Investment Management Certificate Program (IMCP)

University of Wisconsin-Milwaukee

Lubar School of Business

www.lubar.uwm.edu/IMCP

Class of 2020 Report Packet

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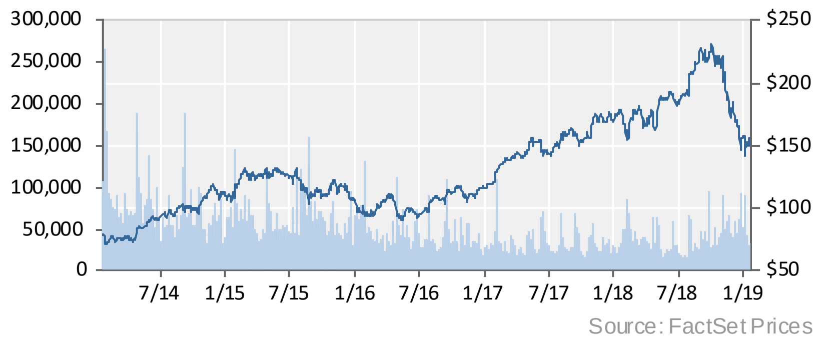
Recommendation	BUY
Target (today's value)	$200
Current Price	$156.82
52 week range	$142.00-233.47

Technology Hardware

Apple Inc.



Share Data	
Ticker:	AAPL
Market Cap. (Billion):	$741.7
Inside Ownership	0.1%
Inst. Ownership	61.3%
Beta	1.11
Dividend Yield	1.90%
Payout Ratio	22.9%
Cons. Long-Term Growth Rate	10.0%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$215.6	$229.2	$265.6	$274.8	$285.6
Gr %	-3.0%	11.5%	22.0%	3.5%	4.0%
Cons	-	-	-	$278.0	$289.4
EPS					
Year	$8.35	$9.27	$12.01	$12.60	$14.68
Gr %	-10.0%	11.0%	29.6%	13.8%	12.9%
Cons	-	-	-	$12.32	$13.73

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	36.9%	49.4%	49.4%	49.4%	62%
Industry	24.1%	24.9%	24.9%	42.3%	40.%
NPM (%)	21.2%	22.4%	22.4%	22.4%	22%
Industry	16.6%	13.6%	13.6%	23.9%	20.%
A. T/O	0.66	0.72	0.72	0.73	0.79
ROA (%)	13.9%	16.1%	16.1%	16.3%	17%
Industry	8.9%	8.3%	8.3%	14.5%	12%
A/E	2.51	2.80	3.41	4.61	10.03

Valuation	'17	'18	'19E	'20E
P/E	18.9	19.3	14.2	12.7
Industry	38.0	28.9	15.0	14.3
P/S	3.90	4.11	3.02	2.89
P/B	6..5	9.0	7.6	8.3
P/CF	13.6	14.3	11.4	10.2
EV/EBITDA	14.2	16.6	9.6	9.6

Performance	Stock	Industry
1 Month	-12.9%	-14.2%
3 Month	-23.5%	-18.6%
YTD	-.1%	3.6%
52-week	-1.5%	8.9%
3-year	49.4%	-9.5%

Summary: I recommend a buy rating with a target of $200. Although iPhone sales are slowing, Apple has large growth areas in Services and Wearables. Innovation in product lines and continuing expansion in high margin businesses are a tailwind. The stock is undervalued based on DCF analysis.

Key Drivers:

- iPhone Unit Sales and Average Selling Price: Unit sales growth is slightly negative and with iPhones likely priced toward the higher end of what they will be able to charge, iPhone growth will be low going forward.
- Services and Wearables products: Services and Wearables are the fastest growing and the highest margin segments for Apple. The valuation of these segments will add significantly to growth going forward.
- International Expansion: Apple's greatest chance for international expansion has shifted from China to Europe. Unlike Europe, the middle class in China does not have enough income to afford premium smartphones.
- Consumer Trends: Apple is able to charge premium pricing because of brand loyalty. If this were to be lost, it would have a large impact on margins and sales.
- Manufacturing and Supply Chain: Apple produces almost all of its products overseas. The firm has pricing power over suppliers and because AAPL does not manufacture its own products, capital investments are minor and free cash flow is high.

Valuation: Using a relative valuation approach, Apple appears to be overvalued in comparison to its industry. On a DCF basis, the stock is undervalued as it is worth $200 and the stock is at $157.

Risks: Threats to the business include declining iPhone sales, trade war concerns, consumer trends, and competition.

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Company Overview

Apple Inc. (AAPL) designs, manufactures and markets mobile communication, media devices, and personal computers. Apple sells a collection of services, third-party applications, and related software. AAPL's leading products include the iPhone, Mac, iPad, Apple Watch, Airpods, Apple TV, a diverse set of professional and consumer software applications, iOS, MacOS, Apple Pay, iCloud, App Store, and Apple Music. As a multinational corporation, Apple has 132,000 employees and was founded in 1977. Apple is the leading manufacturer of smartphones and personal computers. It conducts business through the following four segments:

iPhone- (63% of revenue)
iPhone sales is responsible for the largest segment of revenue for Apple. As the leading segment, iPhone has a 5-yr compounded annual growth rate (CAGR) of 6.1%. Apple has three new models of phones and a series of older products:

- iPhone XS Max starting at $1,099
- iPhone XS starting at $999
- iPhone XR in various colors beginning at $749
- Older phones include iPhone X, iPhone 8 and 8 plus, iPhone 7 and 7 plus, iPhone 6 and 6s products, ranging in price from $449 to $899.

Mac and iPad- (17% of revenue)
Mac is the company's product line of premium personal computers and iPad is Apple's line of multi-purpose tablets, both of which are based on its IOS operating system. This is Apple's slowest growing segment with a 5-yr CAGR of -5.7%. Its products include:

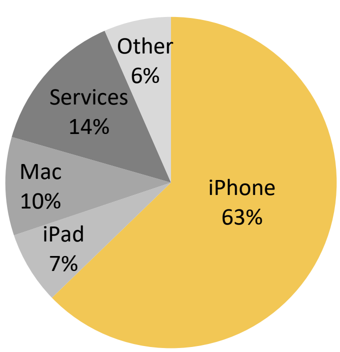
- iPad, iPad pro, and iPad mini, Mac Retina 5k display, Mac Pro, and Mac Mini.

Services- (14% of revenue)
The iTunes Store, App Store, and Mac App Store available on IOS devices allow consumers to download and purchase in-app content. Services are sold on an installed base of 1.3 billion Apple products, which includes 700 million iPhones. As the fastest growing segment, Services has a 21.7% 5-yr CAGR.
Services consists of the following segments:

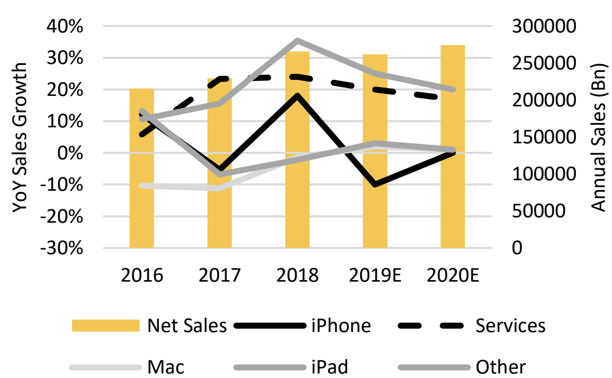
- App Store, Apple Music, iCloud, Apple Pay, Apple Care.

Wearables and Other- (6% of revenue)
Apple's Wearables segment consists of Airpods and headphones, Beats products, Apple Watch, and a variety of other products and supplies. Other products include HomePod and the AirPower mat that can wirelessly charge Apple products.

Figures 1 and 2: Revenue Sources for AAPL, year-end 2018 (left) and forecasted revenue growth (right)



Source: Company reports



Source: Company reports

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Business/Industry Drivers

While there are many factors that contribute to the firm's success, I have outlined below the most important business drivers:

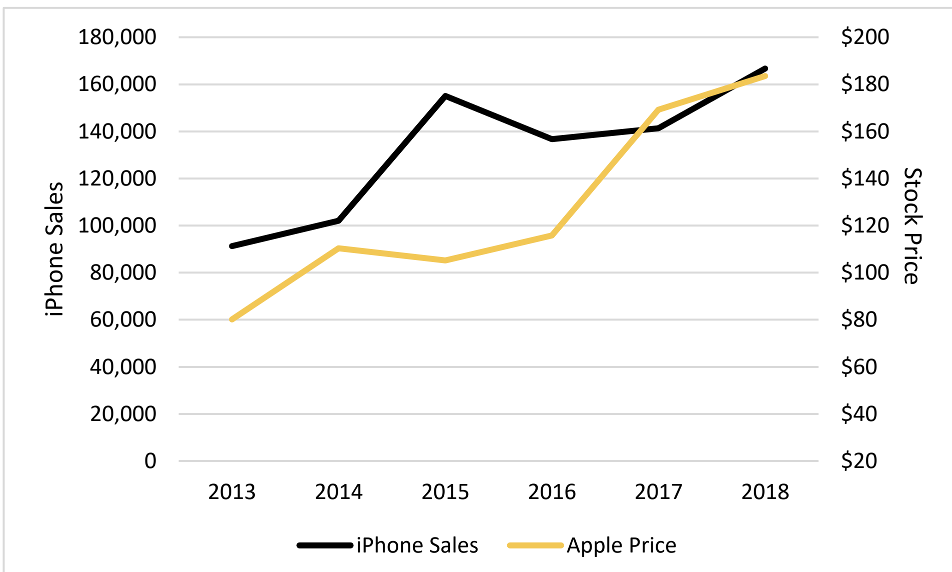
1) iPhone Unit Sales and Average Selling Price
2) Services and Wearable products
3) International Expansion
4) Consumer Trends
5) Manufacturing and Supply Chain

iPhone Unit Sales and Average Selling Price

AAPL's global smartphone market share is flat

Apple's largest segment is from the selling of iPhones, which makes up 63% of total revenue. Apple iPhones with their high prices and constant innovations are located in the premium smartphone market of which Apple has a 45% of global market share. IPhone sales have increased 18% in the past year, compared to growth rates of 52%, -12%, and 3% in 2015, 2016, and 2017, respectively.

Figure 3: iPhone sales and Apple Stock Price

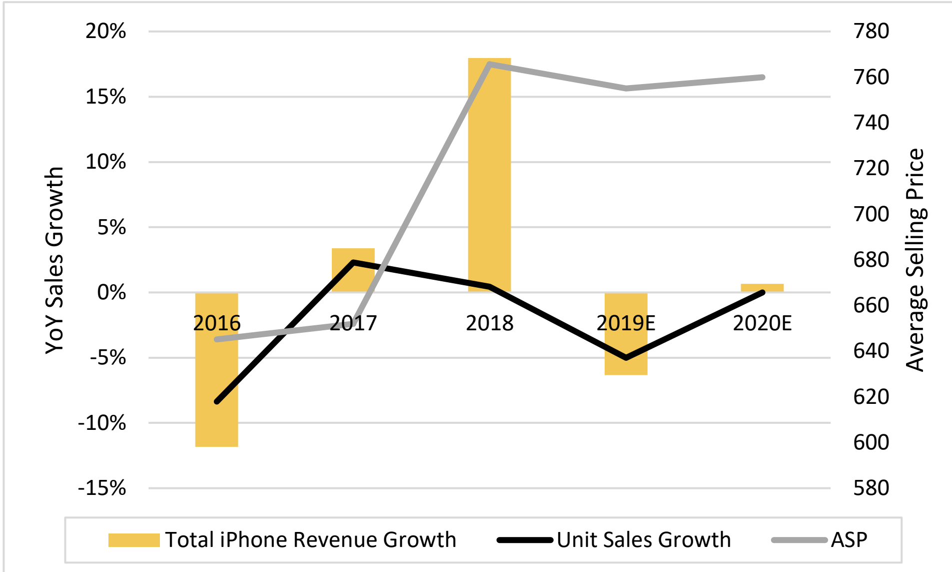


Source: Company reports

AAPL's average selling price of iPhones has increased 18% YoY

Monthly payment plans have driven the average selling price of iPhones steadily upwards in the last few years. IPhone selling prices increased to $765 from $651 last year, which led to an 18% y/y increase in iPhone revenue in 2018. In November 2017, Apple released the iPhone X with a starting price of $999. The iPhone X was the most popular selling phone for Apple in 2018, the first time that the most expensive model has also been the best seller. On September 12th, Apple unveiled its 2018 lineup of phones, which includes the iPhone XR that starts at $749, the XS for $999, and the XS Max starting at $1,099. The continued increase in iPhone selling prices reflects the demand for Apple phones and the ease in which consumers can purchase high priced phones while only paying monthly premiums of $40-$50 a month.

Figure 4: Unit sales growth and average selling price of iPhones



Source: Company reports

The iPhone XS Max is the most expensive phone Apple has ever made with the 512GB model selling for $1449. Demand for the XS Max was strong as soon as it was available for pre-order earlier this year with shipping estimates increasing as soon as it was announced.

Figure 5: Comparison of iPhone XS Max and Samsung Galaxy Note 9

iPhone XS Max	Phone	Galaxy Note 9
$1,099	Cost	$999
6.5x3.05x.3	Dimensions	6.4 x3.01x.35in
Yes	Face Detection	Yes
Wired/Wireless	Charging Capabilities	Wired/Wireless
528G/128G	Storage	528G/128G
IOS	Operating System	Android
2 meters for 30 min	Water resistance	5 ft for 30 min
12MP	Camera pixel size	12MP
7.34 oz	Weight	7.09 oz
Silver, Space Grey Gold	Colors	Blue/Purple

Source: Company reports

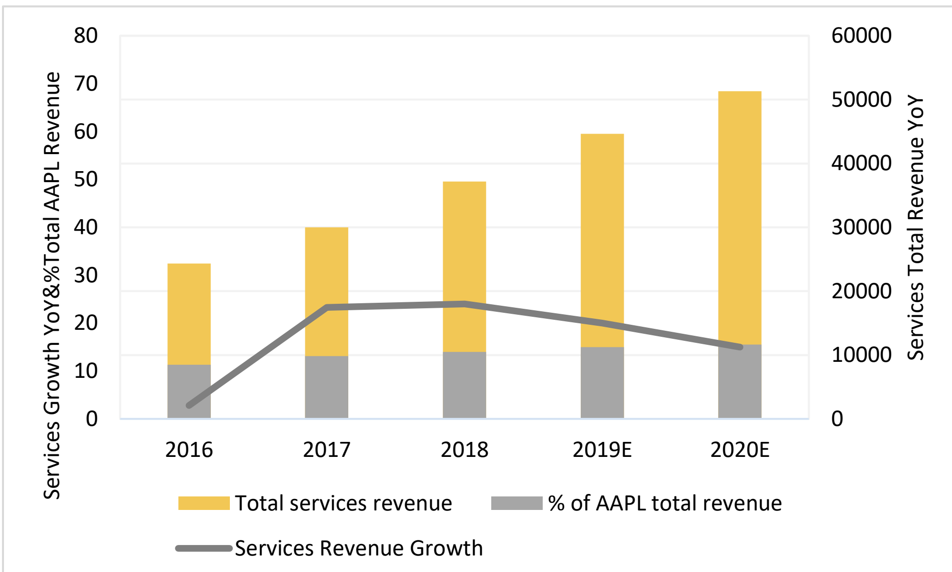
Services and Wearables Products

Apple's second largest and fastest growing segment of its business is the selling of services to customers which includes Apple Music, App Store, iCloud, Apple Pay, and Apple Care. Apple services revenues grew to $37.2 billion in 2018, a 24% increase y/y, and management seeks to have revenue hit the realistic goal of $50 billion in 2020.

The installed base of 1.3 billion Apple products, that includes 700 million iPhones, has enabled the services business to grow. The increase in the installed base of Apple products has a significant impact on the services business because with Apple's integrated set of products it is the only place one is able to purchase application software for its products. The iPhone and services businesses resemble a razor-razor blade model. When a consumers purchases an iPhone, this is just the first sale of many associated purchases with the product. The consumer then purchases books on iTunes, games they enjoy on the App store, and/or Apple Music. These two parts of the business work off each other and result in consumers getting hooked on AAPL's products.

The services business also drives iPhone sales. If you have purchased all of your music and audiobooks on iTunes, stored your photos on iCloud, use Apple pay for payments, you cannot transfer these to other products outside of the Apple ecosystem. In addition, the more services one has the most likely one uses up space and needs to upgrade phones. These factors explain why retention rates for iPhones are above 90%.

Figure 6: Services revenue and growth as a part of overall AAPL sales



Source: Company reports

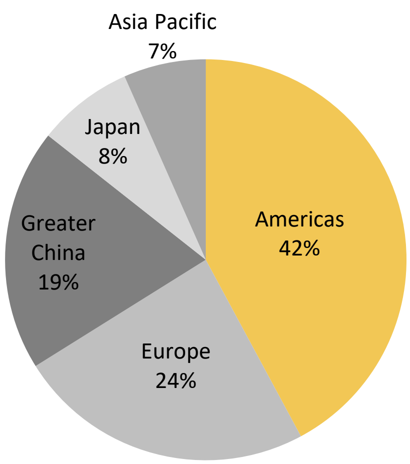
Apple's wearable segment is comprised of Apple Watch, Beats headphones, Airpods and headphones. Over the past four quarters that coincide with the launch of Airpods, this segment has garnered over $10 billion in revenue with a 35% y/y growth rate. The Apple Airpods were introduced with a price tag of $159. Similar to many other products offered by Apple, the firm is able to charge a premium price for a product that has low costs and thus gives it a high margin. The newly available Apple Watch Series 4 with a starting price of $499 is now able to assess the need for a medical emergency and can notify help without the owner's assistance. This shows Apple's continued dive into the medical device side of technology that is becoming more popular.

<u>International Expansion</u>

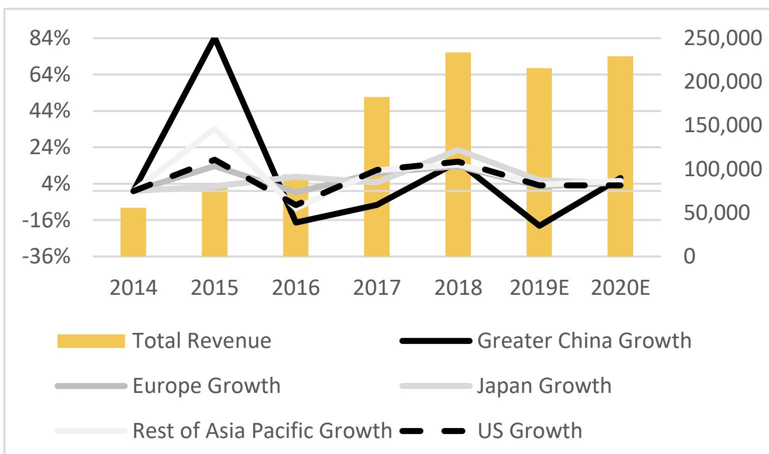
58% of AAPL's total revenue comes from international markets

58% of AAPL's revenue comes from outside of the U.S. AAPL's premium priced products have had a negative effect on international sales especially in lower income countries such as China and India. Sales in China, that make up 19% of APPL revenues, fell 23.8% to 44.7 billion in 2017, gained 16% in 2018 to 51.9 billion, and is still off from its peak of 58.7 billion in 2015. Huawei, the largest smart phone producer in China, has increased its market share in China at the expense of AAPL's unit sales. Many Chinese consumers do not see an attractive value proposition by upgrading to an iPhone compared to the models Huawei and other lower end smartphone producers' offer. Chinese currency headwinds also have had a large negative affect on iPhone sales in China. The iPhone XR is priced at $749 in the U.S and over $950 after currency conversion in China. It gets worse when you compare the most expensive iPhones. The XS Max begins at $1,099 in the U.S and in China, it starts at $1,397, almost a 30% increase. With large declines in demand in China Apple is slashing prices, with some down 15% which will hurt margins. Apple controls 88% of the smartphone market in China with prices over $800 and is split about 40%/40% with Samsung for $600-$800 premium market. These price points offer limited upside potential in China because of their demographics. About 3% of China's population are considered high income individuals with incomes over $32,000. Another 8% of the population are considered upper middle class and have incomes from $11,000 to $32,000. Estimating that half of the upper middle class and all of the high income individuals can afford an Apple phone, China has an approximate total addressable market of 100 million individuals. Population of the upper middle class and high income class are projected to increase roughly 50% by 2030. This would result in an approximate growth rate of 3-4% in the total premium market. With Apple controlling about 60% of this market, I project Apple to be able to sustain 2% growth in China. In fiscal year 2018, Apple increased sales in Europe 14% to 62.4 billion and has surpassed China as the largest international market. Europe has more favorable demographics than China. GDP per capita in Europe is $37,000 compared to about $10,000 for China. Although China has a higher population (1.4 billion) vs Europe (750 million), Europe has a higher TAM because of their incomes. Given modest GDP growth of about 2% in Europe for the next handful of years, Apple should be able to grow iPhones at a proportional amount with additional revenues coming from the Services segment.

Figure 7 and 8: International revenue by region (left) & international growth by region (right)



Source: Company Reports



Source: Company Reports

<u>Consumer Trends</u>

Consumers are trending toward larger phones and away from iPads

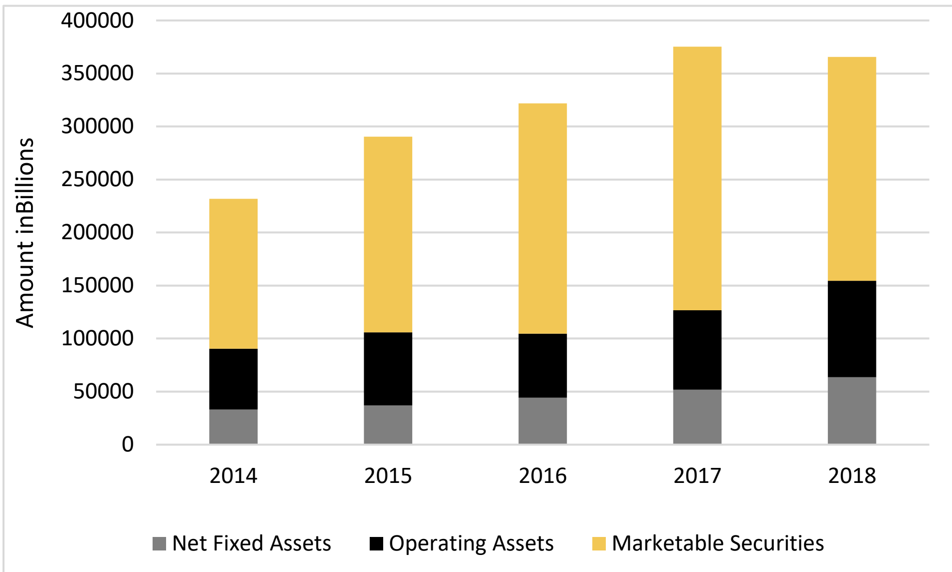
Recent consumer trends have been favorable to Apple products, specifically more expensive iPhones and services sold across Apple products. As smartphones take up more and more of people's everyday lives, consumers are willing to spend more on the device they use all day. One reason iPad sales are trending downward is because consumers are using their phones to do the same activities and tasks as they used to do on their iPads. Apple's move to larger screens with less dead space exhibited with the iPhone X and subsequent new phones enable users to play more games on their smartphone and download applications that have an option to buy additional services.

Supply Chain

Apple manufactures nearly all of its products in China. A complex web of suppliers are relied upon to manufacture, assemble, and test Apple products. This is a significant competitive advantage for Apple. With these operational efficiencies, much less capital is needed to continue day-to-day operations. Apple does not own all of the property, plant, and equipment, which most manufacturing companies are forced to invest capital. The only property, plant, and equipment Apple has is its stores and general buildings related with management. With these built in advantages, Apple is able to use cash flow for buybacks and R&D to innovate its product line for the future.

Apple uses minor amounts of capital in its business

Figure 9: Net Fixed Assets, Operating Assets, and Marketable Securities



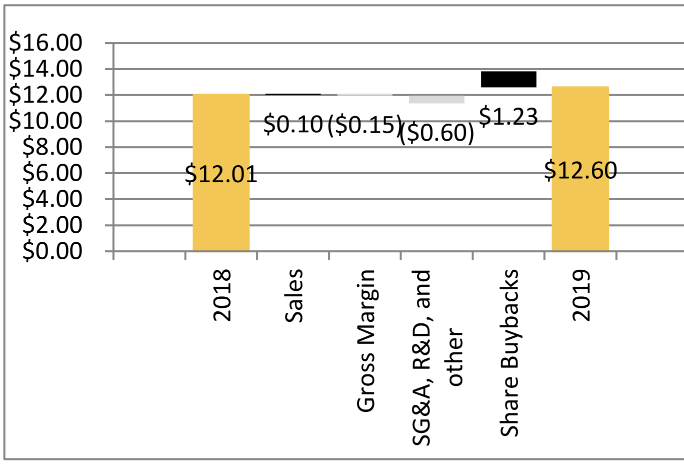
Source: Company Reports

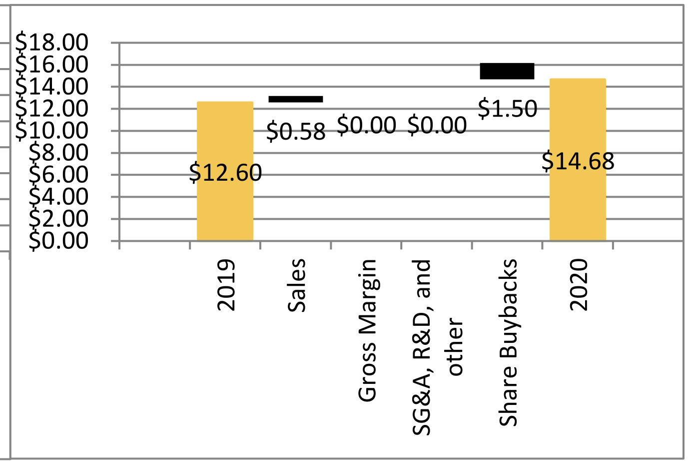
Financial Analysis

Quantification of Drivers

I expect EPS in 2019 to grow to $12.60 from $12.01 in 2018. In 2019, I anticipate a 1.4% decrease in sales driven by declining iPhone revenue and by the increases in the Services and Wearables business segment. I forecast iPhone ASP will be $755, down 2% y/y, and an 8% reduction in unit sales, which will lead to a 10% decrease in total iPhone sales. Gross margin should be slightly lower from a combination of increased margins from the growing Services and Wearables business segments and decreasing margins in iPhone, Mac, and iPad segments. Over time, as the Services and Wearables segments become a larger percentage of sales gross margins will expand proportionally. I expect Apple to continue to spend more on R&D as a percent of sales. R&D spending has increased at a 3 year CAGR of 11%, which will outpace gross sales and result in more spending on R&D as a percent of sales. I project SG&A and R&D expenses will increase to 12% of sales from 11.6% in 2018 and flatten after 2019. In 2020, I expect EPS to improve to $14.68 from $12.60 in 2019. A significant portion of this increase comes from the large buyback program. Stable revenue from iPhone and increases in the Services and Wearables segments explain my projection of sales increasing by 4.7% in 2020. In the foreseeable future I see iPhone ASPs remaining stable with downside risk if Apple were to release a phone with a lower price point.

Figure 10 and 11: Quantification of 2019 Drivers (Left) and Quantification of 2020 Drivers (Right)





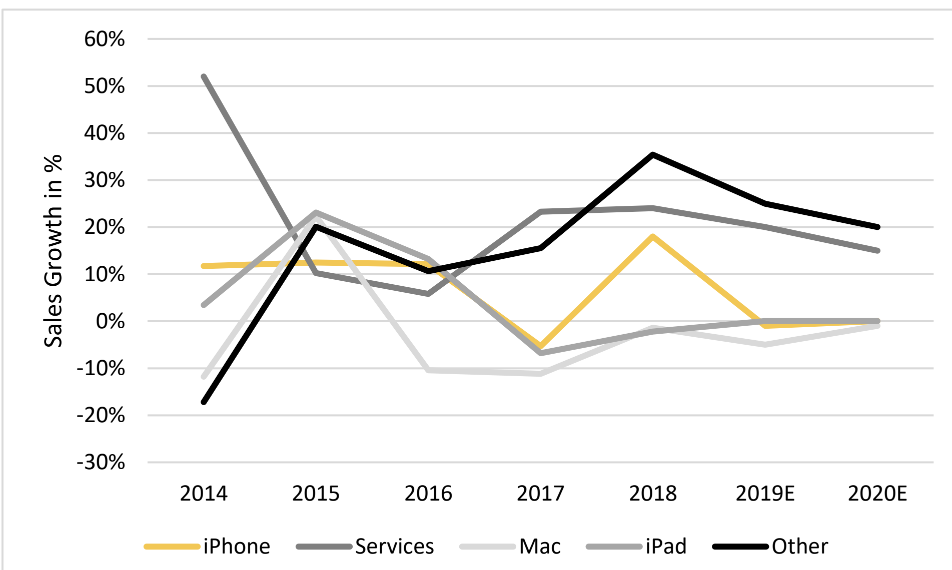
Source: Company Reports, IMCP

Source: Company Reports, IMCP

Sales Forecast

In 2018, Apple's sales increased by 15.9% and were driven by the increase in iPhone sales. iPhone revenue increased by 18%, almost entirely attributable to the increase in ASP. In 2019 and beyond, Apple will be unable to increase its ASP significantly. I expect ASP to decrease to $755 from $765 in 2019 and for an 8% decrease in unit sales. Overall, I expect Apple sales to decrease by 1.4% in 2019. Projected increases of 20% and 25% in the Services and Other segment, do not make up for the 10% decline in iPhone revenues. With Apple introducing their new phones in the September quarter instead of the January quarter as the firm typically does, it brought sales forward to the October quarter and this factors into my projection that unit sales will fall 8% in 2019.

Figure 12: Projected % Sales Growth by Business Segment



Source: Company Reports

Figure 14 highlights my 2019 and 2020 estimates compared to consensus. My EPS during both years are above consensus based on two main factors. First, consensus is projecting a steadying of the large share buyback growth. I believe Apple will continue to increase buybacks substantially and that it will obtain cash neutral in three years. Secondly, I expect the high margin businesses that include Services and Wearables to grow faster than consensus. I project Services growing 20% in 2019 and 15% in 2020 while consensus is slightly lower. I have also projected sales in Wearables growing faster than consensus at 25% and 20% in 2019 and 2020. My sales forecasts come in below consensus in both 2019 and 2020 mainly attributable to my estimates of continued decline in Mac and iPad while consensus has these divisions even over the next two years.

Figure 13: Model vs. Consensus

My Estimates	2019E	2020E	Consensus	2019E	2020E
EPS	12.60	14.68	EPS	12.32	13.73
Growth	4.9%	22.2%	Growth	2.6%	14.3%
Sales	261.8	274.2	Sales	261.9	272.8
Growth	-1.4%	4.7%	Growth	-1.4%	2.7%

Source: Company Reports, IMCP

Free Cash Flow

NOPAT increased by 27.9% in 2018 accounting for the largest increase in FCFF per share, which grew to $8.87, a growth rate of 40.1%. Apple's NOPAT has a 5 year CAGR of 11.7%. My forecast is that the trend of NOPAT will continue to increase but at a much slower rate than in the past. With the iPhone total sales projected to turn negative in 2019, Apple's high margin businesses such as Services and Wearables will account for the majority of the increase in NOPAT.

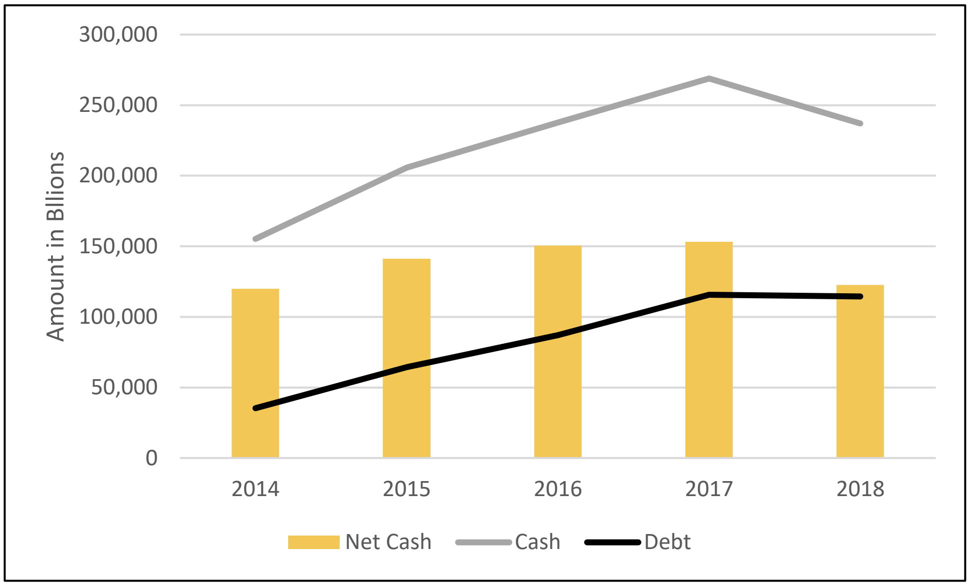
Figure 14: Apple's Free Cash Flow Breakdown, 2014-2020E

Free Cash Flow	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
NOPAT	$38,786	$52,448	$44,684	$46,280	$59,200	$54,976	$57,579
Growth		*35.2%*	*-14.8%*	*3.6%*	*27.9%*	*-7.1%*	*4.7%*
NOWC	30,354	34,776	30,091	41,461	50,721	48,237	43,970
Net fixed assets	33,146	36,902	44,387	51,960	63,587	62,676	65,644
Total net operating capital	$63,500	$71,678	$74,478	$93,421	$114,308	$110,914	$109,614
Growth		*12.9%*	*3.9%*	*25.4%*	*22.4%*	*-3.0%*	*-1.2%*
- Change in NOWC		4,422	(4,685)	11,370	9,260	(2,484)	(4,267)
- Change in NFA		3,756	7,485	7,573	11,627	(911)	2,967
FCFF		$44,270	$41,884	$27,337	$38,313	$58,371	$58,879
Growth			*-5.4%*	*-34.7%*	*40.1%*	*52.4%*	*0.9%*
- After-tax interest expense		(946)	(1,003)	(2,071)	(1,674)	(1,713)	(1,713)
+ Net new short-term and long-term debt		34,327	24,508	40,403	5,642	-	-
FCFE		$79,543	$67,395	$69,811	$45,629	$60,083	$60,592
Growth			*-15.3%*	*3.6%*	*-34.6%*	*31.7%*	*0.8%*

Apple will continue to buyback significant amounts of stock and the company has a long-term goal of becoming cash neutral. As of the end of 2018, AAPL has a net cash position of $122 billion. Using projected FCF in the upcoming years, Apple could increase its buyback program by $10 billion each year for three years to hit this level. In 2018, the company bought back $72 billion worth of stock and I project the buyback to be $82, $92, and $102 billion in 2019, 2020, and 2021, respectively. This represents 11%, 12.5%, and 14%, of the stock in these years.

Apple has a net cash position of $122.6 billion at the end of 2018, or 16% of market cap.

Figure 15: Apple's Net Cash 2014-2018



Source: Company Reports

ROE

Apple's ROE has been and will continue to be far ahead of its industry average. 2018 ROE increased to 49.4% as NOPAT increased to 22.3% from 20.2% and as the firm increased leverage by purchasing stock. Equity decreased by 27 billion in 2018 because of the large buyback. Companies that are able to use low amounts of capital in their operations often have the problem of equity decreasing and it turning negative. In the future, ROE will be distorted by Apple's significant buyback, which will turn Apple's equity to negative. Thus, a better measure than ROE to consider is ROIC.

Figure 16: 5 Stage Dupont Analysis

ROE	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
5-stage						
EBIT / sales	30.5%	27.8%	26.8%	26.7%	25.0%	25.0%
Sales / avg assets	0.90	0.70	0.66	0.72	0.76	0.91
EBT / EBIT	101.8%	102.2%	104.5%	102.8%	103.1%	103.0%
Net income /EBT	73.6%	74.4%	75.4%	81.7%	84.0%	84.0%
ROA	20.5%	14.9%	13.9%	16.1%	16.4%	19.7%
Avg assets / avg equity	2.26	2.47	2.66	3.07	3.97	7.14
ROE	46.2%	36.9%	36.9%	49.4%	65.2%	140.8%

Source: Company Reports, IMCP

Return on Invested Capital

Apple's return on capital is a good way to evaluate Apple's success. To calculate the "real" ROIC of Apple, I stripped out the marketable securities and cash from net fixed assets. Once cash and marketable securities are taken out of the invested capital, Apple's ROIC triples to 73.3%.

Figure 17: Apple's Return on Invested Capital excluding Cash 2015-2020E

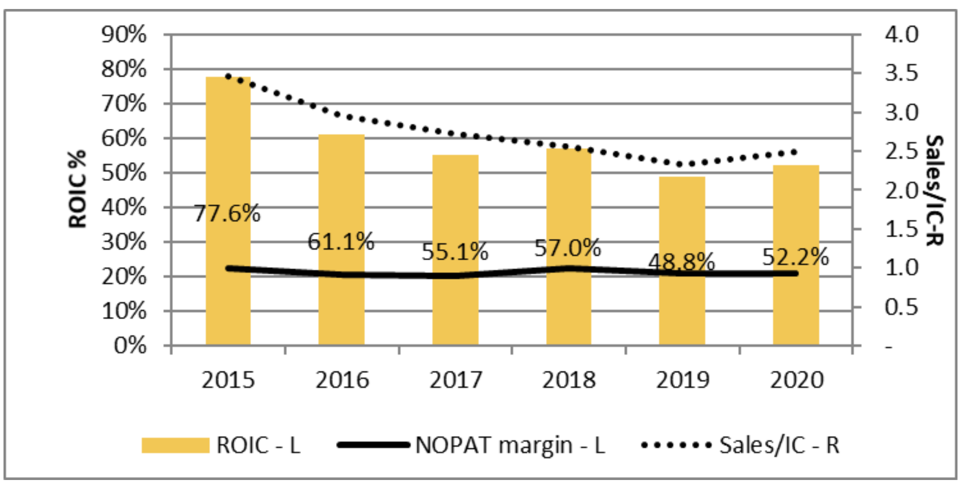
ROIC	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
NOPAT to sales	22.4%	20.7%	20.2%	22.3%	21.0%	21.0%
Sales to NWC	15.50	18.54	14.90	11.55	10.54	10.77
Sales to NFA	6.67	5.31	4.76	4.60	4.15	4.27
Sales to IC ex cash	4.66	4.13	3.61	3.29	2.98	3.06
Total ROIC ex cash	104.7%	85.5%	72.8%	73.3%	62.5%	64.2%

Source: Company Reports, IMCP

Figure 18 includes cash in the ROIC equation. You can see that excluding cash adds about 16% to ROIC. Either way, Apple is highly profitable.

Apple had a ROIC of 57% in 2018

Figure 18: Apple's Return on Invested Capital including Cash 2015-2020E



Source: Company Reports, IMCP

Valuation

Apple was valued based on using multiples and a three stage discounted cash flow model. The relative valuation earnings multiple is given less emphasis due to the lack of good comparables to Apple's business. Relative valuation shows Apple to be overvalued based on its fundamentals compared to its peers. I place more weight on the discounted cash flow method, as this offer a better analysis of the stock's value. Based on these valuations, I believe the firm is worth $200.

Trading History

Apple's current P/E relative to the S&P 500 has moved between .6 and 1.1 since the beginning of 2016. This is telling because it stayed in a range relative to the market while the P/E of the market itself has made large moves up and down in the past couple years. I believe Apple's current NTM P/E of 12.8 is low relative to their history and the gains in NOPAT and FCF that I project.

Figure 19: Apple's LTM Relative to the S&P 500

Source: Factset

Assuming the firm maintains a 14.2 NTM P/E at the end of 2019, it should trade at $180 by the end of the year.

- P=PE × EPS = 14.2* $12.60 =$178.92

Discounting **$**178.92 back to today at an 12.2% cost of equity yields a price of $157.45.

Relative Valuation

Apple is trading at a TTM P/E of 12, which is close to the median of the industry. This is likely due to the unit growth scare going forward of declining sales in its largest segment. Apple said in its most recent earnings call that it would not be reporting unit sales of iPhones to investors. Investors took this as a clear signal unit growth is decreasing and my estimates agree with this. Apple competes mainly in the premium smartphone market and that market's main competitor is Samsung, which is a diversified firm. Apple also has a much higher profit margin because of its premium priced products. In the past, Apple has been an extremely innovative company. It has been eight years since the release of iPad, its last significant innovation in a product line that yielded tangible results. The services business is a mix of products that work off the Apple ecosystem rather than a new blockbuster product. Nonetheless, even if Apple does not come up with the next "iPhone," it can add small products or services (airpods or Apple Music as an example) that are highly profitable and produce incremental gains for the stock. These smaller (or larger) innovations or service lines are not priced into the stock, and I believe Apple is not done adding to its ecosystem.

Figure 20: Apple Comparable 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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
AAPL	APPLE INC	$156.82	$741,727	0.6	(5.6)	(27.4)	(17.6)	(12.5)	(0.6)	8.6	0.7%	11.8%	29.3%	15.4%	9.8%		1.10	87.5%	B+	1.79%	22.9%
HPE	HEWLETT PACKARD ENTERPRISE	$14.68	$20,533	2.9	7.7	(4.2)	(7.8)	(8.1)	11.1	8.0	37.8%	25.9%	10.6%	1.3%	8.9%		1.09	86.3%	B+	1.69%	71.4%
HPQ	HP INC	$21.75	$33,789	2.4	1.6	(8.5)	(7.6)	(6.6)	6.3	6.1	-32.7%	3.1%	22.4%	8.4%	5.0%	4.4%	1.70	96.1%	B	5.41%	125.4%
MSFT	MICROSOFT CORP	$107.71	$826,945	1.5	3.6	(0.7)	2.5	19.5	6.0	13.1	86.7%	47.3%	-35.4%	202.3%	15.4%		1.09	86.3%	B+	1.69%	71.4%
WDC	WESTERN DIGITAL CORP	$39.20	$11,345	7.5	1.2	(29.8)	(50.2)	(54.6)	6.0	-9.7	222.6%	80.6%	60.3%	-48.9%	4.1%		1.70	96.1%	B	5.41%	125.4%
005930-KR	SAMSUNG ELECTRONIC	$37.71	$236,127	0.8	8.7	(4.0)	(9.1)	(15.2)	9.3	0.7	-26.3%	116.2%	18.5%	0.3%	6.6%	14.2%	1.05	0.5%		3.66%	21.3%
Average			$311,744	2.6	2.9	(12.4)	(15.0)	(12.9)	6.4	4.5	48.1%	47.5%	17.6%	29.8%	8.3%	9.3%	1.29	75.5%		3.28%	73.0%
Median			$134,958	2.0	2.6	(6.4)	(8.5)	(10.3)	6.2	7.0	19.3%	36.6%	20.5%	4.8%	7.7%	9.3%	1.10	86.9%		2.72%	71.4%
SPX	S&P 500 INDEX	$2,671		1.3	4.9	(3.5)	(5.1)	(4.6)	6.5			1.3%	11.7%	20.5%	9.8%						

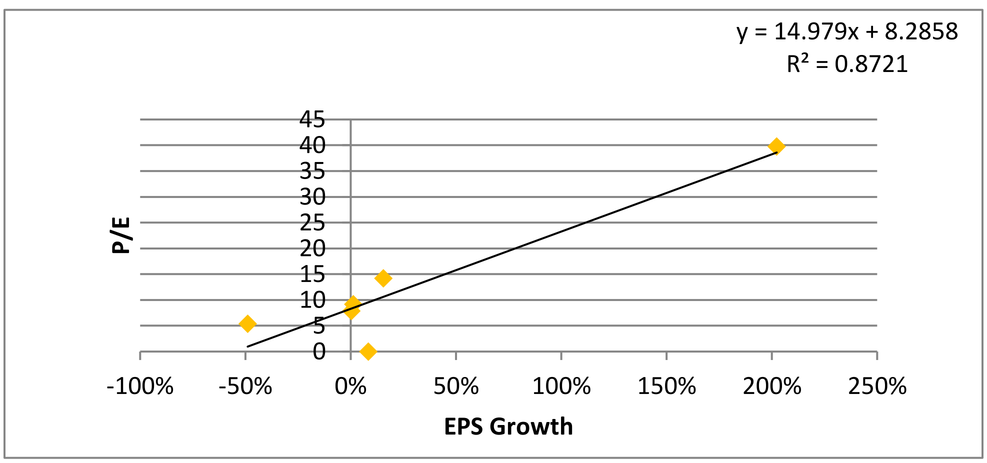
		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
AAPL	http://www.apple.com	52.9%	6.96	12.8	12.6	14.2	13.2	13.1	11.4	10.4	21.2%	2.79	26.7%	27.6%	16.6	18.3		-2.7%	3.8%	9.2%	$22.53
HPE	http://www.hpe.com	10.5%	0.98	7.9	9.5	9.2	12.8	9.3	9.3	8.5	7.1%	0.67	8.1%	6.2%	12.4	2.9		11.1%	10.8%	-11.6%	$14.93
HP	http://www.hpe.com	10.5%	0.98	7.9	9.5	9.2	12.8	9.3	9.3	8.5	7.1%	0.67	1.5%	10.3%	205.3	9.3		11.1%	10.8%	-6.0%	$14.93
MSFT	http://www.microsoft.com	19.2%	9.62	24.5	18.7	39.8	44.7	23.9	16.6	14.4	15.0%	7.51	32.4%	10.7%	20.5	31.9		11.1%	10.8%	7.2%	$11.19
WDC	http://www.wdc.com	37.4%	1.00	11.8	7.4	5.4	24.6	7.6	5.2	5.0	20.6%	0.55	17.5%	2.9%	7.8	3.3		-20.0%	6.8%	6.1%	$39.36
005930-KR	http://www.samsung.com	19.5%	1.22	9.1	5.9	7.9	5.9	8.0	6.2	5.9	17.1%	1.07	25.2%	20.8%	5.5	3.5	4.7	-8.3%	3.9%	3.6%	$30.94
Average		25.0%	3.46	12.3	10.6	14.3	19.0	11.9	9.7	8.8	14.7%	2.21	18.6%	13.1%	44.7	11.6	4.7	0.4%	7.8%	1.4%	
Median		19.3%	1.11	10.5	9.5	9.2	13.0	9.3	9.3	8.5	16.0%	0.87	21.4%	10.5%	14.5	6.4	4.7	4.2%	8.8%	4.8%	
spx	S&P 500 INDEX			17.5	18.9	20.2			16.7	15.2											

An analysis of the correlation of EPS growth and P/E computes an R^2 of .8721. Therefore 87% of Apple's P/E is owed to its NTM EPS Growth. Based on figure 21, Apple is overly valued versus its peer group.

- Estimated P/E= Estimated 2019 EPS Growth (5%) × 14.979 + 8.2858 = 9.03
- Target Price = Estimated P/E (9.03) × 2019E EPS (12.60) = $113.78

Discounting back to the present at a 12% cost of equity produces a target of $100.

Figure 21: PE vs 2018 EPS Growth



Source: Factset

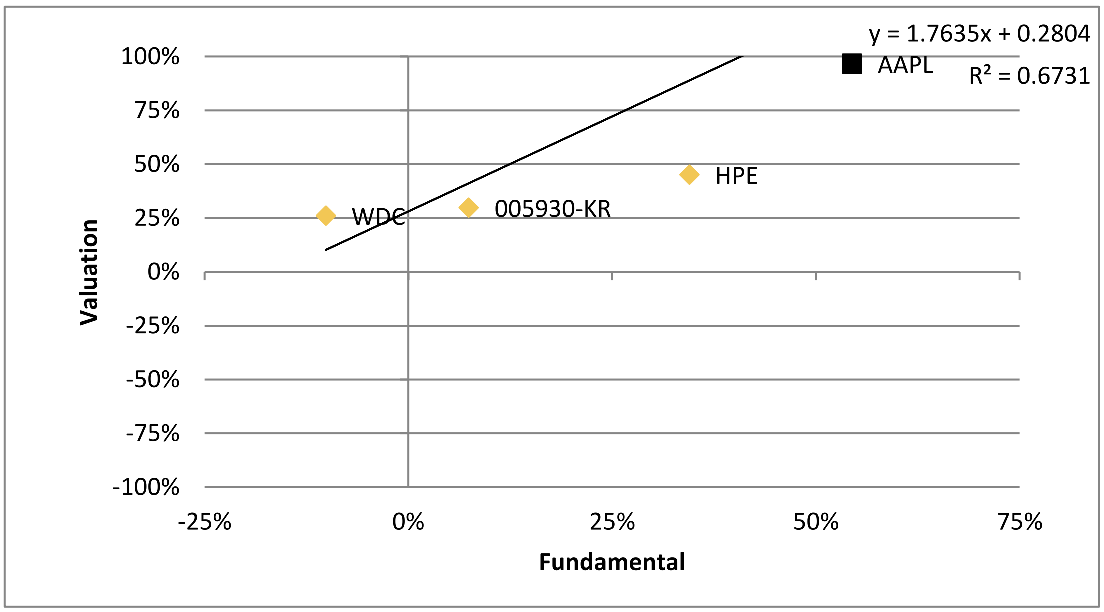
I also created a composite ranking of three valuation and five fundamental metrics (Figure 22). Each variable has a different scale and were converted to a percentile based on the range of data for each variable. For my valuation metrics, I chose to include P/B, P/S, and P/CF. For my fundamentals I chose long-term growth, 2018, and 2019 earnings growth as well as 2018 ROE and next 12-month sales growth.

Figure 22: Composite Valuation, % of range

		Fundamentals					Valuation		
		20.00%	20.00%	20.00%	20.00%	20.00%	33.30%	33.30%	33.30%
			Earnings Growth		2018	Sales Growth			
Ticker	Name	LTG	2018	2019	ROE	NTM	P/B	P/S	P/CF
AAPL	APPLE INC	77	49	8	100	39%	77	40	63
HPE	HEWLETT PACKARD ENTERPRISES	34	18	1	20%	100%	10	9	34
HPE	HP INC	47	37	4	0	0%	100	100	67
MSFT	MICROSOFT CORP	100	-59	100	36%	100%	100	100	54
WDC	WESTERN DIGITAL CORP	-23	100	-24	7%	-174%	11	8	11
005930-KR	SAMSUNG ELECTRONIC	0	31	0	37%	-29%	12	14	11

Source: IMCP

Figure 23: Composite Relative Valuation



Source: Factset

<u>Discounted Cash Flow Analysis</u> **(see figure 24)**

A three stage discounted cash flow model was used to value Apple (Figure 24).

For the purpose of this analysis, the cost of equity for the company was calculated to be 12.2% 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 2.75%.
- A ten-year beta of 1.30 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 those assumptions, the cost of equity is 12.2% (2.75 + 1.30 (10.0 – 2.75)

Stage One- The discounted cash flow model discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These cash flows per share are forecasted to be $13.35 and $15.00 in 2019 and 2020 respectively. Discounting these cash flows to the cost of equity stated above (12.2%) results in a value of $23.82.

Stage two- Stage two of this model focuses on the next five years, 2021-2025. During this period, FCFE is calculated based on revenue growth, NOPAT margin, and capital growth expectations. The contributing cash flows are then discounted using the 12.2% cost of equity. I assumed a constant growth rate of 3% for these five years. I projected sales to NWC will increase over time along with NFA turnover. I expect NOPAT margins to be stable from 2018 to 2025. The second stage of cash flows comes to a value of $55.44.

Stage three- Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. A P/E ratio of 12 is assumed at the end of Apple's terminal year. This is slightly above the industry average and on the lower than the long-term average of the S&P 500 of 14-17 times earnings. Given the terminal P/E value of 12, a terminal value per share of $268.53 is calculated. Using the cost of equity of 12.2%, this number is discounted back to a present value of $120.15.

Total present value- Given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $199.42 is calculated ($23.82 + $55.44 + $120.15). With Apple's current price of $156.82, the model indicates that the stock is undervalued.

<u>Scenario Analysis</u>

Figure 25 shows a best-case scenario or bull case.

In this scenario, I assumed a constant sales growth rate of 5% over the next 5 years and a terminal P/E of 12. In all of my scenarios, I believe sales will grow; as Apple releases a new products or line of services. The majority of Apple growth will come from the fastest growing segments of Wearables and Services. With these segments increasing as a percentage of sales, I believe NOPAT margins will grow.

Total present value (Bull Case) - With the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $226.92 is calculated ($23.82 + $60.93 + $142.17). Given Apple's current price of $156.82, the model indicates the stock is undervalued.

<u>Scenario Analysis</u>

Figure 26 shows a worst-case scenario or bear case.

For this case, I assumed sales growth of 2% over the next five years and a terminal P/E of 12. I also decreased share buybacks in this scenario due to lower free cash flow as a result of lower sales growth.

Total present value (Bear Case) - Given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $184.56 is calculated ($23.82 + $52.15 + $108.58). Given the price of $156.82, this scenario analysis indicates the stock is undervalued.

Figure 24: Base Care Scenario

	1	2	3	4	5	6	7
	First Stage		Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*-1.4%*	*4.7%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
NOPAT / S	*21.0%*	*21.0%*	*21.3%*	*21.6%*	*21.8%*	*22.1%*	*22.4%*
S / NOWC	*5.43*	*6.24*	*7.21*	*8.19*	*9.16*	*10.14*	*11.11*
S / NFA (EOY)	*4.18*	*4.18*	*4.20*	*4.23*	*4.25*	*4.28*	*4.30*
S / IC (EOY)	*2.36*	*2.50*	*2.65*	*2.79*	*2.90*	*3.01*	*3.10*
ROIC (EOY)	*49.6%*	*52.5%*	*56.5%*	*60.1%*	*63.4%*	*66.5%*	*69.4%*
ROIC (BOY)		*51.9%*	*54.8%*	*59.0%*	*62.7%*	*66.2%*	*69.4%*
Share Growth		*-10.2%*	*-6.0%*	*-5.0%*	*-4.0%*	*-3.0%*	*-3.0%*
Sales	$261,791	$274,186	$282,411	$290,884	$299,610	$308,599	$317,857
NOPAT	$54,976	$57,579	$60,097	$62,715	$65,435	$68,262	$71,200
Growth		*4.7%*	*4.4%*	*4.4%*	*4.3%*	*4.3%*	*4.3%*
- Change in NOWC	-2484	-4267	-4804	-3629	-2829	-2259	-1838
NOWC EOY	*48237*	*43970*	*39166*	*35537*	*32707*	*30448*	*28610*
Growth NOWC		*-8.8%*	*-10.9%*	*-9.3%*	*-8.0%*	*-6.9%*	*-6.0%*
- Chg NFA	-911	2967	1573	1613	1654	1696	1740
NFA EOY	*62,676*	*65,644*	*67,217*	*68,830*	*70,484*	*72,180*	*73,920*
Growth NFA		*4.7%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*
Total inv in op cap	-3394	-1300	-3231	-2016	-1175	-563	-99
Total net op cap	110914	109614	106383	104367	103192	102629	102530
FCFF	$58,371	$58,879	$63,328	$64,731	$66,610	$68,825	$71,299
% of sales	*22.3%*	*21.5%*	*22.4%*	*22.3%*	*22.2%*	*22.3%*	*22.4%*
Growth		*0.9%*	*7.6%*	*2.2%*	*2.9%*	*3.3%*	*3.6%*
- Interest (1-tax rate)	-1713	-1713	-1713	-1713	-1713	-1713	-1713
Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w debt	$60,083	$60,592	$65,040	$66,443	$68,322	$70,537	$73,011
% of sales	*23.0%*	*22.1%*	*23.0%*	*22.8%*	*22.8%*	*22.9%*	*23.0%*
Growth		*0.8%*	*7.3%*	*2.2%*	*2.8%*	*3.2%*	*3.5%*
/ No Shares	4499.4	4039.4	3,797.1	3,607.2	3,462.9	3,359.0	3,258.3
FCFE	$13.35	$15.00	$17.13	$18.42	$19.73	$21.00	$22.41
Growth		*12.3%*	*14.2%*	*7.5%*	*7.1%*	*6.4%*	*6.7%*
* Discount factor	0.89	0.79	0.71	0.63	0.56	0.50	0.45
Discounted FCFE	$11.90	$11.92	$12.14	$11.63	$11.11	$10.54	$10.03
Third Stage							
Terminal value P/E							
Net income	$56,689	$59,292	$61,810	$64,427	$67,147	$69,975	$72,912
% of sales	*21.7%*	*21.6%*	*21.9%*	*22.1%*	*22.4%*	*22.7%*	*22.9%*
EPS	$12.60	$14.68	$16.28	$17.86	$19.39	$20.83	$22.38
Growth		*16.5%*	*10.9%*	*9.7%*	*8.6%*	*7.4%*	*7.4%*
Terminal P/E							12.00
* Terminal EPS							$22.38
Terminal value							$268.53
* Discount factor							0.45
Discounted terminal value							$120.15

Summary		
First stage	$23.82	Present value of first 2 year cash flow
Second stage	$55.44	Present value of year 3-7 cash flow
Third stage	$120.15	Present value of terminal value P/E
Value (P/E)	**$199.42**	= value at beg of fiscal yr 2019

Figure 25: Bull Case Scenario

	1	2	3	4	5	6	7
	First Stage		**Second Stage**				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*2.9%*	*8.2%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
NOPAT / S	*21.0%*	*21.0%*	*21.3%*	*21.6%*	*21.8%*	*22.1%*	*22.4%*
S / NOWC	*5.71*	*6.47*	*7.39*	*8.32*	*9.25*	*10.18*	*11.11*
S / NFA (EOY)	*4.18*	*4.18*	*4.20*	*4.23*	*4.25*	*4.28*	*4.30*
S / IC (EOY)	*2.41*	*2.54*	*2.68*	*2.80*	*2.91*	*3.01*	*3.10*
ROIC (EOY)	*50.6%*	*53.3%*	*57.0%*	*60.4%*	*63.6%*	*66.6%*	*69.4%*
ROIC (BOY)		*54.8%*	*56.7%*	*60.7%*	*64.3%*	*67.6%*	*70.8%*
Share Growth		*-10.2%*	*-6.0%*	*-5.0%*	*-4.0%*	*-3.0%*	*-3.0%*
Sales	$273,299	$295,784	$310,573	$326,102	$342,407	$359,527	$377,504
NOPAT	$57,393	$62,115	$66,090	$70,308	$74,782	$79,527	$84,561
Growth		*8.2%*	*6.4%*	*6.4%*	*6.4%*	*6.3%*	*6.3%*
- Change in NOWC	-2822	-2147	-3748	-2823	-2172	-1695	-1335
NOWC EOY	*47899*	*45751*	*42003*	*39181*	*37009*	*35314*	*33979*
Growth NOWC		*-4.5%*	*-8.2%*	*-6.7%*	*-5.5%*	*-4.6%*	*-3.8%*
- Chg NFA	1845	5383	3105	3244	3389	3540	3699
NFA EOY	*65,432*	*70,815*	*73,920*	*77,163*	*80,552*	*84,093*	*87,792*
Growth NFA		*8.2%*	*4.4%*	*4.4%*	*4.4%*	*4.4%*	*4.4%*
Total inv in op cap	-978	3236	-643	421	1217	1845	2364
Total net op cap	113330	116566	115923	116344	117561	119406	121770
FCFF	$58,371	$58,879	$66,733	$69,886	$73,565	$77,682	$82,197
% of sales	*21.4%*	*19.9%*	*21.5%*	*21.4%*	*21.5%*	*21.6%*	*21.8%*
Growth		*0.9%*	*13.3%*	*4.7%*	*5.3%*	*5.6%*	*5.8%*
- Interest (1-tax rate)	-1713	-1713	-1713	-1713	-1713	-1713	-1713
Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w debt	$60,083	$60,592	$68,446	$71,599	$75,277	$79,395	$83,909
% of sales	*22.0%*	*20.5%*	*22.0%*	*22.0%*	*22.0%*	*22.1%*	*22.2%*
Growth		*0.8%*	*13.0%*	*4.6%*	*5.1%*	*5.5%*	*5.7%*
/ No Shares	4499.4	4039.4	3,797.1	3,607.2	3,462.9	3,359.0	3,258.3
FCFE	$13.35	$15.00	$18.03	$19.85	$21.74	$23.64	$25.75
Growth		*12.3%*	*20.2%*	*10.1%*	*9.5%*	*8.7%*	*9.0%*
* Discount factor	0.89	0.79	0.71	0.63	0.56	0.50	0.45
Discounted FCFE	$11.90	$11.92	$12.77	$12.54	$12.24	$11.86	$11.52
Third Stage							
Terminal value P/E							
Net income	$59,105	$63,827	$67,803	$72,020	$76,494	$81,240	$86,273
% of sales	*21.6%*	*21.6%*	*21.8%*	*22.1%*	*22.3%*	*22.6%*	*22.9%*
EPS	$13.14	$15.80	$17.86	$19.97	$22.09	$24.19	$26.48
Growth		*20.3%*	*13.0%*	*11.8%*	*10.6%*	*9.5%*	*9.5%*
Terminal P/E							12.00
* Terminal EPS							$26.48
Terminal value							$317.74
* Discount factor							0.45
Discounted terminal value							$142.17

Summary			
First stage	$23.82	Present value of first 2 year cash flow	
Second stage	$60.93	Present value of year 3-7 cash flow	
Third stage	$142.17	Present value of terminal value P/E	
Value (P/E)	**$226.92**	= value at beg of fiscal yr	2019

Figure 26: Bear Case Scenario

	1	2	3	4	5	6	7
	First Stage		Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*-3.8%*	*1.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*21.0%*	*21.0%*	*21.3%*	*21.6%*	*21.8%*	*22.1%*	*22.4%*
S / NOWC	*5.28*	*6.02*	*7.04*	*8.06*	*9.08*	*10.09*	*11.11*
S / NFA (EOY)	*4.18*	*4.18*	*4.20*	*4.23*	*4.25*	*4.28*	*4.30*
S / IC (EOY)	*2.33*	*2.47*	*2.63*	*2.77*	*2.89*	*3.00*	*3.10*
ROIC (EOY)	*49.0%*	*51.8%*	*56.0%*	*59.8%*	*63.2%*	*66.4%*	*69.4%*
ROIC (BOY)		*49.7%*	*53.5%*	*57.9%*	*61.8%*	*65.3%*	*68.6%*
Share Growth		*-10.2%*	*-6.0%*	*-5.0%*	*-4.0%*	*-3.0%*	*-3.0%*
Sales	$255,514	$259,510	$264,700	$269,994	$275,394	$280,902	$286,520
NOPAT	$53,658	$54,497	$56,328	$58,211	$60,146	$62,135	$64,180
Growth		*1.6%*	*3.4%*	*3.3%*	*3.3%*	*3.3%*	*3.3%*
- Change in NOWC	-2299	-5339	-5488	-4089	-3161	-2513	-2043
NOWC EOY	*48422*	*43083*	*37595*	*33506*	*30345*	*27832*	*25789*
Growth NOWC		*-11.0%*	*-12.7%*	*-10.9%*	*-9.4%*	*-8.3%*	*-7.3%*
- Chg NFA	-2414	957	871	886	900	915	930
NFA EOY	*61,173*	*62,130*	*63,001*	*63,887*	*64,787*	*65,702*	*66,632*
Growth NFA		*1.6%*	*1.4%*	*1.4%*	*1.4%*	*1.4%*	*1.4%*
Total inv in op cap	-4713	-4382	-4617	-3204	-2261	-1598	-1113
Total net op cap	109595	105213	100597	97393	95132	93534	92422
FCFF	$58,371	$58,879	$60,945	$61,414	$62,407	$63,733	$65,293
% of sales	*22.8%*	*22.7%*	*23.0%*	*22.7%*	*22.7%*	*22.7%*	*22.8%*
Growth		*0.9%*	*3.5%*	*0.8%*	*1.6%*	*2.1%*	*2.4%*
- Interest (1-tax rate)	-1713	-1713	-1713	-1713	-1713	-1713	-1713
Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w debt	$60,083	$60,592	$62,657	$63,127	$64,119	$65,446	$67,006
% of sales	*23.5%*	*23.3%*	*23.7%*	*23.4%*	*23.3%*	*23.3%*	*23.4%*
Growth		*0.8%*	*3.4%*	*0.7%*	*1.6%*	*2.1%*	*2.4%*
/ No Shares	4499.4	4039.4	3,797.1	3,607.2	3,462.9	3,359.0	3,258.3
FCFE	$13.35	$15.00	$16.50	$17.50	$18.52	$19.48	$20.56
Growth		*12.3%*	*10.0%*	*6.1%*	*5.8%*	*5.2%*	*5.5%*
* Discount factor	0.89	0.79	0.71	0.63	0.56	0.50	0.45
Discounted FCFE	$11.90	$11.92	$11.69	$11.05	$10.42	$9.78	$9.20
Third Stage							
Terminal value P/E							
Net income	$55,370	$56,210	$58,041	$59,923	$61,859	$63,848	$65,893
% of sales	*21.7%*	*21.7%*	*21.9%*	*22.2%*	*22.5%*	*22.7%*	*23.0%*
EPS	$12.31	$13.92	$15.29	$16.61	$17.86	$19.01	$20.22
Growth		*13.1%*	*9.8%*	*8.7%*	*7.5%*	*6.4%*	*6.4%*
Terminal P/E							12.00
* Terminal EPS							$20.22
Terminal value							$242.68
* Discount factor							0.45
Discounted terminal value							$108.58

Summary

First stage	$23.82	Present value of first 2 year cash flow
Second stage	$52.15	Present value of year 3-7 cash flow
Third stage	$108.58	Present value of terminal value P/E
Value (P/E)	**$184.56**	= value at beg of fiscal yr 2019

Business Risks

In comparison to other analysts, I have a slightly more optimistic view on Apple. I believe the company will resemble a razor-razor blade model where add on services help its main product lines. These services and other smaller products have much higher margins than the iPhone, Mac, and iPad product lines. However, this view is far from certain and a number of factors could prohibit this from happening.

Innovation

If Apple is not able to continue to develop products consumers are willing to pay a premium price for then this will be detrimental to the company's health.

Pricing

A large risk to Apple's business is the risk that premium smartphone prices are unable to grow over time. Since 2015, Apple has significantly raised ASPs. If smartphone prices follow personal computers over the last 20 or so years, it could be a devastating headwind to growth.

Trade Concerns

With Apple manufacturing almost all of its products in China, a trade war could have negative effects on Apple. Apple could be the target for China if the US keeps or increase tariffs on China. Apple has little ability to change supply chains over any short period.

Appendix 1: Porter's 5 Forces

Threat of New Entrants- Relatively Low

Risk of new entrants to AAPL's premium smartphone market is low, mainly due to the significant amount of fixed capital, human capital, and intellectual property needed to be able to compete effectively. The moat around AAPL's business is wide with its variety of products and integrated lineup of products.

Threat of Substitutes- Medium

Samsung and other phone companies have similar and often lower priced products Apple's advantage is being able to differentiate its products by the strength of its brand.

Supplier Power- Relatively Low

Apple has various suppliers for its products. The size of Apple gives it the ability to negotiate with suppliers to receive lower prices.

Buying Power- Low

Customer loyalty for Apple has been one of its hallmarks. The costs of switching to another phone, after considering the services consumers have purchased on the iPhone, and other products that would be lost, is significant.

Intensity of Competition- Medium

The premium smartphone market has relatively few competitors. This is reflected by the rising ASPs across many phones. The lower end of the smartphone market is becoming more competitive with Huawei and Samsung offering many more phones at a lower price points.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Wide product moat	Maturing US smartphone markets
Financial strength	Currency headwinds
Product innovation	
Opportunities	**Threats**
Expanding product lines	Trade Conflicts
International expansion	Government regulation
Expanded service offerings	Consumer trends

Appendix 3: Income Statement

Income Statement	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
Sales	$182,795	$233,715	$215,639	$229,234	$265,595	$261,791	$274,186
Direct costs	112,258	140,089	131,376	141,048	163,756	162,311	169,995
Gross Margin	70,537	93,626	84,263	88,186	101,839	99,481	104,191
SG&A, R&D, and other	18,034	22,396	24,239	26,842	30,941	34,033	35,644
EBIT	52,503	71,230	60,024	61,344	70,898	65,448	68,546
Interest	(980)	(1,285)	(1,348)	(2,745)	(2,005)	(2,039)	(2,039)
EBT	53,483	72,515	61,372	64,089	72,903	67,487	70,585
Taxes	13,973	19,121	15,685	15,738	13,372	10,798	11,294
Income	39,510	53,394	45,687	48,351	59,531	56,689	59,292
Other	-	-	-	-	-	-	-
Net income	39,510	53,394	45,687	48,351	59,531	56,689	59,292
Basic Shares	6,085	5,753	5,471	5,217	4,955	4,499	4,039
EPS	$6.49	$9.28	$8.35	$9.27	$12.01	$12.60	$14.68
DPS	$1.83	$2.01	$2.22	$2.45	$2.77	$3.35	$4.11

Appendix 4: Balance Sheet

Balance Sheet	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
Cash	13,844	21,120	20,484	20,289	25,913	23,367	17,922
Operating assets ex cash	43,454	47,777	39,714	54,464	65,038	64,139	67,176
Operating assets	57,298	68,897	60,198	74,753	90,951	87,506	85,098
Operating liabilities	26,944	34,121	30,107	33,292	40,230	39,269	41,128
NOWC	30,354	34,776	30,091	41,461	50,721	48,237	43,970
NOWC ex cash (NWC)	16,510	13,656	9,607	21,172	24,808	24,870	26,048
NFA	33,146	36,902	44,387	51,960	63,587	62,676	65,644
Invested capital	*$63,500*	*$71,678*	*$74,478*	*$93,421*	*$114,308*	*$110,914*	*$109,614*
Marketable securities	141,395	184,546	217,101	248,606	211,187	174,187	126,187
Total assets	*$231,839*	*$290,345*	*$321,686*	*$375,319*	*$365,725*	*$324,369*	*$276,928*
Short-term and long-term c	$65,491	$99,818	$124,326	$164,729	$170,371	$170,371	$170,371
Other liabilities	27,857	37,051	39,004	43,251	47,977	47,977	47,977
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	111,547	119,355	128,249	134,047	107,147	66,753	17,453
Total supplied capital	*$204,895*	*$256,224*	*$291,579*	*$342,027*	*$325,495*	*$285,101*	*$235,801*
Total liabilities and equity	*$231,839*	*$290,345*	*$321,686*	*$375,319*	*$365,725*	*$324,369*	*$276,928*

Appendix 5: Sales Forecasting

Sales Forecasting	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
Sales	$182,795	$233,715	$215,639	$229,234	265,595	$261,791	$274,186
Growth		*27.9%*	*-7.7%*	*6.3%*	*15.9%*	*-1.4%*	*4.7%*
iPhone	101,991	155,041	136,700	141,319	166,699	150,029	150,029
Growth		*52.0%*	*-11.8%*	*3.4%*	*18.0%*	*-10.0%*	*0.0%*
% of sales	*55.8%*	*66.3%*	*63.4%*	*61.6%*	*62.8%*	*57.3%*	*54.7%*
Services	18,063	19,909	24,348	29,980	37,190	44,628	52,215
Growth		*10.2%*	*22.3%*	*23.1%*	*24.0%*	*20.0%*	*17.0%*
% of sales	*9.9%*	*8.5%*	*11.3%*	*13.1%*	*14.0%*	*18.0%*	*15.0%*
iPad	30,283	23,227	20,628	19,222	18,805	19,369	19,563
Growth		*-23.3%*	*-11.2%*	*-6.8%*	*-2.2%*	*3.0%*	*1.0%*
% of sales	*16.6%*	*9.9%*	*9.6%*	*8.4%*	*7.1%*	*7.4%*	*6.0%*
Mac	24,079	25,471	22,831	25,850	25,484	25,994	26,254
Growth		*5.8%*	*-10.4%*	*13.2%*	*-1.4%*	*2.0%*	*1.0%*
% of sales	*13.2%*	*10.9%*	*10.6%*	*11.3%*	*9.6%*	*9.9%*	*9.6%*
Other	8,379	10,067	11,132	12,863	17,417	21,771	26,126
Growth		*20.1%*	*10.6%*	*15.5%*	*35.4%*	*25.0%*	*20.0%*
% of sales	*4.6%*	*4.3%*	*5.2%*	*5.6%*	*6.6%*	*8.3%*	*9.5%*

Appendix 6: Ratio Analysis

Ratios	Oct-14	Oct-15	Oct-16	Oct-17	Oct-18	Oct-19	Oct-20
Profitability							
Gross margin	38.6%	40.1%	39.1%	38.5%	38.3%	38.0%	38.0%
Operating (EBIT) margin	28.7%	30.5%	27.8%	26.8%	26.7%	25.0%	25.0%
Net profit margin	21.6%	22.8%	21.2%	21.1%	22.4%	21.7%	21.6%
Activity							
NFA (gross) turnover		6.67	5.31	4.76	4.60	4.15	4.27
Total asset turnover		0.90	0.70	0.66	0.72	0.76	0.91
Liquidity							
Op asset / op liab	2.13	2.02	2.00	2.25	2.26	2.23	2.07
NOWC Percent of sales		13.9%	15.0%	15.6%	17.4%	18.9%	16.8%
Solvency							
Debt to assets	28.2%	34.4%	38.6%	43.9%	46.6%	52.5%	61.5%
Debt to equity	58.7%	83.6%	96.9%	122.9%	159.0%	255.2%	976.2%
Other liab to assets	12.0%	12.8%	12.1%	11.5%	13.1%	14.8%	17.3%
Total debt to assets	40.3%	47.1%	50.8%	55.4%	59.7%	67.3%	78.8%
Total liabilities to assets	51.9%	58.9%	60.1%	64.3%	70.7%	79.4%	93.7%
Debt to EBIT	1.25	1.40	2.07	2.69	2.40	2.60	2.49
EBIT/interest	(53.57)	(55.43)	(44.53)	(22.35)	(35.36)	(32.10)	(33.62)
Debt to total net op capi	103.1%	139.3%	166.9%	176.3%	149.0%	153.6%	155.4%
ROIC							
NOPAT to sales	21.2%	22.4%	20.7%	20.2%	22.3%	21.0%	21.0%
Sales to NWC		15.50	18.54	14.90	11.55	10.54	10.77
Sales to NFA		6.67	5.31	4.76	4.60	4.15	4.27
Sales to IC ex cash		4.66	4.13	3.61	3.29	2.98	3.06
Total ROIC ex cash		104.7%	85.5%	72.8%	73.3%	62.5%	64.2%

Appendix 7: Apple Comps 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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
AAPL	APPLE INC	$156.82	$741,727	0.6	(5.6)	(27.4)	(17.6)	(12.5)	(0.6)	8.6	0.7%	11.8%	29.3%	15.4%	9.8%		1.10	87.5%	B+	1.79%	22.9%
HPE	HEWLETT PACKARD ENTERPRISE	$14.68	$20,533	2.9	7.7	(4.2)	(7.8)	(8.1)	11.1	8.0	37.8%	25.9%	10.6%	1.3%	8.9%		1.09	86.3%	B+	1.69%	71.4%
HPQ	HP INC	$21.75	$33,789	2.4	1.6	(8.5)	(7.6)	(6.6)	6.3	6.1	-32.7%	3.1%	22.4%	8.4%	5.0%	4.4%	1.70	96.1%	B	5.41%	125.4%
MSFT	MICROSOFT CORP	$107.71	$826,945	1.5	3.6	(0.7)	2.5	19.5	6.0	13.1	86.7%	47.3%	-35.4%	202.3%	15.4%		1.09	86.3%	B+	1.69%	71.4%
WDC	WESTERN DIGITAL CORP	$39.20	$11,345	7.5	1.2	(29.8)	(50.2)	(54.6)	6.0	-9.7	222.6%	80.6%	60.3%	-48.9%	4.1%		1.70	96.1%	B	5.41%	125.4%
005930-KR	SAMSUNG ELECTRONIC	$37.71	$236,127	0.8	8.7	(4.0)	(9.1)	(15.2)	9.3	0.7	-26.3%	116.2%	18.5%	0.3%	6.6%	14.2%	1.05	0.5%		3.66%	21.3%
Average			$311,744	2.6	2.9	(12.4)	(15.0)	(12.9)	6.4	4.5	48.1%	47.5%	17.6%	29.8%	8.3%	9.3%	1.29	75.5%		3.28%	73.0%
Median			$134,958	2.0	2.6	(6.4)	(8.5)	(10.3)	6.2	7.0	19.3%	36.6%	20.5%	4.8%	7.7%	9.3%	1.10	86.9%		2.72%	71.4%
SPX	S&P 500 INDEX	$2,671		1.3	4.9	(3.5)	(5.1)	(4.6)	6.5			1.3%	11.7%	20.5%	9.8%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
AAPL	http://www.apple.com	52.9%	6.96	12.8	12.6	14.2	13.2	13.1	11.4	10.4	21.2%	2.79	26.7%	27.6%	16.6	18.3		-2.7%	3.8%	9.2%	$22.53
HPE	http://www.hpe.com	10.5%	0.98	7.9	9.5	9.2	12.8	9.3	9.3	8.5	7.1%	0.67	8.1%	6.2%	12.4	2.9		11.1%	10.8%	-11.6%	$14.93
HP	http://www.hpe.com	10.5%	0.98	7.9	9.5	9.2	12.8	9.3	9.3	8.5	7.1%	0.67	1.5%	10.3%	205.3	9.3		11.1%	10.8%	-6.0%	$14.93
MSFT	http://www.microsoft.com	19.2%	9.62	24.5	18.7	39.8	44.7	23.9	16.6	14.4	15.0%	7.51	32.4%	10.7%	20.5	31.9		11.1%	10.8%	7.2%	$11.19
WDC	http://www.wdc.com	37.4%	1.00	11.8	7.4	5.4	24.6	7.6	5.2	5.0	20.6%	0.55	17.5%	2.9%	7.8	3.3		-20.0%	6.8%	6.1%	$39.36
005930-KR	http://www.samsung.com	19.5%	1.22	9.1	5.9	7.9	5.9	8.0	6.2	5.9	17.1%	1.07	25.2%	20.8%	5.5	3.5	4.7	-8.3%	3.9%	3.6%	$30.94
Average		25.0%	3.46	12.3	10.6	14.3	19.0	11.9	9.7	8.8	14.7%	2.21	18.6%	13.1%	44.7	11.6	4.7	0.4%	7.8%	1.4%	
Median		19.3%	1.11	10.5	9.5	9.2	13.0	9.3	9.3	8.5	16.0%	0.87	21.4%	10.5%	14.5	6.4	4.7	4.2%	8.8%	4.8%	
spx	S&P 500 INDEX			17.5	18.9	20.2			16.7	15.2											

Recreational Vehicles

Harley-Davidson, Inc.

