	12	19	19	19	19
+ Net new short-term and long-term debt		(31)	21	85	-	-	-
FCFE		$129	$57	$141	$148	$131	$146
Growth			-55.6%	145.9%	5.2%	-11.2%	11.5%
FCFF per share		$3.89	$1.09	$1.75	$3.93	$3.62	$4.09
Growth			-71.8%	59.8%	124.9%	-7.9%	13.0%
FCFE per share		$2.89	$1.31	$3.31	$3.49	$3.16	$3.62
Growth			-54.9%	153.9%	5.2%	-9.2%	14.5%

Source: Company Reports, IMCP

In figure 19, we can see changes in Sensient's free cash flow over time. I chose to include debt and cash as SXT is a mature company that not only generates cash, but consistently has enough to maintain and grow its dividend and carry out back-to-back share repurchase programs. The firm's free cash flow fell dramatically from 2016 to 2017 but has recovered since. This could be attributed to the drop in NOPAT between these years and the decline and then rise in investments from 2016-2017. NOPAT growth in 2017 was -25.7 percent, but recovered to 74 percent in 2018, falling again -5.3 percent in 2019- the same rate of growth for overall sales that year. I expect both to stabilize in coming years. Investments, on a net basis, are expected to be zero in 2021 and 18 million in 2020. The firm has over $130 million per year in FCFE, which is plenty for the share buyback and dividends.

Valuation

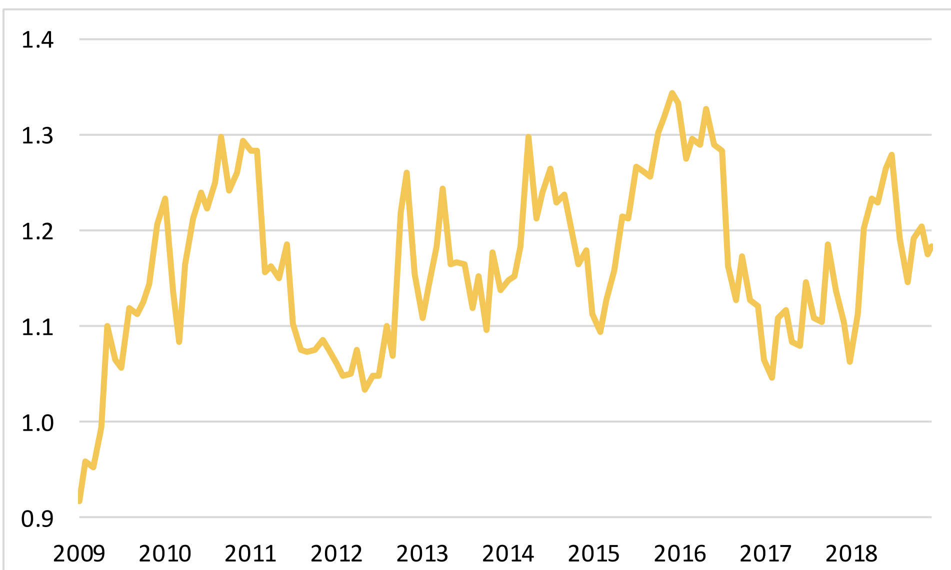
Weighting the DCF target price more heavily, I assign a target price of $79.30 to SXT.

SXT was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is expensive relative to other firms and is worth $74.20. Relative valuation shows SXT to be undervalued based on its fundamentals versus those of its peers. Price to book valuation yielded a price of $86.63. A detailed DCF analysis values SXT lower at $78.18; I give this value more weight because it incorporates assumptions that reflect SXT's already completed restructuring program, significant potential for sales growth due to the growing natural products market, and Sensient's historic outperformance of the S&P 500 in economic downturns. Weighting the DCF target price at 50 percent and the others at 25 percent each, I value the stock at $79.30.

Trading History

SXT is currently trading at 1.18 times the relative P/E valuation average, near its 10-year average of 1.18. The stock's current NTM P/E is 22.3, down from its 10-year peak of 45.62 in 2015, but close to its average of 23.53.

Figure 20: SXT NTM P/E relative to S&P 500



Source: FactSet, IMCP

If the firm maintains a NTM P/E of 22.3 through the end of 2020, it should trade at $81.62 by the end of 2020:

- Price = P/E x EPS = 22.3 x 2021 EPS of $3.66 = $81.62

Discounting this price back one year would give a current target price of $74.20 assuming a cost of equity of 10 percent as used in the DCF section below.

Relative Valuation

Sensient's 2020 P/E is 20.9 using consensus estimates versus a P/E of 22.2 for its peers. The firm's stock is relatively cheap relative to its immediate competitors. This may be because the market recognizes SXT's slumped sales growth. While there is reason to be optimistic about SXT's growth potential given the natural food market's potential, the company's competitors have the same opportunity, so Sensient is not guaranteed a large portion of the market. Looking at Sensient's more immediate competitors- IFF, INGR, and TATE, the firm's 2019 ROE of 72% is in line with all but IFF, whose ROE of 44% is considerably lower. SXT's P/B of 38% is higher than any of these competitors, with IFF again having the lowest ratio at 29%.

Figures 21, 22, & 23: SXT Comparable Companies

	2019		P/E							Sales Growth		
Ticker	**ROE**	**P/B**	**2017**	**2018**	**2019**	**TTM**	**NTM**	**2020**	**2021**	**NTM**	**STM**	**Pst 5yr**
SXT	13.5%	2.97	36.0	15.1	21.9	20.2	20.7	20.5	18.5	-0.1%		
KRZ-IE	16.9%	5.06	26.7	24.7	29.9			27.1	24.7			2.5%
MKC	20.5%	6.62	23.9	28.0	32.3	32.9	32.1	31.0	29.0	2.7%	2.6%	5.6%
IFF	10.9%	2.39	25.9	21.4	22.0	40.1	21.0	21.6	19.6	3.8%	33.6%	6.1%
INGR	16.8%	2.37	18.2	13.2	14.1	15.7	14.1	14.1	13.5	2.2%		-1.6%
TATE-GB	16.7%	2.63	15.6	12.5	15.7			14.6	14.2			-2.6%
GIVN-CH	21.6%	7.97	27.9	31.9	33.8			32.7	29.9			
Average	16.7%	4.29	24.9	21.0	24.3	27.2	22.0	23.1	21.4	2.1%	18.1%	2.0%
Median	16.8%	2.97	25.9	21.4	22.0	26.5	20.9	21.6	19.6	2.4%	18.1%	2.5%
SPX			20.6	15.6	19.6			18.9	17.5			

Fundamental Percent of Max

					Weight	0.0%	25.0%	25.0%	0.0%	0.0%	0.0%	0.0%	25.0%	25.0%
	Rank		Target	Weighted		Earnings Growth							2019	2019
Ticker	**Diff**	**Diff**	**Value**	**Fund**	**Value**	**LTG**	**NTM**	**2018**	**2019**	**2020**	**2021**	**Pst 5yr**	**ROE**	**NPM**
SXT	4	8%	59%	62%	50%	88%	-3%	100%	37%	50%	100%	41%	72%	79%
IFF	3	3%	59%	62%	57%	77%	100%	8%	-8%	15%	94%	41%	44%	97%
INGR	1	-28%	7%	32%	34%	59%	12%	-12%	-26%	0%	40%	9%	69%	57%
TATE-GB	2	-6%	37%	49%	43%	19%	49%	12%	-7%	59%	26%	-17%	71%	66%

Valuation Percent of Max

					Weight	0.0%	25.0%	0.0%	25.0%	0.0%	0.0%	25.0%	25.0%	0.0%	0.0%	0.0%
	Rank		Target	Weighted		P/E									EV/	1/
Ticker	**Diff**	**Diff**	**Value**	**Fund**	**Value**	**2017**	**2018**	**TTM**	**NTM**	**2019**	**2020**	**P/B**	**P/S**	**P/CF**	**EBIT**	**Yield**
SXT	4	8%	59%	62%	50%	100%	47%	52%	68%	66%	69%	38%	48%	60%	54%	27%
IFF	3	3%	59%	62%	57%	72%	67%	100%	67%	64%	71%	29%	65%	73%	81%	31%
INGR	1	-28%	7%	32%	34%	50%	41%	38%	43%	40%	45%	28%	24%	56%	39%	21%
TATE-GB	2	-6%	37%	49%	43%	43%	39%	69%	72%	45%	47%	32%	31%	37%	45%	15%

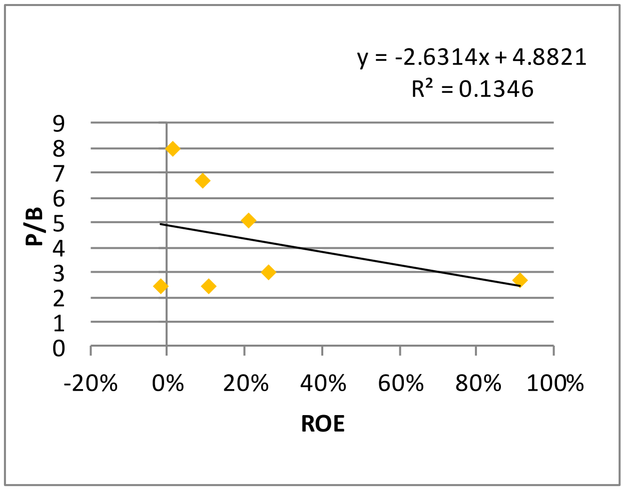
Source: FactSet, IMCP

Using the regression below in figure 24, I found that Sensient's target price is actually above its current price of $63.89:

- Target P/B = Estimated 2020 ROE (17.2%) x -2.6314 + 4.8821 = 4.43
- Appreciation = Target P/B (4.43) / Current P/B (2.97) – 1 = 49.2%
- Target Price= Current Price ($63.89) x Appreciation (1 + 49.2%) = $95.30

Discounting this back one year at a 10 percent cost of equity yields a target price of $86.63.

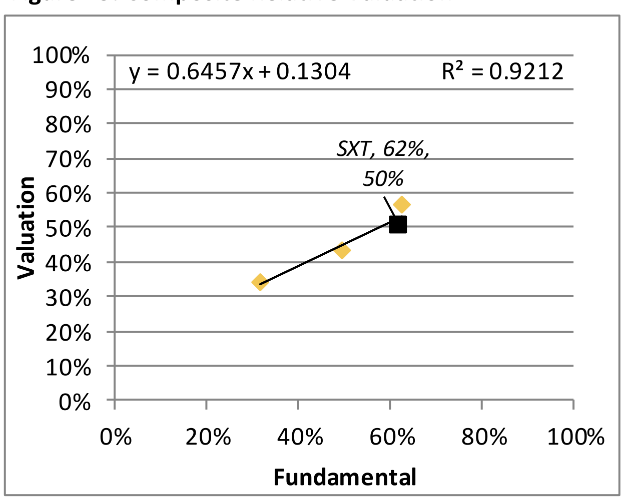
Figure 24: P/B vs ROE



Source: IMCP

For a final comparison, I created a composite of fundamental variables and compared this to a composite of valuation. I removed some outlier comps- KRZ, MKC, and GIVN. Since each variable has a different scale, I first converted each number to a percentile before creating the weighted composite values. I weighted NTM and 2018 EPS growth and ROE and net profit margin 25 percent each, and NTM and 2018 P/E, P/B, and P/CF 25 percent each. Figure 25 shows that Sensient is slightly below the line and inexpensive.

Figure 25: Composite Relative Valuation



Source: IMCP

DCF Valuation

A three stage discounted cash flow model was also used to value SXT.

For the purpose of this analysis, the company's cost of equity was calculated to be 10.00 percent using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.9 percent.
- A beta of 1.0 was utilized since the company has risk in line with the market. Its 52-week beta is currently 1.01.
- A long-term market rate of return of 10 percent was assumed, since historically, the market has generated an annual return of about 10 percent.

Given the above assumptions, the cost of equity is 10.00 percent (1.9 + 1.0 (10.0 – 1.9)).

NOPAT margin is forecasted to improve to 16 percent as SXT's restructuring efforts take effect.

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $3.22 and $4.05, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $6.28 per share. Thus, stage one of this discounted cash flow analysis contributes $6.28 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 10.00 percent cost of equity. I assume 2.0 percent sales growth in 2022, rising to 3.5 percent through 2026 stemming from the firm's natural-focused initiatives. The NOPAT margin is expected to rise to 16.0 percent in 2026 from 13.4 percent in 2022 as a result of the realization of Sensient's recently completed restructuring efforts. Finally, share repurchases are projected to continue, contributing to steady negative share growth of -1.5 percent, down 2.6 percent in 2021.

Figure 26: FCFE and discounted FCFE, 2020-2026

	2020	2021	2022	2023	2024	2025	2026
FCFE	$3.22	$4.05	$3.21	$3.18	$3.50	$3.79	$4.25
Discounted FCFE	$2.93	$3.35	$2.41	$2.17	$2.18	$2.14	$2.18

Source: IMCP

Added together, the second stage discounted cash flows total $11.08.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $3.61 in 2020 to $5.93 in 2026.

Figure 27: EPS estimates for 2020-2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$3.61	$3.66	$4.02	$4.43	$4.88	$5.39	$5.93

Source: IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this analysis, I have chosen a terminal P/E of 20. This is in line with the company's current P/E, but also lower than its average of the last 10 years of 23.53. SXT tends to outperform the S&P 500 in economic downturns, and we may be near the end of a cycle. We may not have a recession, but it is reasonable to anticipate at least some kind of correction will happen in the coming years. At the bottom of the 2009 financial crisis, Sensient's P/E was 10.92. Several years later in December of 2012, it recovered to 14.17, but this is still below my terminal P/E of 20. However, I am expecting that the market will price in low risk as SXT tends to outperform the S&P 500 in economic downturns. Thus, a multiple above "normal" for the S&P 500 of 15-17 seems reasonable.

Given the assumed terminal price to earnings ratio of 20, a terminal value of $118.53 per share is calculated. Using the 10.00 percent cost of equity, this number is discounted back to a present value of $60.82.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $78.18 is calculated ($6.28 + $11.08 + $60.82). With SXT'S current price at $63.89, this model indicates that the stock is undervalued.

<u>Scenario Analysis</u>

Sensient's stock performance is difficult to predict without some knowledge of how the economy at large will perform. The company's sales have been less than stellar in recent years but given the company's historic performance relative to the overall stock market in downturns, SXT could see improvements in coming years. Even if the economy and market were to stay stable, recent investments in restructuring should eventually bear fruit in increased efficiencies and improved margins. Additionally, if the firm is able to capture enough of the predicted continued outsize growth of demand for natural ingredients, then this alone could help bolster revenues. Depending on these macroeconomic, company-specific, and industry factors, I valued SXT in two different scenarios for the period 2022-2026.

Bull Case: If the economy faces a downturn and Sensient Technologies continues its pattern of market outperformance, I expect an additional 2 percent of sales growth for the company by the end of 2026. Assuming Sensient's restructuring efforts result in a meaningful annual cost savings, I project an improvement of NOPAT to sales to 18 percent in 2026. I also predict SXT to realize a further 2 percent of sales growth by end of 2026 from capturing growth from the trend towards natural products. With a slightly higher terminal P/E of 22, I forecast a target price of $91.93.

Figure 28: Bull case estimated value for 2020

Summary (using P/E multiple for terminal value)		
First stage	$6.28	Present value of first 2 year cash flow
Second stage	$13.33	Present value of year 3-7 cash flow
Third stage	$72.33	Present value of terminal value P/E
Value (P/E)	**$91.93**	

Source: IMCP

Bear Case: Assuming either the economy stays stable, or if it does have a downturn, Sensient does not outperform the market, all else held equal I expect sales growth to continue a trend of slight decline, with growth in 2026 of -1 percent. Regarding the firm's restructuring program, SXT had to invest more than anticipated to carry it out and has not yet realized much in terms of cost savings. It is possible that this will persist, and the company will only see modest improvement in NOPAT to sales of 2 percent- gradually improving to a rate of 14.7 percent in 2026. Finally, Sensient Technologies faces stiff competition in its market. Even if the demand for natural ingredients does substantially increase, this does not mean the firm will realize the same rate of growth, so I project only a modest boost to sales growth of 0.5 percent from this market shift. This increase would offset the aforementioned negative sales growth trend, resulting in overall sales growth of only 0.5% by 2026. With a lower terminal P/E of 18, my bear case target price is $62.38.

Figure 29: Bear case estimated value for 2020

Summary (using P/E multiple for terminal value)		
First stage	$6.28	Present value of first 2 year cash flow
Second stage	$13.16	Present value of year 3-7 cash flow
Third stage	$42.94	Present value of terminal value P/E
Value (P/E)	**$62.38**	

Source: IMCP

Business Risks

Although there are multiple reasons to be optimistic about Sensient Technologies Corporation's future performance, there are significant risks in its current position and inherent in its industry that lead to my neutral position on the company's stock.

Natural ingredient demand:

Increase in consumer demand for goods with naturally derived ingredients is potentially one of the largest sources of sales growth for Sensient. If demand growth in this area slows, or even simply fails to meet expectations, SXT's recently sluggish sales are less likely to turn around.

Technology from acquisitions:

Technology from recent acquisitions are another expected source of Sensient's future sales growth. Implementation of this technology across existing business segments could take longer than expected or fail to bear revenue increases once fully integrated.

Failure to realize anticipated restructuring savings:

The firm has already invested 49-58 percent more than expected in its 2014-2017 restructuring efforts and has yet to realize its projected $30 million in annual savings. In an environment where Sensient Technologies has had stagnant sales growth, savings from restructuring could be a source of improved margins.

Competitive market:

Sensient's business is in a highly competitive industry. The company's 2018 annual report details how many of its customers have consolidated, giving them greater buying power. SXT is considerably smaller than its competitors and may be less able to resist pushes to decrease prices. Additionally, Sensient faces the risk of customers switching suppliers most especially in the case of the company's more commodity-like offerings, such as dehydrated onion, which are sold through its Sensient Natural Ingredients segment. In 2018, the firm reported this segment was responsible for 16.2 percent of sales.

International market concerns:

While participating meaningfully in the global marketplace offers Sensient several upsides from diversification, it also exposes the firm to international market risks. SXT's 2018 annual report specifies that BREXIT could have a negative financial impact on the firm in both the short and long-term.

Source: Company Reports

Appendix 1: Porter's 5 Forces

Threat of New Entrants- Low

Sensient's industry is mature and has significant barriers to entry. Manufacture of its products relies upon sourcing raw materials from many different individual suppliers around the globe, formulating them into ingredients, complying with environmental and other regulations such as from the U.S. FDA, and keeping relationships with different customers in each product segment. Establishing and maintaining all of these relationships and processes is unlikely to happen without significant time and investment.

Threat of Substitutes- Moderate

The likelihood of Sensient's customers switching to different suppliers varies in part depending on the product in question. For the company's more commodity-like ingredients, such as dehydrated onion, the threat is high as they are more easily and closely copied by competitors. However, SXT has a focus on formulating proprietary products with unique properties that are harder to replicate, as these increase customers' switching costs and make them more "sticky."

Supplier Power- Low

The raw materials purchased by Sensient are not specialized and can be sourced from multiple locations. Suppliers do not have significant leverage over the firm as SXT does not rely exclusively on any one supplier. In its annual report, the company states that it would be able to reformulate its offerings using different raw material suppliers if necessary.

Buyer Power- High

Consumers of Sensient's ingredients have significant bargaining power. Customers have consolidated, giving them greater ability to push back on price increases, which can negatively impact the firm's margins.

Intensity of Competition- High

In all markets where Sensient participates, competition is high. It varies in which companies compete depending on the product line; SXT does not compete with any single company across all product lines. Competition is highest for simple, commodity-like ingredients, such as dehydrated vegetables. The ability of the firm to differentiate its offerings is lower in these cases and it risks being undercut by rivals on the basis of price.

Source: Company Reports

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Globally diversified Defensive stock Barriers to entry	Stagnant sales growth Small player in industry Some products easily copied
Opportunities	**Threats**
Integration of new tech Growing natural market Expansion in Asia	Consolidating customers Intense competition International concerns

Appendix 3: Sales Forecast

Sales Forecasts (in thousands)							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	1,376	1,383	1,362	1,387	1,313	1,326	1,313
Growth		*0.5%*	*-1.5%*	*1.8%*	*-5.3%*	*1.0%*	*-1.0%*
Flavors & Fragrances	793	769	727	723	686	725	718
Growth		*-3.1%*	*-5.5%*	*-0.5%*	*-5.2%*	*5.7%*	*-1.0%*
% of sales	*57.7%*	*55.6%*	*53.4%*	*52.1%*	*52.2%*	*54.7%*	*54.7%*
Colors	466	487	513	540	511	480	475
Growth		*4.5%*	*5.3%*	*5.3%*	*-5.3%*	*-6.2%*	*-1.0%*
% of sales	*33.9%*	*35.2%*	*37.6%*	*38.9%*	*38.9%*	*2.0%*	*36.2%*
Asia Pacific	116	127	122	123	116	121	120
Growth		*9.2%*	*-3.7%*	*0.6%*	*-6.0%*	*4.6%*	*-1.0%*
% of sales	*8.5%*	*9.2%*	*9.0%*	*8.9%*	*8.8%*	*9.1%*	*6.0%*
Corporate & Other	-	-	-	1	-	-	-
Growth					*-100.0%*	*0.0%*	*0.0%*
% of sales	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	*100.0%*	*100.0%*
North America	744	746	719	723	692	706	699
Growth		*0.2%*	*-3.6%*	*0.6%*	*-4.3%*	*2.0%*	*-1.0%*
% of sales	*54.1%*	*53.9%*	*52.8%*	*52.1%*	*52.7%*	*53.2%*	*53.2%*
Europe	349	343	325	342	315	327	324
Growth		*-1.8%*	*-5.3%*	*5.4%*	*-7.8%*	*3.6%*	*-1.0%*
% of sales	*25.4%*	*24.8%*	*23.8%*	*24.7%*	*24.0%*	*24.7%*	*24.7%*
Asia Pacific	178	197	209	213	200	192	190
Growth		*10.9%*	*6.1%*	*2.0%*	*-6.2%*	*-4.0%*	*-1.0%*
% of sales	*12.9%*	*14.2%*	*15.3%*	*15.4%*	*15.2%*	*14.5%*	*14.5%*
Other	105	98	110	109	106	102	101
Growth		*-6.7%*	*12.4%*	*-0.9%*	*-3.1%*	*-3.9%*	*-1.0%*
% of sales	*7.6%*	*7.1%*	*8.1%*	*7.9%*	*8.0%*	*7.7%*	*7.7%*

Appendix 4: Income Statement

Income Statement (in thousands)							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	$1,376	$1,383	$1,362	$1,387	$1,313	$1,326	$1,313
Direct costs	922	908	887	921	872	880	872
Gross Margin	454	475	475	466	441	446	441
SG&A, R&D, and other	288	290	308	263	249	251	249
EBIT	166	186	168	203	193	194	193
Interest	17	18	19	22	22	22	22
EBT	149	167	148	182	171	173	171
Taxes	42	44	59	24	23	23	23
Income	107	123	90	157	148	150	148
Other	0.5	(3)	-	-	-	-	-
Net income	107	126	90	157	148	150	148
Basic Shares	45.9	44.5	43.8	42.4	42.4	41.5	40.4
Fully Diluted Shares	46.2	44.8	44.0	42.5	42.4	41.5	40.4
EPS	$2.33	$2.84	$2.05	$3.71	$3.49	$3.61	$3.66
EPS Fully Diluted	$2.31	$2.82	$2.03	$3.70	$3.49	$3.61	$3.66
DPS	$1.05	$1.11	$1.23	$1.35	$1.56	$1.72	$1.89

Appendix 5: Balance Sheet

Capital							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Cash	12	26	29	32	32	34	52
Operating assets ex cash	717	691	704	791	791	799	791
Operating assets	729	717	733	823	823	833	843
Operating liabilities	192	193	196	195	195	197	195
NOWC	537	524	537	628	628	637	648
NOWC ex cash (NWC)	525	498	508	596	596	602	596
NFA	975	951	991	1,002	1,002	1,012	1,002
Invested capital	*$1,511*	*$1,475*	*$1,528*	*$1,630*	*$1,630*	*$1,649*	*$1,650*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$1,704*	*$1,668*	*$1,724*	*$1,825*	*$1,825*	*$1,845*	*$1,845*
Short-term and long-term debt	$634	$603	$624	$710	$710	$710	$710
Other liabilities	32	36	52	61	61	61	61
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	845	836	852	860	860	878	880
Total supplied capital	*$1,511*	*$1,475*	*$1,528*	*$1,630*	*$1,630*	*$1,649*	*$1,650*
Total liabilities and equity	*$1,704*	*$1,668*	*$1,724*	*$1,825*	*$1,825*	*$1,845*	*$1,845*

Appendix 6: Ratios

Ratios							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Profitability							
Gross margin	33.0%	34.4%	34.9%	33.6%	33.6%	33.6%	33.6%
Operating (EBIT) margin	12.1%	13.4%	12.3%	14.7%	14.7%	14.7%	14.7%
Net profit margin	7.8%	9.1%	6.6%	11.3%	11.3%	11.3%	11.3%
Activity							
NFA (gross) turnover		1.44	1.40	1.39	1.31	1.32	1.30
Total asset turnover		0.82	0.80	0.78	0.72	0.72	0.71
Liquidity							
Op asset / op liab	3.79	3.71	3.74	4.23	4.23	4.24	4.33
NOWC Percent of sales		38.3%	39.0%	42.0%	47.9%	47.7%	48.9%
Solvency							
Debt to assets	37.2%	36.2%	36.2%	38.9%	38.9%	38.5%	38.5%
Debt to equity	75.0%	72.2%	73.2%	82.5%	82.5%	80.8%	80.6%
Other liab to assets	3.6%	2.1%	3.0%	3.3%	3.3%	3.3%	3.3%
Total debt to assets	40.8%	38.3%	39.2%	42.2%	42.2%	41.7%	41.8%
Total liabilities to assets	52.1%	49.9%	50.6%	52.9%	52.9%	52.4%	52.3%
Debt to EBIT	3.81	3.25	3.72	3.49	3.69	3.65	3.68
EBIT/interest	9.82	10.13	8.66	9.31	8.81	8.90	8.81
Debt to total net op capital	42.0%	40.9%	40.9%	43.5%	43.5%	43.0%	43.0%
ROIC							
NOPAT to sales	8.7%	9.9%	7.4%	12.7%	12.7%	12.7%	12.7%
Sales to NWC		2.70	2.71	2.51	2.20	2.21	2.19
Sales to NFA		1.44	1.40	1.39	1.31	1.32	1.30
Sales to IC ex cash		0.94	0.92	0.90	0.82	0.83	0.82
Total ROIC ex cash		9.3%	6.9%	11.4%	10.4%	10.5%	10.4%
NOPAT to sales	8.7%	9.9%	7.4%	12.7%	12.7%	12.7%	12.7%
Sales to NOWC		2.61	2.57	2.38	2.09	2.10	2.04
Sales to NFA		1.44	1.40	1.39	1.31	1.32	1.30
Sales to IC		0.93	0.91	0.88	0.81	0.81	0.80
Total ROIC		9.1%	6.7%	11.2%	10.2%	10.3%	10.1%
NOPAT to sales	8.7%	9.9%	7.4%	12.7%	12.7%	12.7%	12.7%
Sales to EOY NWC	2.62	2.78	2.68	2.33	2.20	2.20	2.20
Sales to EOY NFA	1.41	1.45	1.37	1.38	1.31	1.31	1.31
Sales to EOY IC ex cash	0.92	0.95	0.91	0.87	0.82	0.82	0.82
Total ROIC using EOY IC ex cash	8.0%	9.4%	6.8%	11.0%	10.4%	10.4%	10.4%

Ratios							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
NOPAT to sales	8.7%	9.9%	7.4%	12.7%	12.7%	12.7%	12.7%
Sales to EOY NOWC	2.56	2.64	2.54	2.21	2.09	2.08	2.03
Sales to EOY NFA	1.41	1.45	1.37	1.38	1.31	1.31	1.31
Sales to EOY IC	0.91	0.94	0.89	0.85	0.81	0.80	0.80
Total ROIC using EOY IC	7.9%	9.2%	6.6%	10.8%	10.2%	10.2%	10.1%
ROE							
5-stage							
EBIT / sales		13.4%	12.3%	14.7%	14.7%	14.7%	14.7%
Sales / avg assets		0.82	0.80	0.78	0.72	0.72	0.71
EBT / EBIT		90.1%	88.4%	89.3%	88.6%	88.8%	88.7%
Net income /EBT		75.5%	60.4%	86.7%	86.7%	86.7%	86.7%
ROA		7.5%	5.3%	8.9%	8.1%	8.2%	8.0%
Avg assets / avg equity		2.01	2.01	2.07	2.12	2.11	2.10
ROE		15.0%	10.6%	18.4%	17.2%	17.2%	16.8%
3-stage							
Net income / sales		9.1%	6.6%	11.3%	11.3%	11.3%	11.3%
Sales / avg assets		0.82	0.80	0.78	0.72	0.72	0.71
ROA		7.5%	5.3%	8.9%	8.1%	8.2%	8.0%
Avg assets / avg equity		2.01	2.01	2.07	2.12	2.11	2.10
ROE		15.0%	10.6%	18.4%	17.2%	17.2%	16.8%
Payout Ratio		39.3%	60.3%	36.5%	44.7%	47.6%	51.6%
Retention Ratio		60.7%	39.7%	63.5%	55.3%	52.4%	48.4%
Sustainable Growth Rate		9.1%	4.2%	11.7%	9.5%	9.0%	8.2%

Appendix 7: Comp Sheet

		Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
SXT	SENSIENT TECHNOLOGIES CORP	$62.88	$2,661	(0.4)	(3.9)	2.6	(10.5)	2.2	(4.9)	10.0	-2.7%	82.3%	-22.4%	6.6%	10.8%		1.07	70.2%	B+	2.22%	46.2%
KRZ-IE	KERRY GROUP	$129.87	$22,925	0.6	4.2	12.5	9.2	30.1	6.0	10.7		-4.8%	8.2%	10.6%	9.4%	44.8%	0.48			0.65%	
MKC	MCCORMICK & CO INC	$172.67	$22,950	(0.1)	2.6	7.9	8.7	38.9	1.7	5.1	2.3%	16.7%	7.6%	4.1%	6.8%	19.1%	0.02	110.8%	A+	1.37%	42.5%
IFF	INTL FLAVORS & FRAGRANCES	$135.79	$14,500	(0.2)	8.6	13.4	(7.0)	(1.0)	5.2	8.7	90.9%	6.6%	-1.8%	1.9%	10.2%	-0.7%	0.62	70.6%	A-	2.29%	86.9%
INGR	INGREDION INC	$92.26	$6,160	(0.7)	(0.3)	16.5	17.4	(5.3)	(0.7)		11.4%	-10.1%	-5.6%	0.0%	4.3%	4.0%	1.12	81.1%	A-	2.69%	42.7%
TATE-GB	TATE & LYLE	$10.35	$4,803	1.3	3.1	16.9	4.6	13.5	4.2	2.4		9.8%	-1.5%	7.6%	2.8%	-7.8%	1.26			3.89%	
GIVN-CH	GIVAUDAN SA	$3,248.87	$29,948	2.0	3.7	11.4	19.5	28.6	4.1	11.3		-12.7%	21.7%	12.8%	9.3%		0.77			1.98%	
Average			$14,849	0.4	2.6	11.6	6.0	15.3	2.2	8.0	25.5%	12.5%	0.9%	6.2%	7.7%	11.9%	0.76	83.2%		2.16%	54.5%
Median			$14,500	(0.1)	3.1	12.5	8.7	13.5	4.1	9.4	6.9%	6.6%	-1.5%	6.6%	9.3%	4.0%	0.77	75.9%		2.22%	44.4%
SPX	S&P 500 INDEX	$3,295		(0.9)	2.2	9.5	9.1	24.7	2.0			23.6%	1.3%	7.2%	7.7%						

		2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
SXT	http://www.sensient.com	13.5%	2.97	36.0	15.1	21.9	20.2	20.7	20.5	18.5	9.3%	2.04	11.3%	14.6%	10.5%	15.1	15.1	-0.1%			$21.19
KRZ-IE	http://www.kerrygroup.com	16.9%	5.06	26.7	24.7	29.9			27.1	24.7	9.6%	2.87	8.2%	11.5%	9.4%	22.3	27.0			2.5%	$25.69
MKC	http://www.mccormickcorpora	20.5%	6.62	23.9	28.0	32.3	32.9	32.1	31.0	29.0	13.2%	4.27	17.3%	17.5%	13.1%	26.0	26.4	2.7%	2.6%	5.6%	$26.10
IFF	http://www.iff.com	10.9%	2.39	25.9	21.4	22.0	40.1	21.0	21.6	19.6	12.8%	2.83	8.4%	17.6%	4.8%	22.6	20.2	3.8%	33.6%	6.1%	$56.72
INGR	http://www.ingredion.com	16.8%	2.37	18.2	13.2	14.1	15.7	14.1	14.1	13.5	7.6%	1.07	7.6%	13.1%	9.9%	10.9	15.6	2.2%		-1.6%	$38.91
TATE-GB	http://tateandlyle.com	16.7%	2.63	15.6	12.5	15.7			14.6	14.2	8.8%	1.38	6.6%	10.7%	9.6%	12.6	10.3			-2.6%	$3.94
GIVN-CH	http://www.givaudan.com	21.6%	7.97	27.9	31.9	33.8			32.7	29.9	12.8%	4.73	11.3%	14.9%	9.7%	34.5	25.1				$407.78
Average		16.7%	4.29	24.9	21.0	24.3	27.2	22.0	23.1	21.4	10.6%	2.74	10.1%	14.3%	9.6%	20.6	20.0	2.1%	18.1%	2.0%	
Median		16.8%	2.97	25.9	21.4	22.0	26.5	20.9	21.6	19.6	9.6%	2.83	8.4%	14.6%	9.7%	22.3	20.2	2.4%	18.1%	2.5%	
SPX	S&P 500 INDEX			20.6	15.6	19.6			18.9	17.5											

Appendix 8: 3-stage DCF Model

	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*1.0%*	*-1.0%*	*2.0%*	*3.0%*	*3.2%*	*3.5%*	*3.5%*
NOPAT / S	*12.7%*	*12.7%*	*13.4%*	*14.0%*	*14.7%*	*15.3%*	*16.0%*
S / NWC	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*	*2.20*
S / NFA (EOY)	*1.31*	*1.31*	*1.31*	*1.31*	*1.31*	*1.31*	*1.31*
S / IC (EOY)	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*	*0.82*
ROIC (EOY)	*10.4%*	*10.4%*	*11.0%*	*11.5%*	*12.1%*	*12.6%*	*13.1%*
ROIC (BOY)		*10.3%*	*11.2%*	*11.9%*	*12.4%*	*13.0%*	*13.6%*
Share Growth		*-2.6%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*
Sales	$1,326	$1,313	$1,339	$1,380	$1,423	$1,473	$1,525
NOPAT	$169	$167	$179	$194	$209	$226	$244
Growth		*-1.0%*	*7.3%*	*8.1%*	*8.0%*	*8.1%*	*7.9%*
- Change in NWC	6	-6	12	18	20	23	23
NWC EOY	*602*	*596*	*608*	*627*	*646*	*669*	*693*
Growth NWC		*-1.0%*	*2.0%*	*3.0%*	*3.2%*	*3.5%*	*3.5%*
- Chg NFA	10	-10	20	31	33	38	39
NFA EOY	*1,012*	*1,002*	*1,022*	*1,053*	*1,086*	*1,124*	*1,164*
Growth NFA		*-1.0%*	*2.0%*	*3.0%*	*3.2%*	*3.5%*	*3.5%*
Total inv in op cap	16	-16	32	49	53	61	63
Total net op cap	1614	1599	1631	1680	1733	1794	1856
FCFF	$153	$182	$147	$145	$156	$165	$181
% of sales	*11.5%*	*13.9%*	*11.0%*	*10.5%*	*10.9%*	*11.2%*	*11.9%*
Growth		*19.6%*	*-19.4%*	*-1.7%*	*7.7%*	*6.2%*	*9.6%*
- Interest (1-tax rate)	19	19	19	20	21	21	22
Growth		*0.0%*	*2.0%*	*3.0%*	*3.2%*	*3.5%*	*3.5%*
FCFE w/o debt	$134	$164	$128	$125	$135	$144	$159
% of sales	*10.1%*	*12.5%*	*9.5%*	*9.0%*	*9.5%*	*9.8%*	*10.4%*
Growth		*22.3%*	*-21.9%*	*-2.4%*	*8.5%*	*6.6%*	*10.5%*
/ No Shares	41.5	40.4	39.8	39.2	38.6	38.0	37.5
FCFE	$3.22	$4.05	$3.21	$3.18	$3.50	$3.79	$4.25
Growth		*25.6%*	*-20.7%*	*-0.9%*	*10.1%*	*8.2%*	*12.1%*
* Discount factor	0.91	0.83	0.75	0.68	0.62	0.56	0.51
Discounted FCFE	$2.93	$3.35	$2.41	$2.17	$2.18	$2.14	$2.18
Third Stage							
Terminal value P/E							
Net income	$150	$148	$160	$174	$188	$205	$222
% of sales	*11.3%*	*11.3%*	*11.9%*	*12.6%*	*13.2%*	*13.9%*	*14.6%*
EPS	$3.61	$3.66	$4.02	$4.43	$4.88	$5.39	$5.93
Growth		*1.6%*	*9.6%*	*10.3%*	*10.2%*	*10.3%*	*10.0%*
Terminal P/E							20.00
* Terminal EPS							$5.93
Terminal value							$118.53
* Discount factor							0.51
Discounted terminal value							$60.82

Summary (using P/E multiple for terminal value)

First stage	$6.28	Present value of first 2 year cash flow
Second stage	$11.08	Present value of year 3-7 cash flow
Third stage	$60.82	Present value of terminal value P/E
Value (P/E)	**$78.18**	

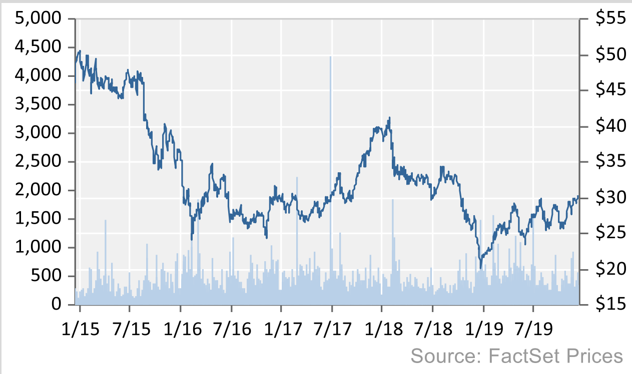
Recommendation: Hold

Current Price	**$31.16**	---	Ticker	APAM
1 Year Bear	$29	*-7%*	Sh. Out. (M)	77.8
1 Year Base	**$34**	***10%***	M.Cap. ($M)	2,425
1 Year Bull	$43	*35%*	EV ($M)	2,478

Financials, Investment Managers

Artisan Partners Asset Management, Inc.

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	2.2%	13%	0.2%	53%	62%	10%	11%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($M)	**806**	**721**	**796**	**829**	**791**	**823**	**856**
Gr. %	*-2.3%*	*-11%*	*10%*	*4%*	*-4.5%*	*4%*	*4%*
Cons.	-	-	-	-	-	*5.3%*	*3.8%*
Ind.	*-3.5%*	*-9.6%*	*9.6%*	*10.9%*	*-6.8%*	*6%*	*-2.4%*
EPS	**1.85**	**1.57**	**0.75**	**2.84**	**2.62**	**2.97**	**3.14**
Gr. %	-	*-11%*	*-52%*	*277%*	*-8%*	*13%*	*6%*
Cons.	-	-	-	-	-	*6.5%*	*3.7%*
Ind.	*18.8*	*5.1%*	*18.9%*	*-4.2%*	*6.7%*	*9.7%*	*5.4%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**10.2%**	**10.1%**	**6.2%**	**19.1%**	**19.2%**	**19.5%**	**19.8%**
Ind.	*15.4%*	*9.5%*	*14.8%*	*18.6%*	*20.9%*	-	-
ROE	*54.6%*	*45.8%*	*27.8%*	*113.4%*	*113.9%*	*138.0%*	*172.3%*
Ind.	*14.9%*	*11.4%*	*11.2%*	*12.7%*	*16.4%*	-	-
ROA	*7.32*	*6.37*	*3.79*	*16.91*	*18.3%*	*18.9%*	*19.8%*
Ind.	*1.8%*	*1.9%*	*2.5%*	*4.9%*	*3.5%*	-	-
A T/O	0.90	0.77	0.90	1.02	0.96	0.97	1.00
A/E	7.27	7.09	7.75	5.73	6.75	7.99	9.57

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	19.39	18.95	52.67	7.78	8.40	11.50	11.40
v. Ind.	18.00	17.32	19.39	10.99	14.91	13.59	12.90
P/S	1.59	1.57	2.20	1.29	2.22	-	-
P/B	10.93	9.52	18.13	8.85	16.65	-	-
P/CF	3.98	4.20	8.64	3.24	5.79	-	-
EV/EBITDA	1.79	1.78	2.62	1.51	6.4	-	-
D/P	*7.2%*	*9.3%*	*7.5%*	*14.9%*	*9.5%*	-	-

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Summary

I recommend a neutral rating with a target of $34. Artisan has historically traded in line with equity market sentiment and in the past year, APAM has shown significant price appreciation. Despite Artisan's excellent performance of its investment strategies, the firm has struggled with translating this performance into consistent AUM growth. I forsee this becoming an increasing strife for the firm as domestic investors shift into more passive strategies. The stock is fairly valued based on relative and DCF analysis.

Key Drivers

- Investment strategy performance: Retaining investors through generation of alpha is the largest driver for Artisan's long-term success. Of Artisan's 14 established strategies, 13 have outperformed their relative benchmarks since inception. Strong performance retains AUM and creates revenues for APAM.
- Expansion of market share through talent acquisition: The ability for Artisan to efficiently attract top managers and launch new investment strategies provides opportunity for AUM growth.
- Increased demand for active management in foreign markets: Artisan has more than doubled its share of AUM from investors in the past five years. As domestic demand for active AUM falls in the U.S., the firm has successfully attracted new investors to recoup potential lost revenues.
- Competition: Artisan Partners' yields the highest dividend return within its peer management and the firm consistently pays out 80% of its cash each quarter. This capital allocation structure puts Artisan ahead of its peers.

Valuation

Using a relative valuation approach, APAM appears to be fairly valued in comparison to the investment management industry. DCF analysis implies that the stock is much undervalued and worth $39.54. Taking a weighted average of the approaches suggests that APAM is fairly valued, as the stock's value is about $34 and the shares trade at $33.16.

Risks

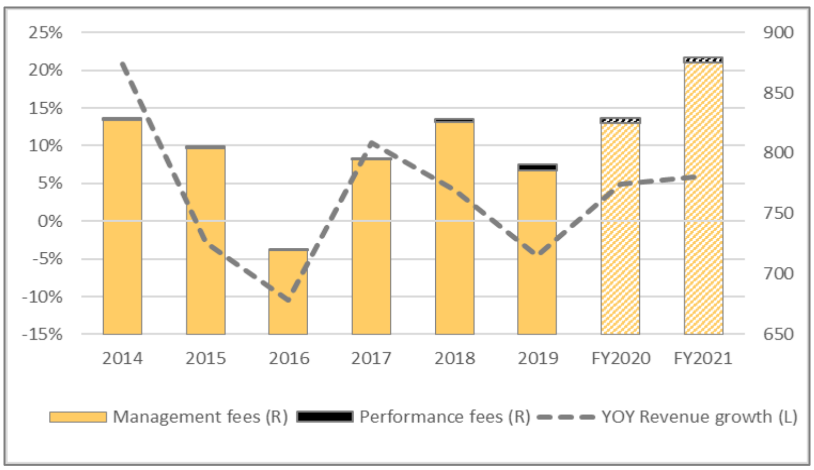
- Failure to retain key investment managers
- Failure to generate returns above benchmarks
- A slowdown in equity markets, effecting investor sentiment
- Macroeconomic risks and global political uncertainty

Company Overview

Artisan Partners Asset Management Inc. (APAM) operates as an investment management firm with a focus on providing high value add strategies to a global network of clients. Artisan Partners structures itself around a central business leadership team that provides the necessary operational infrastructure to its autonomous investment teams.