Recommendation	**BUY**
Target (today's value)	$55
Current Price	$36.02
52 week range	$34.79 - $56.50

Share Data	
Ticker:	HOG
Market Cap. (Billion):	$5.87
Inside Ownership	0.2%
Inst. Ownership	91.3%
Beta	1.04
Dividend Yield	4.1%
Payout Ratio	45.9%
Cons. Long-Term Growth Rate	8.2%

	'16	'17	'18E	'19E	'20E
Sales (billions)					
Year	$6.0	$5.7	$5.7	$5.8	$6.0
Gr %		-5.8%	0.6%	2.3%	2.8%
Cons	-	-	$5.1	$5.1	$5.1
EPS					
Year	$3.85	$3.04	$3.71	$4.09	$4.80
Gr %		-21.2%	22.3%	10.2%	17.3%
Cons	-	-	$3.86	$3.70	$4.08

Ratio	'16	'17	'18E	'19E	'20E
ROE (%)	36.8%	27.7%	27.7%	33.4%	29.7%
Industry	25.6%	23.7%	23.7%	35.2%	29.0%
NPM (%)	11.5%	9.2%	9.2%	11.1%	11.4%
Industry	6.7%	6.0%	6.0%	7.2%	7.3%
A. T/O	0.60	0.57	0.57	0.50	0.49
ROA (%)	7.0%	5.3%	5.3%	5.5%	5.6%
Industry	12.6%	12.2%	12.2%	13.3%	11.9%
A/E	5.29	5.28	5.12	4.60	4.16

Valuation	'17	'18E	'19E	'20E
P/E	16.2	11.2	9.3	9.7
Industry	25.1	13.6	11.2	10.9
P/S	1.6	1.0	1.2	1.2
P/B	4.7	2.7	3.0	2.8
P/CF	7.4	5.1	6.6	6.4
EV/EBITDA	16.0	16.8	15.5	13.0

Performance	Stock	Industry
1 Month	-11.7%	-14.9%
3 Month	-19.0%	-28.5%
YTD	-29.2%	-36.9%
52-week	-29.4%	-38.2%
3-year	-21.1%	28.3%

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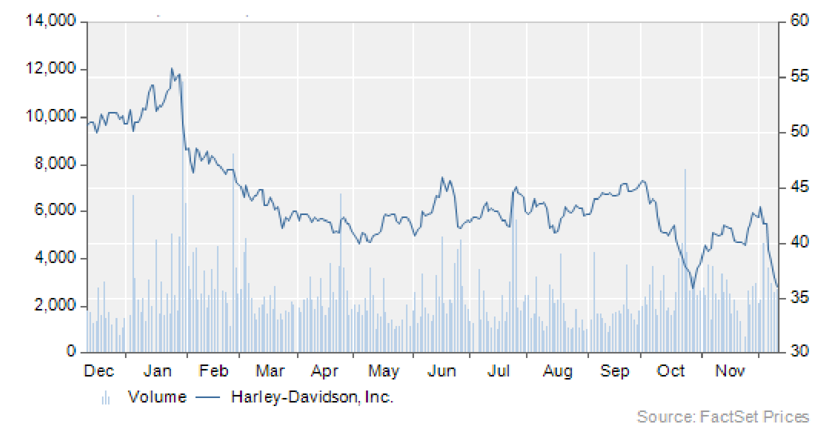


Summary: I recommend a buy rating with a target of $55. HOG has strong brand recognition in the recreational vehicle industry. The company has struggled with appealing to the younger generation of motorcycle riders and expanding internationally. My buy rating is based on my belief that the market has not priced in the anticipated growth potential of the stock as HOG plans to focus heavily on international expansion and new product offerings starting in 2019. The stock is undervalued based on relative and DCF analysis.

Key Drivers:

- Recreational vehicle trends: Many recreational vehicle companies are focusing on offering smaller displacement motorcycles to reach younger and less experienced riders. HOG does not offer small displacement motorcycles as other companies do. Instead, HOG is focusing on offering electric motorcycles to establish dominance in the electric motorcycle market.

- International expansion: HOG plans to release new motorcycles into the Asia Pacific market. HOG has opened 44 new dealerships in the region from 2015-2017. The company plans to move production overseas for its international markets.

- Macroeconomic trends: HOG is positively correlated with the consumer confidence index. If the economy continues to perform well, consumers will be comfortable purchasing recreational vehicles.

Valuation: Using a relative valuation approach, Harley-Davidson appears to be undervalued in comparison to the recreational vehicle industry. DCF analysis suggests the stock is worth $54. A combination of the approaches suggests that Harley-Davidson is undervalued, as the stock's value is $55 and the shares trade at $36.02.

Risks: Threats to the business include loyal customers increasing in age, loss of brand identity, increased difficulty in expansion to India, and new product offerings not attracting new customers.

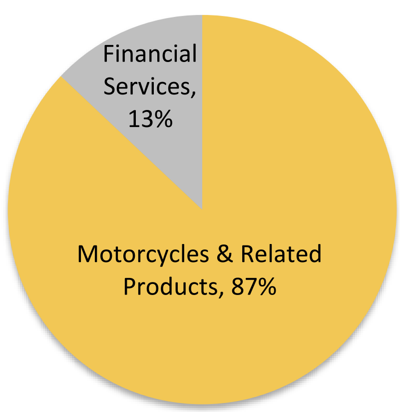
Company Overview

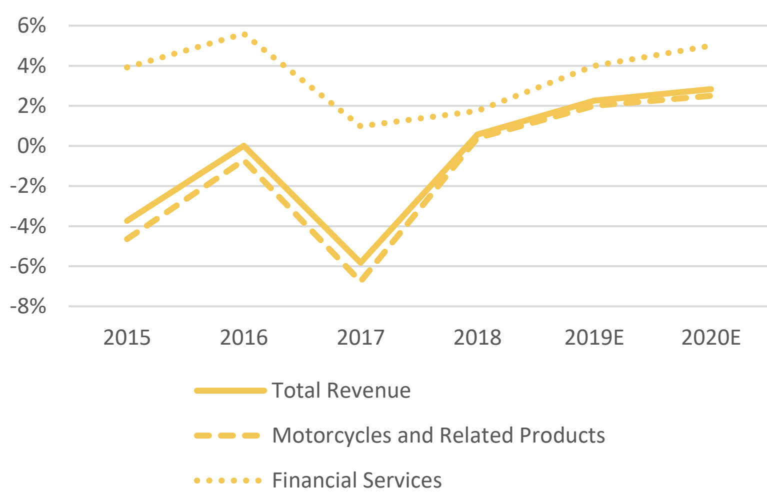
Harley-Davidson (HOG) is a manufacturer of heavyweight motorcycles. Harley manufactures five styles of motorcycles including Touring, Cruiser, Standard, Sport bike and Dual style motorcycles. Over the past 100 years, Harley-Davidson has grown into a global company with a presence in almost 100 countries. HOG's management takes pride in the culture that has grown around its motorcycles by hosting events at its dealerships and plants for its customers and future customers. While most of the firm's motorcycles are shipped to independent dealers within the United States, Harley-Davidson also produces and sells products internationally. The company has dealers in Canada, Europe, Asia Pacific, and Latin America. Harley-Davidson is headquartered in Milwaukee, Wisconsin.

Harley generates 87% of its total revenue from motorcycles and related products and 13% of its total revenue from financial services. HOG has two reporting segments:

- Motorcycles and Related Products: Motorcycles, motorcycle parts, clothing, accessories, and collectables. In 2017, Harley-Davidson shipped 241,498 motorcycles. This is about 7.9% less than the 262,221 motorcycles shipped in 2016. I forecast motorcycles and related products sales to grow by 2.0% in 2019 and 2.5% in 2020.
- Financial Services: Financial services provided to independent dealers and retail customers of those independent dealers. In 2017, Harley-Davidson financed 61.2% of its new motorcycles sold by the independent Harley dealers in the United States. This is 0.5% less than in 2016 when Harley-Davidson financed 61.7% of its new motorcycles. I forecast financial services to grow 4.0% in 2019 and 5.0% in 2020.

Figures 1 and 2: Revenue sources for HOG, year-end 2017 (left) and revenue history growth since 2013 (right)





2

Business/Industry Drivers

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

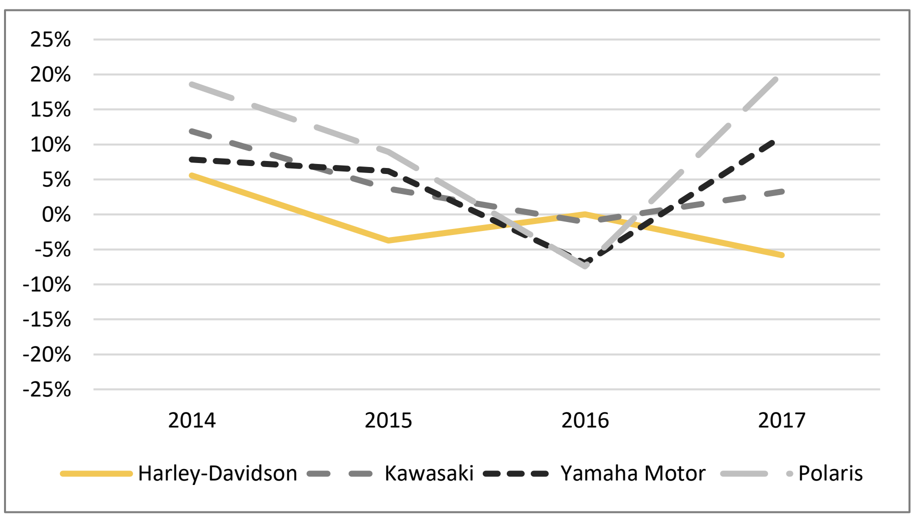
1) Recreational vehicle trends
2) International expansion
3) Competitor analysis
4) Macroeconomic trends

Recreational vehicle trends

HOG has created a recognizable brand in the recreational vehicle industry. The firm is best known for producing large engined cruising and touring motorcycles. Because of the size and quality of Harley-Davidson motorcycles, the prices of its motorcycles are usually more expensive than others. This price premium has created an age trend in the company with few younger riders able to afford HOG's products. Other large motorcycle manufacturers such as Kawasaki, Yamaha and Polaris also offer large, expensive motorycles. However, most of them have recently began focusing on expanding their product offerings in the smaller, entry level motoryclce market. In 2013, Harley-Davidson released the 2014 Street 500. This model appeals to individuals who want to ride a Harley-Davidson motorcycle but can not afford larger models. In 2013, HOG had the highest year-over-year sales growth since 2011 at 5.72% when the firm launched the 2014 Street 500. While Harley continues to release new versions of the Street 500, the company has not released any smaller or less expensive models. The Street 500 still sells at a premium compared to other brands. The 2018 Street 500 from the company retails at $6,899. In comparison, the 2018 Rebel 500 from Honda retails at $6,099.

HOG 2017 sales growth lagged the rebounding rates of other large motorcycle manufacturers.

Figure 3: Sales growth of Harley-Davidson and other large motorcycle manufacturers



Source: Company reports

Harley-Davidson announced, "More Roads to Harley-Davidson." This is Harley's plan to introduce new smaller to middle displacement size motorcycles into the market by 2020. The firm will introduce an electric motorcycle, LiveWire™, by 2019, and plans to release additional electric motorcycles through 2022. There are few to no motorcycle manufacturers or recreational vehicle companies currently offering electric motorcycles. The LiveWire™ will not have a manual transmission like most motorcycles, which will help new riders feel more comfortable riding it. I believe this is an intelligent move by Harley-Davidson. This may help the company to establish early dominance in the electric motorcycle market.

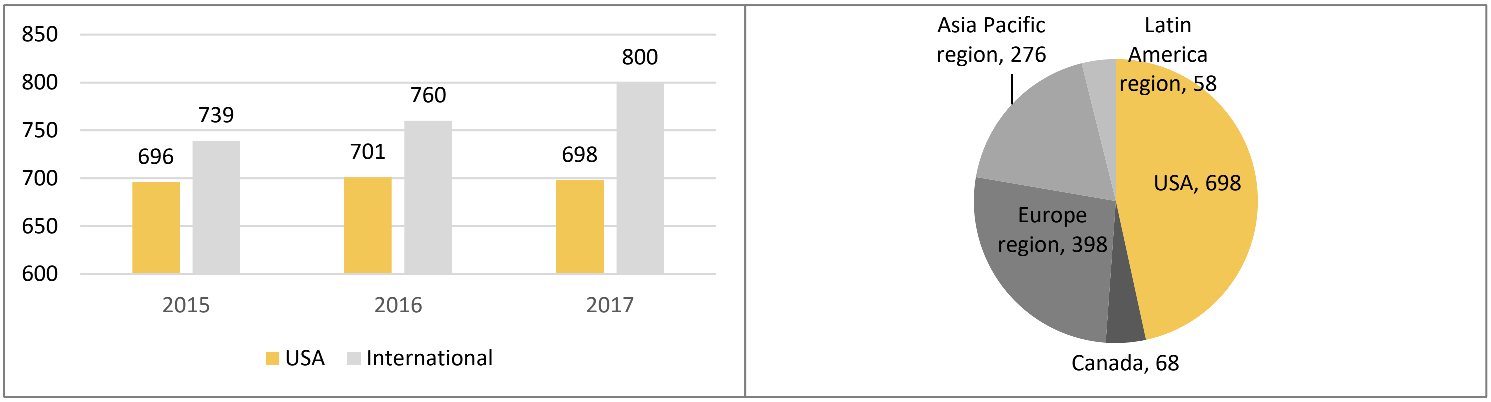
International expansion

While motorcycles are popular forms of transportation and recreational vehicles in the United States, motorcycles and recreational vehicles are incredibly popular worldwide. During 2017, Harley-Davidson closed three United States dealerships and opened 40 internationally. This dramatic international expansion is due to the "More Roads to Harley-Davidson" plan that was announced this summer.

From 2015-2017, 44 new dealerships were established in the Asia Pacific region.

In "More Roads to Harley-Davidson," HOG announced that it is in the process of developing smaller engine size motorcycles for the Asia emerging markets. This helps explain why Harley has so many new dealerships in the Asia Pacific region. The number of Asia Pacific dealerships has been rising since 2015.

Figures 4 and 5: Number of dealerships in the United States and internationally (left) and dealerships by region at year-end 2017 (right)



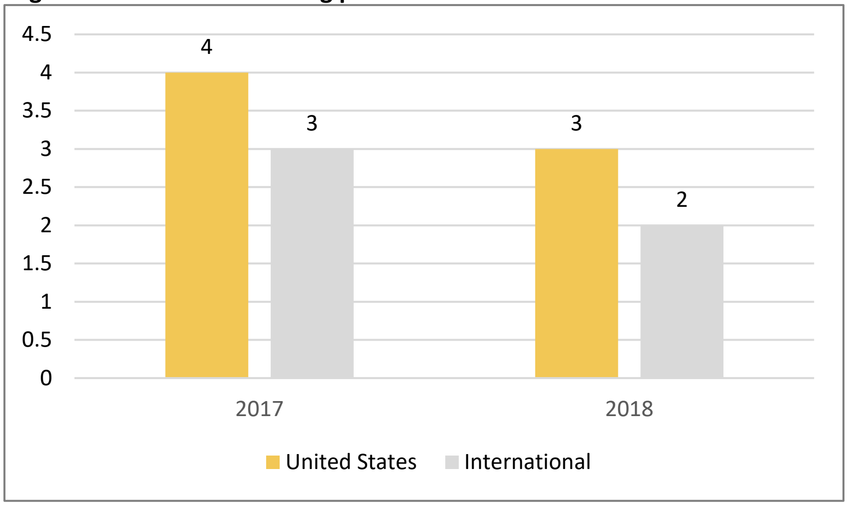
Source: Company reports

Harley-Davidson is focusing on international expansion rather than expansion within the United States.

As the global trade conflict has become increasingly relavant, Harley-Davidson announced that it will be moving production for European markets overseas to avoid the cost of the European tariffs. Although this may move jobs that could have been in America to Europe, this change in European production, which is expected to lower the cost of the product, may improve the overall long-term health of the company.

At year-end 2017, Harley-Davidson had four manufacturing plants in the United States and three international manufacturing plants (Brazil, India and Australia). At the beginning of 2018, the firm announced that it would be closing down manufacturing plants in Kansas City, MO and Adelaide, Australia.

Figure 6: HOG manufacturing plants in the United States and international



Source: Company reports

HOG has not announced if moving production for European markets overseas entails opening a new manufacturing plant. The remaining plants in Brazil and India assemble models for the Brazilian market and the Indian market respectively. The India plant also produces the Street platform for non-North American markets.

Competitor analysis

The recreational vehicles industry is a competitive industry with low barriers to entry. As technology has progressed and trends change, new firms can enter the space by developing a product that large manufacturers have not. Since customers purchase recreational vehicles when consumer confidence is growing, competitors must offer the trendiest products that are still affordable for the general population. Most consumers cannot pay for large recreational vehicles with cash, so it is also important for competitors to have reliable financing options for customers. Brand identity is crucial in the recreational vehicle industry as it allows companies to raise prices and have a consistent competitive advantage.

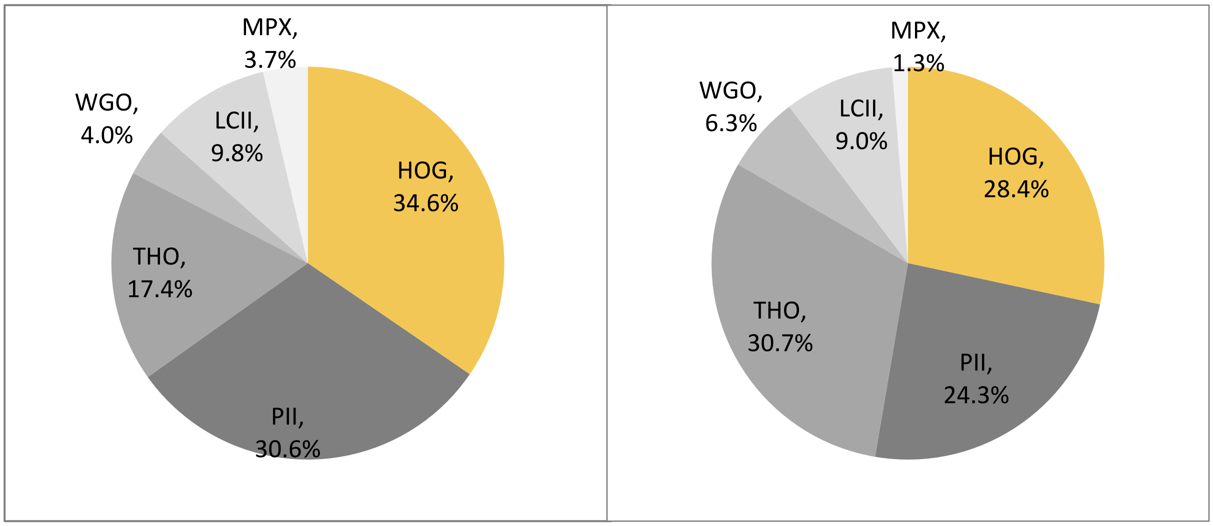
HOG has a strong brand identity, which has allowed it to retain customers with a premium. However, the price premium has limited Harley-Davidson in appealing to a younger population. Harley-Davidson has had difficulty staying trendy and appealing to new customers. Harley-Davidson's financial sector helps it retain customer loyalty by allowing its customers to finance vehicles. Rates start at 3.99% APR for new motorcycles and 4.99% for used motorcycles. During the financial crisis, when even HOG could not find lenders, Warren Buffett's Berkshire Hathaway saved Harley-Davidson. Berkshire Hathaway offered HOG a $303 million loan with a 15% interest rate. Although the interest rate was high, Harley-Davidson took the loan to have the funds to finance customers and keep the company running.

HOG has an impressive brand identity, but management must focus on offering trendy, new models if it wants to stay competitive.

The recreational vehicles industry is dominated in market cap by Harley-Davidson; however, it is dominated in sales by Thor Industries. Although HOG trails in retail sales, its premium market cap to Thor could mean that the market projects better growth for Harley-Davidson, or that it is more profitable than Thor. HOG has an impressive profit margin compared to its peers. HOG's NPM was 11.4% in 2017, while the average of its peers was 6.8%.

Going into 2020, I believe Harley-Davidson will grow in its retail sales with the help of its “More Roads to Harley-Davidson” plan. With the release of the electric motorcycles, the firm will be reaching new customers by bringing a new product to the industry.

Figures 7 and 8: Comparison of HOG comps by market cap (left) and retail sales (right)



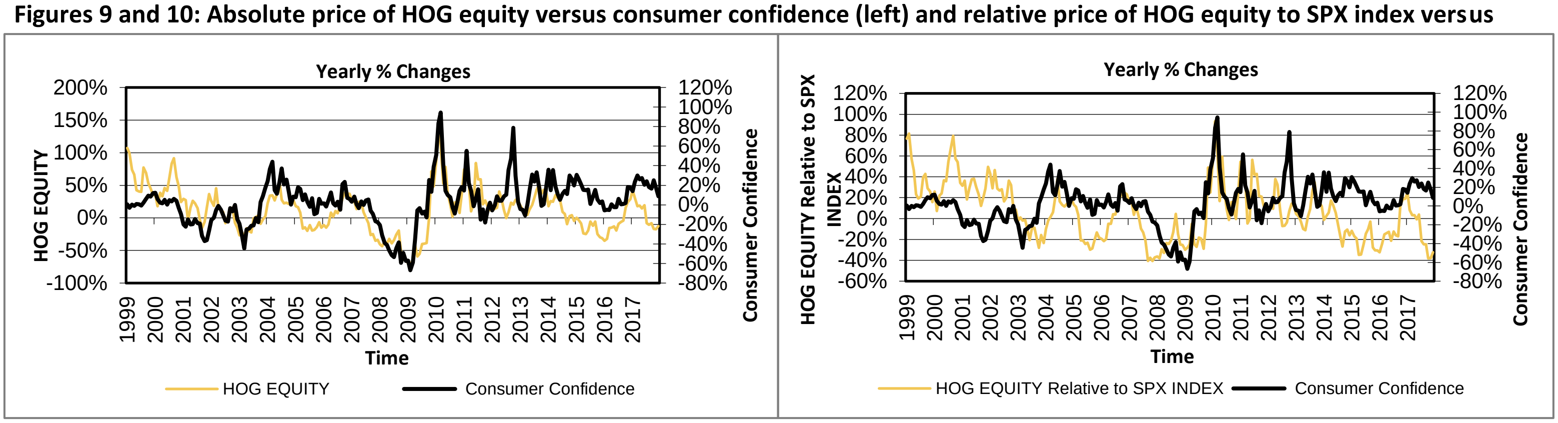
Source: FactSet, IMCP

Macroeconomic trends

The stock rises as consumer confidence increases.

The stock is positively correlated with the consumer confidence index. If consumers believe the economy is doing well and will continue to do well, they are comfortable spending money on recreational vehicles. Harley-Davidson also offers apparel and other merchandise products that are less dependent on consumer confidence; however, motorcycle sales are the largest source of revenue. Figure 9 shows the absolute price of HOG equity versus consumer confidence (a positive correlation of 0.55). Figure 10 shows that HOG equity relative to the SPX index versus consumer confidence has a positive correlation of 0.24.

Figures 9 and 10: Absolute price of HOG equity versus consumer confidence (left) and relative price of HOG equity to SPX index versus

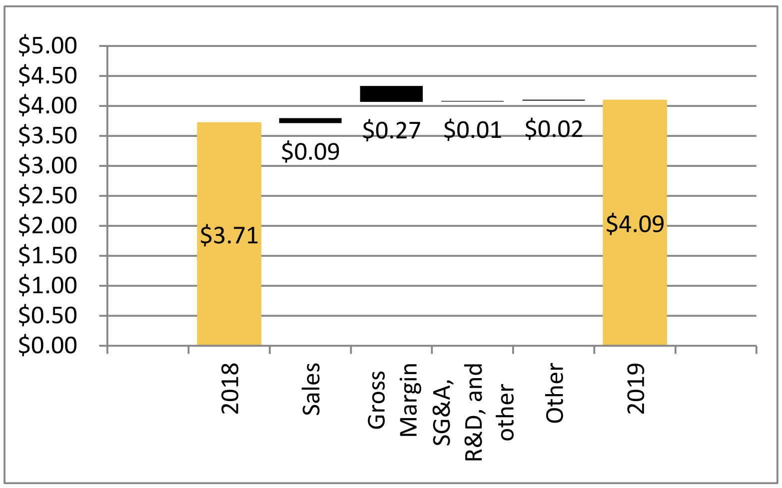


Source: Bloomberg, IMCP

Financial Analysis

I anticipate EPS to grow to $4.09 for fiscal year 2018. An increase in sales and gross margin should boost earnings by $0.09 and $0.27, respectively. I anticipate this growth due to the "More Roads to Harley-Davidson" plan. The international expansion and new product offerings mentioned in the plan have the possibility to positively impact the EPS. With the recent closing of manufacturing plants and expectation to move production overseas for the overseas markets, I expect a minimal increase of $0.01 in earnings due to SG&A, R&D, and Other. The increase in overseas production should replace the SG&A expense amount lost in the closing of the manufacturing plants that occurred in 2018. I expect an increase of $0.02 in earnings driven by stock buybacks and paying off short-term and long-term debt.

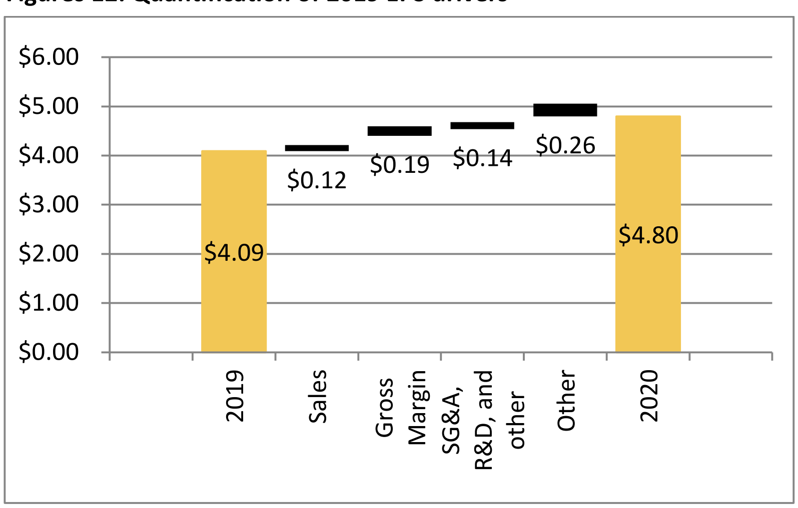
Figures 11: Quantification of 2018 EPS drivers



Source: Company Reports, IMCP

I expect 2019 EPS to increase from $4.09 to $4.80. Harley-Davidson should continue to have a positive gain in earnings due to the expected increase in its sales and gross margin by $0.12 and $0.25, respectively. I anticipate this growth due to the continued release of new products into new markets. I expect that SG&A will have a $0.14 positive impact on earnings due to the continued focus on production overseas and expanding into the markets overseas. EPS should increase $0.26 by the continuance of stock buybacks and paying off short-term and long-term debt.

Figures 12: Quantification of 2019 EPS drivers



Source: Company Reports, IMCP

I am more optimistic than consensus estimates for 2019 and 2020. With how much focus HOG has on international expansion, I believe that there will be much higher growth in revenue than consensus estimates. With this increase in revenue growth, there should be more available cash for the company to pay off its short-term and long-term debt and buyback shares to grow EPS at a considerable rate.

Figure 13: EPS and YoY growth estimates

	FY 2019E	FY2020E
Revenue - Estimate	$5,807	$5,972
YoY Growth	2%	3%
Revenue - Consensus	$5,055	$5,074
YoY Growth	0%	0%
EPS - Estimate	$4.09	$4.80
YoY Growth	10%	17%
EPS - Consensus	$3.72	$4.08
YoY Growth	-3%	10%

Source: Factset, IMCP

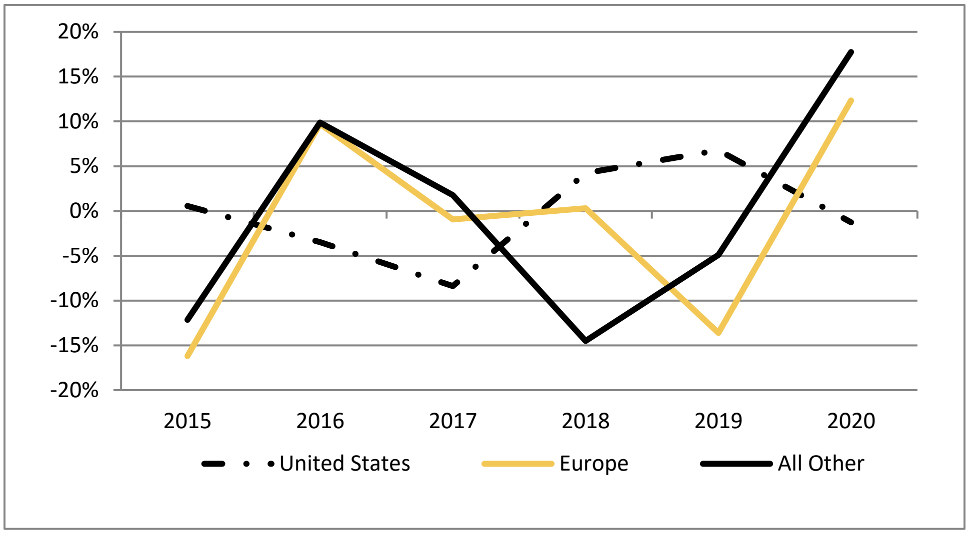
Revenues

Harley-Davidson had a steady decline in revenues since 2013. 2018, however, has appeared to be a better year for HOG. I anticipate that moving into 2019 and 2020, HOG will experience continued growth in its revenues. This expectation is driven by the announcement of new products being released to United States markets. I believe the main contributor to US revenue growth will be the LiveWire™ product line expected to be released in 2019, with new models being released every year until 2022. HOG does not release new and unique models often, so this change has the possibility to rejuvenate its markets in the United States that have been on decline. I anticipate a reasonable amount of growth for 2019, followed by a slight decay in United States sales growth in 2020. Following the release of the new models in 2019, it will be difficult for HOG to continue to mirror that same sales growth unless the new models of the 2020 LiveWire™ model are drastically different than the 2019 model.

Jawa plans to release three new motorcycles into the market.

International revenue, specifically in the Asia Pacific markets, should experience growth in 2019 and 2020. In the coming years, the company is focusing heavily on growing into new markets, especially the Asia Pacific markets. The company's largest focus is in India. I expect the release of new models in India in 2020. Growth could be greater than what I anticipate, however, a new competitor, Mahindra & Mahindra, will restore the Jawa brand. The Jawa brand was introduced in India back in the 1990's but ceased production due to financial issues. With this new competitor entering India's motorcycle market at roughly the same time as Harley-Davidson, the company's growth could be more difficult to achieve.

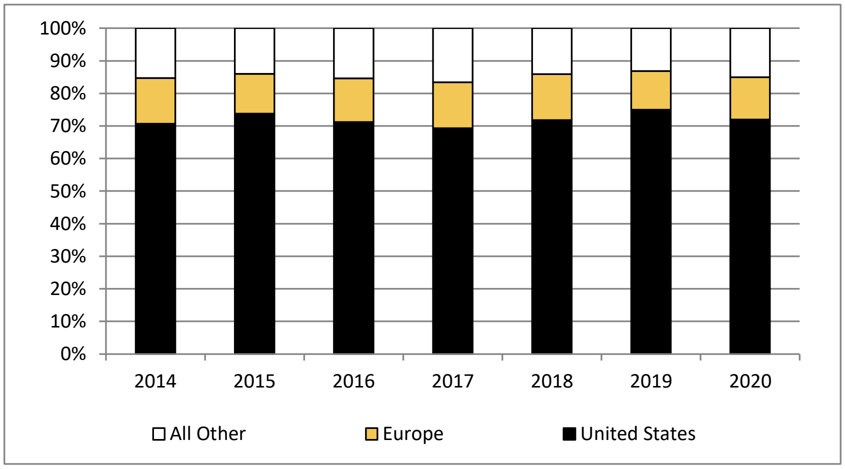
Figure 14: Revenue by region, 2015-2020E



Source: Company Reports, IMCP

Releasing new products in the United States and internationally should keep a somewhat consistent US/international mix through 2020. With the LiveWire™ being released in 2019, I expect the United States to have a larger percentage of sales than previous years. However, with the expectation of new products for the Asia Pacific markets in 2020, I expect the all other region to have a larger percentage of sales than in previous years.

Figure 15: Percentage of revenue by region, 2015-2020E



Source: Company Reports, IMCP

Return on Equity

Harley-Davidson has had a relatively cyclical ROE since 2015. I expect that ROE will plateau after 2018 and stay within 2% of the 2018 ROE. DuPont analysis for HOG reveals that ROE is driven mostly by the tax burden; although, EBIT margins have also fallen. Asset turnover has been consistent and only fluctuating from 0.61 to 0.57 since 2015.

Figure 16: ROE breakdown, 2015-2020E

5-stage DuPont	2015	2016	2017	2018	2019E	2020E
EBIT / sales	18.3%	17.2%	15.9%	15.0%	16.0%	17.2%
Sales / avg assets	0.61	0.60	0.57	0.57	0.58	0.58
EBT / EBIT	104.9%	99.3%	96.1%	95.3%	95.7%	96.3%
Net income /EBT	65.4%	67.6%	60.4%	77.0%	76.0%	78.0%
ROA	7.7%	7.0%	5.3%	6.3%	6.7%	7.5%
Avg assets / avg equity	4.11	5.29	5.28	5.12	4.60	4.16
ROE	31.7%	36.8%	27.7%	32.0%	30.9%	31.3%

Source: Company Reports

In the future, I expect ROE to rise due to the corporate tax law that became effective January 1, 2018. The law stabilizes and lowers the tax burden.

Free Cash Flow

Figure 17: Free cash flows 2015 – 2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$834	$717	$697	$543	$655	$706	$801
Growth		*-14.0%*	*-2.8%*	*-22.1%*	*20.5%*	*7.9%*	*13.5%*
NWC*	652	508	231	39	410	419	340
Net fixed assets	5,580	6,008	6,036	6,088	6,100	6,238	6,415
Total net operating capital*	$6,232	$6,516	$6,268	$6,127	$6,510	$6,657	$6,755
Growth		*4.6%*	*-3.8%*	*-2.2%*	*6.3%*	*2.3%*	*1.5%*
- Change in NWC*		(144)	(277)	(192)	371	9	(79)
- Change in NFA		428	28	52	12	138	177
FCFF*		$433	$946	$684	$271	$559	$704
Growth			*118.4%*	*-27.7%*	*-60.3%*	*105.9%*	*25.9%*
- After-tax interest expense	(11)	(35)	5	21	31	30	30
FCFE**		$468	$941	$663	$241	$529	$674
Growth			*101.0%*	*-29.5%*	*-63.7%*	*119.7%*	*27.4%*
FCFF per share		$2.14	$5.26	$3.98	$1.62	$3.38	$4.38
Growth			*146.3%*	*-24.4%*	*-59.4%*	*109.3%*	*29.5%*
FCFE per share		$2.31	$5.24	$3.85	$1.43	$3.20	$4.19
Growth			*126.8%*	*-26.4%*	*-62.8%*	*123.3%*	*31.0%*

Source: Company Reports, IMCP

HOG has experienced a considerable amount of volatility in its free cash flows over the past few years. From 2014 to 2015, the company experienced an increase in NFA by $428 million. This is due to the announcement in 2014 for the plan to eventually release an electric motorcycle into the market. In 2014, the company also released the "Project Rushmore" motorcycle lineup. The project consisted of eight new motorcycles. Then, in 2017, NOPAT declined. In 2018, FCF is held back by increasing working capital which declined for several years. Going forward, I expect NOPAT and NFA to continue to grow through 2019 and 2020.

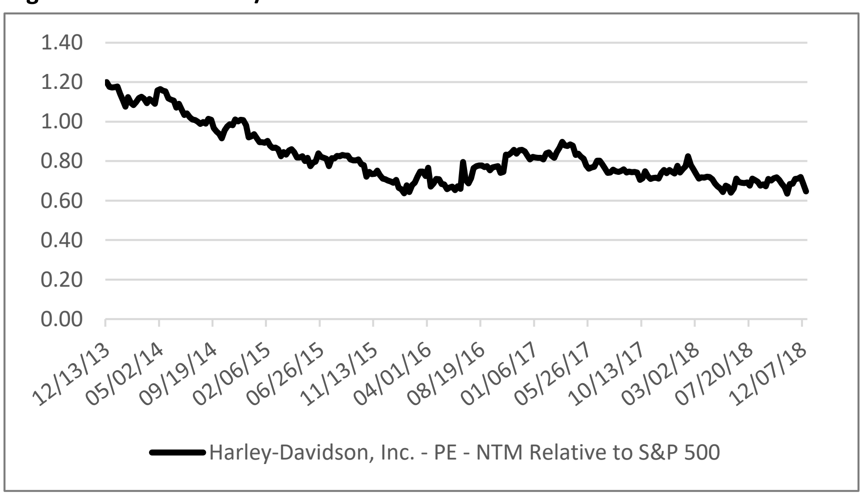
Valuation

HOG was valued using multiples and a 3-stage discounting cash flow model. Based on P/B and NTM ROE analysis, HOG is undervalued compared to its peers. Another valuation approach shows HOG to be slightly overvalued based on its fundamentals versus those of its peers in the recreational vehicle industry. Price to book valuation yielded a price of $60. A DCF analysis values HOG slightly lower, at $54. I give the DCF analysis more weight as it considers continued changes in the company. Because of these valuations, I value the stock at $55.

Trading History

HOG is currently trading near its five year low on relative P/E. This is mainly the result of the slowdown in the market and perhaps because people are worried about the next recession. HOG's five-year average P/E is 15.2, which is much higher than the NTM P/E of 10.3. Over the next economic cycle, I expect the P/E to rise towards the five-year average of 15.2.

Figure 18: HOG NTM P/E relative to S&P 500



Source: Factset

Assuming the firm maintains a 9.7 NTM P/E at the end of 2019, it should trade at $46.56 by the end of the year.

- Price = P/E x EPS = 9.7 x $4.80 = $46.56

Discounting $46.56 back to today at a 10.6% cost of equity (explained in Discounted Cash Flow section) yields a price of $42.10. Given HOG's potential for earnings growth and continued profitability, this seems to be a low valuation.

Relative Valuation

Harley-Davidson is currently trading at a slightly lower P/E compared to its peers, with a P/E TTM of 11.2 compared to the average of 13.6. Investors are willing to pay a premium for HOG's peers as HOG is a mature company and may not have the same potential to grow as its peers. HOG's P/B ratio is slightly lower than the average of its peers, and its P/S ratio is slightly higher than the average of its peers despite its above average ROE and profit margin.

Figure 19: HOG 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	2016	2017	2018	2019	Pst 5yr	Beta	Equity	Rating	Yield	Payout
HOG	HARLEY-DAVIDSON INC	$36.02	$5,865	(0.2)	(11.7)	(19.0)	(16.9)	(29.4)	(29.2)	8.2	7.9%	3.8%	-10.4%	12.5%	-4.1%	1.9%	1.48	194.9%	B+	3.49%	45.9%
PII	POLARIS INDUSTRIES INC	$83.98	$5,188	0.9	(7.5)	(21.5)	(34.2)	(34.4)	(32.3)	16.4	55.8%	-48.4%	39.4%	35.1%	6.6%	-9.4%	1.40	200.1%	A	2.47%	55.7%
THO	THOR INDUSTRIES INC	$55.98	$2,956	(0.6)	(18.8)	(41.0)	(44.3)	(62.5)	(62.9)	10.0	25.1%	30.5%	45.3%	14.8%	-13.4%	14.4%	1.83	0.0%	A-	2.21%	25.1%
WGO	WINNEBAGO INDUSTRIES	$21.13	$674	0.1	(23.0)	(42.6)	(48.1)	(61.5)	(62.0)	3.1	18.2%	10.5%	50.6%	27.3%	16.1%		1.37	54.5%	B	1.60%	12.4%
LCII	LCI INDUSTRIES	$65.87	$1,661	(1.5)	(9.6)	(28.7)	(29.6)	(47.1)	(49.3)	15.0	10.4%	62.5%	10.8%	6.9%	8.4%	26.0%	1.15	33.1%	B+	3.04%	40.2%
MPX	MARINE PRODUCTS CORP	$18.02	$622	1.8	(20.6)	(20.8)	9.8	20.6	41.4		17.0%	12.8%	36.4%	0.45	2.3%	23.6%	0.51	0.0%	B+	1.84%	53.7%
Average			$2,828	0.1	(15.2)	(28.9)	(27.2)	(35.7)	(32.4)	10.5	22.4%	11.9%	28.7%	23.6%	2.7%	11.3%	1.29	80.4%		2.44%	38.8%
Median			$2,309	(0.1)	(15.2)	(25.1)	(31.9)	(40.7)	(40.8)	10	17.6%	11.7%	37.9%	21.0%	4.4%	14.4%	1.39	43.8%		2.34%	43.0%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			-3.3%	8.2%	38.2%	8.6%						

		2017		P/E							2017	2017			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2015	2016	2017	TTM	NTM	2018	2019	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
HOG	http://www.harley-davidson.com	25.9%	2.72	12.3	15.2	14.8	11.2	10.3	9.3	9.7	11.4%	1.19	15.4%	8.0%	16.8	5.7	10.4	-13.2%	-1.3%	0.2%	$13.22
PII	http://www.polaris.com	33.4%	5.78	12.7	23.7	25.6	19.7	12.7	12.8	12.0	5.5%	0.96	7.2%	9.1%	21.8	8.7	14.7	12.8%	5.2%	11.1%	$14.54
THO	http://www.thorindustries.com	19.3%	1.52	15.0	20.5	21.3	9.4	7.5	6.9	7.9	4.9%	0.38		23.4%	7.5	6.7		5.8%		20.8%	$36.77
WGO	http://www.winnebagoind.com	14.9%	1.25	13.1	18.8	22.0	6.6	5.6	6.6	5.6	4.7%	0.40	8.1%	13.3%	9.1	5.2		7.3%	10.2%	20.2%	$16.95
LCII	http://www.lci1.com	19.7%	2.26	19.0	20.7	22.6	11.5	10.4	10.7	9.9	6.8%	0.77	8.6%	20.4%	15.3	7.7	13.5	2.9%		19.0%	$29.17
MPX	http://www.marineproductscorp.com	25.7%	7.72	15.5	31.5	21.2	23.1	19.8	20.7	20.2	7.7%	2.33	12.1%	27.7%	14.3	22.1	21.7	7.6%	6.8%	12.4%	$2.33
Average		23.2%	3.54	14.6	21.7	21.2	13.6	11.0	11.2	10.9	6.8%	1.00	10.3%	17.0%	14.1	9.3	15.1	3.8%	5.2%	13.9%	
Median		22.7%	2.49	14.1	20.6	21.6	11.4	10.4	10.0	9.8	6.1%	0.86	8.6%	16.8%	14.8	7.2	14.1	6.5%	6.0%	15.7%	
SPX	S&P 500 INDEX			18.2	20.6	22.8			16.3	15.0											

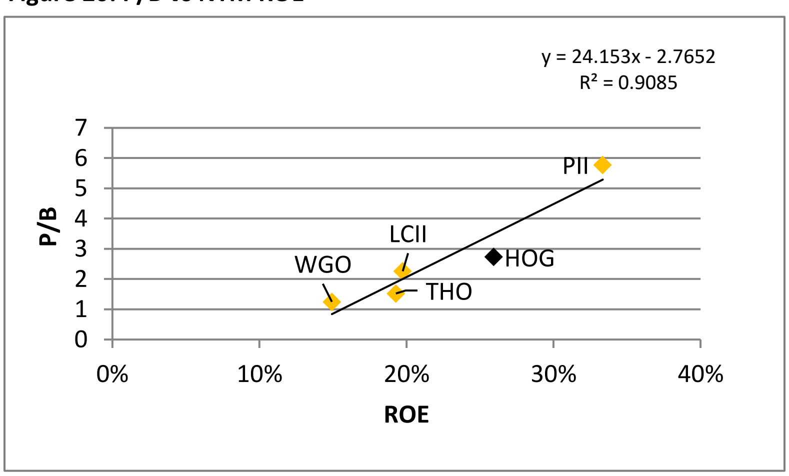
Source: Factset

A more thorough analysis of P/B and ROE is shown in figure 20. The R-squared of the regression shows that that over 90% of the firm's P/B is explained by its NTM ROE. Marine Products Corporation is excluded from this regression as the P/B ratio is an extreme outlier in the dataset. According to this measure, HOG is very undervalued.

- Estimated P/B = Estimated 2019 ROE (30.9%) x 24.153 – 2.7652 = 4.70
- Target Price = Estimated P/B (4.70) x 2019E BVPS (14.08) = $66.18

Discounting back to the present at a 10.6% cost of equity leads to a target price of $59.84.

Figure 20: P/B vs NTM ROE



Source: Factset

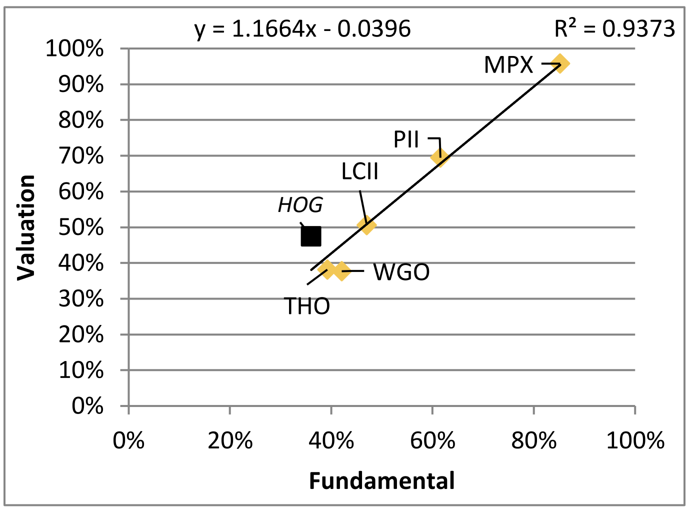
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A weighting of 1/Beta, 2017 ROE, 2017 NPM and NTM sales growth was compared to an equal weighting of 2017 P/E, 2018 P/E, P/B and P/S. The R-squared resulting from this weighting equated to over 90%. HOG is above the line, so it is expensive compared to its peers.

Figure 21: Composite value, % of range

				Fundamental Percent of Max				Valuation Percent of Max			
			Weight	50.0%	25.0%	12.5%	12.5%	25.0%	25.0%	25.0%	25.0%
		Weighted		1/	2017	2017	Sales Growth	P/E			
Ticker	Name	Fund	Value	Beta	ROE	NPM	NTM	2017	2018	P/B	P/S
HOG	HARLEY-DAVIDSON INC	36%	47%	34%	78%	100%	-104%	58%	45%	35%	51%
PII	POLARIS INDUSTRIES INC	62%	69%	36%	100%	49%	100%	100%	62%	75%	41%
THO	THOR INDUSTRIES INC	39%	38%	28%	58%	43%	45%	83%	33%	20%	17%
WGO	WINNEBAGO INDUSTRIES	42%	38%	37%	45%	42%	57%	86%	32%	16%	17%
LCII	LCI INDUSTRIES	47%	51%	44%	59%	60%	23%	88%	52%	29%	33%
MPX	MARINE PRODUCTS CORP	85%	96%	100%	77%	68%	59%	83%	100%	100%	100%

Source: IMCP

Figure 22: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

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

For this analysis, the company's cost of equity was calculated to be 10.6% 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 2.89%.
- A ten-year beta of 1.08 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 10.6% (2.89 + 1.08 (10.0 – 2.89)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $2.29 and $3.26, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $4.74 per share. Thus, stage one of this discounted cash flow analysis contributes $4.74 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 10.6% cost of equity. I assume 2% sales growth in 2021, 1% in 2022, and 0.5% in 2023, 2024, and 2025. The ratio of NWC to sales and NFA turnover will remain at the 2020 levels. The NOPAT margin is expected to slightly decrease from 13.1% in 2021 to 12.0% in 2025. Share growth is expected to be -2% each year from 2021 to 2025 as I anticipate the company will continue to buy back shares.

Figure 23: FCFE and discounted FCFE, 2019-2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$2.29	$3.26	$3.72	$4.16	$4.39	$4.38	$4.38
Discounted FCFE	$2.07	$2.67	$2.75	$2.79	$2.65	$2.40	$2.17

Added together, these discounted cash flows total $12.76.

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 increase from $4.80 in 2020 to $4.97 in 2025.

Figure 24: EPS estimates for 2019-2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$4.09	$4.80	$4.89	$4.93	$4.95	$4.96	$4.97

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. A P/E ratio of 14.8 is assumed at the end of HOG's terminal year.

Given the assumed terminal earnings per share of $4.97 and a price to earnings ratio of 14.8, a terminal value of $46.88 per share is calculated. Using the 10.6% cost of equity, this number is discounted back to a present value of $36.46.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $53.96 is calculated (4.74 + 12.76 + 36.46). Given HOG's current price of $36.02, this model indicates that the stock is undervalued.

<u>Scenario Analysis</u>

Harley-Davidson is difficult to value with accuracy because its fortunes are somewhat dependent on the economy. HOG's growth has slowed compared to its peers as its peers have appealed to the younger population and have continued releasing new products. In the coming years, Harley-Davidson will be taking big steps towards international expansion and in its product offerings. These opportunities have the possibility to immensely grow the company or backfire. Depending on how much the company grows, I valued HOG in two different scenarios for the years of 2021-2025.

Bull Case: Assuming HOG's focus on international expansion goes well and its new products sell well, I expect the value of the stock to substantially increase. I expect sales will grow at a constant 3% per year from 2021-2025 and the NOPAT margin to continue to grow from 13.7% in 2021 to 15.0% in 2025. I also expect the share growth to drop 2% per year. As a result, I anticipate a target price of $69.58.

Figure 25: Bull case estimated value for 2019

Summary			
First stage	$4.74	Present value of first 2 year cash flow	
Second stage	$13.85	Present value of year 3-7 cash flow	
Third stage	$50.99	Present value of terminal value P/E	
Value (P/E)	**$69.58**	= value at beg of fiscal yr	2019

Bear Case: Assuming HOG's focus on international expansion does not go well and its new products do not perform as well as expected, I expect the value of the stock to substantially decrease. I expect the sales growth to diminish from 2% growth in 2021 to -2% in 2025. I also anticipate the NOPAT margin to decrease over time from 12.2% in 2021 to 7.5% in 2025. My target price is $35.62.

Figure 26: Bear case estimated value for 2019

Summary			
First stage	$4.74	Present value of first 2 year cash flow	
Second stage	$10.63	Present value of year 3-7 cash flow	
Third stage	$20.25	Present value of terminal value P/E	
Value (P/E)	**$35.62**	= value at beg of fiscal yr	2019

Business Risks

Although I have many reasons to be optimistic about Harley-Davidson, there are several risks associated with the company that should be noted:

Loyal customers increasing in age:

HOG has continued to market its products to the older generation with its premium prices and encouragement of the older culture that has been built around the company.

Loss of brand identity:

New products in the United States and internationally have the possibility to increase revenue growth. However, there is the possibility that the new products, specifically the LiveWire™ models, backfire on the company. Harley-Davidson is known for having large, loud motorcycles. The LiveWire™ electric motorcycles will not have the typical Harley-Davidson engine and will not have the signature Harley sound.

International expansion to India may be more difficult:

During November 2018, Mahindra & Mahindra announced that the Jawa brand motorcycles will be resurrected. This may harm HOG's growth in India. Jawa motorcycles were originally introduced in the mid 1900's but ceased production in the late 1990's due to financial issues. The return of the Jawa motorcycles will lower HOG's market share and could severely hurt the company's future in India.

New product offerings may not attract new customers:

Harley-Davidson plans to introduce 500cc to 1250cc middleweight motorcycles beginning in 2020. New motorcycle riders are encouraged to start riding on smaller motorcycles, usually in the 250cc range. Since HOG does not offer a 250cc motorcycle, new riders start with other brands. Currently, HOG offers a 500cc model, the Harley-Davidson Street 500. Releasing another motorcycle with the same engine size may appeal to the same market instead of attracting new customers.

Appendix 1: SWOT Analysis

Strengths	Weaknesses
Brand loyalty Brand recognition	Susceptable to economic downturns Dependence on mature generation
Opportunities	**Threats**
International expansion New markets with new models	Competition Tariffs on overseas production

Appendix 2: Porter's 5 Forces

Threat of New Entrants – High

Harley-Davidson has many competitors that produce similar products. A motorcycle company could produce a model with new technology that takes away Harley's market share. Harley-Davidson has a culture formed around its motorcycles that other competitors have not been able to replicate. This culture helps to keep Harley-Davidson in its own motorcycle class and differentiate from competitors.

Threat of Substitutes – High

While Harley-Davidson motorcycles are forms of transportation, many consumers use them for recreational purposes. It is easy for consumers to choose to use a car or public transportation instead of a motorcycle for their commutes. There are many brands and styles of motorcycles available to consumers. Consumers are easily able to switch to another brand.

Supplier Power – Low

The suppliers have minimal leverage over Harley-Davidson and other motorcycle manufacturers. Harley-Davidsons products are manufactured using materials that are stable and readily available.

Buyer Power – High

Consumers have great control over how Harley-Davidson will perform. Consumers can easily switch products if prices rise too much. In the industry, there is a great amount of information available to consumers. Consumers have much information to intelligently compare motorcycle options.

Intensity of Competition – Very High

There are many companies manufacturing similar motorcycles to Harley-Davidson's. With Harley-Davidson's recent plan to have a stronger focus on international markets, competition will only increase.

Appendix 3: Sales forecast

Sales Forecasts (in thousands)							
Items	**Dec-14**	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**
Sales	$6,229	$5,995	$5,996	$5,647	$5,679	$5,807	$5,972
Growth		*-3.7%*	*0.0%*	*-5.8%*	*0.6%*	*2.3%*	*2.8%*
Motorcycles and Related Products	5,568	5,309	5,271	4,915	4,934	5,033	5,158
Growth		*-4.7%*	*-0.7%*	*-6.8%*	*0.4%*	*2.0%*	*2.5%*
% of sales	*89.4%*	*88.5%*	*87.9%*	*87.0%*	*86.9%*	*86.7%*	*86.4%*
Financial Services	661	687	725	732	745	775	814
Growth		*3.9%*	*5.6%*	*1.0%*	*1.7%*	*4.0%*	*5.0%*
% of sales	*10.6%*	*11.5%*	*12.1%*	*13.0%*	*13.1%*	*13.3%*	*13.6%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	4,400	4,425	4,272	3,914	4,079	4,356	4,300
Growth		*0.6%*	*-3.5%*	*-8.4%*	*4.2%*	*6.8%*	*-1.3%*
% of sales	*70.6%*	*73.8%*	*71.2%*	*69.3%*	*71.8%*	*75.0%*	*72.0%*
Europe	875	734	805	798	800	691	776
Growth		*-16.2%*	*9.7%*	*-0.9%*	*0.3%*	*-13.6%*	*12.3%*
% of sales	*14.1%*	*12.2%*	*13.4%*	*14.1%*	*14.1%*	*11.9%*	*13.0%*
All Other	953	837	920	936	800	761	896
Growth		*-12.2%*	*9.9%*	*1.8%*	*-14.5%*	*-4.9%*	*17.7%*
% of sales	*15.3%*	*14.0%*	*15.3%*	*16.6%*	*14.1%*	*13.1%*	*15.0%*

Appendix 4: Income Statement

Income Statement (in thousands)							
Items	**Dec-14**	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**
Sales	$6,229	$5,995	$5,996	$5,647	$5,679	$5,807	$5,972
Direct costs	3,850	3,731	3,783	3,606	3,629	3,653	3,715
Gross Margin	2,379	2,265	2,214	2,041	2,050	2,155	2,257
SG&A, R&D, and other	1,112	1,168	1,183	1,142	1,200	1,225	1,230
EBIT	1,267	1,097	1,031	899	850	929	1,027
Interest	(16)	(54)	7	35	40	40	38
EBT	1,283	1,150	1,024	864	810	889	989
Taxes	439	398	332	342	186	213	218
Income	844	752	692	522	624	676	771
Other	-	-	-	-	-	-	-
Net income	844	752	692	522	624	676	771
Basic Shares	216.3	202.7	179.7	172.0	168.0	165.2	160.7
EPS	$3.90	$3.71	$3.85	$3.04	$3.71	$4.09	$4.80
DPS	$1.10	$1.23	$1.40	$1.46	$1.49	$1.51	$1.56

Appendix 5: Balance Sheet

Balance Sheet (in thousands)							
Items	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20
Cash	849	677	754	688	650	629	652
Operating assets ex cash	3,041	3,261	3,094	3,197	3,210	3,283	3,285
Operating assets	3,891	3,938	3,848	3,885	3,860	3,911	3,937
Operating liabilities	2,389	2,753	2,863	3,158	2,800	2,863	2,944
NOWC	1,501	1,185	986	727	1,060	1,048	992
NOWC ex cash (NWC)	652	508	231	39	410	419	340
NFA	5,580	6,008	6,036	6,088	6,100	6,238	6,415
Invested capital	*$7,081*	*$7,193*	*$7,022*	*$6,815*	*$7,160*	*$7,286*	*$7,407*
Marketable securities	57	45	6	-	-	-	-
Total assets	*$9,528*	*$9,991*	*$9,890*	*$9,973*	*$9,960*	*$10,149*	*$10,352*
Short-term and long-term debt	$3,762	$4,845	$4,667	$4,587	$4,670	$4,520	$4,370
Other liabilities	467	554	441	383	440	440	440
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	2,909	1,840	1,920	1,844	2,050	2,326	2,597
Total supplied capital	*$7,138*	*$7,239*	*$7,028*	*$6,815*	*$7,160*	*$7,286*	*$7,407*
Total liabilities and equity	*$9,528*	*$9,991*	*$9,890*	*$9,973*	*$9,960*	*$10,149*	*$10,352*

Appendix 6: Ratios

Ratios							
Items	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20
Profitability							
Gross margin	38.2%	37.8%	36.9%	36.1%	36.1%	37.1%	37.8%
Operating (EBIT) margin	20.3%	18.3%	17.2%	15.9%	15.0%	16.0%	17.2%
Net profit margin	13.6%	12.5%	11.5%	9.2%	11.0%	11.6%	12.9%
Activity							
NFA (gross) turnover		1.03	1.00	0.93	0.93	0.94	0.94
Total asset turnover		0.61	0.60	0.57	0.57	0.58	0.58
Liquidity							
Op asset / op liab	1.63	1.43	1.34	1.23	1.38	1.37	1.34
NOWC Percent of sales		22.4%	18.1%	15.2%	15.7%	18.1%	17.1%
Solvency							
Debt to assets	39.5%	48.5%	47.2%	46.0%	46.9%	44.5%	42.2%
Debt to equity	129.3%	263.4%	243.1%	248.7%	227.8%	194.3%	168.3%
Other liab to assets	4.9%	5.5%	4.5%	3.8%	4.4%	4.3%	4.3%
Total debt to assets	44.4%	54.0%	51.6%	49.8%	51.3%	48.9%	46.5%
Total liabilities to assets	69.5%	81.6%	80.6%	81.5%	79.4%	77.1%	74.9%
Debt to EBIT	2.97	4.42	4.53	5.10	5.49	4.86	4.25
EBIT/interest	(78.21)	(20.49)	146.64	25.97	21.25	23.40	26.74
Debt to total net op capital	53.1%	67.4%	66.5%	67.3%	65.2%	62.0%	59.0%
ROIC							
NOPAT to sales	13.4%	12.0%	11.6%	9.6%	11.5%	12.2%	13.4%
Sales to NWC		10.33	16.21	41.78	25.29	14.01	15.73
Sales to NFA		1.03	1.00	0.93	0.93	0.94	0.94
Sales to IC ex cash		0.94	0.94	0.91	0.90	0.88	0.89
Total ROIC ex cash		11.3%	10.9%	8.8%	10.4%	10.7%	11.9%
NOPAT to sales	13.4%	12.0%	11.6%	9.6%	11.5%	12.2%	13.4%
Sales to NOWC		4.46	5.52	6.60	6.36	5.51	5.85
Sales to NFA		1.03	1.00	0.93	0.93	0.94	0.94
Sales to IC		0.84	0.84	0.82	0.81	0.80	0.81
Total ROIC		10.0%	9.8%	7.9%	9.4%	9.8%	10.9%
NOPAT to sales	13.4%	12.0%	11.6%	9.6%	11.5%	12.2%	13.4%
Sales to EOY NWC	9.55	11.79	25.92	144.61	13.85	13.85	17.56
Sales to EOY NFA	1.12	1.00	0.99	0.93	0.93	0.93	0.93
Sales to EOY IC ex cash	1.00	0.92	0.96	0.92	0.87	0.87	0.88
Total ROIC using EOY IC ex cash	13.4%	11.0%	11.1%	8.9%	10.1%	10.6%	11.9%
NOPAT to sales	13.4%	12.0%	11.6%	9.6%	11.5%	12.2%	13.4%
Sales to EOY NOWC	4.15	5.06	6.08	7.77	5.36	5.54	6.02
Sales to EOY NFA	1.12	1.00	0.99	0.93	0.93	0.93	0.93
Sales to EOY IC	0.88	0.83	0.85	0.83	0.79	0.80	0.81
Total ROIC using EOY IC	11.8%	10.0%	9.9%	8.0%	9.1%	9.7%	10.8%
ROE							
5-stage							
EBIT / sales		18.3%	17.2%	15.9%	15.0%	16.0%	17.2%
Sales / avg assets		0.61	0.60	0.57	0.57	0.58	0.58
EBT / EBIT		104.9%	99.3%	96.1%	95.3%	95.7%	96.3%
Net income /EBT		65.4%	67.6%	60.4%	77.0%	76.0%	78.0%
ROA		7.7%	7.0%	5.3%	6.3%	6.7%	7.5%
Avg assets / avg equity		4.11	5.29	5.28	5.12	4.60	4.16
ROE		31.7%	36.8%	27.7%	32.0%	30.9%	31.3%
3-stage							
Net income / sales		12.5%	11.5%	9.2%	11.0%	11.6%	12.9%
Sales / avg assets		0.61	0.60	0.57	0.57	0.58	0.58
ROA		7.7%	7.0%	5.3%	6.3%	6.7%	7.5%
Avg assets / avg equity		4.11	5.29	5.28	5.12	4.60	4.16
ROE		31.7%	36.8%	27.7%	32.0%	30.9%	31.3%
Payout Ratio		33.1%	36.5%	48.2%	40.1%	37.0%	32.4%
Retention Ratio		66.9%	63.5%	51.8%	59.9%	63.0%	67.6%
Sustainable Growth Rate		21.2%	23.4%	14.4%	19.2%	19.5%	21.2%

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	2016	2017	2018	2019	Pst 5yr	Beta	Equity	Rating	Yield	Payout
HOG	HARLEY-DAVIDSON INC	$36.02	$5,865	(0.2)	(11.7)	(19.0)	(16.9)	(29.4)	(29.2)	8.2	7.9%	3.8%	-10.4%	12.5%	-4.1%	1.9%	1.48	194.9%	B+	3.49%	45.9%
PII	POLARIS INDUSTRIES INC	$83.98	$5,188	0.9	(7.5)	(21.5)	(34.2)	(34.4)	(32.3)	16.4	55.8%	-48.4%	39.4%	35.1%	6.6%	-9.4%	1.40	200.1%	A	2.47%	55.7%
THO	THOR INDUSTRIES INC	$55.98	$2,956	(0.6)	(18.8)	(41.0)	(44.3)	(62.5)	(62.9)	10.0	25.1%	30.5%	45.3%	14.8%	-13.4%	14.4%	1.83	0.0%	A-	2.21%	25.1%
WGO	WINNEBAGO INDUSTRIES	$21.13	$674	0.1	(23.0)	(42.6)	(48.1)	(61.5)	(62.0)	3.1	18.2%	10.5%	50.6%	27.3%	16.1%		1.37	54.5%	B	1.60%	12.4%
LCII	LCI INDUSTRIES	$65.87	$1,661	(1.5)	(9.6)	(28.7)	(29.6)	(47.1)	(49.3)	15.0	10.4%	62.5%	10.8%	6.9%	8.4%	26.0%	1.15	33.1%	B+	3.04%	40.2%
MPX	MARINE PRODUCTS CORP	$18.02	$622	1.8	(20.6)	(20.8)	9.8	20.6	41.4		17.0%	12.8%	36.4%	0.45	2.3%	23.6%	0.51	0.0%	B+	1.84%	53.7%
Average			$2,828	0.1	(15.2)	(28.9)	(27.2)	(35.7)	(32.4)	10.5	22.4%	11.9%	28.7%	23.6%	2.7%	11.3%	1.29	80.4%		2.44%	38.8%
Median			$2,309	(0.1)	(15.2)	(25.1)	(31.9)	(40.7)	(40.8)	10	17.6%	11.7%	37.9%	21.0%	4.4%	14.4%	1.39	43.8%		2.34%	43.0%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			-3.3%	8.2%	38.2%	8.6%						

		2017		P/E							2017	2017			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2015	2016	2017	TTM	NTM	2018	2019	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
HOG	http://www.harley-davidson.com	25.9%	2.72	12.3	15.2	14.8	11.2	10.3	9.3	9.7	11.4%	1.19	15.4%	8.0%	16.8	5.7	10.4	-13.2%	-1.3%	0.2%	$13.22
PII	http://www.polaris.com	33.4%	5.78	12.7	23.7	25.6	19.7	12.7	12.8	12.0	5.5%	0.96	7.2%	9.1%	21.8	8.7	14.7	12.8%	5.2%	11.1%	$14.54
THO	http://www.thorindustries.com	19.3%	1.52	15.0	20.5	21.3	9.4	7.5	6.9	7.9	4.9%	0.38		23.4%	7.5	6.7		5.8%		20.8%	$36.77
WGO	http://www.winnebagoind.com	14.9%	1.25	13.1	18.8	22.0	6.6	5.6	6.6	5.6	4.7%	0.40	8.1%	13.3%	9.1	5.2		7.3%	10.2%	20.2%	$16.95
LCII	http://www.lci1.com	19.7%	2.26	19.0	20.7	22.6	11.5	10.4	10.7	9.9	6.8%	0.77	8.6%	20.4%	15.3	7.7	13.5	2.9%		19.0%	$29.17
MPX	http://www.marineproductscorp.com	25.7%	7.72	15.5	31.5	21.2	23.1	19.8	20.7	20.2	7.7%	2.33	12.1%	27.7%	14.3	22.1	21.7	7.6%	6.8%	12.4%	$2.33
Average		23.2%	3.54	14.6	21.7	21.2	13.6	11.0	11.2	10.9	6.8%	1.00	10.3%	17.0%	14.1	9.3	15.1	3.8%	5.2%	13.9%	
Median		22.7%	2.49	14.1	20.6	21.6	11.4	10.4	10.0	9.8	6.1%	0.86	8.6%	16.8%	14.8	7.2	14.1	6.5%	6.0%	15.7%	
SPX	S&P 500 INDEX			18.2	20.6	22.8			16.3	15.0											

Appendix 8: 3-stage DCF Model

First Stage			Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*2.3%*	*2.8%*	*2.0%*	*1.0%*	*0.5%*	*0.5%*	*0.5%*
NOPAT / S	*12.2%*	*13.4%*	*13.1%*	*12.8%*	*12.6%*	*12.3%*	*12.0%*
S / NWC	*13.85*	*17.56*	*17.56*	*17.56*	*17.56*	*17.56*	*17.56*
S / NFA (EOY)	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*	*0.93*
S / IC (EOY)	*0.87*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*	*0.88*
ROIC (EOY)	*10.6%*	*11.9%*	*11.6%*	*11.4%*	*11.1%*	*10.9%*	*10.6%*
ROIC (BOY)		*12.0%*	*11.8%*	*11.5%*	*11.2%*	*10.9%*	*10.7%*
Share Growth		*-2.8%*	*-2.0%*	*-2.0%*	*-2.0%*	*-2.0%*	*-2.0%*
Sales	$5,807	$5,972	$6,091	$6,152	$6,183	$6,214	$6,245
NOPAT	$706	$801	$800	$791	$777	$763	$749
Growth		*13.5%*	*-0.2%*	*-1.2%*	*-1.7%*	*-1.8%*	*-1.8%*
- Change in NWC	9	-79	7	3	2	2	2
NWC EOY	*419*	*340*	*347*	*350*	*352*	*354*	*356*
Growth NWC		*-18.9%*	*2.0%*	*1.0%*	*0.5%*	*0.5%*	*0.5%*
- Chg NFA	138	177	128	65	33	33	33
NFA EOY	*6,238*	*6,415*	*6,543*	*6,608*	*6,642*	*6,675*	*6,708*
Growth NFA		*2.8%*	*2.0%*	*1.0%*	*0.5%*	*0.5%*	*0.5%*
Total inv in op cap	147	98	135	69	35	35	35
Total net op cap	6657	6755	6890	6959	6994	7029	7064
FCFF	$559	$704	$665	$722	$742	$728	$714
% of sales	*9.6%*	*11.8%*	*10.9%*	*11.7%*	*12.0%*	*11.7%*	*11.4%*
Growth		*25.9%*	*-5.5%*	*8.5%*	*2.8%*	*-1.9%*	*-1.9%*
- Interest (1-tax rate)	30	30	30	29	29	29	28
Growth		*-0.7%*	*-1.1%*	*-1.2%*	*-1.2%*	*-1.2%*	*-1.2%*
+ Net new debt	-150	-150	-50	-50	-50	-50	-50
Debt	4520	4370	4320	4270	4220	4170	4120
Debt / tot net op capital	*67.9%*	*64.7%*	*62.7%*	*61.4%*	*60.3%*	*59.3%*	*58.3%*
FCFE w debt	$379	$524	$585	$642	$663	$650	$636
% of sales	*6.5%*	*8.8%*	*9.6%*	*10.4%*	*10.7%*	*10.5%*	*10.2%*
Growth		*38.3%*	*11.8%*	*9.8%*	*3.3%*	*-2.0%*	*-2.1%*
/ No Shares	165.2	160.7	157.4	154.3	151.2	148.2	145.2
FCFE	$2.29	$3.26	$3.72	$4.16	$4.39	$4.38	$4.38
Growth		*42.2%*	*14.1%*	*12.0%*	*5.4%*	*0.0%*	*-0.1%*
* Discount factor	0.90	0.82	0.74	0.67	0.61	0.55	0.49
Discounted FCFE	$2.07	$2.67	$2.75	$2.79	$2.65	$2.40	$2.17
Third Stage							
Terminal value P/E							
Net income	$676	$771	$770	$761	$748	$735	$721
% of sales	*11.6%*	*12.9%*	*12.6%*	*12.4%*	*12.1%*	*11.8%*	*11.5%*
EPS	$4.09	$4.80	$4.89	$4.93	$4.95	$4.96	$4.97
Growth		*17.3%*	*1.9%*	*0.8%*	*0.3%*	*0.2%*	*0.2%*
Terminal P/E							14.83
* Terminal EPS							$4.97
Terminal value							$73.67
* Discount factor							0.49
Discounted terminal value							$36.46

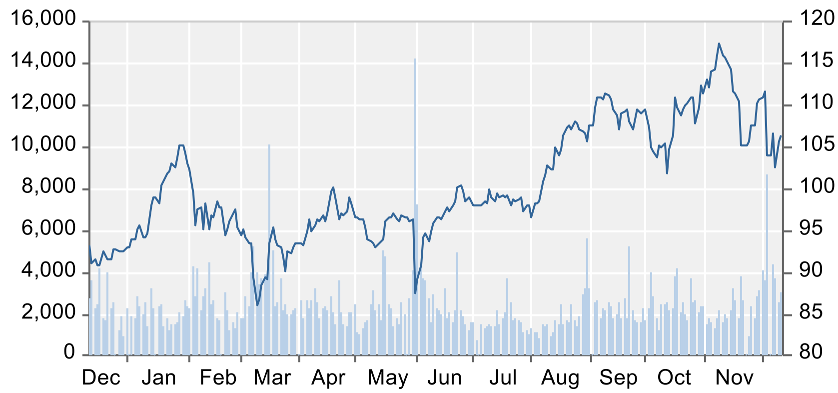
First stage	$4.74	Present value of first 2 year cash flow	
Second stage	$12.76	Present value of year 3-7 cash flow	
Third stage	$36.46	Present value of terminal value P/E	
Value (P/E)	$53.96	= value at beg of fiscal yr	2019

Analyst: Julia Bruns

Discount Retailer

Dollar General

Recommendation	NEUTRAL
Target (today's value)	$100
Current Price	$105.63
52 week range	$85.54-$118.45



Source: FactSet Prices

Share Data	
Ticker:	DG
Market Cap. (Billion):	$28.01
Inside Ownership	0.1%
Inst. Ownership	103.1%
Beta	0.72
Dividend Yield	1.09%
Payout Ratio	16.7%
Cons. Long-Term Growth Rate	14.3%

Summary: I recommend a neutral rating with a target of $100. While DG has remarkably strong store growth, I believe that the firm will continue to struggle with maintaining its same store sales. However, Dollar General stands out among its competitors due to its convenient and easy-to-find store locations.

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$20.37	$21.99	$23.47	$25.30	$27.32
Gr %	7.7%	7.9%	7.5%	8.8%	9.0%
Cons	-	-	-	$25.57	$27.47
EPS					
Year	$3.96	$4.45	$5.66	$6.15	$6.77
Gr %	12.8%	12.2%	26.8%	8.9%	10.1%
Cons	-	-	-	$6.04	$6.66

Key Drivers:

- Store expansion and same store sales: Dollar General has a strong ability to capture growth opportunities in underserved markets. Opening almost 1,000 stores a year, DG seeks out rural locations with 20,000 people or less.
- Margin Performance: Dollar General has continued to make strong efforts to maintain margins and improve its EPS. A small increase in net margins makes a large impact on the business.
- Competition: The discount retailer industry is growing ever more competitive, and it's hard to stand out. Dollar General aims to build on its convenience factor to attract customers to its location.
- Macroeconomic factors: The firm is greatly affected by macroeconomic trends including unemployment and consumer confidence. Times of economic turmoil reveal the firm's defensive nature, but currently confidence is high and unemployment is low.

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	21%	23%	26%	25%	25%
Industry	20%	21%	24%	22%	21%
NPM (%)	5.7%	5.7%	6.6%	6.4%	6.4%
Industry	5.7%	6.6%	6.6%	6.3%	6.3%
A. T/O	1.81	1.92	1.94	1.98	2.03
ROA (%)	10.4%	10.9%	12.7%	12.7%	13%
Industry	7.5%	7.9%	9.5%	9.5%	8.4%
A/E	2.03	2.13	2.10	2.00	1.93

Valuation	'17	'18	'19E	'20E
P/E	16.5	17.6	16.0	14.5
Industry	16.2	17.3	14.6	14.1
P/S	0.94	1.16	1.13	1.1
P/B	3.72	4.36	4.4	4.3
P/CF	12.86	15.08	13.0	13.9
EV/EBITDA	11.4	14.6	14.2	12.9

Valuation: Using a relative valuation approach, Dollar General appears to be fairly to slightly over valued in comparison to the retail apparel industry. DCF analysis implies a $99.94 value. A combination of the approaches suggests that DG is fairly valued, as the stock's value is about $100 and the shares trade at $105.63.

Performance	Stock	Industry
1 Month	-8.74%	-3.28%
3 Month	-4.57%	-8.73%
YTD	13.58%	-1.38%
52-week	15.8%	-1.03%
3-year	14.51%	9.43%

Risks: Threats to the business include store cannibalization, poor margin management, and cannibalization due to rapid store growth.

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Company Overview

Dollar General (DG) is an American discount retailer that provides a broad variety of merchandise for its customers focused in the southern, southeastern, midwestern, and eastern regions. Customers from a wide target base are drawn into convenient locations with the promise of high-quality products at low prices. These products include consumables, seasonal, home products, and apparel, provided by companies including Clorox, Energizer, Coca-Cola, and General Mills. Dollar General also gives its customers the option between these widely recognized national brands and its own private label brands, which sell for further discounted prices. Target customers at Dollar General include low to fixed income households that make less than $40,000 a year. However, customers of a higher income are also drawn to Dollar General by its convenient locations and shopping experience. Since its founding in 1939, Dollar General has opened over 14,609 stores, with the aim of being within five miles of 75% of American households. Since 2014, DG has increased its store count by over 30.3%, with 9% of that growth being within the past year.

Dollar General generates 100% of its revenue from four segments:

Consumables - 77% of revenue

- Packaged foods, perishables, paper products, health, beauty, and tobacco products are just a few consumables that Dollar General provides. Since 2013, this integral part of Dollar General's business has grown at a compound annual growth rate (CAGR) of 8.80%.

Seasonal Products - 12% of revenue

- Decorations, costumes, toys, gardening and lawn care supplies make up the second largest category of DG's revenue. Christmas decorations consist of the largest portion of seasonal sales. This division is categorized by its 5.5% CAGR since 2013.

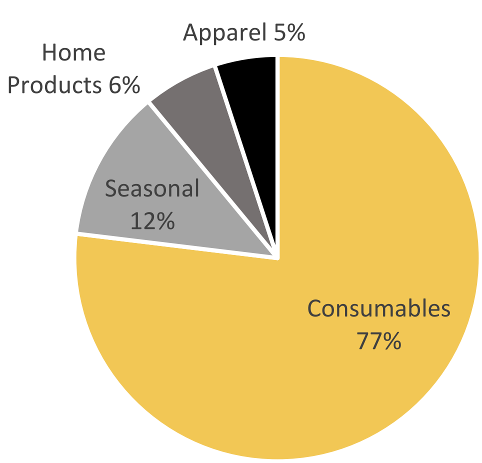
Home Products - 6% of revenue

- Non-consumable household products including cookware, home office, and automotive supplies take up a small fraction of Dollar General's revenue. This division has seen the slowest growth at a CAGR of 3.6% since 2013.

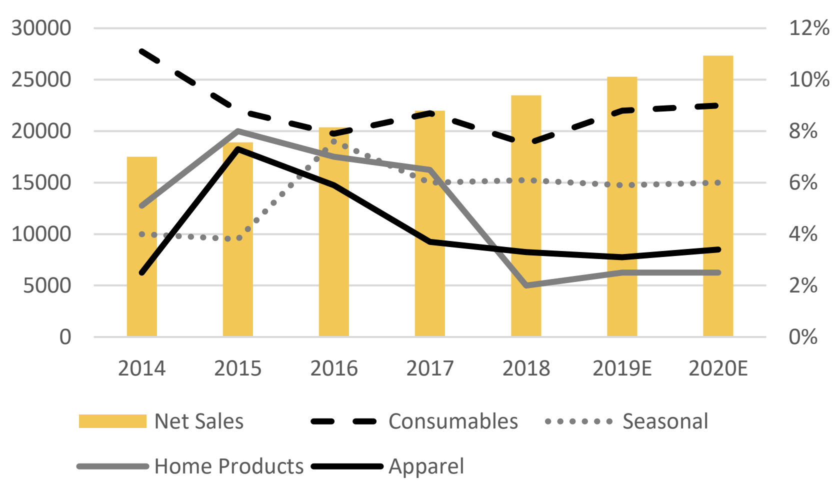
Apparel - 5% of revenue

- Apparel for any age and gender is available for customers. Apparel ranges from athletic children's clothing to work appropriate clothing for adults. Since 2013, this division has seen a CAGR of 5.1%

Figures 1 and 2: Revenue Sources for DG, year-end 2017 (left) and sales growth per segment since 2013



Source: Company reports



Source: Company reports

Business/Industry Drivers

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

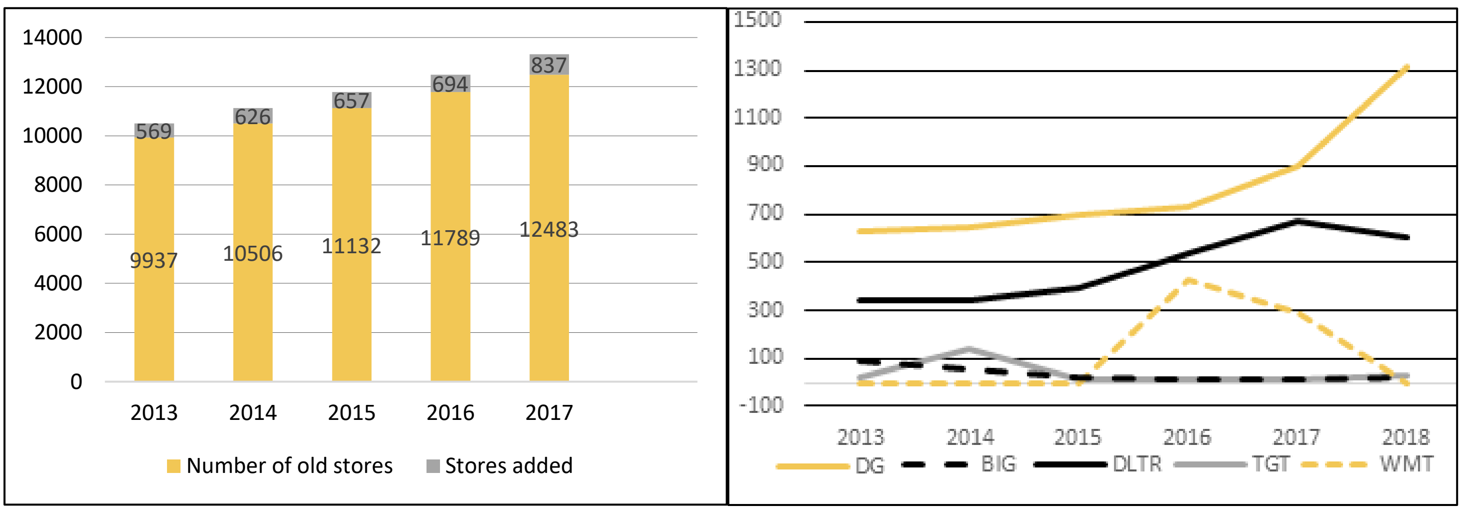
1) Store expansion and same-store-sales
2) Margin performance
3) Competitor analysis
4) Macroeconomic trends

<u>Store expansion and same-store-sales</u>

Dollar General has continued to open, remodel, and relocate its stores.

Unlike most retail stores in the age of booming internet sales, Dollar General has been opening, remodeling, and relocating stores around the country. The ability to capture growth opportunities has propelled Dollar General to past success. By the end of 2018, the firm hopes to open 900 new stores, remodel 1,000, and relocate 100. This is a 32% decrease from 1,315 new store openings in 2017. All new and remodeled stores include large coolers, which support perishable food products. DG has remodeled 1,000 stores a year since 2017, a trend I expect to continue.

Figure 3 & 4: Comparison of Dollar General store additions since 2013 (left) vs competitors

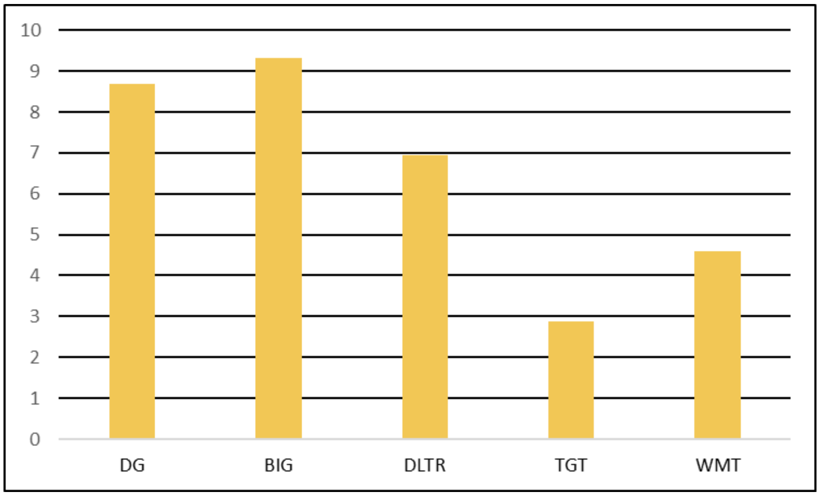


Source: Company reports

Opening new stores is relatively cheap, costing approximately $250,000 per new store. This can be due in part to the relatively small average size of 7,300 square feet and the firm's ability to rent locations instead of building new ones. This is a fraction of the $16-20 million price tag that big-box discount retailers like Walmart and Target pay for new stores. New stores generate an average internal rate of return of 20% with a payback period of two years for DG. Figure 5 displays that Dollar General has the second highest PPE turnover when compared to its competitors.

Traditionally, DG has been found in primarily rural areas that aren't within 20 miles of a big-box retailer or grocery store. In fact, 75% of Dollar General locations are in towns with populations of 20,000 people or less. In recent years, the company has started experimenting with smaller format stores of less than 6,000 feet, in both metropolitan areas and rural areas with a fewer households. The addition of stores in metropolitan areas raises concerns for investors, who are asking, "could DG have met its limit for store opportunities in rural areas?" 60 million Americans live in towns with less than 20,000 people, so if the firm continues to build stores at the rate that it has in Texas (1,296 stores for 28.3 million citizens), there are at least 30,000 more store opportunities nationwide.

Figure 5: Dollar General's PPE turnover relative to its competitors

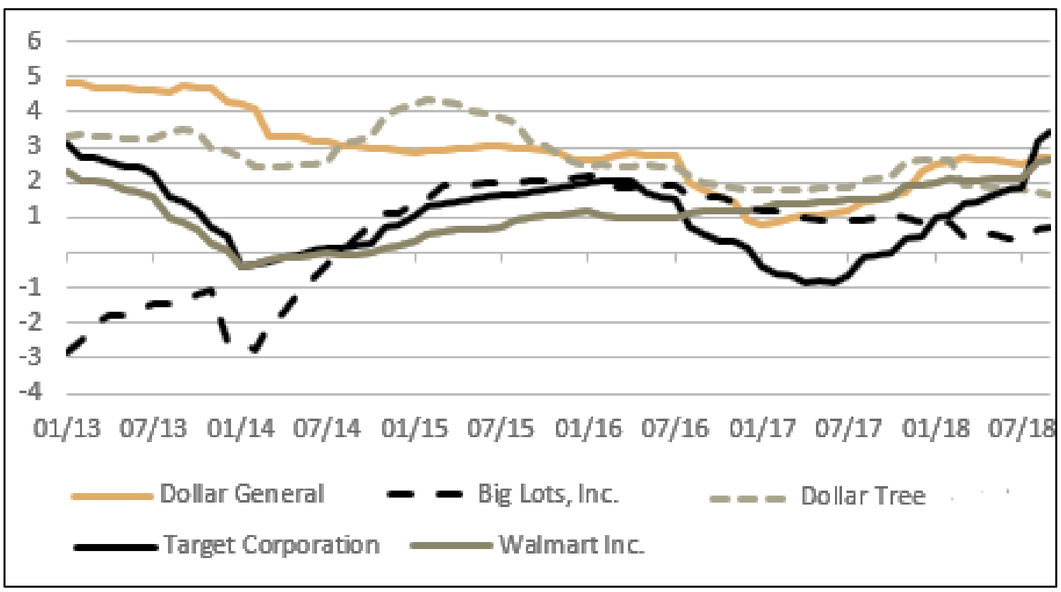


Source: Company reports

Dollar General is among the highest of its competitors in regards to same stores sales growth

DG continues to build new stores, as it is providing convenience to customers. DG's average customer doesn't want to walk through an entire warehouse just to find consumable goods like paper towels. Consumable items, known for slim profit margins, keep customers coming back. This means that it's important to have simple store formats in frequently seen locations where customers can easily find what they're seeking. Frequent store visits tend to lead to an increase in sales for other goods as customers pick up other kinds of products during their visits. In fact, a key addition during store remodeling has been to add "impulse buy" products in the new queue lines. These products typically involve snacks, candy, and tobacco products.

Figure 6: Same store sales growth (as a percentage) versus competitors



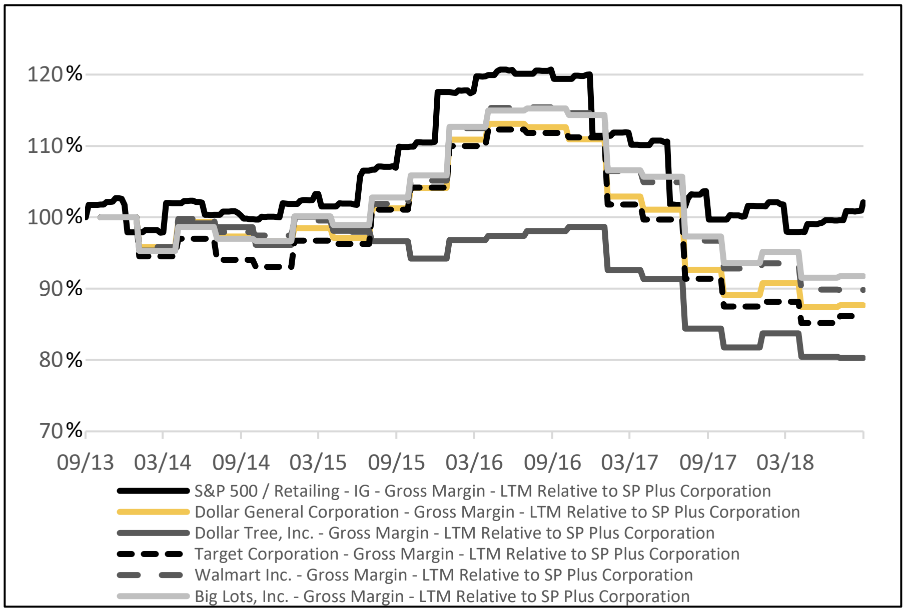
Source: Factset

Same store sales are slowing, but still growing close to 3%, so cannibalization through additional stores does not appear to be a high risk. Dollar General is trailing closely behind Target, which has the highest same store sales. Following closely behind Dollar General is Walmart. The average same store sales growth for competitors has been 1.3% over the past five years while Dollar General's same store sales growth rate averaged 2.6%.

Margin Performance

The discount retailer industry is "cut throat" in terms of margin performance. In an industry where the retailers need to appease its value-seeking customers, there is increased pressure on margins. Price competition, as illustrated in figure 7 shows that gross margins of discounters is below the retail average, and DG, being a very low price retailer, has one of the lowest gross margins.

Figure 7: Gross margin for DG and comps in comparison to the S&P 500 retail Index



Source: Factset

Following the year of 2016, the retail industry experienced a significant drop in gross margin, with discount retailers being no exception to the rule. I anticipate that this drop is due in part to the rise of Amazon. However, I believe that Dollar General may be partially insulated from Amazon due to the fact that its consumers don't need to travel far in order to find a store location, a more attractive option rather than waiting for two days for items to ship to their house.

From Q2 2017 to Q2 2018, gross profit as a percentage of sales changed from 30.7 to 30.6, a change of 7 basis points. This may be due to Dollar General's increase in sales for consumables, which generally tend to have lower margins. As noted earlier, consumables consist of 75% of sales, and have grown at a CAGR of 8.8% since 2013.

Dollar General appears to be embracing this trend with its additions of coolers to support more sale space for perishable items. This addition may draw in more customer traffic (same store sales growth), but has the potential to shrink margins even further. This is due in part to the increased cost of transporting, storing, and maintaining fresh foods and protein. To offset the effects of increased consumables on profit margins, Dollar General is constantly looking for ways to improve margins in other areas.

Dollar General's private brand improves margin performance

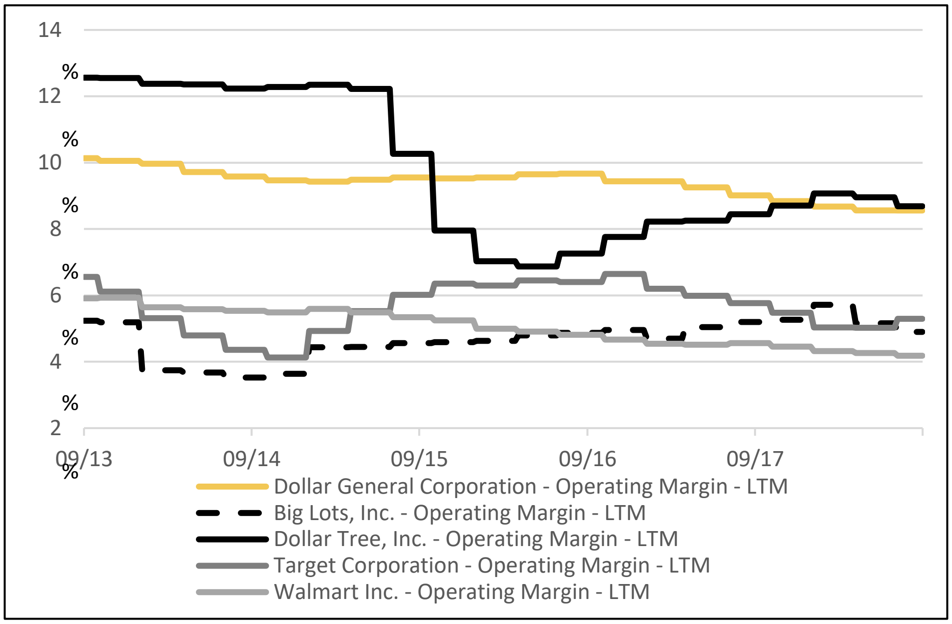
One way that Dollar General is attempting to improve margins is through its private brand. Currently, there are 40 unique private label product lines. These private label goods make up to 25% of the items that the firm provides. Over the course of 2018, the private line will expand to health and beauty products.

Dollar General also improves margins using excellent supply chain efficiencies. DG carries around 10,000 items in its inventory, nearly 1/5 of what most big-box retailers carry. This results in the need for fewer employees both on the sales floor and in operational roles. The average sales associate manages 1,200 items while its competitors give employees only 400-600 items to manage. This means that there can be as few as 5-6 employees in a Dollar General at any given time.

In the year of 2017, Dollar General experienced its lowest level of store manager turnover in over five years. This was accompanied by the first year in several that Dollar General experienced a reduction in turnover rates for lower level management positions and store associates. Training new employees is expensive, especially in management positions. Dollar General plans to continue to invest in employees to reduce turnover, which in turn would reduce inventory shrink and improve factors such as employee efficiency and inventory management.

The firm has above average operating margin relative to its competitors.

Figure 8: Operating margin for Dollar General and its competitors



Source: Factset

Figure 8 shows that while there's a general trend of decreasing operation margins, Dollar General continues to stay ahead of most of its competitors.

Increasing federal minimum wages will likely put a great amount of pressure on DG's margins. A typical DG associate makes $8 an hour at the start of employment. If an average of two associates are working every hour that the store is open (thirteen hours per day), this would lead to annual costs of: 2 employees * $8/hour * 13 hours * 15,277 stores * 365 days = $1.16 billion. If minimum wage was increased to $10/hour, this would increase costs to $1.45 billion. An increase to $15/hour would increase costs to 2.18 billion. These wage increases would increase SG&A as a percent of sales from 22.0% to 23.3% and 26.4%, respectively.

Dollar General continues to improve margins by developing more efficient means of distribution.

A final way that the company improves its margins is by selling individual items, rather than items in bulk such as paper towel rolls. Consumers are happy to pay a low price at Dollar General, unaware that buying in bulk would be even more cost efficient.

Competitor Analysis

Competition within this industry is fierce. Due to the variety of discount retailers today, customers living on any kind of budget usually have many options when it comes to where they purchase their goods. Because consumers have so much control over the success of discount retailers, Dollar General has continued to actively seek opportunities to retain and grow its economic moat.

Since its opening, Dollar General's aim has been to capture sales from customers that don't have many options when it comes to discounted goods. These customers live outside of close proximity to grocery stores and big-box retailers like Walmart. In fact, 70% of Dollar General's stores are positioned in towns with 20,000 people or less. Typically, these towns include customers making an average of $25,000-40,000 annually.

Dollar General has a relatively low threat of substitution from online retailers, unlike most retail stores. This is likely due to DG's close proximity to customers, already low prices, and low transaction amounts in comparison to online retailers like Amazon.

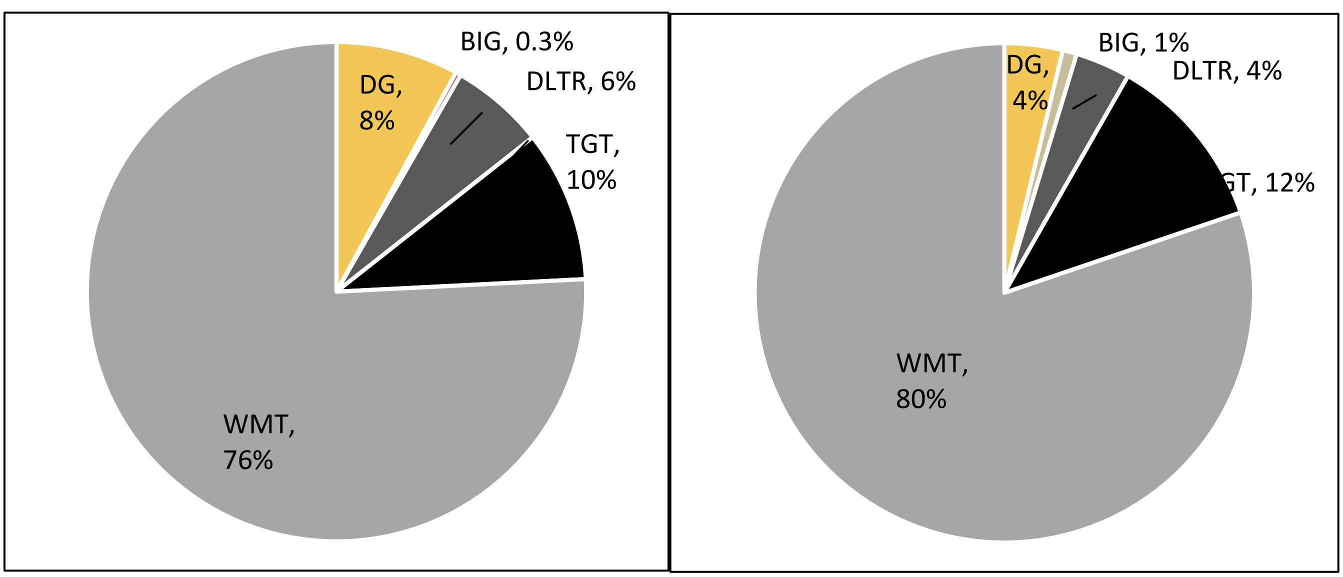
Dollar General also benefits from having economies of scale. Dense store networks in combination with new distribution centers has resulted in more efficient supply chain management and barriers to entry for competitors. Dollar General has continued to add to its distribution centers this year, building locations in Texas, Georgia, and New York. There are now 15 distribution centers, a 25% increase from 2014.

Dollar General is increasing its use of technology in stores to boost convenience for customers

Because Dollar General has a limited variety of products in comparison to competitors, the company can enjoy the benefits of being large to suppliers. This benefit includes bargaining power, which ensures that the firm will be able to get the best prices relative to most buyers.

A final way that Dollar General is trying to ward off competitors is through expanding its use of technology. DG has started to incorporate its mobile application to drive store traffic in a variety of ways. The first and earliest way has been through its digital coupon offering via mobile apps. This initiative has expanded to 14 million users from 10 million at this time last year. Management reports that they are also in the testing process of a new feature of the mobile application, which would allow customers to scan and purchase their items without having to take a trip to the register. This would strengthen the brand's reputation as being both cost effective and convenient. If this initiative is successful, I believe that it may reduce the number of cashiers needed to be working at any given time at Dollar General. While many stores only staff two cashiers at a time, I believe that the firm can remove one of these cashiers, cutting wage costs in half. This would amount to around $58 million in savings. Given the competitive advantages above, I believe that Dollar General has a moderate economic moat to support its future growth.

Figures 9 & 10: Comparison of competitor market capitalization (left) and sales (right)



Source: Factset, IMCP

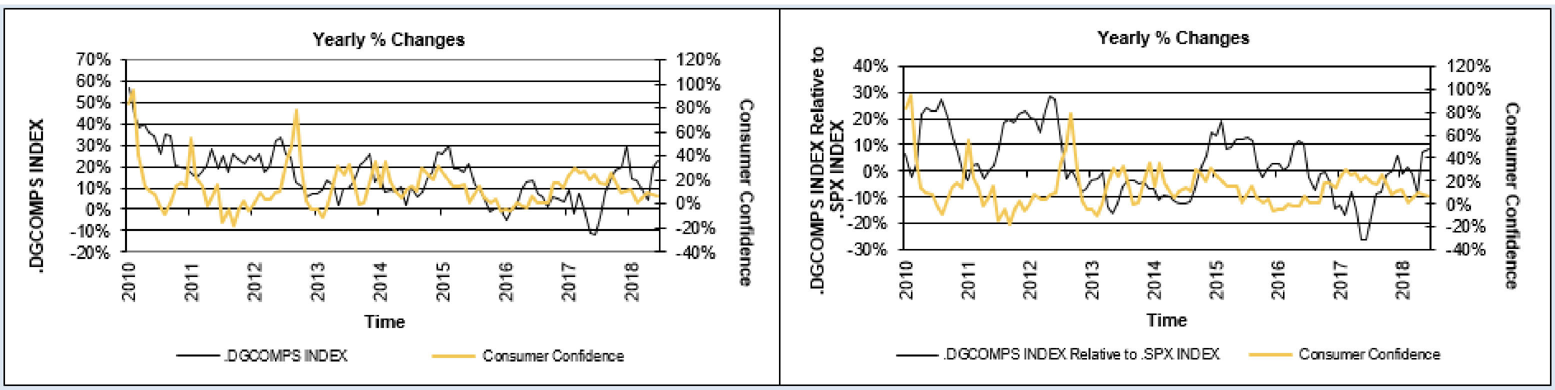
Figures 9 and 10 highlight how much ofhe discount retail industry that big box retailers like Walmart and Target take over. However, it is also important to notice that DG outpreforms its closest competitor, DLTR.

Macroeconomic Trends

Naturally, when consumers feel confident about the economy they are more likely to go out and spend their dollars. However, in times of economic turmoil discount retailers have an advantage relative to other retailers. When consumers can't afford to buy higher priced items or items in bulk, they may turn to discount retailers as a way to save a percentage of their income.

(Figure 11) Dollar General's competitors have a .209 correlation with consumer confidence. However, the peers movement relative to the S&P 500 has a correlation of -0.276 when compared to customer confidence. It is clear that discount retailers outperform the market during times of weakening consumer confidence. This is an excellent group to position defensively to the market.

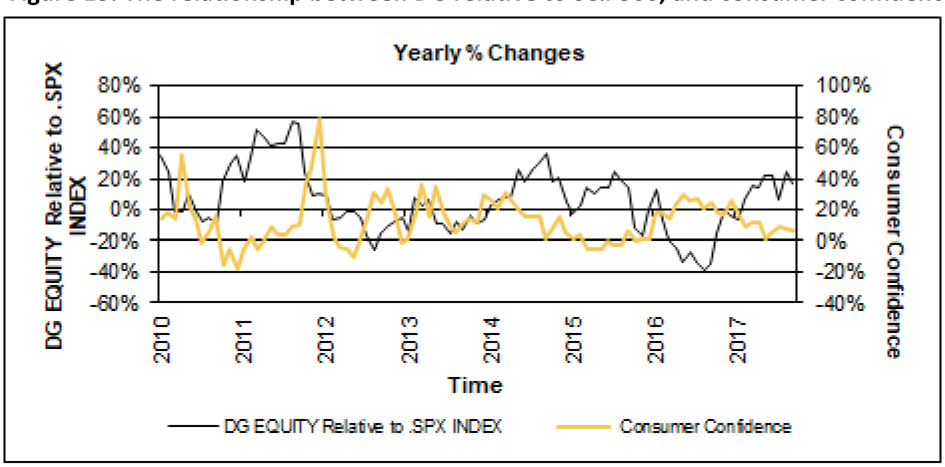
Figures 11 & 12: The relationship between Dollar General's competitors and consumer confidence (left), and Dollar General's competitors relative to the S&P500 in comparison to consumer confidence



Source: Bloomberg, IMCP

Figure 13 shows a slightly higher correlation of -0.297 between Dollar General alone and consumer confidence. This shows that Dollar General performs slightly better than its peer group during times of falling consumer confidence.

Figure 13: The relationship between DG relative to S&P500, and consumer confidence



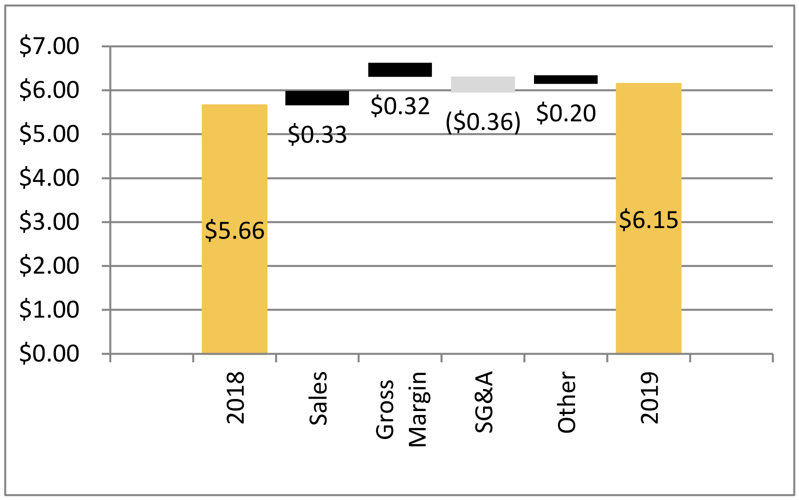
Source: Bloomberg, IMCP

Financial Analysis

I anticipate DG EPS to grow to $6.15 in FY 2019. I forecast a 7.8% growth rate in revenue, which adds $0.33 to EPS. This will be enhanced even further by growth in gross margins, adding $0.32 to EPS. I also anticipate a slight increase in SG&A/Sales, from 22.2% to 22.7%, which offsets much of the growth in gross margins. This is followed by a slight decrease in EBT margins, from 8.4% to 8.3%. Increasing interest expenses are offset by the repurchase of 8.4 million shares.

DGs margins are very sensitive to changes in SG&A as a percentage of sales.

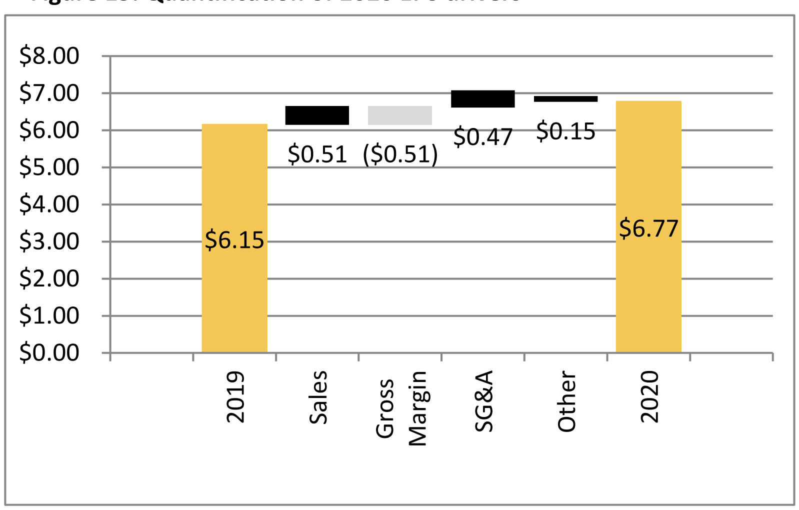
Figure 14: Quantification of 2015 EPS drivers



Source: Company Reports, IMCP

I expect EPS to grow from $6.15 to $6.77 in FY 2020. Sales growth of 7.9% will add $0.51 to EPS. A decline in gross margins will offset much of this growth, but I believe we will see improvements in SG&A, which will greatly offset the decline in gross margins. The firm will continue to repurchase shares, which I believe will amount to 6.7 million. This will offset the increasing interest expenses and add $0.15 to EPS.

Figure 15: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

I am slightly more optimistic in terms of EPS for 2019 and 2020. However, my sales estimates are about the same.

Figure 16: Consensus EPS and sales estimates vs. my own

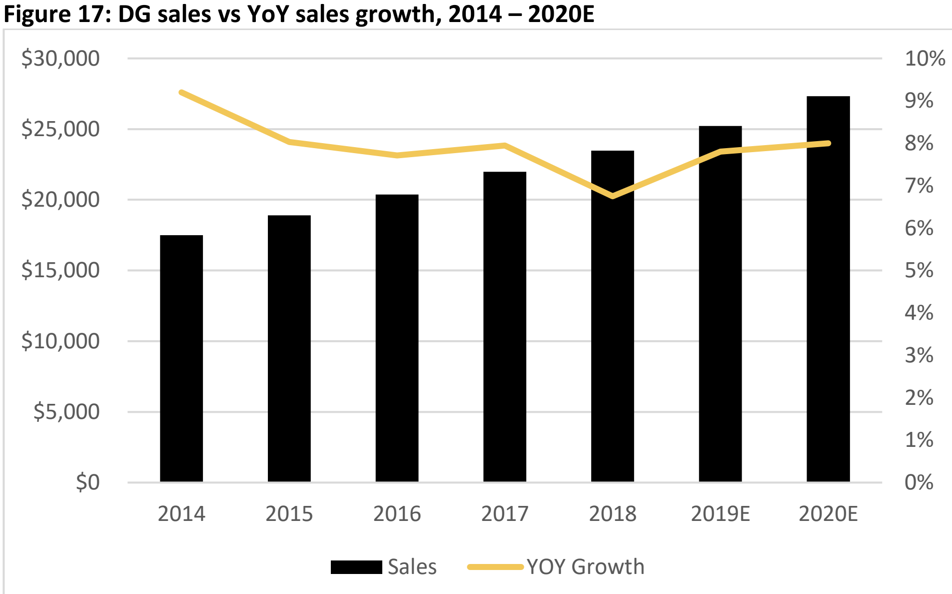
	Sales		EPS	
	2019E	2020E	2019E	2020E
Me	$25,299	$27,324	$6.15	$6.77
Consensus	$25,571	$27,474	$6.04	$6.66

Source: Factset, IMCP

Revenues

Dollar Generals' revenues have been increasing over the years, with the peak growth rate being 8% in 2015. After 2015, revenue growth decreased slightly, but has been increasing since. I expect this trend to continue, with DG reaching 7.9% growth in 2019. For 2020, I anticipate that DG will return to its previous maximum growth rate of 8.0%. This is driven by the continued store growth of about 6% annually, or about 900 stores a year. However, some of this store growth is expected to be offset by cannibalization causing a slight decrease in same store sales growth.

Figure 17: DG sales vs YoY sales growth, 2014 – 2020E

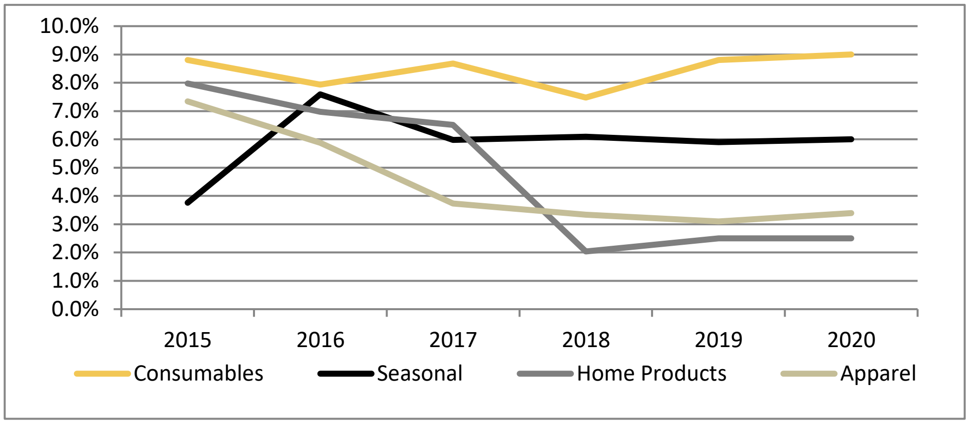


Source: Company Reports

The increase in consumables will improve revenue and same store sales.

Revenue growth will likely be driven by strong performance in the consumables segment. I expect the consumables segment to continue to grow as a percentage of overall sales as the firm adds coolers to all of its new and remodeled stores. DG has remodeled 2,874 of its original stores without coolers since 2016, and I anticipate that there are approximately As customers in rural areas see a convenient replacement for their local grocery stores, I anticipate that more customers will be drawn to DG. DG has made headlines this year for putting local grocers out of business. This leads to many rural customers being further from the next closest grocer, making DG a more convenient and obvious choice.

Figure 18: Dollar General segment revenue growth, 2015 – 2020^E^



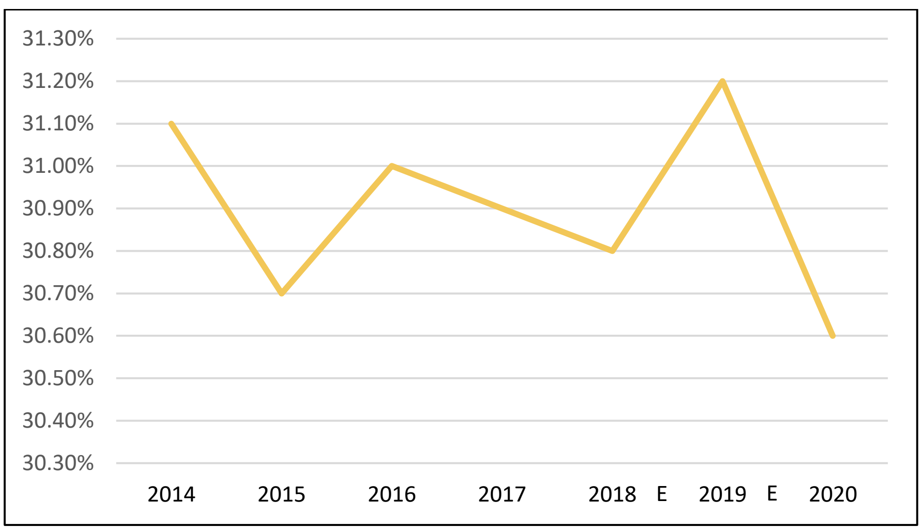
Source: Company Reports, IMCP

Improvements to technology and additional distribution centers will improve margins.

<u>Operating Income and Margins</u>

Operating income and margins are incredibly important for the firm to manage. Pricing markdowns, promotions, transportation expenses, inventory shrinkage, and consumable sales as a percentage of overall sales are a few factors that contribute to DG's margins. I expect gross margins to increase from 30.8% to 31% for the year of 2019. This is due to the addition of two new distribution centers in Texas and New York, which will be completed during 2019. This will reduce transportation costs within those areas. Dollar General also is implementing Electric Article Surveillance technology to help prevent inventory shrinkage, an issue the firm has struggled to combat for years.

Figure 19: Dollar General gross margins



Source: Company Reports

In 2020, I anticipate that the continued addition of coolers to stores will put increased pressure on margins. Within each new store and remodeled store, there will be new coolers and fresh produce sections. Over the past three years, Dollar general has remodeled 2,551 stores, or 22% of the stores that are currently operating. As the percentage of stores with fresh produce increases, gross margins are expected to shrink. However, I expect the firm to continue to add distribution centers where it sees fit to combat the transportation costs that they face.

SG&A costs are mostly related to rent expenses, retail labor expenses, employee incentive compensation, occupancy costs, and credit and debit transaction fees. In 2019, I expect SG&A to increase as a percentage of sales as the firm continues to invest in employees- which includes investment towards in store manager compensation and higher incentive compensation. I also anticipate increased rent expenses and occupancy costs.

By 2020, I expect SG&A as a percentage of sales to decrease slightly as the firm improves its employee turnover. This is especially important for store managers, which historically have had a turnover rate of 30%. The firm is improving turnover through enhanced employee training programs and compensation towards managers.

Dollar General is increasing its use of technology in stores to boost convenience for customers

Figure 20: Dollar General operating margins

	2017	2018	2019E	2020E
Sales	$21,987	$23,471	$25,301	$27,327
Direct costs	$15,204	$16,250	$17,413	$18,970
Gross income	$6,783	$7,221	$7,888	$8,356
Gross margin	30.9%	30.8%	31.2%	30.6%
SG&A	$4,720	$5,213	$5,737	$6,047
as % of sales	21.5%	22.2%	22.7%	22.1%
Operating income	$2,063	$2,008	$2,150	$2,309
Operating margin	9.4%	8.7%	8.1%	8.5%

Source: Company Reports, IMCP

Return on Equity

Over the past few years, the firms ROE has remained higher than most of its competitors and has continued to grow. However, I expect this growth to slow down and begin to slightly decrease over the course of 2019 and 2020. ROE has been driven by the firm's growth in profit margins and asset turnover. While asset turnover is expected to continue to grow, I expect a small decrease in profit margins to offset this growth. A slow-down in share repurchases will also decrease ROE by a small margin.

Figure 21: 5-Stage DuPont ROE

5-stage DuPont	2015	2016	2017	2018	2019E	2020E
EBIT / sales	9.4%	9.5%	9.4%	8.6%	8.5%	8.5%
Sales / avg assets	1.71	1.81	1.92	1.94	1.98	2.03
EBT / EBIT	95.0%	95.5%	95.2%	95.2%	95.7%	95.9%
Net income /EBT	63.4%	62.9%	63.6%	80.5%	79.0%	79.0%
ROA	9.7%	10.4%	10.9%	12.7%	12.7%	13.0%
Avg assets / avg equity	1.99	2.03	2.13	2.10	2.00	1.93
ROE	19.2%	21.0%	23.2%	26.7%	25.5%	25.1%

Source: Company Reports, IMCP

Free Cash Flow

Figure 22: Free cash flows 2014 – 2020E

Free Cash Flow							
Year	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$1,040	$1,121	$1,221	$1,320	$1,586	$1,699	$1,824
Growth		7.8%	8.9%	8.2%	20.1%	7.1%	7.4%
NWC*	964	1,092	1,280	867	1,016	1,387	1,538
Net fixed assets	7,662	7,676	7,825	7,995	8,269	8,462	8,844
Total net operating capital*	$8,626	$8,768	$9,105	$8,861	$9,285	$9,849	$10,382
Growth		1.6%	3.8%	-2.7%	4.8%	6.1%	5.4%
- Change in NWC*		128	188	(413)	149	371	151
- Change in NFA		14	149	170	274	193	382
FCFF*		$979	$884	$1,564	1,163	$1,135	$1,291
Growth			-9.7%	77.0%	-25.7%	-2.4%	13.8%
- After-tax interest expense	53	56	55	63	77	73	75
FCFE**		$923	$829	$1,501	$1,086	$1,061	$1,216
Growth			-10.2%	81.1%	-27.7%	-2.3%	14.6%
+ Net new debt/other cap		(95)	246	(261)	(105)	100	(50)
Sources of cash		$829	$1,075	$1,240	$981	$1,161	$1,166
Uses of cash							
Other expense		-	-	-	-	-	-
Increase cash and mkt sec		74	(422)	30	79	17	166
Dividends		-	258	281	283	304	330
Change in other equity		757	1,240	941	537	840	670
		$832	$1,076	$1,252	$899	$1,161	$1,166
Change in other liab		3	1	19	(111)	-	-
Total		$829	$1,075	$1,234	$1,009	$1,161	$1,166
FCFF per share		$3.22	$3.01	$5.57	$4.26	$4.29	$5.00
Growth			-6.6%	85.1%	-23.4%	0.7%	16.5%
FCFE per share		$3.03	$2.82	$5.34	$3.98	$4.01	$4.71
Growth			-7.0%	89.4%	-25.5%	0.8%	17.3%

Source: Company Reports, IMCP

I anticipate that Dollar General will continue buying back shares and paying dividends.

Dollar General's FCF to the firm has varied over the last several years, but I see potential for growth. I expect NOPAT growth to normalize in the years following 2018, but still have an overall growth of over 7% per year, to a total of $1,824 million in 2020. I expect NFA growth to slow down in the year of 2019 but return to a high rate in 2020, as the firm tends to build new distribution centers every other year.
Overall, I expect NFA to increase at a rate of 7% over the course of the two years following 2018.

I believe DG will continue to spend a significant amount of cash on share buybacks, as management just added another $1 billion to its share repurchase program. In 2019, FCFF will decrease slightly, leading to an issuance of $100 million in debt in order to continue dividend payments and buybacks. Following 2019, FCFF should rise in 2020. Overall, free cash flow to equity excluding debt is about

$1.1 to $1.2 billion, the share buybacks are $1 billion, and dividends are $630 million. Even with growth, buybacks, and dividends, the firm has little need for new debt and the leverage ratio is expected to fall (see figure 21).

Valuation

I have valuated Dollar General using multiples and a 3-stage discounted cash flow analysis. Based on earnings multiples, DG has traded with the market. However, relative to peers, the stock trades at a premium due to its higher margins, same store sales, and store growth. I place more weight on the discounted cash flow method (target= $99.94), as this offers a more up-to-date analysis of the firm's ongoing opportunities for growth.

Trading History

Based on trading history, Dollar General is currently over valued.

DG is currently trading at a NTM P/E of 16.2, a discount to its five year average NTM P/E of 16.5. Currently, DG is trading at 1.08 times relative to the S&P 500, which is higher than it has historically at 1.01.

Figure 23: DG NTM P/E relative to S&P 500

Source: Factset

Assuming the firm maintains a 16.22 NTM P/E at the end of 2019, it should trade at $109.67 by the end of the year.

- Price = P/E x EPS = 16.2 x $6.77 = $109.67

Discounting $109.67 back to today at an 8.9% cost of equity (explained in Discounted Cash Flow section) yields a price of $100.70. Given DG's potential for earnings growth and continued profitability, this seems to be a low valuation relative to the current stock price of $105.63, but significant growth prospects have the stock trading above its intrinsic value.

Relative Valuation

Dollar General is currently trading at a P/E higher than most of its peers, with a P/E TTM of 15.8 compared to an average of 11.7- if you exclude the outlier, WMT. Investors are willing to temporarily pay a premium for DG because it has the potential for greater growth than many of the other companies in its market segment. However, DG's P/B and P/S ratios are significantly higher than those of its peers. P/B is currently at 4.41, vs the average of 3.17. P/S is currently at 1.19, vs the competitor average of 0.67. This is a reflection of DG's relatively higher net margin, which is the second highest of its peers at 6.4% vs the average of 4.8%. While ROE is at the average, DG is much less levered (45.75% vs 74.8%), so it has a higher quality ROE.

Figure 24: DG comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
DG	DOLLAR GENERAL CORP	$106.56	$28,013	0.9	(8.2)	(4.1)	11.1	14.2	14.6	14.3	-4.8%	12.1%	28.9%	7.0%	10.1%	14.6%	0.87	45.7%	A	1.02%	16.7%
BIG	BIG LOTS INC	$29.94	$1,208	1.0	(30.1)	(30.4)	(30.8)	(48.4)	(46.7)	-3.2	-1.0%	6.9%	33.3%	24.8%	6.8%	8.0%	1.68	104.5%	B+	2.64%	31.8%
DLTR	DOLLAR TREE INC	$84.81	$20,182	1.2	(1.8)	1.2	1.0	(20.8)	(21.0)	10.4	-23.4%	95.9%	91.6%	-34.5%	13.6%	21.9%	0.60	63.5%	B+	0.00%	
TGT	TARGET CORP	$66.78	$34,848	(2.3)	(23.2)	(24.8)	(15.5)	8.1	2.3	8.7	-6.9%	-5.4%	6.1%	-3.6%	4.3%	3.4%	0.86	91.2%	B+	3.55%	42.0%
WMT	WALMART INC	$93.85	$270,843	(0.1)	(11.1)	(2.9)	11.3	(3.2)	(5.0)	6.9	167.0%	-4.2%	-2.3%	12.9%	-2.3%	-8.2%	0.45	69.3%	A-	2.12%	118.3%
Average			$71,382	0.1	(14.9)	(12.2)	(4.6)	(10.0)	(11.1)	7.4	26.2%	21.1%	31.5%	1.3%	6.5%	7.9%	0.89	74.8%		1.87%	52.2%
Median			$28,013	0.9	(11.1)	(4.1)	1.0	(3.2)	(5.0)	8.7	-4.8%	6.9%	28.9%	7.0%	6.8%	8.0%	0.86	69.3%		2.12%	36.9%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			8.2%	38.2%	8.6%	10.5%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
DG	http://www.dollargeneral.com	23.8%	4.41	19.2	16.5	17.8	15.8	16.6	17.3	15.7	6.4%	1.19	8.5%	18.3%	14.6	12.7	13.8	7.4%	1.7%	7.9%	$24.18
BIG	http://www.biglots.com	28.8%	1.98	12.8	15.2	13.7	8.3	8.4	5.5	5.2	3.3%	0.23	4.5%	23.3%	8.8	4.2	7.6	0.4%	3.3%	-0.5%	$15.15
DLTR	http://www.dollartreeinfo.com	21.8%	2.54	42.3	20.1	15.6	11.5	15.0	17.8	15.6	7.8%	0.91	8.4%	14.6%	15.0	9.4	14.6	2.7%	6.1%	24.6%	$33.37
TGT	http://www.target.com	26.3%	3.14	13.1	12.1	13.4	11.1	12.0	12.4	11.9	4.1%	0.48	5.4%	13.0%	13.2	6.1	8.3	1.8%	4.0%	-0.4%	$21.23
WMT	http://corporate.walmart.com	17.3%	3.80	14.8	15.1	24.7	53.7	20.1	19.4	19.9	2.5%	0.54	4.2%	8.4%	16.8	10.3	9.8	2.6%	4.2%	1.3%	$24.72
Average		23.6%	3.17	20.4	15.8	17.0	20.1	14.4	14.5	13.7	4.8%	0.67	6.2%	15.5%	13.7	8.5	10.8	3.0%	3.9%	6.6%	
Median		23.8%	3.14	14.8	15.2	15.6	11.5	15.0	17.3	15.6	4.1%	0.54	5.4%	14.6%	14.6	9.4	9.8	2.6%	4.0%	1.3%	
spx	S&P 500 INDEX			17.9	19.4	17.4			15.0	13.5											

Source: Factset, IMCP

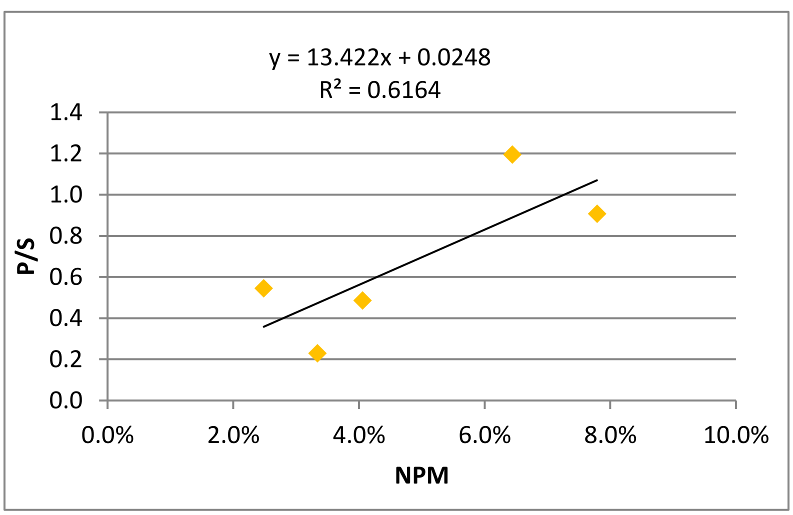
A more thorough analysis of P/S and net profit margin is shown in figure 24. The calculated R-squared of the regression indicates that over 61% of a sampled firm's P/S is explained by its net profit margins. DG has a P/S higher than its peers, and net profit margin is significantly greater than the average. Dollar General has the opportunity to increase its net profit margin with an increase in operating efficiencies and higher markups; although I expect stable operating margins in 2019-20.

Using relative valuation, I find again that DG is overvalued.

- Estimated P/S= Estimated 2019 NPM (6.4%) x 13.422x-0.0248=.8342
- Estimated stock price = Estimated P/S x expected sales per share = .8342 x 95.69= $79.83

Figure 24 shows that based on NPM and P/S, DG appears to be over-valued. The estimated price at the end of 2019 is $79.83. Discounting the anticipated price at the end of 2019 back to today results in a price of $76.41. The stock currently trades for $105.65.

Figure 25: DG comparable companies



Source: Factset

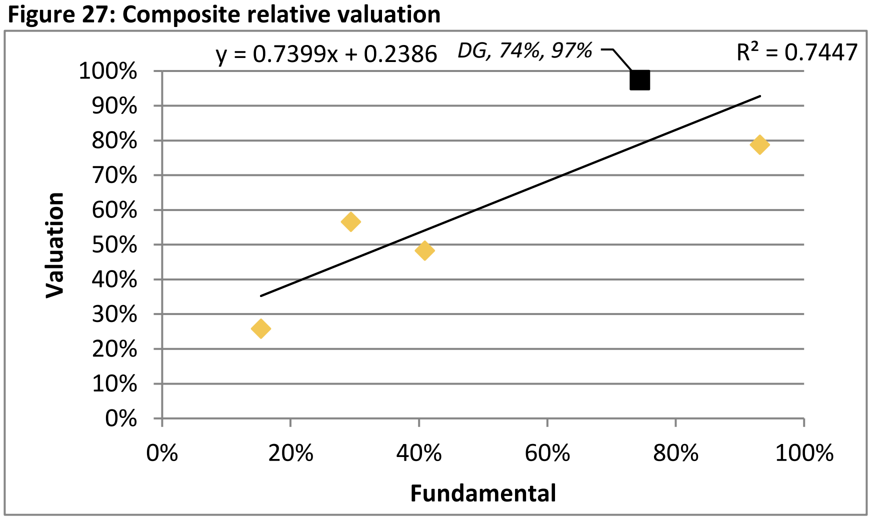
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A 25% weighting of LTG Earnings growth, 50% 2018 NPM, and 25% past 5yr sales growth were compared to an 80% weighting of P/S and 20% EV/EBIT. The regression line had an R-squared of .7447. One can see that DG is above the line, showing it is expensive relative to peers based on fundamentals.

Figure 26: Composite ranking

				Fundamentals			Valuation	
			Weight	25.0%	50.0%	25.0%	80.0%	20.0%
				Earnings Growth	2018	Sales Growth		
Ticker	Name	Fund	Value	LTG	NPM	Pst 5yr	P/S	EV/EBIT
DG	DOLLAR GENERAL CORP	74%	97%	100%	83%	32%	100%	87%
BIG	BIG LOTS INC	15%	26%	-22%	43%	-2%	19%	52%
DLTR	DOLLAR TREE INC	93%	79%	73%	100%	100%	76%	90%
TGT	TARGET CORP	41%	48%	61%	52%	-2%	41%	79%
WMT	WALMART INC	29%	57%	49%	32%	5%	46%	100%

Source: Factset, IMCP

Figure 27: Composite relative valuation



Source: Factset, IMCP

Discounted Cash Flow Analysis

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

For the purpose of this analysis, the company's cost of equity was calculated to be 8.9% 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 2.89%.
- A ten year beta of 0.85 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 8.9% (2.89 + .085 (10.0 – 2.89)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $4.01 and $4.71, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $7.65 per share. Thus, stage one of this discounted cash flow analysis contributes $7.65 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 8.9% cost of equity. I forecast sales growth to slow down from 6.7% to 6.2% throughout these years. The ratio of NWC to sales will remain at 2020 levels, but NFA turnover will range between 3.01 to 3.05 as same store sales growth slows down (3.09 in 2020). NOPAT will decline from 8% to 6.7% in 2025. Finally, after-tax interest is expected to rise 1% per year as the result of modest increases in borrowing, and share buybacks slow to 1.05% from 1.5%.

Figure 28: FCFE and discounted FCFE, 2019-2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$4.01	$4.71	$3.92	$4.39	$5.14	$5.08	$5.68
Discounted FCFE	$3.68	$3.97	$3.03	$3.12	$3.35	$3.04	$3.12

Source: IMCP

Added together, these discounted cash flows total $23.32, with the second stage at $15.66.

Using discounted cash flow analysis, I find that DG is slightly over valued.

Stage Three – Net income for the years 2019 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $6.15 in 2019 to $9.30 in 2025.

Figure 29: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$6.15	$6.77	$7.25	$7.72	$8.27	$8.84	$9.30

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, it is generally assumed that as a company grows larger and matures, its P/E ratio will decline. Dollar general is a very stable business and generally bears less risk than the market. My terminal P/E is 15, and while this is below the historical five year average of 18, I believe that Dollar General will eventually have to slow down its rapid store growth as cannibalization and market saturation become even more apparent. Also, the long-term market average P/E is 15-16, so DG may trade at the low end since retail sales are still cyclical. Finally, 15 is just a little less than the current TTM P/E of 15.8.

Given the assumed terminal earnings per share of $9.30 and a price to earnings ratio of 15, a terminal value of $139.49 per share is calculated. Using the 8.9% cost of equity, this number is discounted back to a present value of $76.63.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $99.94 is calculated (7.65 + 15.66 + 76.63). Given DG's current price of $105.63, this model indicates that the stock is slightly overvalued.

Scenario Analysis

Because DG's value is so highly dependent on its margins and sales growth, different scenarios can yield very different results. DG has been working on cost saving initiatives while expanding its store numbers, and depending on the success of these initiatives, very different outcomes may occur. Given the sensitivity to these variables, my scenario analysis has arrived at two very different values. Figure 30 displays my assumptions for the three different scenarios.

For the bear case, I assumed that DG's beta would come significantly closer to the beta of the market. I also assumed a P/E of 13 as investors lose optimism towards store as sales growth slows. Sales growth slows, but I assumed that it would remain above 4% for as long as DG continues to open stores. Margins grow tighter as the cost saving initiatives are unsuccessful. DG's value in the bear case dropped down to $64.21.

A slow-down in sales and store growth would greatly harm the firms value.

For the bull case, I assumed that the store growth and cost saving initiatives are met with great success. Sales increased significantly along with improved margin performance. I also assumed that store growth was propelled forward by the revival of the home products segment, which has been slowing in growth over the years. I assumed a terminal P/E of 19 and a beta of .8, and that brought DG's value up to $150.32.

Figure 30: DCF target price scenario analysis

Base Case	2019	2020	2021	2022	2023	2024	2025
Beta	0.85						
Sales Growth	7.8%	8.0%	7.0%	6.9%	6.5%	6.6%	6.7%
NOPAT/S	6.7%	6.7%	6.6%	6.5%	6.5%	6.4%	6.2%
S/NFA	2.99	3.09	3.05	3.03	3.03	3.01	3.02
Terminal Year P/E	15						
Bear Case							
Beta	0.95						
Sales Growth	6.0%	5.5%	5.0%	4.8%	4.5%	4.4%	4.4%
NOPAT/S	6.3%	6.1%	6.0%	5.8%	5.7%	5.8%	5.7%
S/NFA	2.60	2.55	2.50	2.47	2.46	2.45	2.45
Terminal Year P/E	13						
Bull Case							
Beta	0.8						
Sales Growth	7.8%	9.2%	9.3%	8.3%	8.3%	8.4%	8.5%
NOPAT/S	6.9%	7.0%	7.0%	7.1%	7.1%	7.1%	7.2%
S/NFA	2.90	2.95	3.00	3.01	2.90	2.85	2.80
Terminal Year P/E	18						

Figure 31: Values at beginning of fiscal year 2019 under different scenarios

Base Case Expectation	
Value of P/E 15	$ 99.94
Bear Case Expectation	
Value of P/E 13	$ 64.21
Bull Case Expectation	
Value of P/E 19	$150.32

Source: Factset, IMCP

Business Risks

Although I have many reasons to be optimistic about Dollar General, there are several good reasons why I find the stock to be fairly priced at 10.8% below its 52 week high:

Poor economic conditions:

Many of DG's customers have fixed or low incomes and generally have limited discretionary spending dollars. In poor economic conditions, customers may choose to either not spend money at all or to spend their money on less profitable items.

Failure to achieve sales goals or margin efficiencies:

The firm plans significantly around strategies and initiatives designed to increase sales and improve operations. DG can miss these goals by failing to train employees properly, failing to choose products that customers demand, and failing to market products efficiently.

Store openings:

The firm's ability to open, relocate, and remodel profitable stores is a key component of planned future growth. Delayed store openings, failure to expand into market areas, poor negotiation, and failure to hire personnel can lead to significant risks in store openings.

Intense competition:

The retail industry is highly competitive with respect to price, store location, merchandise quality, product assortment, and employees. DG competes with other discount retailers and mass merchandisers. In order to combat this competition, DG may need reduce markups on certain items-thus reducing margins.

Inventory shrinkage:

Dollar General is subject to the risk of inventory loss and theft. The firm experiences significant inventory shrinkage-approximately 3% as a percentage of sales, up 1% from the retail industry average of 2%. If the firm experiences higher inventory shrinkage than normal, results of operations and financial condition may be affected adversely.

Source: Company reports

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Relatively Low

With more store locations than any other discount retailer, it would be difficult to enter the business and become a major competitor of Dollar General. To compete in this industry would take massive amounts of capital, which may be hard to accumulate from investors.

Threat of Substitutes – Moderate

From Walmart, to Target, to Dollar Tree, to Costco, there is a wide range of discount stores that try to offer the best deals to customers. In theory, switching costs would be low and this would normally pose a threat. Due to the fact that Dollar General prefers to be in rural locations with low populations, customers in these areas are less likely to go out of their way to find substitutes. Also, many consumers are loyal to the retailers that they frequently visit.

Supplier Power - Moderate

Due to Dollar General's high volume of business in a narrow set of products, it has power over suppliers. Although, many of them are also large businesses. Moving to provide more private label products may benefit the firm.

Buyer Power – Relatively High

Consumers of discount retail goods have a great degree of power over retailers. There is little to no cost of switching between discount and convenience stores, which are large in number. However, buyer power is lower in the more rural locations that Dollar General focuses on since there are fewer options.

Intensity of Competition – Very High

Between online discount retailers, big-box discount retailers, convenience stores, and smaller discount stores like Dollar Tree, there is always pressure from competition. Dollar General faces a great deal of pressure to keep prices down to stay competitive.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Defensive in nature Brand recognition Efficient Supply chain	Low profit margins Little to no global penetration Poor marketing for private brand
Opportunities	**Threats**
Acquisition of smaller chains Expansion to international Expansion of tech use	Cannibalization risk Powerful competition Lack of innovation

Appendix 3: Income Statement

Income Statement (in millions)							
	2014	2015	2016	2017	2018	2019E	2020E
Revenue	$17,504	$18,910	$20,369	$21,987	$23,471	$25,302	$27,327
Cost of goods sold	12,068	13,107	14,062	15,204	16,250	17,413	18,971
Gross profit	5,436	5,803	6,307	6,783	7,221	7,888	8,357
Sales, general & administrative	3,700	4,034	4,367	4,720	5,213	5,738	6,048
Earnings before interest & tax	1,736	1,769	1,940	2,063	2,008	2,151	2,309
Interest	89	88	87	98	97	93	95
Earnings before tax	1,647	1,681	1,853	1,965	1,911	2,058	2,214
Taxes	661	616	687	715	368	432	465
Net operating profit after tax	987	1,065	1,166	1,251	1,539	1,626	1,749
Other	39	-	-	-	-	-	-
Net income	1,025	1,065	1,166	1,251	1,539	1,626	1,749
Dividends			258.3	281.1	282.9	304.1	330.0
Basic Shares	323.3	304.4	294.0	281.0	272.8	264.4	258.3
EPS	$3.17	$3.50	$3.97	$4.45	$5.64	$6.15	$6.77
DPS	$0.00	$0.00	$0.88	$1.00	$1.04	$1.15	$1.28

Appendix 4: Balance Sheets

Balance Sheets (in millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Cash	506	580	158	188	267	284	450
Operating assets ex cash	2,700	2,953	3,274	3,490	3,981	4,259	4,640
Operating assets	3,206	3,533	3,432	3,678	4,248	4,543	5,090
Operating liabilities	1,736	1,861	1,994	2,623	2,965	2,872	3,102
NOWC	1,470	1,672	1,438	1,055	1,283	1,671	1,989
NFA	7,662	7,676	7,825	7,995	8,269	8,462	8,844
Invested capital	$9,132	$9,348	$9,263	$9,049	$9,552	$10,134	$10,833
Marketable securities	-	-	-	-	-	-	-
Total assets	$10,868	$11,209	$11,257	$11,672	$12,517	$13,005	$13,934
Short-term and long-term debt	$2,820	$2,725	$2,971	$2,710	$2,605	$2,705	$2,655
Other liabilities	910	913	914	933	822	822	822
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	5,402	5,710	5,378	5,406	6,126	6,607	7,356
Total supplied capital	$9,132	$9,348	$9,263	$9,049	$9,552	$10,134	$10,833
Total liabilities and equity	$10,868	$11,209	$11,257	$11,672	$12,517	$13,005	$13,934

Appendix 5: Sales Forecast

Sales							
Items	Feb-14	Feb-15	Feb-16	Feb-17	Feb-18	Feb-19	Feb-20
Sales	$17,504	$18,910	$20,369	$21,987	$23,471	25,299	27,324
Growth		8.0%	7.7%	7.9%	6.7%	7.8%	8.0%
Consumables	13,162	14,321	15,458	16,799	18,055	19,644	21,412
Growth		8.8%	7.9%	8.7%	7.5%	8.8%	9.0%
% of sales	75.2%	75.7%	75.9%	76.4%	76.9%	77.6%	78.4%
Seasonal	2,260	2,345	2,523	2,674	2,837	3,004	3,185
Growth		3.8%	7.6%	6.0%	6.1%	5.9%	6.0%
% of sales	12.9%	12.4%	12.4%	12.2%	12.1%	2.0%	11.7%
Home Products	1,116	1,205	1,289	1,373	1,401	1,436	1,472
Growth		8.0%	7.0%	6.5%	2.0%	2.5%	2.5%
% of sales	6.4%	6.4%	6.3%	6.2%	6.0%	5.7%	6.0%
Apparel	967	1,038	1,099	1,140	1,178	1,215	1,256
Growth		7.3%	5.9%	3.7%	3.3%	3.1%	3.4%
% of sales	5.5%	5.5%	5.4%	5.2%	5.0%	4.8%	4.6%

Appendix 6: Key ratios

Ratios	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	31.1%	30.7%	31.0%	30.9%	30.8%	31.2%	30.6%
Operating (EBIT) margin	9.9%	9.4%	9.5%	9.4%	8.6%	8.5%	8.5%
Net profit margin	5.9%	5.6%	5.7%	5.7%	6.6%	6.4%	6.4%
Activity							
NFA (gross) turnover		2.47	2.63	2.78	2.89	3.02	3.16
Total asset turnover		1.71	1.81	1.92	1.94	1.98	2.03
Liquidity							
Op asset / op liab	1.85	1.90	1.72	1.40	1.43	1.58	1.64
NOWC Percent of sales		8.3%	7.6%	5.7%	5.0%	5.8%	6.7%
Solvency							
Debt to assets	25.9%	24.3%	26.4%	23.2%	20.8%	20.8%	19.1%
Debt to equity	52.2%	47.7%	55.2%	50.1%	42.5%	40.9%	36.1%
Other liab to assets	8.4%	8.1%	8.1%	8.0%	6.6%	6.3%	5.9%
Total debt to assets	34.3%	32.5%	34.5%	31.2%	27.4%	27.1%	24.9%
Total liabilities to assets	50.3%	49.1%	52.2%	53.7%	51.1%	49.2%	47.2%
Debt to EBIT	1.62	1.54	1.53	1.31	1.30	1.26	1.15
EBIT/interest	19.51	20.06	22.32	21.05	20.70	23.15	24.27
Debt to total net op capital	30.9%	29.2%	32.1%	29.9%	27.3%	26.7%	24.5%
ROIC							
NOPAT to sales	5.9%	5.9%	6.0%	6.0%	6.8%	6.7%	6.7%
Sales to NOWC		12.04	13.10	17.64	20.08	17.13	14.93
Sales to NFA		2.47	2.63	2.78	2.89	3.02	3.16
Sales to IC		2.05	2.19	2.40	2.52	2.57	2.61
Total ROIC		12.1%	13.1%	14.4%	17.1%	17.3%	17.4%
NOPAT to sales	5.9%	5.9%	6.0%	6.0%	6.8%	6.7%	6.7%
Sales to EOY NOWC	11.91	11.31	14.16	20.84	18.29	15.14	13.74
Sales to EOY NFA	2.28	2.46	2.60	2.75	2.84	2.99	3.09
Sales to EOY IC	1.92	2.02	2.20	2.43	2.46	2.50	2.52
Total ROIC using EOY IC	11.4%	12.0%	13.2%	14.6%	16.6%	16.8%	16.8%
ROE							
5-stage							
EBIT / sales		9.4%	9.5%	9.4%	8.6%	8.5%	8.5%
Sales / avg assets		1.71	1.81	1.92	1.94	1.98	2.03
EBT / EBIT		95.0%	95.5%	95.2%	95.2%	95.7%	95.9%
Net income /EBT		63.4%	62.9%	63.6%	80.5%	79.0%	79.0%
ROA		9.7%	10.4%	10.9%	12.7%	12.7%	13.0%
Avg assets / avg equity		1.99	2.03	2.13	2.10	2.00	1.93
ROE		19.2%	21.0%	23.2%	26.7%	25.5%	25.1%
Payout Ratio		0.0%	22.2%	22.5%	18.4%	18.7%	18.9%
Retention Ratio		100.0%	77.8%	77.5%	81.6%	81.3%	81.1%
Sustainable Growth Rate		19.2%	16.4%	18.0%	21.8%	20.8%	20.3%

Appendix 7: Comp Sheet

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
DG	DOLLAR GENERAL CORP	$106.56	$28,013	0.9	(8.2)	(4.1)	11.1	14.2	14.6	14.3	-4.8%	12.1%	28.9%	7.0%	10.1%	14.6%	0.87	45.7%	A	1.02%	16.7%
BIG	BIG LOTS INC	$29.94	$1,208	1.0	(30.1)	(30.4)	(30.8)	(48.4)	(46.7)	-3.2	-1.0%	6.9%	33.3%	24.8%	6.8%	8.0%	1.68	104.5%	B+	2.64%	31.8%
DLTR	DOLLAR TREE INC	$84.81	$20,182	1.2	(1.8)	1.2	1.0	(20.8)	(21.0)	10.4	-23.4%	95.9%	91.6%	-34.5%	13.6%	21.9%	0.60	63.5%	B+	0.00%	
TGT	TARGET CORP	$66.78	$34,848	(2.3)	(23.2)	(24.8)	(15.5)	8.1	2.3	8.7	-6.9%	-5.4%	6.1%	-3.6%	4.3%	3.4%	0.86	91.2%	B+	3.55%	42.0%
WMT	WALMART INC	$93.85	$270,843	(0.1)	(11.1)	(2.9)	11.3	(3.2)	(5.0)	6.9	167.0%	-4.2%	-2.3%	12.9%	-2.3%	-8.2%	0.45	69.3%	A-	2.12%	118.3%
Average			$71,382	0.1	(14.9)	(12.2)	(4.6)	(10.0)	(11.1)	7.4	26.2%	21.1%	31.5%	1.3%	6.5%	7.9%	0.89	74.8%		1.87%	52.2%
Median			$28,013	0.9	(11.1)	(4.1)	1.0	(3.2)	(5.0)	8.7	-4.8%	6.9%	28.9%	7.0%	6.8%	8.0%	0.86	69.3%		2.12%	36.9%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			8.2%	38.2%	8.6%	10.5%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
DG	http://www.dollargeneral.com	23.8%	4.41	19.2	16.5	17.8	15.8	16.6	17.3	15.7	6.4%	1.19	8.5%	18.3%	14.6	12.7	13.8	7.4%	1.7%	7.9%	$24.18
BIG	http://www.biglots.com	28.8%	1.98	12.8	15.2	13.7	8.3	8.4	5.5	5.2	3.3%	0.23	4.5%	23.3%	8.8	4.2	7.6	0.4%	3.3%	-0.5%	$15.15
DLTR	http://www.dollartreeinfo.com	21.8%	2.54	42.3	20.1	15.6	11.5	15.0	17.8	15.6	7.8%	0.91	8.4%	14.6%	15.0	9.4	14.6	2.7%	6.1%	24.6%	$33.37
TGT	http://www.target.com	26.3%	3.14	13.1	12.1	13.4	11.1	12.0	12.4	11.9	4.1%	0.48	5.4%	13.0%	13.2	6.1	8.3	1.8%	4.0%	-0.4%	$21.23
WMT	http://corporate.walmart.com	17.3%	3.80	14.8	15.1	24.7	53.7	20.1	19.4	19.9	2.5%	0.54	4.2%	8.4%	16.8	10.3	9.8	2.6%	4.2%	1.3%	$24.72
Average		23.6%	3.17	20.4	15.8	17.0	20.1	14.4	14.5	13.7	4.8%	0.67	6.2%	15.5%	13.7	8.5	10.8	3.0%	3.9%	6.6%	
Median		23.8%	3.14	14.8	15.2	15.6	11.5	15.0	17.3	15.6	4.1%	0.54	5.4%	14.6%	14.6	9.4	9.8	2.6%	4.0%	1.3%	
spx	S&P 500 INDEX			17.9	19.4	17.4			15.0	13.5											

Appendix 8: 3-stage DCF Model

	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*7.8%*	*8.0%*	*7.0%*	*6.9%*	*6.5%*	*6.6%*	*6.7%*
NOPAT / S	*6.7%*	*6.7%*	*6.6%*	*6.5%*	*6.5%*	*6.4%*	*6.2%*
S / NWC	*18.24*	*17.76*	*17.76*	*17.76*	*17.76*	*17.76*	*17.76*
S / NFA (EOY)	*2.99*	*3.09*	*3.05*	*3.03*	*3.03*	*3.01*	*3.02*
S / IC (EOY)	*2.57*	*2.63*	*2.60*	*2.59*	*2.59*	*2.57*	*2.58*
ROIC (EOY)	*17.2%*	*17.6%*	*17.2%*	*16.8%*	*16.7%*	*16.4%*	*16.0%*
ROIC (BOY)		*18.5%*	*18.6%*	*18.1%*	*17.8%*	*17.5%*	*17.0%*
Share Growth		*-2.3%*	*-1.0%*	*-1.0%*	*-1.2%*	*-1.5%*	*-1.0%*
Sales	$25,302	$27,327	$29,240	$31,258	$33,290	$35,487	$37,864
NOPAT	$1,699	$1,824	$1,930	$2,032	$2,147	$2,257	$2,348
Growth		*7.4%*	*5.8%*	*5.3%*	*5.7%*	*5.1%*	*4.0%*
- Change in NWC	371	151	108	114	114	124	134
NWC EOY	*1387*	*1538*	*1646*	*1760*	*1874*	*1998*	*2132*
Growth NWC		*10.9%*	*7.0%*	*6.9%*	*6.5%*	*6.6%*	*6.7%*
- Chg NFA	193	382	743	729	671	803	748
NFA EOY	*8,462*	*8,844*	*9,587*	*10,316*	*10,987*	*11,790*	*12,538*
Growth NFA		*4.5%*	*8.4%*	*7.6%*	*6.5%*	*7.3%*	*6.3%*
Total inv in op cap	564	533	851	843	785	927	882
Total net op cap	9849	10382	11233	12076	12861	13788	14670
FCFF	$1,135	$1,291	$1,079	$1,189	$1,362	$1,330	$1,465
% of sales	*4.5%*	*4.7%*	*3.7%*	*3.8%*	*4.1%*	*3.7%*	*3.9%*
Growth		*13.8%*	*-16.5%*	*10.2%*	*14.6%*	*-2.3%*	*10.2%*
- Interest (1-tax rate)	73	75	76	77	77	78	79
Growth		*2.4%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
FCFE w/o debt	$1,061	$1,216	$1,003	$1,112	$1,285	$1,252	$1,386
% of sales	*4.2%*	*4.5%*	*3.4%*	*3.6%*	*3.9%*	*3.5%*	*3.7%*
Growth		*14.6%*	*-17.6%*	*10.9%*	*15.5%*	*-2.5%*	*10.7%*
/ No Shares	264.4	258.3	255.8	253.2	250.2	246.4	243.9
FCFE	$4.01	$4.71	$3.92	$4.39	$5.14	$5.08	$5.68
Growth		*17.3%*	*-16.7%*	*12.1%*	*16.9%*	*-1.1%*	*11.9%*
* Discount factor	0.92	0.84	0.77	0.71	0.65	0.60	0.55
Discounted FCFE	$3.68	$3.97	$3.03	$3.12	$3.35	$3.04	$3.12
Third Stage							
Terminal value P/E							
Net income	$1,626	$1,749	$1,854	$1,955	$2,070	$2,179	$2,269
% of sales	*6.4%*	*6.4%*	*6.3%*	*6.3%*	*6.2%*	*6.1%*	*6.0%*
EPS	$6.15	$6.77	$7.25	$7.72	$8.27	$8.84	$9.30
Growth		*10.1%*	*7.1%*	*6.5%*	*7.2%*	*6.9%*	*5.2%*
Terminal P/E							15.00
* Terminal EPS							$9.30
Terminal value							$139.49
* Discount factor							0.55
Discounted terminal value							$76.63

Summary		
First stage	$7.65	Present value of first 2 year cash flow
Second stage	$15.66	Present value of year 3-7 cash flow
Third stage	$76.63	Present value of terminal value P/E
Value (P/E)	**$99.95**	= value at beg of fiscal yr 2019

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Recommendation	HOLD
Target (today's value)	$55
Current Price	$51.57
52 week range	$47.10 – $66.99

Share Data	
Ticker:	LUV
Market Cap. (Billion):	$28.72
Inside Ownership	0.4%
Inst. Ownership	81.4%
Beta	1.08
Dividend Yield	1.25
Payout Ratio	9.0%
Cons. Long-Term Growth Rate	3.0%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$20.4	$21.2	$21.9	$23.5	$24.9
Gr %	-	3.7%	3.5%	7.5%	6.1%
Cons	-	-	-	$21.9	$23.6
EPS					
Year	$3.58	$5.80	$3.43	$4.88	$5.42
Gr %		62.2%	-41.0%	42.2%	11.1%
Cons	-	-	$4.15	$4.81	$5.33

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	28.4%	37.0%	18.2%	22.3%	22.0%
Industry	37.2%	27.2%	30.2%	27.7%	28.0%
NPM (%)	11.0%	16.5%	9.2%	11.7%	12.0%
Industry	8.7%	8.7%	7.4%	7.6%	7.8%
A. T/O	0.92	0.87	0.82	0.80	0.79
ROA (%)	10.1%	14.4%	7.5%	9.3%	9.1%
Industry	6.7%	6.7%	6.0%	6.2%	6.4%
A/E	2.82	2.56	2.41	2.39	2.34

Valuation	'17	'18	'19E	'20E
P/E	18.8	8.1	12.3	10.6
Industry	13.9	10.4	11.9	9.4
P/S	1.87	1.35	1.31	1.21
P/B	4.4	2.8	2.5	2.1
P/CF	9.6	6.5	7.3	6.6
EV/EBITDA	8.5	9.1	15.1	9.8

Performance	Stock	Industry
1 Month	-2.7%	-16.9%
3 Month	-18.9%	-19.3%
YTD	-22.0%	2.8%
52-week	-19.3%	5.9%
3-year	2.6%	-24.0%

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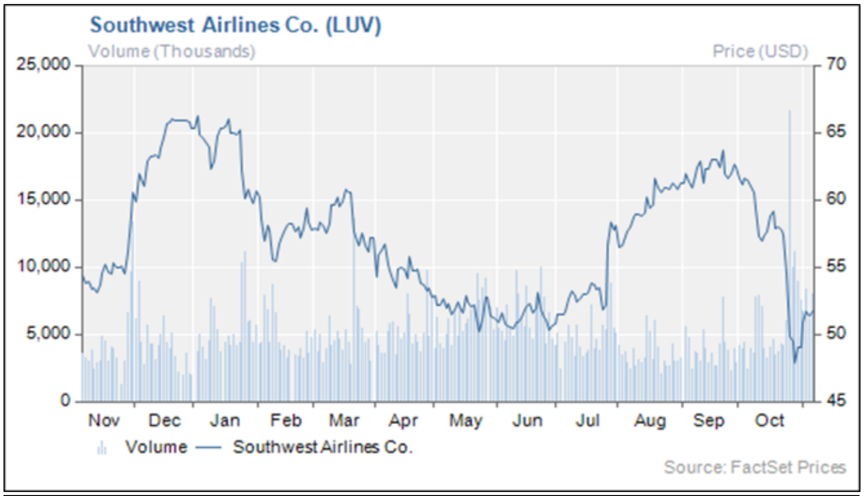
Industrials, Airlines

Southwest Airlines



Summary: I recommend a neutral rating with a target of $55. LUV has the most efficient cost structure compared to its peers, providing it with the ability to withstand price volatility in the market. LUV's low-cost and pricing structure is a market maker, and as other airlines continue to raise fares, LUV should be able to keep its fares low and consumer demand steady. Most relevant headwinds to LUV are its hedging derivatives against rising fuel cost becoming ineffective, and increases in labor uncertainties, based off multiples and DCF analysis, the stock is currently fairly valued.