Artisan currently operates nine investment teams, managing 17 individual investment strategies. Producing unique and attractive investment strategies is a core business model for Artisan. The firm's autonomous investment teams operate a widespread range of U.S., non-U.S. and global investment strategies that vary by asset class, market cap and investment style. The firm is headquartered in Milwaukee, WI and was founded 1994. APAM completed its IPO in March 2013.

Artisan Partners generates almost of its revenues from investment management fees, which are a specified percentage of client's average assets under management. A majority of Artisan's expenses, including compensation expense, accumulate directly with changes in revenue. In 2018, the firm generated $828.7 million in revenues. As shown by figure 1, Artisan has grown revenues 0% in the past five years. Over a shorter, three-year term, the firm grew revenues by ~15%. The fee structure is divided into two segments:



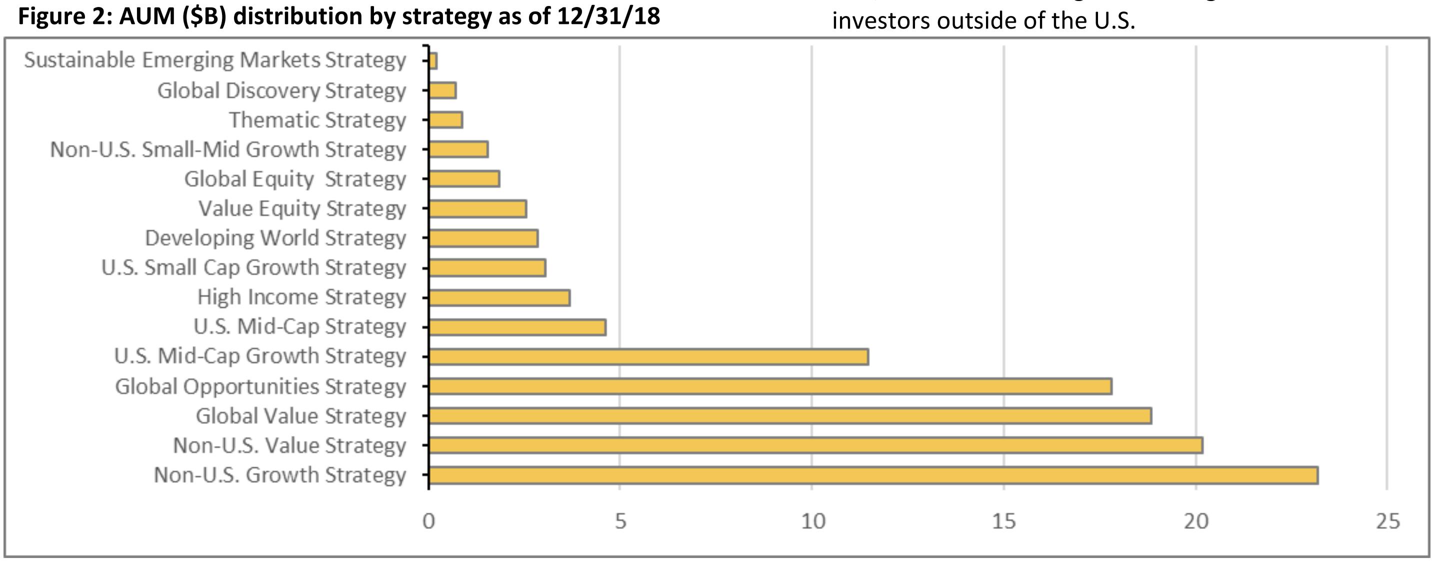
Source: FactSet

1) **Management Fees** – The vast majority of Artisans revenues come from management fees. This segment made up approximately 99.6% of total revenue or $825.7 million in 2018. The firm determines these fees through investment advisory and sub-advisory agreements with clients.

2) **Performance Fees** – The remaining revenue is derived from performance fees. Artisan generated $3 million, or 0.4% of total revenue, from this segment in 2018.

As of June 30, 2019, the firm had $113,843 million in assets under management. Of Artisan's assets, 79% belong to clients and investors within the U.S., and the remaining 21% belong to clients and investors outside of the U.S.

Figure 2: AUM ($B) distribution by strategy as of 12/31/18



Source: Company filings

Business/Industry Drivers

Artisan Partners' company and industry drivers can be found below:

1) Investment Strategy Performance
2) Expansion of Market Share through Talent Acquisition
3) Increase in Demand for Asset Management in Foreign Markets
4) Competitor Analysis
5) Macroeconomic Environment

<u>Investment Strategy Performance</u>

Since inception, only one of APAM's strategies has failed to beat its benchmark

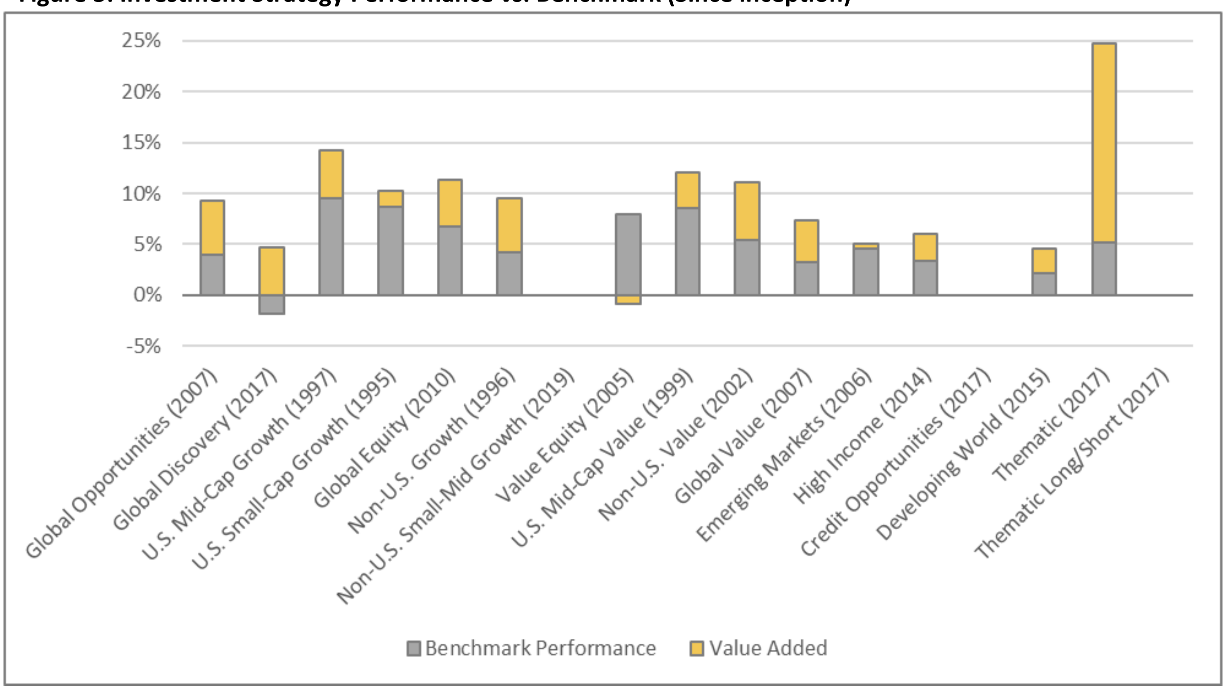
Being a high-value added asset management firm, the most important driver to Artisan Partners' long-term success will be its ability to generate alpha over the long-term. The firm owns nine different autonomous investment teams:

- Growth Team	- Global Equity Team	- U.S. Value Team
- Global Value Team	- Sustainable Emerging Markets Team	- Credit Team
- International Value Team	- Developing World Team	- Thematic Team

These nine teams collectively operate 17 individual investment strategies. APAM benchmarks these strategies to their best respective market indexes. Figure 3 below shows us that out of Artisans' 14 established[1] strategies, 13 outperformed their relative indices on a gross composite return bases.

The firm's four largest strategies collectively hold about 71% of the firm's total AUM or $80 Billion. The strategies are as follows: Non-U.S. Growth, Non-U.S. Value, Global Value, and Global Opportunities. Their track record is stellar and each fund has outperformed its relative indices on both a short five year term and over the longer term. This performance is critical for Artisan's overall success.

Figure 3: Investment Strategy Performance vs. Benchmark (Since inception)



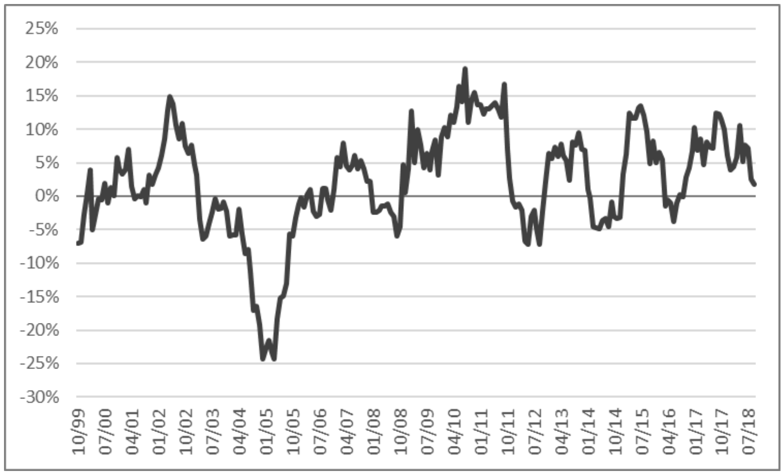
[1] The Non-U.S. Small-Mid Growth Strategy has yet to report returns. Artisan has intentionally omitted returns for the Credit Opportunities and the Thematic Long/Short strategies

Trends in foreign markets is another large driver for Artisans' overall strategy performance. The firm currently has nine (including its four largest funds) investment strategies solely targeting returns from foreign markets. To put the value added from these strategies into perspective, we can look at the past 20 year returns of the S&P 500 vs. the MSCI Global Index (ex. U.S.).

Artisan's four largest strategies, which make up ~80% of AUM, focus on foreign markets

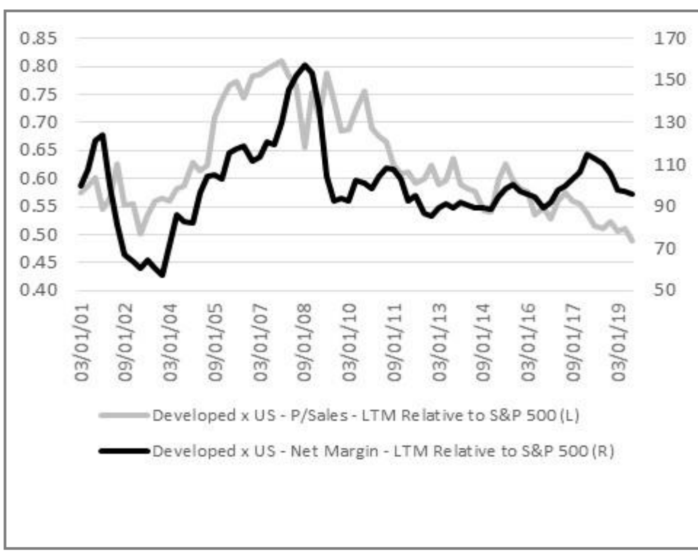
Figure 4 below shows the year over year return difference between the two indices. We can see that the S&P 500 generate higher returns on a much more frequent basis than the MSCI Global Index (ex U.S.). While some may say that there are more opportunities to find growth and value in emerging markets, with that incentive to invest comes a lot of risk. It is impressive that Artisan's largest and best performing strategies are operating in markets that are not necessarily generating the greatest returns.

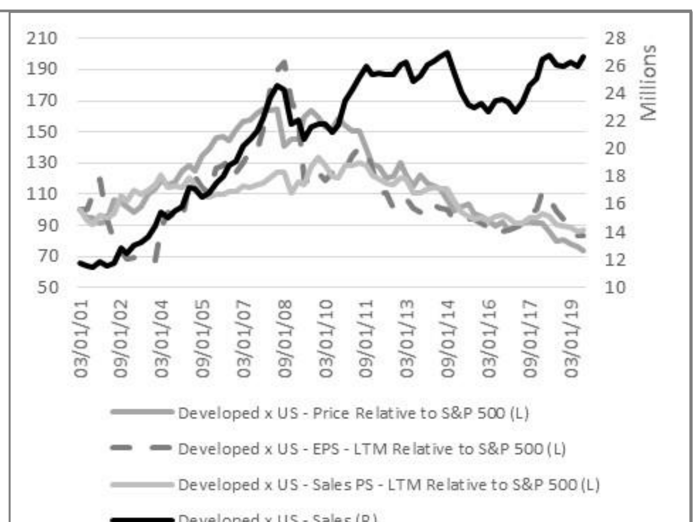
Figure 4: YOY S&P 500 returns vs. YOY MSCI Global Index (ex U.S.) returns



To continue the discussion on US markets vs. foreign markets, figures 5 and 6 below look at the growth and valuation of these markets. We can see that ex-US growth is beginning to pick up, while the 2018-19 recent relative move down may be temporary as a result of the US tax cut. A reversal of this trend could be excellent for Artisan's performance due to its heavy fund exposure to the global markets.

Figures 5 & 6: LTM Developed x US P/Sales and Net Margin, Relative to S&P500 (left) and Developed x US Sales Valuations relative to S&P500 (right)





Source: FactSet

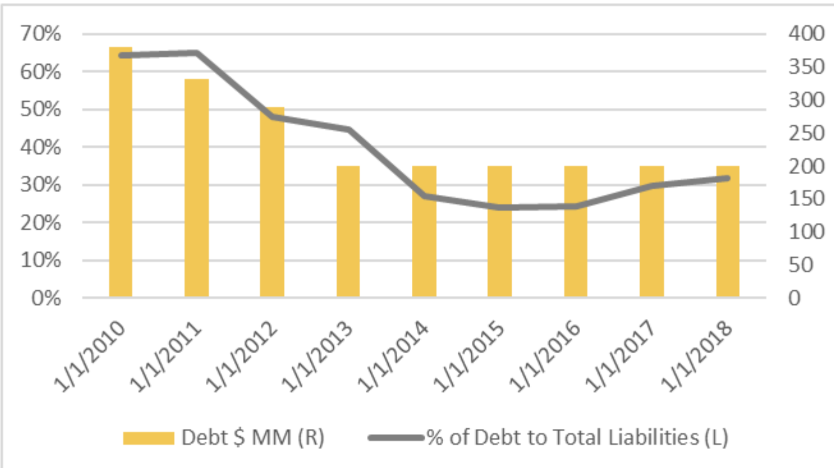
Artisan Partners launched six new investment strategies in the past five years

Expansion of Market Share through Talent Acquisition

With the freedom given to Artisans' autonomous investment teams and the ever-changing landscape within the field, it is important that the firm is ready to create new strategies whenever necessary. In the past five years, Artisan Partners launched seven new funds: Global Discovery, Non-U.S. Small-Mid Growth, High Income, Credit Opportunities, Developing World, Thematic, and Thematic long/short. The introduction of these funds raised an additional 9.63 billion in AUM as of 6/30/19. Collectively, new strategies have yielded an average of 967 BPs net of fees since inception. For reference, the average BPs return net of fees for established strategies over the past five years was only 92.69.

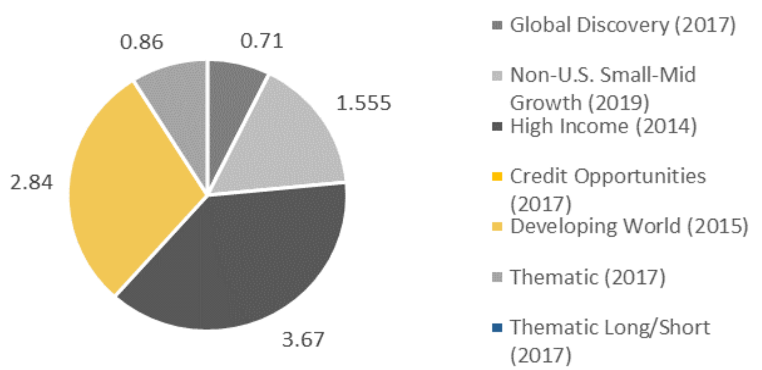
Historically, Artisan Partners has expanded its investment strategy offerings through acquisitions of other investment managers. One such example came in 2006 when the firm's acquired four senior investment professionals from DuPont Capital Management to launch a new emerging markets strategy. Whilst an efficient and necessary way for the firm to grow, Artisan became highly levered in this process. In 2010, debt made up ~66% of total liabilities vs. the ~30% we see now. Figure 7, below, shows Artisan's debt balance over time.

Figure 7: Firm Total Debt in ($) millions vs. Firm Debt as a % of Total Liabilities



Source: FactSet

Figure 8: Distribution of AUM ($ B) in newly established strategies



Source: Company filings

In the past ~8 years Artisan has focused on expanding its investment strategies through both direct talent hiring and development of internal talent. This strategy has reduces costs for the firm and allows for a more organic approach to growth. The autonomous nature of Artisan's structure allows for a seamless onboarding process for new managers.

In 2018, Rezo Kanovich joined Artisan Partners to oversee the new Non-U.S. Small-Cap Growth Strategy. Prior to joining the firm, Kanovich was a PM of the Oppenheimer International Small-Mid Company fund. Since its release to investors on 1/1/2019, Kanovich's strategy has raised $1.555 billion in AUM and generated 1,145 BP value add net of fees.

In 2016, Chris Smith joined the firm as a founding portfolio manager for the new thematic team. The thematic team have since released two strategies: thematic and a thematic long/short. The thematic strategy released to investors in May of 2017 and has since raised $860 million in AUM and generated 1,684 BP value add net of fees.

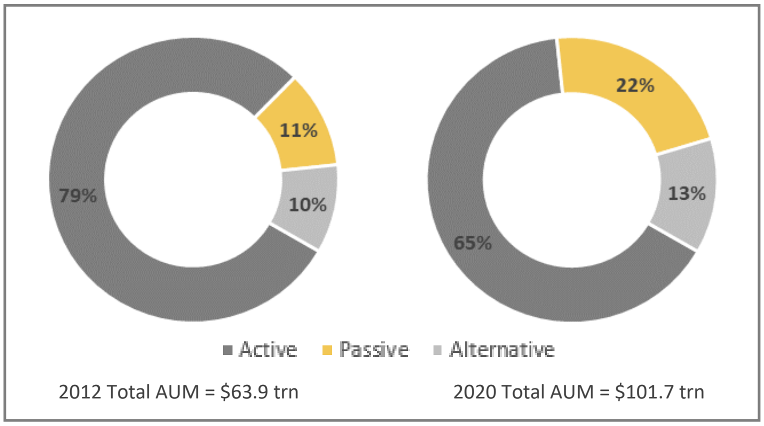
Other notable strategy acquisition developments include:
2015 - Developing World Fund launched by Lewis Kaufman
2014 – Launch of High-Income Fund by Bryan Krug

Increase in Demand for Asset Management in Foreign Markets

Artisan Partners has increased investment from foreign clients by ~40% since 2013

A large potential growth opportunity for Artisan Partners is leveraging the autonomous nature of its investment teams to tap funds from foreign investors. The growing number of sophisticated investors in emerging markets such as Asia, Africa, and the Middle East have driven new demand for active management across the industry. This has helped to offset the declining active AUM share in the U.S. due to the rise of lower fee passive management strategies. Artisan has been able to keep fees high amidst the trend due to its commitment to high-yielding equity strategies.

Figure 9: 2012 AUM Breakdown (Left) and 2020 est. AUM Breakdown (Right)

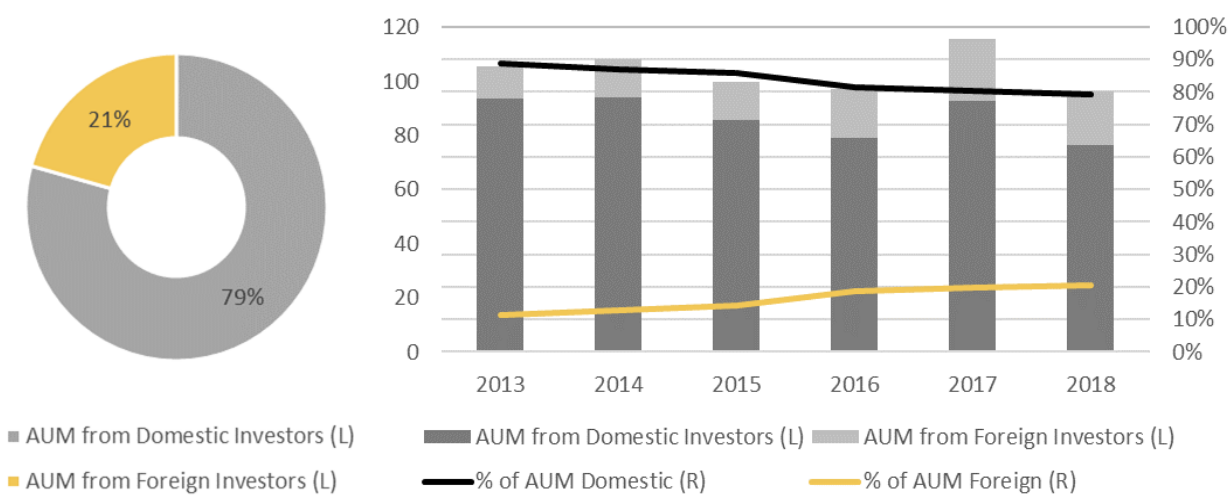


~15% growth estimated for non-active AUM

Source: PwC Analysis

Since its IPO in 2013, APAM has steadily grown its share of AUM from foreign investors. Figures 6 and 7 below shows a breakdown of Artisan's AUM allocation to domestic and foreign clients since 2013. In 2013, only ~11% of AUM was generated from foreign investors. Today, foreign investors represent ~21% of total AUM. This increase represents a ~40% growth in foreign investor AUM since 2013.

Figures 10 & 11: AUM distribution (Left) and AUM distribution history since 2013 (Right)

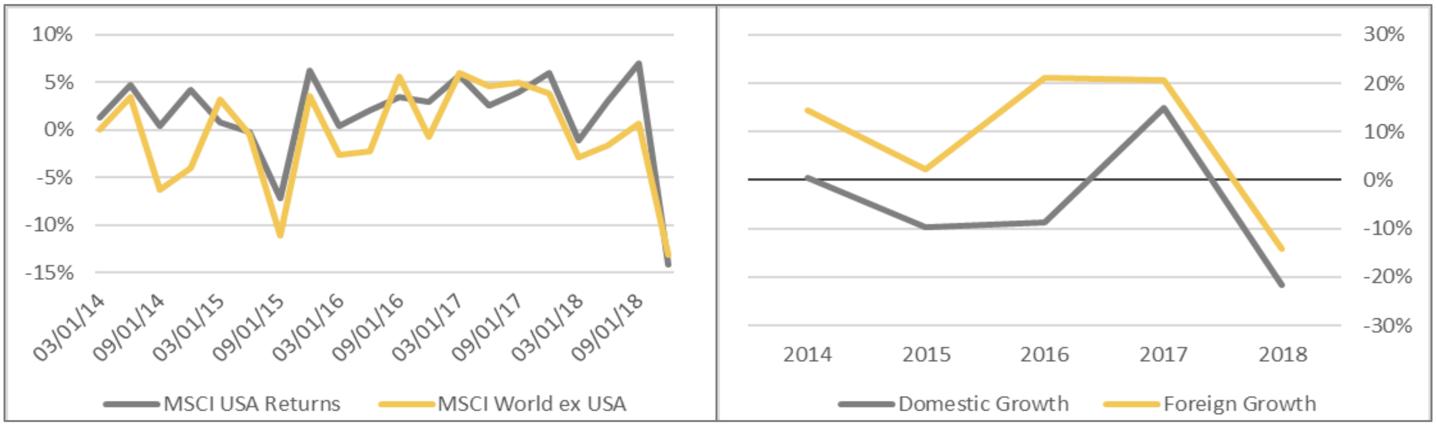


Source: FactSet, Company Filings

Artisan's AUM from foreign investors is growing faster than AUM from domestic investors

I believe that this is a huge opportunity for Artisan as competition for domestic investors increases. Figure 13 below shows that since 2014 foreign AUM growth has outperformed domestic growth on a relative basis. I expect to see these this trend to continue as active domestic AUM share continues decreasing. This money flow trend correlates well with world market trends. In periods of low returns, money flows are fairly negative and vice versa. A strong initiative for Artisan is keeping foreign growth rates high during the steady run of positive market returns from EOY 2015 to EOY 2017.

Figures 12 & 13: MCSI USA Annual Return vs. MSCI ex USA Annual Return (Left) & Domestic and Foreign AUM Growth Rate (Right)



Source: FactSet, Company Filings

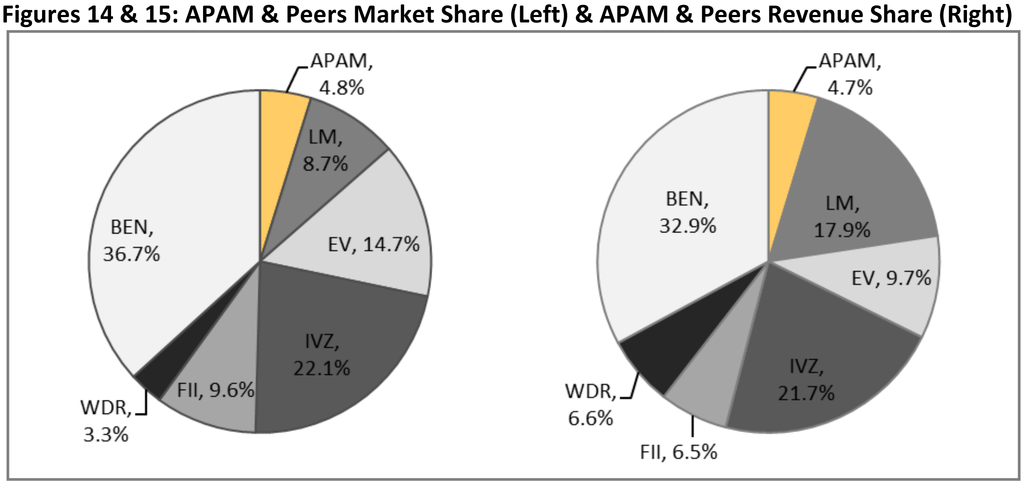
<u>Competitor Analysis</u>

Active managers face an extremely competitive market space. Artisan Partners competes with the small-to-mid part of the industry based on market cap and AUM trends. New entrants to this market may face boundaries due to tight regulations and difficulties establishing relationships and raising capital. Firms, however, are very susceptible to competitive AUM fluctuations and underperforming a benchmark during a given quarter can prove costly to the bottom line.

APAM carries additional risk compared to competitors due to its exposure to equity markets

Looking at Artisan Partners specifically, figure 14 and 15 below shows that the firm has 4.8% of its peer-allocated market cap while contributing 4.7% of the market's sales. This implies that Artisan is fairly valued, assuming it has the same margins, risk, and growth as the competitors. Its net margins are right at the median (see figure 29). I expect good growth in the future for AUM, but perhaps risk is higher since the firm is focused on equity markets.

Figures 14 & 15: APAM & Peers Market Share (Left) & APAM & Peers Revenue Share (Right)

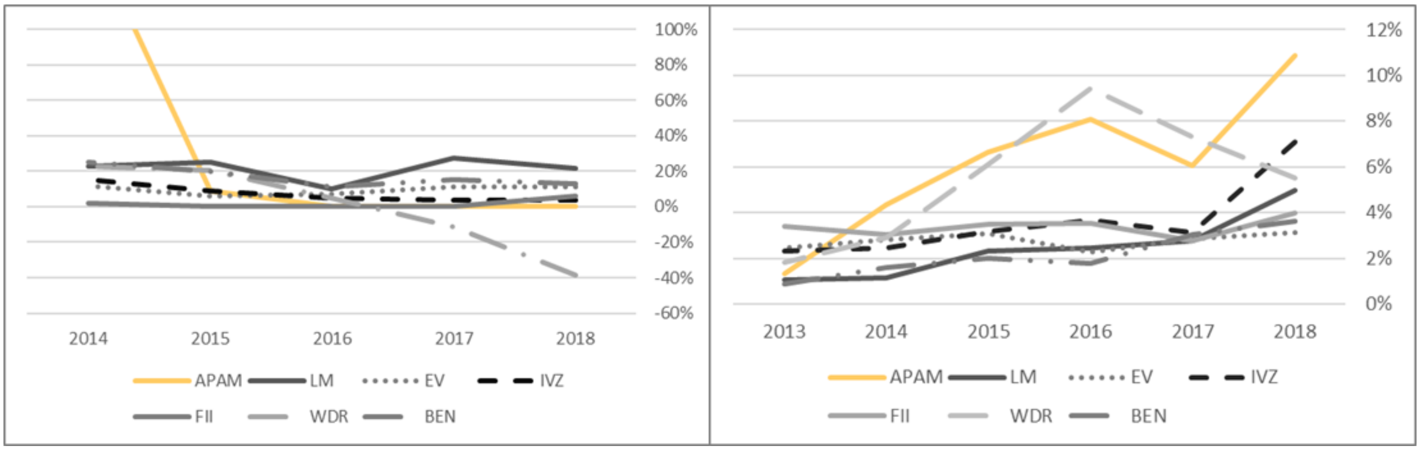


Source: FactSet

Artisan Partners averages a higher dividend payout ratio than all of its peers

A large differentiator for Artisan over its peers is its extremely high dividend yield. Over the past five years, Artisan Partners has annually yielded a dividend ~3% greater than its closest peer. Artisan Partners' management has stated that it expects to allocate 80% of cash generated every quarter towards dividends for shareholders. In addition to the quarterly dividend, management may also distribute a "special annual dividend" that will take into consideration Artisans' annual performance and overall business condition. For perspective, in Q4 of 2018 the firm distributed a quarterly dividend of $0.56 a share plus a special annual dividend of $1.03 per share. This annual dividend rewards investors and may help convince investors to stick around for a full dividend cycle. Figures 16 & 17 below show Artisan Partners' dividend distribution statistics compared to peers.

Figure 16 & 17: Peer Group Dividend Growth (Left) & Peer Group Annual Dividend Yield (Right)



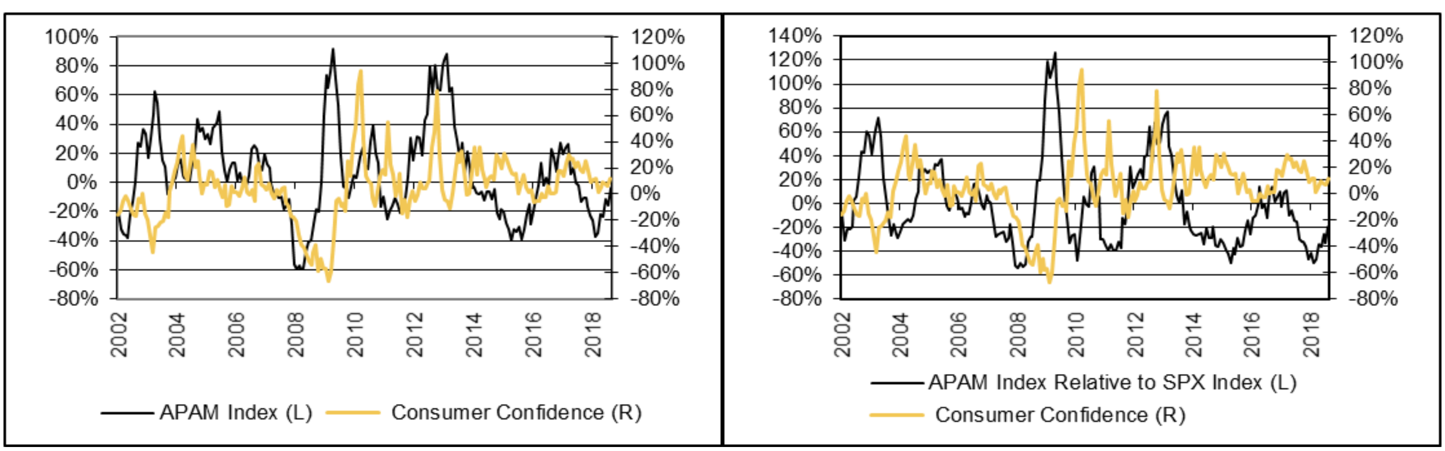
Source: FactSet

Investment managers react far faster to the market than their potential investors

<u>Macroeconomic Trends</u>

The investment management industry is a cyclical business, and is positively correlated to consumer confidence. APAM and its competitors in investment management are particularly sensitive to the overall economic environment. The peer group relative to S&P tends to lead the consumer confidence index by about a year, which would make sense as consumers may be sightly slower to react to trends in the market than investment managers.

Figures 18 and 19: Consumer confidence YOY compared to APAM peers YOY (left) and Consumer Confidence YOY Compared to APAM Peers Relative to the S&P 500 Index (right)



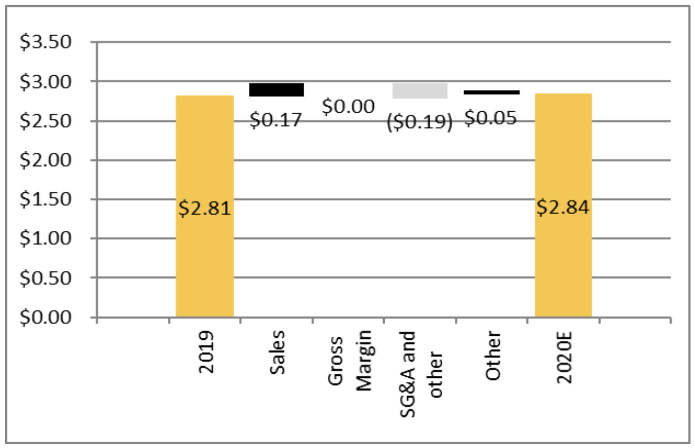
Source: Bloomberg, IMCP

Financial Analysis

Quantification of Drivers

I anticipate EPS to grow slightly to $2.84 in FY2020 – up from $2.81 in 2019. Sales growth, driven by a strong equity market environment and inflows to AUM, will continue to be Artisan's most important earnings driver. I predict that our current market condition continues throughout the next year and that strong fund performances will add $0.17 in EPS accretion. Artisan's efficiency-driven autonomous business model helps to eliminate almost all direct costs associated with sales. I predict a continuation of this initiative in 2020, with gross margin having a net zero on EPS growth. Although, SG&A and other will rise as a percentage of sales, detracting $0.14 from EPS.

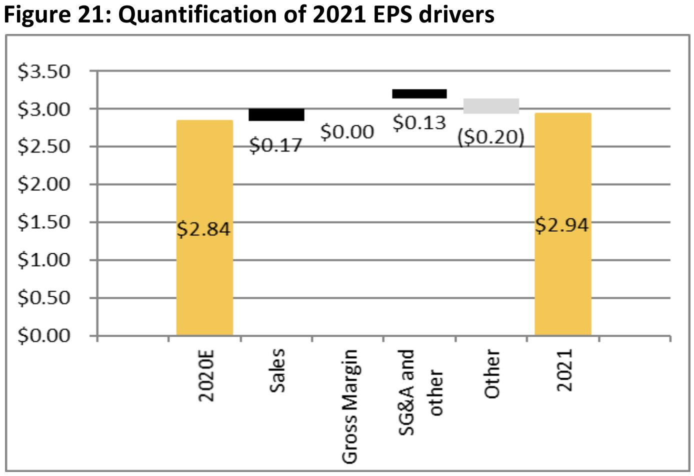
Figure 20: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

In FY2021, I predict EPS to expand once again to $2.94 from 2020's expected eps of $2.84. Assuming that we see a lack of post-election volatility in the equity markets, I expect returns to continue their above average trend. Sales and a decrease in SG&A as a percent of sales will add a combined $0.30 in EPS accretion. Almost three years of strong equity market performance would leave Artisan with surplus cash, and I predict new investment from the firm on the ever-evolving technology side of the business. I expect this spend to decrease EPS by around $0.20.

Figure 21: Quantification of 2021 EPS drivers



Source: Company Reports, IMCP

Estimate & Consensus Comparison

I am slightly more optimistic than consensus with my estimates for 2020 and 2021. My estimates for EPS growth are fairly bullish relative to consensus over both forward-looking years. This is because I believe in Artisan's ability to continue growing its share of AUM from foreign investors. The above average AUM growth in this division will be extremely important for driving sales in a post-election U.S. market. Any signs of increased volatility may drive domestic investors to shift their assets into strategies that are more passive, taking sales away from the firm. I expect sales to reflect these same beliefs, and grow at a consistent rate of 4% in the next two years.

Figures 22: APAM Estimates vs. Market Consensus

My Estimates	FY2020	FY2021	Consensus	FY2020	FY2021
EPS	$2.97	$3.14	EPS	$2.77	$2.87
Growth	13.2%	5.9%	Growth	6.5%	3.7%
Sales ($ M)	823	856	Sales ($ M)	836.3	855.2
Growth	4.8%	6.0%	Growth	5.3%	2.3%

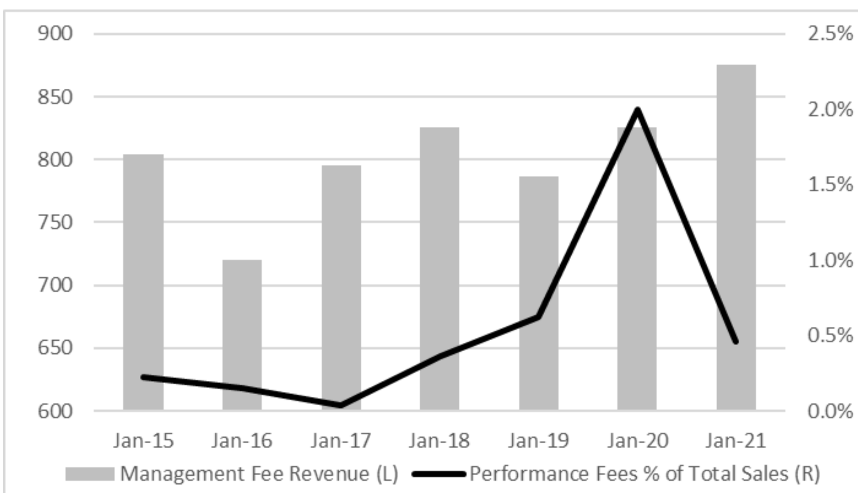
Revenues

Artisan Partners' revenue growth has increased steadily since hitting a five-year low in 2016. Since then, Artisan has increased revenues by about ~15% to an all-time sales high in 2018. As stated previously, the vast majority of the firm's sales are derived purely from management fees on AUM. In 2018, management fees accounted for 99.6% of revenues generated by the firm. A lot of volatility in revenues can be explained by this business structure, and a 10% to -10% YOY swing in revenues in not uncommon for APAM.

The firm is on track to decrease revenues by about ~5% in 2019 to $791m. I predict this trend to reverse come 2020 and have modeled a 4.8% uptick in revenue from 2019. Consensus is a bit more optimistic myself and they predict a 5.3% growth in revenues in FY2020. Looking forward to FY2021, I am confident that Artisan will continue growing sales, and have priced in a reflecting growth rate of 6%.

Performance fees make up the remainder of Artisan's revenues. These fees represent a minuscule portion of the firm's revenues, but they may tell a lot about performance in a given year. YOY changes is this category tend to mirror management fee growth and I have forecasted high growth bar FY2021, where I predict incentive fees to slow slightly despite growth.

Figures 23: Management fee revenues (L) and Performance fees as a % of total sales (R)



Source: Company Reports, IMCP

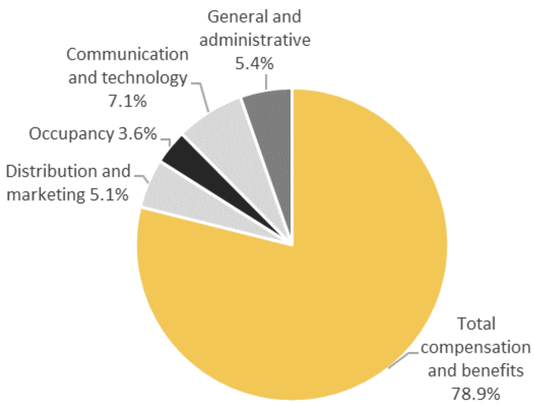
Compensation related expenses have totaled ~79% every year for the past 5 years

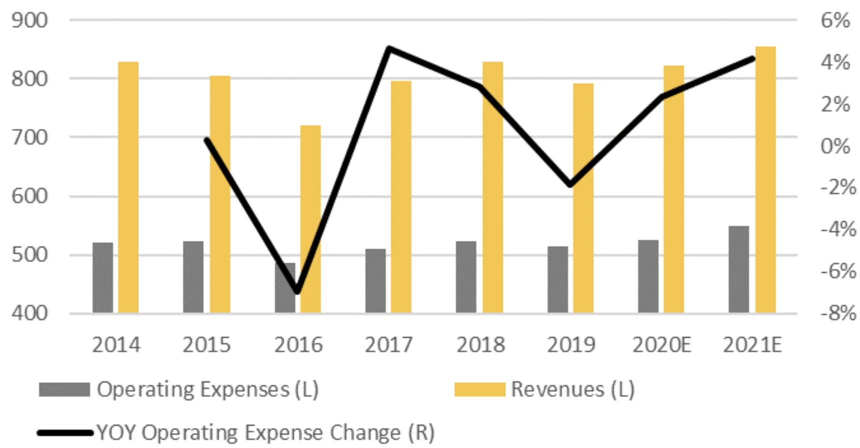
Operating Income and Margins

A majority of Artisan's expenses fluctuate directly with revenues. Operating expense is composed primarily of compensation & benefit packages, marketing & technology costs, and selling, general and administrative costs. The firm's operating expense ratio is extremely consistent and historically costs have floated between 62% and 67% of total revenues. The firm, however, will not cut costs that affect the overall structure of the firm. Meaning that if revenues decline too much, profits will begin declining as well.

The largest expense comes from its compensation structure. Historically, compensation and benefits have accumulated roughly ~79% of the firm's total expenses. In such a performance and incentive-based field, this ratio does not surprise me. Human capital is Artisan Partners' greatest asset and it must be willing pay a premium to keep its managers in such a competitive industry.

Figures 24 & 25: Composition of 2018 operating expenses (left); Operating expenses & Revenues vs YoY operating expense growth (right)





Source: Company Reports, IMCP

Return on Equity

Market environment heavily effects APAM's ROE: In 2018, ROE rose 75%

Artisan Partners' ROE relative to comps is extremely high (refer to figure 29). From the firm's IPO in 2013 to EOY 2018, APAM has averaged an ROE of 58.66%, but in the past three years, ROE has risen by almost ~75%. In 2018, ROE was significantly impacted by a 13% increase in sales margin, which can be credited to that year's extremely strong equity bull market. With my predicted continuation of a strong sales trend, combined with the equalization of common stock issuance by the firm, we see ROE continue to rise to all-time highs for the firm.

Figure 26: ROE breakdown, 2016 – 2021E

3-stage DuPont	2016	2017	2018	2019	2020E	2021E
Net income / sales	10.1%	6.2%	19.1%	19.2%	19.5%	19.8%
Sales / avg assets	0.77	0.90	1.01	0.96	0.97	1.00
ROA	7.8%	5.6%	19.3%	18.3%	18.9%	19.8%
Avg assets / avg equity	7.18	7.39	6.61	6.21	7.32	8.72
ROE	55.7%	41.3%	127.4%	113.9%	138.0%	172.3%

Source: Company Reports

With a 3-stage DuPont analysis, we can see that APAM's ROE was considerably positively affected by rising margins and asset turnover. This drove ROA from 7.85 in 2016 to 18.35 in 2019. ROE is also rising, despite the leverage ratio declining from 7.2 to 6.2. Going forward, I expect margin and asset turns to rise modestly, but there will be a big bump in leverage.