Key Drivers:

- Jet Fuel Prices: LUV's hedging program consists of derivatives and allows for protection against volatile fuel prices. LUV has less risk compared to some of its competitors that do not hedge and protect themselves against rising fuel prices.

- Operational Performance: LUV has an above average operational performance in comparison to the airline industry. LUV experiences efficient operational performance partly because its entire fleet comprises of the Boeing 737, hedges fuel prices, its employee's efforts towards exceptional service to please customers, and due to its new reservation system.

- Competitor Analysis: LUV competes domestically with major airlines and other ultra-low-cost carriers. LUV's core fundamentals make it incredibly difficult to compete with on a number of factors such as maintaining high passenger revenue per available seat mile, high passenger load factor, and low-cost per available seat mile.

- Macroeconomic & Other Factors: Demand for airline tickets is driven by business and consumer trends. When business and consumer confidence is high, this has a positive impact on the airline industry due to an increase in consumer spending for business and leisure travel. There are other factors that may have a negative impact on the airline industry such as severe weather, natural disasters, and terrorist attacks that may be more difficult to project into the future.

Valuation: Using a relative valuation approach, Southwest Airlines appears to be fairly valued in comparison to the airline industry. A DCF analysis suggests a $55 value. A combination of the approaches implies that Southwest Airlines is fairly valued, as the stock's value is about $46 and the shares trade at $51.57.

Risks: Threats to the business include changes in consumer preference, demographics, economic downturns, geopolitical events, increased tax and fee structure, higher oil prices, natural disasters, and terrorist attacks.

Company Overview

Southwest Airlines Co. (LUV) is a Dallas-based American airline that provides point-to-point air transportation for passengers and freight in the United States and near-international markets. Southwest's point-to-point route structure has allowed for more nonstop flights. During 2017, about 76% of the company's customers enjoyed the benefits of nonstop flights. Since 2003, Southwest has been the nation's largest domestic air carrier. Some of Southwest's main differentiating factors are its outstanding customer service, low airfare, its entire fleet is comprises of the Boeing 737, and the fact that it is the only U.S. airline that offers free transportation of luggage. Its extensive list of international and domestic airport contracts provides operation in 99 destinations in the United States and 10 additional countries as shown below. At the beginning of 2018, Southwest announced that its intent to sell flights to Hawaii by the end of the year. While the sales of Southwest fares to Hawaii has not officially started, over the last two quarters competitor airlines have reacted to this announcement with some of the largest discounting of fares to the islands in history. It all comes down to getting its fleet certified for ETOPS (Extended-range Twin-engine Operational Performance Standards). LUV must demonstrate that in the case of an engine failure, its 737s must be able to fly utilizing one-engine until it reaches the closest acceptable airport.

Figures 1: Southwest Airlines Destinations

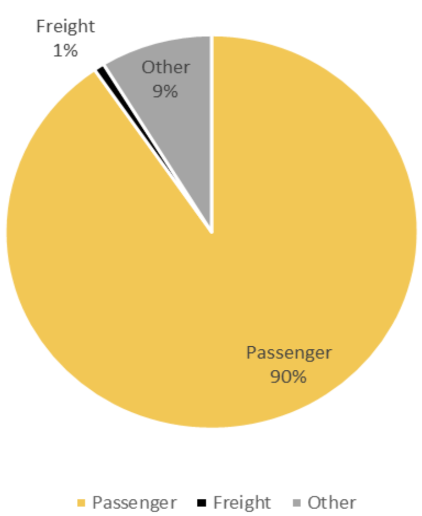
Southwest flies to 99 U.S. destinations.

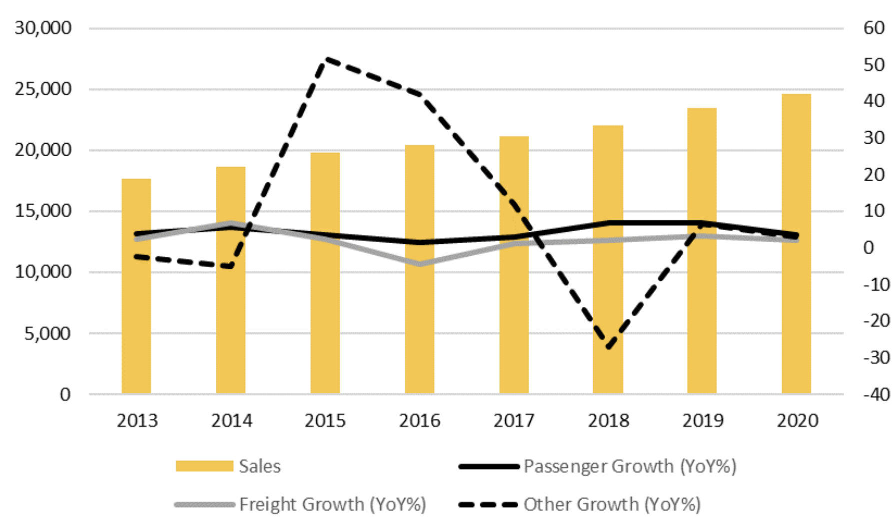
Source: Southwest Airlines

LUV generates its revenue from three different segments. These include passenger revenues, cargo, and other streams of revenue as described below.

- Passenger Revenues: Passenger revenues account for 90% of Southwest's total revenue. Southwest offers three categories of fares: "Wanna Get Away, Anytime, and Business Select." "Wanna Get Away" fares are the lowest fares Southwest offers, and accounts for the majority of ticket sales. "Anytime" fares are refundable and offer the option of flying standby or changing to an earlier or later flight on the day of departure without any additional charges. Over the last five years, passenger revenue has remained steady at an average growth rate of 3.5%. Projected growth rates are 6.7%, 6.8%, and 3.5% for 2018, 2019, and 2020, respectively. The rise in growth rates could be due to opening new international concourses in Fort Lauderdale's airport and in other locations to expand flight destinations to the Caribbean, Mexico, Costa Rica, the Dominican Republic, and Central America. Year-end passenger revenues during 2017 were $19.1 billion. As of September 30, 2018, passenger revenues were $16.3 billion over the past year.
- Cargo: Southwest offers expedited air cargo to all of its destinations across the map. In 2017, cargo accounted for about $173 million, which is about a 1.2% increase of from the previous year. In May 2018, Southwest started servicing four additional Mexican cities – Mexico City, Cancun, Los Cabos and Puerto Vallarta – and added more markets throughout the year. Since December 2013, cargo growth has averaged 1.6%. Projected growth rates are 6.7%, 6.8%, and 3.5% for 2018, 2019, and 2020, respectively.
- Other: Other revenues account for 9% of operating revenues. Ancillary revenue for Southwest consists of food and beverage, EarlyBird Check-In, pet transportation, unaccompanied-minor fees, third-bag fees, and their loyalty program. The majority of this segment's revenue comes from EarlyBird Check-In, which is a sliding scale fee that depends on the length of the flight as well as how many other people want to buy EarlyBird Check-In passes. So far this year, Southwest has made approximately $466 million from EarlyBird Check-in, in-flight purchases, and upgraded boarding, which already exceeds $412 million as of September 30, 2017. Overall, Southwest's ancillary revenue is up 17% so far in 2018, after recovering from a three-year decline.

Figures 2 and 3: Revenue Sources for LUV, year-end 2017 (left) and Revenue history since 2013 (right)





Sources: Company reports, FactSet

Business/Industry Drivers

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

1) Jet Fuel Prices
2) Operational Performance
3) Competitor Analysis
4) Macroeconomic Factors

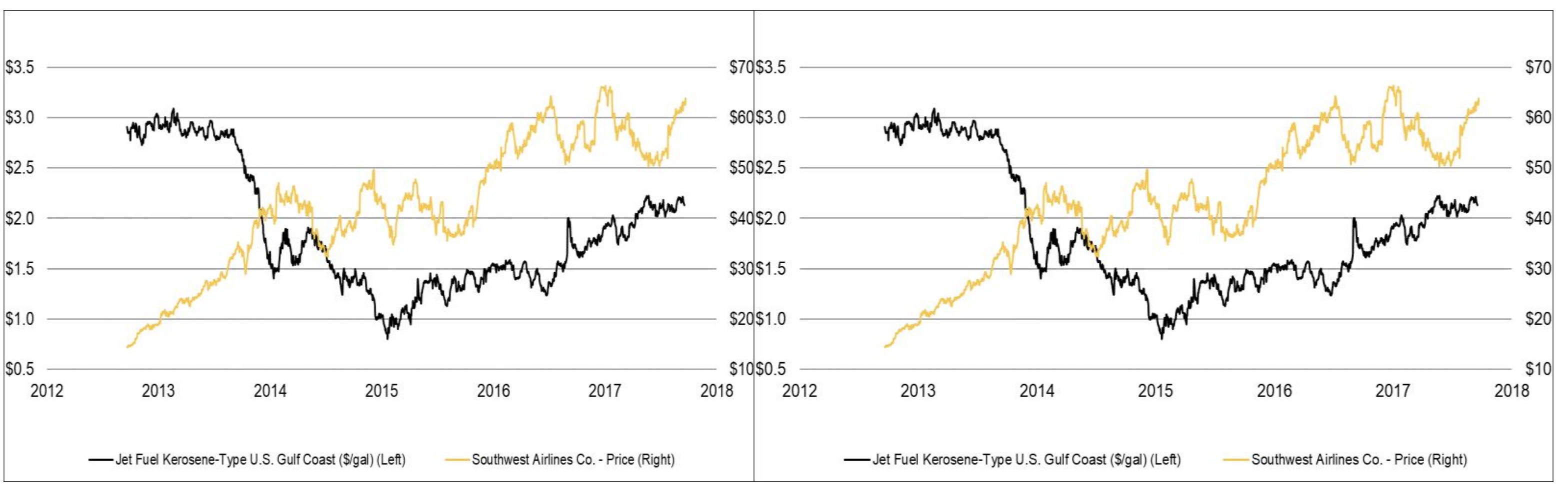
<u>Jet Fuel Prices</u>

LUV expects its average economic fuel price to increase only 2% in 2018

Airlines are naturally dependent upon oil to function and, therefore, are significantly impacted by the volatility in jet fuel prices. Additionally, jet fuel and oil are one of the largest operating expenses behind salaries, wages, and benefits. At year-end, 2017, jet fuel and oil accounted for 22.3% of LUV's total operating expenses.

LUV aims to acquire jet fuel at the lowest possible cost and seeks to reduce volatility in operating expenses through its fuel hedging program. As of June 30, 2018, LUV had fuel derivative instruments set up for approximately 80% of its fuel consumption. As of July, 2018, American Airlines, Delta Airlines and United Airlines have all reported increased fuel costs by as much as 40%, vs. a 12% increase for Southwest during the first half of 2018. Since LUV is highly hedged against rising fuel prices, this will greatly benefit it in comparison to competitors going forward, providing less downward pressure on earnings moving into 2019, given that jet fuel prices continue to rise in relation to its strategy.

Figures 4 and 5: LUV Price v. Price of Jet Fuel per Gallon (left) and LUV Price v. WTI (right)



Source: FactSet

For the first nine months of 2018, fuel and oil expense decreased 4.0% while the price of LUV has decreased by 11.0%. This expense can be partially attributed to $228 million in net hedging losses in the first six months of 2017, which translated into a 16% decline in the price of LUV's stock. This loss was partially offset by the recognition of $79 million in net hedging gains for the first six months of 2018.

LUV is in its 45th consecutive year of profitability

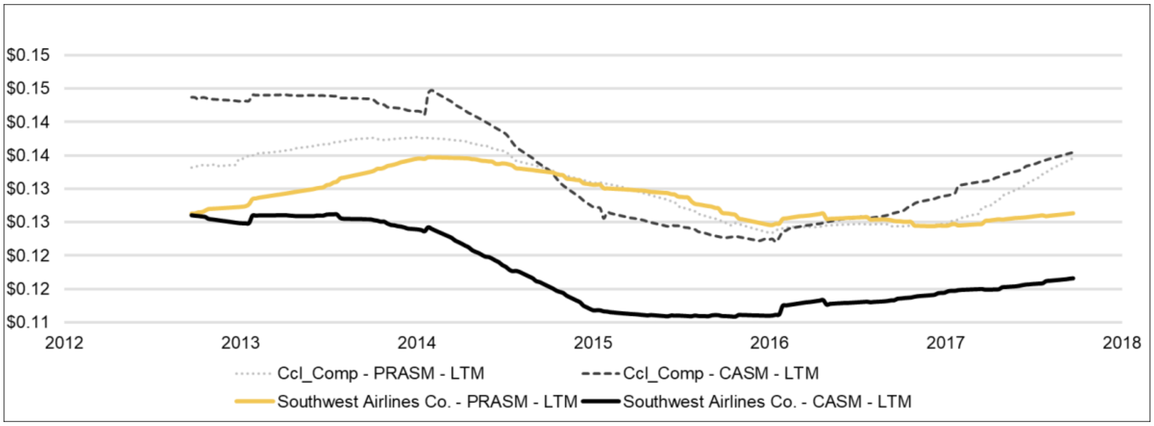
Operational Performance

RASM and CASM are commonly used measures to compare revenue and cost performance, expressed in cents received (RASM) or cents payed (CASM) for each available seat mile. Over the last five years, Southwest has proven to be operationally profitable, which can be attributable to several factors.

LUV COMPS:
JBLU
AAL
DAL
ALK
SAVE

In 2017, Southwest completed its new single reservation system designed to improve flight scheduling, inventory management, enable revenue enhancements, and support additional international growth. Southwest estimates that the new system will drive improvements in pre-tax results of $200 million in 2018 that translates into .26 EPS and is about 1% of sales, rising to $500 million by 2020 that translates into .71 EPS and is about 2% of sales. Since Southwest began, the company has only used one type of aircraft – the Boeing 737. Only having one type of aircraft in LUV's fleet results in cost-saving efficiencies. As of October 1, Southwest acquired 13 new 737 MAX 8 aircrafts that cost the firm $96 million. Southwest predicts to receive economic benefits from this transaction of an estimated $200 million through 2020, resulting in lower fuel costs, and lesser maintenance, repair, and out-of-service costs. Total operating revenues were $21.2 billion in 2017, up 3.7% compared to 2016, resulting in a slight increase in RASM. Total operating expenses increased 5.9% to $17.7 billion, resulting in a 2.3% rise in CASM, excluding fuel. In comparison to Southwest's competitors, currently Southwest is operating 1.07 cents better than its competitors' composite, in terms of RASM – CASM.

Figures 6: Annual RASM and CASM for LUV v. Competitors



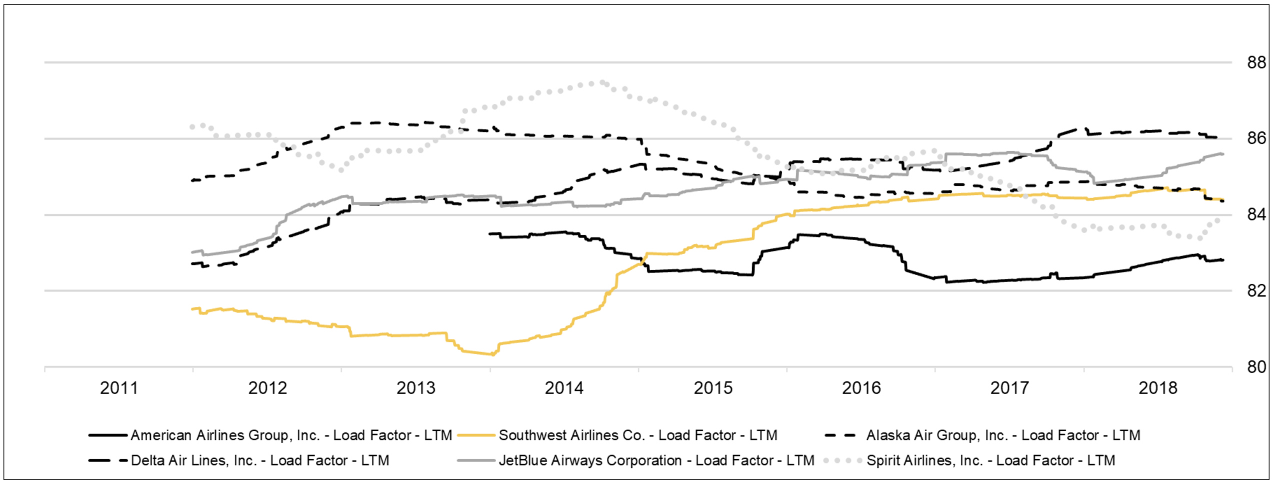
Source: FactSet

Competitor Analysis

PLF = Revenue Per Mile / Available Seat Mile

The airline industry is an extremely competitive market. In recent years, pricing has become hypercompetitive with the growth of low-cost carriers entering into the industry, led by Southwest with an 17.9% market share. LUV's core fundamentals make it incredibly difficult to compete with on a number of factors. Airlines have high fixed costs related to each flight. Therefore, it is imperative that airlines efficiently utilize and fill each seat per flight. Passenger Load Factor (PLF) is a key indicator that measures the percentage of available seating capacity that is filled with passengers. Generally, once an airline PLF exceeds its break-even point, more revenue will flow down to the bottom line. Currently, LUV has the third highest PLF amongst its competitors. With the recent purchase of the Boeing 737 MAX 8 and the increase in demand for low-cost carriers heading into the holiday season, LUV's PLF is predicted to exceed all of its low-cost competitors.

Figures 7: LUV vs Competitors – Passenger Load Factor (PLF)

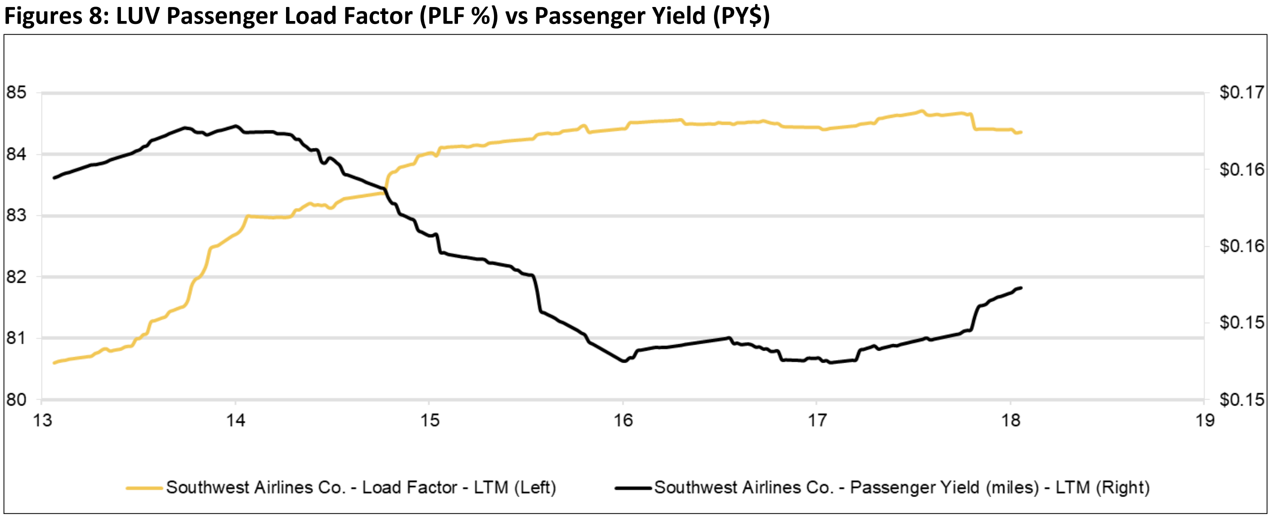


Source: FactSet

Since 2015, LUV's share of market cap rose from 4.5% to 31.7%, refelecting its improving outlook. However, it only generates 8.5% of the industry's sales. This reflects the fact that LUV's net profit margin from 2013 to 2017 of 9.8% is higher than its competitors average net profit margin of 9.1%. It also suggests that LUV has higher growth as well.

Even with a strong outlook, difficult and unpredictable events do occur on occasion that can negatively impact sales. On April 17, 2018, LUV incurred a fatal accident that cost the airline over $100 million worth of business. One of the fan blades on the Boeing 737 – 700's engine broke off, puncturing a window that resulted in a passenger getting sucked through the opening. The financial effects of this accident are expected to subside in the third quarter of 2018, after causing unit revenue to decrease by 3%.

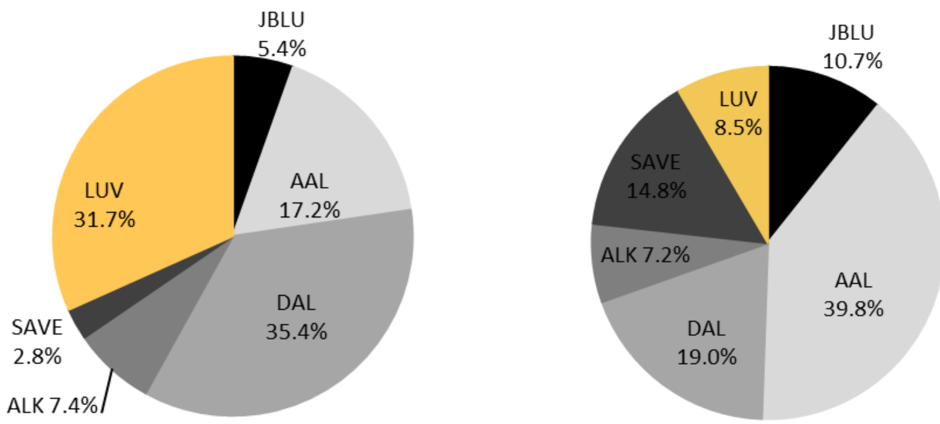
Figures 8: LUV Passenger Load Factor (PLF %) vs Passenger Yield (PY$)



Source: FactSet

From 2013 to 2018, LUV's PLF rose by about 4% while its passenger yield declined by about 2%. Passenger yield represents the average amount that a passenger pays to fly one mile. Over time, LUV's capacity has expanded which has dropped prices and created pressure on revenues.

Figures 9 and 10: Comparison of LUV comps by market cap (left) and sales



Source: Company Reports, IMCP

Macroeconomic Factors

The airline industry is highly cyclical. By nature, it's highly capital intensive and moves up and down with the economy because the demand for airline tickets is driven by business and consumer trends. As disposable income rises, passengers are more able to purchase airline tickets instead of choosing to travel by car or public transit.

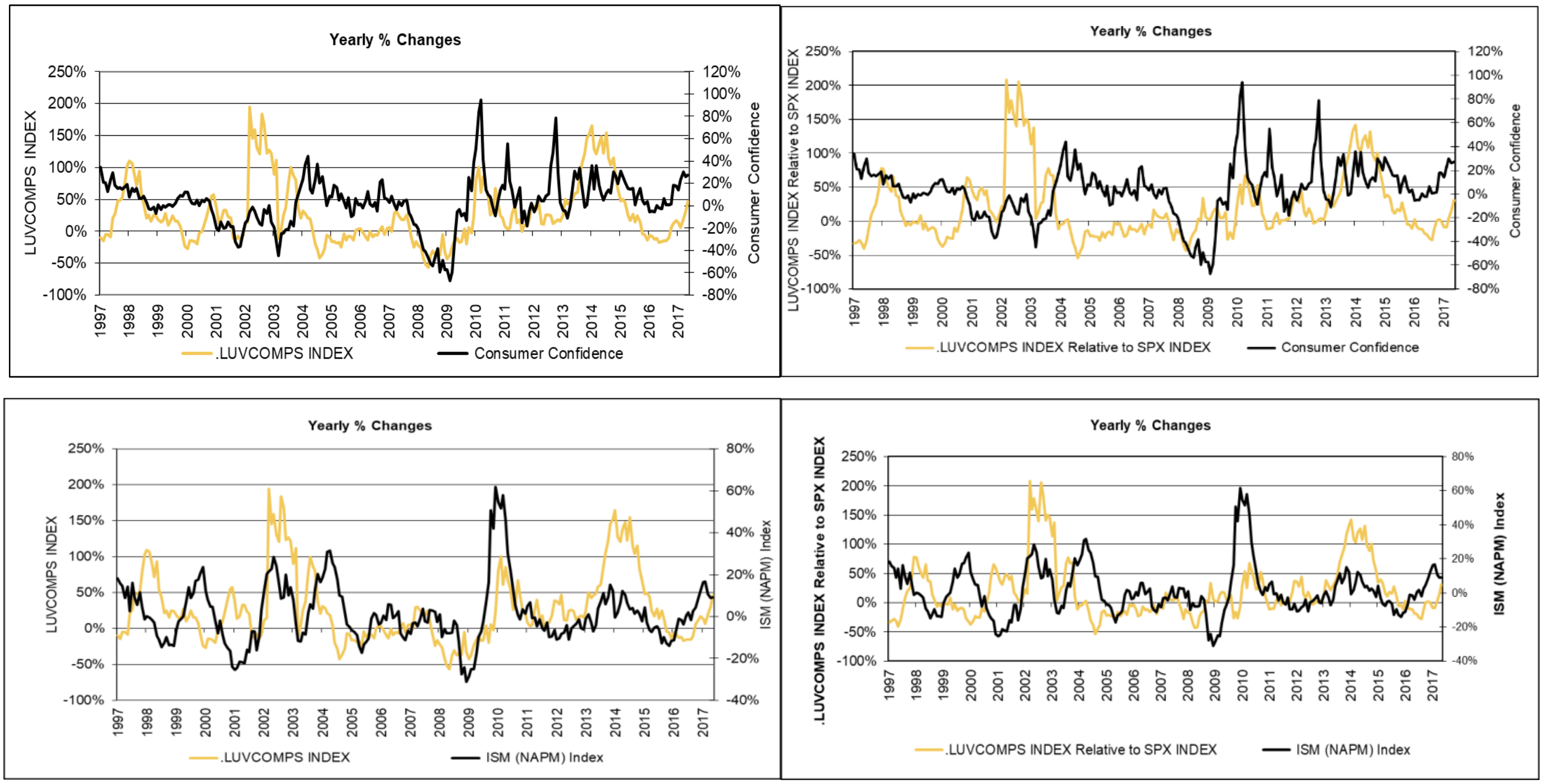
Over the past 20 years, the airline industry has been very volatile by nature due to terrorist attacks and the global economic crises. As a result, the cost of insurance has increased, which lowers profit margins.

From a supply standpoint, there are two primary aircraft manufacturers: Airbus and Boeing. These suppliers compete with each other with new airplane models, outsourcing, updating technology, and offering competitive pricing. Boeing's costs and revenues are primarily in dollars, so a higher price to foreigners does not impact Boeing unless they buy fewer units as a result of higher prices. Airbus product costs are mostly in euros. Since Boeing is the primary supplier of 747s for LUV, if Boeing's costs increase, it will likely increase its prices that will negatively impact LUV. As the dollar falls in relation to the euro, this creates a competitive advantage for Boeing and makes planes cheaper, which could have a positive impact on sales since customers like LUV would be inclined to purchase more 747s due to a lower price.

The impacts of the economy are reflected in the consumer confidence and ISM index. The airline industry has a beta of 0.55 to annual changes in consumer confidence. Relative to the S&P 500, the performance of the airline industry has a correlation of 0.48 and 0.33 R^2 of relative returns are explained by changes in consumer confidence. If consumers believe the economy is healthy and are confident in their ability to cover the cost of living, more discretionary income is allocated toward airline travel.

The airline industry has a beta of 1.01 correlation of 0.31 to annual changes in the ISM. In comparison to the S&P 500, the airline industry's relative performance has a beta of 0.47 and correlation of 0.14 to the ISM. A rising ISM means businesses are more optimistic, so they are potentially willing to spend more on travel. Currently, both ISM and consumer confidence are high, so overall this has benefited the industry.

Figures 11 and 12: U.S. Airlines Relative to SPX v. Consumer Confidence (left) and U.S. Airlines Relative to SPX v. Consumer Confidence (right)



Sources: Bloomberg, IMCP

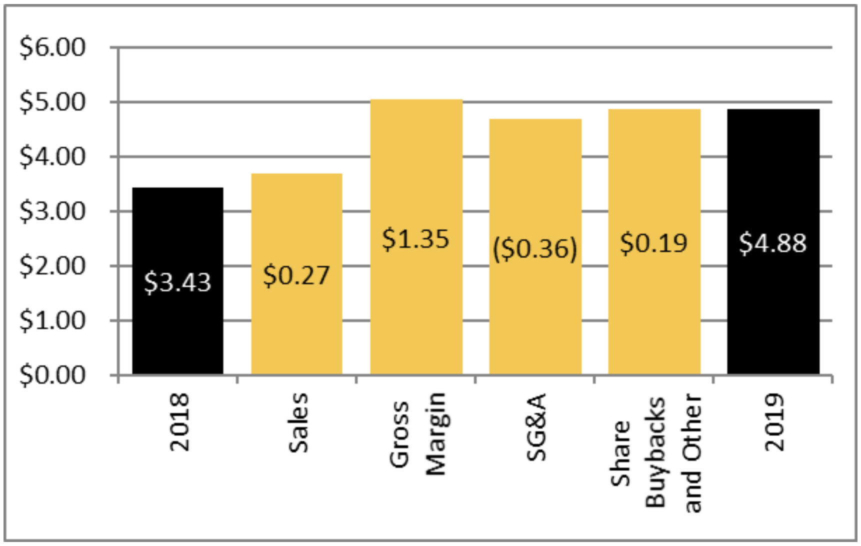
Note that the firm's growth was stagnant from 2000 to 2007, but experienced significant growth from 2013 to 2018. The correlation has been rising since 2005 as its growth has matured. Prior to 2005, the ISM and confidence did not matter as much since the company was in the startup and growth stages of its life cycle.

Financial Analysis

I expect EPS to decline in 2018 and rise throughout 2020

I anticipate EPS to grow from $3.43 in FY 2018 to $4.88 in FY 2019. Increases in domestic and foreign passenger sales should increase earnings by $0.27. I predict a $1.35 increase in gross margin due to the use of a single Boeing 737 aircraft and 15 new MAX 8 aircrafts taking delivery in 2019, which is likely to replace its older aircraft, lowering maintenance costs and improving fuel efficiency. Furthermore, initiatives towards technology improvements taken in 2017, such as its new reservation system, is expected to retain approximately $500 million of incremental annual revenue throughout 2020 and should enhance its flight scheduling, inventory management, support international growth, and improve its operational efficiency going forward. Additionally, I project a $0.36 decrease because of higher SG&A as a percent of sales from rising wages and fuel prices. Finally, I forecast $0.19 increase in EPS due to share buybacks and other revenues. I expect LUV's EPS to continue to rise due to the reduction of the federal corporate tax rate from 35% to 21%, reducing LUV's annual tax liability by hundreds of millions of dollars in the years to come and providing more opportunity to buy back shares and pay dividends to shareholders. This cash utilization assumption is in line with historical cash equivalent levels and reserves.

Figure 13: Quantification of 2019 EPS drivers



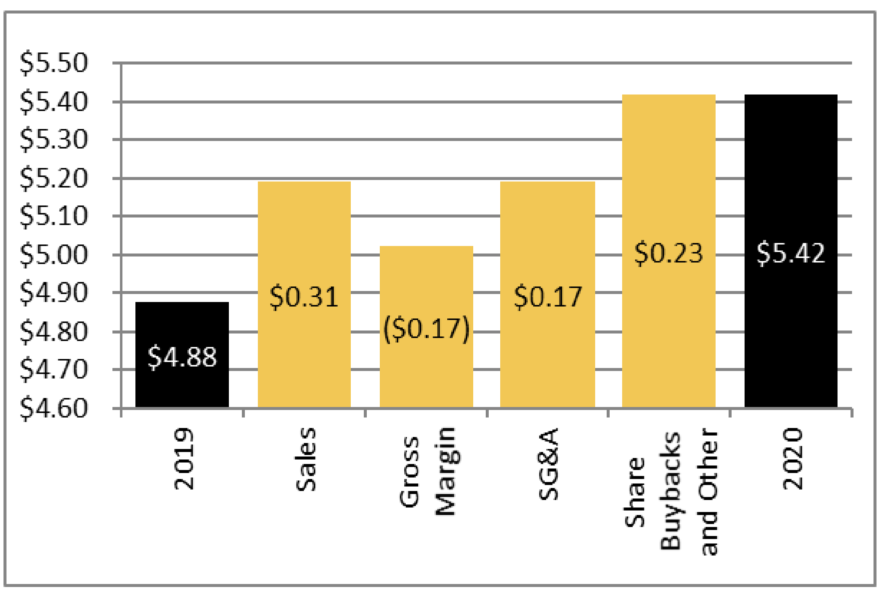
Sources: Company Reports, IMCP

<u>Sales - Estimates vs. Consensus</u>
2019: $23,555 vs. $23,665

<u>EPS – Estimates vs. Consensus</u>
2019: $4.88 vs. $4.78

I expect 2020 EPS to increase from $4.88 in FY 2019 to $5.42 in 2020. I anticipate a $0.31 increase in EPS from sales because of continued growth in servicing domestic and international destinations. I expect a decrease of $0.17 in EPS from gross margin losses due to a 32% decrease in its fuel derivative contracts that cover estimated fuel consumption. If fuel prices continue to rise throughout 2020, its hedging positions will likely not be able to offset as much of the fuel costs as in prior years. I forecast an increase of $0.17 in EPS from SG&A declining as a percent of sales from the continued benefits of replacing its fleet with new MAX 8 aircrafts and its reservation system. Lastly, I predict a $0.23 increase in EPS from share buybacks and incremental gains in ancillary revenues from cardholder spending on LUV's co-branded Chase Visa credit card and EarlyBird Check-in. Overall, LUV expects the retirement of its classic Boeing 737 models to produce significant cost savings and improvements in pre-tax results of approximately $200 million by the end of 2020.

Figure 14: Quantification of 2020 EPS drivers



Sources: Company Reports, IMCP

<u>Sales - Estimates vs. Consensus</u>
2020: $24,992 vs. $25,124

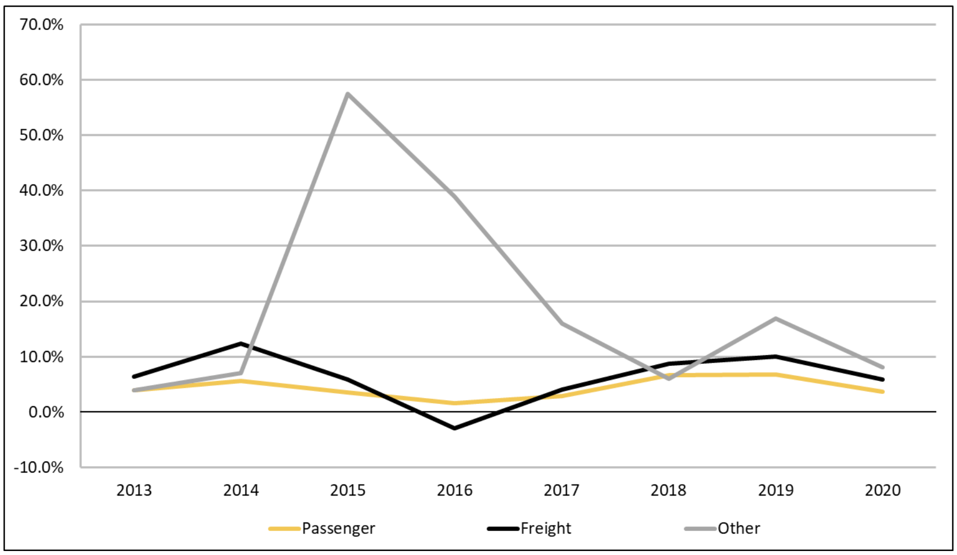
<u>EPS – Estimates vs. Consensus</u>
2020: $5.42 vs. $5.33

I am slightly more pessimistic than consensus estimates for 2019 and 2020 in regards to sales. However, I anticipate a higher estimate for EPS in years 2019 and 2020 primarily driven by LUV's operational and technical improvements that will further increase its operating and net profit margins.

Revenues

From 2014 to 2016, revenues from all three segments deceased primarily due to sluggish demand. The significant rise of other revenues resulted from the July 2015 amended agreement with Chase and the resulting change in accounting methodology. This caused an acceleration in the timing of passenger revenues on a prospective basis and resulted in approximately 90% of the increase.

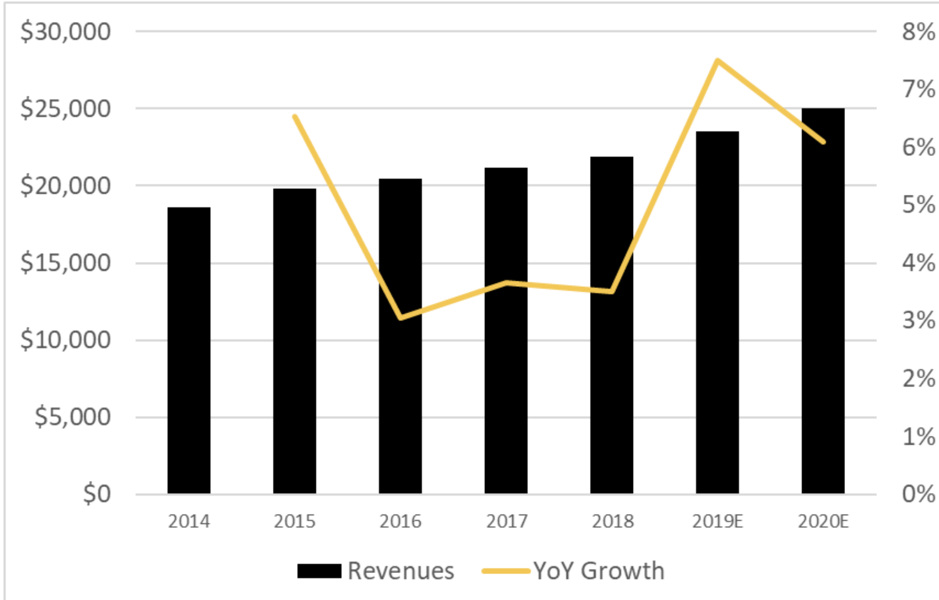
Figure 15: Southwest Airlines segment revenue growth rates, 2013 –



Source: Company Reports, IMCP

Passenger revenue should continue to rise throughout 2020 as LUV services new destinations since 2017 that consist of Cincinnati, Grand Cayman, Turks & Caicos, and Hawaii.

Figure 16: Revenue vs YoY revenue growth, 2014 – 2020E

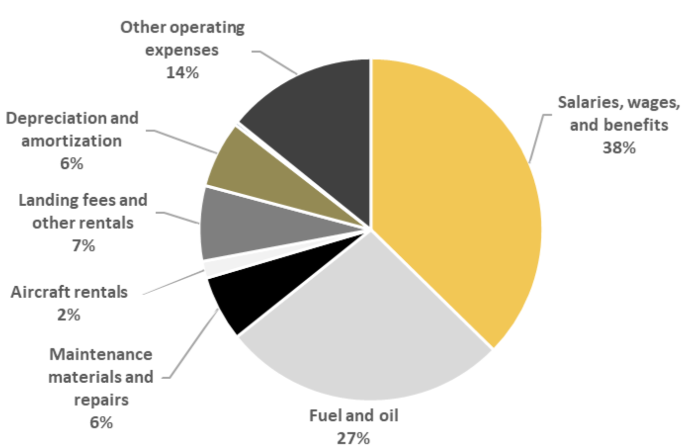


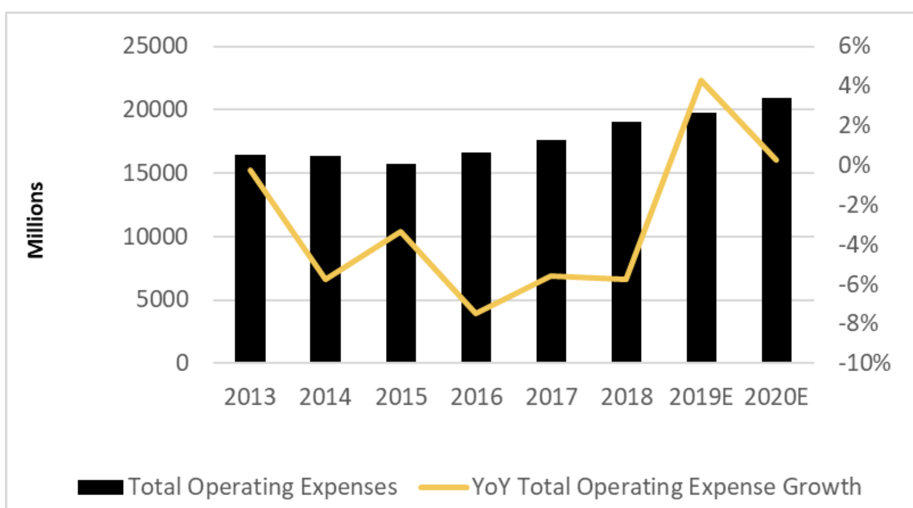
Source: Company Reports, IMCP

Operating Income and Margins

LUV's two largest operating expenses are composed of mainly labor and fuel costs. Other operating expenses include interest expense, capitalized interest, interest income, and other gains and losses. Fuel prices are expected to continue to rise, which will likely cut into margins. On the other hand, given that LUV is highly hedged against the rise in fuel costs, the firm will likely not be harmed as much as other airline companies. From 2018 to 2020, LUV has $229 million derivative contracts in place to effectively manage this risk. LUV's reservation system and the decrease in the age of its fleet should mitigate the increase in operating costs due to increased fuel efficiency, reduced maintenance requirements, and increased revenue potential with a larger capacity of available seat miles (ASM).

Figures 17 & 18: Arithmetic average composition of 2013 - 2017 operating expenses (left) and operating expenses vs YoY operating expense growth (right)





Source: Company Reports

Figure 19: LUV Operating Margins, 2014 – 2020E

	2014	2015	2016	2017	2018	2019E	2020E
Sales	$18,605	$19,820	$20,425	$21,171	$21,912	$23,555	$24,992
Direct costs	$13,115	$12,410	$12,925	$13,751	$14,929	$15,005	$16,045
Growth		-5.38%	4.15%	6.39%	8.57%	0.51%	6.93%
Gross Income	$5,490	$7,410	$7,500	$7,420	$6,983	$8,550	$8,947
Gross Margin	29.51%	37.39%	36.72%	35.05%	31.87%	36.30%	35.80%
Operating Expenses	$3,265	$3,294	$3,740	$3,905	$4,159	$4,748	$4,913
Operating Income	$2,225	$4,116	$3,760	$3,515	$2,824	$3,802	$4,034
Operating Margin	11.96%	20.77%	18.41%	16.60%	12.89%	16.14%	16.14%

Source: Company Reports

Return on Equity

Southwest Airline's ROE had been improving over the past few years, until 2018 when margins and asset turns fell. Its improved tax burden ratio in 2018 is due to the new tax law. Profit margin fell from 2015 – 2018 due to the rise of other low-cost carriers and higher fuel prices. However, I expect improvements going forward as discussed earlier. This, along with lower taxes, should lead to a rebound in ROE going forward. The replacement of its fleet with the new Boeing 737 MAX 8 has contributed to rising debt and caused the leverage ratio to increase over time. Also, LUV has made continued efforts to utilize its free cash-flow for share buyback programs, however, equity is still rising faster than assets and leverage has declined. As future fares are expected to rise for the industry, LUV should be able to resist increasing fairs due to its motives toward improving margins by other means as discussed earlier and continuing to be the leader among its low-cost carrier competitors.

Figure 20: ROE breakdown, 2014 – 2020E

5-Stage DuPont	2014	2015	2016	2017	2018	2019E	2020E
Tax Burden Ratio	62.56%	62.70%	63.30%	107.30%	76.04%	76.04%	76.02%
Interest Burden Ratio	81.62%	84.52%	94.34%	92.49%	94.12%	95.40%	95.31%
Operating Profit Ratio	11.96%	20.77%	18.41%	16.60%	12.89%	16.14%	16.14%
Asset Turnover Ratio	94.33%	93.00%	87.71%	84.31%	76.81%	77.25%	77.05%
Finanical Leverage Ratio	2.91	2.90	2.76	2.41	2.41	2.37	2.32
ROA	5.76%	10.23%	9.64%	13.89%	7.08%	9.04%	9.01%
ROE	16.77%	29.65%	26.60%	33.45%	17.08%	21.39%	20.86%

Source: Company Reports

Figure 21: Free cash-flows 2014 – 2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$1,392	$2,580	$2,379	$3,771	$2,147	$2,891	$3,067
Growth		85.4%	-7.8%	58.5%	-43.1%	34.6%	6.1%
NWC*	$ (3,020)	$ (4,328)	$ (3,460)	$ (3,237)	$ (3,334)	$ (3,584)	$ (3,803)
Net fixed assets	$ 15,796	$ 17,288	$ 18,788	$ 20,295	$ 21,528	$ 23,142	$ 24,554
Total net operating capital*	$12,776	$12,960	$15,328	$17,058	$18,194	$19,558	$20,751
Growth		1.4%	18.3%	11.3%	6.7%	7.5%	6.1%
- Change in NWC*		$ (1,308)	$ 868	$ 223	$ (97)	$ (250)	$ (219)
- Change in NFA		$ 1,492	$ 1,500	$ 1,507	$ 1,233	$ 1,614	$ 1,412
FCFF*		$2,396	$11	$2,041	$1,011	$1,527	$1,874
Growth			-99.6%	18881.5%	-50.5%	51.0%	22.8%
- After-tax interest expense	$256	$399	$135	$283	$126	$133	$144
FCFE**		$1,997	-$124	$1,758	$885	$1,394	$1,730
Growth			-106.21%	-1517.74%	-49.66%	57.49%	24.14%

Source: Company Reports, IMCP

Free Cash-Flow

LUV's free cash-flow has been extremely volatile over the last several years. Even though capital investments are relatively stable, NOPAT is not. Throughout 2019 and 2020, LUV will spend $1.717 billion in aircraft purchase commitments and $1.309 billion on other fixed assets such as flight equipment.

I expect both FCFF and FCFE to increase over 50% in 2019 as the result of a 34.6% rise in NOPAT in 2019, with only a 7.5% increase in net fixed assets. LUV is expected to have $1.4 to 1.7 billion in FCFE in 2019 and 2020, respectively. About $1.2 billion will be used for share repurchases and dividends.

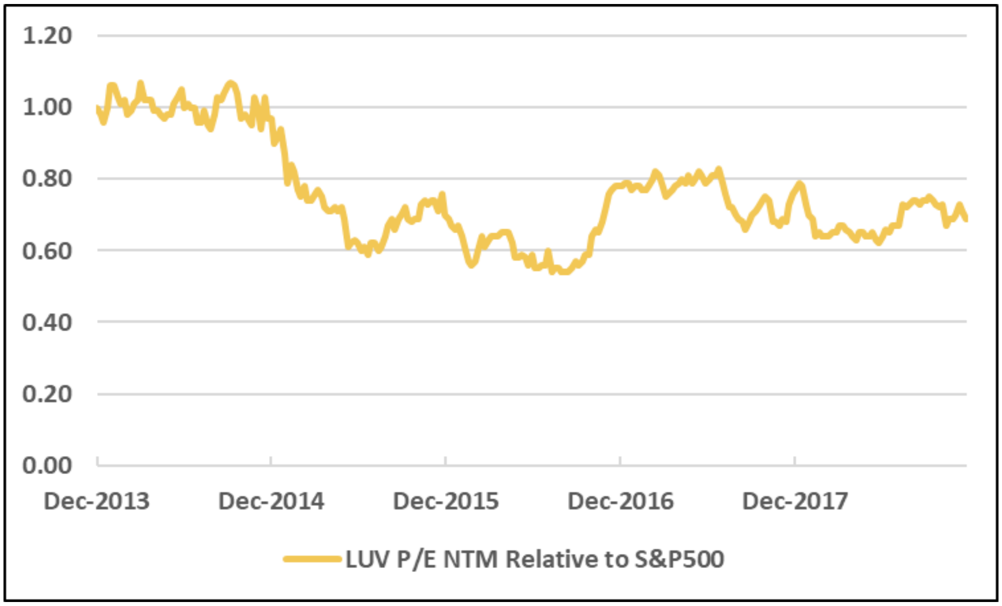
Valuation

LUV was valued using multiples and a 3-stage discounting cash-flow model. LUV is currently trading at a 10.66 P/E, which is higher than its peers at an average of 9.50. LUV is also currently trading at a 1.22 P/S ratio, which higher than all of its peers. Some investors are willing to pay a premium for LUV due to its competitive advantage at keeping costs low, high margins, and share repurchase program.

Trading History

LUV is currently trading below its five-year average P/E relative to the S&P 500. This is the result of recent earnings rising and the fact that most analysts believe that earnings will grow in the future. LUV's current NTM P/E is at 10.66 compared to its five-year average of 13.55. While I expect some regression towards that number in the long run, I would expect its P/E to steadily rise over the next two years.

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



Source: Company Reports, IMCP

Assuming the firm maintains a 10.66 NTM P/E at the end of 2019, it should trade at $57.78 by the end of the year.

- Price = P/E x EPS = 10.66 x $5.42 = $57.78

Discounting $57.78 back to today at a 10.56% cost of equity (explained in Discounted Cash-Flow section) yields a price of $52.31. Given LUV's potential for earnings growth and continued profitability, this seems to be a fair valuation. Overall, I am slightly more bullish about earnings than consensus for 2019 and 2020.

<u>Relative Valuation</u>

LUV is currently trading at a P/E higher than its peers are, with a P/E NTM of 10.9 compared to an industry average of 9.8. Investors are willing to temporarily pay a premium for LUV because it has the potential for greater growth than many of the other airline companies. LUV's P/B and P/S ratios are also higher than those of its peers. This is a reflection of LUV's strong performing ROE and net margin compared to its competitors.

Figure 23: LUV comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
LUV	SOUTHWEST AIRLINES	$51.08	$28,723	(0.1)	(2.7)	(18.9)	0.2	(19.3)	(22.0)	12.3	-25.6%	6.5%	-6.7%	17.4%	13.6%	59.7%	1.66	31.1%	A-	1.04%	9.0%
JBLU	JETBLUE AIRWAYS CORP	$17.92	$5,462	(0.2)	(1.0)	(5.9)	(6.1)	(19.2)	(19.8)	11.1	-21.1%	12.1%	-20.7%	-18.2%	15.3%	55.3%	0.88	38.9%	B+	0.00%	
AAL	AMERICAN AIRLINES GROUP INC	$34.10	$15,706	0.8	(5.9)	(15.1)	(22.8)	(33.5)	(34.5)	12.1	89.8%	-37.4%	-14.5%	-7.8%	14.9%		1.44			1.00%	13.8%
DAL	DELTA AIR LINES INC	$55.89	$38,319	(0.8)	(1.3)	(4.1)	1.8	2.8	(0.2)	15.4	30.6%	15.4%	-7.3%	11.8%	14.3%	32.9%	1.07	59.2%	B	2.16%	25.6%
ALK	ALASKA AIR GROUP INC	$62.43	$7,698	(1.7)	(5.4)	(9.5)	(0.7)	(10.5)	(15.1)	5.4	-6.1%	12.4%	-9.3%	-37.3%	35.8%	30.5%	1.22	44.4%	A-	1.75%	20.0%
SAVE	SPIRIT AIRLINES INC	$61.43	$4,194	1.7	15.9	26.7	62.4	43.2	37.0	16.9	27.5%	-5.5%	-19.4%	11.4%	22.6%	32.3%	-0.08	96.6%		0.00%	
ALGT	ALLEGIANT TRAVEL CO	$125.12	$2,022	(0.2)	2.6	(1.2)	(17.8)	(14.4)	(19.1)	19.1	-9.5%	2.1%	-44.5%	30.3%	17.6%	24.1%	0.75	100.8%	B+	2.08%	22.3%
Average			$14,589	(0.1)	0.3	(4.0)	2.4	(7.3)	(10.5)	13.2	12.2%	0.8%	-17.5%	1.1%	19.2%	39.1%	0.99	61.8%		1.15%	18.1%
Median			$7,698	(0.2)	(1.3)	(5.9)	(0.7)	(14.4)	(19.1)	12.3	-6.1%	6.5%	-14.5%	11.4%	15.3%	32.6%	1.07	51.8%		1.04%	20.0%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			0.5%	11.9%	21.8%	9.2%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
LUV	http://www.southwest.com	19.4%	2.83	12.2	13.3	18.7	8.1	10.9	12.4	10.9	9.3%	1.36	14.5%	27.7%	9.8	8.1	9.6	8.1%	5.5%	4.4%	$18.06
JBLU	http://www.jetblue.com	12.2%	1.24	11.4	10.1	12.7	8.4	10.7	12.4	10.8	7.6%	0.78	9.1%	19.2%	8.5	5.7	5.7	9.7%	8.7%	7.1%	$14.48
AAL	http://www.aa.com	-395.7%	-27.65	4.6	8.2	10.7	11.8	6.2	7.6	6.6	5.3%	0.37	8.2%	7.3%	9.4	3.5	4.9	4.7%	4.5%	11.2%	-$1.23
DAL	http://www.delta.com	24.7%	2.80	11.0	9.2	11.4	11.3	8.6	10.1	8.9	8.2%	0.93	12.6%	18.3%	7.5	8.9	6.7	5.6%	3.7%	2.4%	$19.99
ALK	http://www.alaskaair.com	21.6%	2.03	12.4	12.1	11.1	9.9	10.5	15.0	11.0	10.3%	0.97	10.1%	17.9%	7.2	7.0	7.4	6.6%	6.4%	11.2%	$30.73
SAVE	http://www.spirit.com	12.4%	2.29	9.1	14.0	13.5	13.5	10.6	16.6	13.5	8.6%	1.58	12.9%	15.4%	9.2	7.9		19.7%	13.8%	15.4%	$26.86
ALGT	http://www.allegiantair.com	18.1%	3.10	13.0	12.6	21.1	9.9	11.0	13.1	11.1	7.9%	1.34	14.8%	14.3%	12.4	5.3	8.2	8.7%	9.9%	10.6%	$40.41
Average		-41.0%	-1.91	10.5	11.4	14.2	10.4	9.8	12.5	10.4	8.2%	1.05	11.7%	17.2%	9.1	6.6	7.1	9.0%	7.5%	8.9%	
Median		18.1%	2.29	11.4	12.1	12.7	9.9	10.6	12.4	10.9	8.2%	0.97	12.6%	17.9%	9.2	7.0	7.0	8.1%	6.4%	10.6%	
spx	S&P 500 INDEX			17.2	18.8	20.0			16.2	14.9											

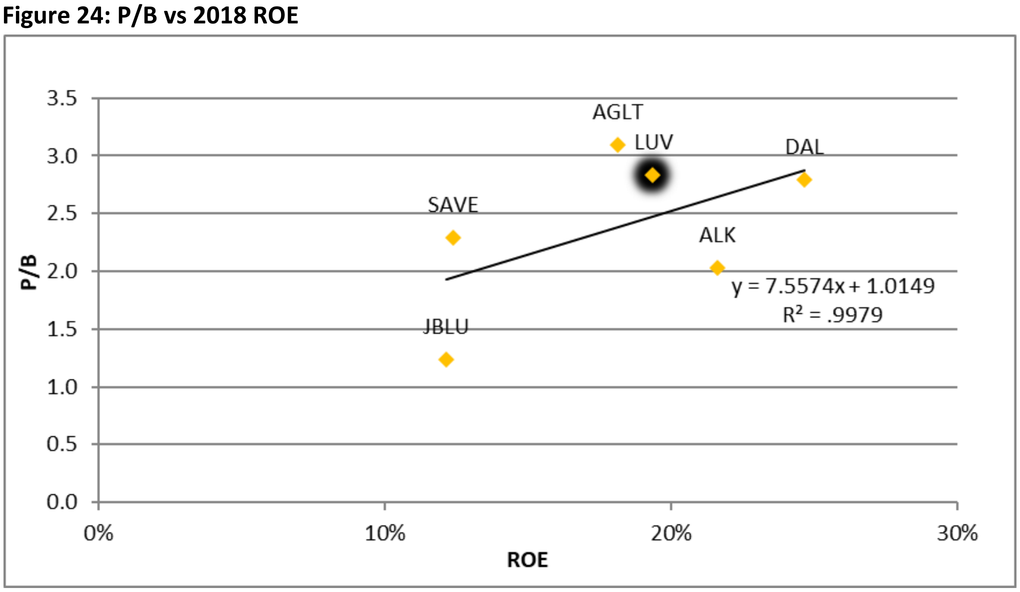
Source: FactSet

A more thorough analysis of P/B and ROE is shown in figure 24. The calculated R-squared of the regression indicates that over 99% of a sampled firm's P/B is explained by its 2018 ROE. Note that that American Airlines is excluded from this regression, because it has very high price/book ratio. LUV has the 2nd highest P/B and ROE of this grouping, and according to this measure, is slightly overvalued. Given the rising growth of low cost carriers, I believe that ROE will be more highly valued by investors in the coming months.

- Estimated P/B = Estimated 2019 ROE (21%) x 7.5574 + 1.0149 = 2.63
- Target Price = Estimated P/B (2.63) x 2019E BVPS (22.82) = $60.05

Discounting back to the present at a 10.56% cost of equity leads to a target price of $60.05 using this metric.

Figure 24: P/B vs 2018 ROE



Source: FactSet

15

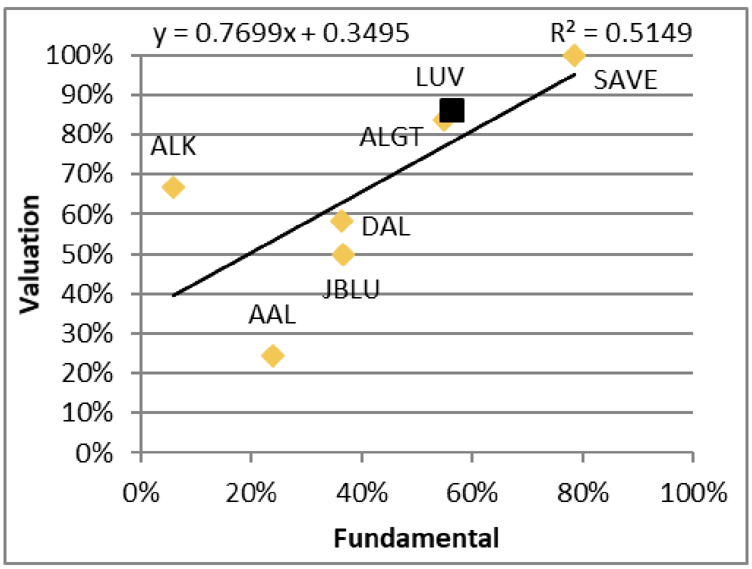
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. I applied the greatest fundamental value to the next twelve months of sales, the past five years of earnings growth, and 2019 earnings because the airline industry is very levered and cyclical which can affect sales variability from year to year. A 100% weight was placed into P/S because it is fitting for normalized valuation analysis. One can see that LUV is slightly above the line (R-squared is about 52%), so it is value based on its fundamentals is relatively captured using these metrics.

Figure 25: Composite valuation, % of range

		Weight		Fundamental			Valuation
				20%	20%	60%	100%
				Earnings	Growth	Sales Growth	P/S
Ticker	Name	Fund	Value	2019	Pst 5yr	NTM	
LUV	SOUTHWEST AIRLINES	56%	86%	58%	100%	41%	86%
JBLU	JETBLUE AIRWAYS CORP	37%	50%	-60%	93%	50%	50%
AAL	AMERICAN AIRLINES GROUP INC	24%	25%	-26%	70%	25%	25%
DAL	DELTA AIR LINES INC	36%	58%	39%	55%	29%	58%
ALK	ALASKA AIR GROUP INC	6%	67%	-123%	51%	34%	67%
SAVE	SPIRIT AIRLINES INC	78%	100%	38%	54%	100%	100%
ALGT	ALLEGIANT TRAVEL CO	55%	84%	100%	40%	45%	84%

Source: IMCP

Figure 26: Composite relative valuation



Source: Company Reports, IMCP

<u>Discounted Cash-Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 10.56% 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 3.00%.
- A ten-year beta of 1.08 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 10.56% (3.0% + 1.08 (10.0% – 3.0%)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash-flow to equity (FCFE). These per share cash-flows are forecasted to be $2.47 and $2.88, respectively. Discounting these cash-flows, using the cost of equity calculated above, results in a value of $4.59 per share. Thus, stage one of this discounted cash-flow analysis contributes $4.59 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 10.56% cost of equity. I assume 3.0% sales growth in 2021, remaining constant through 2025. The ratio of NWC to sales will remain at 2021 levels, and NFA turnover will remain constant at 1.02 in 2021 through 2025. However, the NOPAT margin is expected to fall to 11.0% in 2025 from 11.5% in 2021.

Figure 27: FCFE and discounted FCFE, 2019 – 2021

	2019	2020	2021	2022	2023	2024	2025
FCFE	$2.47	$2.88	$4.04	$4.10	$4.17	$4.23	$4.30
Discounted FCFE	$2.23	$2.36	$2.99	$2.75	$2.52	$2.32	$2.13

Added together, second stage discounted cash-flows total $12.70.

Stage Three – Net income for the years 2019 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $4.88 in 2019 to $5.60 in 2025.

Figure 28: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$4.88	$5.42	$5.19	$5.29	$5.39	$5.50	$5.60

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. By 2025, LUV's growth should be more reflective of the industry which has traded at a 10-year average P/E of 13.74. However, Southwest should still have better margins, so it deserves a premium at (11.48 + 2) 13.48.

Given the assumed terminal earnings per share of $5.60 and a price to earnings ratio of 13.48, a terminal value of $29.01 per share is calculated. Using the 10.56% cost of equity, this number is discounted back to a present value of $37.38.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash-flow model, an intrinsic value of **$54.67** is calculated (4.59 + 12.70 + 37.38). Given LUV's current price of $51.57, this model indicates that the stock is slightly undervalued.

Scenario Analysis

Southwest Airlines is difficult to value with certainty because it is cyclical (both revenues and costs) and operates in a competitive industry. Changes in the economic cycle, bargaining power of labor unions, which represents approximately 83% of LUV's employees, and the volatility of jet fuel prices contribute to significant variability in the airline industry. Considering these assumptions, I also value LUV under bull and bear case scenarios.

Sales Growth – Bull growth assumes that LUV will gain market share. Under this assumption, I increase sales growth from 7.5% to 10.5% in 2019 and a 6.1% to 6.6% growth in 2020. This will reverse the decreasing sales growth trend from 2015 to 2018. Bear growth assumes that LUV will experience a decrease in sales growth from 7.5% to 5.3% in 2019 and a 6.1% to 2.9% in 2020. This scenario may occur if LUV does not keep up with consumer demand by investing in infrastructure and better services for its customers, or an economic downturn arises that could negatively affect the airline industry as a whole as travel demand decreases.

Gross Margin – The bull scenario assumes an increase in gross margin from 36.3% to 39.4% in 2019 and 35.8% to 26.3% in 2020. The bear scenario suggests that gross margin would decrease from 36.3% to 33.3% in 2019 and 35.8% to 31.7% in 2020. An unexpected increase in the price of oil that LUV's derivative contracts do not cover could cause margins to fall.

Operating Efficiency – LUV's primary competitive advantage is that it is able to offer low fares because of above average operating margins. LUV has made significant efforts to remain competitive in this regard by implementing a new reservation system in 2017 that was designed to improve flight scheduling, inventory management, enable revenue enhancements, support international growth, and enable other foundational operational capabilities. LUV's use of a single aircraft type allows for simplified scheduling, maintenance, training, flight operations, and fuel efficiency. The bull scenario assumes an increase in the EBIT margin from 16.1% to 18.8% in 2019 and 15.3% to 16.5% in 2020. EPS would increase from to $5.89 in 2019 and $5.73 in 2020. The valuation of the stock would be $63.92. The bear scenario assumes a decrease in the EBIT margin from 16.1% to 14.3% in 2019 and 15.3% to 12.6% in 2020. EPS would decrease to $4.20 in 2019 and $3.95 in 2020. The valuation of the stock would be $46.23.

Business Risks

Economic Downturns:

The airline industry is naturally sensitive to changes in economic conditions, especially in the event of unfavorable downturns. The airline industry is also subject to high fixed costs, high variable costs, and unpredictable demand. From a historical perspective, unfortunate U.S. economic events have created travel patterns and resulted in reduced spending for both leisure and business travel. Unfavorable economic conditions have also hindered airlines' ability to raise fares to offset any increases in fuel, labor, and other costs. Even though the U.S. economy has experienced the longest bull market in history over the past 10 years, any continuing or future U.S. or global negative economic events could affect operations and cause the company to change its business strategies.

Jet Fuel Prices:

LUV's profitability can be can be heavily impacted by volatile fuel prices, and its operations are vulnerable to interruption in the event of any delayed supply of fuel; therefore, its future profitability is likely to be impacted by its ability to effectively address fuel price increases, volatility, and availability, primarily by hedging strategies. In addition, LUV is subject to the risk that its fuel derivatives will not be efficient, which can create additional earnings volatility.

Labor issues:

The airline industry is labor intensive. Salaries, wages, and benefits present the largest source of LUV's operating expenses. As of December 31, 2017, approximately 83% of its employees were represented for collective bargaining purposes by labor unions, making it vulnerable in the event of labor-related job actions. Some employment-related issues include hiring/retention rates, pay rates, outsourcing costs, work rules, health care costs, and retirement benefits.

Competition:

Since LUV's inception, its low-cost structure has been one of its primary competitive advantages in the airline industry. LUV's low-cost position has become even more significant with the increased number of ULCCs entering into the airline industry. This has made it difficult for LUV to improve upon its industry cost position. As competitors continue to grow their fleets and broaden their organizations, they are likely able to better control costs per available seat mile. Some competitors like LUV have added a significant number of new and various aircraft to their fleets, which could possibly decrease their operating costs through more efficient fuel usage and lower maintenance costs.

Single Supplier:

LUV is currently dependent on Boeing as its only supplier for aircraft and a significant portion of its aircraft parts and is dependent on other suppliers for specific aircraft parts. Even though LUV is able to purchase some aircraft from different companies other than Boeing, the majority of its purchases are primarily from Boeing. As a result, if it was not able to gain access to additional aircraft from Boeing, LUV's operation would be negatively affected. Additionally, it is also reliant on sole suppliers for aircraft engines and other aircraft parts and would be adversely affected in the event of unavailability of parts, or mechanical or regulatory problems related to engines and other parts.

Weather & Disastrous events:

Bad weather, terrorist attacks, and other hostilities - whether actual or threatened have historically negatively impacted the demand for air travel and also have forced increased safety and security costs. Safety measures produce delays and difficulties that can reduce LUV's competitiveness against surface transportation for short-distance routes.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

The barriers to entry are remarkably high in the airline industry. Operating costs are significant, which makes it difficult to acquire profitable margins for new entrants. Additionally, technology systems and government regulations in the airline industry limit the number of new companies that are reasonably able to succeed.

Threat of Substitutes - Moderate

Alternate modes of transportation such as trains, automobiles, and ships force the airline industry to consistently compete on lowering airfares with other low-cost substitutes. The primary competitive advantage that the airline industry does have, is traveling by plane is currently the fastest mode of transportation.

Supplier Power - High

There are few suppliers in the airline industry. This gives airline manufacturers the power to control pricing on inputs such as fuel, craft, technology, and skilled labor. Fuel prices are subject to changes based on economic and political factors. The craft and technology suppliers are scarce in number and aviation brands depend on them for fuel efficient, fast and quality aircrafts. The two primary aircraft manufacturers are Boeing and Airbus. LUV purchases all of its 737 aircrafts from Boeing. Overall, there is a big investment in purchase, maintenance and aircraft upkeep through highly paid labor professionals.

Buyer Power – Very High

Bargaining power of buyers has remarkably increased significantly since the 2008 recession. Airlines focus on passenger safety, convenience, loyalty programs, low airfares, and creating a great experience overall to gain customers. There are about 80 different airlines within the U.S. that give consumers many options. LUV is the leader among low-cost carriers.