Free Cash Flow

Figure 27: Free cash flow calculations

Free Cash Flow	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	$222	$182	$154	$264	$229	$244	$259
Growth		*-17.9%*	*-15.5%*	*71.5%*	*-13.0%*	*6.5%*	*5.9%*
NOWC	209	199	202	216	231	220	206
Net fixed assets	702	705	609	549	577	588	611
Total net operating capital	$911	$904	$811	$765	$808	$807	$817
Growth		*-0.7%*	*-10.3%*	*-5.7%*	*5.6%*	*-0.1%*	*1.2%*
- Change in NOWC		(9)	3	14	15	(11)	(14)
- Change in NFA		3	(95)	(60)	28	11	24
FCFF		$189	$246	$310	$186	$245	$249
Growth			*30.7%*	*25.7%*	*-39.8%*	*31.5%*	*1.6%*
- After-tax interest expense		9	3	9	9	9	9
+ Net new short-term and long-term debt		(6)	48	(31)	(12)	19	25
FCFE		$174	$291	$270	$165	$255	$265
Growth			*67.1%*	*-7.4%*	*-38.7%*	*54.4%*	*3.9%*
* NWC excludes cash							
** No adjustment is made for debt							

Source: Company Reports, IMCP

In 2017, APAM incurred a $420M income tax expense, abnormally reducing NOPAT

APAM's free cash flow has been fairly volatile over the last several years. NOPAT has been trending upwards since 2017. The 2017 NOPAT decrease of ~16% was from an abnormally high deferred-tax expense due the federal tax reform, reducing NOPAT in this year to levels unintended. After 2018, NOPAT rose by 71.5%. This is due to the large reduction in income taxes paid by Artisan after the tax reform, which allowed the firm to reduce its income tax expense by a considerable after adjusting for new policies in the prior year.

I expect NOPAT to continue its current trend, and rise / fall with overall equity market performance. Looking forward two years, my forecast is based on the belief that world equity markets will not see a significant pullback. Compared to investment in 2019 of $43 million, in 2020 reduction in working capital and growth in net fixed assets offset and in 2021, I only forecast $10 mil in investment. Given NOPAT is rising and investments are low, I expect FCFF to rise. FCFE is even higher after considerations of new debt. This will be used to help pay a dividend that is greater than income.

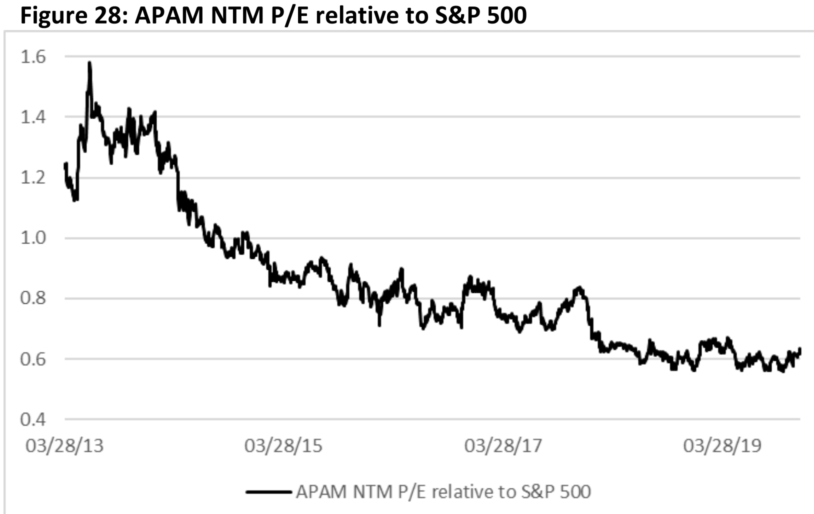
Valuation

APAM was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is priced in line with other comparative firms and is worth $26; however, due to the volatility of APAM's earnings the past few years, as well as the effect of recent market conditions, I believe this number undervalues Artisan's potential. Relative valuation shows APAM to be overvalued based on its fundamentals versus those of its peers in the investment management space. A P/B valuation yielded a price target of $27. A detailed DCF analysis values APAM higher, at $40; I give this value a bit more weight because it incorporates assumptions of margin changes and appropriate growth rates for an expanding company like APAM. Based on these valuations, I believe the firm is worth $34.

Trading History

APAM is currently trading near its all-time low relative to the S&P 500, but it is bottoming. This is the result of consistently good, but overall lackluster, earnings performance and the fact that most analysts believe that the firm's growth initiatives haven't been translating into earnings. APAM's current NTM P/E is at 11.29 compared to its five year average of 12.95. While I expect some progression towards that number in the future, I understand that there could be hindering natural growth barriers (cyclical client flows affecting revenues, etc.) that effect the firm's ability to convince the market of growth potential.

Figure 28: APAM NTM P/E relative to S&P 500



Source: FactSet

Assuming the firm maintains its current 11.29 NTM P/E at the end of 2020, it should trade at $33.19 by the end of the year:

- Price 2020E = NTM P/E x EPS 2021E = 11.29 x $2.94 = $33.19.

Discounting $33.19 back to today at a 15.8% cost of equity (explained in Discounted Cash Flow section) yields a price of $26.33. Given APAM's consistent earnings growth and continued profitability, this seems to be a reasonable valuation. However, one might argue this valuation metric underrates APAM's growth due to naturally cyclical tendencies regarding money flows for the firm and the impacting results on past earnings growth.

Relative Valuation

Artisan is currently trading at a P/E near the average of its peers. With a P/E TTM of 12.9 compared to a peer average of 12.4[2], the stock is trading in-line with market expectations for its industry. APAM's dividend yield is the highest among peers, with 2019 number of 7.95% compared to 2019 industry average of 4.99%. APAM's P/S is slightly above average as well, with a 2019 P/S of 2.22 vs. an average of 2.04 among peers. Lastly, Artisan has the highest P/B of all its peers, with a 2019 P/B of 16.55 compared to an average of 4.16. This is due to its very high ROE, but its debt/equity ratio is also about three times the industry average (254% vs. 90%).

Figure 29: APAM comparable companies

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
APAM	$31.17	$1,754	2.6	6.0	8.9	21.0	28.5	41.0	-1.1	13.4%	22.0%	-10.9%	3.4%	1.1%		1.96	254.4%		7.95%	95.3%
LM	$36.56	$3,174	0.6	(6.6)	(8.0)	(0.4)	37.9	43.3	10.0	-616.6%	-117.4%	-1052.6%	60.8%	7.2%		1.08	61.0%	B	3.79%	
EV	$47.05	$5,343	0.8	(2.7)	0.9	14.4	27.9	33.7	5.2	0.5%	12.4%	23.1%	6.5%	9.6%	7.5%	1.41	187.6%	B+	3.02%	40.7%
IVZ	$17.71	$8,038	3.6	0.6	2.6	(13.5)	0.4	5.8	6.7	125.1%	175.0%	-527.3%	-18.1%	-33.8%	2.1%	1.37	81.4%		7.00%	105.0%
FII	$34.43	$3,482	1.3	2.5	2.7	5.7	37.6	29.7	7.9	12.9%	21.2%	10.9%	-25.8%	-5.5%	7.1%	0.34	24.1%	B	3.22%	43.4%
WDR	$16.84	$1,184	2.0	2.7	(6.8)	(0.5)	(10.3)	(6.9)	-10.5	-21.5%	-7.6%	24.1%	4.2%	6.7%	-5.0%	1.15	13.3%	B+	6.19%	51.9%
BEN	$26.79	$13,343	3.3	(4.2)	(10.1)	(19.5)	(16.2)	(9.7)	10.0	7.6%	-5.0%	27.5%	-9.8%	-7.1%		1.05	7.3%	B+	3.78%	44.3%
Average		$5,188	2.0	(0.2)	(1.4)	1.0	15.1	19.6	4.0	-68.4%	14.4%	-215.0%	3.0%	-3.1%	2.9%	1.19	89.9%		4.99%	63.4%
Median		$3,482	2.0	0.6	0.9	(0.4)	27.9	29.7	6.7	7.6%	12.4%	10.9%	3.4%	1.1%	4.6%	1.15	61.0%		3.79%	48.1%
SPX	$3,169		0.9	2.5	5.3	10.0	19.5	26.4			11.5%	22.1%	4.2%	11.2%						

	2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
APAM	140.0%	16.65	12.3	13.4	8.4	12.9	11.3	11.5	11.4	18.6%	2.22	16.6%	35.9%	46.8%	3.8		5.7%	-	3.6%	$1.87
LM	8.4%	0.85	13.7	-110.5	7.0	-49.5	9.6	6.3	5.9	10.8%	1.09	-1.1%	16.5%	-0.6%	9.0	8.9	0.6%	-	1.1%	$42.86
EV	23.3%	4.48	23.7	28.3	14.4	13.4	13.4	18.0	16.5	16.5%	3.16	22.2%	31.0%	13.2%	12.8	10.7	2.8%	-	4.4%	$10.50
IVZ	-4.3%	0.82	379.3	166.1	-17.8	15.2	6.8	-23.0	-34.7	-9.8%	1.85	16.3%	24.2%	5.4%	10.4	6.2	-13.7%	-1.0%	2.1%	$21.63
FII	44.5%	3.66	9.1	9.6	6.4	13.9	12.3	11.1	11.8	32.1%	2.64	18.6%	26.1%	22.0%	9.1	11.5	13.0%	7.8%	5.0%	$9.40
WDR	30.5%	1.43	6.2	7.7	5.0	8.7	11.1	4.5	4.2	23.8%	1.11	15.8%	20.5%	18.9%	3.2		-3.3%	-1.3%	-3.5%	$11.79
BEN	31.1%	1.36	7.8	9.0	4.8	11.4	10.6	4.9	5.2	54.4%	2.38	20.6%	27.3%	11.1%	6.9	11.9	-1.5%	0.3%		$19.66
Average	39.1%	4.18	64.6	17.7	4.0	3.7	10.7	4.8	2.9	20.9%	2.06	15.6%	25.9%	16.7%	7.9	9.8	0.5%	1.4%	2.1%	
Median	30.5%	1.43	12.3	9.6	6.4	12.9	11.1	6.3	5.9	18.6%	2.22	16.6%	26.1%	13.2%	9.0	10.7	0.6%	-0.4%	2.8%	

Source: FactSet, IMCP

APAM has strong ROE and dividend yield

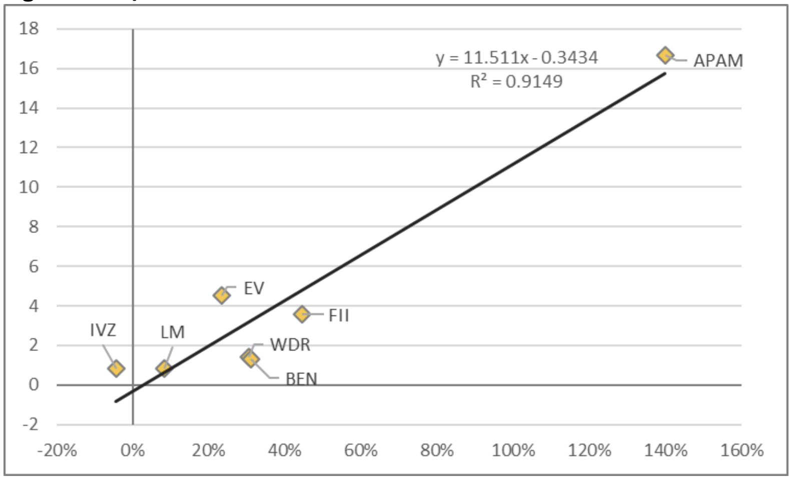
A more thorough analysis of P/B and ROE is shown in figure 29. The calculated R-squared of the regression indicates that over 91% of a sampled firm's P/B is explained by its NTM ROE. APAM has the highest P/B and ROE of this grouping, and according to this measure, is overvalued.

- Appropriate P/B = Estimated 2020 ROE (138%) x 11.511 + .3434 = 16.233
- Target Price = Estimated P/B (16.233) x 2020E BVPS (1.96) = $31.87

Discounting back to the present at a 15.8% cost of equity leads to a target price of $26.83 using this metric.

[2] Legg Mason ($LM) omitted from peer group calculation due to negative earnings growth skewing the average

Figure 30: P/B vs NTM ROE



Source: IMCP

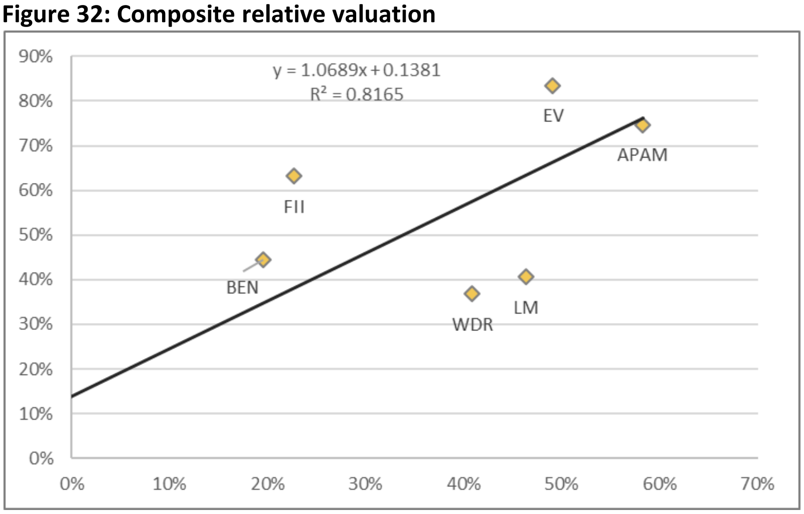
I created a composite ranking of several valuation and fundamental metrics to further compare APAM to competing firms. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A fundamental weighting of earnings growth, payout ratio, and 2019 ROE was compared to a valuation weight composite of 2020E P/E, P/B and P/CF. Regressing this composite gives an R-squared of 0.82. One can see that APAM is slightly below the line, so it is slightly inexpensive based on its fundamentals.

Figure 31: Composite valuation, % of range

	Fundamentals				Valuation				
	15%	15%	25%	45%	50%	20%	30%		
	Earnings Growth		1/Payout	ROE	P/E				
Ticker	2020	2021	2019	2019	2020	P/B	P/CF	Fund	Value
APAM	6%	12%	43%	100%	63%	100%	77%	58%	75%
LM	100%	75%	69%	6%	34%	5%	76%	46%	41%
EV	11%	100%	100%	17%	100%	27%	94%	49%	84%
IVZ	-30%	-353%	39%	-3%	-126%	5%	53%	-49%	-46%
FII	-43%	-57%	94%	32%	60%	21%	97%	23%	63%
WDR	7%	70%	78%	22%	24%	8%	77%	41%	37%
BEN	-16%	-74%	92%	22%	26%	8%	100%	20%	45%

Source: IMCP

Figure 32: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value APAM.

For the purpose of this analysis, the company's cost of equity was calculated to be 15.8% using the Capital Asset Pricing Model (CAPM). The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.82%.
- A ten-year beta of 1.61 was utilized since the company has higher risk than the market.
- A long-term market rate of return of 10.5% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 15.8% (1.82 + 1.61 (10.5 – 1.82)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $4.44 and $4.45, respectively. Discounting these cash flows per share, using the cost of equity calculated above, results in a values of $3.83 and $3.32. Thus, stage one of this discounted cash flow analysis contributes $7.16 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 15.8% cost of equity. I assume volatile sales growth figures through 2021 to 2026, as it is possible that equity market environment changes in this time period. My estimates for sales growth as follows: 2022 -> 6.0%, 2023 -> 10%, 2024 -> 8%, 2025 -> -5%, 2026 -> 5%. The ratio of NWC to sales will remain at 2021 levels, but NFA turnover will rise slowly from 1.4 in 2021 to 1.48 in 2026 as a result of improvements in operations. NOPAT margin is expected to rise and fall with the respective sales growth figures.

Figure 33: FCFE and discounted FCFE, 2020 – 2026

	First Stage		Second Stage				
	2020	2021	2022	2023	2024	2025	2026
FCFE	$4.44	$4.45	$4.43	$3.56	$3.87	$4.76	$4.06
Discounted FCFE	$3.83	$3.32	$2.85	$1.98	$1.86	$1.97	$1.46

Added together, the second stage discounted cash flows total $10.12.

Stage Three – Net income for the years 2021 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $2.97 in 2020 to $4.44 in 2026.

Figure 34: EPS estimates for 2020 – 2026

	2020	2021	2022	2023	2024	2025	2026
EPS	$2.97	$3.14	$3.75	$4.49	$4.71	$4.03	$4.44

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. A P/E ratio of 14 is assumed at the end of APAM's terminal year. While this may be a high multiple at the end of 2026, it is important to keep in mind the NTM industry P/E for investment managers of 10.7. I believe this is a fair P/E for Artisan as, historically, the firm's price and earnings have grown and fallen with the industry. In tandem, by 2026, the firm's successful strategy should be better recognized and perhaps fears of a market meltdown may have passed (especially if this already occurs by then).

Given the assumed terminal earnings per share of $4.44 and a price to earnings ratio of 14, a terminal value of $62.14 per share is calculated. Using the 15.8% cost of equity, this number is discounted back to a present value of $22.26.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $39.54 is calculated (7.16 + 10.12 + 22.26). Given APAM's current price of $31.16, this model indicates that the stock is undervalued.

Scenario Analysis

The cyclicality of financials and the investment management sector can cause significant changes to my valuation assumptions. To try to understand how these fluctuations could change my valuation, I made adjustments to my DCF model assumptions to create a scenario analysis. In each of my scenarios, I made adjustments to the beta, second stage growth rate, and the terminal P/E.

Figure 35 & 36: Bull case (top) and bear case (bottom)

Bull			**Changes**	
First stage	$7.20	Present value of first 2 year cash flow	Decrease beta by .06	1.55
Second stage	$10.38	Present value of year 3-7 cash flow	Amplify changes in positive growth rates	
Third stage	$25.97	Present value of terminal value P/E	Increase terminal P/E by 1	15
Value (P/E)	**$43.55**			

Bear			**Changes**	
First stage	$7.11	Present value of first 2 year cash flow	Increase beta by .06	1.67
Second stage	$10.01	Present value of year 3-7 cash flow	Amplify changes in negative growth rates	
Third stage	$12.80	Present value of terminal value P/E	Decrease terminal P/E by 2	13
Value (P/E)	**$29.91**			

Business Risks

Loss of key investment professional within the senior management team:

The success of Artisan's market strategies can be credited to its long tenured and extremely experienced investment professionals. A loss or disruption in their abilities to execute a given funds' philosophies could be damaging to APAM's long-term performance, and subsequently effect client flows. For example, the firm's largest strategy (the Non-U.S. Growth strategy), which has 22% of Artisan's AUM, is solely led by one senior portfolio manager.

Inability to cultivate an attractive and effective investment environment:

Artisan's most important asset is its investment professionals and the ideas they bring to the firm. Any combination of scenarios that create an unstable or negative corporate culture could hinder managers' ability to perform, thus damaging overall fund performance and revenues.

Poor investment strategy performance:

The performance of Artisan's respective funds is critical for retaining existing clients and attracting new AUM. Poor performance from a fund could lead to the following:

- Damaged and possibly terminated relationships with existing clients
- Lack of product recommendations from third party financial advisors and consultants
- Decline in rating and ranking of funds given by Morningstar and Lipper, which have a negative effective on the ability for a fund to attract new investors

Difficult market conditions:

Almost all of the firm's revenues are generated from investment management fees. These fees are directly tied to the market value of the firm's AUM. The values of Artisan's funds could decline at any moment from factors outside of the firm's control, such as declining markets, economic downturn, political uncertainty or acts of terrorism. In the downturn that followed the financial crisis of 2008, the firm's AUM declined by 43%.

Macroeconomic risks:

As of 12/31/18, approximately 54% of the firm's assets under management were invested in securities of non-U.S. companies. In addition, approximately 48% of the firm's AUM were invested in securities denominated in currencies other than the U.S. dollar. Global economic and political effects could have an adverse effect on the performance of foreign companies and the value of foreign currencies.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Moderate

New investment management firms face high amounts of regulation, which may restrict early stage growth. Much of the business is relationship dependent. Building the reputation needed to attract new investors takes long amounts of time. However, a firm's reputation is based on its investment professionals who can walk out the door and start a new firm.

Threat of Substitutes – High

Artisan relies on its fund performance and diverse strategy offerings to convince investors of its value. For larger asset managers, launching a new fund to compete with an Artisan would take little investment. This factor will always be an issue in this industry, as investors are free to move their assets out of funds at will.

Supplier Power - Moderate

Investment managers use various forms of technology to perform their jobs. Once this is ingrained in the process, it is difficult to change.

Buyer Power – High

Investors of mutual funds have a great degree of power over managers. There are no exit fee costs for Artisan's funds and there are a large number of potential substitutes. There is little urgency for investors to tolerate poor performance, so they are able to pick and choose the best funds.

Intensity of Competition – Very High

There are numerous high-value added mutual fund managers in the asset management space. As ease of access to investors continues, APAM's rivals are fighting even harder to obtain market share.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Strong historical fund performance High operating margins AUM expanisions	Lack of revenue diversification Exposure to equity markets
Opportunities	**Threats**
Foreign investor growth Lauch of new, high value-add strategies	Rise of passive management and fee decompression Global Instability

Appendix 3: Income Statement

Income Statement						Base Case		Bull Case		Bear Case	
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**
Sales	$806	$721	$796	$829	$791	$823	$856	$846	$906	$775	$767
Direct costs	-	-	-	-	-	-	-	-	-	-	-
Gross Margin	806	721	796	829	791	823	856	846	906	775	767
SG&A, R&D, and other	535	485	213	516	514	526	548	525	561	519	522
EBIT	271	236	583	313	277	296	308	322	344	256	246
Interest	12	12	11	11	11	11	11	11	11	11	11
EBT	259	225	571	302	266	285	297	310	333	245	235
Taxes	47	51	421	48	46	50	48	48	53	46	42
Income	**212**	**173**	**151**	**254**	**220**	**235**	**250**	**262**	**280**	**198**	**192**
Other	130	100	101	96	68	75	80	95	100	105	110
Net income	**82**	**73**	**50**	**158**	**152**	**160**	**170**	**167**	**180**	**93**	**82**
Basic Shares	35.5	38.1	44.6	48.9	54.0	54.0	54.0	53.7	54.9	53.5	53.5
EPS	$1.85	$1.57	$0.75	$2.84	$2.62	$2.97	$3.14	$3.12	$3.27	$1.74	$1.54
DPS	$3.49	$3.03	$2.93	$3.43	$3.56	$3.33	$3.43	$3.35	$3.37	$2.99	$2.62

Appendix 4: Balance Sheet

Balance Sheet						Base Case		Bull Case		Bear Case	
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**
Cash	166	157	137	160	150	154	154	165	156	73	71
Operating assets ex cash	78	75	91	96	123	107	103	95	95	78	84
Operating assets	244	232	228	256	273	261	257	260	252	151	156
Operating liabilities	35	32	26	40	42	41	51	34	41	47	42
NOWC	209	199	202	216	231	220	206	226	211	104	114
NOWC ex cash (NWC)	43	42	65	56	81	66	51	61	54	31	42
NFA	702	705	609	549	577	588	611	529	584	646	614
Invested capital	*$911*	*$904*	*$811*	*$765*	*$808*	*$807*	*$817*	*$755*	*$795*	*$750*	*$727*
Marketable securities	-	-	-	-	-	-	-	-	-	-	-
Total assets	***$946***	***$936***	***$837***	***$805***	***$850***	***$848***	***$868***	***$789***	***$836***	***$797***	***$770***
Short-term and long-term debt	$200	$199	$199	$199	$199	$198	$198	$199	$199	$198	$198
Other liabilities	576	572	456	408	478	478	478	438	423	483	493
Debt/equity-like securities	5	-	48	17	5	25	50	15	35	25	50
Equity	130	132	108	140	126	106	91	103	138	44	(13)
Total supplied capital	*$911*	*$904*	*$811*	*$765*	*$808*	*$807*	*$817*	*$755*	*$795*	*$750*	*$727*
Total liabilities and equity	***$946***	***$936***	***$837***	***$805***	***$850***	***$848***	***$868***	***$789***	***$836***	***$797***	***$770***

Appendix 5: Sales Forecast

Sales						BaseCase		Bull Case		Bear Case	
Sales	$806	$721	796	$829	$791	$829	$879	$886	$975	$806	$812
Growth		*-10.5%*	*10.4%*	*4.2%*	*-4.5%*	*4.8%*	*6.0%*	*12.0%*	*10.0%*	*1.9%*	*0.8%*
Management Fees	803.7	719.8	795.3	825.7	786.1	825	875	880	968	802	810
Growth		*-10.4%*	*10.5%*	*3.8%*	*-4.8%*	*5.0%*	*6.0%*	*12.0%*	*10.0%*	*2.0%*	*1.0%*
% of sales	*99.8%*	*99.8%*	*100.0%*	*99.6%*	*99.4%*	*99.5%*	*99.5%*	*99.3%*	*99.3%*	*99.5%*	*99.7%*
Perfromance Fees	1.8	1.1	0.3	3.0	4.9	4	4	6	6	4	3
Growth		*-38.9%*	*-72.7%*	*900.0%*	*63.3%*	*-20.0%*	*3.0%*	*20.0%*	*10.0%*	*-10.0%*	*-40.0%*
% of sales	*0.2%*	*0.2%*	*0.0%*	*0.4%*	*0.6%*	*2.0%*	*0.5%*	*0.7%*	*0.7%*	*0.5%*	*0.3%*
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
United States	806	721	796	829	791	829	879	886	975	806	812
Growth		*-10.5%*	*10.4%*	*4.1%*	*-4.5%*	*4.8%*	*6.0%*	*12.0%*	*10.0%*	*1.9%*	*0.8%*
% of sales	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*

Appendix 6: Ratios

Ratios											
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**	**Dec-20**	**Dec-21**
Profitability											
Gross margin	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Operating (EBIT) margin	33.6%	32.8%	73.2%	37.8%	35.0%	36.0%	36.0%	38.0%	38.0%	33.0%	32.0%
Net profit margin	10.2%	10.1%	6.2%	19.1%	19.2%	19.5%	19.8%	19.8%	19.9%	12.0%	10.7%
Activity											
NFA (gross) turnover		1.03	1.21	1.43	1.41	1.41	1.43	1.53	1.63	1.27	1.22
Total asset turnover		0.77	0.90	1.01	0.96	0.97	1.00	1.03	1.11	0.94	0.98
Liquidity											
Op asset / op liab	6.92	7.18	8.79	6.42	6.50	6.34	5.01	7.68	6.17	3.24	3.69
NOWC Percent of sales		28.3%	25.2%	25.2%	28.3%	27.4%	24.8%	27.0%	24.1%	21.6%	14.2%
Solvency											
Debt to assets	21.1%	21.3%	23.8%	24.8%	23.4%	23.3%	22.8%	25.2%	23.8%	24.9%	25.7%
Debt to equity	153.8%	151.1%	184.3%	141.9%	157.9%	186.5%	218.2%	192.5%	144.0%	447.9%	-1482.6%
Other liab to assets	60.9%	61.1%	54.5%	50.7%	56.2%	56.3%	55.0%	55.5%	50.6%	60.6%	64.0%
Total debt to assets	82.0%	82.4%	78.3%	75.5%	79.6%	79.7%	77.9%	80.7%	74.4%	85.5%	89.8%
Total liabilities to assets	85.7%	85.9%	81.4%	80.4%	84.6%	84.5%	83.8%	85.0%	79.3%	91.3%	95.2%
Debt to EBIT	0.74	0.84	0.34	0.64	0.72	0.67	0.64	0.62	0.58	0.77	0.81
EBIT/interest	23.16	20.29	50.89	27.92	24.96	26.64	28.28	28.86	31.44	23.01	22.55
Debt to total net op capital	22.0%	22.1%	24.5%	26.0%	24.6%	24.5%	24.2%	26.4%	25.0%	26.4%	27.2%
ROIC											
NOPAT to sales	27.5%	25.2%	19.3%	31.8%	29.0%	29.7%	30.2%	32.1%	31.9%	26.7%	26.2%
Sales to NWC		16.96	14.85	13.76	11.57	11.21	14.61	11.93	15.71	13.84	20.96
Sales to NFA		1.03	1.21	1.43	1.41	1.41	1.43	1.53	1.63	1.27	1.22
Sales to IC ex cash		0.97	1.12	1.30	1.25	1.25	1.30	1.36	1.47	1.16	1.15
Total ROIC ex cash		24.4%	21.6%	41.2%	36.3%	37.3%	39.3%	43.6%	47.1%	31.0%	30.2%
NOPAT to sales	27.5%	25.2%	19.3%	31.8%	29.0%	29.7%	30.2%	32.1%	31.9%	26.7%	26.2%
Sales to NOWC		3.53	3.97	3.96	3.54	3.65	4.02	3.70	4.14	4.63	7.05
Sales to NFA		1.03	1.21	1.43	1.41	1.41	1.43	1.53	1.63	1.27	1.22
Sales to IC		0.79	0.93	1.05	1.01	1.02	1.05	1.08	1.17	1.00	1.04
Total ROIC		20.1%	17.9%	33.5%	29.2%	30.3%	31.9%	34.8%	37.3%	26.6%	27.3%
NOPAT to sales	27.5%	25.2%	19.3%	31.8%	29.0%	29.7%	30.2%	32.1%	31.9%	26.7%	26.2%
Sales to EOY NWC	18.93	16.97	12.29	14.86	9.77	12.50	16.67	13.89	16.67	25.00	18.18
Sales to EOY NFA	1.15	1.02	1.31	1.51	1.37	1.40	1.40	1.60	1.55	1.20	1.25
Sales to EOY IC ex cash	1.08	0.96	1.18	1.37	1.20	1.26	1.29	1.43	1.42	1.15	1.17
Total ROIC using EOY IC ex cash	29.8%	24.4%	22.8%	43.6%	34.9%	37.4%	39.1%	46.1%	45.3%	30.6%	30.7%
NOPAT to sales	27.5%	25.2%	19.3%	31.8%	29.0%	29.7%	30.2%	32.1%	31.9%	26.7%	26.2%
Sales to EOY NOWC	3.86	3.62	3.94	3.83	3.42	3.75	4.16	3.74	4.30	7.45	6.76
Sales to EOY NFA	1.15	1.02	1.31	1.51	1.37	1.40	1.40	1.60	1.55	1.20	1.25
Sales to EOY IC	0.88	0.80	0.98	1.08	0.98	1.02	1.05	1.12	1.14	1.03	1.05
Total ROIC using EOY IC	24.3%	20.1%	19.0%	34.5%	28.4%	30.3%	31.7%	36.0%	36.4%	27.6%	27.7%
ROE											
5-stage											
EBIT / sales		32.8%	73.2%	37.8%	35.0%	36.0%	36.0%	38.0%	38.0%	33.0%	32.0%
Sales / avg assets		0.77	0.90	1.01	0.96	0.97	1.00	1.03	1.11	0.94	0.98
EBT / EBIT		95.1%	98.0%	96.4%	96.0%	96.2%	96.5%	96.5%	96.8%	95.7%	95.6%
Net income /EBT		32.5%	8.7%	52.5%	57.1%	56.2%	57.1%	53.9%	54.0%	38.1%	35.1%
ROA		7.8%	5.6%	19.3%	18.3%	18.9%	19.8%	20.4%	22.1%	11.3%	10.5%
Avg assets / avg equity		7.18	7.39	6.61	6.21	7.32	8.72	7.15	6.73	9.67	50.78
ROE		55.7%	41.3%	127.4%	113.9%	138.0%	172.3%	145.9%	148.9%	109.5%	534.5%
3-stage											
Net income / sales		10.1%	6.2%	19.1%	19.2%	19.5%	19.8%	19.8%	19.9%	12.0%	10.7%
Sales / avg assets		0.77	0.90	1.01	0.96	0.97	1.00	1.03	1.11	0.94	0.98
ROA		7.8%	5.6%	19.3%	18.3%	18.9%	19.8%	20.4%	22.1%	11.3%	10.5%
Avg assets / avg equity		7.18	7.39	6.61	6.21	7.32	8.72	7.15	6.73	9.67	50.78
ROE		55.7%	41.3%	127.4%	113.9%	138.0%	172.3%	145.9%	148.9%	109.5%	534.5%
Payout Ratio		158.1%	264.2%	106.0%	126.5%	112.4%	109.1%	107.6%	102.8%	171.7%	169.8%
Retention Ratio		-58.1%	-164.2%	-6.0%	-26.5%	-12.4%	-9.1%	-7.6%	-2.8%	-71.7%	-69.8%
Sustainable Growth Rate		-32.3%	-67.8%	-7.6%	-30.2%	-17.1%	-15.7%	-11.0%	-4.2%	-78.5%	-373.2%

Appendix 7: 3-Stage DCF Model

	Year						
	1	2	3	4	5	6	7
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*4.0%*	*4.0%*	*-6.0%*	*10.0%*	*8.0%*	*-5.0%*	*5.0%*
NOPAT / S	*29.7%*	*30.2%*	*26.5%*	*29.0%*	*28.5%*	*26.0%*	*27.5%*
S / NWC	*12.50*	*16.67*	*14.00*	*16.50*	*16.00*	*15.00*	*16.00*
S / NFA (EOY)	*1.40*	*1.40*	*1.42*	*1.42*	*1.44*	*1.46*	*1.48*
S / IC (EOY)	*1.26*	*1.29*	*1.29*	*1.31*	*1.32*	*1.33*	*1.35*
ROIC (EOY)	*37.4%*	*39.1%*	*34.1%*	*37.9%*	*37.7%*	*34.6%*	*37.3%*
ROIC (BOY)		*39.6%*	*32.2%*	*41.0%*	*40.2%*	*32.6%*	*38.4%*
Share Growth		*0.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
Sales	$823	$856	$804	$885	$955	$908	$953
NOPAT	$244	$259	$213	$257	$272	$236	$262
Growth		*5.9%*	*-17.6%*	*20.4%*	*6.1%*	*-13.3%*	*11.1%*
- Change in NWC	-15	-14	6	-4	6	1	-1
NWC EOY	*66*	*51*	*57*	*54*	*60*	*61*	*60*
Growth NWC		*-22.0%*	*11.9%*	*-6.7%*	*11.4%*	*1.3%*	*-1.6%*
- Chg NFA	11	24	-43	55	40	-42	22
NFA EOY	*588*	*611*	*568*	*623*	*663*	*622*	*644*
Growth NFA		*4.0%*	*-7.1%*	*9.7%*	*6.5%*	*-6.3%*	*3.6%*
Total inv in op cap	-5	9	-37	51	47	-41	21
Total net op cap	653	662	625	677	723	682	703
FCFF	$249	$250	$250	$205	$226	$277	$241
% of sales	*30.3%*	*29.2%*	*31.1%*	*23.2%*	*23.6%*	*30.5%*	*25.3%*
Growth		*0.3%*	*0.2%*	*-17.9%*	*9.9%*	*22.7%*	*-13.1%*
- Interest (1-tax rate)	9	9	9	9	10	10	10
Growth		*-0.3%*	*-6.0%*	*10.0%*	*8.0%*	*-5.0%*	*5.0%*
FCFE w/o debt	$240	$241	$242	$196	$215	$267	$231
% of sales	*29.1%*	*28.1%*	*30.0%*	*22.1%*	*22.6%*	*29.4%*	*24.2%*
Growth		*0.3%*	*0.4%*	*-18.9%*	*10.0%*	*24.0%*	*-13.7%*
/ No Shares	54.0	54.0	54.5	55.1	55.6	56.2	56.8
FCFE	$4.44	$4.45	$4.43	$3.56	$3.87	$4.76	$4.06
Growth		*0.3%*	*-0.6%*	*-19.7%*	*8.9%*	*22.8%*	*-14.6%*
* Discount factor	0.86	0.75	0.64	0.56	0.48	0.41	0.36
Discounted FCFE	$3.83	$3.32	$2.85	$1.98	$1.86	$1.97	$1.46
Terminal value P/E							
Net income	$160	$170	$205	$247	$262	$226	$252
% of sales	*19.5%*	*19.8%*	*25.4%*	*27.9%*	*27.4%*	*24.9%*	*26.4%*
EPS	$2.97	$3.14	$3.75	$4.49	$4.71	$4.03	$4.44
Growth		*5.9%*	*19.4%*	*19.6%*	*5.0%*	*-14.5%*	*10.2%*
Terminal P/E							14.00
* Terminal EPS							$4.44
Terminal value							$62.14
* Discount factor							0.36
Discounted terminal value							$22.26

First stage	$7.16	Present value of first 2 year cash flow
Second stage	$10.12	Present value of year 3-7 cash flow
Third stage	$22.26	Present value of terminal value P/E
Value (P/E)	**$39.54**	

Cost of equity	
Market return	10.5%
- Risk free rate	1.82%
= Market risk premium	8.7%
* Beta	1.61
= Stock risk premium	14.0%
r = r_f+ stock RP	**15.8%**

Analyst: Christine Symchych

December 20, 2019

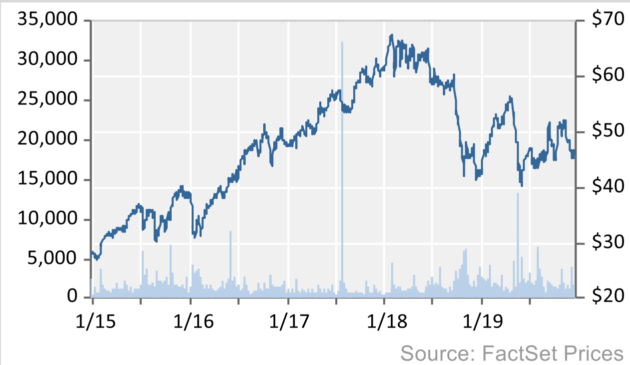
Industrials, Building Materials

A.O. Smith, Corporation

Recommendation: Hold

Current Price	**$47.13**	---	Ticker	AOS
1 Year Bear	$35	*-25%*	Sh. Out. (M)	163.1
1 Year Base	**$44**	***0%***	M.Cap. ($M)	7,798
1 Year Bull	$49	*4%*	EV ($M)	7,707

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	73.9%	-2.7%	-23%	-11%	10.9%	-2.4%	-1.9%

Summary

I recommend a neutral rating with a target of $44. Although AOS is making strides to right size in ROW, macro factors still outweigh internal efforts creating more risk than comps. Sales growth is negative for 2019 and could take some time to turn positive again. The stock is fairly valued based on relative and DCF analysis.

Financials

	2015	2016	2017	2018	2019	2020E	2021E
Sales($B)	**2.5**	**2.7**	**3.0**	**3.2**	**3.0**	**3.0**	**3.0**
Gr. %	7.7%	5.9%	11.6%	6.4%	-5.3%	0%	0.5%
Cons.	-	-	-	-	-	2.87%	1.20%
Ind.	6.5%	12.3%	5.9%	11.5%	1.93%	5.6%	3.6%
EPS	$1.58	$1.85	$2.17	$2.61	$2.26	**$2.54**	**$2.71**
Gr. %	30.0%	17.1%	17.3%	20.3%	-13.3%	13.35%	6.8%
Cons.	-	-	-	-	-	10.17%	6.4%
Ind.	26.5%	25.4%	14.6%	22.1%	0.3%	11.1%	-

Ratios

	2015	2016	2017	2018	2019	2020E	2021E
NPM	**11.2%**	**12.2%**	**9.9%**	**13.9%**	**12.5%**	**13.6%**	**13.8%**
Ind.	*4.47%*	*5.82%*	*5.73%*	*6.19%*	*6.27%*		
ROE	*19.5%*	*22.1%*	*18.8%*	*26.4%*	*22.5%*	*25.4%*	*27.0%*
Ind.	*21.06*	*21.72%*	*23.54%*	*7.07%*	*12.13%*		
ROA	*11.03*	*8.47%*	*10.96%*	*11.8%*	*9.74%*	*14.0%*	*14.7%*
Ind.	*5.36%*	*7.84%*	*7.57%*	*8.02%*	*7.62%*		
A T/O	0.98	0.97	0.98	1.02	1.00	1.03	1.06
A/E	1.83	1.87	1.92	1.86	1.79	1.81	1.84

Valuation

	2015	2016	2017	2018	2019	2019E	2020E
P/E	24.24	25.64	36.09	16.55	21.10	19.00	18.00
Ind.	28.89	22.29	27.20	16.01	21.0	19.2	17.6
P/S	2.70	3.12	3.57	2.31	2.57		
P/B	4.77	5.89	5.66	6.39	4.54		
P/CF	19.91	18.75	32.78	16.38	17.41		
EV/EBITDA	13.89	14.78	17.14	10.85	12.6		
D/P	1.00%	1.01%	0.90%	1.78%	2.41%		

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Key Drivers

- Strengthening of brand through innovation: AOS has a commitment to brand development through R&D that makes the firm a leader in the industry.
- International exposure in China and India: Benefits of water treatment business in India slightly softening the blow of sales in China hurt by slowing economy and trade uncertainties.
- Competition: AOS' sales strongly supported by brand recognition and positioning of product as premium product.
- Macroeconomic trends: AOS performs well during times of economic strength in China but is now facing strong headwinds as that economy slows down and the trade uncertainties remain unresolved.

Valuation

Using a relative valuation approach, AOS appears to be fairly valued in comparison to its industry and competitors. DCF analysis implies that the stock is worth $40 or overvalued by approximately 10%. A combination of the approaches suggests that AOS is fairly valued at $44 as the shares currently trade at $47.13.

Risks

- Significant exposure in China
- Concentrated customer relationships
- Foreign currency volatility

Company Overview

64 percent of revenue from NA division and 36 percent from ROW

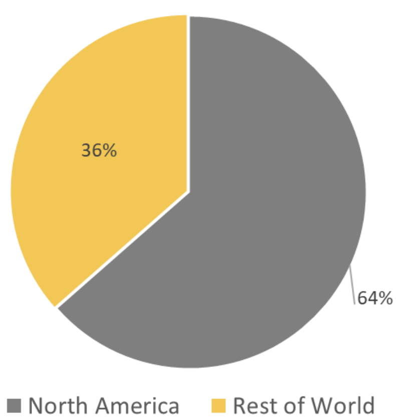
YOY growth (2% in 2019) currently struggling primarily due to slump in sales in China

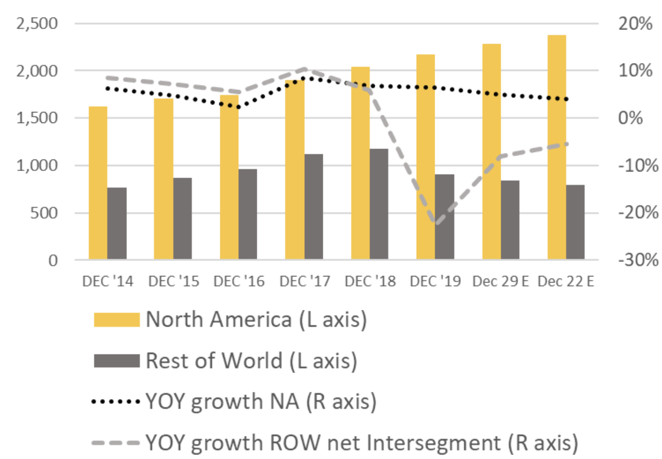
A.O. Smith, Corporation (AOS) manufactures and sells water heaters, water treatment products and air purifier units for both the residential and commercial markets that are distributed through both wholesale and retail channels. The company has two divisions: North America (NA) and Rest of World (ROW). The NA segment primarily manufactures water heaters and boilers, and water treatment products for the residential and commercial markets. This segment also manufactures and markets water tank systems. The ROW segment manufactures and markets water heaters, boilers, water treatment products. In-home air purifiers are manufactured and marketed solely in the Chinese market. 2018 sales were a record $3.2 billion. The company is headquartered in Milwaukee, WI.

The North America segment generates 64% of the company revenue. AOS is the primary player in both the residential and commercial areas of the industry in North America with wholesale accounting for approximately 55% of the market and retail accounting for about 45% of the market. The company is the largest producer of water heaters in North America, selling 9.5 mm units in 2018. Approximately 85% of those sales are driven by replacement of water heaters. The remaining part of the NA market share is predominantly driven by new housing starts. In 2018, A.O. Smith sold 9.5m units in North America. Wholesale customers include four of the six largest national hardware and home service chains including an exclusive relationship for water treatment products with Lowe's that started mid-2018 and added 17,000 stores to the in-store footprint. Sales in 2018 jumped 11.5% in response to these changes. A.O. Smith brand names in North America include A.O. Smith, State, Lochinvar and Aquasana.

The Rest of World segment generates $1.174m in revenue or 36% of total company revenue. This segment consists of large markets in China and India (totaling 94% of ROW revenue) with a small percentage of sales in Europe and the Middle East (6% ROW revenue). A. O. Smith has been in the Chinese market for over 20 years and has been expanding aggressively, targeting middle class and upper middle-class homeowners. The company entered the Indian marketplace in 2008, first with a sales office and then expanding to manufacturing of water heaters in 2010 and water treatment products in 2015.

Figures 1 & 2: 2018 Sales by segment (left); revenue history ($M) and YoY growth since 2014 (right)





Business/Industry Drivers

The following are the most important business drivers for AOS:

1) Strengthening of brand through innovation
2) International exposure: China and India
3) Competitor analysis
4) Macroeconomic trends

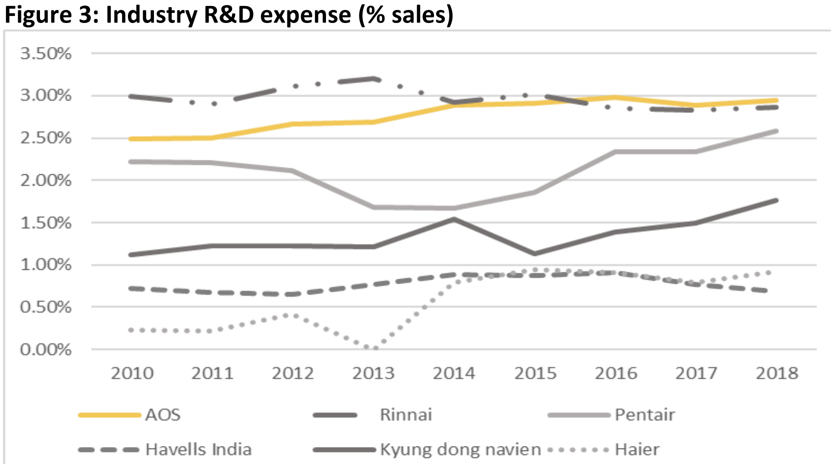
Strengthening of brand through innovation

"Innovation has a name," and that name has a new home in Milwaukee

Innovation in efficiency, conservation and sustainability is a long-standing tenant of AOS' business model and one of management's stated corporate goals. This is led in part by regulation mandating development of units with greater efficiencies but also by consumer demand for both better technologies and environmental practices. In October 2018, the company opened the Lloyd R. Smith Corporate Technology Center in Milwaukee, WI which has the specific purpose of finding new and emergent technologies related to both potable and hydronic water technology. The center, which contains development labs along with prototype labs, has the specific focus of research around the heating, cleaning and conservation of water.

The company offers the most extensive line of high-efficiency water heaters and boilers in the industry, and the company has continually pushed to make the products more recyclable. AOS invests heavily in research and development and considers that an important part of its business model. Not only do dollars invested into research and development outpace those companies that share market share space with AOS, but AOS dollars invested are rising YoY.

Figure 3: Industry R&D expense (% sales)

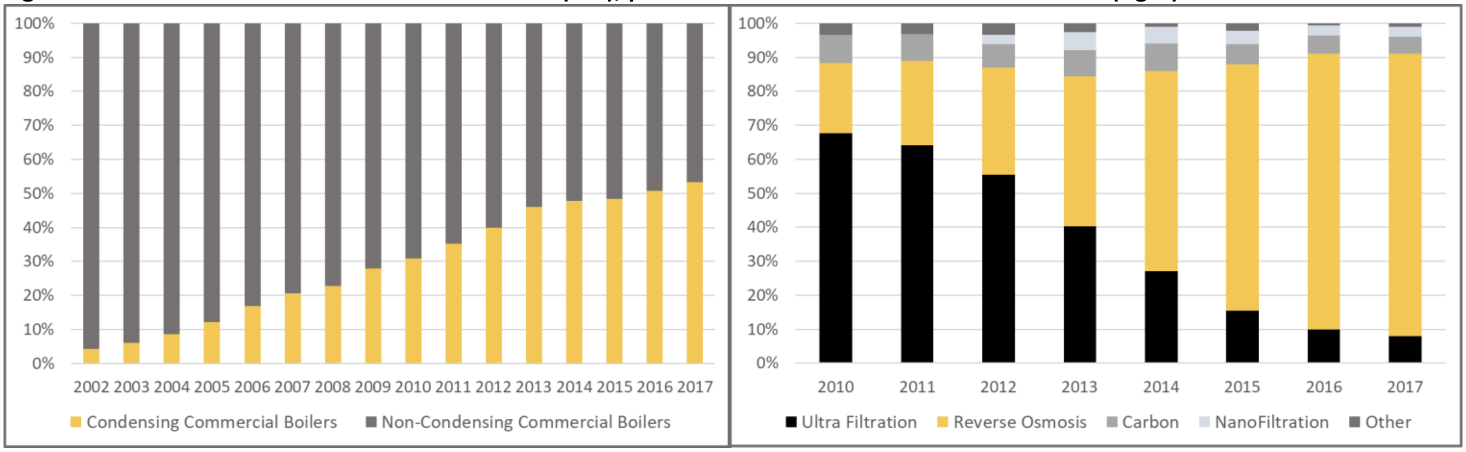


Source: Factset

AOS is an industry leader across all its market segments with technological advances

Water heaters and boilers are a mainstay of AOS' business, responsible for 98.6% of NA sales. Within the NA segment, 85 percent of sales of water heaters are replacement units and of those a portion are purchased prior to end of life specifically to capture benefits of improved technology. The enactment of NAECA (National Appliance Energy Conservation Act) 3 in 2015 requires that manufacturers of water heaters create more energy efficient units. The innovative top selling Cyclone unit, for commercial use first launched in 1997, was significantly overhauled in 2017. This unit is an industry leader with savings of 1,616 MM ft^3 of natural gas and 96,700 tons of GHG emissions in the US annually which in turn helps the company keep a competitive edge in that market space. Similar advancements are being made in the residential market as well with both in tank and tankless versions. Boilers are moving from non-condensing boilers to condensing boilers, a shift to higher efficiency technology. In both market segments, thermal efficiencies dramatically lower operating costs for the user which in turn significantly shorten payback periods and makes a premature upgrade advantageous for consumers.

Figures 4 and 5: Product mix % of AOS boiler sales (left); product mix % of AOS water filtration sales (right)



Source: Company reports

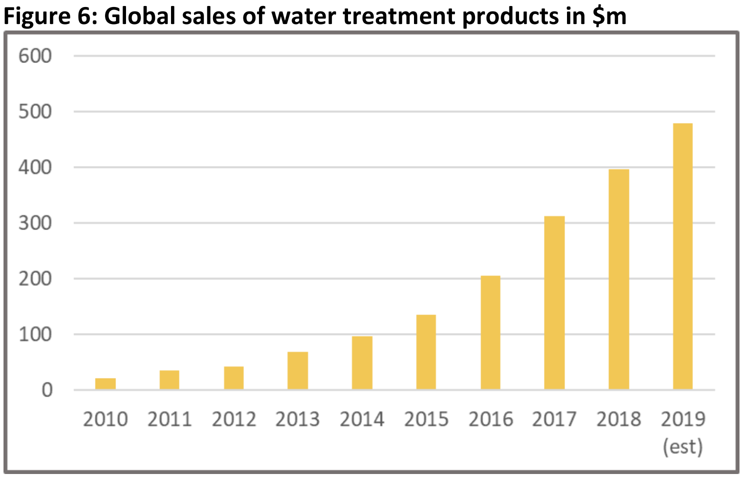
Conservation pushing sales towards more efficient water techology

In 2009 AOS turned its eye towards water treatment and now, just 10 years later the company sees itself as a global leader in this industry offering a full line of point of entry and point of use products. Sales in this portion of the company within NA is driven by the 2017 acquisition of Hague and the relationship with Lowes started in fall 2018 that provides for AOS water treatment to be the exclusive in-store brand. Sales in water treatment are up in 2018 as is COGS due to the investment into physical locations needed to facilitate the relationship with Lowes. Sales of water purification units is rising as the need for water purification increases across the globe. This segment of their market is a significant opportunity for growth moving forward as sales increased $200 million in the last 2 years while overall sales were flat at $3 billion.

38% CAGR in global sales water treatment products led by AOS acquisitions

Water treatment (all brands) excluding refrigerator filters estimated to be present in only 23% of US households

Figure 6: Global sales of water treatment products in $m



Source: Company reports

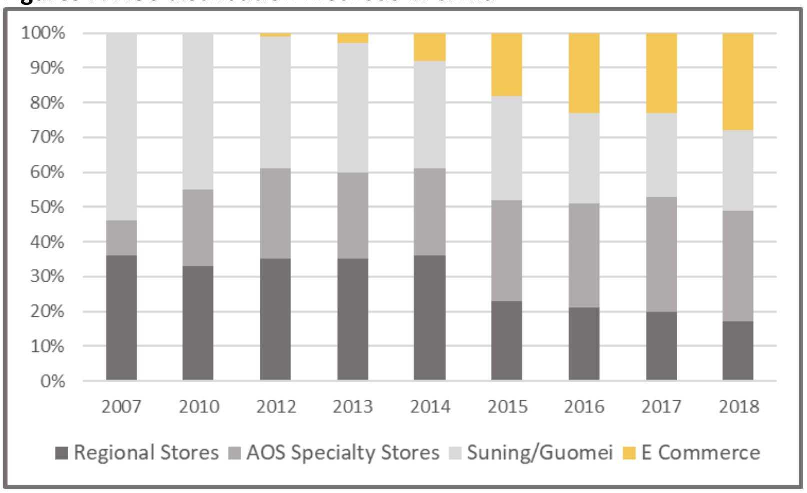
Through innovation, the company is now able to produce a water treatment product that increased output of fresh water by approximately 50 percent using reverse osmosis technology. This technology is particularly important in the Chinese and Indian markets in that it removes nearly all substances including most heavy metals that can be prevalent in the water sources in those countries. A side stream membrane technology is also a differentiator in the industry. This technology increases membrane lifespan to up to 6 months, which can eliminate the use of 2,400 17-oz plastic water bottles, and reduces wastewater by up to 75 percent. (Source: AOS 2018 Corporate Responsibility &Sustainability Report)

International Exposure: China

China sales have grown 19% CAGR over the last 10 years

The Rest of World segment was responsible for $1.2B of sales in 2018, the majority of which comes from China and India. 2018 ROW growth was 5 percent. China specific sales now exceed $1 billion, or over 33% of total sales. Growth in this segment has historically been dependent upon population growth, urbanization of populations, increasing footprint, and aggressive expansion into internet sales. The shift to emphasize internet sales is increasing SG&A and reducing profit margin; however, there is an understanding that the cost of this initiative is front loaded, and the margins will increase as the efforts take hold.

Figures 7: AOS distribution methods in China



Source: Company reports

After 20 years in the Chinese market, AOS starting to see the benefit of replacement water heaters as initial units reach the end of expected lifespan

Sales in China in 2018 were led by strong demand for water treatment products while sales in electric water heaters and air purifiers lagged previous years and expectations. A strong Chinese currency in 2018 helped increase sales numbers where the 2019 devaluation is expected to hurt current year sales.

AOS has had a footprint in China for 20 years. In 2018, 34 percent of the company's net sales were from the region. The company continues to aggressively expand its reach into this marketplace with more than 9,000 retail outlets for water heaters in China. Of those, 2800 of exclusively sell AOS products. Thirty percent of outlets are in Tier 1 cities and 70% are in Tier 2/3 cities (source Winter 2019 company report) With the expected lifespan of 10-15 years for a water heater, the market in China is starting to see the benefit of replacement water heater in Tier 1 cities. The need for replacement will start to show in Tier 2 cities soon as well. Additionally, water treatment products and air purification products are sold in over 7,500 and 3,500 retail outlets in China, respectively. However, due to slowing growth, the company announced that it was going to be closing 700 of its 9000 water heater retail outlets through Q4 2019 and into 2020.

Strong headwinds in China significantly cutting into ROW sales and profit growth

Earlier 2019 growth estimates for China were approximately five percent in local currency, and over eight percent in U.S. dollar terms, echoing previous years' growth. However, the company has downwardly revise '19 earnings by $22 million or 4%. The reduction is attributable to lower than expected sales in air purifiers, less bump than hoped for with e-commerce sales, an increased cost associated with the push to online sales as well as the expense of continual expansion into Tier 2 and Tier 3 cities. The trade war is adding to the woes due to the devaluation of the Chinese currency that occurred in August 2019.

Additionally, a report released in May 2019 raised questions about AOS's relationship with its majority supplier in China. Specifically, there are concerns that both AOS and the supplier have been less than transparent about their relationship which may affect reporting of profits. Even though any business in China is susceptible to similar concerns, the stock dropped 9 percent in the 2 days following the report and has yet to fully recover indicating perhaps that investors are not yet confident the company is addressing the issue adequately.

International Exposure: India

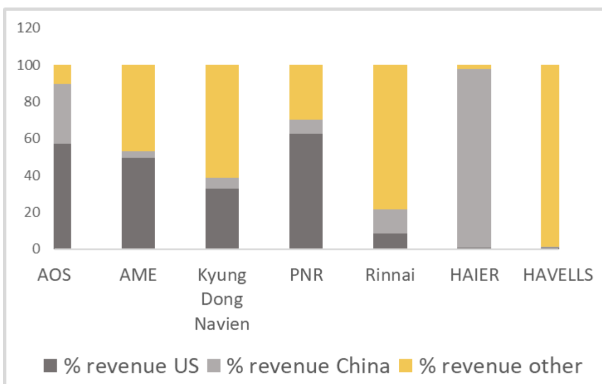
India is helping to mitigate decline in China with increase in sales of water treatment products

On the upside, expansion into India is going well. A.O. Smith first established a sales office in India in 2008 and initially imported products specifically designed for the Indian market. The company then began to manufacture water heaters in India in 2010 and water treatment products in 2015. At present, the company has a footprint in 25 out of 25 cities with a population of greater than 1.5 million, 63 out of 68 cities with a population of 0.5 to 1.5 million and 316 out of 400 cities with a population of 0.1 to 0.5 million. (Source: Summer 2019 Analyst Presentation) 2017 sales in India were 40 percent higher than 2016 sales, and 2018 sales outpaced those numbers with a 40 percent increase. The increase in India is helping to mitigate the unexpected loss of sales and decrease in margin in China, to produce an overall flat rate of ROW sales growth for AOS.

Competitor Analysis

AOS competitors tend to be region and industry specific with little overlap between regions of the world served or product range manufactured.

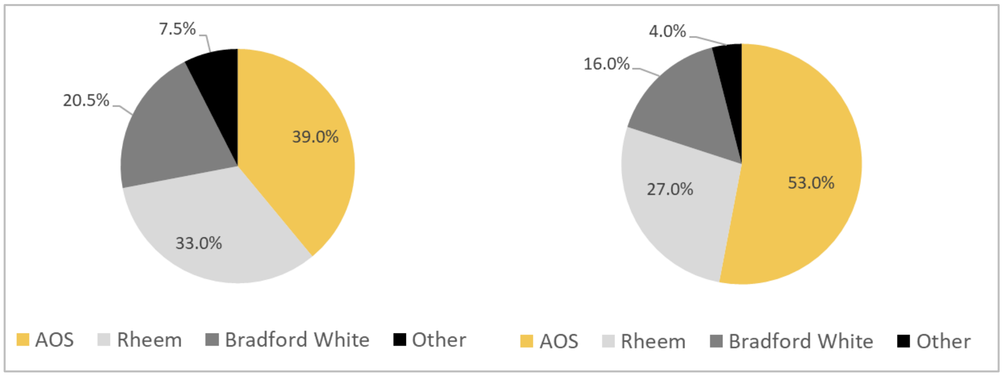
Figure 8: Percentage of revenue in parts of world of AOS and competitors (2018)



Source: Factset

In NA, AOS' competitors in the residential and commercial water heater segments are primarily Rheem and Bradford White. In both segments, AOS controls the market share although it is more dominant in the commercial marketplace. Market share trends do not seem to be moving significantly YoY.

Figures 9 and 10: Domestic market share (2018) for residential water heaters (left); Domestic market share for commercial water heaters (right)



Source: Company Reports (based on AHRI data and shipment estimates)

AOS competitive advantages include local manufacturing and contractual control of passing along raw materials price increase

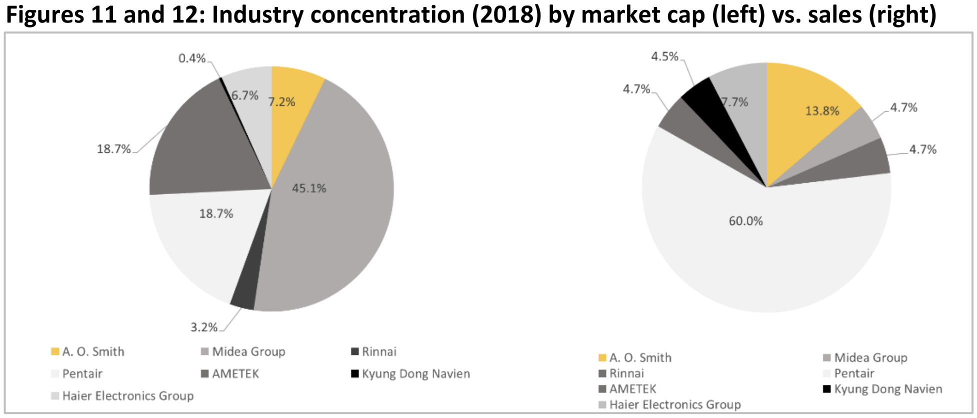
In 2018, AOS enacted a price increase of approximately 10 percent in NA which encouraged consumers to accelerate purchase of units. This boosted NA sales pre-increase and reduced sales post-increase. It also created a boost in sales for 2017 and a drop of sales in 2018. The increase was primarily due to steel and freight increase in cost as well as inflation, all of which would affect a similarly positioned company.

In ROW, competitors tend to be market segment specific. AOS competitors in China include Haier and Midea, both of which are Chinese companies, and Rinnai and Noritz in the water heater space; Qinyuan, Angel, Midea, and Xiaomi in the water treatment segment; and Phillips, Panasonic and Sharp in the air purification market. Competition in India includes Bajaj and Havels in the water heater market and Eureka Forves, Kent and Hindustan Unilever in the water treatment market. Sales figures show that AOS is able to hold a strong position in foreign markets even when competing with a local competitor due to the affinity for American brands and the resources that the company puts into supporting its brand recognition.

One advantage that AOS has over some of its competitors is that it manufactures and distributes in place versus importing/exporting products. Given the current trade war between the United States and China, that is an advantage as far as tariffs go.

AOS has 7.2% of the market cap of its peer group and 13.8% of sales. This suggests that the market appreciates the headwinds. Midea, headquartered in China, has a higher value compared to its sales due to a more diversified product line that includes large appliances as well as a large array of small appliances and higher growth.

Figures 11 and 12: Industry concentration (2018) by market cap (left) vs. sales (right)



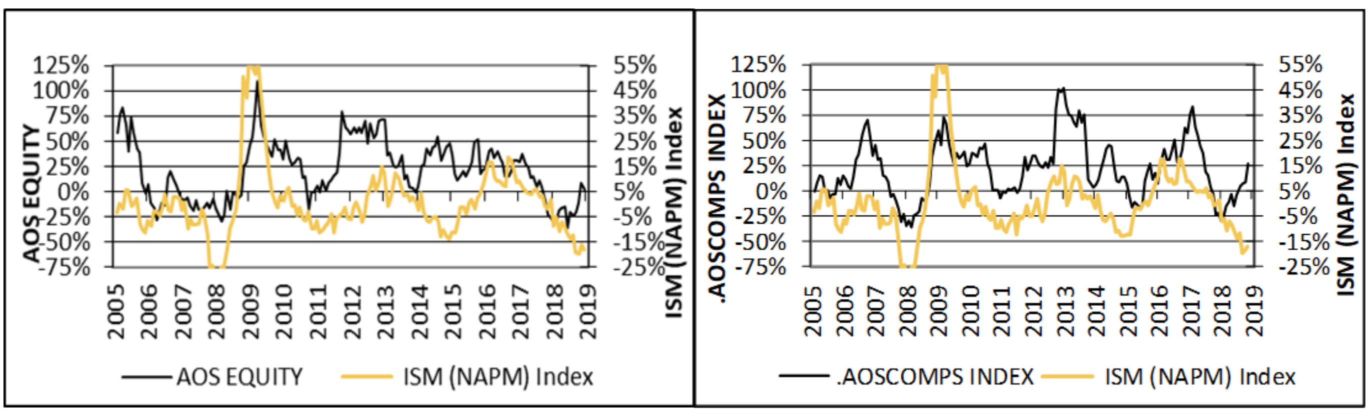
Source: Factset

Macroeconomic Trends

The industrials sector within the US is generally correlated to the ISM PMI. The index has enjoyed a relatively long amount of time over 50, indicating good conditions for the manufacturing sector over that time period. However, it fell to 49.1 in August 2019 and to 47.8 in September indicating that the manufacturing sector is retracting. The PMI is currently at the lowest level in ten years. The China Caixin PMI has not changed in any significant way over the same time period, likely indicative of government control versus any indication of sentiment.

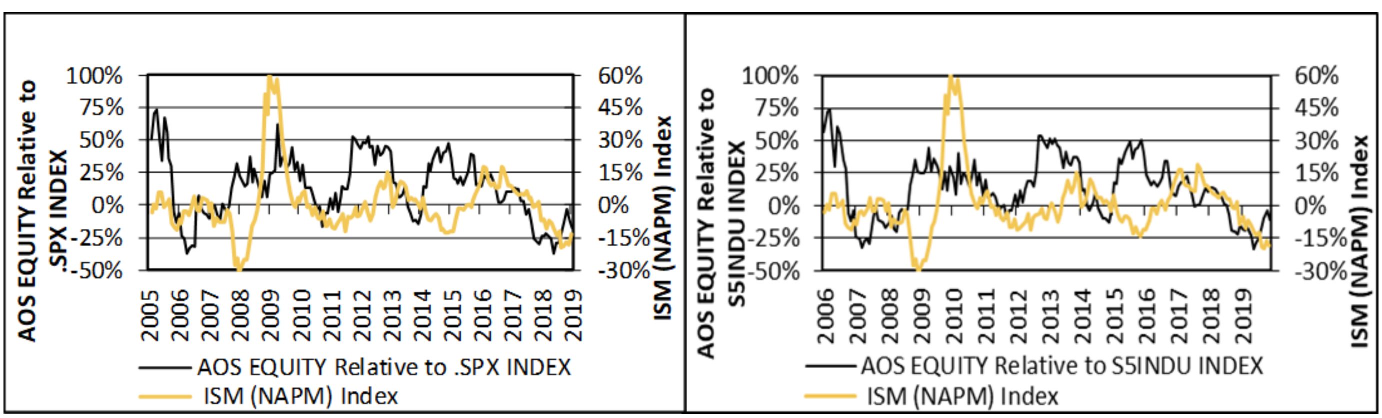
Both AOS and the sector are highly correlated with the PMI as shown Figures 13 and 14, although from 2014-15 and in 2018, AOS was inversely correlated to the ISM PMI. This can be attributed to the exposure in China that helped AOS revenue in times of US economic slowdowns more than other industrials that might not have the same level of international exposure. Also, AOS tends to lead the PMI. This could be in part due to the heavy exposure in China and may indicate that the Chinese economic recovery leads the rest of industrials. Growth in China could lead to higher demands for materials which then drives up the manufacturing sector.

Figures 13 and 14: AOS equity versus ISM PMI (left); AOS comps index versus ISM PMI (right)



Source: Bloomberg, IMCP

Figures 15 and 16: AOS relative to SPX index versus ISM PMI (left); AOS equity relative to S5INDU index versus ISM PMI (right)



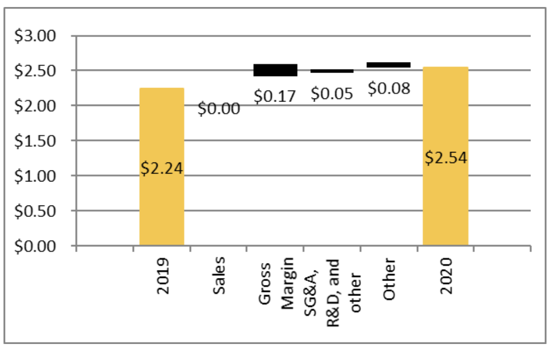
Source: Bloomberg, IMCP

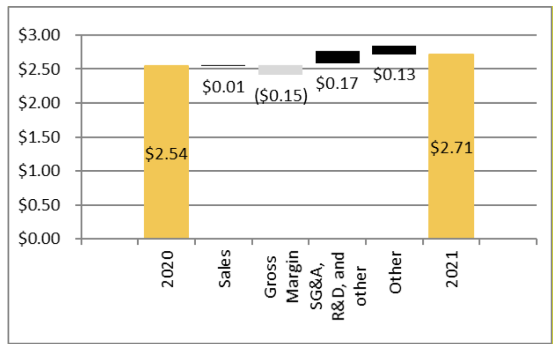
Financial Analysis

Quantification of Drivers

I expect EPS to increase from $2.24 to $2.54 in 2020 and from $2.54 to $2.71 in 2021. While sales in NA should continue to increase at a steady pace and sales in India continue to grow quickly, overall sales are expected to be level given the ongoing negative trend in the dominant ROW market of China. As the company lays off employees and eliminates 700 retail locations in China to address the slowing of demand in China, gross margin should rise slightly in 2021 accounting for most of the change in EPS. The model assumes that margins will fall again in 2021 after company adjustments take place and sales settle into a new appropriately scaled expectation. The model also assumes that share buybacks be a priority in the near future, accounting for $0.08 and $0.13 increase in EPS in years 2020 and 2021, respectively.

Figures 17 and 18: Quantification of EPS drivers 2020 (left) and 2021 (right)





Source: Company Reports, IMCP

Review of Estimates

Consensus EPS predictions have a relatively wide range of $2.33-2.60 for 2020. Similarly, consensus EPS numbers for 2021 range from $2.49-3.00. I believe that the variation in estimates reflects the uncertainty around the strength of the Chinese economy along with the unresolved trade tensions between the United States and China. My estimates, slightly higher than average for both years but well within the range, take into account both the ROW uncertainties over which the company has no control over and also the actions the company is taking to right-size operations in response to the headwinds in China.

Figure 19: Sales and EPS growth estimates 2019-2021 E estimates v. consensus

	2019	2020E	2021E
Sales Estimates	$ 3,019	$ 3,019	$ 3,034
YoY Growth	-5.3%	0.0%	0.5%
Sales Consensus	$ 2,993	$ 3,079	$ 3,042
YoY Growth	-6.12%	2.87%	-1.20%
EPS Estimates	$ 2.24	$ 2.54	$ 2.71
YoY Growth	14.0%	13.4%	6.7%
ESP- Consensus	$ 2.26	$ 2.49	$ 2.70
YoY Growth	-13.3%	10.2%	8.3%

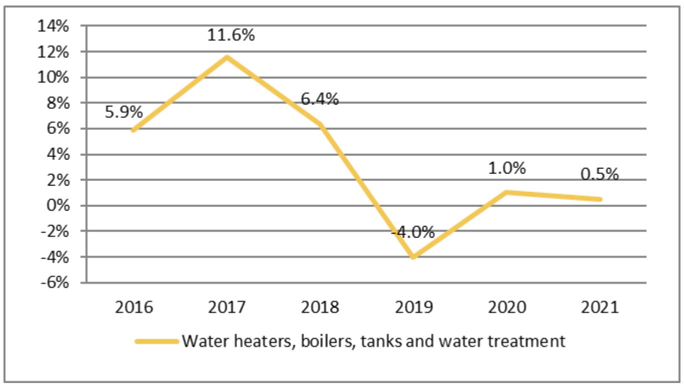
Source: Company Reports, IMCP

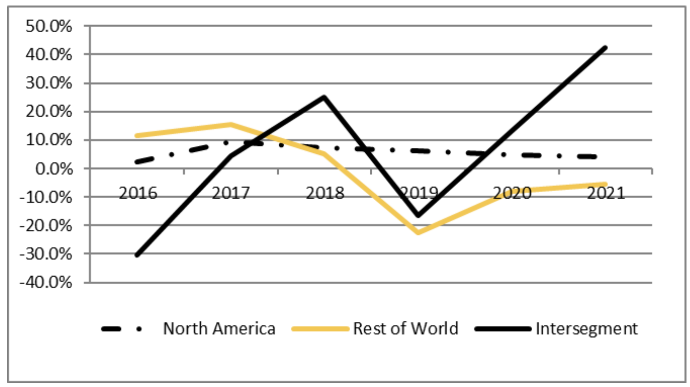
Sales Forecast

Chinese economic activity gives huge boost to AOS during good years and seriously hinders revenues in years when growth slows

AOS' revenue increased steadily from 2015-17 at approximately 6%. In 2017 and 2018, sales jumped 11.6% in and 6.4% respectively. The jump in 2017 is attributable to the company's ROW exposure in China during a strong economic time as well as sales that occurred before of an announced price increase. Unfortunately, the slowing growth in China coupled with the uncertainty of the trade war between the U.S. and China starting in 2018 and has significantly affected revenues in 2019. The company revised earnings in ROW down 22% for 2019 and total company sales for the same period are expected to be down 5%. Given the strength of the ROW headwinds I am estimating small revenue growth for 2020 and 2021 which is well below the levels of the last several years.

Figures 20 and 21: Revenues 2016-2021E, overall (left), broken out by segment (right)





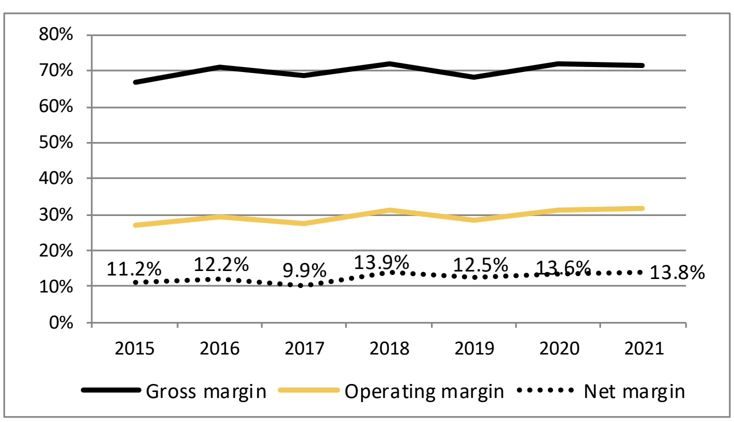
Source: Company Reports, IMCP

Operating Income and Margins

AOS actively working to right size operations in ROW in an attempt to stabilize revenues and margins

AOS is being hurt with direct costs and SGA in ROW, but it is taking action to stem the negative trends. In early 2019, the company announced a 10% layoff in ROW. By the November earnings call, layoffs had increased to 20%. Additionally, the company has closed 700 retailers in China with the expectation that this will save up to $40 million annually. AOS is also trying to minimize inventory in ROW. The company has historically been heavily invested in R&D and shows no signs of slowing down on this front moving into the near future. As seen in Figure 21, the overall reductions in expenses will have a positive impact on AOS's operating margin going forward and should allow for much greater margin expansion when revenues begin to increase again after a short-term stabilization period.

Figure 22: AOS Operating margins, 2015-2021E



Source: Company Reports

Return on Equity

Figure 23 clearly shows the effects of the varying Chinese economy on EBIT as margins dropped in 2019 after being stable 2016-18. This dragged down asset turns, ROA and ROE. ROE was still stable from 2016 to 2019 since taxes fell. Leverage is declining despite the firm buying back 5 million shares since 2016.

Figure 23: ROE breakdown, 2016 – 2021E

5 Stage DuPont	2016	2017	2018	2019	2020E	2021E
EBIT / sales	17.22%	17.34%	17.29%	15.90%	17.50%	17.70%
Sales / avg assets	0.97	0.98	1.02	1.00	1.03	1.06
EBT / EBIT	98.81%	98.13%	98.53%	98.33%	98.91%	98.93%
Net income /EBT	71.44%	58.14%	81.80%	79.87%	78.50%	78.86%
ROA	11.83%	9.74%	14.17%	12.51%	14.05%	14.67%
Avg assets / avg equity	1.87	1.93	1.86	1.79	1.81	1.84
ROE	22.08%	18.76%	26.43%	22.45%	25.42%	26.97%

Source: Company Reports, IMCP

I expect ROE growth to recover to 25.42% in 2020 and 26.97% in 2021 as the company's efforts at stabilizing revenue in ROW takes effect and margins and asset turnover rise due to cost cutting and closing retail operations.

Free Cash Flow

AOS actively repurchasing shares of stock

AOS' free cash flow has been volatile over the last several years. While debt has been relatively level, the firm has partially used FCF to repurchase shares of stock. FCFE rose to $379 million in 2019 from $73 million in 2017. NOPAT rose $81 million in that same time period, but the big gain came from slowing asset growth. FCFE is expected to rise to $453 million in 2019 despite a $64 million drop in NOPAT. The rise is the result of the drop in net fixed assets and working capital. FCFE is expected to stay stable through 2021. In 2018, the board authorized adding 7,500,000 shares of common stock to an existing discretionary share repurchase authority. Additionally, the board authorized another 3 million shares eligible for repurchase in June 2019. I project shares to fall 13 million from 2019-2021. At $50, this is $650 million, or 2/3 of FCFE over that two-year period.

Figure 24: Free cash flow calculations

	2015	2016	2017	2018	2019	2020E	2021E
NOPAT	$281	$325	$291	$436	$372	$410	$416
Growth		*15.6%*	*-10.4%*	*49.7%*	*-14.6%*	*10.1%*	*1.6%*
NWC*	118	49	161	208	197	190	191
Net fixed assets	1,226	1,329	1,431	1,433	1,357	1,313	1,319
Total net operating capital*	$1,344	$1,378	$1,591	$1,641	$1,554	$1,503	$1,510
Growth		*2.5%*	*15.5%*	*3.2%*	*-5.3%*	*-3.3%*	*0.5%*
- Change in NWC*		(69)	112	48	(11)	(7)	1
- Change in NFA		103	102	3	(76)	(44)	7
FCFF*		$291	$78	$386	$459	$461	$409
Growth			*-73.1%*	*393.5%*	*19.1%*	*0.4%*	*-11.3%*
- After-tax interest expense	5	4	5	6	6	4	4
FCFE**		$287	$73	$379	$453	$457	$404
Growth			*-74.7%*	*421.6%*	*19.5%*	*0.8%*	*-11.4%*

Source: Company Reports, FactSet, IMCP

Valuation

AOS' target price is $44.

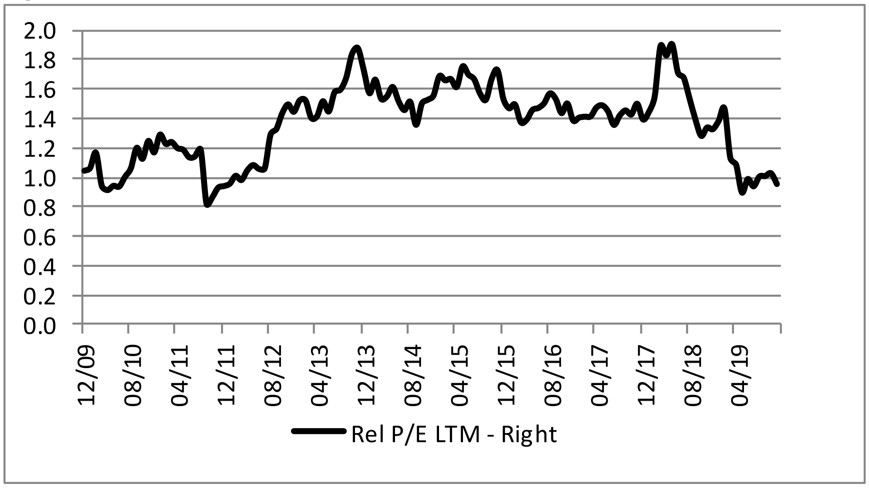
AOS was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is slightly undervalued relative to other firms and is worth $46.50. Relative valuation shows AOS to be slightly undervalued based on its fundamentals versus those of its peers. Price to sales valuation indicates the stock is worth $51. A detailed DCF analysis values AOS at $39.80. Weighting the DCF analysis at 50% to accommodate for the efforts AOS is already making to right size the company in ROW and equally weighting the earnings multiple valuation and relative valuation at 25%, I value AOS at $44.28.

Trading History

The current stock price of AOS is $47.06 and the five-year average price of the stock is $47.41. The high of the stock price was reached on Jan 26, 2018 when the stock traded at $67.84, so the stock is down 30% from its high. This is the result, predominantly, of high exposure in China which is slowing and trade war uncertainties. A weakening domestic ISM PMI is also a contributing factor.

AOS is currently trading at about 1.00 relative NTM P/E, close to the 10-year low. The company's current P/E is 19.2, down from a 5-year average of 25.44 and a peak of 36.09 that occurred in 2017.

Figure 25: AOS NTM P/E relative to S&P 500



Source: FactSet

Assuming the firm maintains a 19.2 NTM P/E at the end of 2020, it should trade at $52.03 the end of the year:

- Price = P/E x EPS = 19.2 x $2.71 = $52.03.

Discounting $52.03 back to today at a 12.0% cost of equity (used below in the DCF) yields a price of $46.45. This is about the current price. This seems somewhat reasonable given that AOS is making steps to fix issues in ROW, but some of the issues are beyond company control and could still negatively affect earnings at least for the short term.

Relative Valuation

AOS' P/E is just under the average of peers and its P/B is higher than average

AOS is currently trading at a P/E just under the average for its comps group with a P/E TTM of 19.8 compared to a P/E TTM of 20 of its peer group as shown in Figure 26. (Note: the peer group is smaller than discussed earlier as I eliminated several outliers that were skewing regression line.) This indicates that the company is slightly cheaper than its competitors most likely due to concerns over the performance of ROW. Its P/B is higher than the average of the comps and the P/S is at the average. Its higher P/B may reflect its slightly higher ROE of 21.69% (source: consensus/Factset) versus 19.9% for the comps. AOS is the only firm with negative EPS growth in 2019.

Figure 26: AOS comparable companies

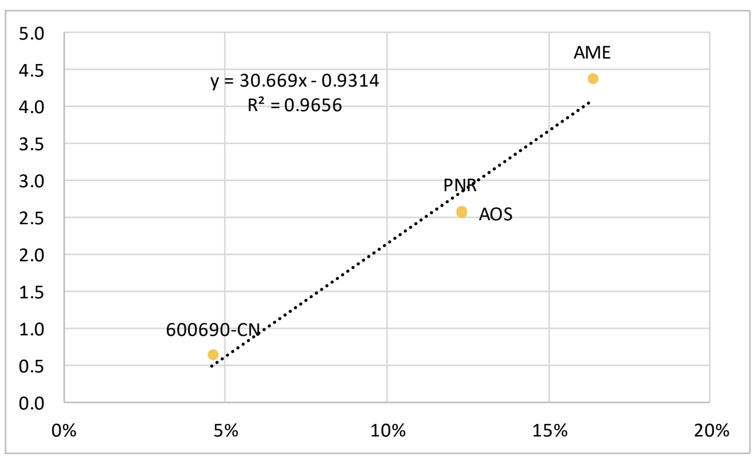
	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
AOS	$47.64	$7,771	0.1	(1.6)	(0.1)	1.0	11.6	11.6	8.0	-1.8%	51.8%	-12.0%	9.7%	8.4%	23.0%	1.57	21.3%	A-	1.89%	36.6%
600690-CN	$2.80	$18,419	1.0	14.3	27.5	12.8	40.8	40.8	8.8	-7.6%	0.0%	11.1%	5.0%	9.5%		1.19	53.4%		1.80%	
AME	$99.74	$22,800	(0.2)	0.7	8.6	9.8	47.3	47.3	9.8	16.4%	13.6%	11.1%	5.7%	8.9%		1.27	48.7%	A	0.56%	15.1%
PNR	$45.87	$7,710	0.1	3.4	21.3	23.3	21.4	21.4	5.7	22.6%	-24.9%	10.2%	13.0%	7.8%	-5.7%	1.02	63.2%		1.57%	34.9%
Average		$14,175	0.3	4.2	14.3	11.7	30.3	30.3	8.1	7.4%	10.1%	5.1%	8.3%	8.7%	8.7%	1.26	46.6%		1.46%	28.9%
Median		$13,095	0.1	2.1	15.0	11.3	31.1	31.1	8.4	7.3%	6.8%	10.6%	7.7%	8.7%	8.7%	1.23	51.0%		1.68%	34.9%
SPX	$3,231		0.3	2.9	8.5	9.8	28.9	28.9			21.6%	1.4%	9.6%	10.7%						

	2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
AOS	21.6%	4.54	36.0	16.6	21.0	19.8	20.2	19.1	17.6	12.3%	2.57	13.9%	17.3%	22.3%	12.6		-1.3%	3.5%	8.2%	$10.49
600690-CN	21.0%	2.94	16.1	11.2	14.0	13.5	14.6	13.3	12.2	4.6%	0.64	4.1%	5.2%	12.5%	12.2	10.4	5.2%		16.2%	$0.95
AME	17.4%	4.69	24.6	20.3	26.9	26.9	23.1	25.4	23.4	16.3%	4.39	16.1%	22.2%	12.5%	16.8	24.5	5.3%	5.0%		$21.29
PNR	19.4%	4.13	18.2	19.3	21.2	22.4	18.3	18.8	17.4	12.2%	2.60	10.8%	16.1%	7.1%	15.5	16.9	3.3%	2.9%	-16.9%	$11.12
Average	19.9%	4.07	23.7	16.8	20.8	20.6	19.0	19.2	17.7	11.4%	2.55	11.2%	15.2%	13.6%	14.3	17.3	3.1%	3.8%	2.5%	
Median	20.2%	4.33	21.4	17.9	21.1	21.1	19.2	19.0	17.5	12.3%	2.59	12.4%	16.7%	12.5%	14.1	16.9	4.3%	3.5%	8.2%	
spx			20.3	15.7	19.9			18.2	16.4											

Source: FactSet

A more thorough analysis of P/S and NPM is shown below in Figure 27. The calculated R-squared of the regression indicates that over 96% of a sampled firm's P/S is explained by its NPM. In this regression I included Haier, AME and PNR but excluded several other comps that don't allow for a reasonable attempt at correlation of data.

Figure 27: P/S versus NPM



Source: IMCP

AOS is below the regression line, implying that either the stock is undervalued, or the market is pricing in more risk and less growth potential for AOS than its peers. I believe the market is pricing in the risk associated with the stock. While AOS is actively working to address issues within its control such as laying off 20% of its workforce in China and eliminating 700 retail outlets in China, macro-economic forces that are slowing growth in China create vulnerabilities for the company.

Assuming the regression line is fair value, the stock should trade at $51.