Intensity of Competition – Very High

The presence of low-cost carriers has intensified the competition in the airline industry. The majority of airlines have reduced prices and focused on increasing the quality of customer service to remain competitive with low-cost carriers like LUV. Investment in marketing has grown in attracting customers and gaining market share. The overall outcome is that low-cost carriers have grown in size and high-cost carriers have been forced to provide better customer service.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Very Profitable Low Cost Great Customer Service	Few Flights to International Locations Dependent on one Supplier - Boeing Only one Class of Seating - Coach
Opportunities	**Threats**
Broader Coverage Internationally Revenue from Freight New Plane Technology	Rising Costs Increased Government Regulations Currency Volatility

Appendix 3: Income Statement

Income Statement (in millions)							
Items	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**
Sales	18,605	19,820	20,425	21,171	21,912	23,555	24,992
Direct costs	13,115	12,410	12,925	13,751	14,929	15,005	16,045
Gross Margin	5,490	7,410	7,500	7,420	6,983	8,550	8,947
SG&A and other	3,265	3,294	3,740	3,905	4,159	4,748	4,913
EBIT	2,225	4,116	3,760	3,515	2,824	3,802	4,034
Interest	409	637	213	264	166	175	189
EBT	1,816	3,479	3,547	3,251	2,658	3,627	3,845
Taxes	680	1,298	1,303	(237)	637	869	921
Net income	1,136	2,181	2,244	3,488	2,021	2,758	2,923
Basic Shares	688	661	627	601	590	565	539
EPS	$1.65	$3.30	$3.58	$5.80	$3.43	$4.88	$5.42
DPS	$0.22	$0.28	$0.37	$0.47	$0.59	$0.70	$0.80

Appendix 4: Balance Sheets

Balance Sheet (in millions)							
Items	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**
Cash	1,282	1,583	1,680	1,495	2,630	2,652	2,898
Operating assets ex cash	2,645	2,441	2,818	3,320	4,371	4,699	4,985
Operating assets	3,927	4,024	4,498	4,815	7,001	7,350	7,883
Operating liabilities	5,665	6,769	6,278	6,557	7,705	8,283	8,788
NOWC	(1,738)	(2,745)	(1,780)	(1,742)	(704)	(932)	(905)
NOWC ex cash (NWC)	(3,020)	(4,328)	(3,460)	(3,237)	(3,334)	(3,584)	(3,803)
NFA	15,796	17,288	18,788	20,295	21,528	23,142	24,554
Invested capital	14,058	14,543	17,008	18,553	20,824	22,210	23,649
Marketable securities	-	-	-	-	-	-	-
Total assets	19,723	21,312	23,286	25,110	28,529	30,493	32,437
Short-term and long-term debt	2,692	3,178	3,387	3,668	3,734	4,058	4,382
Other liabilities	4,591	4,007	5,180	4,455	5,259	5,259	5,259
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	6,775	7,358	8,441	10,430	11,831	12,893	14,008
Total supplied capital	14,058	14,543	17,008	18,553	20,824	22,210	23,649
Total liabilities and equity	19,723	21,312	23,286	25,110	28,529	30,493	32,437

Appendix 5: Sales Forecast

Sales (in millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Sales	18,605	19,820	20,425	21,171	21,912	23,555	24,992
Growth		6.53%	3.05%	3.65%	3.50%	7.50%	6.10%
Passenger	17,658	18,299	18,594	19,141	20,357	21,980	23,478
Growth		3.63%	1.61%	2.94%	6.35%	7.97%	6.82%
% of sales	94.91%	92.33%	91.04%	90.41%	92.90%	93.31%	93.94%
Freight	175	179	171	173	176	181	179
Growth		2.29%	-4.47%	1.17%	1.73%	2.84%	-1.10%
% of sales	0.94%	0.90%	0.84%	0.82%	0.80%	2.00%	0.72%
Other	772	1,170	1,660	1,857	1,379	1,394	2,208
Growth		51.55%	41.88%	11.87%	-25.74%	1.09%	58.39%
% of sales	4.15%	5.90%	8.13%	8.77%	6.29%	5.92%	6.00%

Appendix 6: Ratios

Ratios							
Item	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	29.5%	37.4%	36.7%	35.0%	31.9%	36.3%	35.8%
Operating (EBIT) margin	12.0%	20.8%	18.4%	16.6%	12.9%	16.1%	16.1%
Net profit margin	6.1%	11.0%	11.0%	16.5%	9.2%	11.7%	11.7%
Activity							
NFA (gross) turnover		1.20	1.13	1.08	1.05	1.05	1.05
Total asset turnover		0.97	0.92	0.87	0.82	0.80	0.79
Liquidity							
Op asset / op liab	0.69	0.59	0.72	0.73	0.91	0.89	0.90
NOWC Percent of sales		-11.3%	-11.1%	-8.3%	-5.6%	-3.5%	-3.7%
Solvency							
Debt to assets	13.6%	14.9%	14.5%	14.6%	13.1%	13.3%	13.5%
Debt to equity	39.7%	43.2%	40.1%	35.2%	31.6%	31.5%	31.3%
Other liab to assets	23.3%	18.8%	22.2%	17.7%	18.4%	17.2%	16.2%
Total debt to assets	36.9%	33.7%	36.8%	32.3%	31.5%	30.6%	29.7%
Total liabilities to assets	65.6%	65.5%	63.8%	58.5%	58.5%	57.7%	56.8%
Debt to EBIT	1.21	0.77	0.90	1.04	1.32	1.07	1.09
EBIT/interest	5.44	6.46	17.65	13.31	17.01	21.76	21.31
Debt to total net op capital	19.1%	21.9%	19.9%	19.8%	17.9%	18.3%	18.5%
ROIC							
NOPAT to sales	7.5%	13.0%	11.6%	17.8%	9.8%	12.3%	12.3%
Sales to NWC		(5.39)	(5.25)	(6.32)	(6.67)	(6.81)	(6.77)
Sales to NFA		1.20	1.13	1.08	1.05	1.05	1.05
Sales to IC ex cash		1.54	1.44	1.31	1.24	1.25	1.24
Total ROIC ex cash		20.1%	16.8%	23.3%	12.2%	15.3%	15.2%
NOPAT to sales	7.48%	13.02%	11.65%	17.81%	9.80%	12.27%	12.27%
Sales to NOWC		(8.84)	(9.03)	(12.02)	(17.92)	(28.79)	(27.21)
Sales to NFA		1.20	1.13	1.08	1.05	1.05	1.05
Sales to IC		1.39	1.29	1.19	1.11	1.09	1.09
Total ROIC		18.0%	15.1%	21.2%	10.9%	13.4%	13.4%
NOPAT to sales	7.5%	13.0%	11.6%	17.8%	9.8%	12.3%	12.3%
Sales to EOY NWC	(6.16)	(4.58)	(5.90)	(6.54)	(6.57)	(6.57)	(6.57)
Sales to EOY NFA	1.18	1.15	1.09	1.04	1.02	1.02	1.02
Sales to EOY IC ex cash	1.46	1.53	1.33	1.24	1.20	1.20	1.20
Total ROIC using EOY IC ex cash	10.9%	19.9%	15.5%	22.1%	11.8%	14.8%	14.8%
NOPAT to sales	7.5%	13.0%	11.6%	17.8%	9.8%	12.3%	12.3%
Sales to EOY NOWC	(10.70)	(7.22)	(11.47)	(12.15)	(31.13)	(25.27)	(27.62)
Sales to EOY NFA	1.18	1.15	1.09	1.04	1.02	1.02	1.02
Sales to EOY IC	1.32	1.36	1.20	1.14	1.05	1.06	1.06
Total ROIC using EOY IC	9.9%	17.7%	14.0%	20.3%	10.3%	13.0%	13.0%
ROE							
5-stage							
EBIT / sales		20.8%	18.4%	16.6%	12.9%	16.1%	16.1%
Sales / avg assets		96.6%	91.6%	87.5%	81.7%	79.8%	79.4%
EBT / EBIT		84.5%	94.3%	92.5%	94.1%	95.4%	95.3%
Net income /EBT		62.7%	63.3%	107.3%	76.0%	76.0%	76.0%
ROA		10.6%	10.1%	14.4%	7.5%	9.3%	9.3%
Avg assets / avg equity		2.90	2.82	2.56	2.41	2.39	2.34
ROE		30.9%	28.4%	37.0%	18.2%	22.3%	21.7%
3-stage							
Net income / sales		11.0%	11.0%	16.5%	9.2%	11.7%	11.7%
Sales / avg assets		0.97	0.92	0.87	0.82	0.80	0.79
ROA		10.6%	10.1%	14.4%	7.5%	9.3%	9.3%
Avg assets / avg equity		2.90	2.82	2.56	2.41	2.39	2.34
ROE		30.9%	28.4%	37.0%	18.2%	22.3%	21.7%
Payout Ratio		8.6%	10.5%	8.2%	17.2%	14.4%	14.8%
Retention Ratio		91.4%	89.5%	91.8%	82.8%	85.6%	85.2%
Sustainable Growth Rate		28.2%	25.4%	33.9%	15.0%	19.1%	18.5%

Appendix 7: 3-stage DCF Model

First Stage			Second Stage				
Cash flows	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Sales Growth	7.5%	6.1%	3.0%	3.0%	3.0%	3.0%	3.0%
NOPAT / S	12.3%	11.6%	11.5%	11.3%	11.2%	11.1%	11.0%
S / NWC	(6.57)	(6.57)	(6.57)	(6.57)	(6.57)	(6.57)	(6.57)
S / NFA (EOY)	1.02	1.02	1.02	1.02	1.02	1.02	1.02
S / IC (EOY)	1.20	1.20	1.20	1.20	1.20	1.20	1.20
ROIC (EOY)	14.8%	13.9%	13.8%	13.7%	13.5%	13.4%	13.2%
ROIC (BOY)		14.8%	14.2%	14.1%	13.9%	13.8%	13.6%
Share Growth		-4.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Sales	$23,555	$24,992	$25,742	$26,514	$27,309	$28,129	$28,973
NOPAT	$2,891	$2,891	$2,948	$3,007	$3,066	$3,126	$3,187
Growth		0.0%	2.0%	2.0%	2.0%	2.0%	1.9%
- Change in NWC	-250	-219	-114	-118	-121	-125	-128
NWC EOY	-3584	-3803	-3917	-4034	-4155	-4280	-4408
Growth NWC		6.1%	3.0%	3.0%	3.0%	3.0%	3.0%
- Chg NFA	$1,614	$1,412	$737	$759	$781	$805	$829
NFA EOY	$23,142	$24,554	$25,291	$26,049	$26,831	$27,636	$28,465
Growth NFA		6.10%	3.00%	3.00%	3.00%	3.00%	3.00%
Total inv in op cap	1364	1193	623	641	660	680	701
Total net op cap	19558	20751	21374	22015	22676	23356	24057
FCFF	$1,527	$1,698	$2,326	$2,366	$2,406	$2,446	$2,486
% of sales	6.5%	6.8%	9.0%	8.9%	8.8%	8.7%	8.6%
Growth		11.2%	37.0%	1.7%	1.7%	1.7%	1.7%
- Interest (1-tax rate)	133	144	148	153	157	162	167
Growth		8.3%	3.0%	3.0%	3.0%	3.0%	3.0%
+ Net new debt	324	324	131	135	139	144	148
Debt	4058	4382	4513	4649	4788	4932	5080
Debt / tot net op capital	20.7%	21.1%	21.1%	21.1%	21.1%	21.1%	21.1%
FCFE w/o debt	$1,393.75	$1,553.75	$2,177.59	$2,212.85	$2,248.26	$2,283.81	$2,319.47
% of sales	5.9%	6.2%	8.5%	8.3%	8.2%	8.1%	8.0%
Growth		11.5%	40.2%	1.6%	1.6%	1.6%	1.6%
/ No Shares	565	539	539	539	539	539	539
FCFE	$2.47	$2.88	$4.04	$4.10	$4.17	$4.23	$4.30
Growth		16.9%	40.2%	1.6%	1.6%	1.6%	1.6%
* Discount factor	0.90	0.82	0.74	0.67	0.61	0.55	0.50
Discounted FCFE	$2.23	$2.36	$2.99	$2.75	$2.52	$2.32	$2.13
Third Stage							
Terminal value P/E							
Net income	$2,758	$2,923	$2,800	$2,854	$2,909	$2,964	$3,020
% of sales	11.7%	11.7%	10.9%	10.8%	10.7%	10.5%	10.4%
EPS	$4.88	$5.42	$5.19	$5.29	$5.39	$5.50	$5.60
Growth		11.1%	-4.2%	1.9%	1.9%	1.9%	1.9%
Terminal P/E							13.48
* Terminal EPS							$5.60
Terminal value							$75.48
* Discount factor							0.50
Discounted terminal value							$37.38

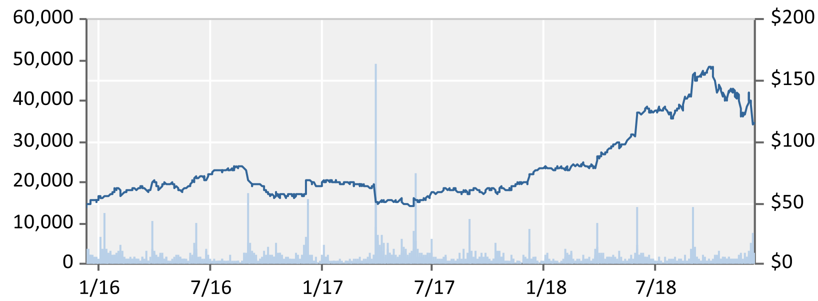
Summary

First stage	$4.59	Present value of first 2 year cash flow	
Second stage	$12.70	Present value of year 3-7 cash flow	
Third stage	$37.38	Present value of terminal value P/E	
Value (CG)	$54.67	= value at beg of fiscal yr	2019

Apparel Retail

Lululemon Athletica, Inc.

Recommendation	Neutral
Target (today's value)	$140
Current Price	$122.65
52 week range	$73.74 - $164.79



Source: FactSet Prices

Share Data	
Ticker:	LULU
Market Cap. (Billion):	$15.47
Inside Ownership	14.7%
Inst. Ownership	79.0%
Beta	0.95
Dividend Yield	0.0%
Payout Ratio	0.0%
Cons. Long-Term Growth Rate	21.3%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$2.06	$2.34	$2.65	$3.32	$4.00
Gr %	-	13.8%	13.0%	25.4%	20.4%
Cons	-	-	-	$32.5	$36.8
EPS					
Year	$1.90	$2.21	$1.90	$3.61	$4.40
Gr %	-	16.2%	(14.1%)	89.7%	21.8%
Cons	-	-	-	$3.69	$4.34

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	25.2%	25.4%	17.5%	28.3%	29.2%
Industry	17.4%	15.6%	11.9%	16.9%	16.8%
NPM (%)	12.9%	12.9%	9.8%	15.2%	15.6%
Industry	6.3%	5.7%	4.4%	5.8%	5.9%
A. T/O	1.58	1.58	1.45	1.51	1.44
ROA (%)	20.4%	20.4%	14.1%	23.0%	22.5%
Industry	10.6%	9.8%	7.5%	9.9%	9.6%
S/NFA	5.55	5.26	5.01	5.24	5.15

Valuation	'17	'18	'19E	'20E
P/E	33.3	37.8	31.6	26.9
Industry	28.1	43.6	17.5	16.4
P/S	4.0	4.4	4.7	4.2
P/B	7.7	7.6	9.5	7.8
P/CF	24.3	27.7	27.5	23.8
EV/EBITDA	23.0	19.7	21.0	18.0

Performance	Stock	Industry
1 Month	(15.1%)	(16.9%)
3 Month	(23.7%)	(19.3%)
YTD	48.7%	2.8%
52-week	58.7%	5.9%
3-year	153.4%	(10.2)%

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Summary: I recommend a neutral rating with a target of $140. Although LULU has potential for significant earnings growth along with momentum from excited investors about future growth, I believe that the market has already priced in the majority of the opportunity. If LULU misses its estimates, the stock will fall substantially. For this reason, I believe the uncertainty and risks associated with growth outweigh its growth potential.

Key Drivers:

- International presence: Only 9.3% of LULU's revenue comes from sales outside of North America. This provides LULU with the potential for significant international sales expansion.

- Direct to consumer sales: LULU's greatest revenue segment growth is in online sales. This will enable the firm to lower its costs while reaching more customers and new markets.

- Same store sales: Apparel retailers are continuously adjusting to the latest trends and styles in the fashion industry. Lululemon has been hitting the popular trends with correct styles, cuts, and colors. Building brand recognition to stand out from its competitors has helped the firm maintain same store sales growth.

- Men's business: Lululemon is traditionally known for its women's apparel. However, the men's segments offers the firm tremendous growth opportunities. LULU has experienced recent store square footage growth as the company works to reconstruct stores to highlight its growing men's line.

Valuation: Using a relative valuation approach, Lululemon appears to be overvalued in comparison to the retail apparel industry. However, I believe that the DCF analysis provides a fairer valuation as it incorporates assumptions that reflect LULU's ongoing growth. DCF work suggest the stock is worth $156. A combination of the approaches suggests that Lululemon is undervalued, as the stock's value is about $140 and the shares trade at $122.65.

Risks: Threats to the business include reputation of the brand, international success, dependency on suppliers, and a growing competitive technical athletic apparel industry.

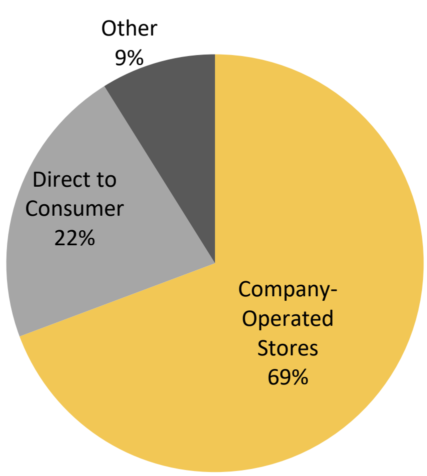
Company Overview

Lululemon Athletica Inc. (LULU) is a specialty designer, distributor, and retailer of active lifestyle driven athletic apparel and accessories. Its apparel product line for women, men, and female youth includes: pants, shorts, tops, and jackets meant for athletic activities such as yoga, weightlifting, running, and training. The athletic accessory line includes products such as socks, bags, underwear, yoga mats, headbands, and water bottles. Lululemon's design team utilizes cutting-edge fabrics combined with creative feels and looks that makes it attractive to those seeking an active lifestyle. Lululemon operates with a vertical retail strategy that allows it to interact and receive advice and concerns from customers. In this sense, Lululemon is able to design and manufacture products that resolve issues customers are experiencing. LULU's customer base is mostly made up of women, although the men's segment is growing with a target strategy in place to attract more male customers. Lululemon operates corporate-owned stores in North America, Europe, and Asia, plus direct to consumer operations in North America, Europe, and Asia are helping expand LULU's brand recognition. Lululemon Athletica is headquartered in Vancouver, British Columbia.

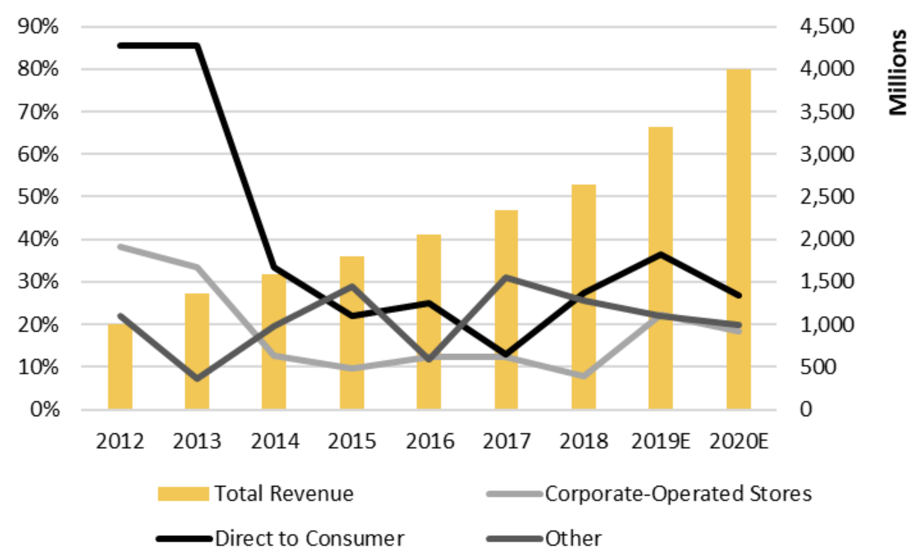
Lululemon Athletica generates 69.3% of its revenue from company-operated stores, 21.8% from its direct to consumer sales, and 8.9% from other.

- Company-Operated Stores: Net revenue from company-operated stores increased 8% in fiscal 2017 from fiscal 2016. This was heavily driven by the opening of 46 net new Lululemon branded stores in fiscal 2017 out of a total of 404. These new stores were located in North America, Asia Pacific, and Europe.
- Direct to Consumer: Income generated from the direct to consumer segment increased 27% in fiscal 2017. This was primarily driven by an increase in e-commerce traffic, improved conversion-rates, and a surge in dollar value per transaction. LULU also hosted an online warehouse sale in the United States and Canada that generated $12.3 million in revenue.
- Other: LULU's other segment includes revenue from outlets and warehouses, temporary locations, wholesale, showrooms, and license and supply agreements. Revenue from other increased 26% in fiscal 2017 primarily due to an increase in the number of outlets.

Figures 1 and 2: Revenue Sources for LULU, year-end 2017 (left) and Revenue history and sales growth rates since 2009



Source: Company reports



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Business/Industry Drivers

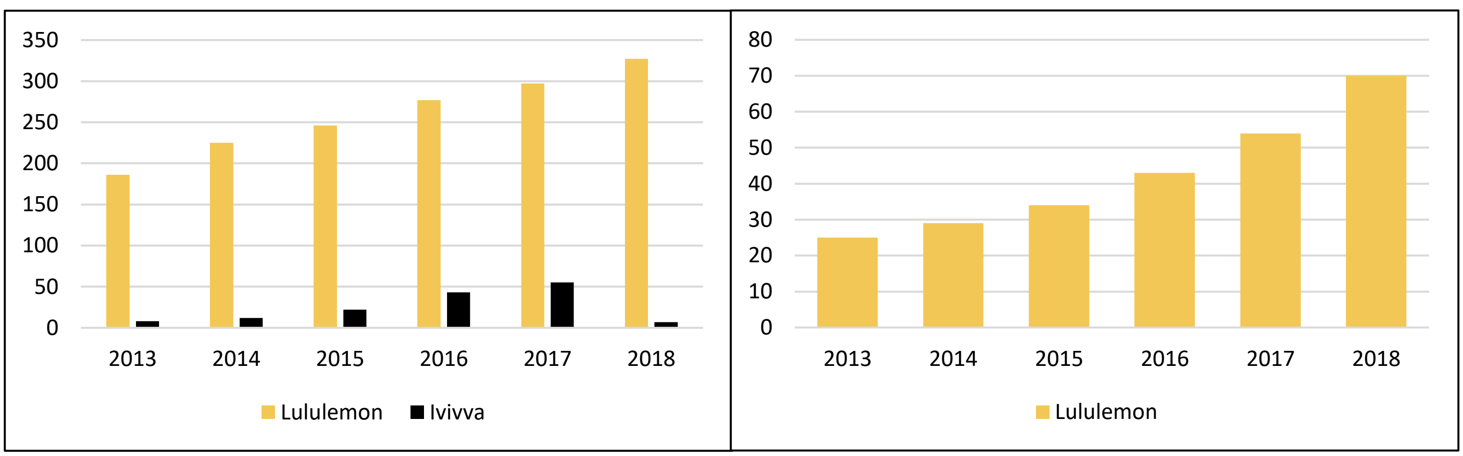
Though there are several factors that may influence Lululemon's future success, the following are the most significant business drivers:

1) Number of locations and international presence
2) Direct to consumer sales growth
3) Same store sales
4) Men's business
5) Macroeconomic trends

<u>Number of locations and International Presence</u>

In fiscal 2018, Lululemon opened 46 net new company-operated stores, which included 16 net new stores outside of North America. LULU performs ongoing evaluations of its company-operated stores and in fiscal 2017 closed three Lululemon branded company-operated stores. In August of 2017, LULU closed 48 of their 55 Ivivva branded company-operated stores as part of its restructuring process. While there is a demand for athletic wear for younger girls, the frequency and the demand is not adequate enough for several expensive stores. The firm hopes to obtain a small operating profit by closing most of the Ivivva stores. The seven outstanding Ivivva stores are expected to stay open. Furthermore, the firm's line of younger girls athletic apparel will continue to be sold online.

Figures 3 and 4: Number of LULU Locations by Brand, North America (left) and International (right)



Source: Company reports

To predict the potential number of Lululemon stores outside of North America, I tried to forecast the number of store potential in China and in Europe based on United States numbers. I calculated how many stores there are per person in the United States and then simulated store potential in China and Europe to have the same number of stores per person as the United States while keeping the US stores constant. For China, I specifically targeted its middle class population as Lululemon products are relatively expensive. Through this analysis, China and Europe to have the ability to have 242 and 418 stores, respectively. This will require a 20.36% store growth rate in China and a 26.03% store growth rate in Europe over the next 15 years, and could more than triple the number of overall stores. However, this analysis faces lots of uncertainty and is reliant on management's ability to successfully penetrate these markets and have the LULU brand be accepted by foreign consumers.

Figure 5: Potential Number of Stores in China and Europe

	United States	China (Middle Class)	Europe
Population	579000000	430000000	741400000
Number of Stores	327	15	13
People Per Store	1770642	1770642	1770642
Potential Number of Stores	**327**	**243**	**419**
Projected Store Growth Rate Over 15 Years	**-**	**20.36%**	**26.03%**

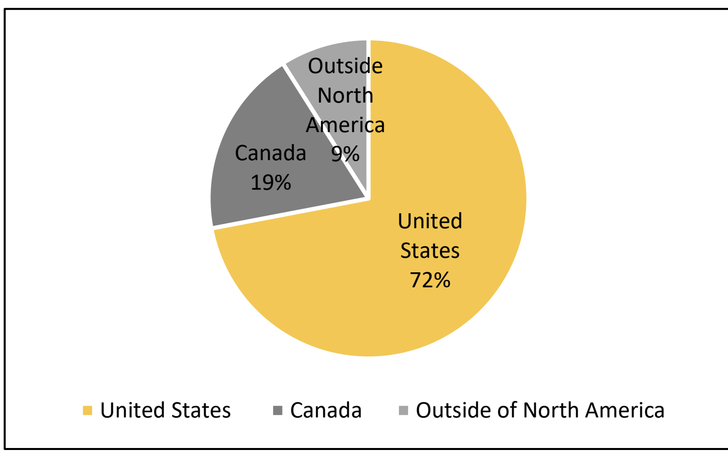
Source: IMCP

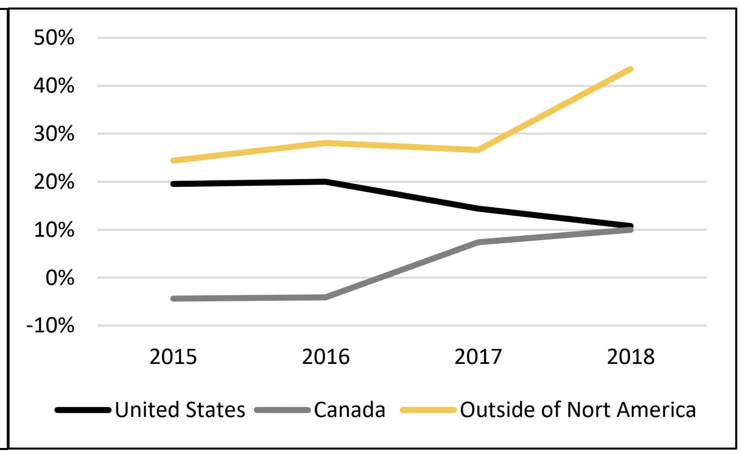
In August of 2017, LULU closed 48 of its 55 Ivivva branded company-operated stores.

LULU generated 90% of its revenue from the United States and Canada. Expanding outside of North America is critical to the continued future success of Lululemon. LULU has been escalating its international presence in Europe (Germany and the United Kingdom) and Asia Pacific (China, South Korea, and Japan). Future international success will be dependent on management's ability to overcome obstacles such as cultural and linguistic differences, different regulations, labor and market practices, and limited brand recognition. The firm has a good management team with the experience helping LULU grow. The firm recently hired Calvin McDonald as the CEO. Prior to joining Lululemon, McDonald was the President and CEO of Americas for Sephora (20113-2018). As the CEO, he led Sephora to years of double-digit top-line growth, expanded product offerings, enhanced both digital and store experiences, and globally expanded Sephora's presence in Mexico and Brazil. Sephora is known for its quality products, unique store experience, and a top digital shopping experience. McDonald's track record at Sephora looks very promising for Lululemon.

As of January 2018, LULU had 57 stores in Asia Pacific and 13 stores in Europe. The firm opened a new store in Munich, Germany, as well as nine new stores in China. Furthermore, LULU has been able to expand its local e-commerce presence in China via Tmall, an online marketplace developed specifically for Chinese consumers.

Figures 6 and 7: LULU's 2017 Sales by Geographic Region and Revenue Growth by Region





Source: Company reports

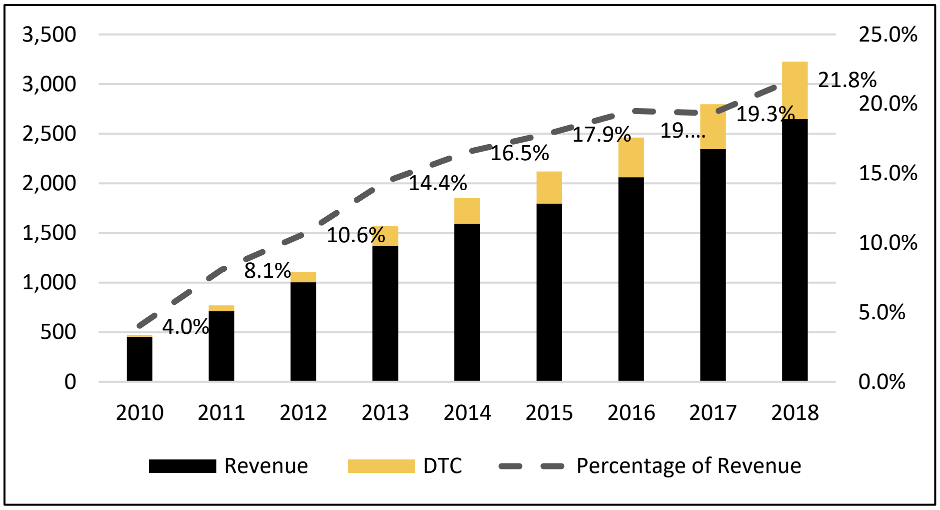
Direct to Consumer Sales

LULU's direct to consumer segment includes its net revenue generated from its e-commerce website www.lululemon.com, country and region specific websites, and its mobile apps. The direct to consumer segment makes Lululemon products more reachable to additional markets than company-operated stores alone. For instance, LULU entered into license and supply agreements with partners in Mexico and the Middle East, which allows LULU the right to run LULU retail locations in the United Arab Emirates, Kuwait, Qatar, Oman, Bahrain, and Mexico. Under these agreements, LULU has the right to sell its products through e-commerce website in these countries.

In fiscal 2018, LULU's revenue from operations from its direct to consumer segment increased roughly 24% from fiscal 2017. However, this increase in revenue was partially offset by an increase in Lululemon's selling, general, and administrative expenses. These expenses are directly related to LULU's online sales as the increase comes from online marketing, website costs, packaging and distribution, and credit card fees.

Lululemon's DTC sales have increasingly become a larger part of total sales.

Figure 8: Direct to Consumer Sales (in millions) and Total Percentage of Sales



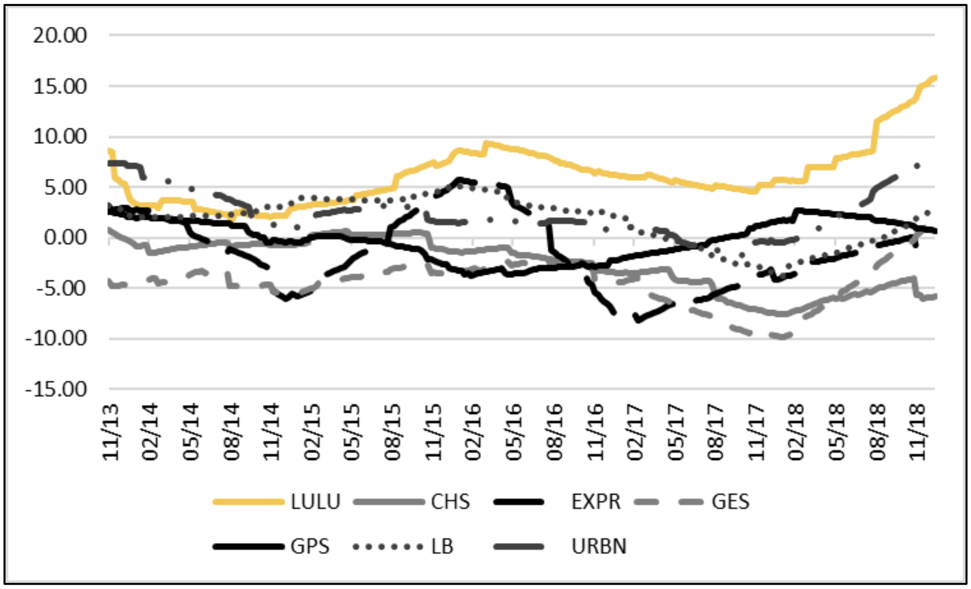
Source: Bloomberg

Same Store Sales

For the fiscal year ended January 28, 2018, LULU's total comparable sales, which includes same store sales as well as direct to consumer sales, increased 7% on a constant dollar basis compared to fiscal 2016. Same store sales increased 1% on a constant dollar basis. The 1% same store sales increase between fiscal 2016 and 2017, led to a $12.8 million increase to net revenue. This increase was chiefly due to increased dollar value per sales transaction.

LULU's same store sales are greater than its competitors in specialty apparel.

Figure 9: Same Store Sales vs Competitors

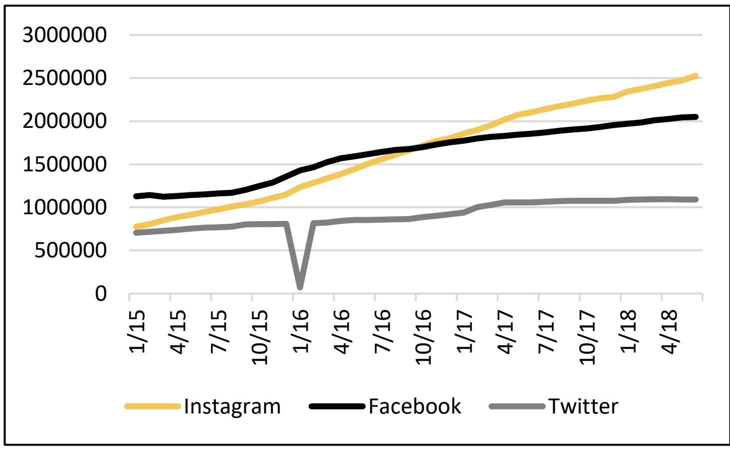


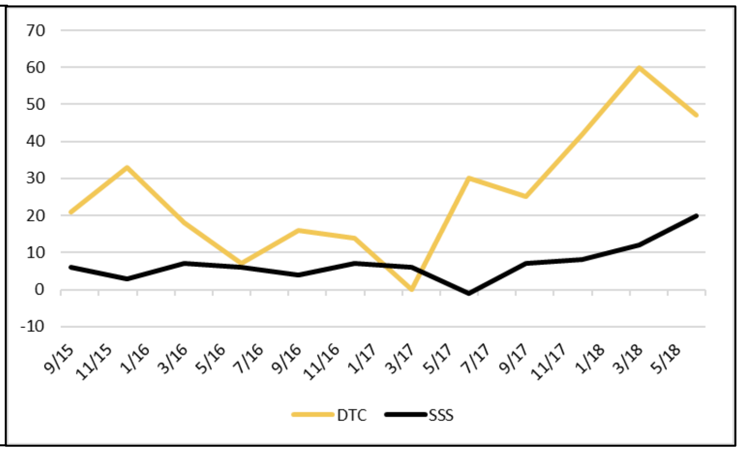
Source: Bloomberg

Increased social media presence has grown LULU's brand and resulted in more sales.

Apparel retailer are constantly adjusting to the latest trends and styles in the fashion industry. LULU has been hitting the popular trends correctly with correct styles, cuts, and colors. LULU has spent a lot of money on marketing with the intention of building brand recognition to stand out from its competitors. This is illustrated through LULU's growing social media followers. LULU's social media presence has worked to entice customers to their stores. Furthermore, LULU's marketing efforts have had a positive impact on their online sales with their direct to consumer sales growing. The trend has been for consumers to complete more and more of their shopping online rather than in-store and LULU is no exception.

Figures 10 and 11: Social Media Followers (left), Direct to Consumer SSS vs SSS (right)





Source: Bloomberg

6

Men's Business

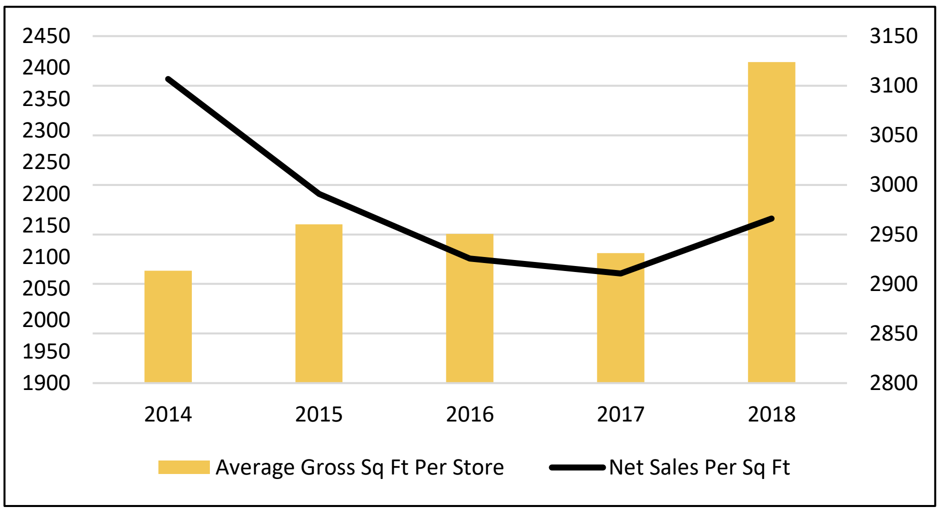
Lululemon is traditionally known for its women's athletic apparel. However, the men's segment offers a tremendous growth opportunity for LULU. Management made its men's business segment one of its four key strategic growth pillars for fiscal 2018. In fiscal 2017, LULU expanded the ABC pant franchise to keep with current fashion trends and include slim and jogger style pants. Additionally, all of the firm's men's fixed waist bottoms now feature the popular ABC construction.

LULU launched its first global marketing campaign aimed at men called "Strength to Be." This marketing campaign has helped LULU's business grow as more and more men are attracted to its distinctive brand name, the technical consistency of the clothing, and the quality of products. Management forecasts that this men's segment will grow from 19% total sales today to 25% of total sales by 2020.

The focus on growing the men's business is evident in square footage growth. In 2017, LULU's square footage growth was 14%, excluding the Ivivva closures. LULU launched "co-located" stores, which offer a more comprehensive expression of its men's line. Management expects this program to accelerate in 2018 with roughly 20 to 25 out 409 stores in this new format.

Net sales per sq. foot is increasing as men's clothing takes up more space in LULU stores.

Figure 12: LULU's Average Gross Sq. Ft per Store and their Net Sales per Sq. Ft

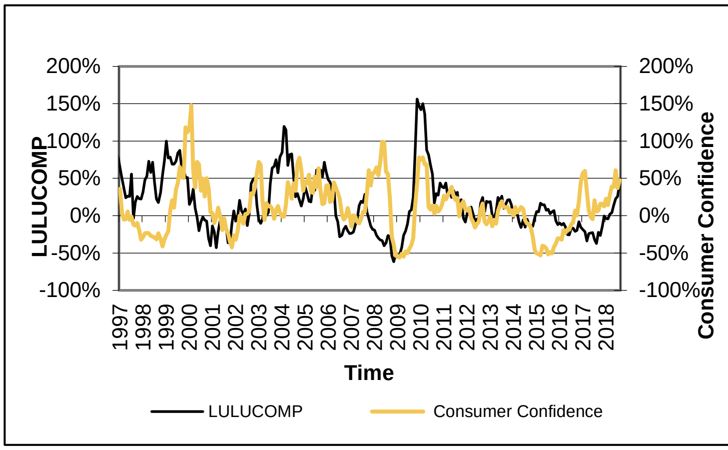


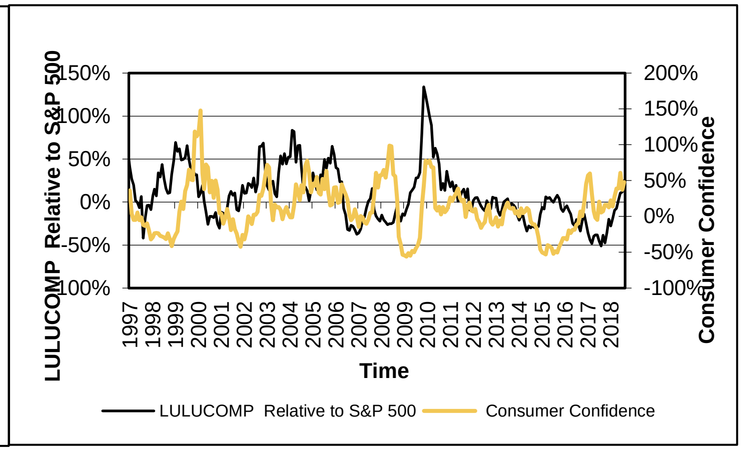
Source: Bloomberg

Macroeconomic Trends

The athletic apparel industry is reasonably cyclical and is positively correlated with consumer confidence. LULU and its competitors have been mostly correlated to consumer confidence since the early 2000's. Furthermore, LULU's stock price has a tendency to move with the economy, falling when the economy is in a recession. Due to this, Lululemon's stock is somewhat dependent on the state of the economy, and please note that consumer confidence is high, currently.

Figures 13 and 14: Consumer Confidence Compared to LULU Comps (left) and Consumer Confidence Compared to LULU Comps Relative to the S&P 500 Index (right)





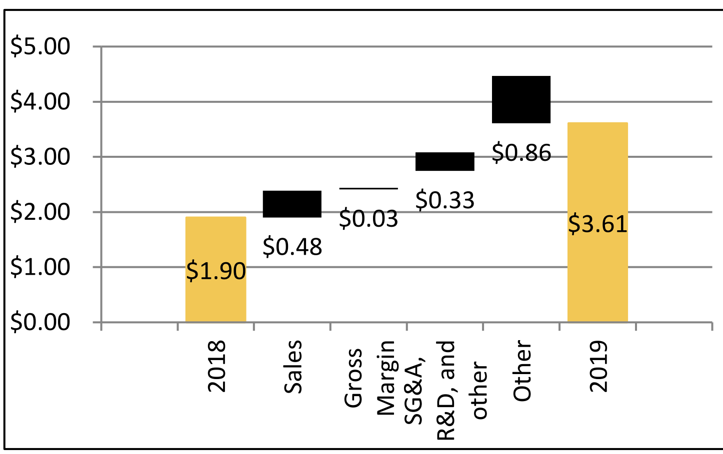
Source: Bloomberg, IMCP

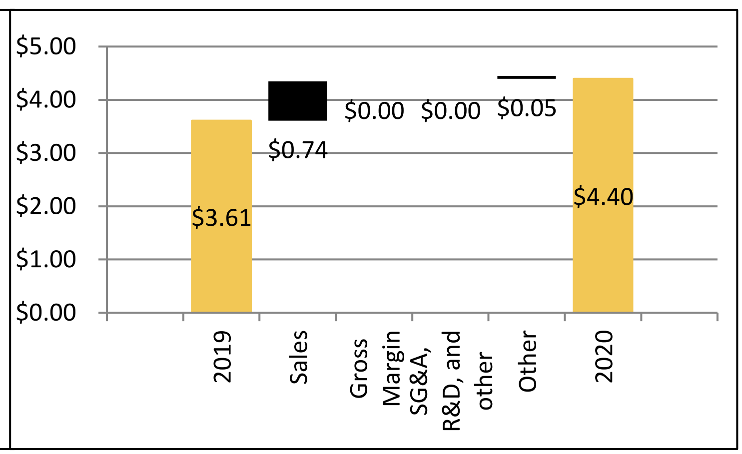
Financial Analysis

> The expansion of sales in regions such as China and Europe are key to the overall growth outlook of LULU.

I anticipate EPS to grow to $3.61 in FY 2019. Increasing sales in the US and international stores should increase earnings by $0.48. Furthermore, a slight improvement to gross margin will provide a modest increase to earnings of $0.03 while a decrease in SG&A as a percent of sales will drive EBIT margin up resulting in an increase to earnings of $0.33. Lastly, I expect an increase of $0.86 per share in other due to LULU's return to a normal tax rate, which will ultimately help earnings rise to $3.61. In 2020, I expect earnings to continue to grow rising by $0.79 to $4.40. I expect that this increase will almost be completely driven by an increase of $0.74 per share in sales in the US and globally as LULU continues to expand its international presence.

Figures 15 and 16: Quantification of 2019 EPS Drivers (left) and Quantification of 2020 Eps Drivers (right)





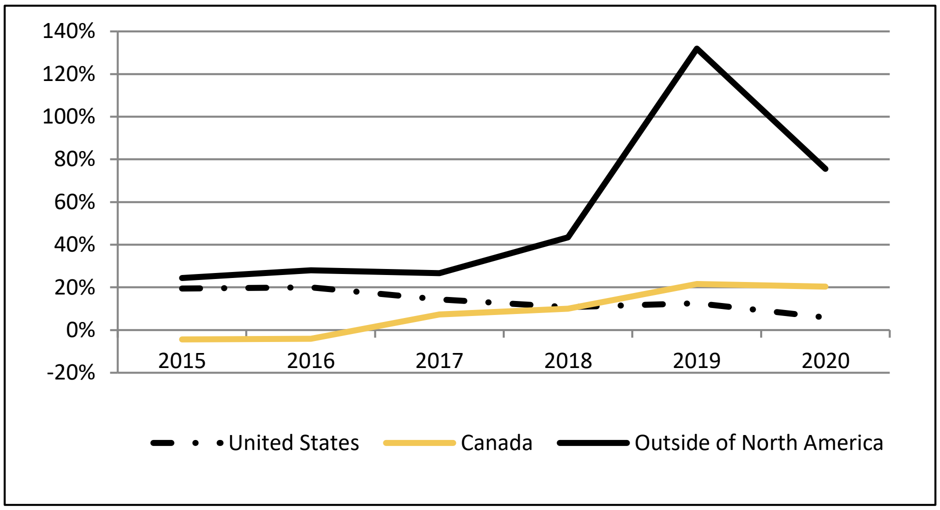
Source: Company Reports, IMCP

Revenues

LULU's revenue has been steadily increasing and I expect that trend to continue in 2019 and 2020. I believe that the majority of its revenue growth will come from expansion of sales outside of North America, particularly in the European and Asian markets. Sales outside of North America can grow from 9.3% of total sales for the fiscal year ended January 2018 to 25% of total sales by the year 2020. This growth in regions outside of the US could cause US sales to decrease from 72.2% of total sales for the year ended January 2018 to 57% of total sales by 2020.

Figures 17: Geographical Revenue Growth Rates

LULU plans to focus on its international sale making it 25% of total sales by 2020.

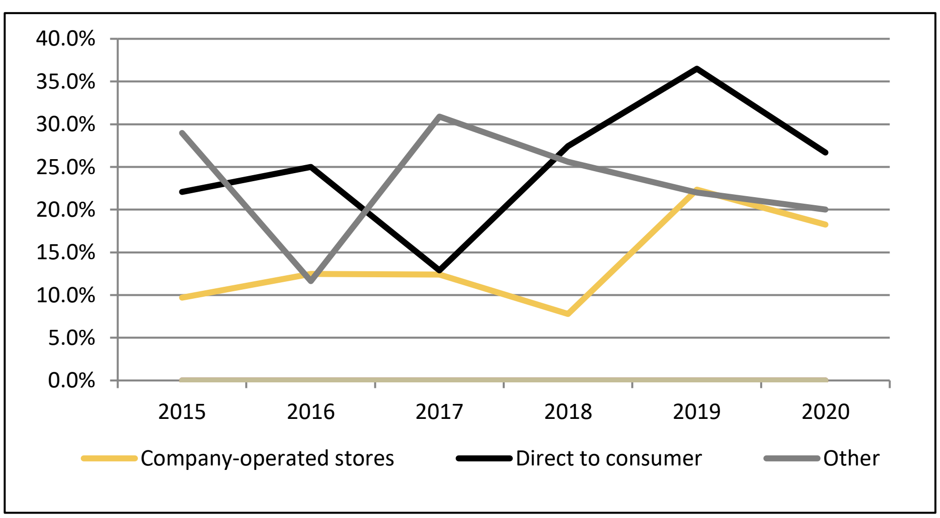


Source: Company Reports, IMCP

LULU hopes to increase its revenue from its direct to consumer sales segment. The firm spent a large amount of capital on improving its digital sales platform and has begun to see results in 2018 with online sales growing. I expect those trends to continue throughout 2019 with direct to consumer sales comprising 23.7% of LULU's total sales and a quarter of total sales by 2020.

Figure 18: LULU Segment Revenue Growth Rates

LULU continues to move with the industry trend of increased direct to consumer sales.



Source: Company Reports, IMCP

Estimates versus Consensus

Analysts' consensus EPS forecasts are a little more bullish than I am in 2019, but consensus is more bearish in 2020. The FactSet consensus has projected EPS for FY 2019 and FY 2020 at $3.69 and $4.34, respectively. I am at $3.61 and $4.40. This variance between my estimates and consensus comes from my more optimistic revenue growth expectations as LULU expands its global presence.

I am $0.08 more pessimistic than consensus for EPS in 2019 and $0.06 more optimistic for 2020.

Figures 16: EPS Consensus vs Estimates

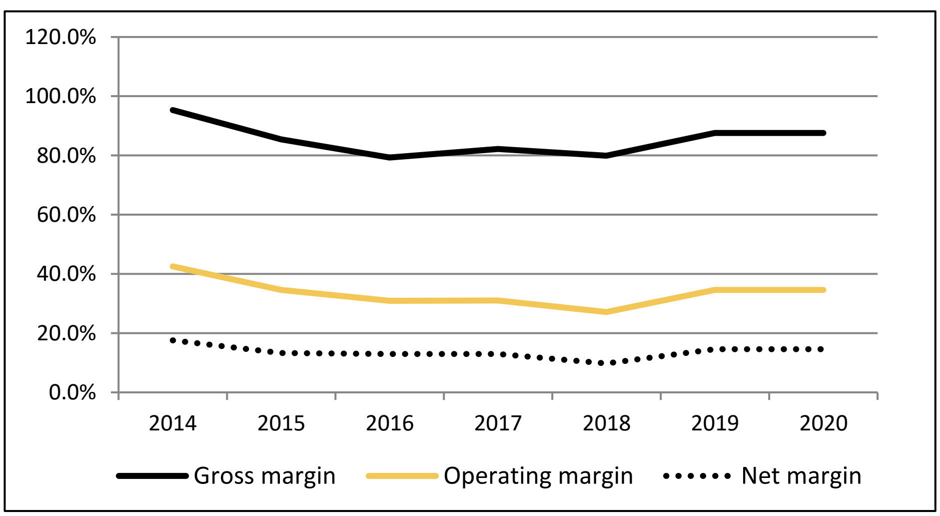
	Estimates		Consensus	
	2019E	2020E	2019E	2020E
Revenue	$3,322	$4,000	$3,244	$3,684
YoY Growth	25.40%	20.40%	22.46%	13.56%
EPS	$3.61	$4.40	$3.69	$4.34
YoY Growth	89.70%	21.80%	94.21%	17.62%
FCF	$304	$401	$392	$425
YoY Growth	35.11%	31.91%	74.22%	8.42%

Source: FactSet, IMCP

Operating Income and Margins

LULU's gross margin increased by 1.6% in fiscal 2018 while the firm's operating margin and net margin both fell by 0.6% and 3.1% respectively. The growth in gross margin came from an increase in lower product costs and an advantageous combination of higher margin products. In fiscal 2018, SG&A expenses increased due to added operating expenses to fund its store and direct to consumer growth. However, I predict LULU's margins to increase in 2019 and 2020 as investments for the online platform slows and sales increase.

Figure 20: Gross, Operating, and Net Margin 2014-2020E



Source: Company Reports, IMCP

Return on Equity

I expect ROE to recover from its dip in 2018 due to a onetime required transition tax.

LULU's ROE dropped 7.9% for the fiscal year ended January 28, 2018 due to a onetime required transition tax on collected foreign subsidiary earnings, which were not previously subject to United States income tax. The tax legislation changes resulted in a provisional income tax expense of $58.9 million for the mandatory transition tax. LULU's tax rate will return to normal levels resulting in a higher ROE for 2019 and 2020. I expect LULU to experience an increase in ROA as well due to an increase in their EBIT margin. Because of this, I anticipate LULU's ROE to rise 10.8% in 2019 to 28.3%, remaining steady in 2020 only increasing another 0.9%.

Figure 21: ROE Breakdown, 2015 – 2020E

5-stage DuPont	2015	2016	2017	2018	2019E	2020E
EBIT / sales	21.3%	17.9%	18.0%	17.4%	20.0%	20.0%
Sales / avg assets	1.41	1.58	1.58	1.45	1.54	1.59
EBT / EBIT	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Net income /EBT	62.4%	72.3%	71.8%	56.2%	73.0%	73.0%
ROA	18.8%	20.5%	20.4%	14.1%	22.5%	23.2%
Avg assets / avg equity	1.16	1.23	1.24	1.24	1.26	1.26
ROE	**21.9%**	**25.2%**	**25.4%**	**17.5%**	**28.3%**	**29.2%**

Source: Company Reports, IMCP

Free Cash Flow

Figure 22: LULU Free Cash Flows 2014-2020E

I expect LULU will carry out the majority of its authorized $600 million share repurchase.

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$280	$239	$267	$303	$259	$485	$584
Growth		*-14.5%*	*11.8%*	*13.5%*	*-14.7%*	*87.5%*	*20.4%*
NWC*	131	127	190	186	153	191	230
Net fixed assets	307	345	397	495	562	705	849
Total net operating capital*	$438	$472	$587	$681	$715	$896	$1,079
Growth		*7.8%*	*24.4%*	*16.0%*	*5.0%*	*25.3%*	*20.4%*
- Change in NWC*		(4)	63	(4)	(33)	38	39
- Change in NFA		38	52	98	67	143	144
FCFF*		$205	$152	$209	225	$304	$401
Growth			*-25.8%*	*37.7%*	*7.3%*	*35.5%*	*31.8%*
- After-tax interest expense	-	-	-	-	-	-	-
FCFE**		$205	$152	$209	$225	$304	$401
Growth			*-25.8%*	*37.7%*	*7.3%*	*35.5%*	*31.8%*
FCFF per share		*$1.66*	*$2.24*	*($0.18)*	*($0.23)*	*$1.86*	*$1.88*
Growth			*35.2%*	*-107.8%*	*30.0%*	*-912.4%*	*1.2%*
FCFE per share		*$1.66*	*$2.24*	*($0.18)*	*($0.23)*	*$1.86*	*$1.88*
Growth			*35.2%*	*-107.8%*	*30.0%*	*-912.4%*	*1.2%*

Source: Company Reports, IMCP

LULU has steadily grown its free cash flows over the past few years and continues to have room for significant growth. This is despite the fact that it is quickly expanding capital to fuel topline growth. I am forecasting FCFE to grow 35.5% to $304 million in 2019 and another 31.8% in 2020 to $401 million. LULU has authorized a $600 million share repurchase funded with cash on and any available borrowings. I predict LULU to spend $250 in 2019 and another $250 in 2020 to aid earnings.

I expect NOPAT to grow at a faster rate than net operating capital in 2019 with growth evening out in 2020, so FCFE is projected to rise strongly.

Valuation

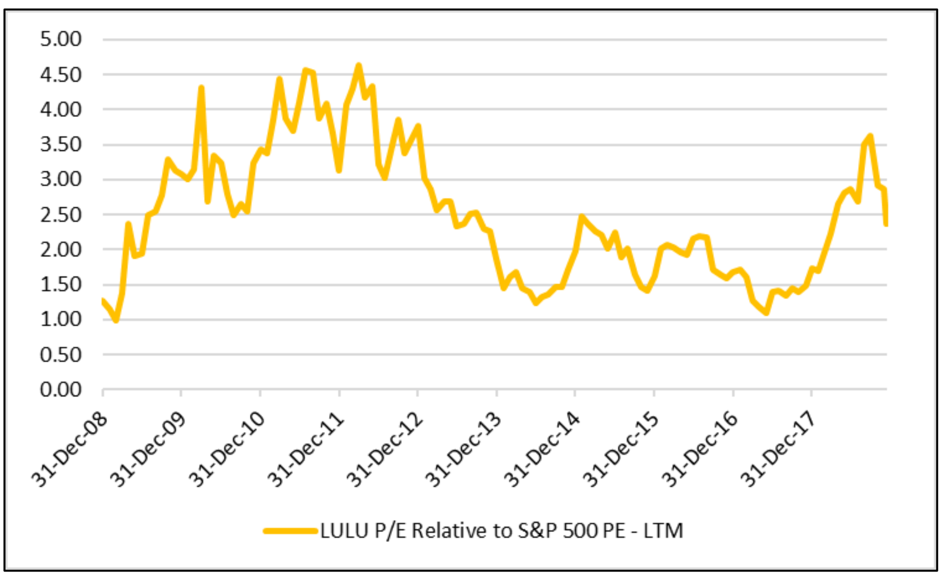
LULU was valued using multiples and a 3-stage discounting cash flow model. Based on comp target NTM P/E, the stock is expensive relative to other firms and is worth $95. However, due to LULU being a high growth stock, I expected that this would be the case since LULU has a much higher P/E compared to its competitors. Another relative valuation approach shows LULU to be overvalued based on its fundamentals versus those of its peers in the retail apparel industry. A detailed DCF analysis values LULU significantly higher, at $156. I give this value much more weight because it incorporates assumptions that reflect LULU's high levels of ongoing growth. As a result of these valuations, I value the stock at $140.

Trading History

LULU has been trading at a high P/E relative to the S&P 500 over the past several years. This is the result of high expectations for LULU and the fact that most analysts believe that earnings will significantly grow in the near future. LULU's TTM P/E is at 43 while its current NTM P/E is at 30 compared to its five year average of 34.9. I expect LULU to maintain a relatively high P/E with it falling by roughly five from its TTM P/E back down to its five year average in the near term.

LULU P/E relative to the market is trading at an almost 5 yr high

Figure 23: LULU NTM P/E Relative to S&P 500



Source: FactSet

Assuming the firm's P/E falls down from its TTM towards the five year average, it should trade at $126.13 by the EOY 2019.

- Price = P/E x EPS = 34.94 x $4.40 = $153.74

Predicting that LULU's P/E moves back down towards its five year average yields a price of $153.74. Given LULU's potential for significant EPS growth, this seems to be a fair valuation.

Relative Valuation

Lululemon is currently trading at a P/E much higher than its peers, with a TTM P/E of 43 compared to an average of 17.25, excluding GES, which had a TTM P/E of -196.8. Investors are willing to temporarily pay a premium for LULU because it has the potential for much greater growth than many of the other companies in its market segment. Its long-term expected growth rate is 21.3% vs a median of 13.7%. Its value is not fully captured by last year's earnings, which were heavily depressed by a onetime required transition tax on collected foreign subsidiary earnings previously not subject to United States income tax. This tax legislation change resulted in a provisional income tax expense of $58.9 million for the mandatory transition tax. Furthermore, LULU's P/B and P/S ratios are significantly higher than those of its peers – both are roughly 4.5x the average for the group. This is a reflection of LULU's relatively higher ROE and net margin compared to its competitors.

Figure 24: LULU 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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
LULU	LULULEMON ATHLETICA INC	$122.65	$16,239	5.0	(9.4)	(19.8)	(1.8)	65.1	56.1	21.3	43.4%	16.3%	-14.0%	90.0%	21.9%	0.5%	0.37	0.0%	B+	0.00%	0.0%
CHS	CHICOS FAS INC	$5.81	$731	1.2	(25.2)	(33.4)	(33.8)	(35.1)	(34.1)	15.0	-71.9%	6800.0%	14.5%	-21.5%	3.2%	-6.1%	1.18	9.4%	B+	6.25%	53.6%
EXPR	EXPRESS INC	$5.82	$427	2.3	(35.1)	(45.2)	(44.3)	(46.5)	(42.7)		-45.1%	-47.1%	-65.8%	88.0%	17.0%	-31.6%	1.18	10.7%		0.00%	
GES	GUESS INC	$21.90	$1,775	1.2	1.1	(3.2)	(2.2)	36.4	29.7	20.2	-1247.8%	-72.2%	-140.7%	-1036.4%	29.1%		0.11	4.4%	B-	3.78%	
GPS	GAP INC	$27.47	$10,478	1.2	0.2	(3.1)	(16.6)	(19.1)	(19.3)	12.0	9.4%	-24.6%	27.8%	18.5%	3.5%	-1.6%	0.48	36.3%	A	3.51%	40.2%
LB	L BRANDS INC	$31.47	$8,658	(0.7)	(15.0)	12.0	(13.8)	(46.0)	(47.7)	8.2	-1.4%	-4.3%	-14.4%	-22.5%	1.5%	6.3%	-0.16		B+	7.25%	89.4%
URBN	URBAN OUTFITTERS INC	$35.20	$3,789	0.1	(11.7)	(20.5)	(26.5)	8.7	0.4	12.4	45.5%	4.5%	-48.1%	180.4%	7.7%	-9.8%	0.68	0.0%	B	0.00%	0.0%
Average			$6,014	1.5	(13.6)	(16.2)	(19.9)	(5.2)	(8.2)	14.9	-181.1%	953.2%	-34.4%	-100.5%	12.0%	-7.0%	0.55	10.1%		2.97%	36.6%
Median			$3,789	1.2	(11.7)	(19.8)	(16.6)	(19.1)	(19.3)	13.7	-1.4%	-4.3%	-14.4%	18.5%	7.7%	-3.8%	0.48	6.9%		3.51%	40.2%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			1.3%	11.7%	20.5%	9.8%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
LULU	http://www.lululemon.com	19.1%	12.30	27.6	29.4	41.4	43.0	30.0	34.0	27.9	9.5%	6.13		17.5%	19.7	29.3	25.0	16.4%	10.5%	14.1%	$9.97
CHS	http://www.chicosfas.com	15.2%	1.12	1067.0	20.9	11.2	9.2	32.9	9.4	9.1	4.4%	0.32	4.3%	14.2%	6.8	4.0	8.6	-6.6%		-2.4%	$5.19
EXPR	http://www.express.com	2.9%	0.68	12.5	14.7	40.6	11.1	20.3	12.4	10.6	0.9%	0.20		2.7%	5.7	3.4	6.8	-2.7%	0.8%	-0.1%	$8.50
GES	http://www.guess.com	-1.0%	2.08	19.5	44.8	-153.5	-196.8	17.1	21.3	16.5	-0.4%	0.75		-0.9%	10.6	14.3	9.7	2.8%		-2.3%	$10.51
GPS	http://www.gapinc.com	24.0%	3.05	11.0	13.3	15.8	11.5	10.6	10.7	10.4	5.2%	0.66	8.2%	19.8%	8.1	6.2	8.4	0.9%	1.3%	0.3%	$9.01
LB	http://www.lb.com	-72.4%	-6.59	22.7	16.3	17.4	11.7	11.9	11.7	11.6	7.5%	0.69	10.8%	19.8%	10.4	6.3	13.8	1.1%	-0.6%	3.8%	-$4.78
URBN	http://www.urbn.com	7.1%	2.59	12.7	15.2	36.1	18.1	12.5	12.9	12.0	2.9%	1.05	9.4%	8.3%	12.5	11.0	11.1	4.5%	4.7%	5.3%	$13.57
Average		-0.7%	2.18	167.6	22.1	1.3	-13.1	19.3	16.1	14.0	4.3%	1.40	8.2%	11.6%	10.5	10.6	11.9	2.3%	3.4%	2.7%	
Median		7.1%	2.08	19.5	16.3	17.4	11.5	17.1	12.4	11.6	4.4%	0.69	8.8%	14.2%	10.4	6.3	9.7	1.1%	1.3%	0.3%	

Source: FactSet

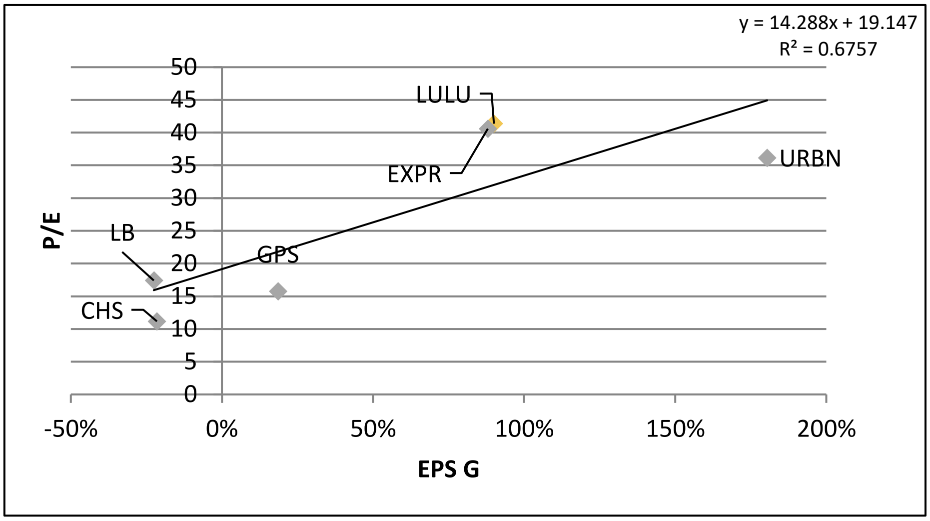
A more thorough analysis of P/E and EPS growth is shown in Figure 22. The calculated R-squared of the regression indicates that over 67% of a sampled firm's P/E is explained by its NTM EPS growth. LULU has the highest P/E and second highest EPS growth of this grouping, and according to this measure is overvalued.

- Estimated P/E = Estimated 2019 EPG G (90%) x 14.288 + 19.147 = 32.006
- Target Price = Estimated P/E (32.006/41.4) x 2018 Current Price ($122.65) = $94.82

Given LULU's potential for earnings growth and continued profitability, $94.82 seems to be an abnormally low value.

Figure 25: P/E vs LTG

LULU is overvalued according to a P/E to EPS G valuation framework.



Source: FactSet & IMCP

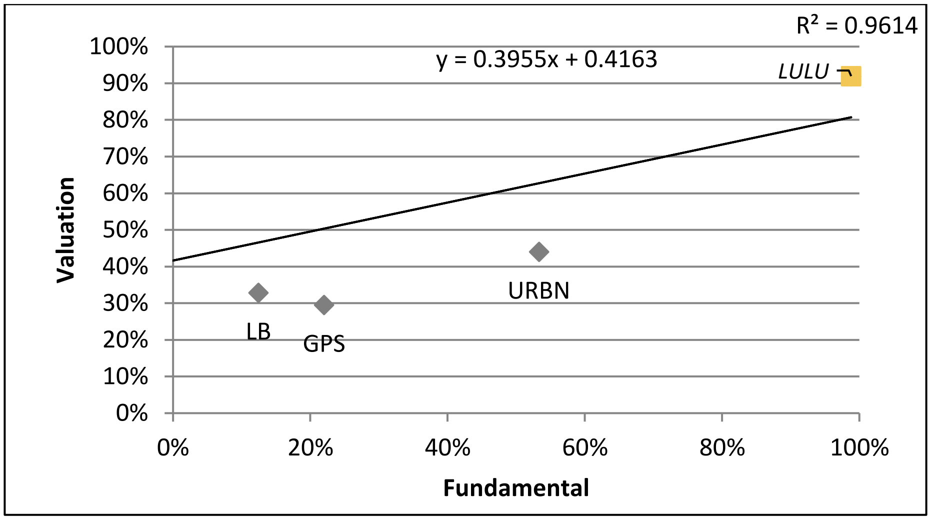
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. 25% weighting of the long term growth rate and NTM earnings growth, and 50% weighting to NTM sales growth was compared to an equal weight composite of TTM P/E and NTM P/E. After eliminating CHS, EXPR, and GES extreme outliers, the regression line had an R-squared of .9614. One can see that LULU is above the line, so it is expensive based on its fundamentals. However, I believe that the premium on LULU could be worth its earnings growth potential.

Figure 26: Composite Valuation, % of Range

		Fundamentals				Valuation			
	Weight	25.0%	25.0%	50.0%	0.0%	50.0%	50.0%		
		Earnings Growth		Sales Growth		P/E			
Ticker	Name	LTG	NTM	NTM	STM	TTM	NTM	Fund	Value
LULU	LULULEMON ATHLETICA INC	100%	95%	100%	100%	100%	84%	99%	92%
CHS	CHICOS FAS INC	71%	-158%	-40%	47%	23%	100%	-42%	62%
EXPR	EXPRESS INC	69%	-98%	-17%	8%	28%	61%	-16%	44%
GES	GUESS INC	95%	-2742%	17%	47%	-492%	52%	-653%	-220%
GPS	GAP INC	56%	21%	6%	12%	28%	31%	22%	29%
LB	L BRANDS INC	39%	-3%	7%	-5%	30%	36%	12%	33%
URBN	URBAN OUTFITTERS INC	59%	100%	27%	45%	48%	40%	53%	44%

Source: FactSet

Figure 27: Composite Relative Valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 11.38% 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 3.10%.
- 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 11.38% (3.10 + 1.20(10.0 – 3.10)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $2.26 and $3.02, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $4.47 per share. Thus, stage one of this discounted cash flow analysis contributes $4.47 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 11.38% cost of equity. I assume 13.5% sales growth in 2017, declining to 2% through 2025. The ratio of NWC to sales will remain at 2020 levels. Moreover, NFA turnover will remain constant at 4.71. Also, the NOPAT margin is expected to rise to 18.5% in 2025 from 14.6% in 2020 due to an increase in sales, lower product costs, and higher margin products

Figure 28: FCFE and Discounted FCFE, 2019 - 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$2.26	$3.02	$4.00	$5.08	$6.16	$7.10	$7.92
Discounted FCFE	$2.03	$2.43	$2.90	$3.30	$3.59	$3.72	$3.72

Source: FactSet & IMCP

Added together, the second stage discounted cash flows total $17.24.

Stage Three – Net income for the years 2021 – 2025 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 2019 to $8.15 in 2025.

Figure 29: EPS Estimates for 2019 - 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$3.61	$4.40	$5.11	$5.84	$6.77	$7.65	$8.15

Source: FactSet & IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this DCF 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. I expect sales growth to slow from 25% in 2019 to 2% in 2025. Thus, I predict LULU's P/E ratio to drop 5 down to 35 by the end of the terminal year. While this may be a high multiple at the end of 2025, 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 LULU's slowing growth.

Given the assumed terminal earnings per share of $8.15 and a price to earnings ratio of 35, a terminal value of $285.25 per share is calculated. Using the 11.38% cost of equity, this number is discounted back to a present value of $134.15.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $155.85 is calculated (4.47 + 17.24 + 134.15). Given LULU's current price of $122.65, this model indicates that the stock is undervalued.

Scenario Analysis

Lululemon Athletica, Inc. is difficult to value with certainty because it is nearly impossible to predict with certainty the changing retail landscape, the ever evolving e-commerce shopping experience, the growing men's business, and how international consumers will react to the Lululemon brand. Furthermore, it will be important to see if new CEO Calvin McDonald will be able to achieve the same international growth that he did while at Sephora. Giving the uncertainty that is to come, a bull and bear case provides a solid demonstration for quantifying all likely scenarios.

Figure 27 displays my assumptions for the bear and bull case scenario analysis. In the bull case, I am assuming a P/E of 40 as investors are excited about sales growth and international store expansion during a strong economy. A beta of 1.1 is given because LULU is still prone to some risk involving its international expansion. NOPAT/S and S/NFA would increase as well as higher sales growth push up margins and asset turnover. The value increased to $166.65, which is 7% higher than the base case.

In the bear case scenario, I lowered sales growth about 1% from the base case scenario. In this particular analysis, I am assuming a weaker economy and a struggling management team. This scenario has a P/E multiple of 30 and 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 value decreases to $91.12, which is 41.5% lower than the base case.

Figure 30: DCF Target Price Scenario Analysis

Base Case Expectations	2019	2020	2021	2022	2023	2024	2025
Beta	1.20						
Sales Growth	25.4%	20.4%	13.5%	8.0%	6.0%	5.0%	2.0%
NOPAT/S	14.6%	14.6%	14.8%	15.5%	16.8%	17.9%	18.5%
S/NFA	4.71	4.71	4.71	4.71	4.71	4.71	4.71
Terminal Year P/E	35.00						
Bear Case Expectations	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Beta	1.4						
Sales Growth	25.4%	20.4%	10%	8.0%	5.5%	2.0%	1.0%
NOPAT/S	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
S/NFA	4.71	4.71	3.8	3.8	3.8	3.8	3.8
Terminal Year P/E	30.00						
Bull Case Expectations	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Beta	1.1						
Sales Growth	25.4%	20.4%	15.0%	13.0%	10.0%	6.0%	3.0%
NOPAT/S	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%	15.0%
S/NFA	4.71	4.71	5.0	5.0	5.0	5.0	5.0
Terminal Year P/E	40						

Base Case Expectaions	
P/E	35
Target Price	$155.85
Bear Case Expectations	
P/E	30
Target Price	$91.12
Bull Case Expectations	
P/E	40
Target Price	$166.65

Source: FactSet & IMCP

Business Risks

Although I have many reasons to be optimistic about Lululemon Athletica, Inc., there are several good reasons why I find the stock to be fairly priced.

Value and reputation of brand:

The value and reputation of the Lululemon name is vital to the firm's success. It is a necessary part of LULU's business as well as a key part of its expansion strategies. Upholding and promoting the LULU name is highly dependent on the success of its marketing and merchandising efforts. LULU will continue to rely heavily on the influence of social media to have a positive impact on its brand image.

Competitive marketplace:

The technical athletic apparel market is highly competitive and growing. Competition may result in pricing pressures thereby reducing profit margins. Furthermore, LULU could lose market share or fail to grow and maintain its share. LULU is competing against wholesalers and direct retailers of athletic apparel with existing global brand recognition.

Reliance on suppliers:

Lululemon does not manufacture its products or the raw materials for them. Instead, the firm is dependent on suppliers. The fabrics that LULU utilizes in its products are technically advanced textile products that are developed and manufactured by third parties and may be available by a very limited number of suppliers. If demand for the products increases, LULU will have to find a way to locate additional supplies of its highly technical textile products.

Technology-based systems

LULU's direct to consumer sales could take away from company-operated store sales while struggling to provide consumers with the same unique in-store experience. Furthermore, consumers are using tablets and smart phones to shop at Lululemon. LULU has to make sure that it uses social media and proprietary mobile apps to interact with its customers in a positive way that enhances their shopping experience.

Limited brand experience and recognition in international markets:

Lululemon's growth is highly dependent on its expansion efforts outside of North America, particularly in the European and Asian markets. The firm has limited experience with regulatory environments and market practices internationally and may not be able to successfully penetrate a new market.

Source: Company Reports & IMCP

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Very High

Several large, established companies in the athletic apparel industry have launched yoga clothing lines in direct competition with Lululemon. Retailers 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 Lululemon.

Threat of Substitutes – High

Lululemon depends on its brand power and image to keep customers paying higher prices for its products. Although the material and quality of its products is difficult to duplicate, other companies can still cater to active individuals for a cheaper price. However, the lower quality products provide an advantage to Lululemon, as customers are less likely to switch to an inferior product.

Supplier Power – High

LULU relies on a limited number of suppliers. However, the firm tends to not engage in long-term contracts with its suppliers. This gives Lululemon a competitive edge as fashion trends are constantly changing.

Buyer Power – Moderate

Lululemon's brand power and high quality products differentiate itself from other competitors. However, if customers were willing to sacrifice quality for price then they could make the switch to a competitor. This market is and will always be competitive.