- Estimated P/S = Estimated 2019 NPM (12.3) x 30.669 - 0.9314 = 2.83

- Target Price = Estimated P/S (2.83) x Estimated sales per share ($17.97) = $50.86

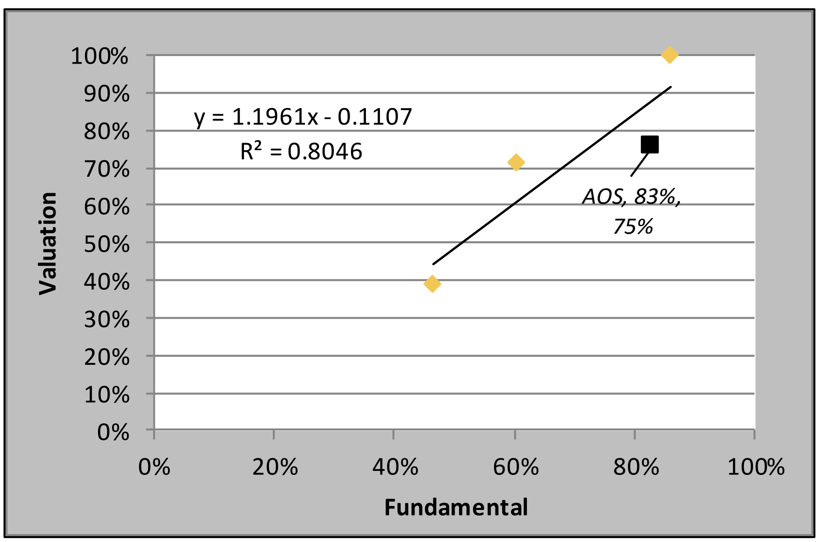
For a final comparison, a composite of several fundamental variables were compared to a composite of valuation variables. Since each variable has a different scale, each was first converted to a percentile before creating the composites. 50% weight on P/S and 25% on NTM P/E and P/B were compared to a 50% weight on net profit margin, 25% for long-term EPS expected growth, and 25% for debt to equity (lower debt/equity stocks are rated better). Figure 29 shows that AOS is below the regression line, so it appears to be undervalued.

Figure 28: AOS Comparable Companies

						Fundamental			Valuation		
					Weight	25.0%	25.0%	50.0%	25.0%	25.0%	50.0%
	Rank		Target	Weighted		EPS G	1/(LTD/	2019	P/E		
Name	Diff	Diff	Value	Fund	Value	LTG	Equity)	NPM	NTM	P/B	P/S
AOS Corporation	4	13%	88%	83%	75%	82%	100%	75%	87%	97%	59%
Haier Smart Home, Co.	3	6%	44%	46%	39%	90%	40%	28%	63%	63%	15%
Ametek, Inc.	2	-8%	92%	86%	100%	100%	44%	100%	100%	100%	100%
Pentair Plc	1	-10%	61%	60%	71%	58%	34%	75%	79%	88%	59%

Source: IMCP

Figure 29: Composite Relative Valuation



Source: IMCP

<u>Discounted Cash Flow Valuation</u>

A three stage discounted cash flow model was also used to value AOS.

For the purpose of this analysis, the company's cost of equity was calculated to be 12.0% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 1.9%.
- A beta of 1.25 was used since it reflects the current initiatives to right-size in ROW. The current 52-week beta of AOS is 1.4, and the average comps group beta is 1.2. The current beta was adjusted slightly downward but keeping it relatively high to consider continued risk in ROW. However, the fact

that AOS gets 62% of revenue from NA and the other companies do not have similar exposure provides some reliability and predictability to the company that the comps don't have.

- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 12.0% (1.9 + 1.25 (10.0 – 1.9)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $2.83 and $2.62, respectively. Discounting these cash flows results in a value of $4.61 per share. Thus, stage one of this discounted cash flow analysis contributes $4.61 to the value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The model assumes that by 2026 the growth of the company will have normalized and recovered from the instability that is currently affecting the ROW. I assume 2.0% sales growth in 2022, rising to 7.0% through 2026. The NOPAT margin is expected to be about stable from 2021. Overall, FCFE is stable as I assume net fixed assets grow with sales.

Figure 30: FCFE and discounted FCFE, 2020 – 2026

	2021	2021	2022	2023	2024	2025	2026
FCFE	$ 2.83	$ 2.62	$ 2.57	$ 2.52	$ 2.51	$ 2.57	$ 2.66
Disc FCFE	$ 2.53	$ 2.09	$ 1.83	$ 1.60	$ 1.42	$ 1.30	$ 1.20

Source: IMCP

Discounting at 12.0% cost of equity, stage two cash flows total $7.36.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $2.54 in 2020 to $3.42 in 2026.

Figure 31: EPS estimates for 2020-26

	2021	2021	2022	2023	2024	2025	2026
EPS	$ 2.54	$ 2.71	$ 2.73	$ 2.84	$ 2.99	$ 3.19	$ 3.42

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this analysis, I assumed a terminal 2026 P/E of 18. The current TTM P/E is 19.2 and does not yet price in likely continuing difficulties in ROW. The company seems committed to addressing the issues to the extent that it can, but it can't address the geopolitical factors that are out of its hands. I believe the company will turn itself around, but it will be slow in doing so and the market will be slow to reward the increase in revenue that results from such changes. However, by 2026 the market will have recognized these efforts so a higher than market, albeit lower than the last five years as growth will have slowed, P/E is justified.

Given the assumed terminal earnings per share of $3.42 and a price to earnings ratio of 18, a terminal value of $61.61 per share is calculated. This number is discounted back at a cost of equity of 12.0% to a present value of $27.83.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $39.80 is calculated (4.61 + 7.36 + 27.83). Given AOS's current price of $47.13 this model indicates that the stock is overpriced by 15%.

Scenario Analysis

AOS is difficult to value with certainty due to the unpredictable trade tensions between China and the United States. Having 38% of sales come from ROW has proven to be a problem for management in the last year. However, it's possible to create a bull and bear case from different possible scenarios. Figures 32-33 shows the bull and bear cases for comparison.

Bull Case: The bull case assumes that the Chinese economy picks up again and AOS is positioned well to take advantage of that increased growth. AOS has such strong brand recognition that it is likely to benefit more than its peers if conditions improve noticeably. Additionally, the bull case assumes that sales in India continue to further augment revenue in ROW. Trade tensions with China ease or disappear, creating greater consumer confidence overall which could boost sales in NA. The bull case stabilization in 2020, slight growth in 2021, and then accelerated growth that gets to a more historically appropriate 7% growth by 2025 and 2026. The NOPAT/sales ratio stays relatively constant, PE rises to 20 and, given a stabilization with ROW revenues and an ease of world tensions, AOS is less susceptible to macro risk lowering the beta to 1.0. In this scenario the target price is $49.39.

Figure 32: Bull case estimated value for 2020

Summary (using P/E multiple for terminal value)		
First stage	$4.74	Present value of first 2 year cash flow
Second stage	$7.98	Present value of year 3-7 cash flow
Third stage	$36.67	Present value of terminal value P/E
Value (P/E)	**$49.39**	

Source: IMCP

Bear Case: The bear case assumes that macros continue to influence fundamentals. The company is taking right steps to address the current headwinds, but that takes longer than hoped for to take hold. Sales in ROW increase slowly and sales in NA don't change much given that there isn't much of a catalyst in place to either accelerate or decelerate NA revenue. The bear case considers stabilization in 2020, slight growth in 2021, and then accelerated growth that gets the company back to an increased but less than average growth rate of 5% by 2026. The NOPAT/sales ratio stays relatively constant and the PE drops to 17. Given that the macros still make AOS susceptible to vulnerabilities but understanding that AOS is addressing the issues over which is has control, the beta rises slightly to 1.3. In this scenario, the target price is $35.28.

Figure 33: Bear case estimated value for 2020

Summary (using P/E multiple for terminal value)		
First stage	$4.59	Present value of first 2 year cash flow
Second stage	$7.41	Present value of year 3-7 cash flow
Third stage	$23.27	Present value of terminal value P/E
Value (P/E)	**$35.28**	

Business Risks

There are multiple reasons to be optimistic about AOS; however, there are significant risks outside of the company's control. This leads to my neutral position on the company's stock.

Global economic issues:

Uneven global economic growth could adversely affect consumer confidence and spending patterns which could result in decreased demand for the products, a delay in purchases, and increased price competition. This could negatively impact profitability and cash flows. In addition, a slowing in current economic conditions could negatively both impact vendors and customers causing an increase in bad debt expense, interruption or delay in supply of materials, increased material prices, and distribution of products all of which could cause a loss of cash flow.

Exposure in China:

Approximately 34 percent of net sales in 2018 were attributable to China. Slowing GDP and housing market in China have created headwinds in the past year highlighting the vulnerability of growth projections for this market. Additionally, trade tensions between China and the U.S. and a slowing Chinese economy weakens consumer confidence that could prompt consumers to go with non-premium brands or lengthen the cycle of replacement purchases. Further slowing in the Chinese economy or lack of resolution of the trade war could significantly adversely affect AOS' financial condition.

Customer concentration:

Net sales to the five largest customers represented approximately 39 percent of sales in 2018. There is no expected change in that customer concentration for the foreseeable future. The concentration of sales and lack of guarantee of continued relationships makes AOS vulnerable. The loss of one or more of the largest customers, any material reduction or delay in sales to these customers, or an inability to successfully develop relationships with additional customers could have a material adverse effect on the company's financial position.

Foreign Currency Risk:

Given significant international operations, AOS holds assets, including $539 million of cash in foreign local currencies, and incurs liabilities in foreign currencies. The financial statements of foreign subsidies are translated into U.S. dollars on the consolidated financial statements which means AOS is subject to risk associated with fluctuations in currency exchange rates. Additionally, products are priced in foreign currencies. An increase in value relative to local currencies has had and will continue to have a negative effect on profitability.

Appendix 1: SWOT Analysis

Strengths	Weaknesses
Brand recognition Research and Development Steady replacement market	Exposure in China Difficult to gain market share in NA Vulnerable to trade uncertainties
Opportunities	**Threats**
Expansion of water purification Expansion in ROW/Asia	Trade war uncertainties Economic slow down in China

Appendix 2: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Given the capital and technical needs to enter the market, there is little risk of a new competitor coming into the marketplace and taking away market share from AOS. However, there is some risk of competitors combining or acquiring an adjacent industry that could help to give it a competitive edge within a market segment.

Threat of Substitutes – Low

AOS has strong name recognition and market share in both in NA and ROW market segments that translates into strong sales. There are other brands at lower price points, but the reputation of the premium product is attractive to consumers.

Supplier Power - Moderate

AOS is a price taker when steel and other material prices rise. However, recent increases in steel have been passed along to consumers through contractual negotiations with distributors.

Buyer Power – High

AOS has 38% of its business coming from its top five customers, making it susceptible to pricing pressure from commercial distributors. On the retail side, AOS is vulnerable given that there are a number of competitors in the marketplace and replacement cycles are long (average 10-15 years). A large portion of non-emergency replacements are made in order to upgrade equipment in order to capture energy efficiencies. The consumer could decide to postpone replacement in order to postpone cost if there is a downturn in the economy.

Intensity of Competition – Moderate

While AOS has competitors, they tend to be region, segment, and product line specific. AOS continues to diversify product lines which helps to minimize the impact of gains by competitors. E-commerce helps AOS sell its products particularly in ROW, but that technology also creates an expanded sales platform for other competitors. AOS puts a significant amount of resources in R&D compared to competitors in the hopes that it can ensure its competitive edge.

Appendix 3: Sales

Sales							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	$2,537	$2,686	2,997	$3,188	3,060	$3,091	$3,106
Growth		*5.9%*	*11.6%*	*6.4%*	*-4.0%*	*1.0%*	*0.5%*
Water heaters etc.	2,537	2,686	2,997	3,188	3,060	3,091	3,106
Growth		*5.9%*	*11.6%*	*6.4%*	*-4.0%*	*1.0%*	*0.5%*
% of sales	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.6%
North America	1,703	1,743	1,905	2,045	2,175	2,281	2,373
Growth		*2.3%*	*9.3%*	*7.3%*	*6.4%*	*4.9%*	*4.0%*
% of sales	*67.1%*	*64.9%*	*63.6%*	*64.1%*	*71.1%*	*73.8%*	*76.4%*
Rest of World	866	966	1,116	1,174	910	838	792
Growth		*11.5%*	*15.5%*	*5.2%*	*-22.5%*	*-8.0%*	*-5.4%*
% of sales	*34.1%*	*36.0%*	*37.2%*	*36.8%*	*29.7%*	*27.1%*	*25.5%*
Intersegment	(33)	(23)	(24)	(30)	(25)	(28)	(40)
Growth		*-30.3%*	*4.3%*	*25.0%*	*-16.7%*	*13.4%*	*42.5%*
% of sales	*-1.3%*	*-0.9%*	*-0.8%*	*-0.9%*	*-0.8%*	*-0.9%*	*-1.3%*

Appendix 4: Income Statement

Income Statement							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Sales	$2,537	$2,686	$2,997	$3,188	$3,019	$3,019	$3,034
Direct costs	1,527	1,567	1,758	1,883	1,819	1,781	1,820
Gross Margin	1,010	1,119	1,239	1,305	1,200	1,238	1,214
SG&A, R&D, and other	607	657	723	754	720	709	677
EBIT	403	463	520	551	480	528	537
Interest	7	6	10	8	8	6	6
EBT	396	457	510	543	472	523	531
Taxes	120	136	224	114	106	117	119
Income	276	321	286	429	366	405	412
Other	(7)	(6)	(11)	(15)	(11)	(5)	(7)
Net income	283	327	297	444	377	410	419
Basic Shares	177.6	174.7	172.7	170.6	168.0	161.4	154.4
Fully Diluted Shares	179.0	176.8	174.6	172.2	170.8	164.1	157.1
EPS	$1.59	$1.87	$1.72	$2.60	$2.24	$2.54	$2.71
EPS Fully Diluted	$1.58	$1.85	$1.70	$2.58	$2.21	$2.50	$2.67
DPS	$0.38	$0.48	$0.56	$0.76	$0.87	$0.96	$1.04

Appendix 5: Balance Sheets

Balance Sheet							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Cash	645	755	820	645	656	653	579
Operating assets ex cash	810	807	947	994	941	921	925
Operating assets	1,403	1,562	1,767	1,639	1,597	1,574	1,505
Operating liabilities	640	758	786	785	744	731	734
NOWC	763	804	981	853	854	843	771
NOWC ex cash (NWC)	118	49	161	208	197	190	191
NFA	1,226	1,329	1,431	1,433	1,357	1,313	1,319
Invested capital	*$1,989*	*$2,133*	*$2,411*	*$2,286*	*$2,211*	*$2,156*	*$2,090*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$2,629*	*$2,891*	*$3,197*	*$3,072*	*$2,954*	*$2,886*	*$2,824*
Short-term and long-term debt	$249	$324	$410	$221	$221	$221	$221
Other liabilities	298	294	356	348	348	348	348
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	1,442	1,515	1,645	1,717	1,641	1,587	1,521
Total supplied capital	*$1,989*	*$2,133*	*$2,411*	*$2,286*	*$2,210*	*$2,155*	*$2,089*
Total liabilities and equity	*$2,629*	*$2,891*	*$3,197*	*$3,071*	*$2,954*	*$2,886*	*$2,824*

Appendix 7: Ratios

Ratios							
Items	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**	**Dec-21**
Profitability							
Gross margin	39.8%	41.7%	41.3%	40.9%	39.7%	41.0%	40.0%
Operating (EBIT) margin	15.9%	17.2%	17.3%	17.3%	15.9%	17.5%	17.7%
Net profit margin	11.2%	12.2%	9.9%	13.9%	12.5%	13.6%	13.8%
Activity							
NFA (gross) turnover		2.10	2.17	2.23	2.16	2.26	2.31
Total asset turnover		0.97	0.98	1.02	1.00	1.03	1.06
Liquidity							
Op asset / op liab	2.19	2.06	2.25	2.09	2.15	2.15	2.05
NOWC Percent of sales		29.2%	29.8%	28.8%	28.3%	28.1%	26.6%
Solvency							
Debt to assets	9.5%	11.2%	12.8%	7.2%	7.5%	7.7%	7.8%
Debt to equity	17.3%	21.4%	24.9%	12.9%	13.5%	13.9%	14.5%
Other liab to assets	11.3%	10.2%	11.1%	11.3%	11.8%	12.0%	12.3%
Total debt to assets	20.8%	21.4%	24.0%	18.5%	19.3%	19.7%	20.1%
Total liabilities to assets	45.1%	47.6%	48.5%	44.1%	44.4%	45.0%	46.1%
Debt to EBIT	0.62	0.70	0.79	0.40	0.46	0.42	0.41
EBIT/interest	61.92	84.09	53.58	68.04	60.00	91.95	93.46
Debt to total net op capital	12.5%	15.2%	17.0%	9.7%	10.0%	10.3%	10.6%
ROIC							
NOPAT to sales	11.1%	12.1%	9.7%	13.7%	12.3%	13.6%	13.7%
Sales to NWC		32.17	28.61	17.29	14.90	15.59	15.91
Sales to NFA		2.10	2.17	2.23	2.16	2.26	2.31
Sales to IC ex cash		1.97	2.02	1.97	1.89	1.98	2.01
Total ROIC ex cash		23.9%	19.6%	27.0%	23.3%	26.8%	27.6%
NOPAT to sales	11.1%	12.1%	9.7%	13.7%	12.3%	13.6%	13.7%
Sales to NOWC		3.43	3.36	3.48	3.54	3.56	3.76
Sales to NFA		2.10	2.17	2.23	2.16	2.26	2.31
Sales to IC		1.30	1.32	1.36	1.34	1.38	1.43
Total ROIC		15.8%	12.8%	18.6%	16.6%	18.8%	19.6%
NOPAT to sales	11.1%	12.1%	9.7%	13.7%	12.3%	13.6%	13.7%
Sales to EOY NWC	21.50	54.81	18.67	15.31	15.31	15.87	15.87
Sales to EOY NFA	2.07	2.02	2.09	2.22	2.22	2.30	2.30
Sales to EOY IC ex cash	1.89	1.95	1.88	1.94	1.94	2.01	2.01
Total ROIC using EOY IC ex cash	20.9%	23.6%	18.3%	26.6%	23.9%	27.3%	27.6%
NOPAT to sales	11.1%	12.1%	9.7%	13.7%	12.3%	13.6%	13.7%
Sales to EOY NOWC	3.32	3.34	3.06	3.74	3.54	3.58	3.94
Sales to EOY NFA	2.07	2.02	2.09	2.22	2.22	2.30	2.30
Sales to EOY IC	1.28	1.26	1.24	1.39	1.37	1.40	1.45
Total ROIC using EOY IC	14.1%	15.2%	12.1%	19.1%	16.8%	19.0%	19.9%
ROE							
5-stage							
EBIT / sales		17.2%	17.3%	17.3%	15.9%	17.5%	17.7%
Sales / avg assets		0.97	0.98	1.02	1.00	1.03	1.06
EBT / EBIT		98.8%	98.1%	98.5%	98.3%	98.9%	98.9%
Net income /EBT		71.4%	58.1%	81.8%	79.9%	78.5%	78.9%
ROA		11.8%	9.7%	14.2%	12.5%	14.0%	14.7%
Avg assets / avg equity		1.87	1.93	1.86	1.79	1.81	1.84
ROE		22.1%	18.8%	26.4%	22.5%	25.4%	27.0%

Appendix 7: Comp Sheet

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
AOS	$47.64	$7,771	0.1	(1.6)	(0.1)	1.0	11.6	11.6	8.0	-1.8%	51.8%	-12.0%	9.7%	8.4%	23.0%	1.57	21.3%	A-	1.89%	36.6%
600690-CN	$2.80	$18,419	1.0	14.3	27.5	12.8	40.8	40.8	8.8	-7.6%	0.0%	11.1%	5.0%	9.5%		1.19	53.4%		1.80%	
AME	$99.74	$22,800	(0.2)	0.7	8.6	9.8	47.3	47.3	9.8	16.4%	13.6%	11.1%	5.7%	8.9%		1.27	48.7%	A	0.56%	15.1%
PNR	$45.87	$7,710	0.1	3.4	21.3	23.3	21.4	21.4	5.7	22.6%	-24.9%	10.2%	13.0%	7.8%	-5.7%	1.02	63.2%		1.57%	34.9%
Average		$14,175	0.3	4.2	14.3	11.7	30.3	30.3	8.1	7.4%	10.1%	5.1%	8.3%	8.7%	8.7%	1.26	46.6%		1.46%	28.9%
Median		$13,095	0.1	2.1	15.0	11.3	31.1	31.1	8.4	7.3%	6.8%	10.6%	7.7%	8.7%	8.7%	1.23	51.0%		1.68%	34.9%
SPX	$3,231		0.3	2.9	8.5	9.8	28.9	28.9			21.6%	1.4%	9.6%	10.7%						

	2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
AOS	21.6%	4.54	36.0	16.6	21.0	19.8	20.2	19.1	17.6	12.3%	2.57	13.9%	17.3%	22.3%	12.6		-1.3%	3.5%	8.2%	$10.49
600690-CN	21.0%	2.94	16.1	11.2	14.0	13.5	14.6	13.3	12.2	4.6%	0.64	4.1%	5.2%	12.5%	12.2	10.4	5.2%		16.2%	$0.95
AME	17.4%	4.69	24.6	20.3	26.9	26.9	23.1	25.4	23.4	16.3%	4.39	16.1%	22.2%	12.5%	16.8	24.5	5.3%	5.0%		$21.29
PNR	19.4%	4.13	18.2	19.3	21.2	22.4	18.3	18.8	17.4	12.2%	2.60	10.8%	16.1%	7.1%	15.5	16.9	3.3%	2.9%	-16.9%	$11.12
Average	19.9%	4.07	23.7	16.8	20.8	20.6	19.0	19.2	17.7	11.4%	2.55	11.2%	15.2%	13.6%	14.3	17.3	3.1%	3.8%	2.5%	
Median	20.2%	4.33	21.4	17.9	21.1	21.1	19.2	19.0	17.5	12.3%	2.59	12.4%	16.7%	12.5%	14.1	16.9	4.3%	3.5%	8.2%	
spx			20.3	15.7	19.9			18.2	16.4											

Appendix 8: 3-stage DCF Model

First Stage			Second Stage				
Year ending December	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*0.0%*	*0.5%*	*2.0%*	*3.5%*	*5.0%*	*6.0%*	*7.0%*
NOPAT / S	*13.6%*	*13.7%*	*13.8%*	*13.8%*	*13.9%*	*13.9%*	*14.0%*
S / NWC	*15.87*	*15.87*	*16.30*	*16.72*	*17.15*	*17.57*	*18.00*
S / NFA (EOY)	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*
S / IC (EOY)	*2.01*	*2.01*	*2.02*	*2.02*	*2.03*	*2.03*	*2.04*
ROIC (EOY)	*27.3%*	*27.6%*	*27.8%*	*28.0%*	*28.2%*	*28.4%*	*28.6%*
ROIC (BOY)		*27.7%*	*28.2%*	*28.9%*	*29.5%*	*30.0%*	*30.5%*
Share Growth		*-4.3%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$3,019	$3,034	$3,095	$3,203	$3,363	$3,565	$3,815
NOPAT	$410	$416	$426	$443	$467	$497	$534
Growth		*1.6%*	*2.4%*	*3.9%*	*5.4%*	*6.4%*	*7.4%*
- Change in NWC	-7	1	-1	2	5	7	9
NWC EOY	*190*	*191*	*190*	*192*	*196*	*203*	*212*
Growth NWC		*0.5%*	*-0.7%*	*0.9%*	*2.4%*	*3.4%*	*4.5%*
- Chg NFA	-44	7	26	47	70	88	109
NFA EOY	*1,313*	*1,319*	*1,346*	*1,393*	*1,462*	*1,550*	*1,659*
Growth NFA		*0.5%*	*2.0%*	*3.5%*	*5.0%*	*6.0%*	*7.0%*
Total inv in op cap	-51	8	25	49	74	94	118
Total net op cap	1503	1510	1535	1584	1658	1753	1870
FCFF	$461	$409	$401	$394	$393	$403	$416
% of sales	*15.3%*	*13.5%*	*13.0%*	*12.3%*	*11.7%*	*11.3%*	*10.9%*
Growth		*-11.3%*	*-1.9%*	*-1.7%*	*-0.4%*	*2.5%*	*3.4%*
- Interest (1-tax rate)	4	4	5	5	5	5	6
Growth		*0.0%*	*2.0%*	*3.5%*	*5.0%*	*6.0%*	*7.0%*
FCFE w/o debt	$457	$404	$397	$390	$388	$397	$411
% of sales	*15.1%*	*13.3%*	*12.8%*	*12.2%*	*11.5%*	*11.1%*	*10.8%*
Growth		*-11.4%*	*-1.9%*	*-1.8%*	*-0.4%*	*2.4%*	*3.4%*
/ No Shares	161.4	154.4	154.4	154.4	154.4	154.4	154.4
FCFE	$2.83	$2.62	$2.57	$2.52	$2.51	$2.57	$2.66
Growth		*-7.4%*	*-1.9%*	*-1.8%*	*-0.4%*	*2.4%*	*3.4%*
* Discount factor	0.89	0.80	0.71	0.63	0.57	0.51	0.45
Discounted FCFE	$2.53	$2.09	$1.83	$1.60	$1.42	$1.30	$1.20
Third Stage							
Terminal value P/E							
Net income	$410	$419	$422	$438	$462	$492	$528
% of sales	*13.6%*	*13.8%*	*13.6%*	*13.7%*	*13.7%*	*13.8%*	*13.9%*
EPS	$2.54	$2.71	$2.73	$2.84	$2.99	$3.19	$3.42
Growth		*6.8%*	*0.7%*	*3.9%*	*5.4%*	*6.4%*	*7.4%*
Terminal P/E							18.00
* Terminal EPS							$3.42
Terminal value							$61.61
* Discount factor							0.45
Discounted terminal value							$27.83

Summary (using P/E multiple for terminal value)		
First stage	$4.61	Present value of first 2 year cash flow
Second stage	$7.36	Present value of year 3-7 cash flow
Third stage	$27.83	Present value of terminal value P/E
Value (P/E)	$39.80	

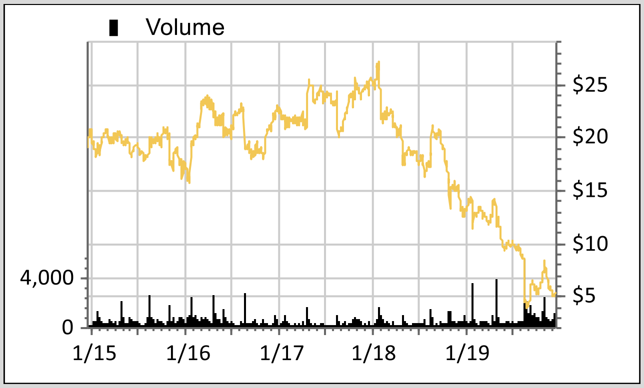
Recommendation: Buy

Current Price	**$5.82**	---	Ticker	BGG
1 Year Bear	$7	*15%*	Sh. Out. (M)	42.4
1 Year Base	**$8**	***35%***	M.Cap. ($M)	0.23
1 Year Bull	$10	*67%*	EV ($M)	0.55

Industrials, Machinery Manufacturing

Briggs & Stratton Corporation

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	-71%	-75%	-77%	-59%	-58%	-13%	-16%

Financials

	2015	2016	2017	2018	2019	2020F	2021F
Sales($B)	**1.89**	**1.80**	**1.78**	**1.88**	**1.83**	**1.89**	**1.95**
Gr. %	-	*-4.5%*	*-1.3%*	*5.3%*	*-2.3%*	*3.3%*	*3.0%*
Cons.	-	-	-	-	-	*1.91*	*1.97*
Ind.	-	-	-	-	-	*2.5%*	*2.5%*
EPS	**$1.03**	**$0.63**	**$1.34**	**($0.26)**	**($1.29)**	**$0.36**	**$0.72**
Gr. %	*-39%*	*-39%*	*114%*	*-120%*	*-400%*	*127%*	*100%*
Cons.	-	-	-	-	-	*$0.22*	*$0.61*
Ind.	-	-	-	-	-	*3.8%*	*9.6%*

Ratios

	2015	2016	2017	2018	2019	2020F	2021F
NPM	**2.4%**	**1.5%**	**3.1%**	**-0.6%**	**-3.0%**	**-0.7%**	**0.2%**
Ind.	-	-	*7.9%*	*7.7%*	*7.6%*	-	-
ROE	*7.14%*	*5.1%*	*10.5%*	*-2.1%*	*-10.7%*	*-2.6%*	*2.1%*
Ind.	-	-	*25.7%*	*23.1%*	*22.7%*	-	-
ROA	*3.1%*	*1.9%*	*3.8%*	*-0.8%*	*-3.6%*	*-0.8%*	*0.3%*
Ind.	-	-	*8.8%*	*8.7%*	*8.5%*	-	-
A T/O	1.31	1.24	1.23	1.30	1.22	1.18	1.17
Ind.	-	-	1.07	1.09	1.08	-	-

Valuation

	2015	2016	2017	2018	2019	2020F	2021F
P/E	19.5	35.1	18.4	41.7	27.3	14.3	9.8
Ind.	-	-	-	30.7	16.9	21.1	20.0
P/S	0.46	0.50	0.57	0.42	0.21	0.12	0.13
Ind.	-	-	-	2.32	1.65	-	-
P/B	1.5	1.8	1.8	1.4	0.8	0.5	0.5
Ind.	-	-	-	6.8	4.6	-	-
EV/EBIT	11.5	17.6	13.6	13.4	32.9	12.5	13.7

Summary

I recommend a buy rating with a target of $8. BGG has an opportunity to dramatically improve efficiency and increase margins, their hurdle rate is at an all time low coming out of a poor 2019 year. I expect BGG to increase margins from improvement in operational effeciency as well from an a overall decrease in extreme negative external weather patterns. BGG will have to limit debt and maintain reasonable estimates for FY204Q in order to achieve my target price.

Key Drivers

- Seasonality: BGG will hope to benefit from less extreme weather patterns as well as more normalized inventory management in the upcoming quarters.
- Retail Sales Growth: Briggs should experience tailwinds from retail growth and strong consumer confidence.
- Gross Margin & Operational Improvements: The firm will achieve a more normal margin from decrease in costs as sale push higher.
- Competitive Forces: As BGG shifts towards more products it will face more competition from established brands.

Valuation

Using a relative valuation approach, Briggs appears to be fairly undervalued in comparison to the machinery industry. DCF analysis implies that the stock is worth $8. A combination of the approaches suggests that Briggs is undervalued, as the stock's value is about $8 as well and the shares trade at $5.50.

Risks

- Another extreme weather season can affect BGG's bottom line.
- Increased contract labor from unexpected demand may increase costs.
- Chinese trade war can increase costs in the short term.

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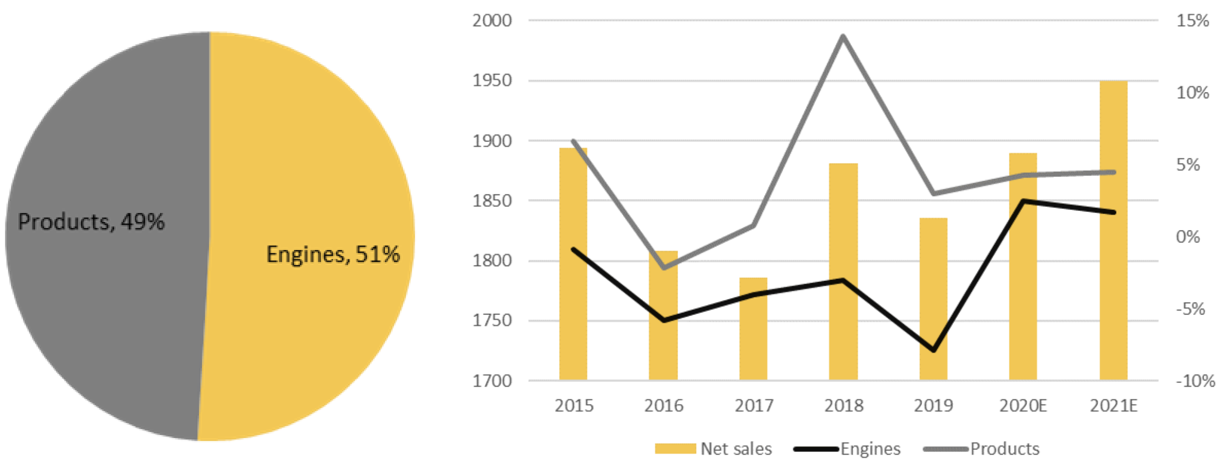
Company Overview

Briggs & Stratton engages in the design, manufacture, and distribution of gasoline engines and outdoor power equipment. The company is divided into two segments: engines and products. The engines segment manufactures four-cycle aluminum alloy gasoline engines that are used in walk-behind and riding lawn mowers, garden tillers, and snow throwers. The engines are sold through direct interaction with customers via its worldwide sales force. The products segment consists of lawn and garden power equipment, turf care products, portable and standby generators, pressure washers, snow throwers, and job site products. The products are sold through multiple channels of retail distribution. BGG was founded in 1908, and it is headquartered in Wauwatosa, WI.

Engines segment accounts for 51% of revenues. International sales account for 15% of revenues, primarily in Europe. The segment's sales come primarily from shipments to the following OEMs: MTD Products Inc. (MTD), Husqvarna Outdoor Products Group (HOP), Deere & Company (DE), and Power Distributors, LLC. Engine sales are expected to grow around 2% for the next two years and they benefit from normal retail sales growth.

Products segment accounts for 49% of revenues with most of those revenues coming from retail distribution to the following outlets: Lowe's (LOW), Sears (SHLDQ), PACE Inc., and The Home Depot (HD). Products are expected to grow around 4.5% for the next two years as the firm shifts SG&A towards the higher margin segments and grow their brand recognition.

Figures 1 & 2: Revenue (in millions) by segment in 2019 (left); revenue history (in millions - right)



Source: Company reports

Business/Industry Drivers

Though several factors may contribute to Briggs & Stratton's future success, the following are the most important business drivers:

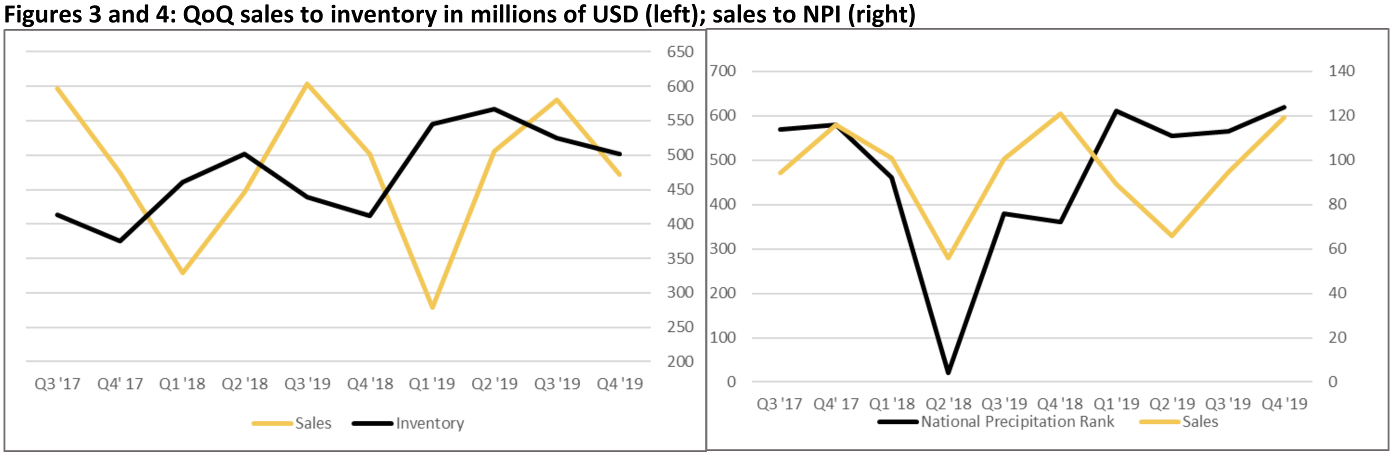
1) Seasonality
2) Retail sales growth
3) Gross margin & operational Improvements
4) Macroeconomic trends
5) Competitive forces

Seasonality

BGG estimates demand for engines in Q1 and does not sell them

BGG sales are seasonal. The firm enters into contracts to produce engines to OEMs and makes consistent amounts throughout the year. Historically, Q1 is the lowest selling quarter and has the highest inventory. Because the contracts are annual, large inventory and overproduction can negatively affect BGG since inventory has a cost. The firm produces the engines in anticipation of consumer demand in the spring and summer seasons.

Figures 3 and 4: QoQ sales to inventory in millions of USD (left); sales to NPI (right)



Source: Company reports and NOAA NPI Data

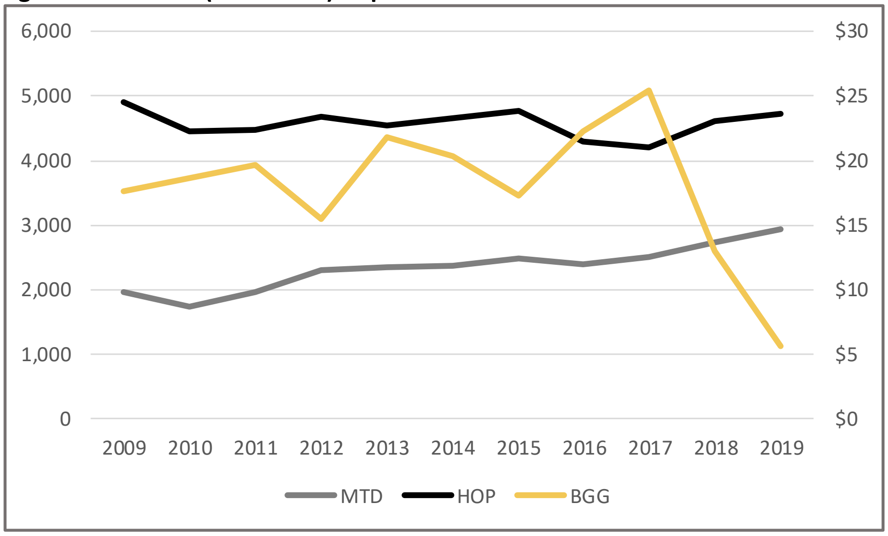
BGG seeks to grow commercial sales to offset uncertainty of consumer seasonal products

Changes in weather drastically influence consumer buying patterns in lawn and garden. Last year in the United States, there were record levels of precipitation (figure 4). NPI tracks the overall precipitation levels of the US excluding Alaska and Hawaii. There is a positive correlation between the amount of precipitation and sales, with a quarter log. Consumers who experience a wet summer are more likely to purchase a new lawn product due to a strong grass growing season. The winter season provides sales of standby generators, portable generators, and snow throwers. These products are affected by the weather and correlate with snowstorms and hurricanes. A wet winter or late winter can dramatically impact sales.

BGG is continuing to diversify its segments into more commercial and fewer seasonal products. The job site products--sold mainly to construction and infrastructure, mining, oil, and gas industries--have grown 5% in 2017 and 7% 2018 and now account for 11% of engine segment sales. This is important for BGG as it's an extremely small cyclical company that is hurt by negative economic downtrends.

Retail Sales Growth

Figure 4: Revenue (in millions) to price of BGG in USD

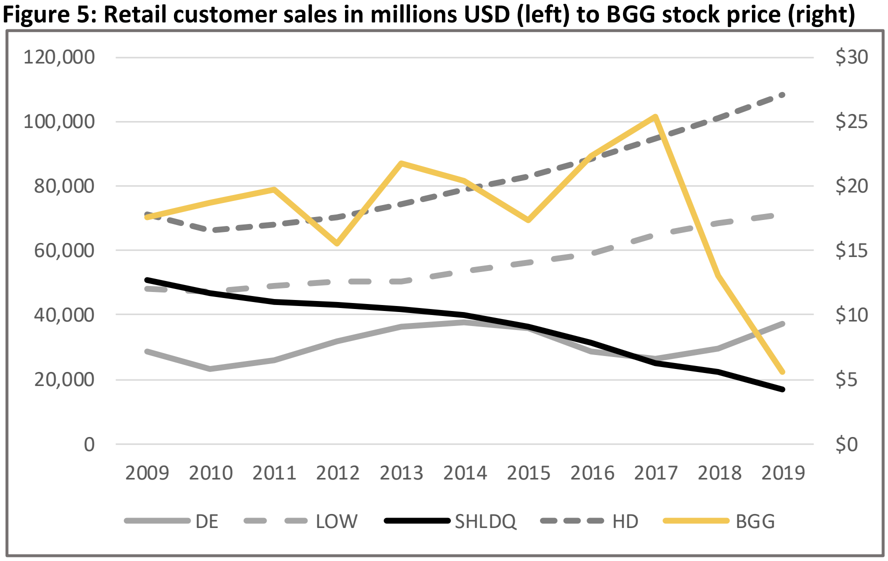


Source: FactSet

BGG's largest engine customers have seen positive sales growth

As shown (figure 4), Briggs stock has continued to slide in price despite growth in sales from its largest OEMs (MTD Products MTD & Husqvarna Outdoor Products Group HOP). A rise in short-term debt, large investment into ERP upgrades, and international tariffs have stunted BGG's price; however, the positive trend of sales from its largest customers provides a positive outlook for BGG. It shows us that consumers are still purchasing lawn and garden equipment at a steady rate. When BGG integrates its ERP (enterprise resource program) system fully, which also transitions parts of manufacturing into the US, BGG can expect steady sales with decreasing debt and rising margins. The ERP is expected to provide a more accurate inventory management system and allow BGG to keep costs down.

Figure 5: Retail customer sales in millions USD (left) to BGG stock price (right)

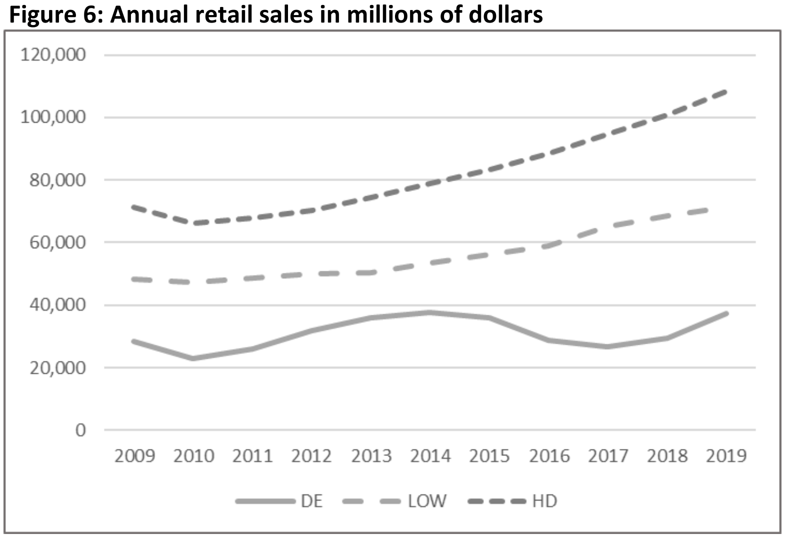


Source: FactSet

(Figure 5) shows sales for De- Deere, LOW- Lowes, SHLDQ- Sears, and HD- Home Depot. According to BGG, 71% of lawn and garden equipment are sold in the retail environment. The retail segment is also growing. While overall retail is hit by ecommercing, in-store retail growth for large-scale products is continuing to outpace demand on the ecommerce side. For example, consumers still prefer to shop for lawnmowers and other large products in person. Thus, BGG may be protected from the fall in brick and mortar retail sales.

The Sears bankruptcy affected BGG in many ways. Most importantly, it exposed the company to its lack of flexibility in responding to catastrophic events. Sears was a major customer for Briggs & Stratton. BGG will hope to transition this loss into better relationships with Home Depot, Walmart, and Lowe's.