Intensity of Competition – High

There are several competitors in the athletic apparel industry. LULU has a niche with yoga clothing. However, some of the bigger and more established retailers have a broader customer range, more financial capabilities, and global brand recognition.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Growing athleisure market Premium brand recognition Product quality	High prices Limited suppliers Narrow product line
Opportunities	**Threats**
International expansion Direct to consumer expansion Men's segment	New entrants Fading athletic apparel trends Current market players

Appendix 3: Income Statement

Income Statement (in millions)	2014	2015	2016	2017	2018	2019E	2020E
Sales	$1,591	$1,797	$2,061	$2,344	$2,649	$3,322	$4,000
Direct costs	751	883	1,063	1,145	1,250	1,561	1,880
Gross Margin	840	914	997	1,200	1,399	1,761	2,120
SG&A, and other	443	531	628	777	939	1,096	1,320
EBIT	397	383	370	423	460	664	800
Interest	-	-	-	-	-	-	-
EBT	397	383	370	423	460	664	800
Taxes	118	144	102	119	201	179	216
Income	280	239	267	303	259	485	584
Other	-	-	-	-	-	-	-
Net income	280	239	267	303	259	485	584
Basic Shares	144.9	143.9	140.4	137.1	136.0	134.4	132.9
EPS	$1.93	$1.66	$1.90	$2.21	$1.90	$3.61	$4.40
DPS	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Growth Statistics							
Sales		*12.9%*	*14.7%*	*13.8%*	*13.0%*	*25.4%*	*20.4%*
Direct Costs		*17.6%*	*20.4%*	*7.7%*	*9.2%*	*24.9%*	*20.4%*
Gross Margin		*8.8%*	*9.1%*	*20.3%*	*16.6%*	*25.9%*	*20.4%*
SG&A, R&D, and other		*19.9%*	*18.2%*	*23.8%*	*20.8%*	*16.8%*	*20.4%*
EBIT		*-3.5%*	*-3.5%*	*14.4%*	*8.8%*	*44.4%*	*20.4%*
Interest							
EBT		*-3.5%*	*-3.5%*	*14.4%*	*8.8%*	*44.4%*	*20.4%*
Taxes		*22.6%*	*-28.9%*	*16.5%*	*68.7%*	*-10.9%*	*20.4%*
Continuing income		*-14.5%*	*11.8%*	*13.5%*	*-14.7%*	*87.5%*	*20.4%*
Other							
Net income		*-14.5%*	*11.8%*	*13.5%*	*-14.7%*	*87.5%*	*20.4%*
Basic Shares		*-0.7%*	*-2.5%*	*-2.3%*	*-0.8%*	*-1.1%*	*-1.2%*
EPS		*-13.9%*	*14.6%*	*16.2%*	*-14.1%*	*89.7%*	*21.8%*
DPS							
Common Size							
Sales	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*	*100.0%*
Direct Costs	*47.2%*	*49.1%*	*51.6%*	*48.8%*	*47.2%*	*47.0%*	*47.0%*
Gross Margin	*52.8%*	*50.9%*	*48.4%*	*51.2%*	*52.8%*	*53.0%*	*53.0%*
SG&A, R&D, and other	*27.8%*	*29.5%*	*30.5%*	*33.1%*	*35.4%*	*33.0%*	*33.0%*
EBIT	*25.0%*	*21.3%*	*17.9%*	*18.0%*	*17.4%*	*20.0%*	*20.0%*
Interest	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
EBT	*25.0%*	*21.3%*	*17.9%*	*18.0%*	*17.4%*	*20.0%*	*20.0%*
Taxes	*7.4%*	*8.0%*	*5.0%*	*5.1%*	*7.6%*	*5.4%*	*5.4%*
Continuing income	*17.6%*	*13.3%*	*13.0%*	*12.9%*	*9.8%*	*14.6%*	*14.6%*
Other	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Net income	*17.6%*	*13.3%*	*13.0%*	*12.9%*	*9.8%*	*14.6%*	*14.6%*

Appendix 4: Balance Sheets

Balance Sheet (in millions)	2014	2015	2016	2017	2018	2019E	2020E
Cash	699	664	501	735	991	1,045	1,196
Operating assets ex cash	244	287	416	428	446	558	672
Operating assets	943	951	917	1,163	1,436	1,603	1,868
Operating liabilities	114	160	226	241	293	367	442
NOWC	829	791	692	921	1,144	1,236	1,426
NOWC ex cash (NWC)	131	127	190	186	153	191	230
NFA	307	345	397	495	562	705	849
Invested capital	*$1,136*	*$1,136*	*$1,089*	*$1,416*	*$1,706*	*$1,941*	*$2,275*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$1,250*	*$1,296*	*$1,314*	*$1,658*	*$1,998*	*$2,308*	*$2,717*
Short-term and long-term debt	$0	$0	$0	$0	$0	$0	$0
Other liabilities	39	47	61	56	109	109	109
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	1,097	1,090	1,027	1,360	1,597	1,832	2,166
Total supplied capital	*$1,136*	*$1,136*	*$1,089*	*$1,416*	*$1,706*	*$1,941*	*$2,275*
Total liabilities and equity	*$1,250*	*$1,296*	*$1,314*	*$1,658*	*$1,998*	*$2,308*	*$2,717*
Growth Statistics							
Cash		*-4.9%*	*-24.5%*	*46.5%*	*34.8%*	*5.5%*	*14.5%*
Operating assets ex cash		*17.3%*	*45.0%*	*3.0%*	*4.2%*	*25.2%*	*20.4%*
Operating assets		*0.9%*	*-3.6%*	*26.8%*	*23.5%*	*11.6%*	*16.5%*
Operating liabilities		*40.8%*	*41.0%*	*7.1%*	*21.2%*	*25.4%*	*20.4%*
NOWC		*-4.6%*	*-12.6%*	*33.2%*	*24.1%*	*8.1%*	*15.4%*
NOWC ex cash (NWC)		*-3.1%*	*50.1%*	*-1.9%*	*-17.8%*	*24.8%*	*20.4%*
NFA		*12.5%*	*15.0%*	*24.6%*	*13.6%*	*25.4%*	*20.4%*
Invested capital		*0.0%*	*-4.2%*	*30.1%*	*20.5%*	*13.8%*	*17.2%*
Marketable securities							
Total assets		*3.7%*	*1.4%*	*26.1%*	*20.6%*	*15.5%*	*17.7%*
Short-term and long-term debt							
Other liabilities		*18.4%*	*30.6%*	*-8.1%*	*94.1%*	*0.0%*	*0.0%*
Debt/equity-like securities							
Equity		*-0.6%*	*-5.7%*	*32.4%*	*17.4%*	*14.7%*	*18.2%*
Total supplied capital		*0.0%*	*-4.2%*	*30.1%*	*20.5%*	*13.8%*	*17.2%*
Total liabilities and equity		*3.7%*	*1.4%*	*26.1%*	*20.6%*	*15.5%*	*17.7%*

Appendix 5: Sales Forecast

Sales (in millions)							
Items	**2014**	**2015**	**2016**	**2017**	**2018**	**2019E**	**2020E**
Sales	$1,591	$1,797	$2,061	$2,344	$2,649	$3,322	$4,000
Growth		*12.9%*	*14.7%*	*13.8%*	*13.0%*	*25.4%*	*20.4%*
Company-operated stores	1,229	1,348	1,516	1,704	1,837	2,247	2,658
Growth		*9.7%*	*12.5%*	*12.4%*	*7.8%*	*22.3%*	*18.3%*
% of sales	*77.2%*	*75.0%*	*73.6%*	*72.7%*	*69.3%*	*67.7%*	*66.4%*
Direct to consumer	263	321	402	453	578	788	999
Growth		*22.1%*	*25.0%*	*12.9%*	*27.4%*	*36.5%*	*26.7%*
% of sales	*16.5%*	*17.9%*	*19.5%*	*19.3%*	*21.8%*	*23.7%*	*25.0%*
Other	99	128	143	187	235	286	343
Growth		*29.0%*	*11.6%*	*30.9%*	*25.6%*	*22.0%*	*20.0%*
% of sales	*6.2%*	*7.1%*	*6.9%*	*8.0%*	*8.9%*	*8.6%*	*6.0%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	1,052	1,257	1,509	1,726	1,912	2,153	2,280
Growth		*19.5%*	*20.0%*	*14.4%*	*10.8%*	*12.6%*	*5.9%*
% of sales	*66.1%*	*70.0%*	*73.2%*	*73.6%*	*72.2%*	*64.8%*	*57.0%*
Canada	454	434	417	447	492	598	720
Growth		*-4.4%*	*-4.1%*	*7.4%*	*10.0%*	*21.6%*	*20.4%*
% of sales	*28.5%*	*24.2%*	*20.2%*	*19.1%*	*18.6%*	*18.0%*	*18.0%*
Outside of North America	85	106	135	171	246	570	1,000
Growth		*24.4%*	*28.1%*	*26.6%*	*43.5%*	*131.9%*	*75.5%*
% of sales	*5.3%*	*5.9%*	*6.6%*	*7.3%*	*9.3%*	*17.2%*	*25.0%*

Appendix 6: Ratios

Ratios	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	52.8%	50.9%	48.4%	51.2%	52.8%	53.0%	53.0%
Operating (EBIT) margin	25.0%	21.3%	17.9%	18.0%	17.4%	20.0%	20.0%
Net profit margin	17.6%	13.3%	13.0%	12.9%	9.8%	14.6%	14.6%
Activity							
NFA (gross) turnover		5.51	5.55	5.26	5.01	5.24	5.15
Total asset turnover		1.41	1.58	1.58	1.45	1.54	1.59
Liquidity							
Op asset / op liab	8.31	5.95	4.07	4.82	4.91	4.37	4.23
NOWC Percent of sales		45.1%	36.0%	34.4%	39.0%	35.8%	33.3%
Solvency							
Debt to assets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Debt to equity	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other liab to assets	3.2%	3.6%	4.6%	3.4%	5.5%	4.7%	4.0%
Total debt to assets	3.2%	3.6%	4.6%	3.4%	5.5%	4.7%	4.0%
Total liabilities to assets	12.2%	15.9%	21.8%	18.0%	20.1%	20.6%	20.3%
Debt to EBIT	-	-	-	-	-	-	-
EBIT/interest	-	-	-	-	-	-	-
Debt to total net op capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
ROIC							
NOPAT to sales	17.6%	13.3%	13.0%	12.9%	9.8%	14.6%	14.6%
Sales to NWC		13.97	13.01	12.45	15.60	19.29	18.98
Sales to NFA		5.51	5.55	5.26	5.01	5.24	5.15
Sales to IC ex cash		3.95	3.89	3.70	3.79	4.12	4.05
Total ROIC ex cash		52.6%	50.5%	47.8%	37.0%	60.2%	59.1%
NOPAT to sales	17.6%	13.3%	13.0%	12.9%	9.8%	14.6%	14.6%
Sales to NOWC		2.22	2.78	2.91	2.57	2.79	3.01
Sales to NFA		5.51	5.55	5.26	5.01	5.24	5.15
Sales to IC		1.58	1.85	1.87	1.70	1.82	1.90
Total ROIC		21.0%	24.0%	24.2%	16.6%	26.6%	27.7%
NOPAT to sales	17.6%	13.3%	13.0%	12.9%	9.8%	14.6%	14.6%
Sales to EOY NWC	12.18	14.19	10.84	12.57	17.29	17.38	17.38
Sales to EOY NFA	5.19	5.21	5.19	4.74	4.71	4.71	4.71
Sales to EOY IC ex cash	3.64	3.81	3.51	3.44	3.70	3.71	3.71
Total ROIC using EOY IC ex cash	63.9%	50.7%	45.5%	44.5%	36.2%	54.1%	54.1%
NOPAT to sales	17.6%	13.3%	13.0%	12.9%	9.8%	14.6%	14.6%
Sales to EOY NOWC	1.92	2.27	2.98	2.54	2.32	2.69	2.81
Sales to EOY NFA	5.19	5.21	5.19	4.74	4.71	4.71	4.71
Sales to EOY IC	1.40	1.58	1.89	1.66	1.55	1.71	1.76
Total ROIC using EOY IC	24.6%	21.0%	24.5%	21.4%	15.2%	25.0%	25.7%

Appendix 7: 3-stage DCF Model

First Stage			Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*25.4%*	*20.4%*	*13.5%*	*8.0%*	*6.0%*	*5.0%*	*2.0%*
NOPAT / S	*14.6%*	*14.6%*	*14.8%*	*15.5%*	*16.8%*	*17.9%*	*18.5%*
S / NWC	*17.38*	*17.38*	*17.38*	*17.38*	*17.38*	*17.38*	*17.38*
S / NFA (EOY)	*4.71*	*4.71*	*4.71*	*4.71*	*4.71*	*4.71*	*4.71*
S / IC (EOY)	*3.71*	*3.71*	*3.71*	*3.71*	*3.71*	*3.71*	*3.71*
ROIC (EOY)	*54.1%*	*54.1%*	*54.8%*	*57.4%*	*62.3%*	*66.3%*	*68.6%*
ROIC (BOY)		*65.2%*	*62.3%*	*62.0%*	*66.0%*	*69.6%*	*69.9%*
Share Growth		*-1.2%*	*-1.2%*	*-1.2%*	*-1.2%*	*-1.2%*	*-1.2%*
Sales	$3,322	$4,000	$4,540	$4,903	$5,198	$5,457	$5,567
NOPAT	$485	$584	$672	$760	$873	$977	$1,030
Growth		*20.4%*	*15.1%*	*13.1%*	*14.9%*	*11.9%*	*5.4%*
- Change in NWC	38	39	31	21	17	15	6
NWC EOY	*191*	*230*	*261*	*282*	*299*	*314*	*320*
Growth NWC		*20.4%*	*13.5%*	*8.0%*	*6.0%*	*5.0%*	*2.0%*
- Chg NFA	143	144	115	77	62	55	23
NFA EOY	*705*	*849*	*964*	*1,041*	*1,104*	*1,159*	*1,181*
Growth NFA		*20.4%*	*13.6%*	*8.0%*	*6.0%*	*5.0%*	*2.0%*
Total inv in op cap	181	183	146	98	79	70	29
Total net op cap	896	1079	1225	1323	1403	1473	1502
FCFF	$304	$401	$526	$662	$794	$907	$1,001
% of sales	*9.2%*	*10.0%*	*11.6%*	*13.5%*	*15.3%*	*16.6%*	*18.0%*
Growth		*31.8%*	*31.1%*	*25.9%*	*19.9%*	*14.2%*	*10.4%*
- Interest (1-tax rate)	0	0	0	0	0	0	0
Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
FCFE w/o debt	$304	$401	$526	$662	$794	$907	$1,001
% of sales	*9.2%*	*10.0%*	*11.6%*	*13.5%*	*15.3%*	*16.6%*	*18.0%*
Growth		*31.8%*	*31.1%*	*25.9%*	*19.9%*	*14.2%*	*10.4%*
/ No Shares	134.4	132.9	131.3	129.7	128.1	126.6	125.1
FCFE	$2.26	$3.02	$4.01	$5.10	$6.19	$7.16	$8.00
Growth		*33.4%*	*32.7%*	*27.4%*	*21.4%*	*15.6%*	*11.7%*
* Discount factor	0.90	0.81	0.72	0.65	0.58	0.52	0.47
Discounted FCFE	$2.03	$2.43	$2.90	$3.32	$3.61	$3.75	$3.76
Third Stage							
Terminal value P/E							
Net income	$485	$584	$672	$760	$873	$977	$1,030
% of sales	*14.6%*	*14.6%*	*14.8%*	*15.5%*	*16.8%*	*17.9%*	*18.5%*
EPS	$3.61	$4.40	$5.12	$5.86	$6.81	$7.72	$8.23
Growth		*21.8%*	*16.5%*	*14.5%*	*16.3%*	*13.2%*	*6.7%*
Terminal P/E							35.00
* Terminal EPS							$8.23
Terminal value							$288.16
* Discount factor							0.47
Discounted terminal value							$135.52

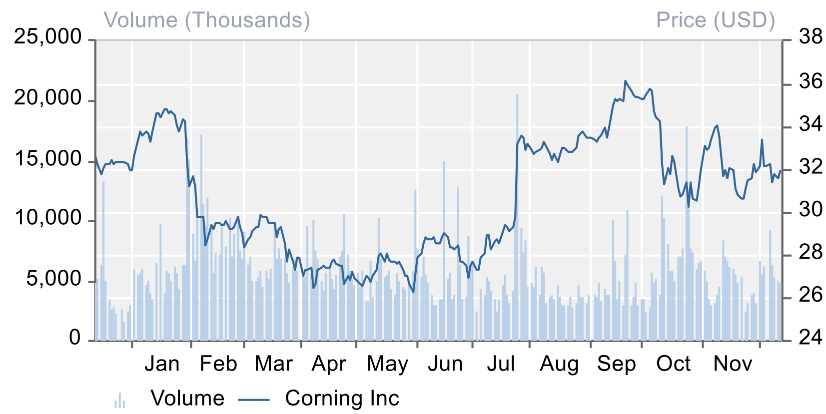
Summary

First stage	$4.47	Present value of first 2 year cash flow
Second stage	$17.34	Present value of year 3-7 cash flow
Third stage	$135.52	Present value of terminal value P/E
Value (P/E)	**$157.33**	= value at beg of fiscal yr 2019

Electronic Components

Corning Inc. (GLW)

Recommendation	**NEUTRAL**
Target (today's value)	$32
Current Price	$31.98
52-week range	$26.11 - $36.56



Source: FactSet Prices

Share Data	
Ticker:	GLW
Market Cap. (Billion):	$28.9
Inside Ownership	0.3%
Inst. Ownership	73.9%
Beta	1.15
Dividend Yield	2.3%
Payout Ratio	49.6%
Cons. Long-Term Growth Rate	10.4%

Summary: I recommend a neutral rating with a target of $32. Although GLW has outperformed in the past, declining margins and net earnings negate the stabilization of sales growth. The potential to beat my bearish growth estimates is why investors are still valuing the stock so highly, despite the stock being overvalued based on my relative and DCF analysis.

	'16	**'17**	**'18**	**'19E**	**'20E**
Sales (billions)					
Year	$9.4	$10.1	$10.3	$10.5	$10.7
Gr %	3.2%	7.8%	1.8%	1.8%	2.0%
Cons	-	-	$11.3	$12.2	$12.9
EPS					
Year	$3.62	$0.56	$1.70	$1.57	$1.56
Gr %	229.8%	-115.3%	406.6%	-7.5%	-1.1%
Cons	-	-	$1.74	$2.04	$2.26

Ratio	**'16**	**'17**	**'18**	**'19E**	**'20E**
ROE (%)	20.1%	-2.9%	8.7%	7.9%	7.6%
Industry	12.3%	13.2%	13.8%	14.8%	15.6%
NPM (%)	39.4%	-4.9%	13.2%	12.0%	11.6%
Industry	9.3%	9.0%	2.3%	6.6%	7.1%
A. T/O	0.33	0.37	0.37	0.36	0.36
ROA (%)	13.1%	-1.8%	4.9%	4.4%	4.2%
Industry	7.0%	6.8%	2.6%	4.5%	5.1%
A/E	1.53	1.64	1.79	1.82	1.79

Valuation	**'17**	**'18**	**'19E**	**'20E**
P/E	NM	18.8	20.4	20.5
Industry	21.5	17.2	14.9	13.1
P/S	2.6	2.3	2.1	2.0
P/B	2.1	2.1	2.0	1.9
P/CF	123.0	47.3	21.7	18.8
EV/EBITDA	10.3	10.9	9.7	9.2

Performance	**Stock**	**Industry**
1 Month	-0.1%	-1.6%
3 Month	-8.7%	-14.4%
YTD	0.1%	-11.1%
52-week	-0.8%	-11.7%
3-year	19.7%	14.1%

Key Drivers:

- Glass component focus: Corning generates $4.6 billion annually from its industrial glass. GLW is choosing to expand its other lagging sectors as glass components become less of a focus of the company.
- International exposure: Corning was a big market contender of glass components in Korea. With heightened pressure from competitors, it has diverted more to the Chinese and US markets, focusing instead on optic fiber products.
- Adaptability: GLW's strength is finding niches of potential customers. Constantly developing innovative products, it has debuted its MiniXtend optic fiber family of products to meet new demand for fiber solutions.
- Macroeconomic trends: Corning is a supplier of consumer discretionary end-products. GLW's success is therefore heavily reliant on the state of the economy and consumer confidence.

Valuation: Using a relative valuation approach, Corning appears to be slightly overvalued in comparison to the electrical components industry. A combination of the approaches suggests that Corning is already valuing in future growth, as the stock's value is about $17 and the shares trade at a price of $31.98.

Risks: Threats to the business include customer concentration, the lengthy R&D cycle, patent enforcement, increasing competition, and currency fluctuations.

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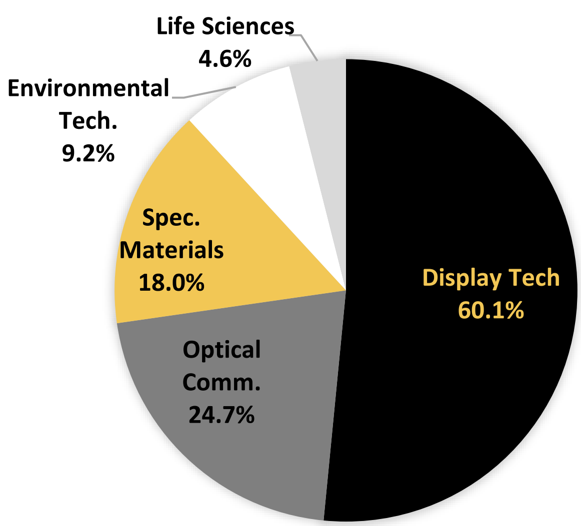
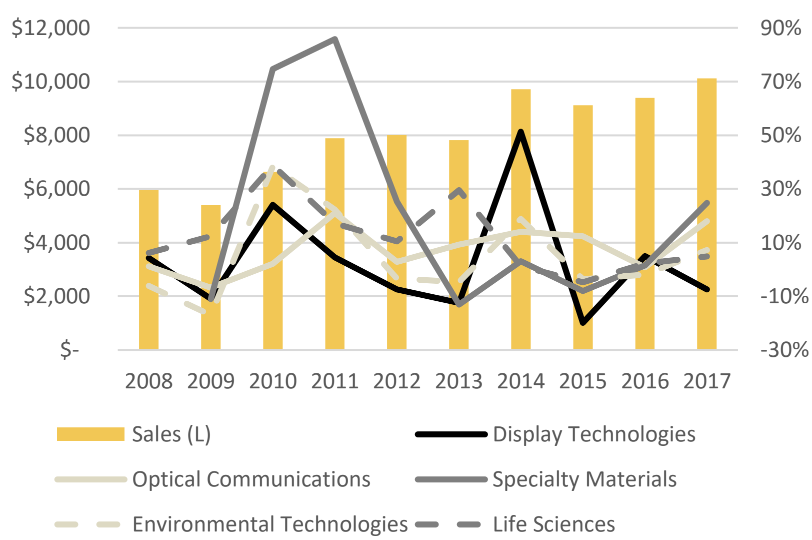
Company Overview

Corning, Inc. (GLW) develops and manufactures specialty glass and ceramics. The company provides glass for notebook computers, flat panel desktop monitors, LCD televisions, and other information display applications; optical fiber and cable, hardware, and equipment products for the telecommunications industry; ceramic substrates for gasoline and diesel engines in automotive and heavy duty vehicle markets; laboratory products for the scientific community and specialized polymer products for biotechnology applications; advanced optical materials for the semiconductor industry and the scientific community; and other technologies. It operates through the following business segments: Display Technologies, Optical Communications, Environmental Technologies, Specialty Materials, and Life Sciences.

- **Display Technologies**: This sector manufactures glass that is integrated onto electronical components. It is most known for its Gorilla Glass®, which was introduced to Apple smartphones in 2007 and Samsung devices in 2012.
- **Optical Communications**: This sector focuses on fiber cable and other connectivity hardware. It supplies these products to telecomm firms, such as Verizon.
- **Specialty Materials**: This sector produces non-electronic glass and ceramic solutions on a smaller, special-order basis. Examples of specialty materials include industrial windows made with Gorilla Glass®, automotive windshields, and ceramic Corning cookware.
- **Environmental Technologies**: This sector manufactures filtration systems for cleaner emissions from machines. These ceramic solutions have been incorporated into automobiles and factories in the US.
- **Life Sciences**: This sector manufactures and supplies biomedical laboratories with glass and ceramic equipment with a focus on temperature resistance. Such products include beakers and graduated cylinders.

Figures 1 and 2: Revenue sources for GLW, year-end 2017 (left) and Revenue history since 2008 (in millions)





Source: Company reports

Business/Industry Drivers

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

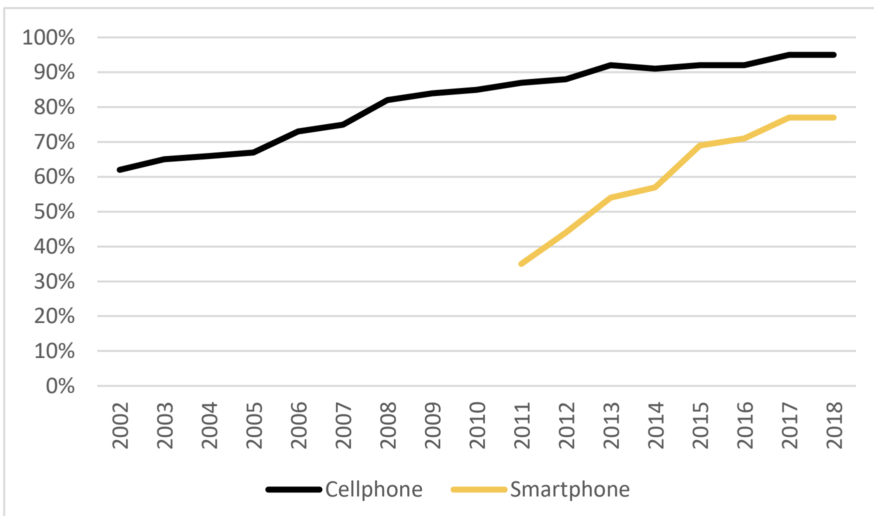
1) Glass Component Focus
2) International Exposure in Emerging Markets
3) Adaptability
4) Macroeconomic Trends

Glass Component Focus

Corning generates almost $4.6 billion annually from its industrial glass.

Although Corning manufactures products across an array of different industries, its most recognized product has always been its glass. The revenues generated by Corning's industrial glass products accounts for over 45% of total revenue of the firm, making it a driving factor of the company's margins. This has given Corning the need to focus on branding its glass to make sure it has industry recognition. With the transition of cell phones from luxuries to necessities in developed countries, Corning has seized the opportunity as a leading manufacturer of glass touchscreens. Thanks to its Gorilla Glass®, it accounts for 14.8% of the industry today.

Figures 3: Percentage of U.S. Adults who own the following devices



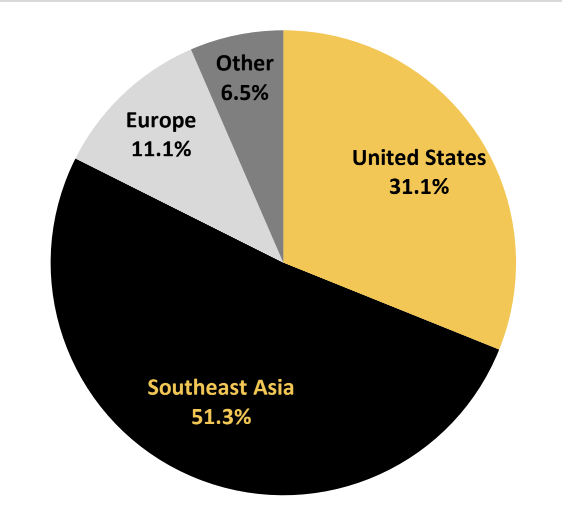
Source: Pew Research Center

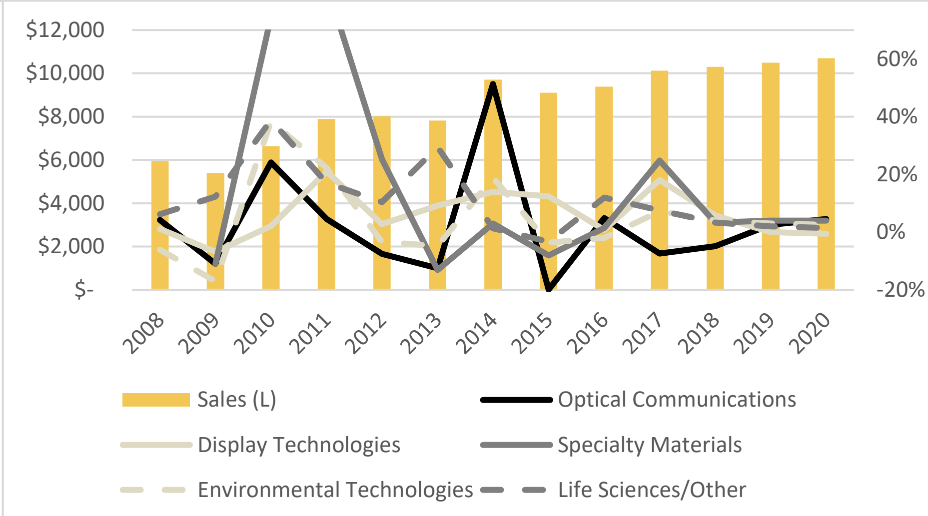
GLW has moved to expand its other lagging sectors, rather than expand its display technology.

Despite the rising trends of cell phone ownership, Corning has shifted its focus and diversified its revenue sources. Instead of pushing for a pseudo-monopoly in the digital display industry, it has invested heavily into its other sectors in recent years. Growth in capital expenditures have gone up 359% in specialty materials and 481% in optical communications since 2013. Sales for display technologies in that time has started to become more volatile while other sectors, such as optical communications, have seen stable growth.

Corning investments are also volatile in display technology, so it is not pushing to lead this industry. After breaking into the tech-savvy South Korean market in 2014, Corning has experienced steadily declining sales since. Corning debuted its latest form of smartphone display, Gorilla Glass 6, in July 2018. This was followed by the announcement from Samsung (a customer of Corning, who had sold Gorilla Glass previously) saying it had developed a flexible OLED display panel deemed indestructible by Underwriters Laboratories. Although intended to be introduced for smartphones, it could be used in all other digital display sectors, which could cause Corning to lose grip in that sector and with South Korean customers.

Figures 4 and 5: 2017 Revenue by Region (left) and Annual Growth Rate by Region (right)





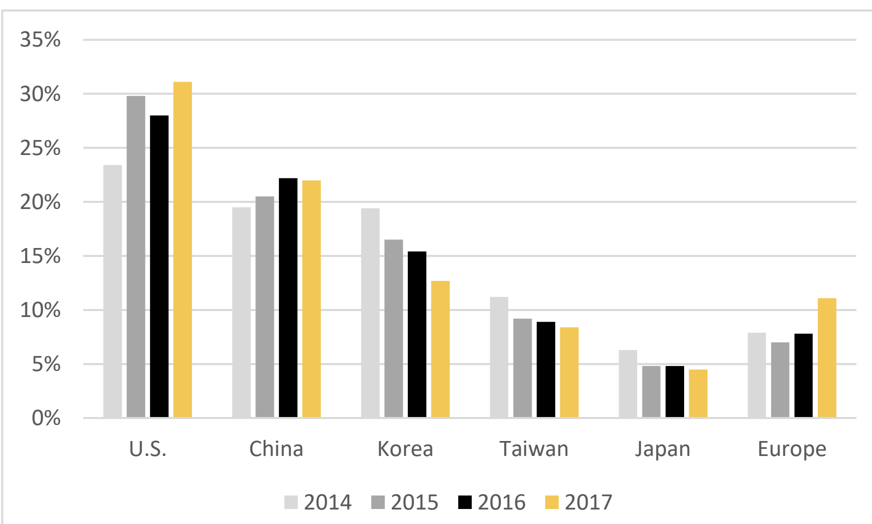
Source: Company reports

International Exposure in Emerging Markets

More than half of Corning's current revenue stream flows from southeastern Asia with a quarter of that coming from China. As referenced in figures 5 and 6, revenues from China have been steadily increasing but the growth rate from South Korea, Taiwan, and Japan have all experienced declines since 2015. This decrease intensified in the past year as Asian markets look to tighten imports from the tariff-raising United States. Corning believes more profitable opportunities lie elsewhere, as new sales are rising in the U.S., China, and Europe.

In recent years, GLW has experienced lower in sales in tech-savvy Asian countries.

Figure 6: Percent of Total Sales by Region



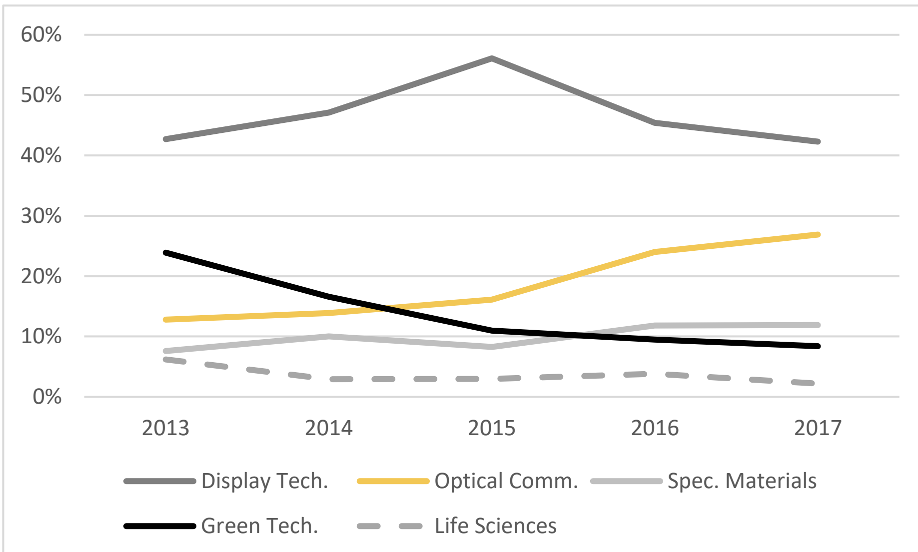
Source: FactSet

The change in geographic mix is related to its effort to diversify into new sectors. When Corning first announced Gorilla Glass in 2007, it was to satisfy a niche. The idea had been in development some 40 years prior, but the lack of a niche gave the company no purpose to launch the product. With the release of the iPhone by Apple in 2007, suddenly there was a need, making it a billion-dollar product.

Its expansion into China can be explained by the growing Chinese economy and the need for stronger communication networks. Corning introduced a line of MiniXtend fiber cables to the U.S. and China in 2015, which offer fiber counts to 288 while being 20-50% smaller than already installed cables and completely backwards compatible. As the developing global economy of China (and the U.S.) increase demand for larger bandwidth, Corning is providing optic fiber solutions to network operators looking to stay ahead of the cyber traffic jam.

GLW is investing in niches by increasing capital in its optical communication and specialty materials.

Figure 7: Makeup of Capital Expenditures by Sector



Source: Company reports

Adaptability

Corning is now open to expanding other sectors after reducing capex and assets in Display Tech.

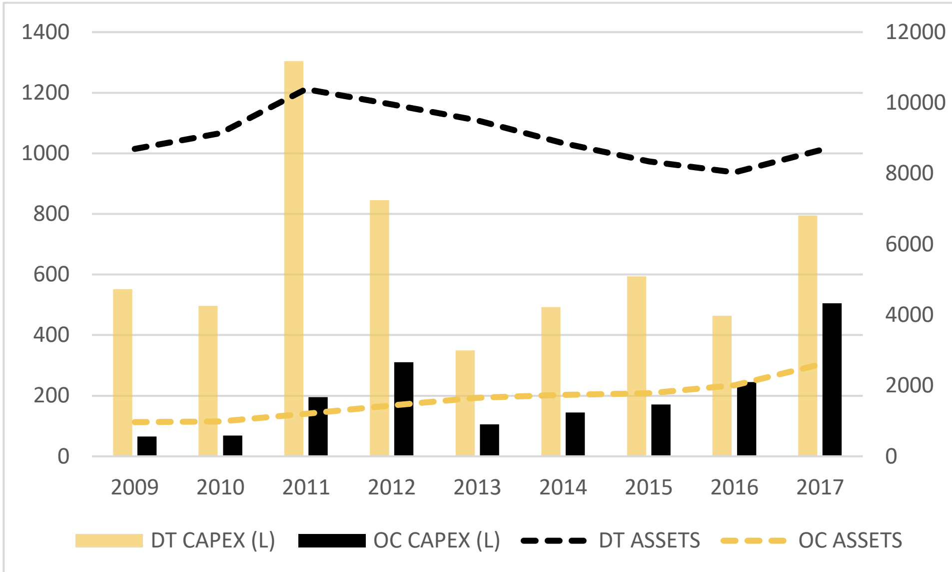
To meet the demand of an ever-changing global economy, Corning hones to changes in consumer tastes and preferences. The firm accomplishes this by finding market niches to profit from. When Apple created buzz with its iPhone release in 2007, Corning was investing heavily in display technologies to keep up with the high demand. Capital expenditures for the year following the iPhone release was over $1.4 billion, or more than double what GLW invested in the last fiscal year.

GLW's change in focus away from displays couldn't have come at a better time from a technology standpoint. Samsung's announcement of a new flexible high-strength plastic phone touchscreen coincided with Corning's drop in capital expenditures for display technologies.

The firm is easing out of digital display technologies and into network communications. This trend has been nearly a decade in the making, as Figure 8 reflects the changes in display technologies and optical communications in both assets and capital expenditures.

Figure 8: Transition from Display Technology into Optical Communications

Growth in capex of optical communications correlates with its growth in assets and display technologies has seen the reverse.

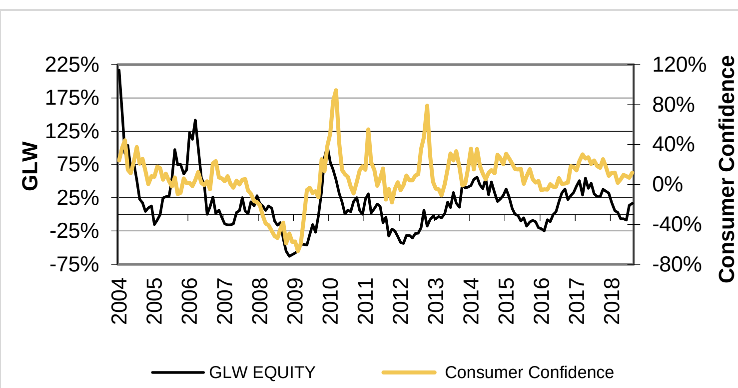


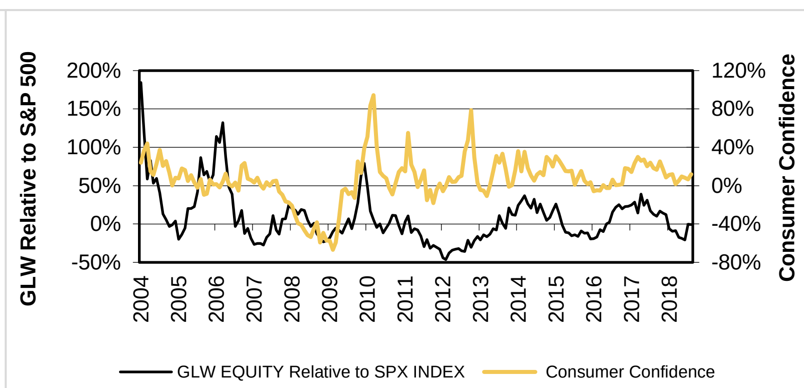
Source: Company Reports

Macroeconomic Trends

The electronic components industry is positively correlated to consumer confidence. Corning sells into discretionary consumer items, so sales rise when confidence and the economy are strong. Apart from 2005-2007, the year-over-year performance of GLW and its competitors closely tracked rises and falls in consumer confidence. This deviation can be traced back to the first touchscreen phones and devices being introduced to the public in 2005-2007.

Figures 9 and 10: Consumer Confidence to GLW comps (left) and Consumer Confidence to GLW Comps Relative to the S&P 500 Index



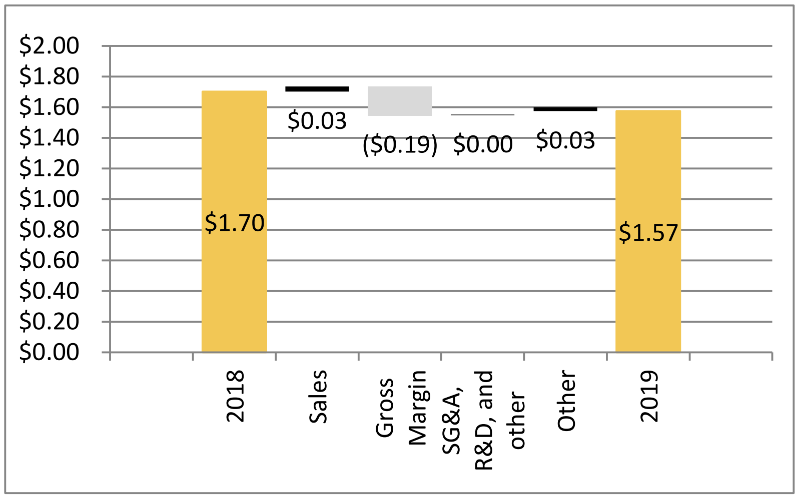


Source: Bloomberg, IMCP

Financial Analysis

In fiscal year 2019, I anticipate EPS to decline from $1.70 to $1.57. I expect increasing sales from the new fiber optic customer base in the U.S. and China. This, however, will be nearly completely offset by declining sales of display technologies from pulling out of the Korean market. I expect a decrease in margins costing $0.19 in EPS as the firm shifts to a focus towards optic fiber cables, which will be produced inefficiently at first to keep up with demand. The culmination of gaining and losing sales via reclassification of a focal product line leads me to forecast their yearend EPS down $0.13 to $1.57.

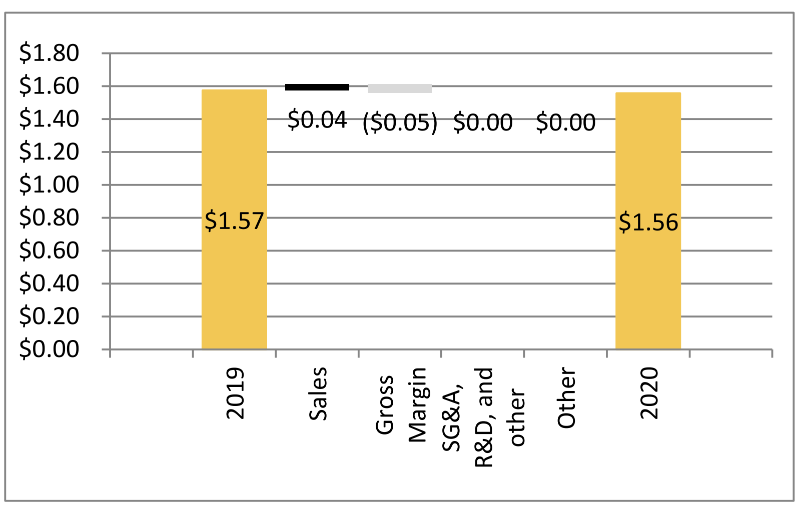
Figure 11: Quantification of 2019 EPS drivers



Source: Company Reports, IMCP

In fiscal year 2020, I expect EPS to remain almost constant and decrease by $0.01. I predict another gain from realized sales in the U.S. and China. Gross margins will again bring a decrease to EPS by $0.05 but is heading back to a positive change as new demand arises for optic fiber and production becomes more efficient. Once Corning cements its transition to focus on optic fiber, I expect gross margin to increase and have a positive effect on EPS.

Figure 12: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

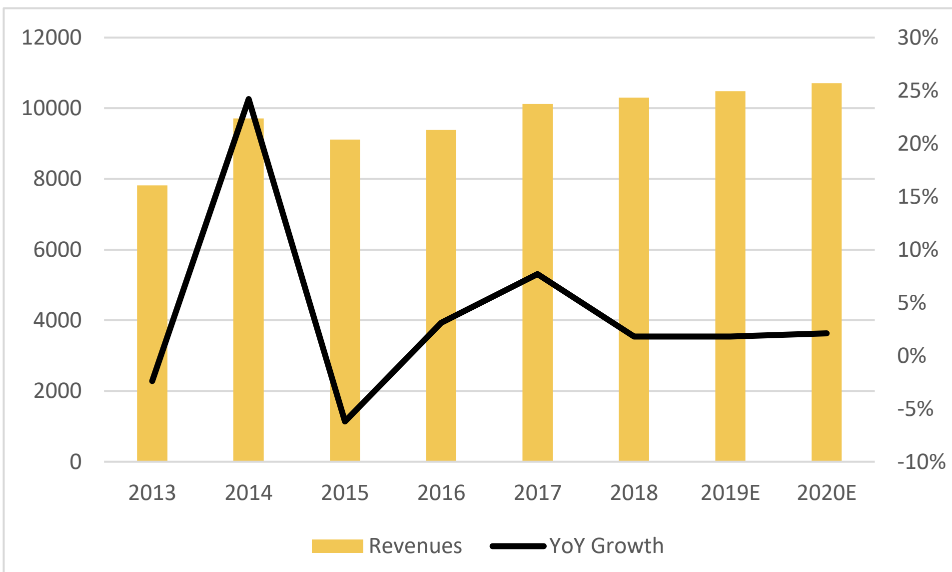
As outlined in figure 13, consensus uses growth opportunities in optical communications as the catalyst for substantial sales growth in 2019 and 2020. While I agree with on the catalyst, I am much more pessimistic with the overall effect of this catalyst driving sales growth, which accounts for my bearish EPS estimates.

Figure 13: EPS and YoY growth estimates

	2019E	2020E
Revenue Estimate	$10,486	$10,705
YoY Growth	1.8%	2.1%
Revenue Consensus	$12,169	$12,949
YoY Growth	7.4%	6.4%
EPS Estimate	$1.57	$1.56
YoY Growth	-7.5%	-1.1%
EPS Consensus	$2.08	$2.30
YoY Growth	17.5%	10.6%

Source: Factset, IMCP

Figure 14: Revenue (in millions) vs YoY revenue growth, 2013-2020E



Source: Factset, IMCP

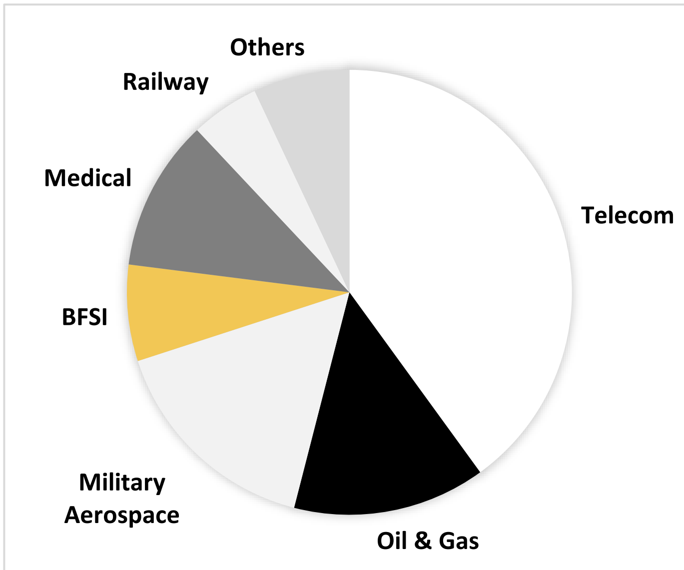
Revenues

Currently, the US has 25% fiber coverage nationwide. Fiber is able to provide faster bandwidth speeds than existing transmitters; up to 100 mb/sec compared to the 11.7 mb/sec national non-fiber average. This is possible because instead of transmitting signal via wavelength vibrations, that is typical for DSL, cable, and wireless connections, fiber optics transmit via light, which moves much faster than sound.

Corning's revenue has grown steadily since its last year-to-year drop in 2015 and I expect this trend to continue in 2019 and 2020, driven by growing its presence in China and the U.S. and an increasing focus on optic communications. Although the average household may not have the need yet for such speeds, it is already proven useful for business and government communications. With the rising usage of data at the personal level, the need for such speeds may not be that far off in the future, which is why I see this as a long-term opportunity for Corning to corner this market as the demand for at-home optic fiber communication develops.

The personal need for faster speed is not the only catalyst driving Corning's delve into a fiber optic headwind. The expansion of fiber optics has tremendous growth potential in other industries, specifically: oil and gas, military and aerospace, and medical. In 2015, telecom was the largest segment for commercial optic fiber application, at about 40% of the market.

Figure 15: Global fiber market share by application, 2015



Source: Grandview Research

Return on Equity

Corning had an uncharacteristically volatile ROE from 2016 to 2017 due to the company reporting a net loss. Rising competition in display technologies, most notably in Korea, cut into the bottom line of GLW. The DuPont analysis of GLW shows that ROE is driven by profit margin. The asset turnover has stayed relatively constant since 2015, fluctuating only from 0.31 to 0.37. I predict the ROE decrease in the next two years as margins decline.

Figure 16: ROE breakdown, 2015-2020E

5-stage DuPont	2015	2016	2017	2018	2019E	2020E
EBIT / sales	17.9%	41.0%	17.9%	18.5%	16.7%	16.2%
Sales / avg assets	0.31	0.33	0.37	0.37	0.36	0.36
EBT / EBIT	91.4%	95.9%	91.4%	90.4%	87.7%	87.6%
Net income /EBT	90.1%	100.1%	-30.0%	79.0%	82.0%	82.0%
ROA	4.6%	13.1%	-1.8%	4.9%	4.4%	4.2%
Avg assets / avg equity	1.45	1.53	1.64	1.79	1.82	1.79
ROE	6.6%	20.1%	-2.9%	8.7%	7.9%	7.6%

Source: Company Reports

Figure 17: Free cash flows 2015-2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$2,557	$1,465	$3,854	-$543	$1,507	$1,436	$1,422
Growth		*-42.7%*	*163.1%*	*-114.1%*	*-377.2%*	*-4.7%*	*-1.0%*
NWC*	1,159	333	571	1,104	922	939	958
Net fixed assets	19,825	20,278	18,851	18,667	19,740	19,418	19,464
Total net operating capital*	$20,984	$20,611	$19,422	$19,771	$20,662	$20,357	$20,422
Growth		*-1.8%*	*-5.8%*	*1.8%*	*4.5%*	*-1.5%*	*0.3%*
- Change in NWC*		(826)	238	533	(182)	17	20
- Change in NFA		453	(1,427)	(184)	1,073	(322)	46
FCFF*		$1,838	$5,043	($892)	616	$1,741	$1,356
Growth			*174.4%*	*-117.7%*	*-169.0%*	*182.8%*	*-22.1%*
- After-tax interest expense	85	126	159	(46)	145	176	176
FCFE**		$1,712	$4,884	($846)	$471	$1,565	$1,180
Growth			*185.3%*	*-117.3%*	*-155.7%*	*232.3%*	*-24.6%*

Source: Company Reports, IMCP

GLW's free cash flow has been in a downward spiral over the last several years, briefly going into the red in 2017. Investment spending has been net modest (about zero) over the last four years, and is expected to be slightly negative in 2019-2020, since NOPAT is positive and growing, free cash flow will rise. In 2018, GLW bought 26 million shares (about $1 billion) and could continue at this rate; however, the stock price has risen slightly so I expect no buybacks in 2019-2020.

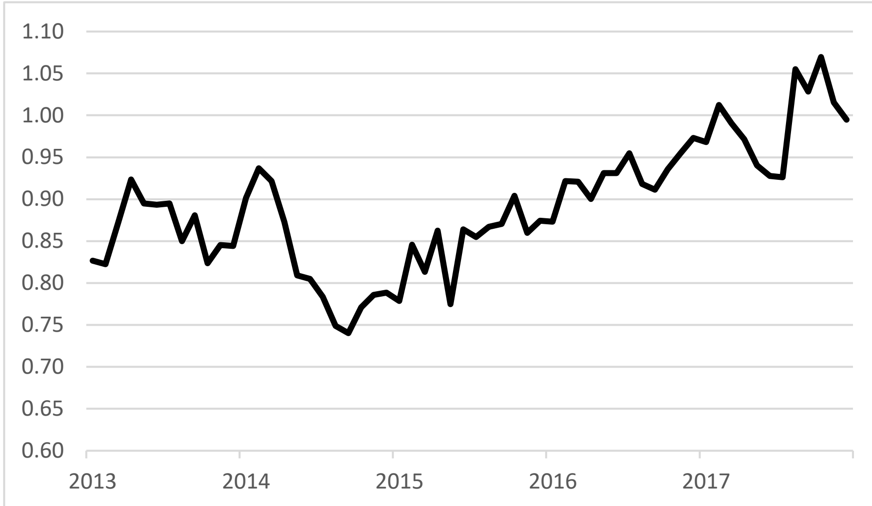
Valuation

GLW was valued using multiples and a 3-stage discounting cash flow model. Until 2017, based on earnings multiples, GLW has been historically cheaper than the industry. Recent changes to the structure and focus of the company, as well as growth potential, have warranted a much higher P/E multiple. I placed more weight on the discounted cash flow method because it offers a better analysis of the firm's future growth opportunities. This analysis also gives insight as to whether the P/E multiple is already accounting for future growth. Based on this analysis, the stock is worth $28.78.

Trading History

GLW is currently trading near its five year high in both price and P/E relative to the S&P 500. This comes at a time when I predict earnings to slow, although most analysts believe it will keep growing quickly in the future. GLW's current NTM P/E is at 18.8. I anticipate the current NTM P/E is already incorporating future projected earnings improvements in the fiber optic business.

Figure 18: GLW NTM P/E relative to S&P 500



Source: Factset

Assuming the firm maintains an 18.8 NTM P/E at the end of 2019, it should trade at $29.33 by the end of the year.

- Price = P/E x EPS = 18.8 x $1.56 = $29.33

Discounting $29.33 back to today at a 11.04% cost of equity (explained in Discounted Cash Flow section) yields a price of $26.41. Given GLW's potential for earnings growth, yet declining profitability, this seems to be a reasonable valuation. Also, I have been more bearish about near-term earnings than consensus, so this valuation seems plausible.

<u>Relative Valuation</u>

Investors expect GLW to deliver growth and are paying a premium with the highest 2019 P/E of the comps. Corning's P/B and P/S, 2.17 and 2.49 respectively, are the best of all its competitors, which reflects GLW's competitive ROE and very high net margin versus its competitors.

Figure 19: GLW 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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
GLW	CORNING INC	$31.98	$25,597	1.2	0.9	(6.0)	11.8	(2.0)	(0.0)	10.4	-378.2%	-115.5%	-403.6%	-7.6%	-0.6%		1.36	43.6%	B	2.23%	
5201-JP	AGC INC	$31.40	$6,836	(0.6)	(8.4)	(18.9)	(23.3)	(25.7)	(27.2)	9.5	-2.5%	13.7%	8.2%	2.0%	1.6%	9.8%	1.57	31.9%		2.85%	33.7%
5801-JP	FURUKAWA ELECTRIC	$25.18	$1,775	1.7	(9.5)	(18.7)	(30.4)	(49.5)	(48.7)	11.0		40.7%	-30.3%	-23.6%	22.3%	51.6%	1.21	62.8%		2.41%	33.8%
5802-JP	SUMITOMO ELECTRIC	$13.32	$10,384	2.0	(4.5)	(9.6)	(11.2)	(19.4)	(20.9)	7.6		8.6%	1.3%	-8.4%	7.1%	26.4%	1.31	20.8%		3.08%	30.4%
COMM	COMMSCOPE HOLDING CO INC	$17.59	$3,381	1.2	(8.6)	(43.5)	(41.8)	(54.6)	(53.5)	10.7	84.9%	-23.8%	18.3%	38.1%	0.5%	114.3%	1.33	227.0%		0.00%	
PRY-IT	PRYSMIAN SPA	$18.96	$4,987	5.0	(4.2)	(20.5)	(29.0)	(37.0)	(36.5)	23.2		1.6%	5.6%	20.6%	31.6%	6.3%	0.54	136.7%		2.57%	
Average			$8,827	1.8	(5.7)	(19.5)	(20.6)	(31.4)	(31.1)	12.1	-98.6%	-12.5%	-66.7%	3.5%	10.4%	41.7%	1.22	87.1%		2.19%	32.6%
Median			$5,912	1.5	(6.4)	(18.8)	(26.2)	(31.3)	(31.8)	10.5	-2.5%	5.1%	3.5%	-2.8%	4.3%	26.4%	1.32	53.2%		2.49%	33.7%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			1.3%	11.7%	20.5%	9.8%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
GLW	http://www.corning.com	11.5%	2.17	5.0	-43.3	18.8	-43.8	15.7	20.4	20.5	13.2%	2.49	13.5%	-2.4%	19.3	9.3	9.8	10.1%	6.9%	4.8%	$14.75
5201-JP	http://www.agc.com	6.5%	0.67	11.7	12.1	14.2	10.6	10.9	10.1	9.9	4.8%	0.49	8.1%	4.7%	13.4	3.9	4.9	0.2%		4.2%	$46.66
5801-JP	http://www.furukawa.co.jp	11.5%	0.83	6.0	5.9	14.2	11.7		9.5	7.8	2.7%	0.20	4.1%	7.7%	14.4	4.4	6.3			0.9%	$30.20
5802-JP	http://www.sei.co.jp	8.8%	0.76	10.2	9.5	11.0	9.1		9.4	8.8	4.2%	0.36	5.4%	6.7%	10.4	4.3	5.8			7.4%	$17.50
COMM	http://www.commscope.com	17.0%	1.93	15.1	28.4	24.4	15.9	8.6	8.2	8.2	6.4%	0.73	11.7%	3.2%	20.0	6.1	12.6	-4.2%	1.4%	6.5%	$9.13
PRY-IT	http://www.prysmiangroup.com	13.2%	1.91	17.4	20.1	24.1	17.5		12.0	9.1	3.1%	0.45	4.8%	8.2%	19.9	8.7	12.2			0.1%	$9.95
Average		11.4%	1.38	10.9	5.4	17.8	3.5	11.7	11.6	10.7	5.7%	0.79	7.9%	4.7%	16.2	6.1	8.6	2.0%	4.2%	4.0%	
Median		11.5%	1.37	11.0	10.8	16.5	11.2	10.9	9.8	9.0	4.5%	0.47	6.8%	5.7%	16.9	5.2	8.0	0.2%	4.2%	4.5%	
spx	S&P 500 INDEX			17.5	18.9	20.2			16.6	15.1											

Source: IMCP, Factset

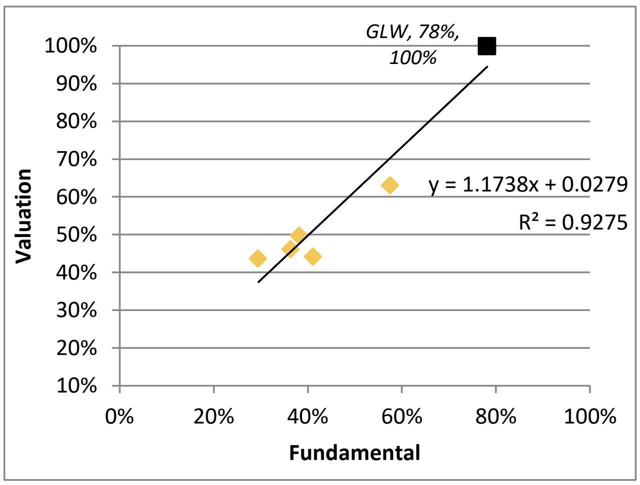
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. An equal weighting of long-term growth, 2018 ROE, 2018 NPM, and NTM sales growth was compared to an equal weighted composite of P/E, P/S, and P/CF. The resulting regression line had an R-squared of 0.94. GLW is just above the line, indicating it is slightly overvalued based on its fundamentals.

Figure 21: Composite valuation, % of max

			Fundamentals				Valuation		
		Weight	25.0%	25.0%	25.0%	25.0%	33.3%	33.3%	33.3%
Name	Fund	Value	LTG	ROE	NPM	NTM	NTM	P/S	P/CF
CORNING INC	78%	100%	45%	68%	100%	100%	100%	100%	100%
AGC INC	29%	44%	41%	39%	36%	2%	69%	20%	42%
FURUKAWA ELECTRIC	41%	44%	47%	68%	21%	29%	77%	8%	47%
SUMITOMO ELECTRIC	36%	46%	33%	52%	32%	29%	77%	15%	47%
COMMSCOPE HOLDING CO IN	38%	50%	46%	100%	49%	-42%	55%	29%	65%
PRYSMIAN SPA	58%	63%	100%	78%	23%	29%	77%	18%	94%

Source: IMCP

Figure 22: Composite relative valuation



Source: IMCP, Factset

Discounted Cash Flow Analysis

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

For the purpose of this analysis, the company's cost of equity was calculated to be 11.04% 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 3.10%.
- A ten-year beta of 1.15 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 **11.04%** (3.10 + 1.15 (10.0 – 3.10)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $1.96 and $1.48, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $2.96 per share. Thus, stage one of this discounted cash flow analysis contributes **$2.96** to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 11.04% cost of equity. I assume 2.0% sales growth each year from 2021 to 2025 as the firm moves toward maturity. The ratio of NWC to sales will remain at 2020 levels and growth in NFA will rise at a rate constant to sales growth. Also, the NOPAT margin is expected to decrease to 10.0% in 2025 from 12.6% in 2021 as a result from competitive pressures.

Figure 23: FCFE and discounted FCFE, 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$ 1.96	$ 1.48	$ 0.99	$ 0.92	$ 0.84	$ 0.76	$ 0.68
Discounted FCFE	$ 1.76	$ 1.20	$ 0.72	$ 0.60	$ 0.50	$ 0.41	$ 0.33

Added together, these discounted cash flows from 2021 to 2025 total **$2.56**.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to decline from $1.56 in 2020 to $1.23 in 2025.

Figure 24: EPS estimates for 2015 – 2021

	2019	2020	2021	2022	2023	2024	2025
EPS	$ 1.57	$ 1.56	$ 1.50	$ 1.44	$ 1.37	$ 1.31	$ 1.23

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. Therefore, a P/E ratio of 19 is assumed at the end of GLW's terminal year as the firm matures from a high-growth company.

Given the assumed terminal earnings per share of $1.23 and a price to earnings ratio of 19, a terminal value of $23.37 per share is calculated. Using the 11.04% cost of equity, this number is discounted back to a present value of $11.23.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $16.75 is calculated (2.96 + 2.56 + 11.23). Given GLW's current price of $31.98, this model indicates that the stock is heavily overvalued.

<u>Scenario Analysis</u>

Corning Incorporated is difficult to value with absolute certainty because of a refocus of product segments, shifting into different global markets, and difficulties with high variability in earnings. Giving the uncertainty in valuation, a bull and bear case scenario analysis provides a spectrum of optimistic and cautious future outlooks. Figure 25 illustrates the different assumptions for different scenarios and the effects on the target price. Note that the base case is the assumptions from the previously reviewed discounted cash flow analysis.

Bull Case

The results of the bull case assumptions provide a target price of $33.20. This scenario uses a higher terminal year P/E of 20 and a less risky beta of 1.05. Sales growth slows over the seven years but starts at a much higher growth rate (4.0%) than the base case. This could be the result of new sales from increasing optic fiber demand. Unlike the base case, the bull case assumes multiples rise over the seven years, because of the firm's new domestic focus with lower taxes. Sales to net fixed assets decline, as it anticipates the firm reinvesting capital to buy new assets for product development. What is most surprising about this case is that the resulting target price is very close to consensus, indicating either my base case was too bearish, or the consensus is overly optimistic.

Bear Case

The bear case assumptions result in a target price of $11.21. This scenario is pessimistic with a lower 16 terminal P/E and a riskier beta of 1.25. Sales growth declines from 1.5% in 2019 to 1.0% in 2025 due to missed sales of display LCD products as the firm transitions to focusing on optic fiber. NOPAT/S decreases from 12.0% to 9.0% over the seven years as margins tighten from competitive pressures. S/NFA stays at a lower-than-base 0.5 multiple as the firm is forced to sell old assets because of low growth.

Figure 25: DCF target price scenario analysis

Base Case Expectations		**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Beta		1.15						
Terminal Year P/E		18.82						
Sales Growth		1.8%	2.1%	2.0%	2.0%	2.0%	2.0%	2.0%
NOPAT/S		13.7%	13.3%	12.6%	12.0%	11.3%	10.7%	10.0%
S/NFA		0.54	0.55	0.55	0.55	0.55	0.55	0.55
Value of P/E	**$ 16.68**							
Bull Case Expectations		**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Beta		1.05						
Terminal Year P/E		20.00						
Sales Growth		4.0%	3.6%	3.2%	2.8%	2.4%	2.2%	2.2%
NOPAT/S		14.0%	14.5%	15.0%	15.5%	16.0%	16.5%	17.0%
S/NFA		0.84	0.8	0.76	0.72	0.68	0.64	0.6
Value of P/E	**$ 33.20**							
Bear Case Expectations		**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Beta		1.25						
Terminal Year P/E		16.00						
Sales Growth		1.5%	1.4%	1.3%	1.2%	1.1%	1.0%	1.0%
NOPAT/S		12.0%	11.5%	11.0%	10.5%	10.0%	9.5%	9.0%
S/NFA		0.5	0.5	0.5	0.5	0.5	0.5	0.5
Value of P/E	**$ 11.21**							

Source: IMCP

Business Risks

As expressed in Corning's 10-K report and previously in this report, I have identified some of the risk factors that could result in sluggish growth:

Exposure to foreign markets:

68.7% of sales originates from foreign markets, making the strength of the dollar compared to the yen, yuan, won, and euro a vital part of income. There are big growth opportunities to expand the fiber optic sector in China, which could increase sales growth higher than my estimates.

Competitive marketplace:

The ability to generate profits and operating cash flow depends largely upon the profitability of the LCD glass business, which is subject to continuous pricing pressure due to intense industry competition, potential over-capacity, and development of new technologies. My estimates for sales growth accounts for a net decline in this sector, so a positive turn in display technologies could prove my estimates low.

Enforcement of intellectual property rights:

Corning relies on patents, copyrights, and trademarks to protect its intellectual property. Inability to protect this due to political pressures or similar forces could result in competitors gaining access to Corning's ideas. Likewise, competitor's patents, or small third party's patents, may inhibit expansion. Many litigation issues arise from third parties who hold copyrights on entities that have no capability to design, manufacture, and/or distribute, rather monetize from larger companies' infringement of these copyrights. Such litigation claims could result in substantial costs for Corning, inhibiting growth.

Lengthy research and development cycle:

Developing new technologies takes a lot of capital investment and time. This can sometimes result in a product not being up to industry standards by the time it is fully developed, the product not gaining back enough revenue to cover its funding, or the product not lowering cost manufacturing platforms as intended, which can negatively impact near- and long-term margins.

Customer Concentration:

A relatively small number of customers accounts for a high percentage of net sales. Mergers and consolidations between customers could result in further concentration of the customer base. If further concentration occurs or a key customer becomes insolvent, it could result in a substantial loss of sales and reduction in anticipated cash flows.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Relatively Low

Barriers to entry are very high. Huge amounts of capital, brand equity, and brand loyalty are all required for a firm to enter this segment. With the speed technology evolves, an extensive R&D division and capital expenditure to fund it is a must.

Threat of Substitutes – Moderate

Corning relies on its quality to sway customers, but if the economy turns down, consumers could look to cut costs with cheaper substitutes. Buyers also have a propensity to substitute if another company provides a more technologically advanced product.

Supplier Power - Low

Because competitors are developing similar products, suppliers have less power to bargain. There are very negligible switching costs because a component manufacturer could change input technology/raw material if the supplier were to price uncompetitively.

Buyer Power – Very High

Buyers of electronic components have a great degree of power over manufacturers. Buyers are very price sensitive and can access different features and prices of competing products due to the internet. This also provides them with feedback from others, reducing switching cost and increasing buying power.

Intensity of Competition – Very High

Continuous innovation in this industry makes for intense competitive rivalry. Whoever leads in innovation has a sustainable competitive advantage.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Product diversification High brand recognition Investing in innovation	High focus on single product Competitors' new technology Overexpansion
Opportunities	**Threats**
International expansion Developing fiber products Promoting green technologies	Currency headwinds Competitive industry Losing digital display niche

Appendix 3: Income Statement

Income Statement (in millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Revenues	$9,712	$9,091	$9,386	$10,115	$10,300	$10,486	$10,705
Direct costs	5,817	5,649	5,777	6,318	6,373	6,679	6,873
Gross Margin	3,895	3,442	3,609	3,797	3,927	3,806	3,832
SG&A, R&D, and other	204	1,816	(242)	1,985	2,021	2,055	2,098
Earnings before interest and taxes	3,691	1,626	3,851	1,812	1,906	1,751	1,734
Interest expense	123	140	159	155	183	215	215
Earnings before taxes	3,568	1,486	3,692	1,657	1,723	1,536	1,519
Taxes	1,096	147	(3)	2,154	361	277	273
Net profit after tax	2,472	1,339	3,695	(497)	1,362	1,260	1,246
Net income	$2,472	$1,339	$3,695	$(497)	$1,362	$1,260	$1,246
Basic Shares	1,305.0	1,219.0	1,020.0	895.0	800.0	800.0	800.0
Earnings per share	$1.89	$1.10	$3.62	($0.56)	$1.70	$1.57	$1.56
Dividends per share	$0.45	$0.56	$0.63	$0.73	$0.84	$0.84	$0.84

Appendix 4: Balance Sheet

BALANCE SHEET							
ITEMS	2014	2015	2016	2017	2018	2019E	2020E
Cash	6,755	5,122	5,726	4,514	4,356	5,246	5,751
Operating assets ex cash	3,483	3,147	3,322	4,313	4,432	4,512	4,606
Operating assets	10,238	8,269	9,048	8,827	8,788	9,758	10,358
Operating liabilities	2,324	2,814	2,751	3,209	3,510	3,573	3,648
NOWC	7,914	5,455	6,297	5,618	5,278	6,185	6,710
NOWC ex cash (NWC)	1,159	333	571	1,104	922	939	958
NFA	19,825	20,278	18,851	18,667	19,740	19,418	19,464
Invested capital	$27,739	$25,733	$25,148	$24,285	$25,018	*$25,603*	*$26,174*
Total assets	$30,063	$28,547	$27,899	$27,494	$28,528	*$29,176*	*$29,822*
Short-term and long-term debt	$3,304	$4,520	$3,902	$5,128	$5,653	$5,653	$5,653
Other liabilities	1,365	1,802	1,744	1,966	2,380	2,380	2,380
Debt/equity-like securities	1,418	548	1,542	1,421	1,415	1,415	1,415
Equity	21,652	18,863	17,960	15,770	15,570	16,155	16,726
Total supplied capital	*$27,739*	*$25,733*	*$25,148*	*$24,285*	*$25,018*	*$25,603*	*$26,174*
Total liabilities and equity	*$30,063*	*$28,547*	*$27,899*	*$27,494*	*$28,528*	*$29,176*	*$29,822*

Appendix 5: Sales Forecast

SALES FORECAST							
ITEMS	2014	2015	2016	2017	2018	2019E	2020E
SALES	**$9,715**	**$9,111**	**$9,390**	**$10,116**	**$10,300**	**$10,486**	**$10,705**
GROWTH		*-6.2%*	*3.1%*	*7.7%*	*1.8%*	*1.8%*	*2.1%*
DISPLAY TECHNOLOGIES	**2,652**	**2,980**	**3,005**	**3,545**	**3,750**	**3,750**	**3,731**
GROWTH		*12.4%*	*0.8%*	*18.0%*	*5.8%*	*0.0%*	*-0.5%*
% OF SALES	*27.3%*	*32.7%*	*32.0%*	*35.0%*	*36.4%*	*35.8%*	*34.9%*
OPTICAL COMM.	**3,851**	**3,086**	**3,238**	**2,997**	**2,850**	**2,921**	**3,053**
GROWTH		*-19.9%*	*4.9%*	*-7.4%*	*-4.9%*	*2.5%*	*4.5%*
% OF SALES	*39.6%*	*33.9%*	*34.5%*	*29.6%*	*27.7%*	*27.9%*	*28.5%*
SPECIALTY MATERIALS	**1,205**	**1,107**	**1,124**	**1,403**	**1,450**	**1,508**	**1,568**
GROWTH		*-8.1%*	*1.5%*	*24.8%*	*3.3%*	*4.0%*	*4.0%*
% OF SALES	*12.4%*	*12.2%*	*12.0%*	*13.9%*	*14.1%*	*14.4%*	*14.7%*
ENVIRONMENTAL TECH.	**1,092**	**1,053**	**1,032**	**1,106**	**1,150**	**1,185**	**1,214**
GROWTH		*-3.6%*	*-2.0%*	*7.2%*	*4.0%*	*3.0%*	*2.5%*
% OF SALES	*11.2%*	*11.6%*	*11.0%*	*10.9%*	*11.2%*	*11.3%*	*11.3%*
LIFE SCIENCES/OTHER	**915**	**885**	**991**	**1,065**	**1,100**	**1,122**	**1,139**
GROWTH		*-3.3%*	*12.0%*	*7.5%*	*3.3%*	*2.0%*	*1.5%*
% OF SALES	*9.4%*	*9.7%*	*10.6%*	*10.5%*	*10.7%*	*10.7%*	*10.6%*

REGIONAL SALES FORECAST							
REGION	2014	2015	2016	2017	2018	2019E	2020E
UNITED STATES	2,275	2,719	2,625	3,146	3,225	3,355	3,640
GROWTH		*19.5%*	*-3.5%*	*19.8%*	*2.5%*	*4.0%*	*8.5%*
% OF SALES	*23.4%*	*29.8%*	*28.0%*	*31.1%*	*31.3%*	*32.0%*	*34.0%*
ASIA	5,783	4,982	5,180	5,195	5,250	5,295	5,353
GROWTH		*-13.9%*	*4.0%*	*0.3%*	*1.1%*	*0.9%*	*1.1%*
% OF SALES	*59.5%*	*54.7%*	*55.2%*	*51.4%*	*51.0%*	*50.5%*	*50.0%*
EUROPE/OTHER	1,657	1,410	1,585	1,775	1,825	1,835	1,713
GROWTH		*-14.9%*	*12.4%*	*12.0%*	*2.8%*	*0.5%*	*-6.7%*
% OF SALES	*17.1%*	*15.5%*	*16.9%*	*17.5%*	*17.7%*	*17.5%*	*16.0%*

Appendix 6: Ratios

RATIOS	2014	2015	2016	2017	2018	2019E	2020E
PROFITABILITY							
GROSS MARGIN	40.1%	37.9%	38.5%	37.5%	38.1%	36.3%	35.8%
OPERATING (EBIT) MARGIN	38.0%	17.9%	41.0%	17.9%	18.5%	16.7%	16.2%
NET PROFIT MARGIN	25.5%	14.7%	39.4%	-4.9%	13.2%	12.0%	11.6%
ACTIVITY							
NFA (GROSS) TURNOVER		0.45	0.48	0.54	0.54	0.54	0.55
TOTAL ASSET TURNOVER		0.31	0.33	0.37	0.37	0.36	0.36
LIQUIDITY							
OP ASSET / OP LIAB	4.41	2.94	3.29	2.75	2.50	2.73	2.84
NOWC PERCENT OF SALES		73.5%	62.6%	58.9%	52.9%	54.7%	60.2%
SOLVENCY							
DEBT TO ASSETS	11.0%	15.8%	14.0%	18.7%	19.8%	19.4%	19.0%
DEBT TO EQUITY	15.3%	24.0%	21.7%	32.5%	36.3%	35.0%	33.8%
OTHER LIAB TO ASSETS	4.5%	6.3%	6.3%	7.2%	8.3%	8.2%	8.0%
TOTAL DEBT TO ASSETS	15.5%	22.1%	20.2%	25.8%	28.2%	27.5%	26.9%
TOTAL LIABILITIES TO ASSETS	23.3%	32.0%	30.1%	37.5%	40.5%	39.8%	39.2%
DEBT TO EBIT	0.90	2.78	1.01	2.83	2.97	3.23	3.26
EBIT/INTEREST	30.01	11.61	24.22	11.69	10.42	8.15	8.07
DEBT TO TOTAL NET OP CAPITAL	11.9%	17.6%	15.5%	21.1%	22.6%	22.1%	21.6%
ROIC							
NOPAT TO SALES	26.3%	16.1%	41.1%	-5.4%	14.6%	13.7%	13.3%
SALES TO NWC		12.19	20.77	12.08	10.17	11.27	11.29
SALES TO NFA		0.45	0.48	0.54	0.54	0.54	0.55
SALES TO IC EX CASH		0.44	0.47	0.52	0.51	0.51	0.53
TOTAL ROIC EX CASH		7.0%	19.3%	-2.8%	7.5%	7.0%	7.0%
NOPAT TO SALES	26.3%	16.1%	41.1%	-5.4%	14.6%	13.7%	13.3%
SALES TO NOWC		1.36	1.60	1.70	1.89	1.83	1.66
SALES TO NFA		0.45	0.48	0.54	0.54	0.54	0.55
SALES TO IC		0.34	0.37	0.41	0.42	0.41	0.41
TOTAL ROIC		5.5%	15.1%	-2.2%	6.1%	5.7%	5.5%
NOPAT TO SALES	26.3%	16.1%	41.1%	-5.4%	14.6%	13.7%	13.3%
SALES TO EOY NWC	8.38	27.30	16.44	9.16	11.17	11.17	11.17
SALES TO EOY NFA	0.49	0.45	0.50	0.54	0.52	0.54	0.55
SALES TO EOY IC EX CASH	0.46	0.44	0.48	0.51	0.50	0.52	0.52
TOTAL ROIC USING EOY IC EX CASH	12.2%	7.1%	19.8%	-2.7%	7.3%	7.1%	7.0%
NOPAT TO SALES	26.3%	16.1%	41.1%	-5.4%	14.6%	13.7%	13.3%
SALES TO EOY NOWC	1.23	1.67	1.49	1.80	1.95	1.70	1.60
SALES TO EOY NFA	0.49	0.45	0.50	0.54	0.52	0.54	0.55
SALES TO EOY IC	0.35	0.35	0.37	0.42	0.41	0.41	0.41
TOTAL ROIC USING EOY IC	9.2%	5.7%	15.3%	-2.2%	6.0%	5.6%	5.4%
ROE							
5-STAGE							
EBIT / SALES		17.9%	41.0%	17.9%	18.5%	16.7%	16.2%
SALES / AVG ASSETS		0.31	0.33	0.37	0.37	0.36	0.36
EBT / EBIT		91.4%	95.9%	91.4%	90.4%	87.7%	87.6%
NET INCOME /EBT		90.1%	100.1%	-30.0%	79.0%	82.0%	82.0%
ROA		4.6%	13.1%	-1.8%	4.9%	4.4%	4.2%
AVG ASSETS / AVG EQUITY		1.45	1.53	1.64	1.79	1.82	1.79
ROE		6.6%	20.1%	-2.9%	8.7%	7.9%	7.6%
3-STAGE							
NET INCOME / SALES		14.7%	39.4%	-4.9%	13.2%	12.0%	11.6%
SALES / AVG ASSETS		0.31	0.33	0.37	0.37	0.36	0.36
ROA		4.6%	13.1%	-1.8%	4.9%	4.4%	4.2%
AVG ASSETS / AVG EQUITY		1.45	1.53	1.64	1.79	1.82	1.79
ROE		6.6%	20.1%	-2.9%	8.7%	7.9%	7.6%
PAYOUT RATIO		50.7%	17.5%	-131.0%	49.6%	53.6%	54.2%
RETENTION RATIO		49.3%	82.5%	231.0%	50.4%	46.4%	45.8%
SUSTAINABLE GROWTH RATE		3.3%	16.6%	-6.8%	4.4%	3.7%	3.5%

Appendix 7: 3-stage DCF Cash Flow

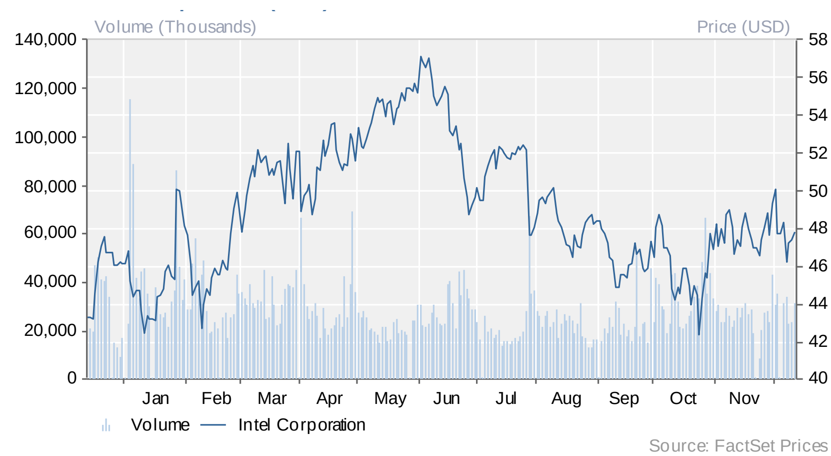
3-stage free cash flow							
				Year			
	1	2	3	4	5	6	7
First Stage			Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*1.8%*	*2.1%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*13.7%*	*13.3%*	*12.6%*	*12.0%*	*11.3%*	*10.7%*	*10.0%*
S / NWC	*11.17*	*11.17*	*11.17*	*11.17*	*11.17*	*11.17*	*11.17*
S / NFA (EOY)	*0.54*	*0.55*	*0.55*	*0.55*	*0.55*	*0.55*	*0.55*
S / IC (EOY)	*0.52*	*0.52*	*0.52*	*0.52*	*0.52*	*0.52*	*0.52*
ROIC (EOY)	*7.1%*	*7.0%*	*6.6%*	*6.3%*	*5.9%*	*5.6%*	*5.2%*
ROIC (BOY)		*7.0%*	*6.8%*	*6.4%*	*6.0%*	*5.7%*	*5.3%*
Share Growth		*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$10,486	$10,705	$10,919	$11,138	$11,360	$11,588	$11,819
NOPAT	$1,436	$1,422	$1,379	$1,333	$1,285	$1,235	$1,182
Growth		*-1.0%*	*-3.0%*	*-3.3%*	*-3.6%*	*-3.9%*	*-4.3%*
- Change in NWC	17	20	19	20	20	20	21
NWC EOY	*939*	*958*	*977*	*997*	*1017*	*1037*	*1058*
Growth NWC		*2.1%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
- Chg NFA	-322	46	389	397	405	413	421
NFA EOY	*19,418*	*19,464*	*19,853*	*20,250*	*20,655*	*21,068*	*21,490*
Growth NFA		*0.2%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Total inv in op cap	-305	66	408	417	425	433	442
Total net op cap	20357	20422	20831	21247	21672	22106	22548
FCFF	$1,741	$1,356	$970	$917	$860	$801	$740
% of sales	*16.6%*	*12.7%*	*8.9%*	*8.2%*	*7.6%*	*6.9%*	*6.3%*
Growth		*-22.1%*	*-28.5%*	*-5.5%*	*-6.1%*	*-6.8%*	*-7.7%*
- Interest (1-tax rate)	176	176	180	183	187	191	194
Growth		*0.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
+ Net new debt	0	0	113	115	118	120	122
Debt / tot net op capital	*27.8%*	*27.7%*	*27.7%*	*27.7%*	*27.7%*	*27.7%*	*27.7%*
FCFE w/o debt	$1,565	$1,180	$791	$733	$673	$611	$545
% of sales	*14.9%*	*11.0%*	*7.2%*	*6.6%*	*5.9%*	*5.3%*	*4.6%*
Growth		*-24.6%*	*-33.0%*	*-7.3%*	*-8.2%*	*-9.3%*	*-10.7%*
/ No Shares	800.0	800.0	800.0	800.0	800.0	800.0	800.0
FCFE	$1.96	$1.48	$0.99	$0.92	$0.84	$0.76	$0.68
Growth		*-24.6%*	*-33.0%*	*-7.3%*	*-8.2%*	*-9.3%*	*-10.7%*
* Discount factor	0.90	0.81	0.73	0.66	0.59	0.53	0.48
Discounted FCFE	$1.76	$1.20	$0.72	$0.60	$0.50	$0.41	$0.33
Third Stage							
Terminal value P/E							
Net income	$1,260	$1,246	$1,199	$1,150	$1,098	$1,044	$987
% of sales	*12.0%*	*11.6%*	*11.0%*	*10.3%*	*9.7%*	*9.0%*	*8.4%*
EPS	$1.57	$1.56	$1.50	$1.44	$1.37	$1.31	$1.23
Growth		*-1.1%*	*-3.8%*	*-4.1%*	*-4.5%*	*-4.9%*	*-5.4%*
Terminal P/E							18.82
* Terminal EPS							$1.23
Terminal value							$23.23
* Discount factor							0.48
Discounted terminal value							$11.16
Summary							
First stage	$2.96	Present value of first 2 year cash flow					
Second stage	$2.56	Present value of year 3-7 cash flow					
Third stage	$11.16	Present value of terminal value P/E					
Value (P/E)	**$16.68**	= value at beg of fiscal yr	2019				

20

Recommendation	**NUETRAL**
Target (today's value)	$49
Current Price	$49.83
52 week range	$42.04 - $57.60

Semiconductors

Intel Corporation



Share Data	
Ticker:	INTC
Market Cap. (Billion):	$218.3
Inside Ownership	0.1%
Inst. Ownership	68.7%
Beta	1.14
Dividend Yield	2.5%
Payout Ratio	43.5%
Cons. Long-Term Growth Rate	9.7%

	'15	**'16**	**'17**	**'18E**	**'19E**
Sales (billions)					
Year	$55.3	$59.4	$62.8	$70.8	$72.7
Gr %	-0.1%	7.3%	5.7%	12.7%	2.7%
Cons	-	-	$62.8	$71.2	$73.2
EPS					
Year	$2.41	$2.18	$2.04	$4.40	$4.50
Gr %	0.1%	-9.5%	-6.4%	115%	2.2%
Cons	-	-	$3.46	$4.52	$4.53

Ratio	**'15**	**'16**	**'17**	**'18E**	**'19E**
ROE (%)	19.5%	16.2%	14.2%	28.6%	26.6%
Industry	36.4%	16.1%	16.1%	45.1%	40.7%
NPM (%)	20.6%	17.4%	15.3%	28.4%	27.4%
Industry	20.3%	15.3%	9.6%	9.6%	26.0%
A. T/O	0.57	0.55	0.53	0.53	0.54
ROA (%)	11.7%	9.6%	8.1%	16.0%	15.0%
Industry	10.3%	8.2%	8.2%	8.2%	18.3%
A/E	1.63	1.66	1.73	1.75	1.72

Valuation	**'16**	**'17**	**'18E**	**'19E**
P/E	17.1	23.2	10.5	10.6
Industry	30.9	28.1	32.6	18.9
P/S	3.0	3.6	3.3	3.1
P/B	2.6	3.1	3.1	3.0
P/CF	8.1	10.1	7.7	7.3
EV/EBITDA	12.5	12.9	12.9	10.0

Performance	**Stock**	**Industry**
1 Month	-1.5%	-6.9%
3 Month	5.5%	-18.4%
YTD	-13.1%	-14.4%
52-week	8.5%	2.1%
3-year	39.5%	-1.4%

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Summary: I recommend a neutral rating with a target of $49. Although INTC has an opportunity to dramatically improve efficiency and increase margins, there is a lot of uncertainty regarding the emerging segments and core business transition. This uncertainty seriously offsets my optimism that the core business can greatly improve in one year. The stock is fairly valued based on relative and DCF analysis.