Figure 6: Annual retail sales in millions of dollars



Source: FactSet

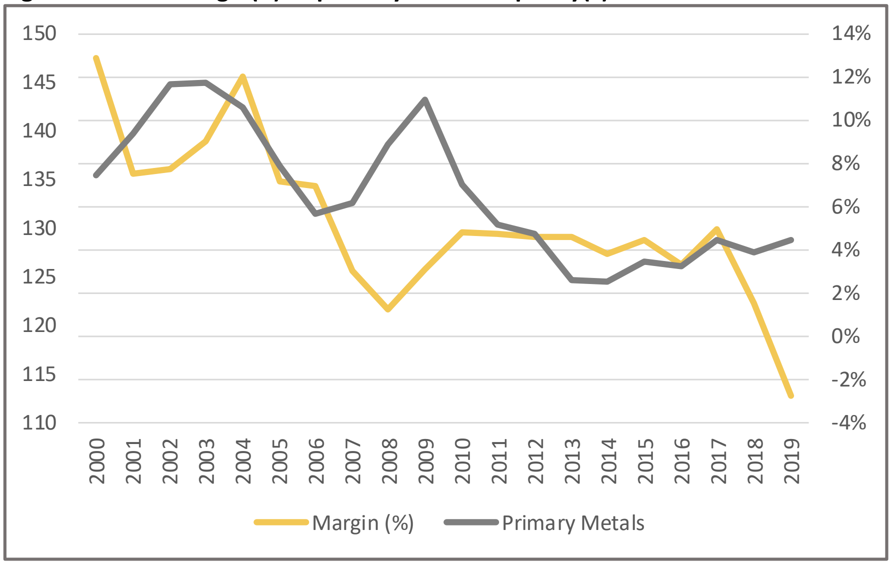
Gross Margin and Operational Improvements

As student debt increases, young consumers are spending less on owning larger shares of land

BGG's costs have recently increased due to the insourcing of a manufacturing plant in New York. The increased operational costs came from increases in skilled labor due to the plant moving some production to the US as well as the introduction of its new business optimization program. Skilled labor increased because of the use of short-term contracted labor that was higher cost than full-time labor. Consolidation of plants due to underutilization has negatively impacted costs as well. The firm consolidated two southern plants to cut costs for producing small engines.

Tariffs, currency losses, weather, and a bankrupt customer disrupted costs and sales. The company was impacted by swings in metals and machinery costs due to the Chinese tariffs, particularly the cost of steel and aluminum. The company signs contracts to fulfill orders in the first fiscal quarter and sells most of its products in Q3. Due to a major loss in hedging in the forex market, BGG has seen costs rise while sales fell. The gap between costs and sales is rising; however, BGG anticipates that the weather will not be as volatile as last year's historic swings, so we can anticipate a steadier year in terms of sales. The firm did not forecast the bankruptcy of Sears and the increased costs of foreign production.

Figure 7: Gross margin(R) vs primary metals capacity(L)



Source: FactSet, IMCP

ERP upgrades and consolidation will increase margins

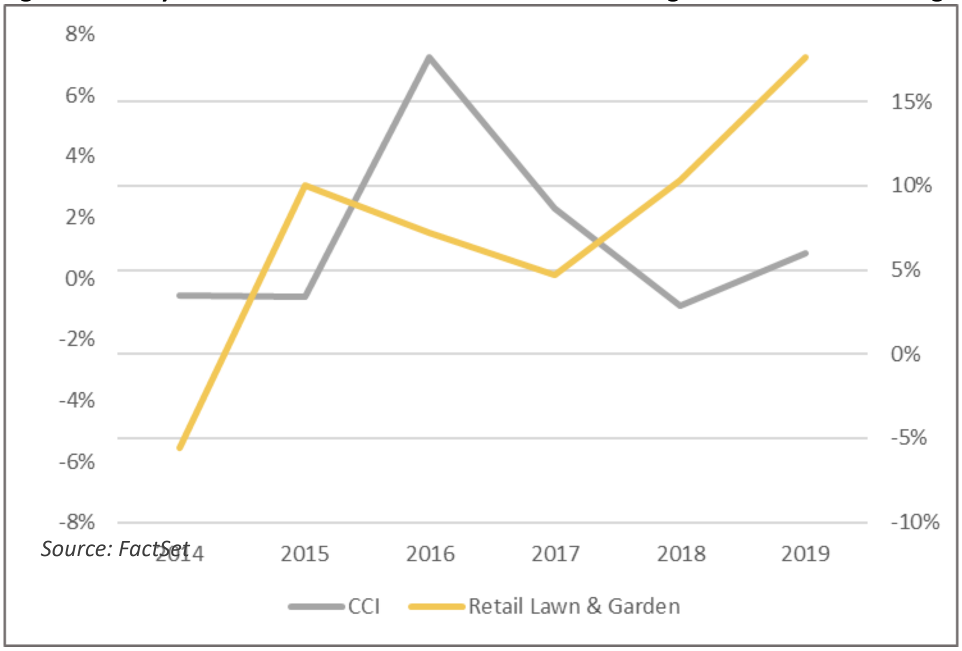
The company experienced a dramatic drop in gross margin due to extremely unpredictable swings in multiple external factors. The improvement of their business optimization program will streamline the inefficiencies in the last fiscal year. The company anticipates a further cost of $5 million for the program in the next fiscal year, but it expects to save more than that through improvements in the production of small engines. $5 million loses in $0.11 to the bottom line.

BGG also plans to increase gross margin through consolidation efforts. Management anticipates a pre-tax cost savings of $12 to $14 million or $0.30 to EPS, which will allow the company to decrease costs even if sales grow. In my DCF model, I have BGG slowly making its way back to a lower than average historical gross margin.

Macroeconomic Trends

As consumer confidence (CCI) improves (figure 8) retail sales rise. As the economy strengthens, consumers purchase better quality goods. With CCI and the job market on the rise, I believe BGG will experience tailwinds. BGG produces higher quality parts for premium models of lawnmowers. Consumers are more likely to buy when CCI is high rather than upgrade current mowers if it is low. I expect the economy to continue to grow as we reach market highs and the strongest job market in five decades.

Figure 8: Yearly consumer confidence index to retail lawn & garden sales YoY% change

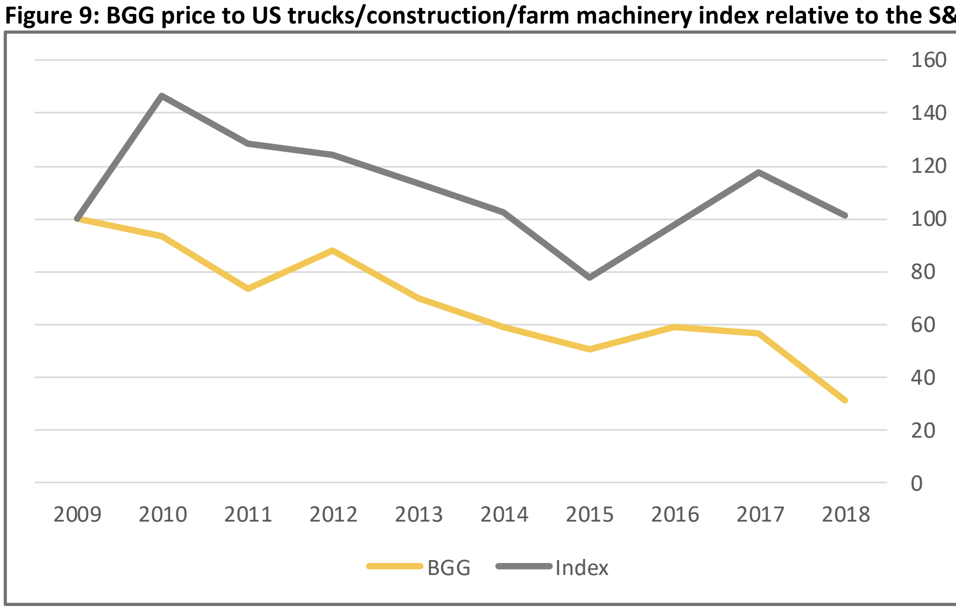


Source: Factset, IMCP

The retail industry has followed changes in consumer confidence

Briggs is highly correlated with the consumer confidence index (CCI). The index shows us how retail sales grow as CCI grows, but with a lag. Even though consumers still need to cut the grass when the economy is depressed, they will seek alternative means rather than buying a brand-new lawnmower.

Figure 9: BGG price to US trucks/construction/farm machinery index relative to the S&P500



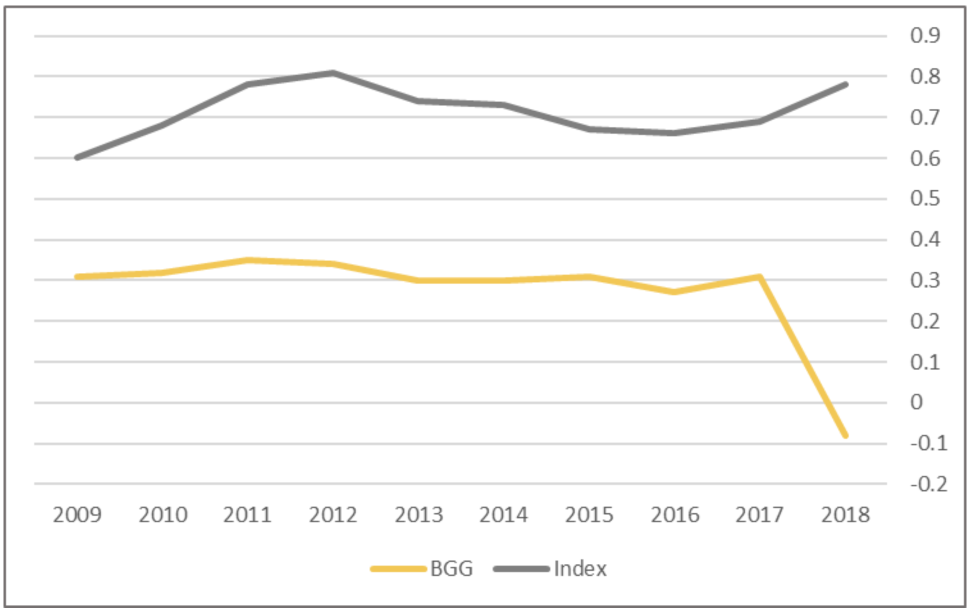
Source: Factset, IMCP

Competitors

Since BGG does not have a direct competitor, its competitors are divisions of larger firms. Versus trucks, construction, and farm machinery, the stock has performed poorly (figure 9). (Figure 10) shows that BGG's operating margin is much below the industry and overall market.

BGG primarily sells to retail. This makes up a smaller portion of the overall mower market. Just 11% of its $989 million engine sales (2019) were for commercial. The firm is making a move to commercial which could improve sales while also lowering risk if sales become more consistent. Commercial lawn care may replace equipment on a more regular schedule. Urbanization has also led to a larger growth rate of commercial sales over retail due to the need to manicure apartment lots.

Figure 10: BGG operating margin relative to S&P500 and US trucks/construction/farm machinery operating margin relative to the S&P500

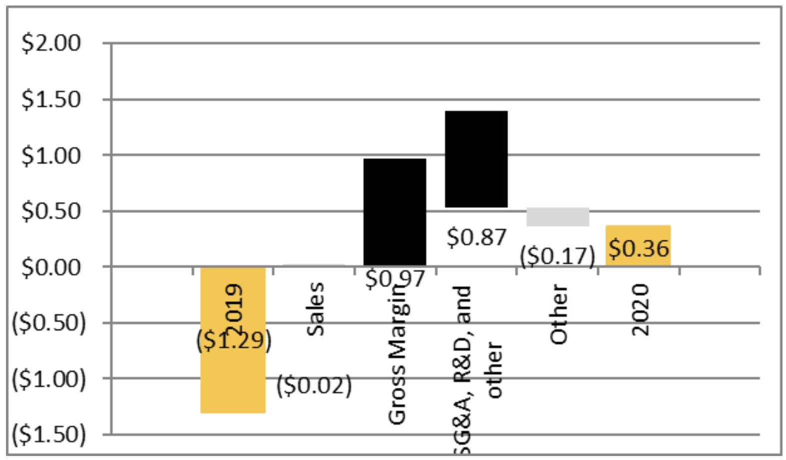


Source: Factset, IMCP

Financial Analysis

I anticipate EPS to grow to $0.36 in FY 2020. EBIT margin expansion through fiscal 2020 will be the main driver of this growth. BGG's gross margin fell to 16.45% in 2019 and from 21.1% in 2018. I expect a rebound to 19.15% which adds $0.97 to EPS. To hit these margin expansion goals, BGG will have to optimize their new ERP system rollout, clear up inventory ordering, and benefit from positive weather patterns throughout the United States. SG&A and other should also decline as a percent of sales and add $0.87 to EPS

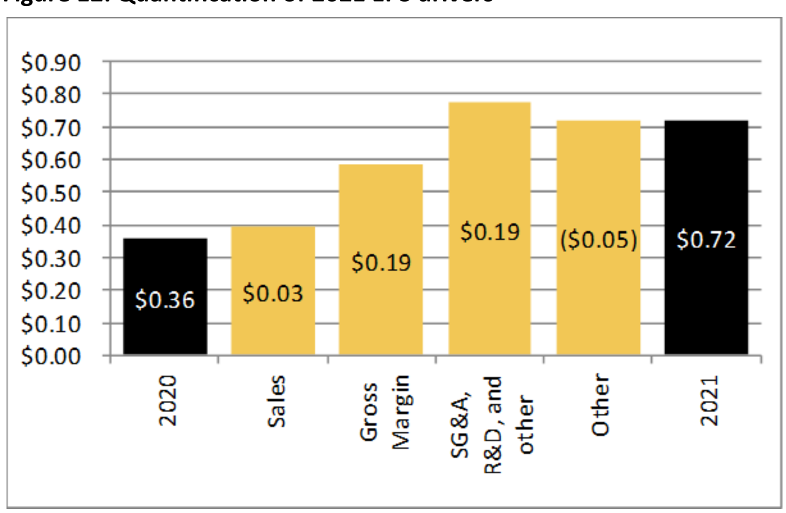
Figure 11: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

For 2021, EPS estimates are to grow 100% to $0.72. With a steady improvement in sales, BGG should benefit from some operating leverage. A reduction in operating expenses, mainly from inventory efficiency improvements, will increase margins as well. Plus, a decrease in labor costs will result from less reliance on short-term contract labor in its NYC plant. This margin expansion is crucial for BGG and its growth as that is the main driver of EPS expansion. I expect gross margin to rise to 19.65% in 2021, and SG&A and other to fall another 0.5% as a percent of sales. This combined boosts EBIT margin by 1% and lifts EPS $0.38.

Figure 12: Quantification of 2021 EPS drivers



Source: Company Reports, IMCP

A normalized margin average from ERP upgrades leads to quick EPS growth.

I am slightly above consensus estimates for fiscal year 1 at $0.32 vs. Streets, at $0.22. However, it is important to note that BGG is only followed by two analysts and one has an estimate of $0.03 and the other is at $0.51. For fiscal year 2021, I am again above consensus at $0.72 vs the Street at $0.61. I am more bullish on increased operational efficiency and expect more normal weather patterns.

Revenues

Sales for fiscal 2020 are expected to grow 3.3% to $1,898 million. This growth comes from an increase in engine sales as the economy continues to strengthen and consumers search for better quality home upgrades.

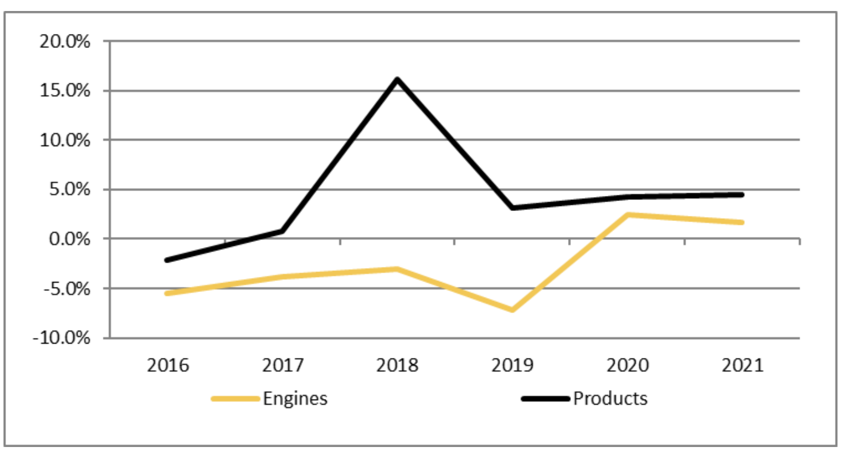
Figure 13: Revenues forecasts 2015-2021E

Items	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21
Sales	$1,895	$1,809	$1,786	$1,881	$1,837	$1,898	$1,955
Direct costs	1,511	1,438	1,402	1,483	1,536	1,535	1,572
Gross Margin	383	371	384	398	301	363	383
SG&A, and other	317	325	287	365	340	306	305
EBIT	66	46	97	33	(39)	57	78
Interest	20	20	20	25	29	26	26
EBT	47	26	77	7	(68)	31	52
Taxes	11	9	23	22	(14)	6	11
Income	36	17	54	(15)	(54)	25	41
Other	(10)	(10)	(3)	(4)		10	12
Net income	45.6	27	57	(11)	(54)	15	29
Basic Shares	44.4	43.0	42.2	42.1	41.6	41.0	40.0
Fully Diluted Shares	44.4	43.2	42.3	42.1	41.6	41.0	40.0
EPS	$1.03	$0.63	$1.34	($0.26)	($1.29)	$0.36	$0.72
EPS Fully Diluted	$1.03	$0.62	$1.34	($0.26)	($1.29)	$0.36	$0.72
DPS	$0.51	$0.55	$0.57	$0.57	$0.43	$0.37	$0.40

Source: Factset, IMCP

Figure 14 shows that engine growth is a driving factor of bringing earnings positive. Engine sales were down 7% in 2019, or $70 million. I expect growth for engines to rebound to 2-3% growth and product sales to grow above 4%. Overall, this yields 3.3% and 3% overall revenue growth in 2020 and 2021 respectively. Products, which have higher margins, will continue to overtake engines as the largest component of sales. This is being driven by a larger push towards marketing and selling of the products as BGG shifts SG&A towards the products segment. Products is forecasted to be 52.0% of sales in 2021 up from 48.1% in 2018.

Figure 14: Engine & Product Sales 2016-2021E



Source: Company Reports

Return on Equity

Briggs has had negative ROE in the latest two fiscal years. I anticipate ROE to move positive in the next two years as EBIT margins return to positive. A host of external and internal events caused margins to move negative. ROE will also rise, perhaps unfortunate due to increased leverage. While debt is not up, average equity declines in 2020 given the loss in 2019 and minimal earnings in 2020. Since P/B is at 0.5, this implies investors are probably skeptical of the improvement which may create an investment opportunity.

Figure 15: ROE breakdown, 2016 – 2021E

5-stage DuPont	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21
EBIT / sales		2.5%	5.4%	1.7%	-2.1%	3.0%	4.0%
Sales / avg assets		1.24	1.23	1.30	1.23	1.20	1.22
EBT / EBIT		56.3%	79.0%	22.9%	175.6%	54.9%	66.2%
Net income /EBT		104.7%	74.1%	-145.3%	79.4%	47.3%	55.8%
ROA		1.9%	3.9%	-0.8%	-3.6%	0.9%	1.8%
Avg assets / avg equity		2.73	2.76	2.56	2.95	3.53	3.55
ROE		5.1%	10.8%	-1.9%	-10.6%	3.3%	6.4%

Source: Company Reports

Net margin expansion means positive ROE.

Free Cash Flow

As NOPAT turned down, FCFE was surprisingly resilient. This was due to the drop in working capital over the last few years; although $88 million of the $275 million decline since 2015 was from lower cash (now at just $30 mil). Going forward, FCFE is expected to remain flat from 2019. As NOPAT rises the firm will invest in net fixed assets, and most of the working capital decline is behind the firm.

Figure 16: Free cash flow calculations

Free Cash Flow With Cash and Debt	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21
NOPAT	$50	$30	$68	-$65	-$31	$45	$62
Growth		*-40.1%*	*124.3%*	*-196.3%*	*-53.0%*	*-247.5%*	*36.7%*
NOWC	460	422	359	295	185	189	159
Net fixed assets	664	716	762	765	789	815	840
Total net operating capital	$1,124	$1,138	$1,121	$1,060	$974	$1,004	$998
Growth		*1.3%*	*-1.6%*	*-5.4%*	*-8.1%*	*3.2%*	*-0.6%*
- Change in NOWC		(38)	(63)	(64)	(110)	5	(31)
- Change in NFA		52	46	3	24	26	24
FCFF		$16	$85	-$4	$56	$14	$68
Growth			*448.8%*	*-105.2%*	*-1345.2%*	*-74.1%*	*371.7%*
- After-tax interest expense		13	14	(50)	23	20	21
+ Net new short-term and long-term debt		(4)	1	(22)	(5)	31	(19)
FCFE		-$1	$72	$24	$27	$25	$28
Growth			*-5623.1%*	*-66.6%*	*14.2%*	*-8.8%*	*12.0%*
Sources of cash (FCFE)		-$1	$72	$24	$27	$25	$28
Uses of cash							
Other expense		($10)	($3)	($4)	$0	$10	$12
Increase mkt sec		-	-	-	-	-	-
Dividends		24	24	24	18	15	16
Change in other equity		84	(33)	(46)	52	0	(0)
		$98	($12)	($26)	$70	$25	$28
Change in other liab		99	(84)	(50)	43	-	-
Total		($1)	$72	$24	$27	$25	$28

Source: Company Reports, IMCP

Valuation

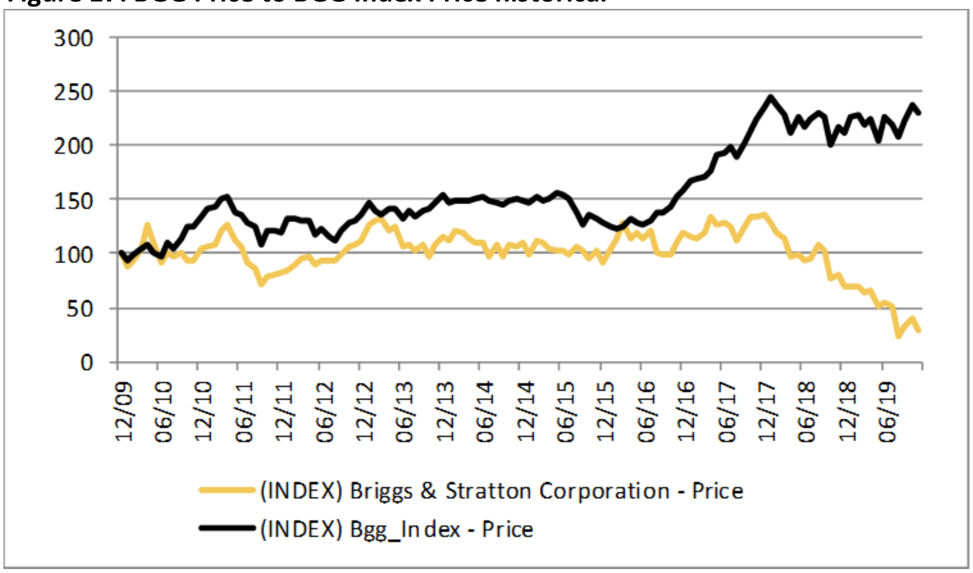
BGG was valued using multiples and a 3-stage discounting cash flow model. BGG is trading at a significant discount to its past as they have reach 44-year lows in price as well as negative earnings in the past two years. However, relative to peers and due to the lack of coverage I believe that BGG is extremely discounted. Even with my most conservative estimates in my bear case, I still have a target price at $6.75 which is an increase from its current $5.50. Using P/B and P/S ratios, I conclude that BGG should hit $8 a share assuming normal weather circumstances. P/E analysis is not meaningful since earnings are negative.

Trading History

In figure 17 I charted BGG price to my custom index of peers (see appendix 9 and figure 18 for names). The stock has significantly underperformed, and especially since mid-2017.

One-time impairments hurt company in the past

Figure 17: BGG Price to BGG Index Price historical



Source: FactSet, IMCP

There are probably low expectations for BGG to perform well in the future. However, I believe BGG has an opportunity to grow from this point using even conservative numbers. Weather returning to normal is not a stretch, replacing temporary workers in NYC seems doable, forex losses should be one time, inventory systems are being implemented, working capital already improved last few years, and perhaps the tariff war is abating. As long as the economy avoids a recession, recovery in margins should occur.

Relative Valuation

BGG is trading significantly lower than its peers on P/B. This should be the case as it is the riskiest asset in the peer group, however, the stock is trading at multi decade lows in terms of P/B. In my DCF model I assumed a consistent P/B ratio of 0.55, which is extremely conservative. With my estimated 3.3% ROE for FY20, I believe BGG can experience improvement in its P/B.

BGG is trading at 1/8 of its peers P/B ratio

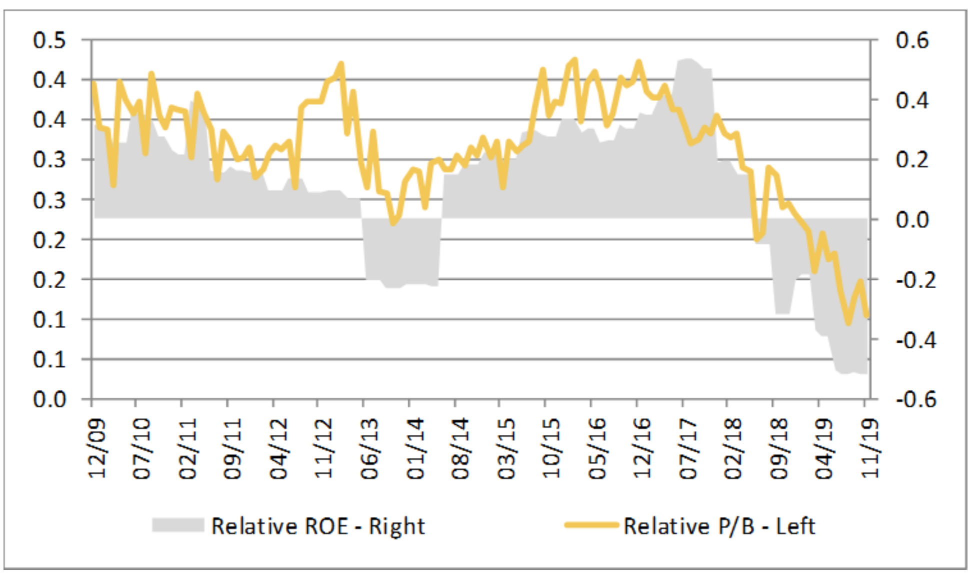
Figure 18: BGG relative too peers

Ticker	2019 ROE	P/B
BGG	-3.0%	0.52
7269-JP	11.3%	1.54
GGG	30.7%	8.66
GNRC	37.6%	7.67
TTC	37.4%	10.25
7012-JP	5.9%	0.94
DE	25.5%	4.43
Average	20.8%	4.86
Median	25.5%	4.43

Source: FactSet, IMCP

Figure 19 shows the relative P/B and relative ROE of the peer group. As ROE improves 3.3%, the stock should trade at a P/B of 0.7. To find this I plotted the peer groups ROE to P/B and found the regression formula y=23.48x-0.0139 and plugged in a 3% projected ROE estimate for 2020. However, I am conservative and assume a P/B of 0.5 in my DCF model.

Figure 19: Relative P/B vs Relative NTM ROE



Source: IMCP

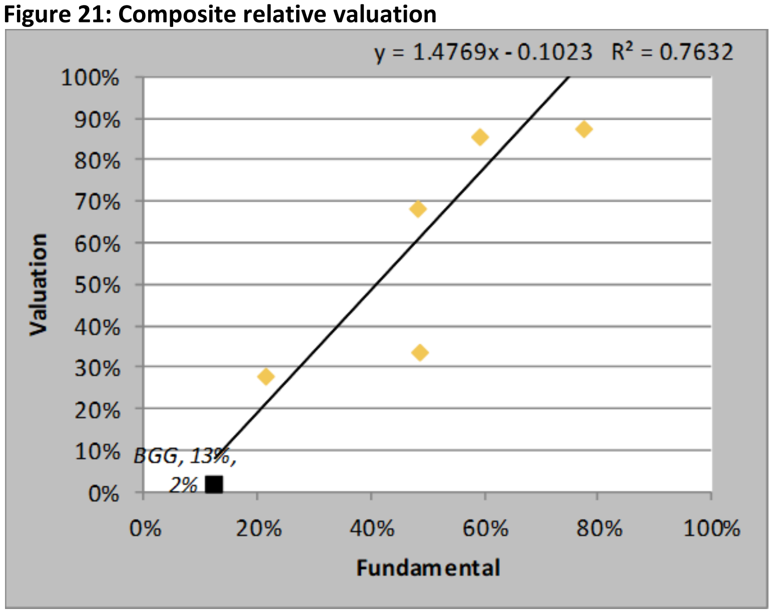
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A 25% weighting of long-term growth rate, 25% weight in 2021E earnings growth, and a 50% weight in NTM ROE was compared to a 20% weight of P/B, P/CF, and EV/EBIT, and a 40% weight of P/S. After eliminating Sears, an extreme outlier, the regression line had an R-squared of 0.76. One can see that BGG is below the line, so it is inexpensive based on its fundamentals. Plus, it is the cheapest stock overall.

Figure 20: Composite valuation, % of range

							Fundamental			Valuation			
						Weight	25.0%	25.0%	50.0%	20.0%	40.0%	20.0%	20.0%
		Rank		Target	Weighted		arnings Growt		2019				EV/
Ticker	Name	Diff	Diff	Value	Fund	Value	LTG	2021	ROE	P/B	P/S	P/CF	EBIT
BGG	BRIGGS & STRATTON	6	38%	40%	13%	2%	50%	0%	0%	0%	0%	8%	0%
7269-JP	SUZUKI MOTOR CORP	5	21%	49%	21%	28%	0%	15%	35%	11%	0%	14%	67%
GGG	GRACO INC	1	-20%	87%	59%	106%	60%	12%	83%	84%	100%	50%	98%
GNRC	GENERAC HOLDINGS INC	2	1%	86%	59%	86%	30%	7%	100%	74%	53%	100%	79%
TTC	TORO CO	4	17%	104%	77%	88%	100%	10%	100%	100%	51%	50%	97%
7012-JP	KAWASAKI HEAVY IND	7	42%	76%	48%	34%	50%	100%	22%	4%	3%	0%	87%
DE	DEERE & CO	3	7%	75%	48%	68%	23%	28%	70%	40%	28%	77%	100%

Source: IMCP

Figure 21: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value BGG.

For the purpose of this analysis, the company's cost of equity was calculated to be 12.40% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the ten-year Treasury bond yield, is 2.00%.

- A ten-year beta of 1.3 was utilized since the company has higher risk than the market.
- A long-term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 12.40% (2 + 1.3 (10.0 – 2)).

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be -$0.21 and -$0.20, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of -$0.35 per share. Thus, stage one of this discounted cash flow analysis contributes -$0.35 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin, and capital growth assumptions. The resulting cash flows are then discounted using the company's 12.40% cost of equity. I assume 1% sales growth in 2022, staying consistent through 2026. The ratio of NWC and NFA to sales will remain at 2021 levels. Also, the NOPAT margin is expected to rise to 6% in 2026 from 2.4% in 2020. Finally, after-tax interest is expected to rise 1% per year as the result of modest increases in borrowing.

Figure 22: FCFE and discounted FCFE, 2020 – 2026

Year ending January	2020	2021	2022	2023	2024	2025	2026
FCFE	($0.21)	($0.20)	$1.06	$1.35	$1.65	$1.96	$2.27
Discounted FCFE	($0.19)	($0.16)	$0.74	$0.85	$0.92	$0.97	$1.00

Source: Factset, IMCP

Added together, these discounted cash flows total $4.48.

Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $1.31 in 2022 to $2.53 in 2021. I also assume dividends grow from $15 million in 2020 to $16 million in 2021, or at a constant payout to EPS.

Figure 23: EPS estimates for 2020 – 2026

Year ending January	2020	2021	2022	2023	2024	2025	2026
EPS	$0.36	$0.72	$1.31	$1.61	$1.91	$2.22	$2.53

Source: Factset, IMCP

Stage three of the model requires an assumption regarding the company's terminal multiples. I used conservative estimates for P/S and P/B. I used the current low P/B of 0.55 and 0.13 P/S. conservative estimate. This gives us a terminal value of $2.95 for P/S and a $3.83 in P/B. While I assume a recovery in the financial wellbeing by 2021, I assume the market is slow to recognize this over the next year, so I keep my multiples low. I also include a Gordon Growth Model value which assumes 1% growth past 2026. In total, including all three stages and all three terminal values (P/S 55% weight, P/B 35%, and Gordon growth 10%), the base case is an $8 value.

Scenario Analysis

Figure 24: Scenario analysis

Valuation(Weight)	Bull	Base	Bear
P/S Val (.55)	$ 9.80	$ 6.86	$ 5.72
P/B Val (.35)	$ 8.66	$ 7.96	$ 6.57
CG Val (.1)	$ 13.00	$ 13.00	$ 13.00
Price	$ 9.72	$ 7.86	$ 6.75
Probability	20%	60%	20%
Target Price		$ 8.01	

Source: Factset, IMCP

Utilizing the weights mentioned earlier in the DCF section, I was able to create a scenario analysis. Major catalysts for the bear case were less gross margin improvement and slower sales growth. This was a 20% weight in my analysis because I believe my base case is conservative and most accurate. Major catalysts for my bull case were more than expected sales and a higher gross margin. A weight of 20% is justifiable because it is possible for the company to hit higher numbers with a great macro environment.

Business Risks

Although I have many reasons to be optimistic about Briggs & Stratton, there are several good reasons to be cautious.

Exposure to Chinese Tariffs

As BGG sources a large amount of materials form China, it is affected heavily from tariffs. An increase in tariffs means an increase in costs for BGG.

Seasonality of Weather Patterns

Extreme negative weather patterns can dramatically impact consumers decisions to buy BGG products, and lead to lower sales.

Labor issues:

An increase in contract labor from bad operational management can lead to increase costs that will dramatically affect earnings.

Inability to grow gross margin:

BGG has to grow margins at least close to what its long-term average was in order to achieve my price target. This means it must decrease costs.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Engines have low margins and entering the business requires much up front capital. BGG has established itself as a quality motor manufacturer for decades.

Threat of Substitutes – Med

Few companies strictly manufacture lawnmowers. The risk would be from a large company deciding to make motors in house.

Supplier Power -- High

BGG has little pricing power over the suppliers as it does not benefit from economies of scale.

Buyer Power – High

Consumers can purchase any lawnmower and BGG has little brand recognition.

Intensity of Competition – Med

Briggs's main competition is itself. In retail, competition is very high as there is a lot of choices for consumers.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Strong Brand Reputation Quality Products and Services Long History	Weak Earnings High Margins Cyclicality of Business
Opportunities	**Threats**
Service Growth International Growth Increased M&A Activity	Weather Patterns Macro Sales Downtrend Rising Labor Costs

Appendix 3: Income Statement

Income Statement							
Items	**Jun-15**	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**	**Jun-21**
Sales	$1,895	$1,809	$1,786	$1,881	$1,837	$1,898	$1,955
Direct costs	1,511	1,438	1,402	1,483	1,536	1,535	1,572
Gross Margin	383	371	384	398	301	363	383
SG&A, and other	317	325	287	365	340	306	305
EBIT	66	46	97	33	(39)	57	78
Interest	20	20	20	25	29	26	29
EBT	47	26	77	7	(68)	31	49
Taxes	11	9	23	22	(14)	6	10
Income	36	17	54	(15)	(54)	25	39
Other	(10)	(10)	(3)	(4)		10	12
Net income	45.6	27	57	(11)	(54)	15	27
Basic Shares	44.4	43.0	42.2	42.1	41.6	41.0	40.0
Fully Diluted Shares	44.4	43.2	42.3	42.1	41.6	41.0	40.0
EPS	$1.03	$0.63	$1.34	($0.26)	($1.29)	$0.36	$0.66
EPS Fully Diluted	$1.03	$0.62	$1.34	($0.26)	($1.29)	$0.36	$0.66
DPS	$0.51	$0.55	$0.57	$0.57	$0.43	$0.37	$0.40

Appendix 4: Balance Sheets

Capital							
Items	**Jun-15**	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**	**Jun-21**
Cash	118	90	62	45	30	27	19
Operating assets ex cash	677	651	628	634	733	759	802
Operating assets	795	741	689	679	763	786	820
Operating liabilities	335	318	330	384	578	597	615
NOWC	460	422	359	295	185	189	205
NOWC ex cash (NWC)	342	333	297	250	155	162	187
NFA	664	716	762	765	789	815	840
Invested capital	*$1,124*	*$1,138*	*$1,121*	*$1,060*	*$974*	*$1,004*	*$1,045*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$1,459*	*$1,457*	*$1,451*	*$1,444*	*$1,551*	*$1,601*	*$1,660*
Short-term and long-term debt	$225	$221	$222	$200	$195	$226	$256
Other liabilities	325	423	340	289	332	332	332
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	574	494	559	570	447	446	457
Total supplied capital	*$1,124*	*$1,138*	*$1,121*	*$1,060*	*$974*	*$1,004*	*$1,045*

Appendix 5: Sales Forecast

Sales						Base Case			Bull Case			Bear Case	
Items	**Jun-15**	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**	**Jun-21**		**Jun-20**	**Jun-21**		**Jun-20**	**Jun-21**
Sales	1,895	1,809	1,786	1,881	1,837	1,898	1,955	-	1,909	1,976	-	1,889	1,936
Growth		*-4.5%*	*-1.3%*	*5.3%*	*-2.3%*	*3.3%*	*3.0%*		*3.9%*	*3.5%*		*2.8%*	*2.5%*
Engines	1,209	1,143	1,099	1,066	989	1,014	1,031		1,019	1,041		1,009	1,021
Growth		*-5.5%*	*-3.8%*	*-3.0%*	*-7.2%*	*2.5%*	*1.7%*		*3.0%*	*2.2%*		*2.0%*	*1.2%*
% of sales	*63.8%*	*63.2%*	*61.5%*	*56.7%*	*53.8%*	*53.4%*	*52.7%*		*53.4%*	*52.7%*		*53.4%*	*52.7%*
Products	789	772	778	904	932	972	1,016		979	1,028		967	1,006
Growth		*-2.2%*	*0.8%*	*16.2%*	*3.1%*	*4.3%*	*4.5%*		*5.0%*	*5.0%*		*3.8%*	*4.0%*
% of sales	*41.6%*	*42.7%*	*43.6%*	*48.1%*	*50.7%*	*51.2%*	*52.0%*		*51.3%*	*52.0%*		*51.2%*	*52.0%*
Other	(102)	(106)	(91)	(89)	(84)	(88)	(92)		(88)	(93)		(87)	(91
Growth		*3.9%*	*-14.2%*	*-2.2%*	*-5.6%*	*4.5%*	*4.5%*		*5.0%*	*5.0%*		*4.0%*	*4.0%*
% of sales	*-5.4%*	*-5.9%*	*-5.1%*	*-4.7%*	*-4.6%*	*-4.6%*	*-4.7%*		*-4.6%*	*-4.7%*		*-4.6%*	*-4.7%*
Total	100.0%	100.0%	100.0%	100.1%	100.0%	100.0%	100.0%		100.0%	100.0%		100.0%	100.0%
United States	1,312	1,299	1,246	1,347	1,355	1,405	1,466		1,413	1,482		1,398	1,452
Growth		*-1.0%*	*-4.1%*	*8.1%*	*0.6%*	*3.7%*	*4.4%*		*4.3%*	*4.9%*		*3.2%*	*3.9%*
% of sales	*69.2%*	*71.8%*	*69.8%*	*71.6%*	*73.8%*	*74.0%*	*75.0%*		*74.0%*	*75.0%*		*74.0%*	*75.0%*
Other Countries	582	510	540	535	482	493	489		496	494		491	484
Growth		*-12.4%*	*5.9%*	*-0.9%*	*-9.9%*	*2.4%*	*-1.0%*		*3.0%*	*-0.5%*		*1.9%*	*-1.4%*
% of sales	*30.7%*	*28.2%*	*30.2%*	*28.4%*	*26.2%*	*26.0%*	*25.0%*		*26.0%*	*25.0%*		*26.0%*	*25.0%*

Appendix 6: Ratios

Ratios							
Items	**Jun-15**	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**	**Jun-21**
Profitability							
Gross margin	20.2%	20.5%	21.5%	21.1%	16.4%	19.1%	19.6%
Operating (EBIT) margin	3.5%	2.5%	5.4%	1.7%	-2.1%	3.0%	4.0%
Net profit margin	2.4%	1.5%	3.2%	-0.6%	-2.9%	0.8%	1.4%
Activity							
NFA (gross) turnover		2.62	2.42	2.46	2.36	2.37	2.36
Total asset turnover		1.24	1.23	1.30	1.23	1.20	1.20
Liquidity							
Op asset / op liab	2.37	2.33	2.09	1.77	1.32	1.32	1.33
NOWC Percent of sales		24.4%	21.9%	17.4%	13.1%	9.9%	10.1%
Solvency							
Debt to assets	15.4%	15.2%	15.3%	13.9%	12.6%	14.1%	15.4%
Debt to equity	39.2%	44.8%	39.7%	35.1%	43.7%	50.6%	56.0%
Other liab to assets	22.2%	29.1%	23.4%	20.0%	21.4%	20.7%	20.0%
Total debt to assets	37.7%	44.3%	38.7%	33.9%	34.0%	34.8%	35.4%
Total liabilities to assets	60.6%	66.1%	61.5%	60.5%	71.2%	72.1%	72.5%
Debt to EBIT	3.39	4.83	2.29	6.10	(5.05)	3.97	3.27
EBIT/interest	3.41	2.29	4.77	1.30	(1.32)	2.22	2.66
Debt to total net op capital	20.0%	19.4%	19.8%	18.9%	20.0%	22.5%	24.5%
ROIC							
NOPAT to sales	2.7%	1.7%	3.8%	-3.5%	-1.7%	2.4%	3.2%
Sales to NWC		5.37	5.67	6.87	9.06	11.96	11.20
Sales to NFA		2.62	2.42	2.46	2.36	2.37	2.36
Sales to IC ex cash		1.76	1.69	1.81	1.88	1.98	1.95
Total ROIC ex cash		2.9%	6.4%	-6.3%	-3.1%	4.7%	6.2%
NOPAT to sales	2.7%	1.7%	3.8%	-3.5%	-1.7%	2.4%	3.2%
Sales to NOWC		4.10	4.57	5.75	7.66	10.14	9.90
Sales to NFA		2.62	2.42	2.46	2.36	2.37	2.36
Sales to IC		1.60	1.58	1.73	1.81	1.92	1.91
Total ROIC		2.7%	6.0%	-6.0%	-3.0%	4.6%	6.0%
NOPAT to sales	2.7%	1.7%	3.8%	-3.5%	-1.7%	2.4%	3.2%
Sales to EOY NWC	5.55	5.44	6.01	7.52	11.84	11.69	10.47
Sales to EOY NFA	2.85	2.53	2.35	2.46	2.33	2.33	2.33
Sales to EOY IC ex cash	1.88	1.73	1.69	1.85	1.95	1.94	1.90
Total ROIC using EOY IC ex cash	5.0%	2.9%	6.4%	-6.4%	-3.2%	4.6%	6.0%
NOPAT to sales	2.7%	1.7%	3.8%	-3.5%	-1.7%	2.4%	3.2%
Sales to EOY NOWC	4.12	4.28	4.97	6.37	9.94	10.02	9.52
Sales to EOY NFA	2.85	2.53	2.35	2.46	2.33	2.33	2.33
Sales to EOY IC	1.69	1.59	1.59	1.77	1.89	1.89	1.87
Total ROIC using EOY IC	4.5%	2.7%	6.0%	-6.1%	-3.1%	4.5%	5.9%
ROE							
5-stage DuPont	**Jun-15**	**Jun-16**	**Jun-17**	**Jun-18**	**Jun-19**	**Jun-20**	**Jun-21**
EBIT / sales		2.5%	5.4%	1.7%	-2.1%	3.0%	4.0%
Sales / avg assets		1.24	1.23	1.30	1.23	1.20	1.20
EBT / EBIT		56.3%	79.0%	22.9%	175.6%	54.9%	62.4%
Net income /EBT		104.7%	74.1%	-145.3%	79.4%	47.3%	54.4%
ROA		1.9%	3.9%	-0.8%	-3.6%	0.9%	1.6%
Avg assets / avg equity		2.73	2.76	2.56	2.95	3.53	3.61
ROE		5.1%	10.8%	-1.9%	-10.6%	3.3%	5.9%
3-stage							
Net income / sales		1.5%	3.2%	-0.6%	-2.9%	0.8%	1.4%
Sales / avg assets		1.24	1.23	1.30	1.23	1.20	1.20
ROA		1.9%	3.9%	-0.8%	-3.6%	0.9%	1.6%
Avg assets / avg equity		2.73	2.76	2.56	2.95	3.53	3.61
ROE		5.1%	10.8%	-1.9%	-10.6%	3.3%	5.9%
Payout Ratio		87.5%	42.4%	-219.7%	-33.0%	101.4%	60.3%
Retention Ratio		12.5%	57.6%	319.7%	133.0%	-1.4%	39.7%
Sustainable Growth Rate		0.6%	6.2%	-6.2%	-14.1%	0.0%	2.3%