Key Drivers:

- Connectivity of smart devices: Over the past several years, Intel has been establishing a presence in the future markets of next generation smart devices. These new devices can be applied to autonomous driving, Industry 4.0, healthcare, retail and smart cities.

- Transition from PC centric to data centric: In reaction to declining demand of the CCG, the firm is currently in transition for the DCG to overtake the CCG as the largest operating segment.

- Artificial Intelligence and Machine Learning: With greater amounts of data needing to be processed, there is a demand that needs to be supplied. Advanced digitized networks have the potential to use preventive action and adaptive production to completely evolve current industries.

- Capital Allocation: Intel has led the semiconductor CPU industry for many years. This is due to its high investments in R&D, strategic acquisitions, and cross-industry partnerships.

Valuation: Using relative valuation approaches, Intel appears to be fairly valued in comparison to the semiconductor industry. A combination of the approaches suggests that Intel is fairly valued, as the stock's value is about $49 and the shares trading at $49.76

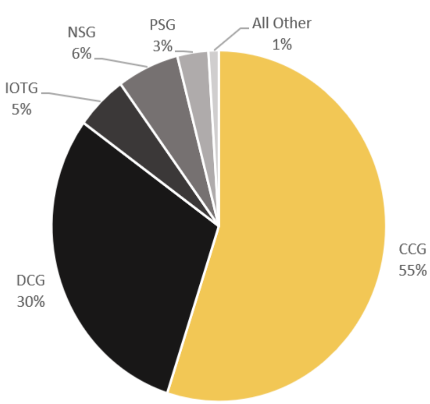
Risks: Threats to the business include volatility of demand, competition, need for constant innovation and a global economic downturn.

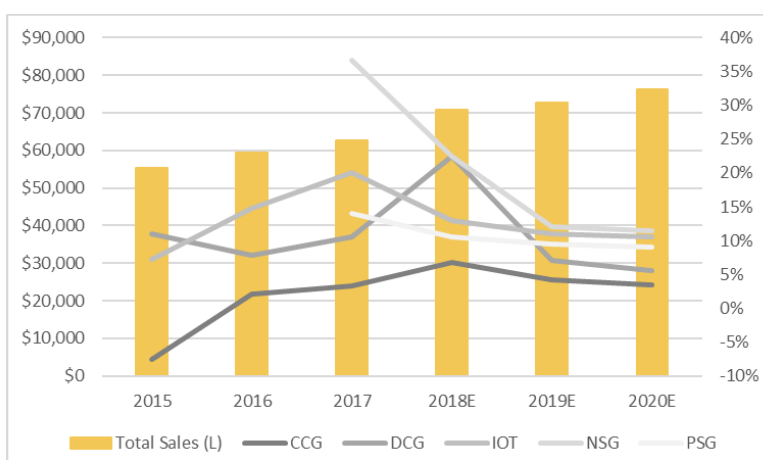
Company Overview

Intel Corporation (INTC) is a specialty semiconductor manufacturer that designs and manufactures processors, platforms, and infrastructure. Intel has six operating segments: Client Computing Group, Data Center Group, Internet of Things Group, Non-Volatile Memory Solutions Group, and the Programmable Solutions Group.

- Client Computing Group (CCG): This is the largest segment for Intel, generating 54% of its revenue. CCG creates the processors, platforms, and accessories for tablet, laptops, modems, and desktops. As annual PC shipment rates have declined to a single digit rate and since 2013, the total addressable market has dropped 18%. However, CCG profitability has improved over 45% from 2013-2017.
- Data Center Group (DCG): DCG creates platforms and products designed for enterprise, cloud, and communication infrastructure. In 2017, DCG produced 30% of Intel's revenue and 40% of the total operating income. DCG had a growth rate of 11% and a 43% operating margin for 2017. This will be the most important segment for Intel in the coming years. I anticipate DCG to increase its percent of revenue from 30.4% in 2017 to 34.5% by 2019.
- Internet of Things Group (IOTG): IOTG reduces embedded systems of networks for analytics of automotive, manufacturing, healthcare, retail, security, and other features. This is the fastest growing segment with an annual growth rate of 15% from 2013-2017. It is expected that IOT will grow with the acceleration of Big Data, cloud networks, automotive connectivity, and smart cities.
- Non-Volatile Memory Solutions Group (NSG): NSG produces the non-volatile memory storage used in desktops, data centers, and embedded systems. All data centers use SSD's as they are nearly impossible to corrupt compared to HDD's. Intel's lines of SSD's include: Optane, Fab 68, and 3D NAND. NSG had $725 million in cost reductions generated by the Fab 68 that brought the operating losses to $284 million. This cost reduction added 11 cents to the firms EPS.
- Programmable Solutions Group (PSG): Builds field programmable gate arrays (FPGA) and related products for communication, data centers, industrial, military, and automotive. These FPGA's increase the workloads of 5G, network function virtualization, cyber analytics, and artificial intelligence. PSG makes up 3% of total revenue for Intel.
- All other: The remaining revenues that are non-reportable are in this category.

Figures 1 and 2: Revenue sources for INTC, year-end 2014 (left) and revenue history since 2010





Source: Company reports

Business/Industry Drivers

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

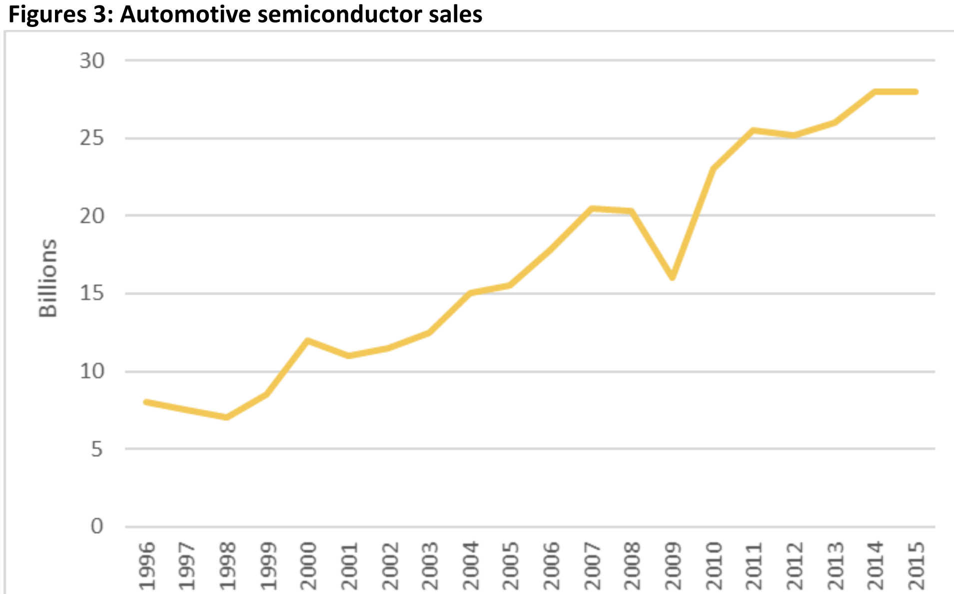
1) Connectivity of Smart Devices
2) Transition from PC-centric to Data-centric
3) Artificial Intelligence and Machine Learning
4) Capital Allocation
5) Management
6) Macroeconomics

<u>Connectivity of Smart Devices</u>

The Internet of Things Group (IoTG) is the fastest growing group within semiconductors with a 9% compounded annual growth rate (CAGR) forecast from 2017-2022, according to Intel. The firm's IoTG grew 20.1% from 2016-2017. As the world becomes more connected, Intel has been creating processors and platforms to be applied to autonomos driving, Industry 4.0, healthcare, retail, and smart cities.

Intel has been increasing R&D for the IoTG, and from 2016-2017, operating income increased $65 million due to higher revenue in the high investment growth automobiles space. In 2018, Intel acquired NetSpeed Systems which designs network on chip (NoC) and system on chip (SoC) processors. In Q2 of 2017, Intel acquired the Israeli based company, Mobileye, an industry leader in computer vision, machine learning, and advanced driver assitance systems (ADAS). During that time, Intel partnered with BMW, Volkswagon, and Nissan to use their automobiles to gather road imagery and upload it to the cloud to create a crowd sourced road environment. McKinsey produced a article in May of 2017 stating the demand for ADAS units increased 48% in automobiles. In 2014, demand was at 94 million units and increased to 139 million units in 2016. Other specific ADAS features grew substantially: surround view (166%), distance (116%), lane-departure warning system (78%), night vision (62%), and adaptive front lighting system (19%). Additionally, a McKinsey article showed that automotive semiconductor sales increased from about $8 billion in 1996 to $27 billion in 2015.

Figures 3: Automotive semiconductor sales



Source: McKinsey

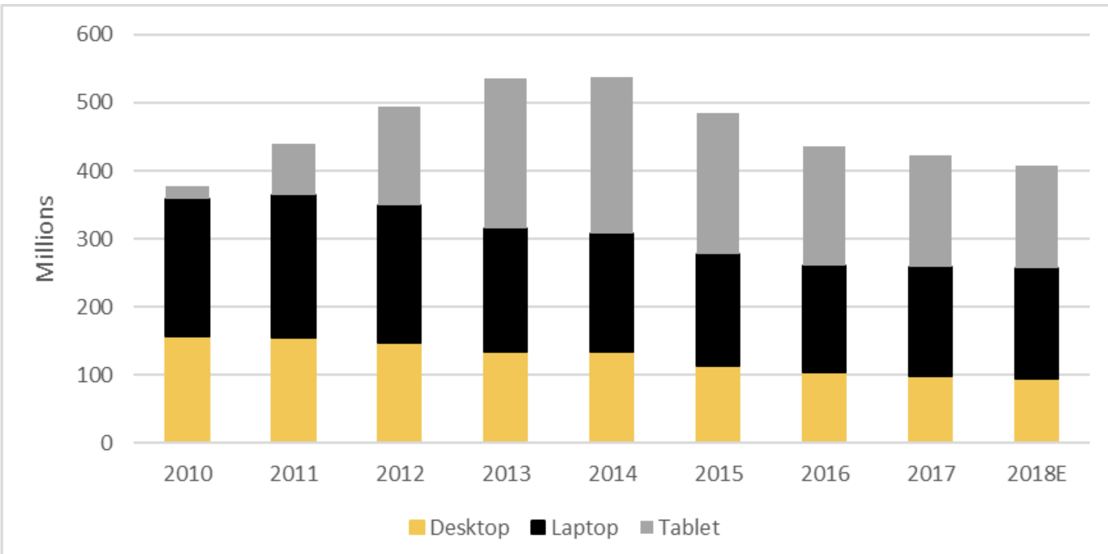
Repositioning from PC-centric to Data-centric

Intel has remained firm in its repositioning from a PC centric business to a data centric business. While desktop, tablet, and laptop sales have been stagnated over the past 10 years, new personal processors have matured and the market is beginning to flatten in sales growth as it reaches maturity. The sales increase in CCG is expected from a cyclical company in about the longest economic upcycle in history.

DC grew 16% YoY adjusting after ISecG was reclassified

While the PC sales are declining, more products are being added to the product mix of personal smart connected devices. Intel will continue to need the PC side of the business to push innovations into the market and transition it into the data centric segments. Processors, solid state storage devices, and platforms will still be needed whether it is commercially based or individually consumer based. DCG platform products saw 28% growth in cloud service, 15% increase in communication and service providers, and a 3% decrease in enterprise and government in 2016-2017. The accumulation of data is becoming a significant force in society and business and will be essential in shaping the future. Large complex applications in the cloud to individual devices customers are searching for solutions to process, analyze, store, and transfer data.

Figure 4: Desktop, laptop, tablet decline (2010 – 2017)



Source: Statista

Artificial Inteligence and Machine Learning

90% of the world's data has been produced over the last two years. This data needs help from machine learning systems. Intel's machine learning uses field programmable gate arrays (FPGA) to accelerate workloads in data centers similar to 5G, network function virtualization (NFV), cyber analytics, and artificial intelligence.

AI and machine learning will eventually be a part of Intel's end to end solution for its customers.

Intel's has server CPU's, the latest of these chips is the Xeon Gold 6138P. The processor is in competition with AMD's EPYC 7601 processor. Both CPU's were released in Q2 of 2018 on a 14nm frame. The Xeon has a better architecture on the chip and it can move data more efficiently than AMD's. The Xeon outperformed the EPYC in Javascript, PHP Runtime, memory caching, DPDK L3 forwarding, Hammer database, NoSQL database, online transaction processing, and server virtualization. The EPYC outperformed the Xeon in integer throughput and floating point throughput and they tied in server side Java. The Xeon performed better with network infrastructure, databases, and virtualization under normal usage.

Figure 5: Comparison of Xeon and EPYC processors

Intel Xeon Gold 6138P		AMD EPYC 7601
18-Jun	Release Date	18-Aug
14nm	Lithography	14nm
20	# of Cores	32
40	# of Threads	64
2.00 GHz	Processor Base Frequency	2.2 GHz
3.7 GHz	Processor Max Frequency	3.2 GHz
27.5 MB L3	Cache	64 MB L3
1.5 TB/skt DDR4	DRAM Capacity	2 TB/skt DDR4
195 W	TDP	180 W
1S: 48 + 20 lanes 2S: 96 + 20 lanes	PCIe	1S: 128 lanes 2S: 128 lanes
6 channels per die	Memory	2 channels per die
0.75 TiB	Max Memory	2 TiB
2666 MHz	Max Memory Speed	2666 MHz
6	Memory Channels	8
160 GB/s	Memory Bandwidth	341 GB/s

Source: Company Reports

Capital Allocation

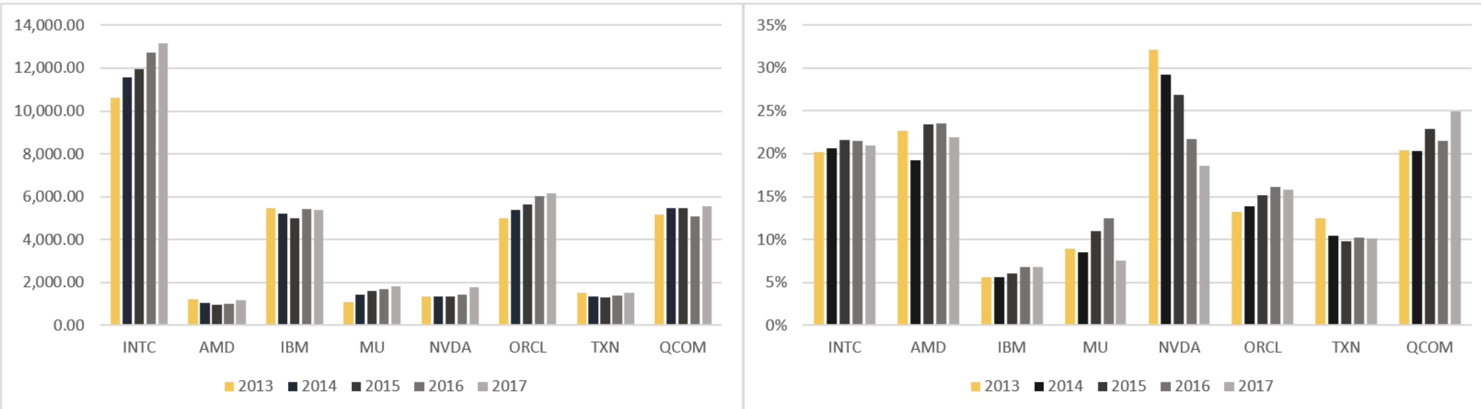
It is incredibly important for semiconductor producers to stay at the forefront of innovation. To adapt and innovate through capital allocation, Intel focuses capital spending on research and development, acquisitions, and returning cash to stockholders. Intel has made a goal of using ~20% of revenue towards research and development. When compared to its competitors, Intel outspends all of them. However, when compared as a percent of revenue, the firm is around the average. The demand to develop powerful processors quicker has prompted Intel to maintain its high R&D.

Since the gradual transition from a PC centric business to a data centric business, Intel made two acquisitions in the past year. As noted earlier, in Q2 of 2017 the firm acquired Mobileye, an Israeli based vision based advanced driver assistance system to prevent collisions and provide machine learning for autonomous cars. From 2016 to 2017, Mobileye's revenue increased by $210 million. The revenue increase is a 220% jump compared to the last years, however, this is less than a 1% increase to Intel's total revenue. Intel's most recent acquisition was of NetSpeed Systems, designer of network on chip (NoC) and system on chip (SoC).

Intel has the highest R&D out of any comparable.

R&D increased by 3% from 2016-2017. This is a relatively small increase compared to the past since Intel is attempting to decrease annual MG&A and R&D expenses as 30% of revenue by 2020. In 2019, I am expecting R&D to rise 9% but, this is due to the 13% increase in total revenue. The use of R&D and strategic acquisitions will be needed to stay well established in the semiconductor industry. Intel has done a good job of keeping up with Moore's Law. Intel's co-found Gordon Moore predicted that new generations of chips would be produced on a two-year cycle, while doubling the number of transistors each. Unfortunately, the 10nm chip from Intel originally was to be released in late 2016. A couple more delays later and the 10nm chip should arrive for 2019's Christmas. However, TSMC, GlobalFoundries, Samsung, AMD, and Apple's 7nm chip are slated to ship before Intel's 10nm arrives. These delays are contributed to the fact that Intel has been having troubles with the low yields from the factories due to the high transistor density and heavy multi patterning. This will continue to hurt the firms margins until the 10nm chipset is completed.

Figure 6 and 7: R&D for INTC and COMPs (left), R&D as a percentage of Revenue

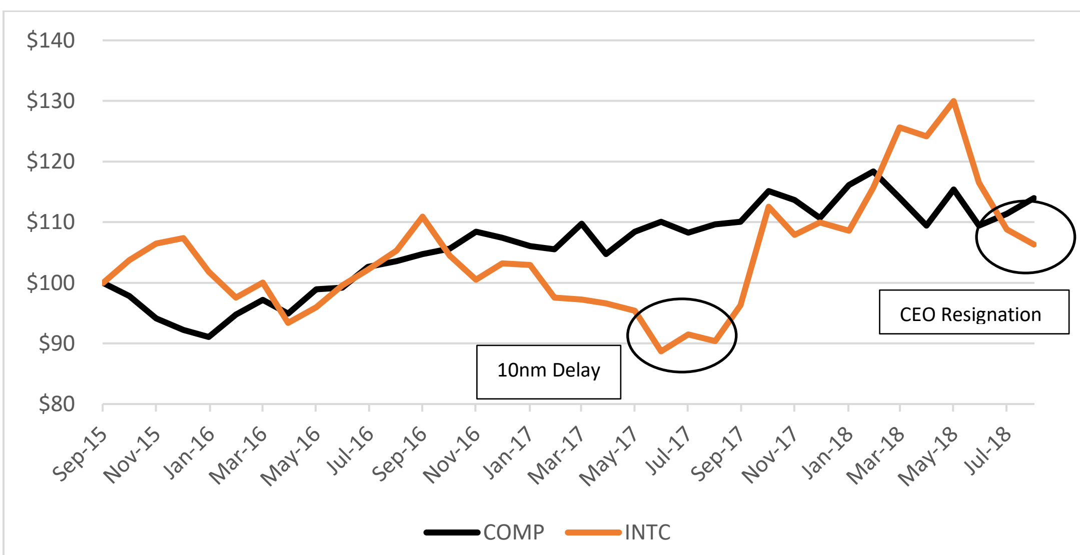


Source: Company Reports

Management

Intel's CEO Brain Krzanich resigned in June 2018, and the board named CFO Robert Swam Interim Chief Executive Officer. Intel put out a statement that Mr. Krzanich had a past consensual sexual relationship with an Intel employee. Mr. Krzanich oversaw moving Intel's push to develop a 10nm processor. The 10nm processor has been promised by Intel since 2015; since then, competitors have been moving forward and should be shipping 7nm processors by the end of the year. Intel being behind means it will make less per chip for its investment if it is not the leading edge at the time of release. The delay of the 10nm chip caused Intel's 2018 Q3 operating income for CCG to decrease by $400 million because of the higher initial production costs for the 10nm products and a lower gross margin from an adjacent business due to initial production costs of its new modem product. Mr. Krzanich sold $25 million of shares last fall and resigned. These events have contributed to the weakness of the stock.

Figure 8: Intel and COMP stock price over the last 3 years

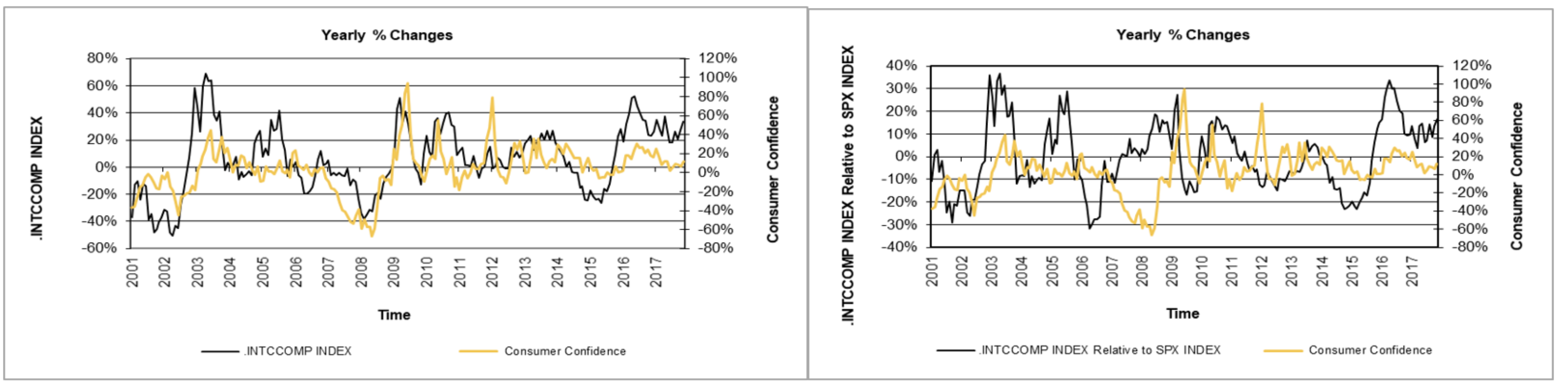


Source: Company Reports

Macroeconomic Trends

Semiconductors are a cyclical business, and is highly correlated (.556) with consumer confidence (figure 9). Businesses also thrive during those environments and buy Intel products. When consumers feel good about the economy, they spend more money on technology products. The semiconductor index and consumer confidence took a major fall during the 2008 recession and made quite a large rebound within the next two years. Semiconductor index relative to the SPX index is also positively related to consumer confidence; however, it appears the relative performance tends to lead confidence. The recent correction in semiconductors is indicative of perhaps a slowing economy.

Figure 9 and 10: Consumer confidence compared to INTC comps (left) and consumer confidence compared to INTC comps relative to the S&P 500 Index

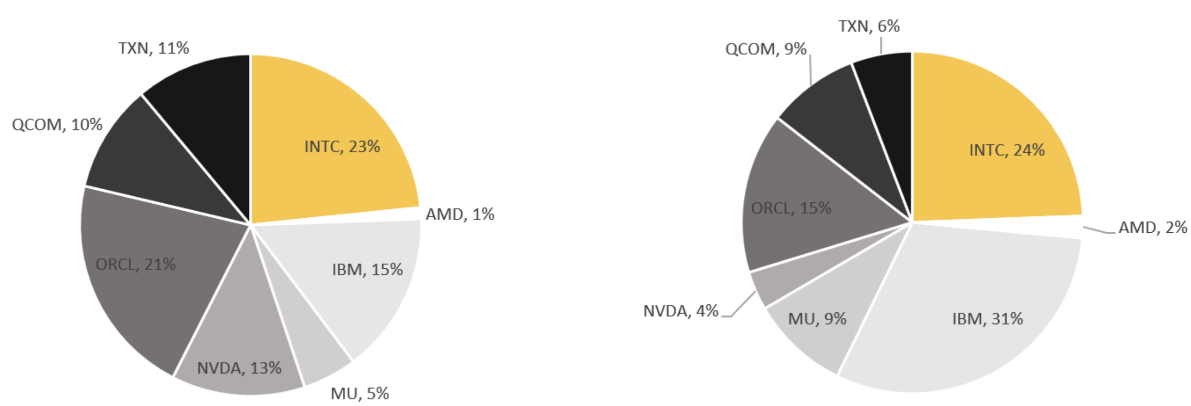


Source: Company Reports

Competitor Analysis

Semiconductors are a competitive sector where companies are reacting to always deliver faster and smaller chips. Consumers are not loyal, and switch quite easily from one company to another. On the other hand, corporations have significant cost to completely change their systems. The competition changes from each segment and each individual product being released. Intel has the second largest revenue to IBM. Since Intel's market cap share is about the same as its sales share, this implies that the market expects similar, in aggregate, growth, risk, and/or profitability for Intel versus the competition. Intel has the highest market capitalization with Oracle close behind.

Figures 12 and 13: Comparison of INTC comps by market cap (left) and retail sales

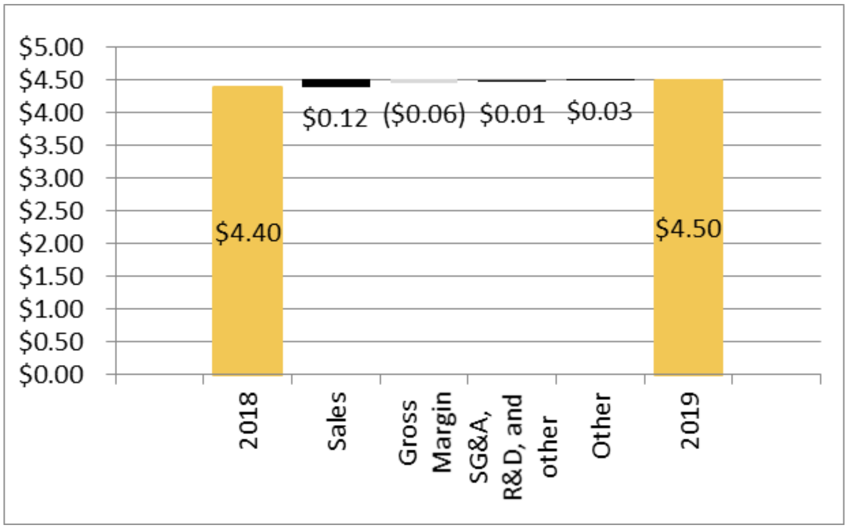


Source: FactSet, IMCP

Financial Analysis

I anticipate EPS to grow to $4.50 in FY 2019. Increasing revenues in the client computing group and the data center group should drive the majority of sales, producing an earnings increase of $0.12. This is partially offset by a decrease in gross margin by (-$0.06). I anticipate a small change in SG&A and R&D as a percent of sales ($0.01). I expect share buybacks to boost EPS by $0.03 this is offset by Intel expected tax rate of around 14% for 2018. I foresee their effective tax rate slowly rising to 18%.

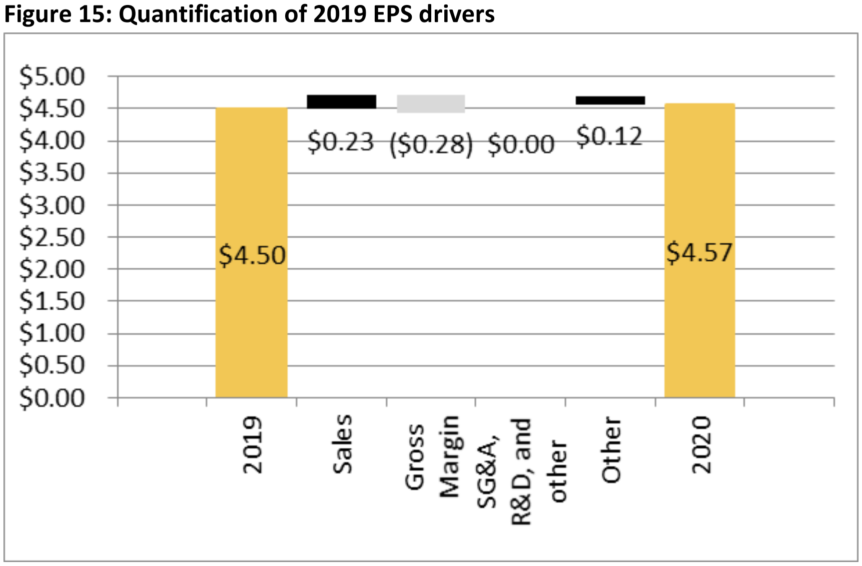
Figure 14: Quantification of 2018 EPS drivers



Source: Company Reports, IMCP

I expect 2019 EPS to increase $0.07 to $4.57 in 2020. Intel will gain $0.23 of earnings from increased sales across operating segments. The primary driving force for this is consistent growth of the data center group, client computing group, and internet of things group. I anticipate that gross margin will continue to slowly regress to the historical average causing a decrease in earnings of $0.28. Since SG&A and R&D will remain the same as a percentage of sales it does not impact EPS. Assuming Intel will continue its rate of share buybacks, this will cause an increase in earnings of $0.12.

Figure 15: Quantification of 2019 EPS drivers



Source: Company Reports, IMCP

I am more pessimistic than the consensus estimates for 2018 and 2019. In 2017 the unusual 7% increase in EBIT margin was a result from a higher ASP in the data center group. I anticipate this margin slowly returning to its historical average. This increase in margin produced a strong three quarters of income in 2018; however, I believe that the demand for processors late in the business cycle will decrease.

Figure 16: EPS and YoY growth estimates

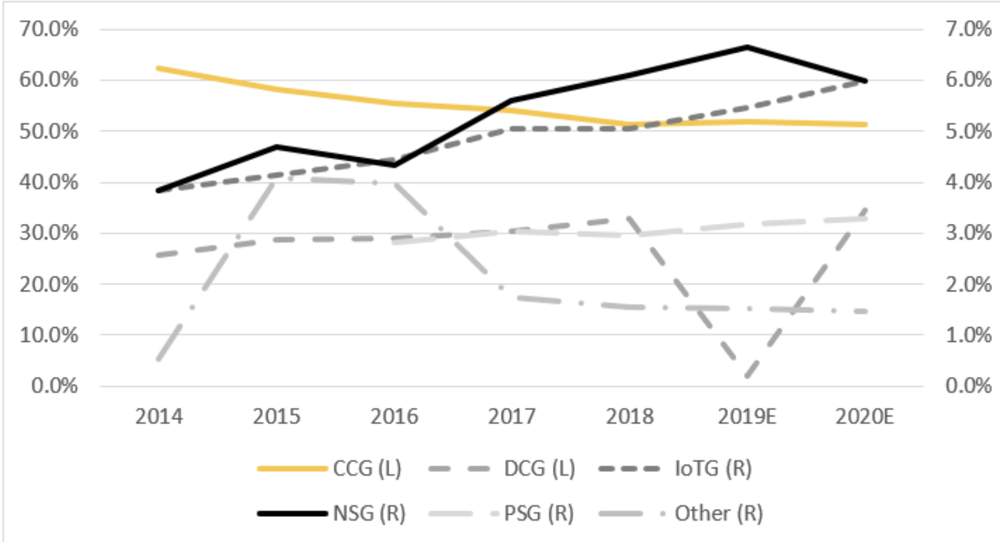
	2019E	2020E
Revenue	$72,726	$76,364
YoY Growth	2.8%	5.0%
Revenue Consensus	$73,303	$75,044
YoY Growth	3.0%	2.4%
EPS	$4.50	$4.57
YoY Growth	2.3%	1.6%
EPS Consensus	$4.53	$4.64
YoY Growth	0.2%	2.4%

Source: Factset, IMCP

Revenues

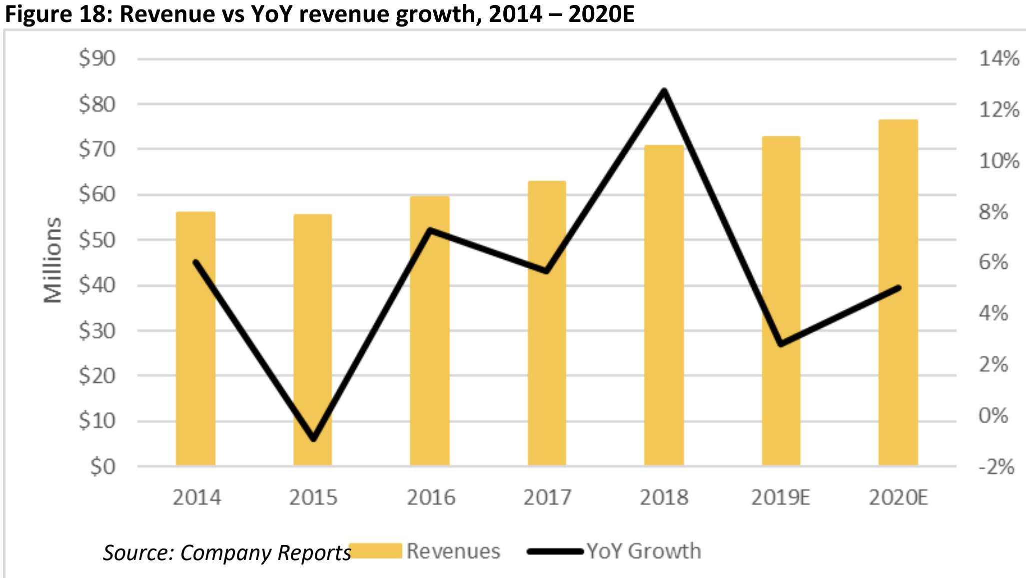
Intel's revenue has experienced strong growth since falling 0.9% in 2015. While I forecast growth to stabilize over the next two years, I believe that strong sales in the Client Computing Group and Data Center Group will primarily lead this growth. I anticipate that Intel's Client Computing Group will lag compared to their competition; however, this is due to ASP decreasing as the firm transitions from PC centric to data centric. I anticipate the firm will continue to produce behind Moores Law. Also, Intel being late to the 10nm and this leads to lower ASP, but this will be marginally offset by improving the infrastructure and efficiency of its 14nm chips. I believe by the end of 2019 Intel will complete the 10nm chipset and begin to implement it. The completion of the 10nm will give Intel a boost in sales and affect NPM positively. In 2017 the firms NPM was 15.3%. I anticipate this to increase to 28.4% in 2018 and slightly drop to 27.4% in 2019. The Data Center Group will see a trickledown effect of the improvements in infrastructure and efficiency while Intel continues its transition. I predict that the during the transition from PC centric to data centric the Data Center Group will continue the trend of out growing the client computing group. The Internet of Things Group will see strong growth from autonomous driving. As the Data Center Group of Intel increases, so will demand for the Non-Volatile Memory Solutions Group.

Figure 17: Intel segment revenues, 2014 – 2020E



Source: Company Reports, IMCP

Figure 18: Revenue vs YoY revenue growth, 2014 – 2020E



Source: Company Reports, IMCP

<u>Return on Equity</u>

Intel's decrease in ROE in 2015-2017 can be explained by the decrease in its ROA. The decrease in ROA was a result of a lower EBIT margin. Gross margin went down, SG&A and R&D went up, and less money was dropping to the bottom line. In 2018, ROA and ROE are recovering from the decrease in profit margins, asset turnover, and continued delays of the 10nm. I predict the EBIT margin will float around 33% through 2020. I anticipate that Intel will see a sustained ROE of around 26% for 2018-2020.

Figure 19: ROE breakdown, 2015 – 2020E

5-stage DuPont	2015	2016	2017	2018	2019E	2020E
EBIT / sales	25.3%	21.7%	28.6%	34.4%	34.0%	32.0%
Sales / avg assets	0.57	0.55	0.53	0.56	0.55	0.54
EBT / EBIT	101.5%	100.5%	113.5%	98.8%	98.4%	98.3%
Net income /EBT	80.4%	79.7%	47.2%	83.7%	82.0%	82.0%
ROA	11.7%	9.5%	8.1%	16.0%	15.0%	13.9%
Avg assets / avg equity	1.67	1.70	1.75	1.79	1.77	1.74
ROE	19.5%	16.2%	14.2%	28.6%	26.6%	24.2%

Source: Company Reports

I expect ROE to decline from 28% to 24% in the next two years due to EBIT and slightly declining margins, as INTC is expected to grow its assets in growth markets that are currently still in their infancy.

Free Cash Flow

Figure 20: Free cash flows 2014 – 2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$11,368	$11,251	$10,267	$8,461	$20,361	$20,276	$20,038
Growth		*-1.0%*	*-8.8%*	*-17.6%*	*140.6%*	*-0.4%*	*-1.2%*
NWC*	(739)	2,010	2,741	(147)	(119)	(122)	(128)
Net fixed assets	57,073	56,749	71,639	89,557	98,652	102,430	109,091
Total net operating capital*	$56,334	$58,759	$74,380	$89,410	$98,533	$102,308	$108,963
Growth		*4.3%*	*26.6%*	*20.2%*	*10.2%*	*3.8%*	*6.5%*
- Change in NWC*		2,749	731	(2,888)	28	(3)	(6)
- Change in NFA		(324)	14,890	17,918	9,095	3,778	6,661
FCFF*		$8,826	($5,354)	($6,569)	11,238	$16,501	$13,383
Growth			*-160.7%*	*22.7%*	*-271.1%*	*46.8%*	*-18.9%*
- After-tax interest expense	(336)	(169)	(49)	(1,140)	250	326	338
FCFE**		$8,995	($5,305)	($5,429)	$10,988	$16,175	$13,045
Growth			*-159.0%*	*2.3%*	*-302.4%*	*47.2%*	*-19.3%*
+ Net new debt/other cap		9,015	2,613	1,530	1,061	1,050	1,050
Sources of cash		$18,010	($2,692)	($3,899)	$12,049	$17,225	$14,095
Uses of cash							
Other expense		-	-	-	-	-	-
Increase cash and mkt sec		10,122	(7,994)	(5,085)	(5,008)	4,729	999
Dividends		4,556	5,925	5,072	5,451	5,996	6,596
Change in other equity		1,644	(750)	1,736	12,196	7,000	7,000
		$16,322	($2,819)	$1,723	$12,639	$17,725	$14,595
Change in other liab		(1,688)	(127)	5,622	590	500	500
Total		$18,010	($2,692)	($3,899)	$12,049	$17,225	$14,095

Source: Company Reports, IMCP

Intel's FCFF has been volatile over the previous years. In 2016, the firm invested $1 billion in working capital and $15 billion in net fixed assets, primarily for MobilEye. In 2017, fixed assets rose $18 billion while working capital declined $3 billion over the three years, 2015-2017 the firm only needed $33 billion in investments, which reflects its strong cash flow.

As of September 2018, Intel has a remaining stock repurchase limit of $4.7 billion, or 2% of shares outstanding. I predict that the firm will purchase an additional one billion shares in Q4 of 2018 and continue the stock repurchase programs in 2019 and 2020. The firm has repurchased $51.4 billion since 2011.

I anticipate both FCFF and FCFE to increase in 2018-2020, as there is no investment in working capital only and $11 billion investment in net fixed assets. The share buyback program will continue through 2020 which will spread cash out among a smaller number of shares.

Valuation

INTC was valued using multiples and a three-stage discounting cash flow model. Based on earnings multiples, the stock is less expensive relative to other firms and is worth $38; however, due to the volatility of Intel's earnings the past few years, as well as the effect of recent nonrecurring expenses, this metric may be unreliable. Another relative valuation approach shows INTC to be slightly overvalued based on its fundamentals versus those of its peers in the semiconductor industry. A detailed DCF analysis values INTC slightly lower, at $51; I give this value a bit more weight because it incorporates assumptions that reflect INTC's ongoing business changes. Because of these valuations, I value the stock at $49.

Trading History

Intel has been trading down compared to the previous 5 years in relation to the S&P 500. This is a result of an economy that may be late cycle and due to the cyclical nature of the stock's firm. The firms current NTM P/E is 10.5, compared to the firm's 5-year average of 13.1.

Figure 21: INTC NTM P/E relative to S&P 500

Source: Factset

Assuming the firm maintains a 10.5 NTM P/E at the end of 2019, it should trade at $47.99 by the end of the year.

- Price = P/E x EPS = 10.5 x $4.50 = $47.25

Discounting $47.25 back to today at 12.32% cost of equity (explained in Discounted Cash Flow section) yields a price of $42.07. Given the firms potential for earnings growth and continued profitability, this seems to be a low valuation given its current price of $49.76. However, this makes sense because I am pessimistic regarding earnings than consensus.

Relative Valuation

Intel is currently trading at a P/E lower than its peers, with a P/E TTM of 14.8 compared to an average of 21.1. Investors are only willing to pay at a discount for Intel because the company's gradual transition from PC centric to data centric, as this is a major change. The stock's P/B and P/S ratios have been much lower than average compared of its peers. This reflects lower ROE and compared to its peers; although it has a similar profit margin.

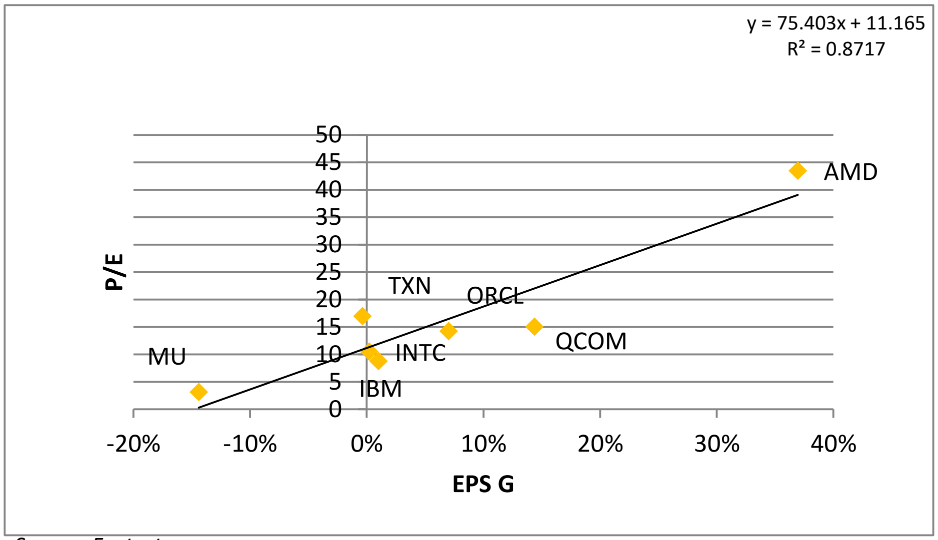
Figure 22: INTC comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
INTC	INTEL CORP	$47.38	$216,242	0.4	(1.5)	5.5	(13.1)	8.5	2.6	9.7	41.0%	-6.1%	127.1%	0.2%	2.4%	-1.4%	0.81	35.4%	B+	2.43%	36.5%
AMD	ADVANCED MICRO DEVICES	$19.98	$19,968	(0.1)	(5.0)	(33.6)	27.0	96.7	94.4	62.5	52.1%	-93.3%	1050.0%	37.0%	52.4%		1.85	181.9%	A-	5.00%	98.7%
IBM	INTL BUSINESS MACHINES CORP	$120.89	$109,864	(0.2)	(2.1)	(17.5)	(17.5)	(22.2)	(21.2)	3.5	122.6%	-50.7%	125.1%	1.0%	2.9%	-15.8%	1.85	181.9%	A-	5.00%	98.7%
MU	MICRON TECHNOLOGY INC	$35.21	$39,439	1.2	(10.0)	(19.2)	(42.6)	(18.1)	(14.4)	-4.6	-13.9%	-1733.3%	156.7%	-14.4%	-9.5%		1.28	11.7%	B-	0.00%	0.0%
NVDA	NVIDIA CORP	$148.19	$90,396	(2.4)	(27.9)	(45.7)	(43.1)	(23.9)	(23.4)	9.4	-21.7%	138.0%	162.3%	-0.4%	20.4%	39.9%	2.65	21.0%	B+	0.37%	8.0%
ORCL	ORACLE CORP	$46.46	$175,989	(0.4)	(8.2)	(5.0)	(3.6)	(7.9)	(1.7)	8.5	269.6%	6.8%	48.0%	7.0%	6.3%		1.05	142.9%	A-	1.56%	81.7%
QCOM	QUALCOMM INC	$57.35	$69,517	0.2	1.1	(20.9)	(4.3)	(12.0)	(10.4)	10.6	-220.9%	-56.4%	130.1%	14.4%	17.6%		1.59	1655.7%	B	4.09%	
TXN	TEXAS INSTRUMENTS INC	$94.54	$90,810	0.8	(1.6)	(10.9)	(18.0)	(4.3)	(9.5)	14.2	14.1%	3.7%	54.3%	-0.4%	10.5%	19.1%	1.31	41.1%	A-	2.63%	53.1%
Average			$101,528	(0.1)	(6.9)	(18.4)	(14.4)	2.1	2.0	14.2	30.4%	-223.9%	231.7%	5.6%	12.9%	10.4%	1.55	283.9%		2.63%	53.8%
Median			$90,603	0.1	(3.6)	(18.4)	(15.3)	(10.0)	(9.9)	9.5	27.5%	-28.4%	128.6%	0.6%	8.4%	8.8%	1.45	92.0%		2.53%	53.1%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			8.2%	38.2%	8.7%	10.5%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
INTC	http://www.intel.com	28.9%	3.03	17.1	23.2	10.5	14.8	10.5	10.5	10.2	29.0%	3.04	32.5%	10.5%	12.9	8.7	9.0	5.7%	2.1%	3.3%	$15.66
AMD	http://www.amd.com	40.8%	17.74	18.9	257.0	43.4	58.8	38.6	31.7	20.8	7.1%	3.07	7.6%	2.3%	75.6	29.6	78.6	-1.3%	0.9%	-0.3%	$1.13
IBM	http://www.ibm.com	63.4%	5.55	13.4	25.0	8.8	19.4	8.7	8.7	8.4	15.7%	1.38	15.3%	10.4%	17.4	11.2	9.6	-1.3%	0.9%	-5.4%	$21.77
MU	http://www.micron.com	40.7%	1.27	-81.2	9.3	3.1	3.1	3.6	3.6	4.0	41.7%	1.30	49.1%	43.8%	4.3	2.2		-1.9%	-0.3%	27.3%	$27.82
NVDA	http://www.nvidia.com	43.4%	9.54	98.8	75.3	22.0	19.8	25.3	22.1	18.3	42.3%	9.31	36.9%	35.4%	46.1	18.7	25.7	-2.7%	19.6%	17.8%	$15.53
ORCL	http://www.oracle.com	32.7%	4.65	18.6	21.4	14.2	50.0	13.5	13.3	12.5	31.1%	4.42	35.8%	3.8%	13.4	25.0		0.9%	2.5%	1.4%	$9.99
QCOM	http://www.qualcomm.com	501.8%	75.33	17.1	38.6	15.0	-17.3	14.3	13.1	11.2	20.4%	3.06	20.5%	-14.6%	23.5	33.6		-7.5%	8.0%	-1.8%	$0.76
TXN	http://www.ti.com	51.1%	8.67	21.0	28.9	17.0	20.2	17.7	17.0	15.4	33.8%	5.74	42.8%	26.7%	17.5	15.6	16.0	-2.8%	5.7%	3.3%	$10.90
Average		100.4%	15.72	15.5	59.8	16.7	21.1	16.5	15.0	12.6	27.6%	3.91	30.1%	14.8%	26.3	18.1	27.8	-1.4%	4.9%	5.7%	
Median		42.1%	7.11	17.8	27.0	14.6	19.6	13.9	13.2	11.8	30.0%	3.06	34.1%	10.5%	17.4	17.1	16.0	-1.6%	2.3%	2.3%	
spx	S&P 500 INDEX			20.6	22.8	16.2			14.9	13.5											

Source: Factset

Figure 24: P/E vs EPS G



Source: Factset

A more thorough analysis of P/E and EPS growth is shown in figure 24. A regression indicates that over 87% of a sampled firm's P/E is explained by its EPS growth. Note that that Nvida has been excluded from this regression, because it has an outlier P/E ratio. INTC has one of the lowest EPS growth rates at 0.22%, and its P/E ratio is directly in the middle of the firm's competitors. According to this measure, the firm is slightly undervalued.

- Estimated P/E = Estimated 2019 EPS growth 0.22% x 75.403 + 11.16 = 11.32
- Target Price = Estimated P/E (11.32) x 2019E EPS ($4.57) = 51.73

Discounting this price back to the present at 12.42% cost of equity gives a target price of $46.01. This is below the current price by 3%.

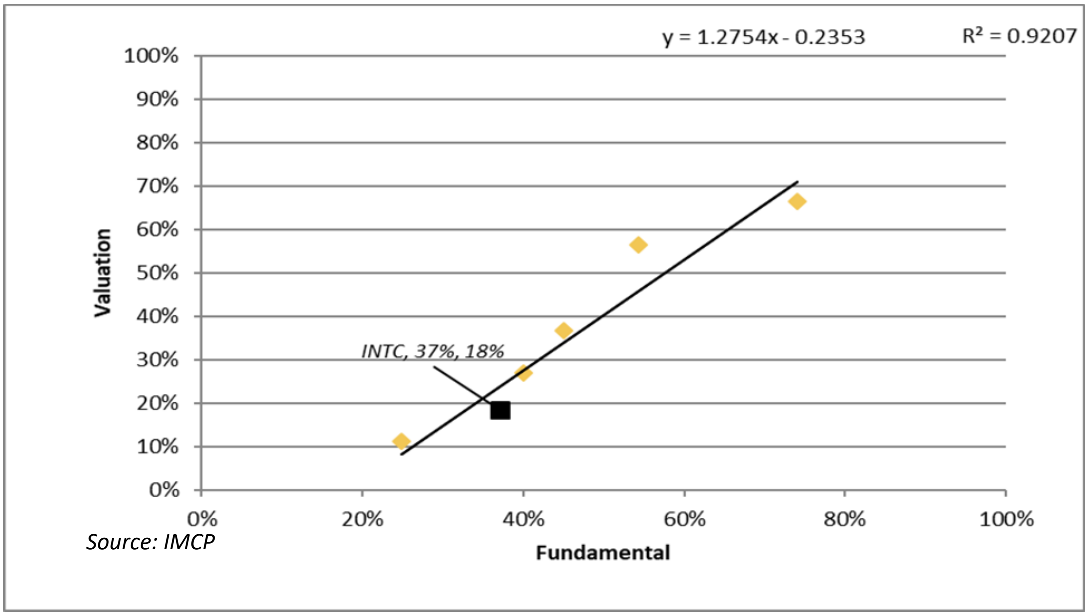
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. An equal weighting of 2018 ROE and 2018 NPM was compared to an equal weight composite of P/B and P/S. After eliminating Micron, an extreme outlier, the regression line had an R-squared of .9207. One can see that Intel is below the line, so it is inexpensive based on its fundamentals.

Figure 25: Composite valuation, % of range

		Fundamentals		Valuation			
	Weight	50.0%	50.0%	50.0%	50.0%		
		2018	2018				
Ticker	Name	ROE	NPM	P/B	P/S	Fund	Value
INTC	INTEL CORP	6%	68%	4%	33%	37%	18%
AMD	ADVANCED MICRO DEVICES	6%	68%	4%	33%	37%	18%
IBM	INTL BUSINESS MACHINES CORP	13%	37%	7%	15%	25%	11%
NVDA	NVIDIA CORP	9%	100%	13%	100%	54%	56%
ORCL	ORACLE CORP	7%	73%	6%	47%	40%	27%
QCOM	QUALCOMM INC	100%	48%	100%	33%	74%	66%
TXN	TEXAS INSTRUMENTS INC	10%	80%	12%	62%	45%	37%

Source: IMCP

Figure 26: Composite relative valuation



Source: IMCP

Discounted Cash Flow Analysis

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

For the purpose of this analysis, the company's cost of equity was calculated to be 11.04% 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 3.1%.
- A ten-year beta of 1.35 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 12.42% (3.1 + 1.15 (10.0 – 3.1)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be \$3.64 and \$3.02, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of \$5.63 per share. Thus, stage one of this discounted cash flow analysis contributes \$5.63 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 12.42% cost of equity. I assume 4.5% sales growth in 2021, decreasing to a 3.2% sales growth by 2025. The ratio of NWC to sales will decrease from 25.8% in 2021 to 24% in 2025 because Intel recently finished building a plant. Also, the share buyback will marginally decrease from -2% in 2021 to -0.5% in 2025.

Figure 27: FCFE and discounted FCFE, 2019 – 2025

Year	2019	2020	2021	2022	2023	2024	2025
FCFE	$3.64	$3.02	$3.63	$3.90	$4.11	$4.14	$4.29
Discounted FCFE	$3.24	$2.39	$2.55	$2.44	$2.29	$2.05	$1.89

Source: IMCP

Added together, these discounted cash flows total $11.23.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $4.50 in 2019 to $5.28 in 2025.

Figure 28: EPS estimates for 2019 – 2025

Year	2019	2020	2021	2022	2023	2024	2025
EPS	$4.50	$4.57	$4.78	$4.99	$5.12	$5.09	$5.28

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, 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. Therefore, a P/E ratio of 15 is assumed at the end of Intel's terminal year. Given the firm's cyclicality, a multiple below the market (15-16) may be reasonable. However, it is probably has a higher growth than the economy after 2025. Thus, a P/E of 15 is reasonable.

Given the assumed terminal earnings per share of $5.28 and a price to earnings ratio of 15, a terminal value of $78.04 per share is calculated. Using the 12.42% cost of equity, this number is discounted back to a present value of $34.41.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $51.27 is calculated (5.63 + 11.23 + 34.41). Given Intel's current price of $47.38, this model indicates that the stock is slightly undervalued.

Scenario Analysis

Intel is difficult to value with certainly due to the quickly evolving technology market, transitioning from a PC centric business to data centric, and its emerging segments. Giving the uncertainty of what is to come, a bull and bear case provides a solid demonstration for quantifying all likely scenarios.

Figure 29 illustrates my assumptions for the bear and bull case scenario analysis. Intel is a cyclical company, which has greater sales when the economy is prosperous. In the bull case, I assume a P/E of 18 as investors get excited about the sales growth during a strong economy. Intel is more stable than its peers in the semiconductor industry, and during an economic expansion, Intel would have strong ability to take over more segments within the semiconductor industry's market share. NOPAT/S also increases as higher sales growth push up margins. The value increased to $65.62 as the P/E value, which, is 28% higher than the base case.

In the bear case scenario, I lowered sales growth about 1% from the base case. In this scenario, I am assuming a weaker economy along with management not being able to adapt to the quickly changing technology environment. I chose a P/E multiple of 10, as growth slows, loss of traction occurs. NOPAT/S will also decrease with sales. The value decreases to $35.76, which, is 30% lower than the base case.

Figure 29: Scenario analysis

Base	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Sales Growth	*2.8%*	*5.0%*	*4.5%*	*4.0%*	*3.5%*	*3.2%*	*3.2%*
NOPAT/S	*25.8%*	*25.5%*	*25.8%*	*25.5%*	*25.0%*	*24.0%*	*24.0%*
S/NFA	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*
Terminal Year P/E	*14.78*						
Bear	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Sales Growth	*2.8%*	*5.0%*	*3.5%*	*3.0%*	*2.5%*	*2.2%*	*2.2%*
NOPAT/S	*24.0%*	*23.5%*	*24.0%*	*23.5%*	*23.0%*	*22.0%*	*22.0%*
S/NFA	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*
Terminal Year P/E	*10*						
Bull	2019E	2020E	2021E	2022E	2023E	2024E	2025E
Sales Growth	*2.8%*	*5.0%*	*5.5%*	*5.0%*	*4.5%*	*4.2%*	*4.2%*
NOPAT/S	*27.0%*	*26.5%*	*27.0%*	*26.5%*	*26.0%*	*25.0%*	*25.0%*
S/NFA	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*	*0.7*
Terminal Year P/E	*18*						

Source: IMCP

Figure 30: Scenario analysis

Base Case Expecation	2025E
Value of P/B	$51.27
Bear Case Expectations	
Value of P/B	$65.62
Bull Case Expectation	
Value of P/B	$35.76

Source: IMCP

Business Risks

Although I have many reasons to be optimistic about Intel Corporation, there are several reasons why I find the stock to be fairly priced only a few dollars above its 52-week low.

Risk associated with demand:

Demand for products is variable, and thus, difficult to anticipate. Intel's products are used across different markets and the demand will vary among client computing, data center, Internet of Things, non-volatile memory solutions and programmable solutions. Changes in demand can reduce revenue, gross margin, or require more debt to sustain business operations.

Competitive marketplace:

The semiconductor industry is a highly competitive industry subject to quick technological developments, changes in customer needs, and frequent product improvements. If Intel does not respond to these factors, then its competitive position will weaken and its products may become outdated. Also, consolidation of the industry could lead to fewer customers and supplies, which would negatively affect the business.

Innovation:

Intel may not be successful in developing new products or efficiencies in its production process. The production of new chips on smaller frames is a complex process, (as seen in the three year delay of the 10nm chipset). There is a need for constant innovation that involves massive investment in R&D and, unfortunately, does not always develop into new technologies.

Global Economic Risk:

Since Intel is in a cyclical industry, downturns in the world economy could exacerbate Intel's income. With computers and smart devices being luxury items, an economic downturn would hurt Intel as customers switch to lower cost products. The Internet of Things group's acquisition of autonomous driving company Mobileye is especially seen as a luxury product that would be negatively affected during an economic downturn. The potential US-China trade war may have a major downstream effect on prices and availability of materials to build products.

Source: Company reports, IMCP

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Moderate

While the barriers to entry into the semiconductor industry are extensive, movement horizontally from a PC centric to data centric firm is possible. It requires significant investment to cause a major disruption in the industry. The most significant threat would be from an IoT and DC company gaining market share while Intel is transitioning.

Threat of Substitutes - Moderate

With Intel falling behind on Moore's Law, this gives competitors the chance for substitution. The cost of switching for commercial customers is very high, but for individuals, AMD and others could take hold of the PC market.

Supplier Power - Low

Intel has access to a moderate supply of materials to create its processors. The bargaining/leverage power of the suppliers is weak.

Buyer Power – Moderate

Consumers of PCs have moderate leverage when buying processors. When building a personal computer, and switching the CPU, the only part needing change is the motherboard. However, for commercial customers, the cost of switching processors, platforms, and all adjacent components is significant. Since the majority of Intel's income is through PCs, a better competitor chip can force a change.

Intensity of Competition – High

There are at least a few dominate players in each segment of the industry, but competition is still fierce to deliver the next best product.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Transition from PC to Data Centric AI & PC revenue	Mobile Market
Opportunities	**Threats**
IoTG Machine Learning 5G Industry 4.0 Smart Cities	Trade War Data Centric loss in revenue

Appendix 3: Income Statement

Income Statement (millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Sales	$55,870	$55,355	$59,387	$62,761	$70,754	$72,726	$76,364
Direct costs	20,261	20,676	23,196	23,692	25,794	26,836	29,706
Gross Margin	35,609	34,679	36,191	39,069	44,960	45,890	46,658
SG&A, R&D, and other	20,262	20,677	23,317	21,133	20,620	21,163	22,222
EBIT	15,347	14,002	12,874	17,936	24,340	24,727	24,436
Interest	(454)	(210)	(62)	(2,416)	299	398	412
EBT	15,801	14,212	12,936	20,352	24,041	24,329	24,024
Taxes	4,097	2,792	2,620	10,751	3,930	4,379	4,324
Net income	11,704	11,420	10,316	9,601	20,111	19,950	19,700
Basic Shares	4,901	4,742	4,730	4,701	4,574	4,437.6	4,314.8
EPS	$2.39	$2.41	$2.18	$2.04	$4.40	$4.50	$4.57
DPS	$0.90	$0.96	$1.25	$1.08	$1.19	$1.35	$1.53

Appendix 4: Balance Sheets

Balance Sheet (millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Cash	2,561	15,308	5,560	3,433	3,407	9,136	11,135
Operating assets ex cash	13,676	15,043	18,409	15,498	16,404	16,861	17,705
Operating assets	16,237	30,351	23,969	18,931	19,811	25,997	28,840
Operating liabilities	14,415	13,033	15,668	15,645	16,523	16,983	17,833
NOWC	1,822	17,318	8,301	3,286	3,288	9,013	11,007
NOWC ex cash (NWC)	(739)	2,010	2,741	(147)	(119)	(122)	(128)
NFA	57,073	56,749	71,639	89,557	98,652	102,430	109,091
Invested capital	*$58,895*	*$74,067*	*$79,940*	*$92,843*	*$101,940*	*$111,444*	*$120,098*
Marketable securities	18,590	15,965	17,719	14,761	9,779	8,779	7,779
Total assets	*$91,900*	*$103,065*	*$113,327*	*$123,249*	*$128,242*	*$137,206*	*$145,710*
Short-term and long-term debt	$13,655	$22,670	$25,283	$26,813	$27,874	$28,924	$29,974
Other liabilities	7,965	6,277	6,150	11,772	12,362	12,862	13,362
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	55,865	61,085	66,226	69,019	71,483	78,437	84,541
Total supplied capital	*$77,485*	*$90,032*	*$97,659*	*$107,604*	*$111,719*	*$120,223*	*$127,877*
Total liabilities and equity	*$91,900*	*$103,065*	*$113,327*	*$123,249*	*$128,242*	*$137,206*	*$145,710*

Appendix 5: Sales Forecast

Sales (millions)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Sales	55,870	55,355	59,387	62,761	70,754	72,726	76,364
Growth		*-0.9%*	*7.3%*	*5.7%*	*12.7%*	*2.8%*	*5.0%*
Operating Segments							
Client Computing	34,872	32,219	32,908	34,003	36,315	37,840	39,127
Growth		*-7.6%*	*2.1%*	*3.3%*	*6.8%*	*4.2%*	*3.4%*
% of sales	*62.4%*	*58.2%*	*55.4%*	*54.2%*	*51.3%*	*52.0%*	*51.2%*
Data Center Group	14,396	15,981	17,236	19,064	23,341	24,975	26,348
Growth		*11.0%*	*7.9%*	*10.6%*	*22.4%*	*7.0%*	*5.5%*
% of sales	*25.8%*	*28.9%*	*29.0%*	*30.4%*	*33.0%*	*2.0%*	*34.5%*
Internet of Things Group	2,142	2,298	2,638	3,169	3,580	3,974	4,391
Growth		*7.3%*	*14.8%*	*20.1%*	*13.0%*	*11.0%*	*10.5%*
% of sales	*3.8%*	*4.2%*	*4.4%*	*5.0%*	*5.1%*	*5.5%*	*6.0%*
Non-Volatile Memory Solutions	2,146	2,597	2,576	3,520	4,311	4,828	5,384
Growth		*21.0%*	*-0.8%*	*36.6%*	*22.5%*	*12.0%*	*11.5%*
% of sales	*3.8%*	*4.7%*	*4.3%*	*5.6%*	*6.1%*	*6.6%*	*6.0%*
Intel Security Group	2,010	-	-	-	-	-	-
Growth		*-100.0%*					
% of sales	*3.6%*						
Programmable Solutions Group	-	-	1,669	1,902	2,102	2,302	2,509
Growth				*14.0%*	*10.5%*	*9.5%*	*9.0%*
% of sales	*0.0%*	*0.0%*	*2.8%*	*3.0%*	*3.0%*	*3.2%*	*3.3%*
All other	304	2,260	2,360	1,103	1,105	1,108	1,114
Growth		*643.4%*	*4.4%*	*-53.3%*	*0.2%*	*0.3%*	*0.5%*
% of sales	*0.5%*	*4.1%*	*4.0%*	*1.8%*	*1.6%*	*1.5%*	*1.5%*
Geographical Segments							
Total	59.2%	58.0%	54.9%	53.7%	53.7%	52.8%	52.3%
United States	9,828	11,121	12,957	12,543	14,140	14,763	16,571
Growth		*13.2%*	*16.5%*	*-3.2%*	*12.7%*	*4.4%*	*12.2%*
% of sales	*17.6%*	*20.1%*	*21.8%*	*20.0%*	*20.0%*	*20.3%*	*21.7%*
China	11,197	11,679	13,977	14,796	16,680	17,381	18,556
Growth		*4.3%*	*19.7%*	*5.9%*	*12.7%*	*4.2%*	*6.8%*
% of sales	*20.0%*	*21.1%*	*23.5%*	*23.6%*	*23.6%*	*23.9%*	*24.3%*
Singapore	11,573	11,544	12,780	14,285	16,104	16,800	17,793
Growth		*-0.3%*	*10.7%*	*11.8%*	*12.7%*	*4.3%*	*5.9%*
% of sales	*20.7%*	*20.9%*	*21.5%*	*22.8%*	*22.8%*	*23.1%*	*23.3%*
Taiwan	8,955	10,661	9,953	10,518	11,857	12,363	13,058
Growth		*19.1%*	*-6.6%*	*5.7%*	*12.7%*	*4.3%*	*5.6%*
% of sales	*16.0%*	*19.3%*	*16.8%*	*16.8%*	*16.8%*	*17.0%*	*17.1%*
Other Countries	14,317	10,350	9,720	10,619	11,973	11,272	10,309
Growth		*-27.7%*	*-6.1%*	*9.2%*	*12.8%*	*-5.9%*	*-8.5%*
% of sales	*25.6%*	*18.7%*	*16.4%*	*16.9%*	*16.9%*	*15.5%*	*13.5%*

Appendix 6: Ratios

Ratios							
Items	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	63.7%	62.6%	60.9%	62.3%	63.5%	63.1%	61.1%
Operating (EBIT) margin	27.5%	25.3%	21.7%	28.6%	34.4%	34.0%	32.0%
Net profit margin	20.9%	20.6%	17.4%	15.3%	28.4%	27.4%	25.8%
Activity							
NFA (gross) turnover		0.97	0.93	0.78	0.75	0.72	0.72
Total asset turnover		0.57	0.55	0.53	0.56	0.55	0.54
Liquidity							
Op asset / op liab	1.13	2.33	1.53	1.21	1.20	1.53	1.62
NOWC Percent of sales		17.3%	21.6%	9.2%	4.6%	8.5%	13.1%
Solvency							
Debt to assets	14.9%	22.0%	22.3%	21.8%	21.7%	21.1%	20.6%
Debt to equity	24.4%	37.1%	38.2%	38.8%	39.0%	36.9%	35.5%
Other liab to assets	8.7%	6.1%	5.4%	9.6%	9.6%	9.4%	9.2%
Total debt to assets	23.5%	28.1%	27.7%	31.3%	31.4%	30.5%	29.7%
Total liabilities to assets	39.2%	40.7%	41.6%	44.0%	44.3%	42.8%	42.0%
Debt to EBIT	0.89	1.62	1.96	1.49	1.15	1.17	1.23
EBIT/interest	(33.80)	(66.68)	(207.65)	(7.42)	81.40	62.19	59.27
Debt to total net op capital	23.2%	30.6%	31.6%	28.9%	27.3%	26.0%	25.0%
ROIC							
NOPAT to sales	20.3%	20.3%	17.3%	13.5%	28.8%	27.9%	26.2%
Sales to NWC		87.10	25.00	48.39	(531.98)	(602.74)	(609.08)
Sales to NFA		0.97	0.93	0.78	0.75	0.72	0.72
Sales to IC ex cash		0.96	0.89	0.77	0.75	0.72	0.72
Total ROIC ex cash		19.6%	15.4%	10.3%	21.7%	20.2%	19.0%
ROE							
5-stage							
EBIT / sales		25.3%	21.7%	28.6%	34.4%	34.0%	32.0%
Sales / avg assets		0.57	0.55	0.53	0.56	0.55	0.54
EBT / EBIT		101.5%	100.5%	113.5%	98.8%	98.4%	98.3%
Net income /EBT		80.4%	79.7%	47.2%	83.7%	82.0%	82.0%
ROA		11.7%	9.5%	8.1%	16.0%	15.0%	13.9%
Avg assets / avg equity		1.67	1.70	1.75	1.79	1.77	1.74
ROE		19.5%	16.2%	14.2%	28.6%	26.6%	24.2%
3-stage							
Net income / sales		20.6%	17.4%	15.3%	28.4%	27.4%	25.8%
Sales / avg assets		0.57	0.55	0.53	0.56	0.55	0.54
ROA		11.7%	9.5%	8.1%	16.0%	15.0%	13.9%
Avg assets / avg equity		1.67	1.70	1.75	1.79	1.77	1.74
ROE		19.5%	16.2%	14.2%	28.6%	26.6%	24.2%
Payout Ratio		39.9%	57.4%	52.8%	27.1%	30.1%	33.5%
Retention Ratio		60.1%	42.6%	47.2%	72.9%	69.9%	66.5%
Sustainable Growth Rate		11.7%	6.9%	6.7%	20.9%	18.6%	16.1%

Appendix 7: 3-stage DCF Model

3 Stage Discounted Cash Flow							
	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*2.8%*	*5.0%*	*4.5%*	*4.0%*	*3.5%*	*3.2%*	*3.2%*
NOPAT / S	*27.9%*	*26.2%*	*25.8%*	*25.5%*	*25.0%*	*24.0%*	*24.0%*
S / NWC	*(594.57)*	*(594.57)*	*(594.57)*	*(594.57)*	*(594.57)*	*(594.57)*	*(594.57)*
S / NFA (EOY)	*0.71*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*
S / IC (EOY)	*0.71*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*
ROIC (EOY)	*19.8%*	*18.4%*	*18.1%*	*17.9%*	*17.5%*	*16.8%*	*16.8%*
ROIC (BOY)		*19.6%*	*18.9%*	*18.6%*	*18.1%*	*17.4%*	*17.4%*
Share Growth		*-2.8%*	*-2.0%*	*-1.5%*	*-1.0%*	*-0.5%*	*-0.5%*
Sales	$72,726	$76,364	$79,800	$82,992	$85,897	$88,646	$91,482
NOPAT	$20,276	$20,038	$20,580	$21,163	$21,474	$21,275	$21,956
Growth		*-1.2%*	*2.7%*	*2.8%*	*1.5%*	*-0.9%*	*3.2%*
- Change in NWC	-3	-6	-6	-5	-5	-5	-5
NWC EOY	*-122*	*-128*	*-134*	*-140*	*-144*	*-149*	*-154*
Growth NWC		*5.0%*	*4.5%*	*4.0%*	*3.5%*	*3.2%*	*3.2%*
- Chg NFA	3778	6661	4909	4560	4150	3927	4052
NFA EOY	*102,430*	*109,091*	*114,000*	*118,560*	*122,710*	*126,637*	*130,689*
Growth NFA		*6.5%*	*4.5%*	*4.0%*	*3.5%*	*3.2%*	*3.2%*
Total inv in op cap	3775	6655	4903	4555	4145	3922	4048
Total net op cap	102308	108963	113866	118421	122565	126487	130535
FCFF	$16,501	$13,383	$15,677	$16,608	$17,329	$17,353	$17,908
% of sales	*22.7%*	*17.5%*	*19.6%*	*20.0%*	*20.2%*	*19.6%*	*19.6%*
Growth		*-18.9%*	*17.1%*	*5.9%*	*4.3%*	*0.1%*	*3.2%*
- Interest (1-tax rate)	326	338	349	360	372	383	396
Growth		*3.7%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*	*3.2%*
+ Net new debt	1050	1050	959	990	1022	1054	1088
Debt	28924	29974	30933	31923	32945	33999	35087
Debt / tot net op capital	*28.3%*	*27.5%*	*27.2%*	*27.0%*	*26.9%*	*26.9%*	*26.9%*
FCFE w/o debt	$16,175	$13,045	$15,328	$16,248	$16,958	$16,969	$17,512
% of sales	*22.2%*	*17.1%*	*19.2%*	*19.6%*	*19.7%*	*19.1%*	*19.1%*
Growth		*-19.3%*	*17.5%*	*6.0%*	*4.4%*	*0.1%*	*3.2%*
/ No Shares	4437.6	4314.8	4,228.5	4,165.0	4,123.4	4,102.8	4,082.2
FCFE	$3.64	$3.02	$3.63	$3.90	$4.11	$4.14	$4.29
Growth		*-17.1%*	*19.9%*	*7.6%*	*5.4%*	*0.6%*	*3.7%*
* Discount factor	0.89	0.79	0.70	0.63	0.56	0.50	0.44
Discounted FCFE	$3.24	$2.39	$2.55	$2.44	$2.29	$2.05	$1.89
Third Stage							
Terminal value P/E							
Net income	$19,950	$19,700	$20,232	$20,803	$21,103	$20,891	$21,560
% of sales	*27.4%*	*25.8%*	*25.4%*	*25.1%*	*24.6%*	*23.6%*	*23.6%*
EPS	$4.50	$4.57	$4.78	$4.99	$5.12	$5.09	$5.28
Growth		*1.6%*	*4.8%*	*4.4%*	*2.5%*	*-0.5%*	*3.7%*
Terminal P/E							14.78
* Terminal EPS							$5.28
Terminal value							$78.06
* Discount factor							0.44
Discounted terminal value							$34.41

Summary			
First stage	$5.63	Present value of first 2 year cash flow	
Second stage	$11.23	Present value of year 3-7 cash flow	
Third stage	$34.41	Present value of terminal value P/E	
Value (P/E)	**$51.27**	= value at beg of fiscal yr	2019

Analyst: James Hawley INVESTMENT MANAGEMENT CERTIFICATE PROGRAM January 22, 2019

Recommendation	**Buy**
Target (today's value)	$71
Current Price	$47.52
52 week range	$43.04 - $67.75

Share Data	
Ticker:	JWN
Market Cap. (Billion):	$8.21
Inside Ownership	30.2%
Inst. Ownership	66.5%
Beta	1.21
Dividend Yield	3.02%
Payout Ratio	53.9%
Cons. Long-Term Growth Rate	8.4%

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Sales (billions)					
Year	$14.5	$15.1	$5.60	$16.4	$16.8
Gr %		4.4%	3.4%	4.8%	2.6%
Cons				$15.9	$16.4
EPS					
Year	$2.04	$2.62	$3.61	$3.77	$4.02
Gr %		28.2%	37.6%	4.5%	6.6%
Cons			$3.61	$3.78	$4.09

Ratio	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
ROE (%)	40.7%	47.3%	58.3%	54.8%	55.6%
Industry	21.2%	25.5%	25.5%	24.0%	22.8%
NPM (%)	2.4%	2.8%	2.8%	3.9%	3.9%
Industry	2.9%	3.9%	3.9%	3.6%	3.5%
A. T/O	1.90	1.94	1.94	1.92	1.95
ROA (%)	4.6%	5.5%	7.3%	7.2%	7.0%
Industry	5.8%	7.2%	7.2%	7.8%	7.9%
D/A	33.4%	30.6%	30.8%	30.6%	30.4%

Valuation	FY 2018	FY 2019	FY 2020	FY 2021
P/E	22.5	17.9	13.6	13.0
Industry	9.1	9.9	10.8	10.0
P/S	0.54	0.53	0.51	0.50
P/B	7.0	6.9	6.8	6.1
P/CF	6.0	5.9	6.3	5.9
EV/EBITDA	9.5	10.7	10.1	9.7

Performance	Stock	Industry
1 Month	-25.1%	16-.9%
3 Month	-25.3%	-19.3%
YTD	3.5%	2.8%
52-week	7.0%	5.9%
3-year	-11.5%	-10.2%

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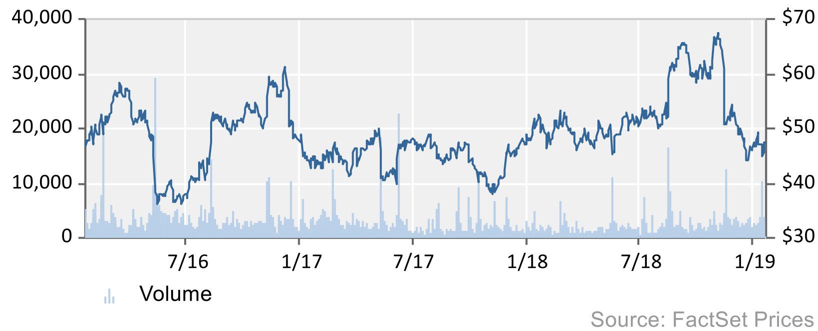
Luxury Department Store

Nordstrom Incorporated



Summary: A buy rating with a target of $71 is recommended for JWN. JWN's potential is surrounded by intense fears rooted in brick and mortar's outlook, however; JWN has opportunities to break into underserved markets and continue to increase digital expansion, which would bypass much of the negative outlook. The stock is undervalued based on relative and DCF analysis.