Appendix 7: Cash Flow Statement

Cash Flow Statement						
Note: This is not the actual cash flow statement. It is created using the indirect method and various simplifying assumptions.					Base Case	
Items	Jun-16	Jun-17	Jun-18	Jun-19	Jun-20	Jun-21
Cash from Operatings (understated - depr'n added to net assets)						
Net income	$27	$57	($11)	($54)	$15	$29
Change in Net Working Capital ex cash	9	35	47	95	(7)	(24)
Cash from operations	$36	$92	$36	$41	$8	$4
Cash from Investing (understated - depr'n added to net assets)						
Change in NFA	($52)	($46)	($3)	($24)	($26)	($24)
Change in Marketable Securities	$0	$0	$0	$0	$0	$0
Cash from investing	($52)	($46)	($3)	($24)	($26)	($24)
Cash from Financing						
Change in Short-Term and Long-Term Debt	($4)	$1	($22)	($5)	$31	($19)
Change in Other liabilities	99	(84)	(50)	43	0	0
Change in Debt/Equity-Like Securities	0	0	0	0	0	0
Dividends	(24)	(24)	(24)	(18)	(15)	(16)
Change in Equity ex NI and Dividends	(84)	33	46	(52)	(0)	0
Cash from financing	($13)	($74)	($50)	($32)	$16	($35)
Change in Cash	(29)	(28)	(17)	(15)	(3)	(55)
Beginning Cash	118	90	62	45	30	27
Ending Cash	$90	$62	$45	$30	$27	($28)

Appendix 8: 3-stage DCF Model

	Year						
	1	2	3	4	5	6	7
	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*3.3%*	*3.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
NOPAT / S	*2.4%*	*3.2%*	*3.7%*	*4.3%*	*4.9%*	*5.4%*	*6.0%*
S / NWC	*11.69*	*10.47*	*10.47*	*10.47*	*10.47*	*10.47*	*10.47*
S / NFA (EOY)	*2.33*	*2.33*	*2.33*	*2.33*	*2.33*	*2.33*	*2.33*
S / IC (EOY)	*1.94*	*1.90*	*1.90*	*1.90*	*1.90*	*1.90*	*1.90*
ROIC (EOY)	*4.6%*	*6.0%*	*7.1%*	*8.2%*	*9.3%*	*10.3%*	*11.4%*
ROIC (BOY)		*6.3%*	*7.2%*	*8.3%*	*9.4%*	*10.5%*	*11.5%*
Share Growth		*-2.4%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$1,898	$1,955	$1,975	$1,994	$2,014	$2,034	$2,055
NOPAT	$45	$62	$74	$86	$98	$111	$123
Growth		*36.7%*	*19.2%*	*16.4%*	*14.4%*	*12.8%*	*11.6%*
- Change in NWC	7	24	2	2	2	2	2
NWC EOY	*162*	*187*	*189*	*190*	*192*	*194*	*196*
Growth NWC		*15.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
- Chg NFA	26	24	8	8	9	9	9
NFA EOY	*815*	*840*	*848*	*856*	*865*	*874*	*882*
Growth NFA		*3.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
Total inv in op cap	33	49	10	10	10	11	11
Total net op cap	977	1026	1037	1047	1057	1068	1079
FCFF	$12	$13	$63	$75	$88	$100	$113
% of sales	*0.6%*	*0.7%*	*3.2%*	*3.8%*	*4.3%*	*4.9%*	*5.5%*
Growth		*8.5%*	*392.5%*	*18.9%*	*16.2%*	*14.2%*	*12.7%*
- Interest (1-tax rate)	20	21	21	21	22	22	22
Growth		*2.4%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
FCFE w/o debt	($9)	($8)	$42	$54	$66	$78	$91
% of sales	*-0.4%*	*-0.4%*	*2.1%*	*2.7%*	*3.3%*	*3.8%*	*4.4%*
Growth		*-6.0%*	*-627.3%*	*27.8%*	*22.2%*	*18.5%*	*15.9%*
/ No Shares	41.0	40.0	40.0	40.0	40.0	40.0	40.0
FCFE	($0.21)	($0.20)	$1.06	$1.35	$1.65	$1.96	$2.27
Growth		*-3.7%*	*-627.3%*	*27.8%*	*22.2%*	*18.5%*	*15.9%*
* Discount factor	0.89	0.79	0.70	0.63	0.56	0.50	0.44
Discounted FCFE	($0.19)	($0.16)	$0.74	$0.85	$0.92	$0.97	$1.00

Third Stage								
Terminal value P/S								
	Sales	$1,898	$1,955	$1,975	$1,994	$2,014	$2,034	$2,055
	Growth		*3.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
	Net profit margin	*0.8%*	*1.5%*	*2.7%*	*3.2%*	*3.8%*	*4.4%*	*4.9%*
	Terminal P/S							0.13
	* Terminal SPS							$51.37
	Terminal value							$6.68
	* Discount factor							0.44
	Discounted terminal value							$2.95
Terminal value P/B								
	Book value	$446	$459	$483	$512	$546	$585	$631
	Growth		*2.9%*	*5.1%*	*6.0%*	*6.7%*	*7.3%*	*7.7%*
	ROE (EOY book)	*3.3%*	*6.3%*	*10.9%*	*12.6%*	*14.0%*	*15.2%*	*16.1%*
	Net income	$15	$29	$53	$64	$76	$89	$101
	Dividends	$15	$16	$29	$36	$42	$49	$56
	Growth		*6.7%*	*81.7%*	*22.6%*	*18.8%*	*16.1%*	*14.1%*
	Shares	41.0	40.0	40.0	40.0	40.0	40.0	40.0
	Price		$6.00	$10.90	$13.37	$15.87	$18.43	$21.04
	Growth			*81.7%*	*22.6%*	*18.8%*	*16.1%*	*14.1%*
	Net issuance		-$6	$0	$0	$0	$0	$0
	Terminal P/B							0.55
	* Terminal BPS							$15.76
	Terminal value							$8.67
	* Discount factor							0.44
	Discounted terminal value							$3.83
Terminal value constant growth								
	FCFE	($0.21)	($0.20)	$1.06	$1.35	$1.65	$1.96	$2.27
	Growth		*-3.7%*	*NM*	*27.8%*	*22.2%*	*18.5%*	*15.9%*
	Long-term growth							1.0%
	Cost of equity							12.4%
	Cost of equity - growth rate							11.4%
	Terminal value (FCFE (1+g) / (r-g))							$20.08
	* Discount factor							0.44
	Discounted terminal value							$8.86

Summary (using P/S multiple for terminal value)		
First stage	($0.39)	Present value of first 2 year cash flow
Second stage	$4.31	Present value of year 3-7 cash flow
Third stage	$2.95	Present value of terminal value P/S
Value (P/S)	**$6.86**	

Summary (using P/B multiple for terminal value)		
First stage	($0.39)	Present value of first 2 year cash flow
Second stage	$4.31	Present value of year 3-7 cash flow
Third stage	$3.67	Present value of terminal value P/B
Value (P/B)	**$7.58**	

Summary (using constant growth for terminal value)		
First stage	($0.39)	Present value of first 2 year cash flow
Second stage	$4.31	Present value of year 3-7 cash flow
Third stage	$8.62	Present value of terminal value constant growth
Value (CG)	**$12.53**	

Appendix 9: Comp Sheet

		Current	Market	Price Change							Earnings Growth							LT Debt/	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
BGG	BRIGGS & STRATTON	$5.50	$234	2.6	(16.8)	(13.5)	(46.3)	(59.3)	(58.0)		-127.0%	-1.5%	-124.8%	#######	3.6%		1.84	158.2%	B	8.79%	
7269-JP	SUZUKI MOTOR CORP	$43.27	$19,962	1.8	(6.8)	8.4	(8.8)	(14.6)	(15.1)	5.0	48.4%	76.5%	-41.7%	3.8%	11.3%	15.6%	0.71	15.7%		1.52%	28.0%
GGG	GRACO INC	$51.08	$8,519	0.4	8.8	9.5	2.7	19.9	22.1	8.0	-4.5%	31.5%	-3.7%	3.9%	9.6%	12.0%	0.96	22.0%	A	1.32%	33.0%
GNRC	GENERAC HOLDINGS INC	$99.05	$6,195	(0.5)	7.1	19.0	51.4	85.1	99.3	6.5	23.4%	38.2%	3.2%	6.2%	7.0%	7.3%	1.15	97.9%		0.00%	0.0%
TTC	TORO CO	$81.16	$8,652	(0.3)	5.8	9.4	18.7	39.6	45.2	10.0	29.8%	10.8%	10.9%	13.9%	8.6%	14.0%	1.00	73.6%	A	1.15%	34.4%
7012-JP	KAWASAKI HEAVY IND	$23.62	$3,946	5.0	(0.4)	7.4	5.1	0.5	9.7			12.1%	-7.0%	-17.7%	53.7%	-6.6%	1.70	73.4%		2.85%	42.8%
DE	DEERE & CO	$172.50	$54,316	(0.8)	(1.8)	4.3	13.8	16.3	15.6	6.2	-7.6%	40.6%	5.9%	-5.6%	17.8%	3.3%	1.40	264.9%	B+	1.81%	30.0%
Average			$14,546	1.2	(0.6)	6.4	5.2	12.5	17.0	7.1	-6.2%	29.7%	-22.5%	-283.7%	15.9%	7.6%	1.25	100.8%		2.49%	28.0%
Median			$8,519	0.4	(0.4)	8.4	5.1	16.3	15.6	6.5	9.5%	31.5%	-3.7%	3.8%	9.6%	9.6%	1.15	73.6%		1.52%	31.5%
SPX	S&P 500 INDEX	$3,169		0.0	2.4	5.4	9.6	19.6	26.4			11.5%	22.1%	4.2%	11.2%						

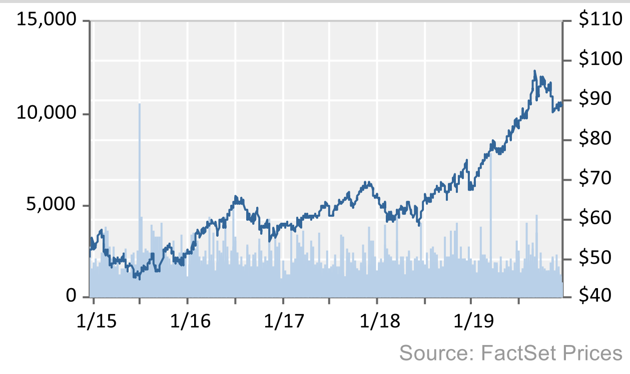
		2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
BGG	http://www.briggsandstratton.com	-3.0%	0.52	19.4	10.1	-18.5	-4.8	17.9	0.9	0.9	-0.7%	0.13	-3.0%	-2.8%	-7.7%	-14.7	5.7	2.6%	3.2%	-0.3%	$10.62
7269-JP	http://www.suzuki.co.jp	11.3%	1.54	18.9	9.3	13.7	18.0	12.1	13.2	11.9	1.0%	0.14	4.6%	8.4%	10.8%	6.8	6.6	2.5%	7.8%	5.7%	$28.05
GGG	http://www.graco.com	30.7%	8.66	31.6	22.3	28.5	26.3	27.5	27.2	24.8	18.6%	5.24	20.6%	26.4%	34.7%	16.7		-0.6%	4.9%	8.4%	$5.90
GNRC	http://www.generac.com	37.6%	7.67	14.6	10.6	20.9	24.0	19.5	19.2	18.0	13.8%	2.82	10.9%	17.7%	14.2%	10.8	19.3	6.5%	6.5%	6.4%	$12.91
TTC	http://www.thetorocompany.com	37.4%	10.25	27.1	20.9	27.4	31.9	24.6	24.1	22.2	10.0%	2.75	10.4%	14.3%	28.6%	16.4		21.8%		5.1%	$7.92
7012-JP	http://www.khi.co.jp	5.9%	0.94	24.9	13.5	15.9	15.9		19.5	12.7	1.7%	0.27	1.7%	4.0%	3.5%	13.1	4.5			2.9%	$25.01
DE	http://www.deere.com	25.5%	4.43	23.4	15.9	17.5	17.0	18.4	18.4	15.6	9.0%	1.56	8.3%	14.1%	8.1%	17.4	15.9	-17.7%	3.6%	1.7%	$38.96
Average		20.8%	4.86	22.8	14.7	15.1	18.3	20.0	17.5	15.1	7.6%	1.84	7.6%	11.7%	13.2%	9.5	10.4	2.5%	5.2%	4.3%	
Median		25.5%	4.43	23.4	13.5	17.5	18.0	18.9	19.2	15.6	9.0%	1.56	8.3%	14.1%	10.8%	13.1	6.6	2.5%	4.9%	5.1%	
spx	S&P 500 INDEX			22.6	19.0	19.9			18.9	17.0											

Recommendation: Sell				
Current Price	**$96**	---	Ticker	WEC
1 Year Bear	$68	*-16%*	Sh. Out. ($M)	315
1 Year Base	**$76**	***-11%***	M.Cap. ($M)	28
1 Year Bull	$87	*0%*	EV ($M)	39

Utility

WEC Energy Group, Inc.

Price History



	5Y	3Y	2Y	LTM	YTD	3M	1M
Return	77%	59%	28%	19%	29%	-2%	3%

Financials

	2015	2016	2017	2018	2019	2020E	2021E
Sales($B)	**5.9**	**7.5**	**7.6**	**7.7**	**7.8**	**8.1**	**8.2**
Gr. %	*18.6%*	*26.1%*	*2.4%*	*0.4%*	*2.0%*	*3.6%*	*1.4%*
Cons.	-	-	-	-	-	*4.3%*	*-0.6%*
Ind.	*-5.3%*	*-4.8%*	*1.8%*	*-4.9%*	*1.4%*	*3.6%*	*0.9%*
EPS ($)	**2.36**	**2.98**	**3.82**	**3.36**	**3.53**	**3.75**	**3.97**
Gr. %		*26.1%*	*28.2%*	*-12%*	*5.0%*	*6.2%*	*5.9%*
Cons.	-	-	-	-	-	*6.2%*	*6.9%*
Ind.	*-1.0%*	*7.0%*	*0.6%*	*4.7%*	*4.5%*	*4.9%*	*4.9%*

Ratios

	2015	2016	2017	2018	2019	2020E	2021E
NPM	**10.8%**	**12.6%**	**15.8%**	**13.8%**	**14.2%**	**14.5%**	**15.1%**
Ind.	*9.0%*	*8.8%*	*10.8%*	*9.5%*	*11.1%*	--	--
ROE	*9.8%*	*10.7%*	*13.1%*	*11.0%*	*11.2%*	*11.4%*	*11.7%*
Ind.	*10.1%*	*10.7%*	*10.3%*	*10.2%*	*10.7%*	--	--
ROA	*2.8%*	*3.1%*	*3.8%*	*3.2%*	*3.2%*	*3.2%*	*3.3%*
Ind.	*2.5%*	*0.4%*	*2.9%*	*2.4%*	*2.8%*	--	--
A T/O	0.26	0.24	0.24	0.24	0.24	0.24	0.23
A/E	3.39	3.37	3.34	3.42	3.42	3.49	3.51

Valuation

	2015	2016	2017	2018	2019	2020E	2021E
P/E	21.93	19.81	17.53	20.74	25.15	23.74	22.20
Ind.	17.74	22.34	20.63	15.46	18.67	20.77	19.55
P/S	2.36	2.49	2.75	2.86	3.58	--	--
P/B	1.87	2.07	2.22	2.23	2.77	--	--
P/CF	10.82	8.84	10.13	8.98	13.17	--	--
EV/EBITDA	13.51	11.53	12.40	14.80	15.68	--	--
D/P	*3.4%*	*3.4%*	*3.1%*	*3.2%*	*2.3%*	--	--

Summary

I recommend a sell rating with a target of $76. Although WEC has increasing sales and capex, much of this growth is fueled with debt. In comparison to the utility sector, WEC has high valuation multiples; therefore, has already priced in future growth. The company has been successful; however, the stock is overvalued based on relative and DCF analysis.

Key Drivers

- Government regulation: The utility sector within the United States is mostly regulated (firms have allowed ROEs that are subject to change). Companies within this sector are regulated by commissions in their regions and can bring forward rate cases that ultimately determine ROEs. WEC has recently settled a rate case to increase allowed ROE, but has no current cases.
- Capital expenditures: This fuels the growth. More assets means more equity for regulated ROE which generates earnings based on an allowed average asset base. Management plans to grow capital expenditures by 7% each year through 2024.
- Clean energy infrastructure: WEC has made multiple deals with wind farms for the next decade giving them an 80% ownership in the energy created (12% of current energy capacity).
- Macroeconomic trends: The utility sector is inversely correlated with long-term interest rates. As interest rates decrease, investors look for other defensive, safe return investments. Interest rates fell in 2019 resulting in good returns for WEC and the sector.

Valuation

Using a relative valuation approach, WEC Energy Group appears to be overvalued in comparison to the United States utility industry. DCF analysis using three valuation multiples, also implies the stock is overvalued and is worth $76. So WEC is overvalued as it currently trades at $96.

Risks

- Governmental regulation
- Uncertainty regarding future interest rates
- Changes in commodity prices
- Weather

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Company Overview

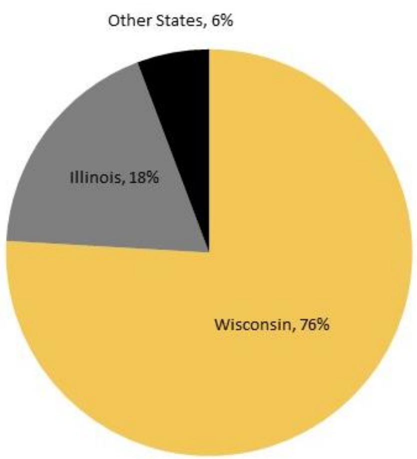
WEC is a holding company based in Wisconsin, engaged mostly in the generation and distribution of electricity and natural gas

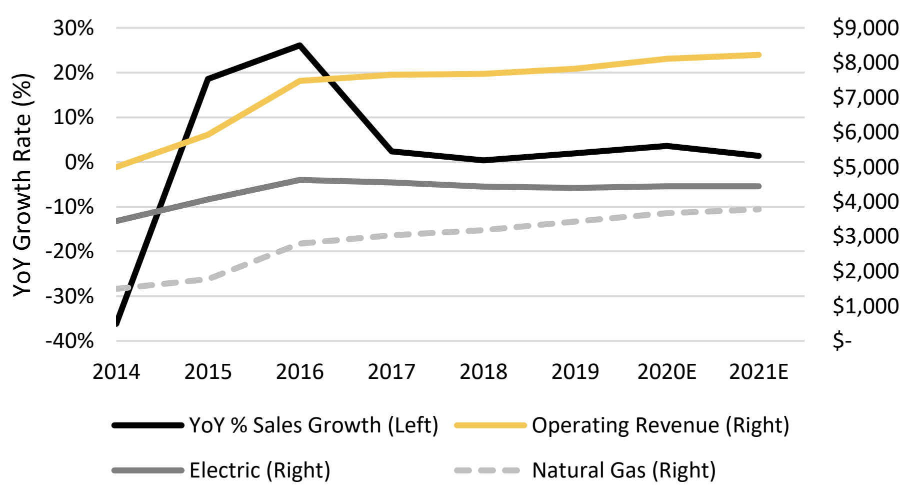
Founded in 1986, WEC Energy Group, Inc. (WEC) is a diversified holding company headquartered in Milwaukee, WI. Its subsidiaries engage in the generation of regulated electricity and natural gas as well as nonregulated renewable energy. The firm acquired 100% of the outstanding common shares of Integrys and changed its name to WEC Energy Group, Inc. on June 29, 2015. Operating through the states of Wisconsin, Illinois, Minnesota, and Upper Michigan, WEC owns three other major holding companies (Wisconsin Energy Corporation Bluewater Natural Gas Holding, LLC, Integrys Holding, Inc., and ATC Holding, LLC). Among these holdings, companies such as We Energies, Wisconsin Public Service, Peoples Gas, North Shore Gas, Minnesota Energy Resources, Michigan Gas Utilities, Upper Michigan Energy Resources, Bluewater Gas Storage, and Wispark, etc. make up most of the company's revenues. WEC ranks fifth in the Russell 3000 by market cap for multi-utilities and tenth for all utilities. The company serves over 1.6 million electric customers and 2.9 million natural gas customers through 70,100 miles of electric distribution and 49,000 miles of gas distribution.

WEC Energy Group generates 76% of its revenue from its subsidiaries in Wisconsin, but records revenues from three other states:

1) Wisconsin: We Energies provides 2.2 million customers with electric and natural gas services; Wisconsin Public Service also brings electric and natural gas to 776,000 customers.
    - 2018 sales YoY growth rate – -0.6%
2) Illinois: 18% of revenues for the company comes from Peoples Gas (PGL) and North Shore Gas (NSG), both of which revolve around Chicago.
    - 2018 sales YoY growth rate – 3.3%
3) Minnesota: Minnesota Energy Resources creates less than 4% of the firm's revenue delivering natural gas to 238,000 customers within MN.
    - 2018 sales YoY growth rate – 2%
4) Michigan: Michigan Gas Utilities and Upper Michigan Energy Resources deliver natural gas and electricity to 220,000 customers and makes up only 2% of the firm's revenues.
    - 2018 sales YoY growth rate – 4.6%

Figures 1 & 2: Revenue sources by states – left; revenue history (in millions) and YoY growth rate – right

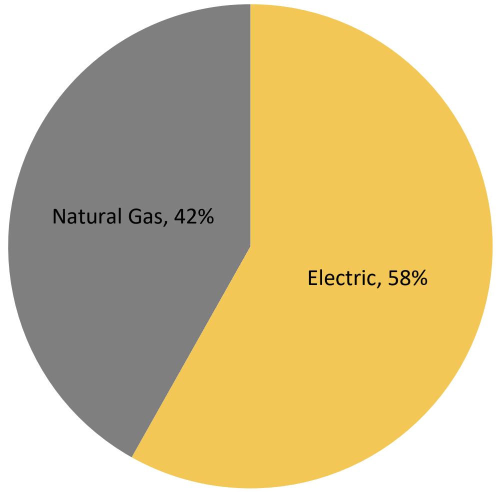




Source: Company Reports

Figures 3: Revenue segments (2018)

Natural gas is the main driver of revenue growth



Source: FactSet

The revenue for the firm is split into two segments shown in figure three, natural gas and electric. Natural gas sales have been consistently growing over the last three years; whereas, electric sales have been steadily decreasing (figure 2). In 2020 and 2021, I predict sales of natural gas to increase 7.0% and 3.0% in its respective years and electric revenues to remain constant resulting in a 3.6% and 1.4% increase in overall revenues over the same years. The natural gas segment will rise to 46% of revenue from 42% in 2018.

Business/Industry Drivers

Though several factors may contribute to WEC Energy Group's future success, the following are the most important business drivers:

1) Regulation
2) Capital Expenditures
3) Clean Energy Trends and Infrastructure Investment
4) Macroeconomic Trends

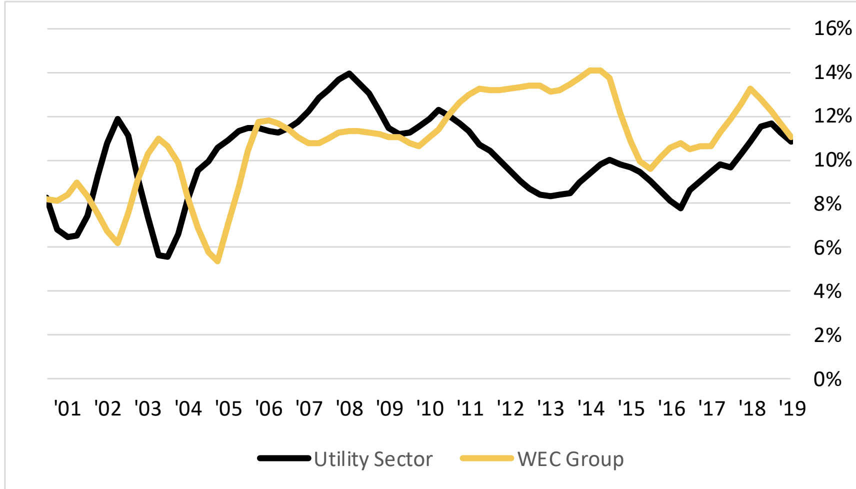
Regulation

WEC's ROE is less volatile than the industry and remains higher than the industry

Utilities can operate in regulated and unregulated businesses. Wisconsin tends to be a more utility-friendly environment. The return on equity for utilities as a sector has fluctuated between six and 14% over the last 20 years. The company has earned a more stable ROE of 11.6% over the last five years. There have been few rate cases since 2015, but the firm is now seeking to raise rates in some of its subsidiaries.

Over the past decade, the Company's ROE has averaged over 11%; whereas, the utility sector was below 10%. In 2015, WEC acquired Integrys resulting with a small, short fall in ROE. In 2018, the sudden change in the corporate tax rate significantly altered the Company's ROE. For the last five years, WEC had a higher ROE than the sector, but followed its overall trend.

Figures 4: Industry 12-month rolling average return on equity (2001-2019)



Source: FactSet

Rate cases ultimately drive WEC's earnings through an allowed rate of return

In April 2019, We Energies requested the Public Service Commission (PSC) to allow it to increase electric rates by 2.9% in 2020 and 2021. On October 31, a settlement was approved giving We Energies a 1.3% and 2.8% increase in electric and gas revenues effective January 1, 2020. The firm does not have any other outstanding rate cases, and the last important rate case was a few years ago. Still, I believe it has the ability to increase its ROE for its larger divisions due to its lack of recent cases. This along with capital spending plans, will lead to higher returns for shareholders.

The firm has potential to increase its regulated rate of return

Figures 5: Important Rate Case Numbers (2019 current allowed rate of returns)

Rate Case	Utility	ROE	Equity
WE	Electric	10.2%	51.0%
WE	Gas	10.2%	51.0%
WPS	Electric	10.0%	51.0%
WPS	Gas	10.0%	51.0%
Michigan	Gas	9.9%	52.0%
Minnesota	Gas	9.7%	50.9%

Source: Company Reports

Capital Expenditures

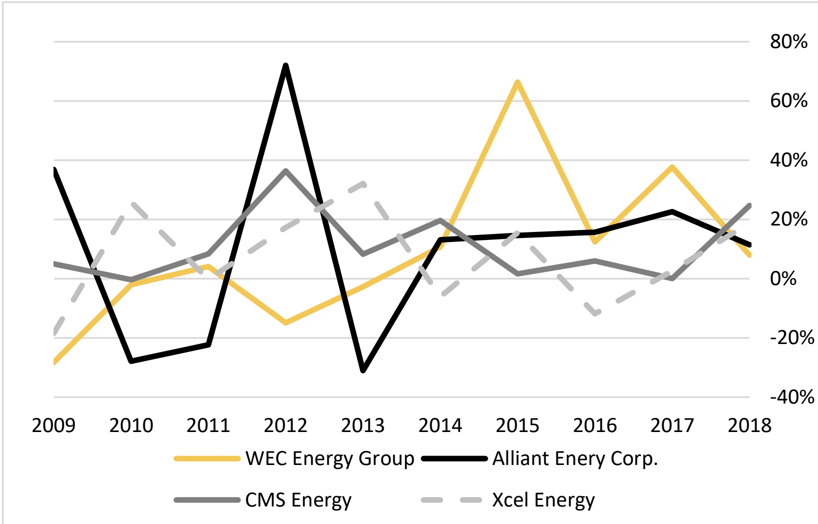
Given that utility companies make a regulated return on capital, growing capital is the key to long-term earnings growth. WEC's average asset base was $19.8 billion as of December 31, 2018 and the firm plans to grow that base to $30.2 billion by FY end 2024 for a compound annual growth rate of 7%. This projected growth would add $2.07 to EPS from 2018 to 2024. Management expects to grow the firm's gas distribution asset base by over 18.4% ($5 billion) in the next five years while its electric generation and distribution should increase by 36.8% ($2.9 billion). The Company's infrastructure (wind farm investments) is forecasted to grow by $1.6 billion for an increase in its infrastructure asset base of over 12x. We Power's capital is forecasted to grow 11.8% ($350 million) and transmission assets to increase 19.8% ($550 million).

In addition to capital expenditures, WEC's investments were high in 2015 due to its acquisition of Integrys Energy Group. In 2017, it also acquired Bluewater Gas Storage based in Michigan providing one-third of its storage needs for natural gas distribution in Wisconsin. These investments have brought higher revenues with no change in its regulated rate of return.

Growth in capital expenditures corresponds to future growth

Alliant Energy Corp (LNT), CMS Energy (CMS), and Xcel Energy (XEL) are all engaged in the generation, purchase, transmission, distribution, and sale of electricity similar to Wisconsin Energy Group. The years of significant increases for LNT and WEC resulted from large acquisitions in 2012 and 2015, respectively.

Figure 6: YoY change in capital expenditures relative to comps (2009-2018)

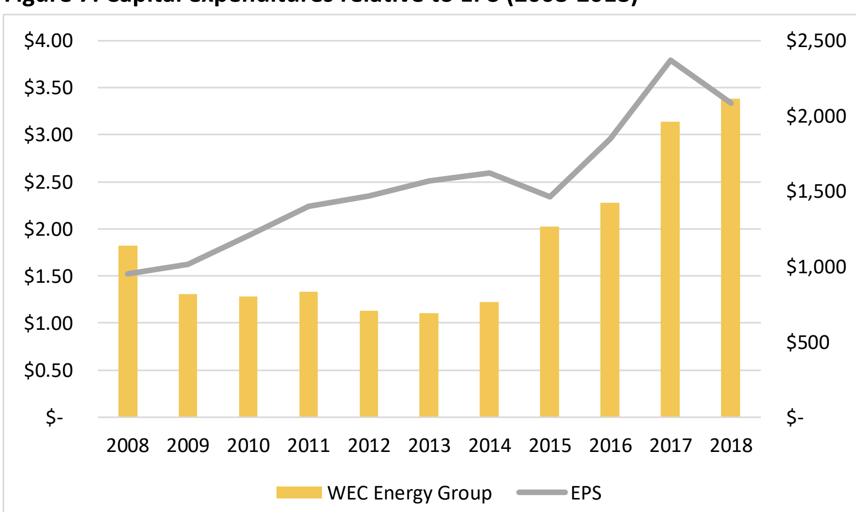


Source: Bloomberg

From 2008 to 2014, capital spending decreased while EPS increased. At this time, the firm sold its money-losing, non-regulated businesses. The firm then cut its dividend and started growing it again as EPS recovered. EPS once again dropped with the acquisition of Integrys in 2015 which was funded by the issuance of new shares and $1.5 billion of debt. The issuances of new shares to fund the acquisition more than offset earnings, ultimately damaging EPS in 2015. The firm's total debt/equity was stable at 117.5% in 2014 and 119.5% in 2015.

Figure 7: Capital expenditures relative to EPS (2008-2018)

WEC's EPS rose 8% CAGR from 2008-2019



Source: Bloomberg

Since 2015, besides the acquisition, the firm has embarked on growing gas distribution as well transmission lines. As part of its capital plan for the next five years, the firm hopes to grow its EPS in line with its capital spending growth resulting in a compounded annual growth rate of 5-7%.

Clean Energy Trends and Infrastructure Investment

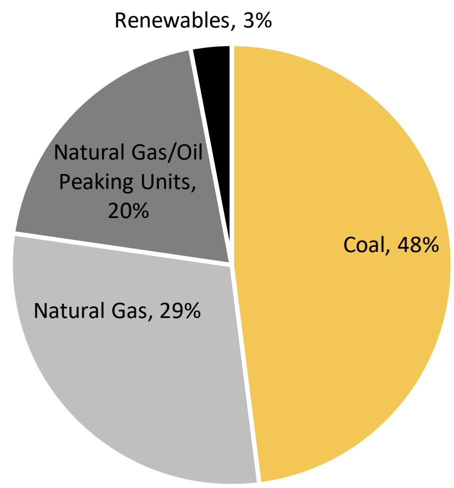
WEC is moving into the clean energy area by investing in wind farms throughout the region

The utility industry is moving toward renewable energy with the movement to use cleaner energy sources. Switching to clean energy is costly for WEC in both infrastructure investments and the loss of customers, but the investment in infrastructure contributes to its base rate which increases revenues. WEC has made multiple investments in small wind farms throughout the region and extending into Nebraska.

The company has invested over $900 million in wind energy contracts (at least 10 years into the future) in four wind farm/energy centers for an average ownership interest of 88%. I forecast this to add $0.26 to EPS ([$900 million x 88% equity x 10.5% ROE] ÷ 316 million shares) over the next 10 years. By the end of this year and into 2020 it will add an additional capacity of 700 Megawatts (MW). This will be a large increase to WEC's 2018 year-end of 220 MW capacity for renewable energy. Renewable energy capacity will grow from 3% to 11.5%. WEC is focused on reducing carbon dioxide emissions by approximately 40% below 2005 levels by 2030 and 80% below 2005 levels by 2050. The firm, along with other utility companies, are reducing coal usage altogether with growing clean energy trends and sources such as renewable energy.

The company's capacity is currently dominated by natural gas and coal

Figure 8: WEC's capacity by fuel source (Megawatts)



Source: Company Reports

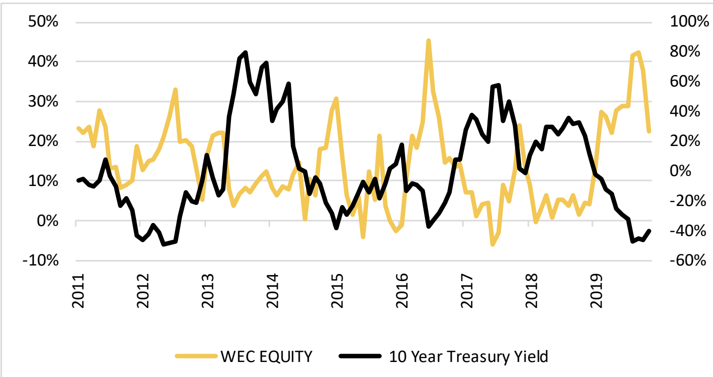
Macroeconomic Trends

The utility sector acts as a substitute for fixed income markets in periods with low interest rates

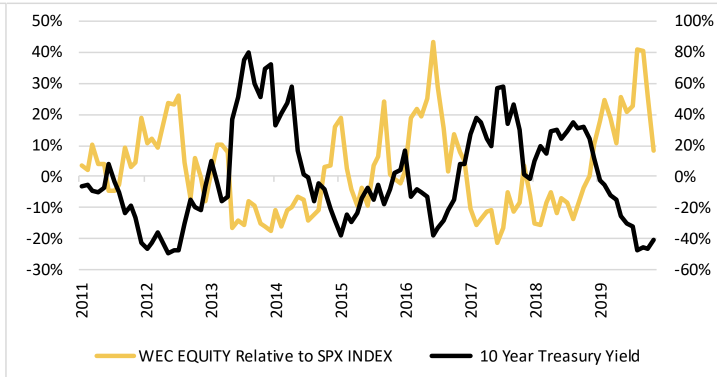
The utility industry is inversely correlated with interest rates, specifically the 10-year treasury yield. As the interest rates decrease for the 10-year treasury yield, WEC and other utilities look more attractive to investors as they pay a high yield (3.0% for the industry and 2.6% for WEC). Plus, utilities are a great defensive equity for investors looking for safe investments in a low-interest rate market that often coincides with a deteriorating economy.

WEC Energy Group had a great 3rd quarter stock return due to the sudden decrease in interest rates. The firm seems to have caught the attention of many people looking to invest in safer securities that earn a higher rate dividend yield than many bonds.

Figures 9 and 10: Yearly changes in absolute price of WEC (left) versus the 10-year treasury yield (right) – left; yearly changes in relative price of WEC compared to the S&P 500 (left) versus 10-year treasury yield (right) – right



Source: Bloomberg, IMCP



Source: Bloomberg, IMCP

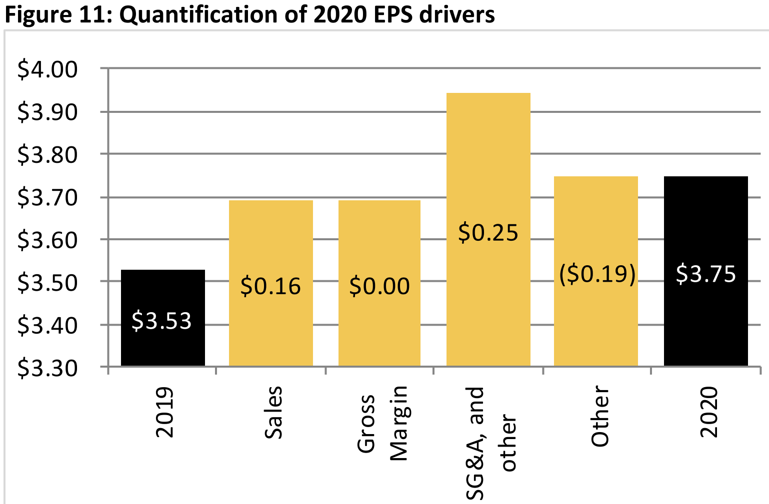
The company has earned an average compounded annual growth rate of 8% over the last ten years compared to the global utility average of 7%. The average dividend yield for the industry sector currently is 3.0% versus WEC at 2.6%. The firm's dividend payout ratio has been 65% for three years and management expects to grow dividends at approximately 6% with its capital spending growth to maintain a payout ratio from 65-75%.

Financial Analysis

I anticipate EPS to grow 6.2% by $0.22 in FY 2020. Due to a relatively stagnant growth for electric energy, natural gas revenue growth is mostly responsible for the increase in EPS. I predict gross margin to be unchanged as a percent of sales due to a slowing decrease in gross margin over the last four years with no change in EPS. SG&A for WEC mostly consists of general expenses like employee salaries, bonuses, etc.; therefore, I forecast a minimal increase in the dollar amount of SG&A. This makes for a larger impact on EPS of $0.25 with SG&A as a percentage of sales decreases through FY 2020.

EPS is expected to grow 6.2% in 2020

Figure 11: Quantification of 2020 EPS drivers

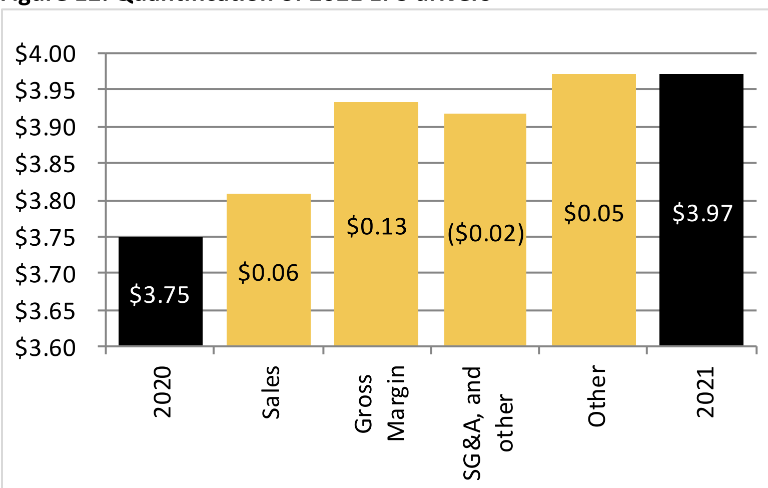


Source: Company Reports, IMCP

Other expenses, such as interest, I forecast to grow at a steadier rate of 4.1% which carries to a 6.8% increase in interest expense in FY 2020. Due to the Tax Cuts and Jobs Act of 2017, the Company took advantage of some of these tax benefits paying only $100 million in taxes for an effective tax rate of 9.4%. With that in mind, I estimate an increase in taxes paid over doubling the tax expense for Wisconsin Energy Group. Along with interest and tax expense increases, I included a steady stock buyback of $75 million (843,000 shares), all of which is contributing a negative $0.19 EPS.

For FY 2021, I predict EPS to grow $0.23 or, 5.9%. Revenue is predicted to grow from increases in natural gas usage. Sales will likely remain stagnant for electric sales. With a 3% increase natural gas revenues, EPS should grow by $0.13 due to an overall increase in sales revenue. The largest increase in EPS of $0.13 is expected to come from an increase in gross margin which I expect to grow from 51.2% to 51.8%. I expect SG&A to rise 1.6% due to general increases in employment expenses which is an increase from 30.2% to 30.3% as a percent of sales revenues for a negative effect of $0.02 on EPS. Interest expense is projected to grow 6.9% due to an increase in new debt of $900 million to aid in the coverage of over $1 billion in capital expenditures. The effective tax rate is expected to raise to 21% from the previous FY 2020 effective tax rate of 18%. This makes for a 16.7% increase in tax expense for WEC. I expect the big increase in interest and tax expense to be more than offset by additional stock buybacks of 843,000 shares to create $0.05 of EPS.

Figure 12: Quantification of 2021 EPS drivers



Source: Company Reports, IMCP

WEC is expected to more pay taxes compared to the previous year and interest is increasing with additional debt

I agree with consensus estimates for FY 2020 and 2021. For FY 2020, I am just $0.01 below consensus EPS due to differences in sales growth as well as direct costs which I predict to grow at a closer rate to sales. As for FY 2021, I see more of an impact on EPS due to the rising debt as well as higher taxes. I anticipate short-term and long-term debt to have a higher cost to the company resulting in lower EPS than consensus.

Figure 13: Revenue, EPS, Direct Costs and YoY Growth estimates

	FY 2019E		FY 2020E		FY 2021E	
	Estimate	Consensus	Estimate	Consensus	Estimate	Consensus
Revenue	$ 7,830	$ 7,828	$ 8,114	$ 8,171	$ 8,224	$ 8,122
YoY Growth	2.0%	1.9%	3.7%	4.4%	0.6%	-0.6%
EPS	$ 3.53	$ 3.53	$ 3.75	$ 3.74	$ 3.97	$ 4.00
YoY Growth	5.7%	5.7%	6.2%	5.9%	6.1%	7.0%
Direct Costs	$ 3,820	$ 3,777	$ 3,959	$ 3,860	$ 3,964	$ 3,909
YoY Growth	2.0%	0.9%	4.8%	2.2%	2.7%	1.3%

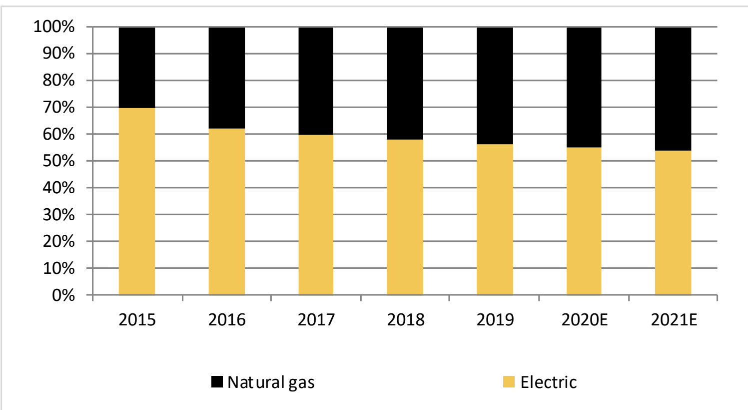
Source: FactSet, IMCP

Revenues

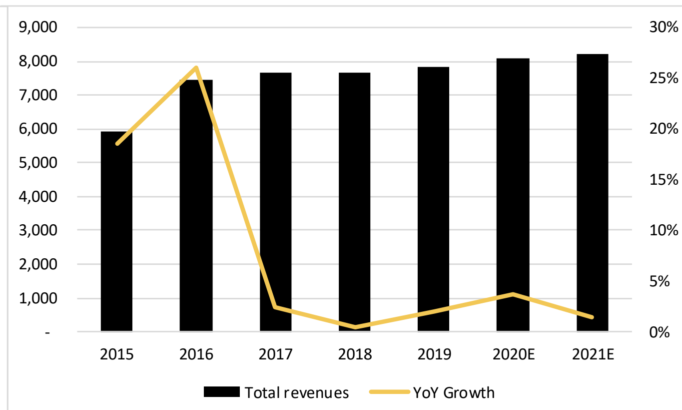
Wisconsin Energy Group's revenue has increased steadily since its acquisition of Integrys in 2016. I expect this trend to continue into 2020 and 2021; however, I see natural gas sales growing significantly (from 2% in 2019 to 3.6% in 2020 and 1.4% in 2021) in comparison to electric sales remaining stagnant. Natural gas sales will continue to increase as power usage increases throughout Wisconsin and parts of Illinois, Minnesota, and Michigan.

The Company's revenues are expected to increase due to overall population growth, but also business development within Wisconsin is growing at a noticeable pace. Foxconn and Amazon are building facilities in Wisconsin which will require great power usage. Foxconn is in the process of being built, and the Amazon fulfillment center expansion is expected to open in the first quarter of 2020. WEC also has lower electric residential bills than the national average which encourage low cost power usage.

Figure 14 & 15: Wisconsin Energy Group segment revenues – left; Revenue (millions, left) vs YoY revenue growth (right) – right



Source: Company Reports, IMCP

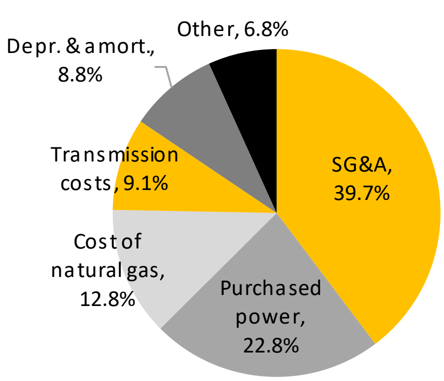


Source: Company Reports

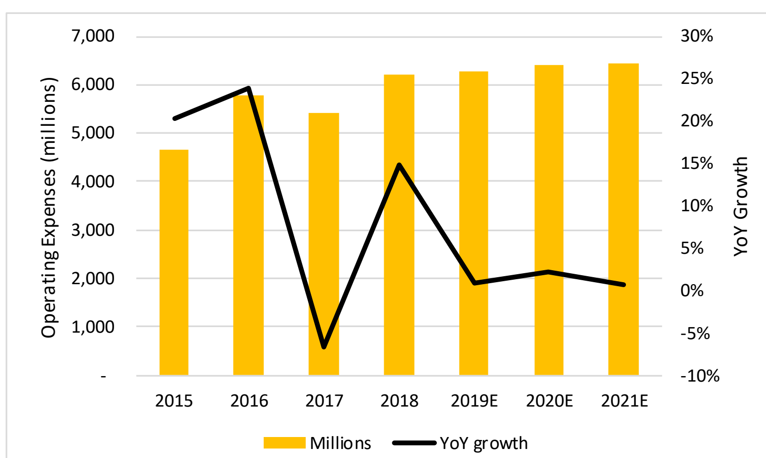
Operating Income and Margins

Operating expenses are composed primarily of selling, general and administrative expense as well as the cost of purchased power and natural gas. SG&A expenses remain relatively stable and predictable making for a stable, but minimal growth rate. Purchased power and natural gas, on the other hand, are more correlated with sales. These are a part of direct costs which I forecast to increase in relation to sales.

Figures 16 & 17: Composition of 2018 operating expenses – left; Operating expenses vs YoY expense growth – right



Source: Company Reports



Source: Company Reports

Return on Equity

Wisconsin Energy Group has a stable ROE with an unusual increase in 2017. Although ROE is regulated for the company, I project, over the short-term, ROE to rise slightly due to increasing margins. However, I expect the rise in ROE to later return to 11%. DuPont analysis for WEC shows the rise in ROE is driven by the increase of margins, but partially offset by a decrease in asset turnover. The average asset base is slowing climbing when compared to average equity, which boosted ROE.

Figure 18: ROE breakdown (2016 – 2021E)

3-stage	2016	2017	2018	2019E	2020E	2021E
Net income / sales	12.6%	15.8%	13.8%	14.2%	14.5%	15.1%
Sales / avg assets	0.25	0.25	0.24	0.23	0.23	0.22
ROA	3.2%	3.9%	3.3%	3.3%	3.3%	3.3%
Avg assets / avg equity	3.38	3.36	3.38	3.42	3.45	3.50
ROE	10.7%	13.1%	11.0%	11.1%	11.4%	11.7%

Source: Company Reports, IMCP

I anticipate ROE growth over the next two years due to increasing leverage as WEC is expected to increase borrowing in order to fund its capital expenditures. The firm will be using additional debt to fund its growth. This will not have any significant impact on the solvency of WEC, as debt/assets increases from 36.2% to 37.7% over 2020 and 2021. I project the company's rate on debt to remain at 4.1%; however, the rate could increase with little effect on the firm's overall operations.

Free Cash Flow

Figure 19: Free cash flow calculations (2015-2021E)

Free Cash Flow	2015	2016	2017	2018	2019E	2020E	2021E
NOPAT	$660	$937	$1,285	$1,225	$1,413	$1,397	$1,397
Growth		42.0%	37.1%	-4.7%	15.4%	-1.1%	0.0%
NOWC	751	755	631	721	759	707	733
Net fixed assets	27,148	27,955	29,377	31,228	32,575	34,528	35,914
Total net operating capital	27,899	28,709	30,008	31,949	33,333	35,235	36,646
Growth		2.9%	4.5%	6.5%	4.3%	5.7%	4.0%
- Change in NOWC		4	(124)	90	38	(52)	26
- Change in NFA		806	1,423	1,851	1,347	1,953	1,385
FCFF		$127	-$14	-$717	$29	-$504	-$14
Growth			-110.7%	5165.6%	-104.0%	-1861.3%	-97.1%
- After-tax interest expense		224	299	371	453	438	451
+ Net new short-term and long-term debt		(201)	858	789	823	1,000	1,015
FCFE		-$298	$545	-$299	$399	$58	$549
Growth			-282.6%	-154.8%	-233.7%	-85.6%	853.6%
FCFF per share		$0.40	($0.04)	($2.27)	$0.09	($1.60)	($0.05)
Growth			-110.7%	5167.3%	-104.0%	-1866.0%	-97.1%
FCFE per share		($0.95)	$1.73	($0.95)	$1.27	$0.18	$1.75
Growth			-282.6%	-154.8%	-233.7%	-85.5%	856.1%

Source: Company Reports, IMCP

WEC's free cash flow has been remarkably volatile over the last several years. The firm last paid down debt in 2016 and ever since has increased debt each year. In 2016, WEC paid off $201 million in debt, only to borrow a total of $2.5 billion over the next three years. Over these three years, interest expense doubled while net fixed assets grew 16.5% ($4.6 billion).

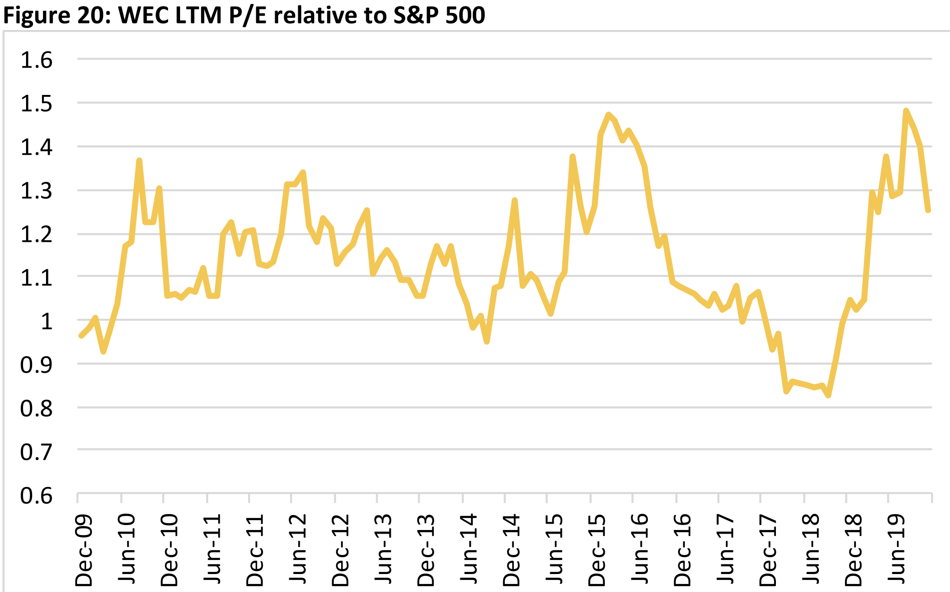
Valuation

WEC was valued using a 3-stage discounting cash flow model with three different multiples: price-to-earnings, price-to-book, and price-to-sales. Relative valuation shows WEC to be overvalued based on its fundamentals versus those of its peers in the utility sector within the United States. Using the DCF analysis, the multiples P/E, P/B and P/S yielded values of $74.84, $81.07, and $71.76 respectively. I chose to use an equal weighting due to the relatively high P/E of the sector over the past year, huge increase in invested capital throughout the industry, and slow sales growth. Finally, this weighted scenario analysis yields a price of $76.

<u>Trading History</u>

WEC's LTM P/E is currently trading near its five year high relative to the S&P 500. This is the result of declining interest rates. WEC's current LTM P/E is at 25.8 compared to its five year average of 21.3. Though this is expensive, there is low risk with its growth. While I expect some regression towards that number in the future, I do not think that is likely to be the case in the near term.

Figure 20: WEC LTM P/E relative to S&P 500



Source: FactSet

Assuming the firm's P/E drops slightly to 24.5 LTM P/E at the end of 2020, it should trade at $91 by the end of the year:

- Price = P/E x EPS = 24.5 x $3.75 = $91.

Discounting $91 back to today at a 5.14% cost of equity (explained in DCF section) yields a price of $86. Given WEC's significant growth in the last twelve months, this seems to be a relatively high valuation.

Relative Valuation

Compared to its peers, WEC is overvalued

Wisconsin energy Group is currently trading at a P/E extremely higher than its peers, with a 2019 P/E of 25.2 compared to an average of 18.7. Investors are willing to temporarily pay a premium for WEC since it has offered high EPS growth and a secure high yield investment. WEC's P/S ratio is significantly higher than its peers, however its P/B ratio is close to its competitor's average. This reflects WEC's higher margin (3% higher) and similar ROE (1% lower).

Figure 21: WEC comparable companies

	Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	Equity	Rating	Yield	Payout
WEC	$96.17	$30,335	1.1	6.1	3.7	11.6	36.8	4.3	6.6	-0.7%	6.4%	5.7%	5.9%	7.0%	5.9%	0.13	108.4%	A	2.56%	67.1%
CMS	$65.38	$18,558	1.1	5.7	2.9	12.0	29.4	4.0	6.4	19.4%	7.4%	6.9%	7.2%	7.9%	7.0%	0.15	245.3%	A-	2.43%	68.8%
EXC	$46.74	$45,436	0.4	4.6	4.1	(3.4)	2.1	2.5	3.2	34.6%	20.0%	0.3%	-1.0%	-2.6%		0.30	101.3%	B	3.18%	60.2%
LNT	$56.78	$13,890	0.9	6.2	8.6	13.7	33.9	3.8	5.2	10.8%	12.4%	6.0%	4.8%	6.2%	6.3%	0.21	111.7%	A-	2.60%	62.8%
XEL	$65.03	$34,101	0.9	3.2	2.4	6.6	29.4	2.4	5.7	8.1%	7.4%	6.1%	6.1%	6.5%	5.3%	0.21	140.1%	A-	2.55%	63.8%
AEE	$79.21	$19,488	1.3	4.6	4.6	3.9	18.8	3.1	5.4	5.3%	19.1%	-3.0%	5.8%	9.8%		0.16	129.9%	B+	2.87%	62.3%
AEP	$97.31	$48,066	0.7	4.6	5.1	7.5	28.5	3.0	5.7	-2.5%	7.3%	6.3%	4.8%	6.4%		0.16	129.9%	B+	2.87%	62.3%
Average		$29,982	0.9	5.0	4.5	7.4	25.6	3.3	5.5	10.7%	11.4%	4.0%	4.8%	5.9%	6.1%	0.19	138.1%		2.72%	63.9%
Median		$30,335	0.9	4.6	4.1	7.5	29.4	3.1	5.7	8.1%	7.4%	6.0%	5.8%	6.5%	6.1%	0.16	129.9%		2.60%	62.8%
SPX	$3,317		0.8	3.9	10.9	10.4	26.8	2.7			23.6%	1.3%	7.2%	7.7%						

	2019		P/E							2019	2019				EV/	P/CF	Sales Growth			Book
Ticker	ROE	P/B	2017	2018	2019	TTM	NTM	2020	2021	NPM	P/S	NM	OM	ROIC	EBIT	Current	NTM	STM	Pst 5yr	Equity
WEC	11.1%	3.02	18.7	19.9	27.2	27.8	28.0	25.7	24.0	14.2%	3.88	13.8%	18.6%	5.6%	23.6	14.2	2.9%		11.2%	$31.86
CMS	14.8%	3.90	19.2	20.3	19.9	29.9	25.0	24.5	22.7	0.9%	0.25	9.6%	16.9%	4.5%	22.1	10.8	3.8%	1.9%	0.9%	$16.78
EXC	9.5%	1.42	13.7	12.6	14.4	19.6	14.6	15.1	15.5	9.1%	1.36	5.6%	13.3%	3.1%	16.7	5.4	-6.2%	8.9%		$32.95
LNT	11.1%	2.74	19.6	19.6	18.4	25.5	23.0	23.6	22.2	15.4%	3.81	14.8%	19.6%	5.7%	23.0	11.9	5.6%		1.5%	$20.71
XEL	10.5%	2.59	17.7	19.5	18.8	26.0	24.1	23.4	22.0	11.6%	2.87	10.9%	17.0%	4.7%	21.6	10.9	5.0%	1.5%	1.1%	$25.06
AEE	10.3%	2.50	18.5	17.5	19.9	24.4	23.2	22.9	20.8	12.8%	3.11	13.0%	21.6%	5.5%	18.6	10.2	13.6%	-7.7%		$31.70
AEP	10.8%	2.50	17.1	18.6	17.8	22.6	23.2	22.1	20.8	12.8%	2.96	11.9%	16.8%	4.9%	22.8	10.5	13.6%	-7.7%		$38.90
Average	11.2%	2.67	17.8	18.3	19.5	25.1	23.0	22.5	21.1	11.0%	2.61	11.4%	17.7%	4.8%	21.2	10.6	5.5%	-0.6%	3.7%	
Median	10.8%	2.59	18.5	19.5	18.8	25.5	23.2	23.4	22.0	12.8%	2.96	11.9%	17.0%	4.9%	22.1	10.8	5.0%	1.5%	1.3%	
SPX			17.2	16.6	15.4			19.0	17.7											

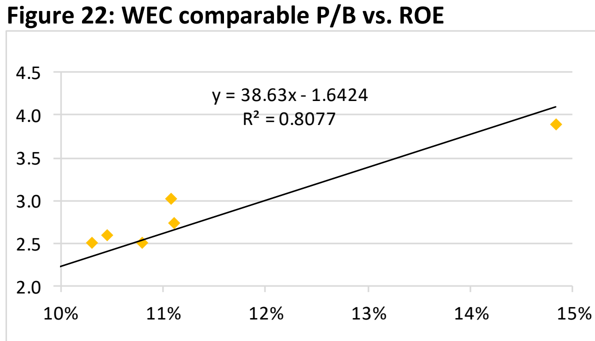
Source: FactSet, IMCP

WEC has a higher P/B than its peers and a slightly lower ROE. According to these measures, the firm is overvalued.

- Estimated P/B = 2020 ROE (11.4%) x b (38.63) + Intercept (1.6424) = 2.76
- Target Price = Estimated P/B (2.76) x 2020 Book Value Per Share ($33.40) = $87.40

Discounting back to the present at a 5.14% cost of equity leads to a target price of $83 using this metric. This metric shows WEC being overvalued relative to its peers; however, I believe its peers are overvalued as a sector due to falling interest rates in the last year.

Figure 22: WEC comparable P/B vs. ROE



Source: IMCP

Using LTG and ROE are good fundamentals for a valuation of WEC with P/B & yield

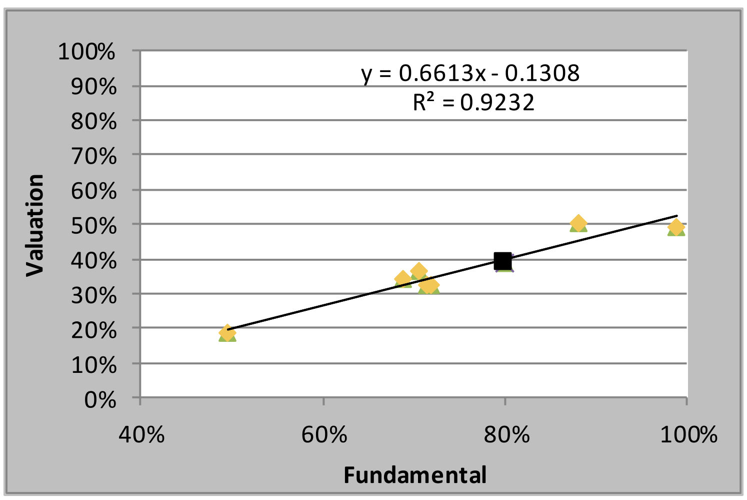
For a final comparison, I created a composite ranking of several valuation and fundamental metrics in figure 23 & 24. Since the variables have different scales, each was converted to a percentile before calculating the composite score. An equal weighting of long-term growth rate and 2019 ROE was compared to an equal weight composite of P/B and yield. The regression line had an R-squared of 0.92. One can see that WEC (black square, figure 24) is directly on the line, so it is fairly valued based on its fundamentals.

Figure 23: Composite valuation, % of range

				Fundamental		Valuation	
			Weight	50%	50%	50%	50%
Ticker	Name	Fund	Value	LTG	ROE	P/B	Yield
WEC	WEC ENERGY GROUP INC	80%	39%	100%	60%	77%	94%
CMS	CMS ENERGY CORP	88%	50%	97%	80%	100%	100%
EXC	EXELON CORP	50%	18%	48%	51%	37%	76%
LNT	ALLIANT ENERGY CORP	71%	37%	79%	62%	73%	93%
FE	FIRSTENERGY CORP	99%	49%	98%	100%	98%	78%
XEL	XCEL ENERGY INC	69%	34%	82%	56%	68%	96%
AEE	AMEREN CORP	72%	33%	89%	55%	65%	84%
AEP	AMERICAN ELECTRIC POWER CO	71%	32%	85%	58%	65%	84%

Source: FactSet

Figure 24: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

A three stage discounted cash flow model was also used to value WEC. I chose to value the firm based on an evenly weighted average of the discounted cash flows using P/E, P/B, and P/S multiples.

For the purpose of this analysis, the company's cost of equity was calculated to be 5.1% using the Capital Asset Pricing Model. The underlying assumptions used in calculating this rate are as follows:

- The risk-free rate, as represented by the 10-year treasury bond yield, is 1.9%.
- A current beta of .4 for the industry was utilized since the sector has a much lower risk than the market.

- A long term market rate of return of 10% was assumed, since historically, the market has generated an annual return of about 10%.

Given the above assumptions, the cost of equity is 1.9% + .4 (10.0% – 1.9%) = 5.1%.

Stage One - The model's first stage simply discounts fiscal years 2020 and 2021 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $0.18 and $1.75, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $1.76 per share. Thus, stage one of this discounted cash flow analysis contributes $1.76 to value.

Stage Two - Stage two of the model focuses on fiscal years 2022 to 2026. During this period, FCFE is calculated based on revenue growth, NOPAT margin and capital growth assumptions. The resulting cash flows are then discounted using the company's 5.1% cost of equity. I assume 3.6% sales growth in 2020, decreasing to 1.4% in 2021 and then a constant growth rate of 2.0% until 2026. NOWC to sales is projected to decrease from 2019 levels and NFA turnover to decrease from 0.24 in 2019 to 0.23 evenly over the seven years to 2026 as a result of increasing assets. Also, the NOPAT margin is expected to decrease from 17.2% in 2020 to 17.0% in 2021 and then increase over the next five years to 18.0%. Finally, after-tax interest is expected to rise approximately 4.5% per year as the result of increases in borrowing. From 2022 to 2026, per share cash flows are $3.06, $3.10, $3.14, $3.19, and $3.24 respectively for a total of $15.73. Discount this back to 2019 and today's value is $12.26.

Figure 25: FCFE and discounted FCFE (2015 – 2021)

	2020	2021	2022	2023	2024	2025	2026
FCFE	$0.18	$1.75	$3.06	$3.10	$3.14	$3.19	$3.24
Discounted FCFE	$0.17	$1.58	$2.63	$2.54	$2.45	$2.36	$2.28

Source: IMCP

Added together, these discounted cash flows total $14.02.

Stage Three – The model requires assumptions regarding the company's terminal price-to-earnings, price-to-book and price-to-sales. I chose P/E, P/B and P/S multiples based on the fact that they may converge to the industry 10-year average since utilities have been bid up the last three years.

P/E Stage Three – Net income for the years 2022 – 2026 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $3.97 in 2021 to $4.43 in 2026. Given the assumed terminal earnings per share of $4.43 and a price to earnings ratio of 19.5, a terminal value of $86.39 per share is calculated. Using the 5.1% cost of equity, this number is discounted back to a present value of $60.82. Add the present value of the first and second stage of the DCF ($14.02) to get a present value of $74.84.

Figure 26: EPS estimates (2015 – 2021)

	2020	2021	2022	2023	2024	2025	2026
EPS	$3.75	$3.97	$4.05	$4.14	$4.23	$4.33	$4.43

Source: IMCP

P/B Stage Three – Book value for the years 2022 – 2026 is calculated by the previous year's book value plus net income minus dividends minus net issuance. Net income is calculated as previously stated for P/E. I forecast dividends to be in between management's target payout ratio of 65-75% and hold stock buybacks at a constant 0.3%. With a projected book value of $12.8 billion, the book value per shares is $41.41 resulting in a $95.23 terminal value when multiplied by a 2.3 P/B. Discount this back at the same cost of equity and today's value of the firm is $67.05. Add $14.02, the present value of the first and second stage of the DCF, to get a present value of $81.07.

Figure 27: Third stage terminal P/B calculation (2020-2026)

Year ending January		2020	2021	2022	2023	2024	2025	2026
				Third Stage				
Terminal value P/B								
	Book value	$10,508	$10,855	$11,216	$11,594	$11,988	$12,402	$12,835
	Terminal P/B							2.30
	* Terminal BPS							$41.41
	Terminal value							$95.23
	* Discount factor							0.70
	Discounted terminal value							$67.05

Source: IMCP

P/S Stage Three – With the sales growth and share buybacks mentioned earlier, terminal sales per share in year 2026 is calculated to be $29.29. This multiplied by the terminal P/S of 2.80 and discounted back to today, calculates a terminal value of $57.75. Once more, add $14.02 to get a present value of $71.76.

Figure 28: Third stage terminal P/S calculation (2020-2026)

Year ending January		2020	2021	2022	2023	2024	2025	2026
				Third Stage				
Terminal value P/S								
	Sales	$8,114	$8,224	$8,389	$8,556	$8,728	$8,902	$9,080
	Terminal P/S							2.80
	* Terminal SPS							$29.29
	Terminal value							$82.02
	* Discount factor							0.70
	Discounted terminal value							$57.75

Source: IMCP

Total Present Value – Given the above calculations and utilizing a three stage discounted cash flow model for the three P/E, P/B and P/S ratios, I used an equal weighted average of the three DCFs to derive a final present value of $76.

- Present Value = ($74.84 + $81.07 + $71.76) / 3 = $76

<u>Scenario Analysis</u>

Bull Case – For the bear case, I assume an increase in sales growth to 3% per year and a rise in NOPAT/sales to 19% instead of increasing to 18%. I then changed the terminal P/E, P/B and P/S to more closely resemble the industry in todays market with higher multiples of 23.5, 2.5, and 3.3 respectively. The terminal values for each multiple are shown below and result in an equal weighted average of $86.88 (present value) which indicates the stock would still be overvalued today.

Figure 29: Third stage bull case valuation

Summary (using P/S multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$8.46	Present value of year 3-7 cash flow
Third stage	$71.46	Present value of terminal value P/S
Value (P/S)	**$81.68**	
Summary (using P/B multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$8.46	Present value of year 3-7 cash flow
Third stage	$75.77	Present value of terminal value P/B
Value (P/B)	**$85.99**	
Summary (using P/E multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$8.46	Present value of year 3-7 cash flow
Third stage	$82.75	Present value of terminal value P/E
Value (P/E)	**$92.97**	

Source: IMCP

Bear Case – For the bear case, I assume a drop in sales growth to just 1% per year and a consistent NOPAT/sales ratio of 17% instead of slowly increasing to 18%. I then changed the terminal P/E, P/B and P/S to converge to their respective 10-year industry average. I used multiples of 18.1, 1.9, and 2.4 respectively. The terminal values for each multiple are shown below and an equal weighted target is $68.

Figure 30: Third stage bear case valuation

Summary (using P/S multiple for terminal value)		
First stage	$1.81	Present value of first 2 year cash flow
Second stage	$12.56	Present value of year 3-7 cash flow
Third stage	$56.77	Present value of terminal value P/S
Value (P/S)	**$71.14**	
Summary (using P/B multiple for terminal value)		
First stage	$1.81	Present value of first 2 year cash flow
Second stage	$12.56	Present value of year 3-7 cash flow
Third stage	$65.50	Present value of terminal value P/B
Value (P/B)	**$79.87**	
Summary (using P/E multiple for terminal value)		
First stage	$1.81	Present value of first 2 year cash flow
Second stage	$12.56	Present value of year 3-7 cash flow
Third stage	$61.04	Present value of terminal value P/E
Value (P/E)	**$75.41**	

Source: IMCP

Business Risks

Although I have many reasons to be optimistic about Wisconsin Energy Group, there are several good reasons why I could be wrong.

Governmental regulation:

The Company is subject to state, local, and federal governmental regulation, including various utility commissions. These regulations ultimately determine the operating environment as well as affect the firm's ability to recover costs from its customers.

Costs to comply with laws, regulations, and greenhouse gas emissions:

There are significant costs incurred while complying with continuously changing laws and regulations for WEC and other utility companies. The firm's electric utilities can be subject to higher costs/penalties as a result of changes to standards by the regulatory commissions and government.

Fluctuation in energy sales:

Energy sales can have large swings due to seasonality changes that can adversely affect WEC's regulated ROE over time.

Capital projects:

There are regular capital projects which are subject to their own risks and uncertainties which can adversely affect costs and the completion of construction projects.

Fluctuating commodity prices:

Operating and liquidity requirements are constantly impacted by current and forward market prices of natural gas, coal, electricity, and renewable energy.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Very Low

Significant barriers to entry exist in the industry. As a natural monopoly, WEC, like all utilities, benefits from the substantial capital and regulatory requirements necessary for aspiring competitors. Furthermore, marginal costs of supplying power to an additional customer are minimal. Geographic restraints vary by state but remain favorable for the majority of WEC operations.

Threat of Substitutes – Low

Technology shifts and government subsidies have decreased price points for solar panels and other renewable generation sources. Self-generation is a growing threat to reduce WEC's customer base. Other self-generation techniques, such as microturbines and fuel cells, provide a long-term threat to WEC's demand but remain nonviable options in short-term demand.

Supplier Power – Medium

Little competition exists amongst suppliers and the utility industry necessitates high building and development capital expenditures. Heightened needs for capacity and delivery shift power to suppliers of WEC. Natural gas and electric power inputs are highly commoditized, and prices are determined by market forces. WEC faces relatively low switching costs with natural gas suppliers and acts to hedge natural gas market price movements.

Buyer Power – Low

Residential, small commercial, and industrial customers have very limited ability to switch suppliers. Customers rarely shift demand for power unless external factors necessitate such actions. As prices rise customers may attempt to reduce energy usage with various conservation efforts. In exchange for low customer buying power, rates and allowed returns are heavily regulated. Retail choice and wholesale rate agreements have shifted power to electric and natural gas buyers, but this represents a small portion of WEC's revenue base.

Intensity of Competition – Low

Industry competition is low due to geographic and regulatory limitations. Independent power producers and retail choice have increased competition, but generally, these are a minimal threat to the industry.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High net magins Economies of scale Growing rate base	High emissions Limited ROE Reliance on C&I customers
Opportunities	**Threats**
Renewing rate cases Customer growth Improving reliability	Changing interest rates Regulation Weather

Appendix 3: Income Statement

Income Statement (in millions)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Sales	$5,926	$7,472	$7,649	$7,680	$7,830	$8,114	$8,224
Direct costs	2,802	3,410	3,621	3,744	3,820	3,959	3,964
Gross Margin	3,124	4,062	4,027	3,936	4,010	4,155	4,260
SG&A and other	1,874	2,380	2,242	2,467	2,450	2,452	2,492
EBIT	1,251	1,682	1,785	1,468	1,560	1,704	1,768
Interest	331	403	416	445	500	534	571
EBT	919	1,279	1,370	1,023	1,060	1,170	1,197
Taxes	434	567	384	170	100	211	251
Income	485	713	986	854	960	959	946
Other (net tax)	(155)	(227)	(219)	(207)	(153)	(220)	(300)
Net income	640	940	1,205	1,061	1,113	1,179	1,246
Basic Shares	271.1	315.6	315.6	315.5	315.4	314.6	313.7
Fully Diluted Shares	272.7	316.9	317.2	316.9	316.8	316.0	315.1
EPS	$2.36	$2.98	$3.82	$3.36	$3.53	$3.75	$3.97
EPS Fully Diluted	$2.35	$2.97	$3.80	$3.35	$3.51	$3.73	$3.95
DPS	$1.68	$1.98	$2.08	$2.21	$2.28	$2.47	$2.63

Appendix 4: Balance Sheets

Balance Sheet (in millions)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Cash	50	38	39	85	48	58	75
Operating assets ex cash	2,157	2,131	2,175	2,163	2,150	2,110	2,138
Operating assets	2,207	2,169	2,214	2,248	2,198	2,167	2,213
Operating liabilities	1,456	1,414	1,583	1,527	1,439	1,461	1,480
NOWC	751	755	631	721	759	707	733
NOWC ex cash (NWC)	701	717	592	637	711	649	658
NFA	27,148	27,955	29,377	31,228	32,575	34,528	35,914
Invested capital	*$27,899*	*$28,709*	*$30,008*	*$31,949*	*$33,333*	*$35,235*	*$36,646*
Total assets	*$29,355*	*$30,123*	*$31,591*	*$33,476*	*$34,773*	*$36,695*	*$38,127*
Short-term and long-term debt	$10,377	$10,176	$11,033	$11,799	$12,571	$13,471	$14,371
Other liabilities	8,837	9,573	9,483	10,307	10,475	11,050	11,100
Debt/equity-like securities	30	30	30	54	105	205	320
Equity	8,655	8,930	9,461	9,789	10,182	10,508	10,855
Total supplied capital	*$27,899*	*$28,709*	*$30,008*	*$31,949*	*$33,333*	*$35,235*	*$36,646*
Total liabilities and equity	*$29,355*	*$30,123*	*$31,591*	*$33,476*	*$34,773*	*$36,695*	*$38,127*

Appendix 5: Sales Forecast

Sales (in millions)							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
Sales	$5,926	$7,472	$7,649	$7,680	$7,830	$8,114	$8,224
Growth		*26.1%*	*2.4%*	*0.4%*	*2.0%*	*3.6%*	*1.4%*
Electric	4,069	4,628	4,559	4,439	4,400	4,444	4,444
Growth		*13.8%*	*-1.5%*	*-2.6%*	*-0.9%*	*1.0%*	*0.0%*
% of sales	*68.7%*	*61.9%*	*59.6%*	*57.8%*	*56.2%*	*54.8%*	*54.0%*
Natural gas	1,775	2,796	3,037	3,194	3,430	3,670	3,780
Growth		*57.5%*	*8.6%*	*5.2%*	*7.4%*	*7.0%*	*3.0%*
% of sales	*30.0%*	*37.4%*	*39.7%*	*41.6%*	*43.8%*	*45.2%*	*46.0%*

Appendix 6: Ratios

Ratios	2015	2016	2017	2018	2019	2020E	2021E
Profitability							
Gross margin	52.7%	54.4%	52.7%	51.3%	51.2%	51.2%	51.8%
Operating (EBIT) margin	21.1%	22.5%	23.3%	19.1%	19.9%	21.0%	21.5%
Net profit margin	10.8%	12.6%	15.8%	13.8%	14.2%	14.5%	15.1%
Activity							
NFA (gross) turnover		0.27	0.27	0.25	0.25	0.24	0.23
Total asset turnover		0.25	0.25	0.24	0.23	0.23	0.22
Liquidity							
Op asset / op liab	1.52	1.53	1.40	1.47	1.53	1.48	1.49
NOWC Percent of sales		10.1%	9.1%	8.8%	9.4%	9.0%	8.8%
Solvency							
Debt to assets	35.3%	33.8%	34.9%	35.2%	36.2%	36.7%	37.7%
Debt to equity	119.9%	114.0%	116.6%	120.5%	123.5%	128.2%	132.4%
Other liab to assets	30.1%	31.8%	30.0%	30.8%	30.1%	30.1%	29.1%
Total debt to assets	65.5%	65.6%	64.9%	66.0%	66.3%	66.8%	66.8%
Total liabilities to assets	70.4%	70.3%	70.0%	70.6%	70.4%	70.8%	70.7%
Debt to EBIT	8.30	6.05	6.18	8.04	8.06	7.91	8.13
EBIT/interest	3.77	4.18	4.29	3.30	3.12	3.19	3.10
Debt to total net op capital	37.2%	35.4%	36.8%	36.9%	37.7%	38.2%	39.2%
ROIC							
NOPAT to sales	11.1%	12.5%	16.8%	15.9%	18.0%	17.2%	17.0%
Sales to NWC		10.54	11.69	12.50	11.62	11.93	12.58
Sales to NFA		0.27	0.27	0.25	0.25	0.24	0.23
Sales to IC ex cash		0.26	0.26	0.25	0.24	0.24	0.23
Total ROIC ex cash		3.3%	4.4%	4.0%	4.3%	4.1%	3.9%
NOPAT to sales	11.1%	12.5%	16.8%	15.9%	18.0%	17.2%	17.0%
Sales to NOWC		9.93	11.04	11.36	10.58	11.07	11.43
Sales to NFA		0.27	0.27	0.25	0.25	0.24	0.23
Sales to IC		0.26	0.26	0.25	0.24	0.24	0.23
Total ROIC		3.3%	4.4%	4.0%	4.3%	4.1%	3.9%
NOPAT to sales	11.1%	12.5%	16.8%	15.9%	18.0%	17.2%	17.0%
Sales to EOY NWC	8.46	10.42	12.92	12.07	11.02	12.50	12.50
Sales to EOY NFA	0.22	0.27	0.26	0.25	0.24	0.24	0.23
Sales to EOY IC ex cash	0.21	0.26	0.26	0.24	0.24	0.23	0.22
Total ROIC using EOY IC ex cash	2.4%	3.3%	4.3%	3.8%	4.2%	4.0%	3.8%
NOPAT to sales	11.1%	12.5%	16.8%	15.9%	18.0%	17.2%	17.0%
Sales to EOY NOWC	7.90	9.90	12.12	10.65	10.32	11.48	11.22
Sales to EOY NFA	0.22	0.27	0.26	0.25	0.24	0.24	0.23
Sales to EOY IC	0.21	0.26	0.25	0.24	0.23	0.23	0.22
Total ROIC using EOY IC	2.4%	3.3%	4.3%	3.8%	4.2%	4.0%	3.8%
3-stage							
Net income / sales		12.6%	15.8%	13.8%	14.2%	14.5%	15.1%
Sales / avg assets		0.25	0.25	0.24	0.23	0.23	0.22
ROA		3.2%	3.9%	3.3%	3.3%	3.3%	3.3%
Avg assets / avg equity		3.38	3.36	3.38	3.42	3.45	3.50
ROE		10.7%	13.1%	11.0%	11.1%	11.4%	11.7%
Payout Ratio		66.5%	54.5%	65.8%	64.7%	65.9%	66.2%
Retention Ratio		33.5%	45.5%	34.2%	35.3%	34.1%	33.8%
Sustainable Growth Rate		3.6%	6.0%	3.8%	3.9%	3.9%	3.9%

Appendix 7: Cash Flow Statement

Cash Flow Statement							
Items	**2015**	**2016**	**2017**	**2018**	**2019**	**2020E**	**2021E**
With cash and debt							
NOPAT	$660	$937	$1,285	$1,225	$1,413	$1,397	$1,397
Growth		*42.0%*	*37.1%*	*-4.7%*	*15.4%*	*-1.1%*	*0.0%*
NOWC	751	755	631	721	759	707	733
Net fixed assets	27,148	27,955	29,377	31,228	32,575	34,528	35,914
Total net operating capital	$27,899	$28,709	$30,008	$31,949	$33,333	$35,235	$36,646
Growth		*2.9%*	*4.5%*	*6.5%*	*4.3%*	*5.7%*	*4.0%*
- Change in NOWC		4	(124)	90	38	(52)	26
- Change in NFA		806	1,423	1,851	1,347	1,953	1,385
FCFF		$127	-$14	-$717	$29	-$504	-$14
Growth			*-110.7%*	*5165.6%*	*-104.0%*	*-1861.3%*	*-97.1%*
- After-tax interest expense		224	299	371	453	438	451
+ Net new short-term and long-term debt		(201)	858	789	823	1,000	1,015
FCFE		-$298	$545	-$299	$399	$58	$549
Growth			*-282.6%*	*-154.8%*	*-233.7%*	*-85.6%*	*853.6%*
Sources of cash (FCFE)		-$298	$545	-$299	$399	$58	$549
Uses of cash							
Other expense		($227)	($219)	($207)	($153)	($220)	($300)
Dividends		625	657	697	720	778	824
Change in other equity		40	17	36	-	75	75
		$438	$454	$526	$567	$633	$599
Change in other liab		736	(90)	825	168	575	50
Total		($298)	$545	($299)	$399	$58	$549

Appendix 8: 3-stage DCF Model

	Year						
	1	2	3	4	5	6	7
	First Stage		Second Stage				
Year ending January	2020	2021	2022	2023	2024	2025	2026
Sales Growth	*3.6%*	*1.4%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*17.2%*	*17.0%*	*17.2%*	*17.4%*	*17.6%*	*17.8%*	*18.0%*
S / NOWC	*11.48*	*11.22*	*11.08*	*10.93*	*10.79*	*10.64*	*10.50*
S / NFA (EOY)	*0.24*	*0.23*	*0.23*	*0.23*	*0.23*	*0.23*	*0.23*
S / IC (EOY)	*0.23*	*0.22*	*0.22*	*0.22*	*0.22*	*0.22*	*0.23*
ROIC (EOY)	*4.0%*	*3.8%*	*3.9%*	*3.9%*	*4.0%*	*4.0%*	*4.1%*
ROIC (BOY)		*4.0%*	*3.9%*	*4.0%*	*4.0%*	*4.1%*	*4.1%*
Share Growth		*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*
Sales	$8,114	$8,224	$8,389	$8,556	$8,728	$8,902	$9,080
NOPAT	$1,397	$1,397	$1,442	$1,488	$1,536	$1,584	$1,634
Growth		*0.0%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*
- Change in NOWC	-52	26	24	25	26	27	28
NOWC EOY	*707*	*733*	*757*	*783*	*809*	*836*	*865*
Growth NOWC		*3.7%*	*3.3%*	*3.4%*	*3.4%*	*3.4%*	*3.4%*
- Chg NFA	1953	1385	686	699	713	726	740
NFA EOY	*34,528*	*35,914*	*36,600*	*37,299*	*38,012*	*38,739*	*39,479*
Growth NFA		*4.0%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*	*1.9%*
Total inv in op cap	1902	1411	711	725	739	754	769
Total net op cap	35235	36646	37357	38082	38821	39575	40344
FCFF	($504)	($14)	$731	$763	$796	$830	$866
% of sales	*-6.2%*	*-0.2%*	*8.7%*	*8.9%*	*9.1%*	*9.3%*	*9.5%*
Growth		*-97.1%*	*-5154.0%*	*4.4%*	*4.3%*	*4.3%*	*4.2%*
- Interest (1-tax rate)	438	451	473	495	517	539	561
Growth		*3.0%*	*4.9%*	*4.6%*	*4.4%*	*4.2%*	*4.1%*
+ Net new debt	1000	1015	700	700	700	700	700
Debt	13471	14371	15071	15771	16471	17171	17871
Debt / tot net op capital	*38.2%*	*39.2%*	*40.3%*	*41.4%*	*42.4%*	*43.4%*	*44.3%*
FCFE w debt	$58	$549	$958	$968	$979	$991	$1,004
% of sales	*0.7%*	*6.7%*	*11.4%*	*11.3%*	*11.2%*	*11.1%*	*11.1%*
Growth		*853.6%*	*74.4%*	*1.1%*	*1.1%*	*1.2%*	*1.3%*
/ No Shares	314.6	313.8	313.1	312.3	311.5	310.8	310.0
FCFE	$0.18	$1.75	$3.06	$3.10	$3.14	$3.19	$3.24
Growth		*855.9%*	*74.8%*	*1.3%*	*1.4%*	*1.5%*	*1.6%*
* Discount factor	0.95	0.90	0.86	0.82	0.78	0.74	0.70
Discounted FCFE	$0.17	$1.58	$2.63	$2.54	$2.45	$2.36	$2.28

Third Stage							
Year ending January	2020	2021	2022	2023	2024	2025	2026
Terminal value P/S							
Sales	$8,114	$8,224	$8,389	$8,556	$8,728	$8,902	$9,080
Growth		*1.4%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Net profit margin	*14.5%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*
Terminal P/S							2.80
* Terminal SPS							$29.29
Terminal value							$82.02
* Discount factor							0.70
Discounted terminal value							$57.75
Terminal value P/B							
Book value	$10,508	$10,855	$11,216	$11,594	$11,988	$12,402	$12,835
Growth		*3.3%*	*3.3%*	*3.4%*	*3.4%*	*3.4%*	*3.5%*
ROE (EOY book)	*11.2%*	*11.5%*	*11.3%*	*11.2%*	*11.0%*	*10.8%*	*10.7%*
Net income	$1,179	$1,246	$1,269	$1,293	$1,318	$1,345	$1,373
Dividends	$778	$824	$832	$841	$849	$858	$866
Growth		*6.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
Shares	314.6	313.8	313.1	312.3	311.5	310.8	310.0
Price		$96.42	$96.34	$96.25	$96.17	$96.08	$96.00
Growth			*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*	*-0.1%*
Net issuance		-$75	-$75	-$74	-$74	-$74	-$74
Terminal P/B							2.30
* Terminal BPS							$41.41
Terminal value							$95.23
* Discount factor							0.70
Discounted terminal value							$67.05
Terminal value P/E							
Net income	$1,179	$1,246	$1,269	$1,293	$1,318	$1,345	$1,373
% of sales	*14.5%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*	*15.1%*
EPS	$3.75	$3.97	$4.05	$4.14	$4.23	$4.33	$4.43
Growth		*5.9%*	*2.1%*	*2.2%*	*2.2%*	*2.3%*	*2.3%*
Terminal P/E							19.50
* Terminal EPS							$4.43
Terminal value							$86.39
* Discount factor							0.70
Discounted terminal value							$60.82

Summary (using P/S multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$12.26	Present value of year 3-7 cash flow
Third stage	$57.75	Present value of terminal value P/S
Value (P/S)	**$71.76**	

Summary (using P/B multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$12.26	Present value of year 3-7 cash flow
Third stage	$67.05	Present value of terminal value P/B
Value (P/B)	**$81.07**	

Summary (using P/E multiple for terminal value)		
First stage	$1.76	Present value of first 2 year cash flow
Second stage	$12.26	Present value of year 3-7 cash flow
Third stage	$60.82	Present value of terminal value P/E
Value (P/E)	**$74.84**	