Key Drivers:

- Location expansion: Nordstrom has been increasing locations; since 2012, 148 new locations have opened. For every full line store that opens, 29 off price stores open. This has increased revenues and brand recognition across the country.

- E-commerce expansion: Segment online growth varies, but overall is very strong and has nearly doubled that of its peers in the past five years in some cases. Combating online retailers will be Nordstrom's most difficult fight long term as it must adapt to a decreased in store consumer market.

- Same Store Sales and Inventory Turnover: JWN needs constant returning customers. Initiatives to create repeated sales have been set in its credit segment. Nordstrom has outpaced most competitors in inventory by staying on top of faster evolving fashion trends.

- Competition: Brick and mortar has been on the decline over the past five years as fears of Amazon have increased. JWN has begun to adapt to this by entering into the off price market with its popular Nordstrom rack stores.

Valuation: Using a relative valuation approach, Nordstrom appears to be undervalued in comparison to the retail apparel industry. Discounted cash flows indicate the stock's value is about $71 and the shares trade at $47.52.

Risks: Threats to the business include cannibalization of sales, slowing online and store growth, increased competition, privatization of company, and inability to choose company direction.

Company Overview

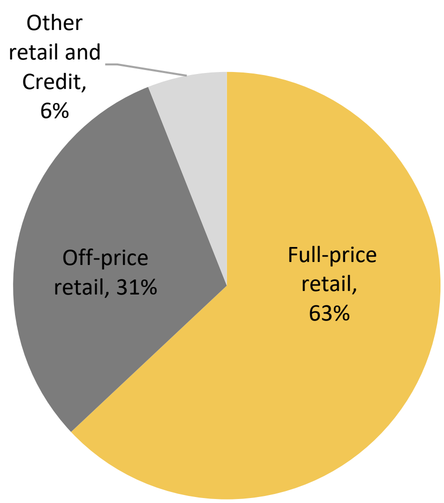
Nordstrom (JWN) is a large chain department store operating in the U.S. and Canada. Headquartered and founded in Seattle, Washington, Nordstrom has gone on to become a leading fashion retailer carrying men's, women's, and children's apparel, shoes, cosmetics, jewelry, handbags, accessories, and fragrances. Starting as a West Coast chain, Nordstrom has begun expanding coast to coast and is making the international jump into Canada. Nordstrom's revenue streams can be broken into two sources, which include a retail and credit segment.

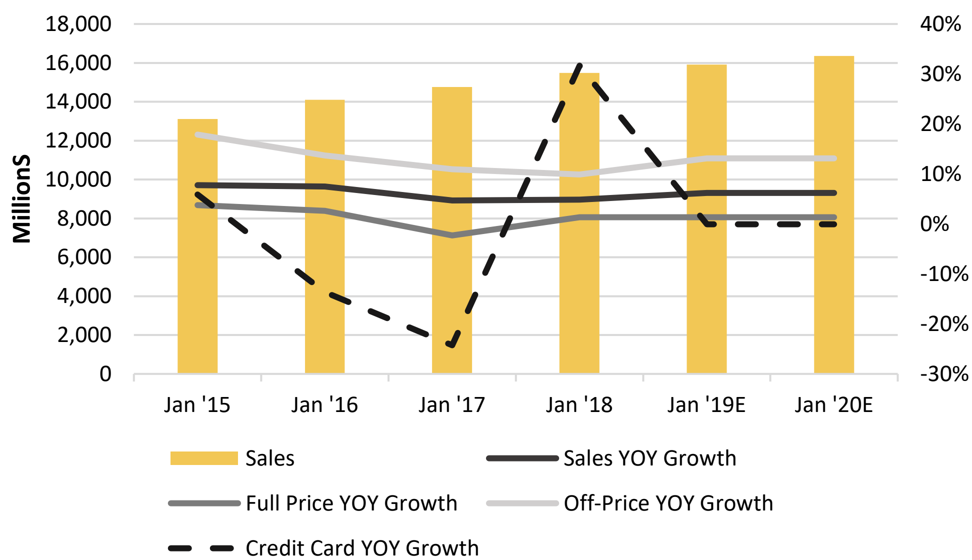
Retail revenue can be derived from three channels all containing multiple brands and online sales. Nordstrom tends to operate in or near malls while also running flagship stores in large urban areas such as Seattle and soon to be New York City in 2019. Nordstrom's second source of revenue comes through its credit segment, which has two sub-segments. Nordstrom offers customers loyalty points on Nordstrom credit cards and has a bank agreement with TD Bank.

Nordstrom generates approximately 98% of sales from its retail segment and the remaining 2% from its credit segment. Nordstrom's operations are based on four channels:

- Full-price: Nordstrom's online and full line stores make up the full-price segment. The full-price segment has seen average year over year (YoY) growth of 1.84% over the past five years.
- Off-price: Nordstrom Rack and Nordstromrack.com/Hautelook all contribute to this segment. Nordstrom Rack is a fast growing marked down outlet. The growth rates of the off-price segment were 14% in 2017.
- Other retail: Trunk Club, Last Chance, and Jeffrey Boutiques create the other retail segment. Trunk Club and Jeffrey Boutiques make up high end retail while Last Chance is Nordstrom's clearance store. These brands have seen very high growth topping 100% each year since 2015, however; they are currently less than 4% of Nordstrom's revenue.
- Credit: Nordstrom offers credit cards to qualified customers as a loyalty initiative and receives revenues through Nordstrom's program agreement with TD Bank. Growth rates over the past five years have been very volatile. In 2018, credit surged 31% from the previous year, which was down -24%.

Figures 1 and 2: Revenue sources for JWN, year-end 2017 (left) and revenue history without other retail since 2015





Source: Company reports, FactSet

Business/Industry Drivers

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

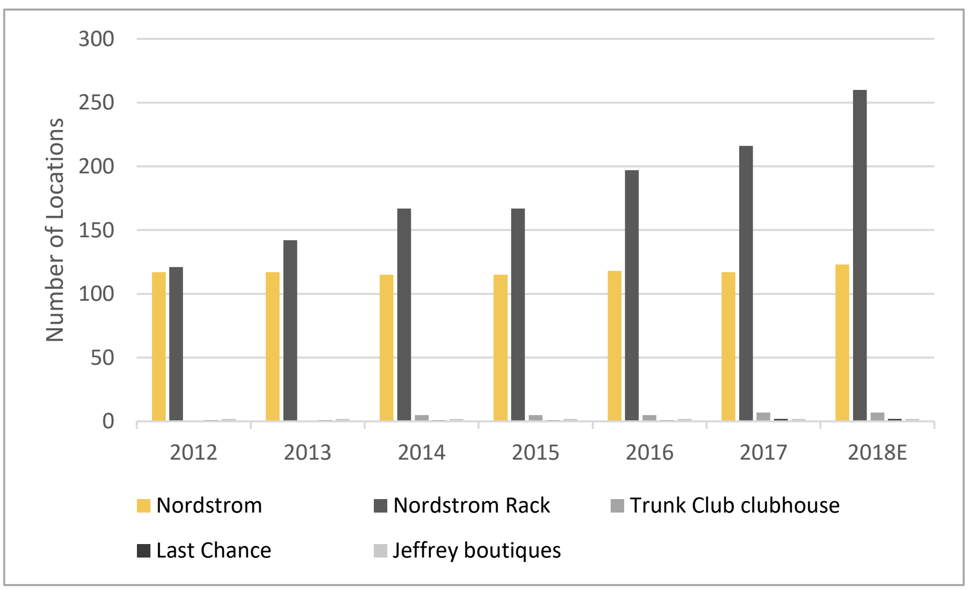
1) Location expansion
2) E-commerce expansion
3) Same store sales and inventory turnover
4) Competitor analysis
5) Macroeconomic trends

Location Expansion

Nordstrom has been steadily increasing its store locations since 2012, opening 148 new locations between the United States and Canada. Of the 148 new locations, Nordstrom's full line brand has only introduced five new locations while Nordstrom off price has contributed 116. Full line locations in terms of physical space are typically 383,000 square feet while off price brands typically operate out of 64,000 square feet locations. Since 2012, only 11 stores have been discontinued due to either poor sales or location. Currently, Nordstrom Rack's in store and online ecommerce account for 31% of sales while Nordstrom's full line brands account for 63%. This leaves the remaining 6% split between other retail and credit. As part of its business strategy, Nordstrom has invested into the Canadian market by opening six Nordstrom full line stores and opened three new Nordstrom Rack locations in 2018. Having a long term Canadian strategy is part of Nordstrom's core international plan. Within the United States, a flag ship Nordstrom is being constructed in Manhattan, New York and will be completed by 2019. This will be Nordstrom's largest push into the East Coast market.

Nordstrom has opened 116 Nordstrom Rack locations while only opening five full line locations since 2012.

Figure 3: Number of JWN locations by brand



Source: Company reports

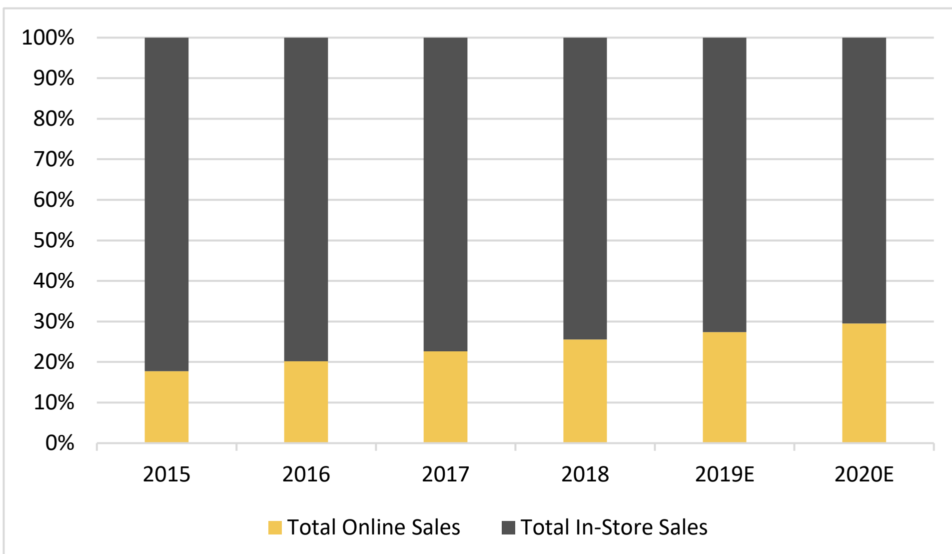
Referencing Figure 3, Nordstrom Rack has significantly outpaced all other brands. Nordstrom Rack primarily operates out of strip malls while Nordstrom full line operates within malls. Due to its popularity and continuted sales growth, Nordstrom will soon come to a cross roads and need to make a serious decision about the company's direction. Nordstrom will either continue flushing capital into Nordstrom Rack, leaving full-price sales behind, or need to cut back to maintain full line sales and its brand. Nordstrom Rack is a marked down off brand outlet with less prestige and quality. This could damage Nordstrom's full line stores and other high end brands as Nordstrom Rack canabalizes sales and brand recognition. Going forward, Nordstrom will need to consider finding a balance between its off-price and full-price brands. In the absence of publicly avaible margins of each segment, margins have been forecasted based on comparable companies. Full price margins were forcasted to be 37% and off price were estimated to be 32%. As the off price brand matures, margins should jump as digital sales and the number of locations increase.

E-commerce expansion

On average, Nordstrom Rack online sales YoY growth has doubled that of Nordstrom's full line digital sales.

It is essential in the apparel retail industry to have a strong online sales presence. Since 2015, online sales have consistently become a larger part of Nordstrom's revenue streams. The retail industry has seen a major shift into digital sales and Nordstrom has attempted to keep up by operating six websites and five applications. Nordstrom.com sales growth has averaged 15.2% and its off-price brands, NordstromRack.com/Hautelook, has averaged 31.6%. Nordstrom has done a great job of outpacing other retailers in the apparel industry as most fall in the range of 10%-14% growth YoY (Bloomberg).

Figure 4: Total online sales vs. total in-store sales



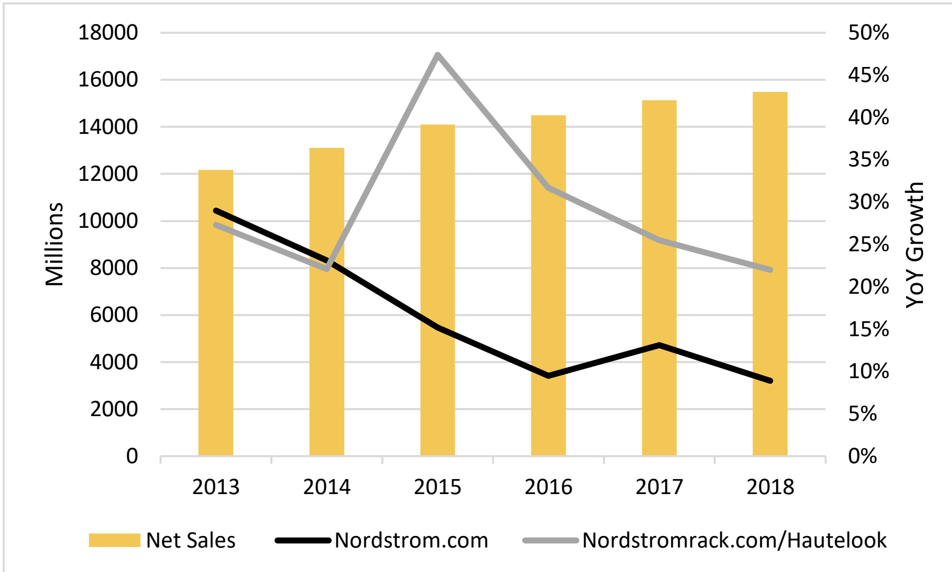
Source: FactSet

Nordstrom's successful online growth can be traced back to its Anniversary sale in July and its and expansion into new markets. Currently, 27% of Nordstrom sales come from ecommerce while the average brick and mortar firm's ecommerce makes up only 11% of their total business. If Nordstrom continues to push digital expansion through its marketing efforts, online sales could further increase and continue to outpace the industry. Nordstrom appears to be pushing for this with consistent increases in online marketing with a total budget of $281 million, which is 6% of SG&A expenses. Relative to the digital market, Nordstrom was ranked 18th by the National Retail Federation as one of the top 50 e-commerce retailers of 2017 and ranked 68th out of 250 on its global retailer ranking (National Retail Federation.)

As net sales grew at a sluggish rate and Nordstrom.com growth slowed, Nordstromrack.com surged ahead from 2014 to 2015. Nordstrom Rack's online sales are approximately 1/3 of Nordstrom.com, but this could change soon if Nordstrom Rack's online sales continue to grow rapidly at more than 25% and Nordstrom.com growth stays in the mid-teens. Future growth will favor Nordstrom Rack versus Nordstrom full line as Nordstrom Rack continues to expand its store base and recognition at a much faster pace.

The decline of brick and mortar stores can be attributed to lower mall foot traffic and the increase of digital sales.

Figure 5: Total sales and YoY online growth by brand



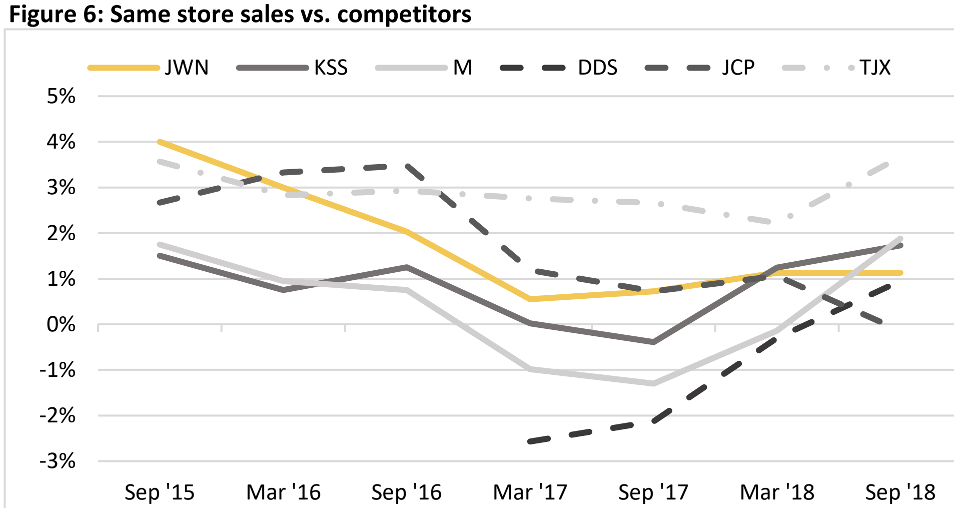
Source: Company reports

<u>Same store sales and inventory turnover</u>

Same store sales (SSS) are one of the most important indicators of a retailer's financial health. Since 2010, SSS has been consistently positive YoY. 2016 was a difficult year for retailers which all faced negative or declining SSS. In Nordstrom's case, SSS growth has been 2% on average since 2015.

Nordstrom had positive sales growth since 2015 but SSS growth has slowed.

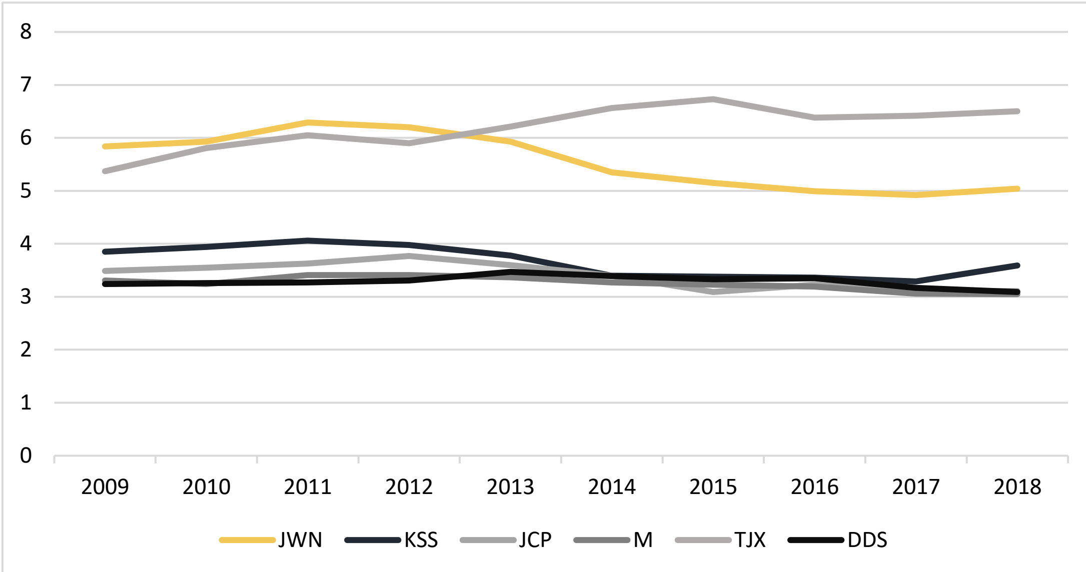
Figure 6: Same store sales vs. competitors



Source: FactSet

Low SSS can be attributed to slowing growth of mall-based stores due to the rise of Amazon, internet retailing, and cannibalization from over building in brick and mortar stores. Following the latest fashion trends and fads is an important for Nordstrom's success. With a variety of different brands coming from six different channels, Nordstrom has created a diverse portfolio of apparel options. The shift to digital platforms increases as the speed at which fashion trends become mainstream.

Figure 7: Inventory turnover vs. competitors



Source: FactSet

Nordstrom has had higher inventory turnover relative to its competitors since 2009

Currently, Nordstrom has an inventory turnover rate of 5.0. In past years this rate was higher but has remained within the 5.0-6.25 range. On average, Nordstrom has historically outperformed many of its competitors by this metric. A higher turnover rate means Nordstrom has been able to continue to move the latest fashion trends in and out its stores more quickly than other players. TJ Maxx is Nordstrom's off price direct competitor and has consistently had a higher inventory turnover ratio. However, as Nordstrom begins to master off price retailing, the gap may shrink and Nordstrom Rack will begin to steal significant market share from TJX. TJX operates 1238 locations across the globe in the off price retail sector. Nordstrom Rack currently operates 244 locations. Both stores follow a similar model, but Nordstrom Rack tends to carry more high-end brands selling at a slightly higher premium than TJ Maxx might. TJX has plans to continue to focus on physical stores rather than try to increase online presence. Because TJX has bought out or merged with most significant off price retailers, growing Nordstrom Rack is an opportunity to gain on TJX and take a larger share of this underserved market.

Competitor analysis

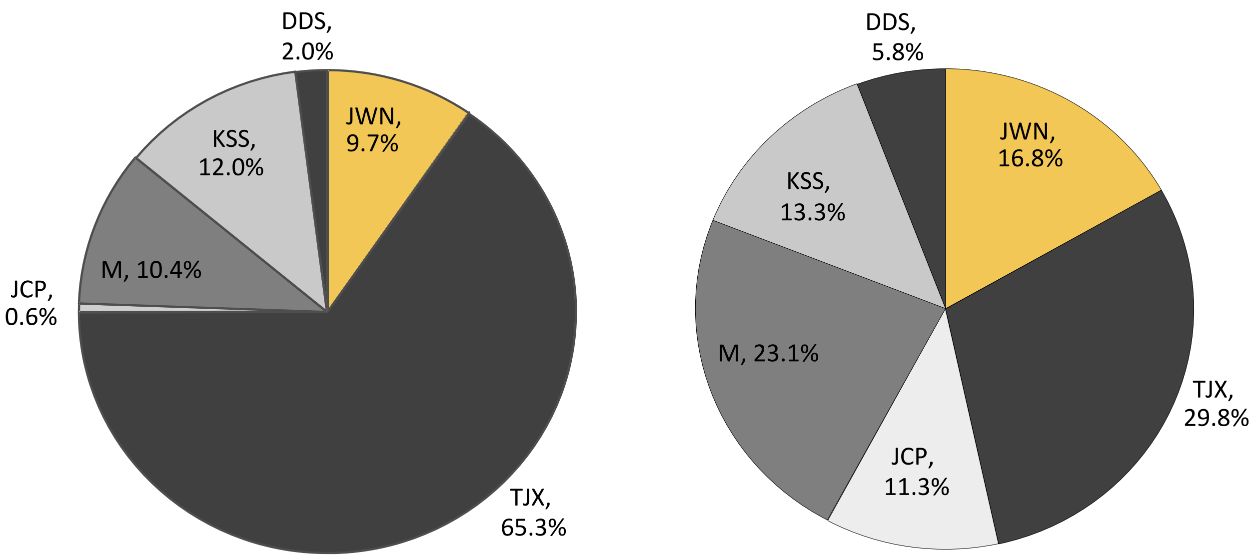
The apparel retail sector is an extremely competitive environment with well established brands. Entering the sector is difficult and gaining ground over other competitors in such a consumer focused area is difficult. Nordstrom must offer superior branding, quality, service, and marketing to gain an edge. Already established as a high-end brand with superior quality products than its competition, continuing to convince consumers that it has superior quality is paramount. By branding itself this way, Nordstrom created a moat in a very competitive sector. This improves Nordstrom's bottom line through better locations and the ability to charge higher prices. To stay established as a high-end retailer, the firm commits $281 million into marketing campaigns and e-commerce yearly.

Nordstrom's full price most closely competes with Macy's while Nordstrom's off-price competes with TJX.

Nordstrom's full-price segment competes directly with Macy's, while its off-price directly competes with TJX. I believe Nordstrom's greatest opportunity is to challenge TJX. Nordstrom Rack is becoming a real threat to TJX as it continues to grow and has potential to become the next big player in off-price retailer. This market is underserved with TJX as a leader and few other competitors.

Nordstrom's off price segment sales have been growing near 12% YoY and have increased to 35% of total sales. TJX has a five year average return on asset (ROA) of 20.2% while Nordstrom has only a 6.8%. This discrepancy can be attributed to the leaner business model TJX has created. If Nordstrom were to move its direction to drop large bulky stores, higher margins could be achieved as the firm masters off price retailing. Referencing figures 8 and 9, these graphs show that TJX is much more highly valued vs its sales share. This implies that investors are more confident in the outlook for TJX than other firms. As Nordstrom grows into this business, it can likewise benefit.

Figures 8 and 9: Comparison of JWN comps by market cap (left) and retail sales

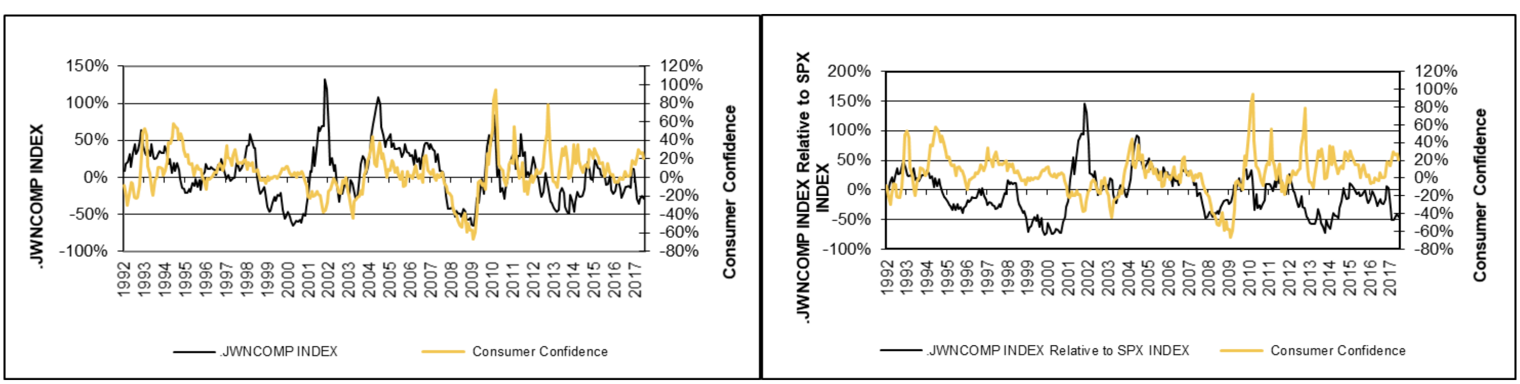


Source: FactSet, IMCP

Macroeconomic Trends

The apparel retail industry's health follows the economic cycle. Rising confidence often boosts discretionary spending. Figures 10 and 11 show that Nordstrom performs better on an absolute basis and relative to the S&P 500 when consumer confidence is rising. However, since 2011 the relationship is less robust. Nordstrom is attempting to expand with high growth online and in the discount area even though the outlook for other mall operations is more grim despite a favorable economic environment with low unemployment and high consumer confidence.

Figure 10 and 11: Consumer confidence compared to JWN comps (left) and consumer confidence rate compared to JWN comps relative to the S&P 500 index

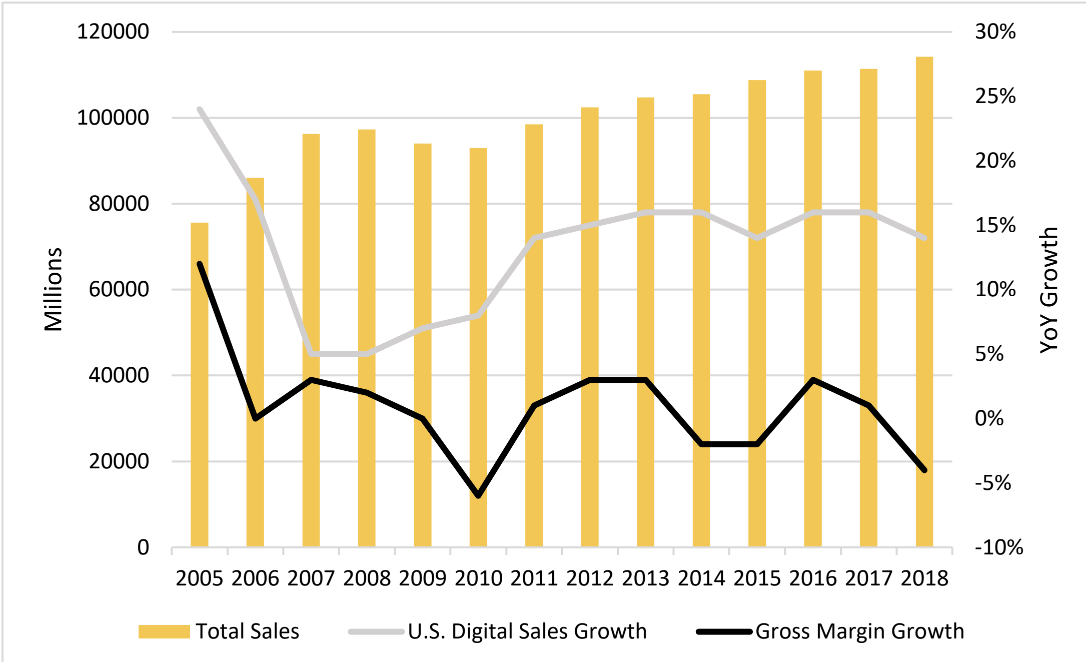


Source: FactSet, IMCP

Figure 12 shows that as digital sales growth has risen, gross margin growth has declined. Brick and mortar retailers have lost out to Amazon and other online retailers, which have taken market share. Nordstrom must adapt to this change and find new areas of growth, as a reduced consumer base is eminent as the mall-based market continues to decline.

Brick and mortar sales slumped from 2012-2015, but have begun to recover as consumer confidence has increased.

Figure 12: Total brick and mortar sales vs. U.S. digital sales growth vs. Brick and mortar gross margins

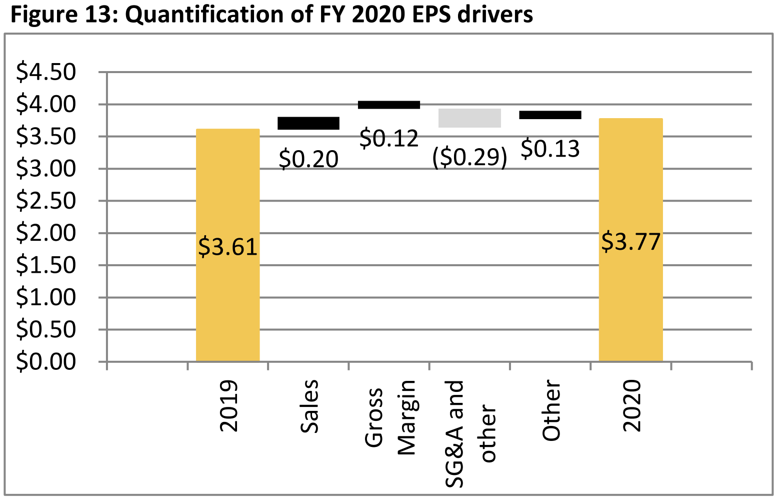


Source: Bloomberg, IMCP

Financial Analysis

EPS are forecasted to grow to $3.77 in FY 2020. Increased revenues should elevate earnings by $0.20 and an increase in gross margins by $0.12. Forecasted SG&A is expected to increase as a percent of sales due to rising expansion expenses, which lowers EPS, by $0.29. Nordstrom has begun to ramp up share buybacks leading to a projected increase of $0.13 in EPS. Because of rapid expansion and continued sales growth, net EPS have been forecasted to increase by $0.16.

Figure 13: Quantification of FY 2020 EPS drivers

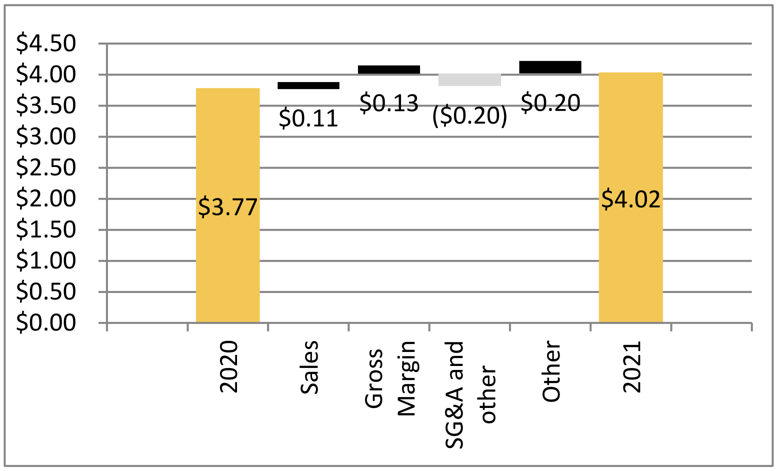


Source: Company Reports, IMCP

EPS growth in FY 2021 is expected to rise to $4.02. Sales should continue to increase, but tapper down slightly as expansion may slow, boosting EPS by $.11. Forecasted gross margin should rise and add $0.13 while SG&A rising as a percentage of sales will cost $0.20 in EPS. Share buybacks are expected to increase which will add $0.20 to EPS. FY 2021 should see another positive year as growth continues but begins to slow. Final estimated EPS are forecasted to increase by a total of $0.25 between FY 2020 and 2021.

SG&A is rising as a percent of sales due to rapid store expansion.

Figure 14: Quantification of FY 2021 EPS drivers



Source: Company Reports, IMCP

Forecasts are about in line with consensus estimates for FY 2020 and 2021. Nordstrom's growth should continue through FY 2021, driven primarily by increasing revenues, expansion, and brand recognition.

Figure 15: EPS, revenues, and YoY growth

	FY 2019	FY 2020	FY 2021
Revenue - Estimate	$15,654	$16,409	$16,838
YoY Growth	3%	5%	3%
Revenue - Consensus	$15,932	$16,366	$16,777
YoY Growth	3%	3%	3%
EPS - Estimate	$3.61	$3.77	$4.02
YoY Growth	38%	4%	7%
EPS - Consensus	$3.61	$3.78	$4.09
YoY Growth	24%	5%	8%

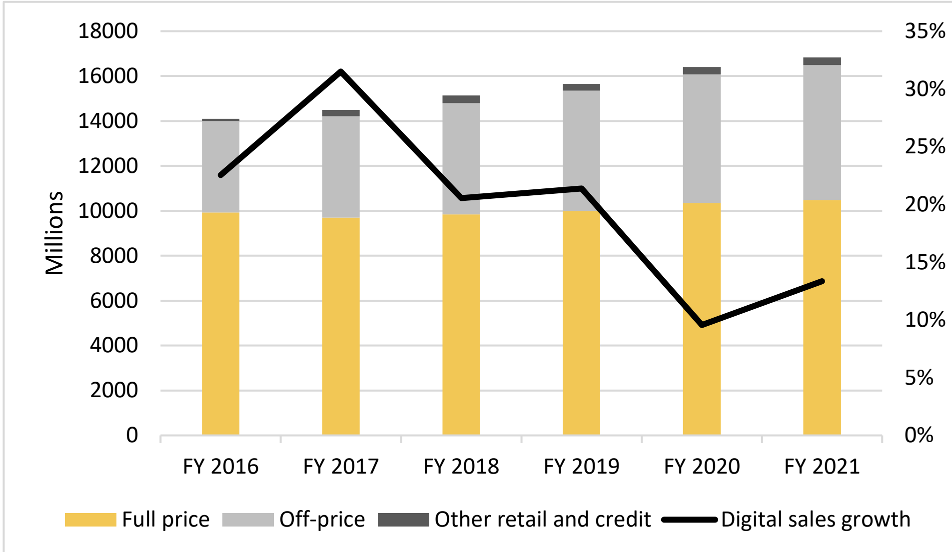
Source: Company Reports, FactSet, IMCP

Revenues

Nordstrom's Anniversary sale is July 12 and accounts for a significant portion of yearly Sales.

Nordstrom's revenue has increased steadily since 2009. This trend should continue in 2019 and 2020, driven primarily by store expansion, gained brand recognition, and continued strong digital sales. Plans to increase new locations are set for 2019, adding 14 new locations which will increase the number of stores by 4%. Notable locations include one new flagship store in Manhattan New York. Total locations for Nordstrom should reach 400 by 2020. If Nordstrom makes a directional decision to move the business further into off price retailing, 400 locations could become a low estimate as off price stores will far outpace full price locations. Consensus is that Nordstrom will increase off price sales by 5.1% over the next year; however, estimated values suggest Nordstrom's off price brands growth will be closer to 7% due to the rise of store locations and the slowing growth of Nordstrom's full line brands.

Figure 16: Segment revenues and digital sales growth, FY 2016-2021



Source: Company Reports, IMCP, FactSet

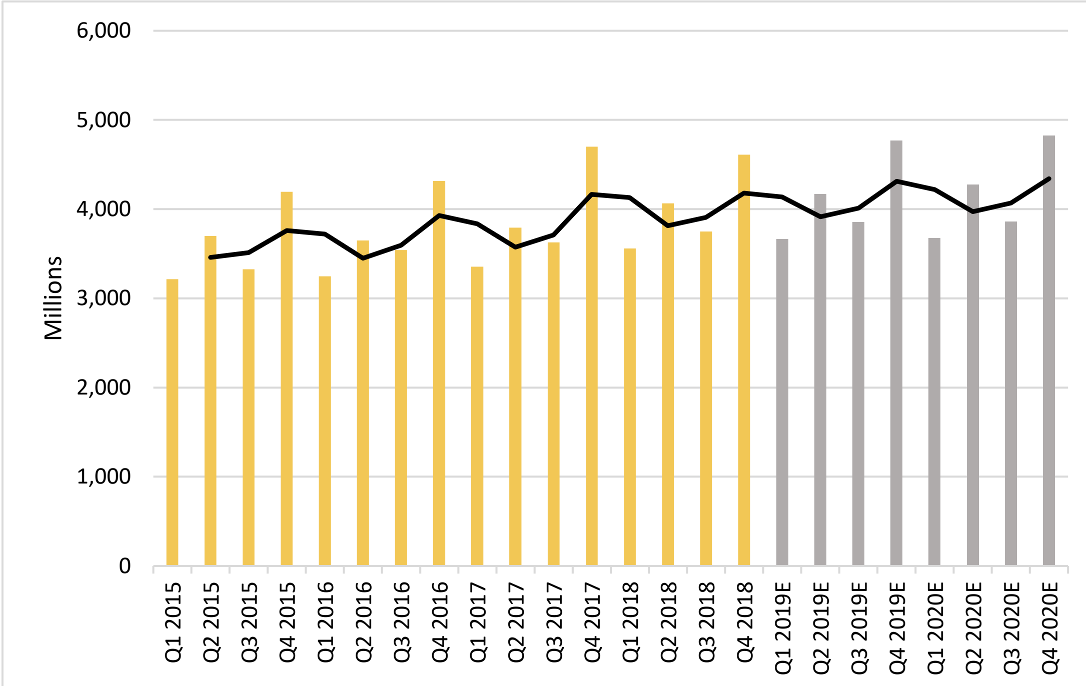
Consensus expects Full line sales to increase 5.6% in FY 2020. Over the past seven years, full line sales growth has only increased about 2% per year. It is surprising consensus believes there is enough excitement surround Nordstrom, to project a new five-year high growth rate. 2% growth is much more realistic as full line sales have climbed steadily and should continue to do so. Nordstrom's digital sales have increased 23% last year and have risen to 27% of overall sales. 2019 and 2020 should see continued growth as Nordstrom allocates more revenues towards marketing increases and continually expands digitally.

Second and fourth quarter sales are high points of Nordstrom's sales. This is due to their anniversary sale in the second quarter and holiday shopping in the fourth.

Revenues are very dependent on holiday shopping and Nordstrom's anniversary sale. Nordstrom's anniversary sale is a second quarter event that is an extremely important to Nordstrom's yearly business cycle. Nordstrom's anniversary sale begins July 12th for early access members and goes through July 20th when the public has full access to the event. Having early access incentivizes members to use their Nordstrom credit cards, which boosts Nordstrom revenues in its retail and credit segments at little to no cost. This not only promotes Nordstrom but increases exposure to individual consumers.

Figure 17 shows that revenues are noticeably seasonal between the highs of the second and fourth quarter. As Nordstrom grows its store presence and brand recognition, this trend should continue to increase leading to higher revenues in both 2019 and 2020. Forecasted sales estimates for FY 2020 are $16,409 while consensus agrees $16,366. Forecasted numbers reflect a more positive scenario as Nordstrom grows the popularity surrounding its anniversary sales and continues to expand its location base.

Figure 17: Seasonality of total revenues, 2015-2020E



Source: Company Reports, FactSet

Return on Equity

As Nordstrom has continued to expand, so has SG&A as a percent of sales. Increasing SG&A has reduced margins to Nordstrom costs from expanding wages, store maintenance, and logistics. A large portion of the SG&A increase is due to an increased workforce, numbering 72,500 employee in 2018 which is up from 67,000 in 2015.

Nordstrom ROE has been rising even as EBIT margins have fallen due to rising leverage and asset turnover. The very high ROE reflects the low equity from share buybacks. Nordstrom has scrapped its original share buyback plan of $327 million to a new initiative of $1.5 billion. Because of rising share buybacks, higher values of ROE and ROA should be expected in the future.

Figures 18: ROE breakdown FY 2015 - 2021

	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
EBIT / sales	7.8%	5.6%	6.1%	6.9%	6.6%	6.5%
Sales / avg assets	1.66	1.86	1.90	1.92	1.97	1.96
EBT / EBIT	88.6%	85.0%	85.3%	87.9%	87.9%	87.7%
Net income /EBT	61.5%	51.8%	55.3%	63.0%	63.0%	63.0%
ROA	7.1%	4.6%	5.5%	7.3%	7.2%	7.0%
Avg assets / avg equity	5.12	8.94	8.65	7.99	7.64	7.90
ROE	36.2%	40.7%	47.3%	58.3%	54.8%	55.6%

Source: Company Reports, IMCP, FactSet

Free Cash Flow

Nordstrom's FCF has been steadily rising since 2017. FCF has been growing due to Nordstrom's expansion through leases rather than ownership. Leasing buildings allows FCF to climb as it lets Nordstrom pay in smaller increments rather than with large additions, which assets would decrease its cash flow. Leasing can also work as a tax shield as lease payments can be written off. NOPAT should slow to less net operating capital over the next two years, and this will limit FCF growth in FY 2020 and 2021.

Figures 19: Free cash flows FY 2015 - 2021

Free Cash Flow	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
NOPAT	$804	$677	$417	$512	$677	$682	$689
Growth		*-15.8%*	*-38.4%*	*22.9%*	*32.1%*	*0.7%*	*1.1%*
NOWC	2,432	113	224	270	370	327	322
Net fixed assets	4,021	4,684	4,616	4,612	4,551	4,770	4,895
Total net operating capital	$6,453	$4,797	$4,840	$4,882	$4,921	$5,098	$5,217
Growth		*-25.7%*	*0.9%*	*0.9%*	*0.8%*	*3.6%*	*2.3%*
- Change in NOWC		(2,319)	111	46	100	(43)	(5)
- Change in NFA		663	(68)	(4)	(61)	219	125
FCFF		$2,333	$374	$470	$638	$505	$570
Growth			*-84.0%*	*25.9%*	*35.7%*	*-20.8%*	*12.8%*
- After-tax interest expense		77	63	75	82	83	85
+ Net new short-term and long-term debt		(326)	(31)	(37)	(2)	80	130
FCFE		$1,930	$280	$358	$555	$503	$615
Growth			*-85.5%*	*27.9%*	*55.0%*	*-9.4%*	*22.4%*
With cash and debt							
FCFF per share		$12.52	$2.16	$2.82	$3.87	$3.17	$3.78
Growth			*-82.8%*	*30.7%*	*37.2%*	*-17.9%*	*19.2%*
FCFE per share		$10.36	$1.62	$2.15	$3.36	$3.16	$4.09
Growth			*-84.4%*	*32.8%*	*56.6%*	*-6.0%*	*29.4%*

Source: Company Reports, IMCP

Nordstrom plans to use its cash flows to shift its stock repurchases from $327 million to $1.5 billion. Estimates of both FCFF and FCFE are expected to decrease in 2019 and slightly recover in 2020. Thus, in order to pay for the buybacks debt must rise. Dividends are also $248 million per year.

Valuation

Nordstrom was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is undervalued relative to other firms and is worth $49.74; however, due to the volatility of brick and mortar retailers, this metric may be unreliable. Another relative valuation approach shows JWN to be undervalued based on its fundamentals versus those of its peers in the retail apparel industry. A detailed DCF analysis values JWN, at $70.54. This value should carry more weight because it incorporates assumptions that reflect JWN's ongoing expansion and movement into new markets.

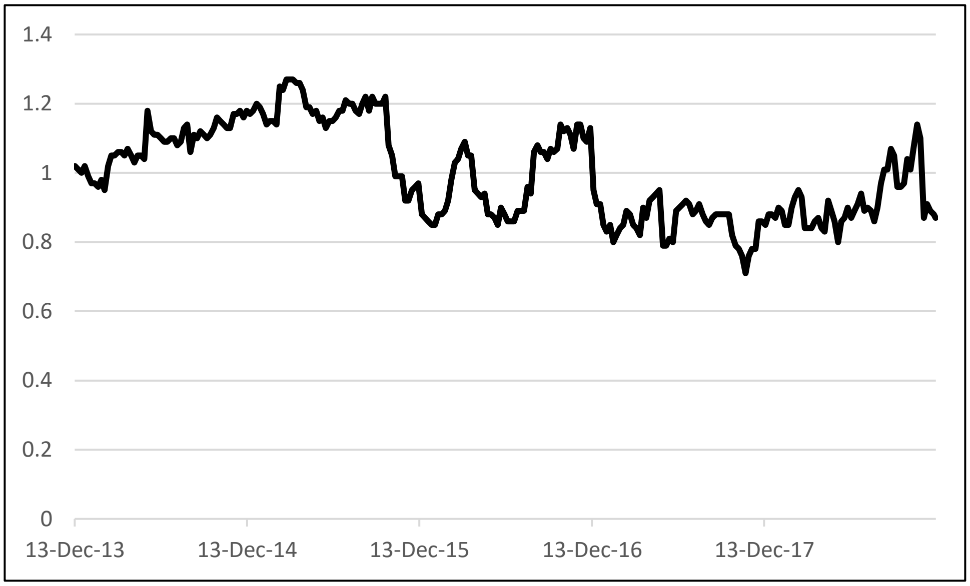
Trading History

Nordstrom has been crushed in recent years, underperforming like much of the industry, since 2016. A significant portion of this is due to the intense fear surrounding brick and mortar retailers and lackluster sales the industry has brought in as online competition rises and market space drops. JWN's current NTM P/E is at 13.2 compared to its five year average of 15.2. Nordstrom's outlook is less bleak than many of its peers, but if Nordstrom does not find a way to combat rising online competition and branch more into underserved markets, it could seriously decline in value. Assuming the firm maintains a 13.2 NTM P/E at the end of 2019, it should trade at $49.74 by the end of next year.

- Price = P/E x EPS = 13.2 x $3.77 = $49.74

Over the past five years, relative to its competition, Nordstrom has had a higher PE than all but TJX.

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



Source: Factset

Relative Valuation

Nordstrom is currently trading at the second highest P/E relative to its peers, with a P/E TTM of 17.9 compared to an average of 9.1. Investors are willing to temporarily pay a premium for JWN because it has the potential for greater growth than many of the other brick and mortar companies in its market segment. JWN's P/B ratio is higher than industry average as well, due to increased revenues and expectations in the years to come. As margins decrease and growth slows, multiples should be expected to come down.

Figure 21: JWN comparable companies

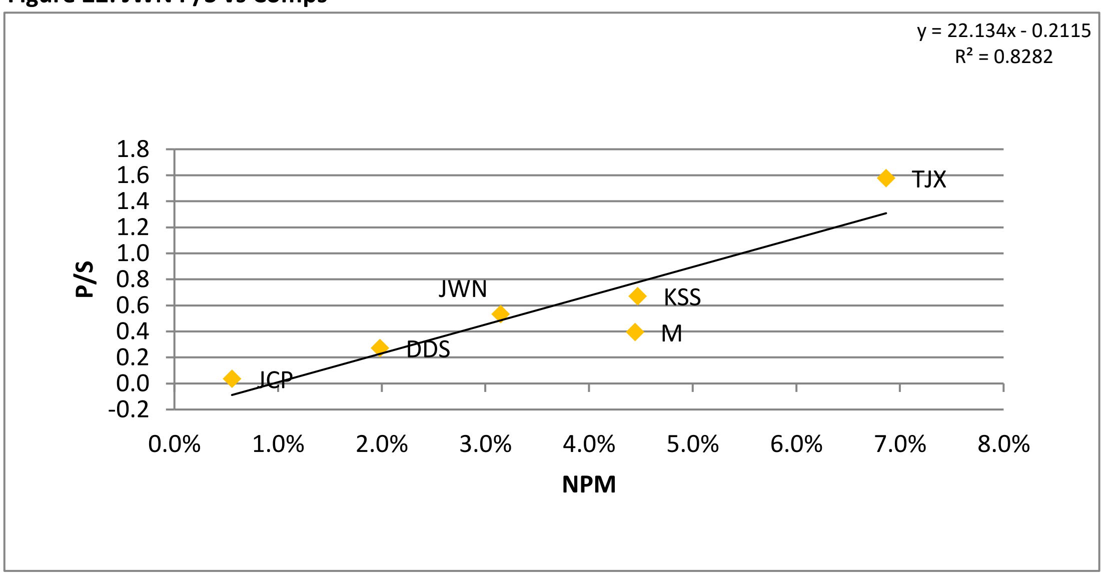
Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2018	2019	2020	2021	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
JWN	NORDSTROM INC	$49.04	$8,239	0.0	(25.1)	(25.3)	(6.2)	7.0	3.5	8.4	35.3%	-5.4%	-7.6%	24.5%	4.7%	-6.2%	0.41	222.6%	A-	2.80%	53.9%
TJX	TJX COMPANIES INC	$45.73	$56,592	(1.0)	(17.8)	(17.1)	(3.7)	24.8	19.6	11.6	4.5%	8.6%	12.4%	23.1%	6.1%	9.6%	0.56	42.5%	A+	1.52%	30.4%
JCP	PENNEY (J C) CO	$1.38	$435	1.5	3.0	(25.0)	(53.2)	(56.9)	(56.3)		299.4%	-107.8%	175.0%	-531.8%	-23.2%		0.67	406.6%	C	0.00%	
M	MACY'S INC	$31.84	$9,790	(0.2)	(15.7)	(12.5)	(19.9)	23.0	26.4	-1.6	-26.2%	-17.5%	15.4%	17.5%	-14.0%	8.9%	0.08	96.5%	B+	4.41%	27.5%
KSS	KOHL'S CORP	$62.95	$10,395	(1.4)	(23.2)	(21.9)	(19.5)	24.8	16.1	16.1	-5.0%	-6.2%	11.4%	0.0%	31.5%	4.1%	0.72	69.7%	B+	3.54%	39.8%
DDS	DILLARDS INC -CL A	$65.77	$1,746	1.5	(17.3)	(14.3)	(30.8)	13.4	9.5	7.6	-29.5%	-24.6%	-5.0%	22.9%	-0.5%	2.0%	0.30	34.9%	B+	0.58%	4.7%
Average			$14,533	0.1	(16.0)	(19.4)	(22.2)	6.0	3.1	8.4	46.4%	-25.5%	33.6%	-74.0%	0.8%	3.7%	0.46	145.5%		2.14%	31.3%
Median			$9,014	(0.1)	(17.6)	(19.5)	(19.7)	18.2	12.8	8.4	-0.2%	-11.9%	11.9%	20.2%	2.1%	4.1%	0.48	83.1%		2.16%	30.4%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			3.2%	20.0%	7.7%	10.1%						

Ticker	Website	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
JWN	http://shop.nordstrom.com	40.7%	6.89	14.4	15.1	16.9	17.9	13.2	13.6	13.0	3.1%	0.53	5.3%	12.0%	10.7	6.6	8.6	1.3%	1.7%	5.0%	$7.12
TJX	http://www.tjx.com	46.7%	10.73	23.0	21.6	23.0	18.8	18.0	18.7	17.6	6.9%	1.58	10.9%	35.9%	12.4	14.5	16.0	4.1%	6.1%	6.7%	$4.26
JCP	http://www.jcpenney.com	6.5%	0.41	-8.1	39.5	6.3	-6.1	-1.5	-1.5	-1.9	0.6%	0.03	1.0%	-2.1%	18.1	1.1	-31.4	-4.7%	-2.8%	-0.7%	$3.41
M	http://www.macysinc.com	19.5%	1.73	9.5	8.1	8.9	5.8	7.8	7.5	8.8	4.4%	0.39	6.4%	13.8%	7.7	4.7	6.3	-1.5%		-2.1%	$18.43
KSS	http://www.kohls.com	12.7%	1.90	12.3	14.4	15.0	10.5	11.1	15.0	11.4	4.5%	0.67	7.4%	8.8%	9.8	5.0	5.7	-2.8%	-1.4%	-0.2%	$33.05
DDS	http://www.dillards.com	7.8%	1.07	9.4	11.9	13.7	7.8	11.0	11.1	11.2	2.0%	0.27	4.3%	9.4%	8.9	4.8	6.8	-1.4%		-1.0%	$61.23
Average		22.3%	3.79	10.1	18.4	14.0	9.1	9.9	10.8	10.0	3.6%	0.58	5.9%	13.0%	11.3	6.1	2.0	-0.8%	0.9%	1.3%	
Median		16.1%	1.82	10.9	14.8	14.4	9.2	11.1	12.4	11.3	3.8%	0.46	5.9%	10.7%	10.2	4.9	6.5	-1.5%	0.1%	-0.5%	

Source: Company Reports, IMCP, FactSet

A more thorough analysis of P/S is shown in figure 22, it indicates that 82% of a sampled firm's P/S and can be explained by its net profit margins. JWN has a mid-tier P/S of this grouping, and according to this measure is slightly overvalued. However, given the volatility and stress the markets have been under, JWN may continue to tumble and this could drive down the P/S ratio.

Figure 22: JWN P/S vs Comps



Source: Company Reports, IMCP, FactSet

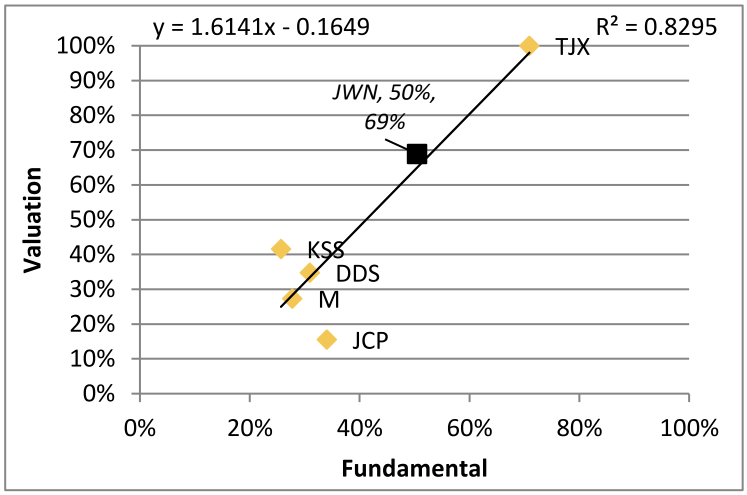
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A weighting of 25% was assigned to NTM EPS growth and the debt to equity ratio while the remaining 50% was assigned to ROE. For valuation, 50% was assigned to P/E and P/B. The regression shows that JWN is hovering above the line and is slightly over valued.

Figure 23: Composite valuation

								Fundamentals			Valuation	
						Weight		25.0%	25.0%	50.0%	50.0%	50.0%
		Rank		Target	Weighted			EPS Growth	1/(LTD/	2019	2019	2019
Ticker	Name	Diff	Diff	Value	Fund	Value		NTM	Equity)	ROE	P/E	P/B
JWN	NORDSTROM INC	2	-28%	41%	50%	69%		12%	16%	87%	74%	64%
TJX	TJX COMPANIES INC	1	-48%	52%	71%	100%		2%	82%	100%	100%	100%
JCP	PENNEY (J C) CO	6	17%	33%	34%	16%		100%	9%	14%	27%	4%
M	MACY'S INC	5	2%	30%	28%	27%		-9%	36%	42%	39%	16%
KSS	KOHL'S CORP	3	-13%	28%	26%	42%		-2%	50%	27%	65%	18%
DDS	DILLARDS INC -CL A	4	-4%	31%	31%	35%		-10%	100%	17%	60%	10%

Source: IMCP, FactSet

Figure 24: Composite relative valuation



Source: IMCP, FactSet

<u>Discounted Cash Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 11.45% 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 3.10%.
- A ten year beta of 1.21 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 11.45% (3.10 + 1.21 (10– 3.10)).

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 $2.67 and $3.36, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a stage one contribution of $5.09 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 11.45% cost of equity. I assume 2% sales growth in FY 2022-2026. NOPAT margin is expected to rise to 5.0% from 4.1% in 2021 as firm increases its operating income from continued expansion. Finally, after-tax interest is expected to rise 2% per year as the result of modest increases in borrowing. Added together, these discounted cash flows total $14.50.

Figure 25: FCFE and discounted FCFE, FY 2020 – 2026

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
FCFE	$2.67	$3.36	$4.07	$4.62	$5.16	$5.47	$5.78
Discounted FCFE	$2.39	$2.70	$2.94	$2.99	$3.00	$2.85	$2.71

Stage Three – Net income for the fiscal 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 $3.77 in FY 2020 to $6.43 in FY 2026.

Figure 26: EPS estimates for FY 2020 – 2026

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
EPS	$3.77	$4.02	$4.63	$5.22	$5.80	$6.11	$6.43

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. JWN's P/E is trading cheaper than the S&P 500, but I expect that by 2026 the industry's headwinds to have calmed as online's market shares stabilize. The S&P 500 historically trades at 15-16 and JWN normally has a near market multiple. However, by 2026 some of the firm's growth opportunities will be mature. Therefore, it will face the industry's headwinds and a P/E of 14 is warranted.

Given the assumed terminal earnings per share of $6.43 and a price to earnings ratio of 17, a terminal value of $108.81 per share is calculated. Using the 11.45% cost of equity, this number is discounted back to a present value of $50.95

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $70.54 is calculated (5.09 + 14.50 +50.95). Given JWN's current price of $47.59, this model indicates that the stock is undervalued.

<u>Scenario Analysis – Bull Case</u>

Figure 28 demonstrates a best-case scenario or bull case.

In this scenario, constant sales growth of 5% over the next 5 years and a terminal year P/E of 20 is assumed. In every previous scenario, sales were expected to increase; however, this bull case assumes all segments including off price, full line, and Nordstrom credit/other to have consistent growth. If Nordstrom is able to break into off price retailing, this scenario is likely to follow, as Nordstrom Rack would be able to make up for any slacking segments.

Total Present Value – (Bull Case) – given the assumptions above and by utilizing a three stage discounted cash flow model, an intrinsic value of $87.76 is calculated (5.09 + 13.00 + 69.66). Given JWN's current price of $47.52, this scenario analysis indicates that the stock is undervalued.

Scenario Analysis – Bear Case

Figure 29 demonstrates a worst-case scenario or bear case

For this case, sales growth is expected to fall to 1% and have P/E drop near the industry average of 14. Failure to move into new markets and slowed off price retailing growth would halt the entire growth of the firm.

Total Present Value – (Bear Case) – given the assumptions above and by utilizing a three stage discounted cash flow model, an intrinsic value of $60.20 is calculated (5.09 + 14.95 + 40.15). Given JWN's current price of $47.52, this scenario analysis indicates that the stock is still undervalued.

Figure 27: 3-Stage Model (Base case)

	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2020	2021	2022	2023	2024	2024	2026
Sales Growth	*4.8%*	*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*4.2%*	*4.1%*	*4.3%*	*4.5%*	*4.6%*	*4.8%*	*5.0%*
S / NWC	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*
S / NFA (EOY)	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*
S / IC (EOY)	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*
ROIC (EOY)	*17.9%*	*17.6%*	*18.4%*	*19.2%*	*20.0%*	*20.8%*	*21.5%*
ROIC (BOY)		*18.1%*	*18.8%*	*19.6%*	*20.4%*	*21.2%*	*22.0%*
Share Growth		*-5.4%*	*-7.0%*	*-5.2%*	*-4.0%*	*1.0%*	*1.0%*
Sales	$16,409	$16,838	$17,175	$17,518	$17,868	$18,226	$18,590
NOPAT	$682	$689	$734	$781	$829	$878	$930
Growth		*1.1%*	*6.5%*	*6.3%*	*6.2%*	*6.0%*	*5.8%*
- Change in NWC	-44	-25	-20	-20	-21	-21	-21
NWC EOY	*-961*	*-986*	*-1006*	*-1026*	*-1047*	*-1068*	*-1089*
Growth NWC		*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
- Chg NFA	219	125	98	100	102	104	106
NFA EOY	*4,770*	*4,895*	*4,993*	*5,093*	*5,194*	*5,298*	*5,404*
Growth NFA		*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Total inv in op cap	175	100	78	80	81	83	85
Total net op cap	3809	3909	3987	4066	4148	4231	4315
FCFF	$507	$590	$656	$701	$747	$795	$845
% of sales	*3.1%*	*3.5%*	*3.8%*	*4.0%*	*4.2%*	*4.4%*	*4.5%*
Growth		*16.3%*	*11.3%*	*6.8%*	*6.6%*	*6.4%*	*6.2%*
- Interest (1-tax rate)	83	85	86	88	90	91	93
Growth		*2.4%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
FCFE w/o debt	$424	$505	$570	$613	$658	$704	$752
% of sales	*2.6%*	*3.0%*	*3.3%*	*3.5%*	*3.7%*	*3.9%*	*4.0%*
Growth		*19.1%*	*12.8%*	*7.6%*	*7.3%*	*7.0%*	*6.8%*
/ No Shares	159.1	150.5	140.0	132.7	127.4	128.7	129.9
FCFE	$2.67	$3.36	$4.07	$4.62	$5.16	$5.47	$5.78
Growth		*25.9%*	*21.3%*	*13.5%*	*11.8%*	*6.0%*	*5.7%*
* Discount factor	0.90	0.81	0.72	0.65	0.58	0.52	0.47
Discounted FCFE	$2.39	$2.70	$2.94	$2.99	$3.00	$2.85	$2.71
Third Stage							
Terminal value P/E							
Net income	$599	$605	$648	$693	$739	$787	$836
% of sales	*3.7%*	*3.6%*	*3.8%*	*4.0%*	*4.1%*	*4.3%*	*4.5%*
EPS	$3.77	$4.02	$4.63	$5.22	$5.80	$6.11	$6.43
Growth		*6.6%*	*15.2%*	*12.8%*	*11.1%*	*5.4%*	*5.2%*
Terminal P/E							16.91
* Terminal EPS							$6.43
Terminal value							$108.81
* Discount factor							0.47
Discounted terminal value							$50.95

Summary		
First stage	$5.09	Present value of first 2 year cash flow
Second stage	$14.50	Present value of year 3-7 cash flow
Third stage	$50.95	Present value of terminal value P/E
Value (P/E)	**$70.54**	= value at beg of fiscal yr 2020

Figure 28: 3-Stage Model (Bull case)

	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2020	2021	2022	2023	2024	2024	2026
Sales Growth	*4.8%*	*2.6%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
NOPAT / S	*4.2%*	*4.1%*	*4.3%*	*4.5%*	*4.6%*	*4.8%*	*5.0%*
S / NWC	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*
S / NFA (EOY)	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*
S / IC (EOY)	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*
ROIC (EOY)	*17.9%*	*17.6%*	*18.4%*	*19.2%*	*20.0%*	*20.8%*	*21.5%*
ROIC (BOY)		*18.1%*	*19.3%*	*20.2%*	*21.0%*	*21.8%*	*22.6%*
Share Growth		*-5.4%*	*-7.0%*	*-5.2%*	*-4.0%*	*1.0%*	*1.0%*
Sales	$16,409	$16,838	$17,680	$18,564	$19,492	$20,466	$21,490
NOPAT	$682	$689	$756	$827	$904	$986	$1,074
Growth		*1.1%*	*9.7%*	*9.5%*	*9.3%*	*9.1%*	*9.0%*
- Change in NWC	-44	-25	-49	-52	-54	-57	-60
NWC EOY	*-961*	*-986*	*-1036*	*-1087*	*-1142*	*-1199*	*-1259*
Growth NWC		*2.6%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
- Chg NFA	219	125	245	257	270	283	297
NFA EOY	*4,770*	*4,895*	*5,140*	*5,397*	*5,666*	*5,950*	*6,247*
Growth NFA		*2.6%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
Total inv in op cap	175	100	195	205	215	226	238
Total net op cap	3809	3909	4104	4309	4525	4751	4988
FCFF	$507	$590	$560	$622	$688	$760	$837
% of sales	*3.1%*	*3.5%*	*3.2%*	*3.4%*	*3.5%*	*3.7%*	*3.9%*
Growth		*16.3%*	*-5.0%*	*11.0%*	*10.7%*	*10.4%*	*10.1%*
- Interest (1-tax rate)	83	85	89	93	98	103	108
Growth		*2.4%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*	*5.0%*
FCFE w/o debt	$424	$505	$471	$529	$591	$657	$729
% of sales	*2.6%*	*3.0%*	*2.7%*	*2.8%*	*3.0%*	*3.2%*	*3.4%*
Growth		*19.1%*	*-6.6%*	*12.1%*	*11.7%*	*11.3%*	*10.9%*
/ No Shares	159.1	150.5	140.0	132.7	127.4	128.7	129.9
FCFE	$2.67	$3.36	$3.37	$3.98	$4.64	$5.11	$5.61
Growth		*25.9%*	*0.4%*	*18.3%*	*16.3%*	*10.2%*	*9.8%*
* Discount factor	0.90	0.81	0.72	0.65	0.58	0.52	0.47
Discounted FCFE	$2.39	$2.70	$2.43	$2.58	$2.70	$2.67	$2.63
Third Stage							
Terminal value P/E							
Net income	$599	$605	$667	$734	$806	$883	$967
% of sales	*3.7%*	*3.6%*	*3.8%*	*4.0%*	*4.1%*	*4.3%*	*4.5%*
EPS	$3.77	$4.02	$4.76	$5.53	$6.33	$6.87	$7.44
Growth		*6.6%*	*18.6%*	*16.1%*	*14.4%*	*8.5%*	*8.3%*
Terminal P/E							20.00
* Terminal EPS							$7.44
Terminal value							$148.77
* Discount factor							0.47
Discounted terminal value							$69.66

Summary

First stage	$5.09	Present value of first 2 year cash flow
Second stage	$13.00	Present value of year 3-7 cash flow
Third stage	$69.66	Present value of terminal value P/E
Value (P/E)	**$87.76**	= value at beg of fiscal yr 2020

Figure 29: 3-Stage Model (Bear case)

	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2020	2021	2022	2023	2024	2024	2026
Sales Growth	*4.8%*	*2.6%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
NOPAT / S	*4.2%*	*4.1%*	*4.3%*	*4.5%*	*4.6%*	*4.8%*	*5.0%*
S / NWC	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*
S / NFA (EOY)	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*
S / IC (EOY)	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*
ROIC (EOY)	*17.9%*	*17.6%*	*18.4%*	*19.2%*	*20.0%*	*20.8%*	*21.5%*
ROIC (BOY)		*18.1%*	*18.6%*	*19.4%*	*20.2%*	*21.0%*	*21.8%*
Share Growth		*-5.4%*	*-7.0%*	*-5.2%*	*-4.0%*	*1.0%*	*1.0%*
Sales	$16,409	$16,838	$17,006	$17,176	$17,348	$17,521	$17,697
NOPAT	$682	$689	$727	$765	$804	$844	$885
Growth		*1.1%*	*5.5%*	*5.3%*	*5.1%*	*5.0%*	*4.8%*
- Change in NWC	-44	-25	-10	-10	-10	-10	-10
NWC EOY	*-961*	*-986*	*-996*	*-1006*	*-1016*	*-1026*	*-1037*
Growth NWC		*2.6%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
- Chg NFA	219	125	49	49	50	50	51
NFA EOY	*4,770*	*4,895*	*4,944*	*4,993*	*5,043*	*5,094*	*5,145*
Growth NFA		*2.6%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
Total inv in op cap	175	100	39	39	40	40	41
Total net op cap	3809	3909	3948	3987	4027	4067	4108
FCFF	$507	$590	$688	$726	$765	$804	$844
% of sales	*3.1%*	*3.5%*	*4.0%*	*4.2%*	*4.4%*	*4.6%*	*4.8%*
Growth		*16.3%*	*16.7%*	*5.5%*	*5.3%*	*5.2%*	*5.0%*
- Interest (1-tax rate)	83	85	85	86	87	88	89
Growth		*2.4%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
FCFE w/o debt	$424	$505	$602	$640	$677	$716	$755
% of sales	*2.6%*	*3.0%*	*3.5%*	*3.7%*	*3.9%*	*4.1%*	*4.3%*
Growth		*19.1%*	*19.3%*	*6.2%*	*5.9%*	*5.7%*	*5.5%*
/ No Shares	159.1	150.5	140.0	132.7	127.4	128.7	129.9
FCFE	$2.67	$3.36	$4.30	$4.82	$5.32	$5.57	$5.81
Growth		*25.9%*	*28.3%*	*12.0%*	*10.3%*	*4.6%*	*4.4%*
* Discount factor	0.90	0.81	0.72	0.65	0.58	0.52	0.47
Discounted FCFE	$2.39	$2.70	$3.11	$3.12	$3.09	$2.90	$2.72
Third Stage							
Terminal value P/E							
Net income	$599	$605	$641	$679	$717	$756	$796
% of sales	*3.7%*	*3.6%*	*3.8%*	*4.0%*	*4.1%*	*4.3%*	*4.5%*
EPS	$3.77	$4.02	$4.58	$5.12	$5.63	$5.88	$6.13
Growth		*6.6%*	*14.1%*	*11.7%*	*10.0%*	*4.4%*	*4.2%*
Terminal P/E							14.00
* Terminal EPS							$6.13
Terminal value							$85.76
* Discount factor							0.47
Discounted terminal value							$40.15

Summary

First stage	$5.09	Present value of first 2 year cash flow
Second stage	$14.95	Present value of year 3-7 cash flow
Third stage	$40.15	Present value of terminal value P/E
Value (P/E)	**$60.20**	= value at beg of fiscal yr 2020

Business Risks

Although there are reasons to be optimistic about Nordstrom, there are several reasons why the stock may stagnate:

Competitive marketplace:

The apparel retail industry is highly competitive both in malls and online. Off priced competitors such as TJX have thrived while full price competitors like Macy's have struggled. Off price retailing has gained more market share in past years as brick and mortar stores have declined due to changing consumer preferences and digital sales. Nordstrom will need to find a comfortable balance to survive long term.

Nordstrom takes the company private:

The Nordstrom family has publicly talked about buying back 100% of shares and taking the company private. In March of 2018, the Nordstrom family stated they would continue talks after the holiday seasons. Going private would pose risks of uncertainty about the company and its future. (Source: company reports)

Slow online expansion:

Nordstrom has had strong online sales growth, far above the average apparel retailer. Being digitally competitive is extremely important as Amazon and other big online retailers enter into the market, which may reduce the size of the market.

Inability to choose company direction:

A crossroads between off price and full price is on the horizon. Nordstrom will need to choose between remodeling the company to pursue an off price market strategy or ramp up growth of its full price stores.

Cannibalization of sales:

Off price sales could significantly cut into full price sales if off price expansion is done at too fast of a rate. Currently, full price stores operate a gross margin of 37% while off price operate at 32%. Expanding off price locations with full price far behind could cannibalize sales and brand recognition.

Appendix 1: Porter's 5 Forces

Threat of Entrants – High

While traditional brick and mortar stores have fallen behind, online conglomerates have surged ahead, leaving the industry with lower margins and growth. 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 this moat.

Threat of Substitutes – High

Nordstrom has branded itself as a higher end apparel retailer. While operating in a heavily competitive environment, it is easy for consumers to switch between brands leaving Nordstrom, like all of its competitors, at a disadvantage.

Supplier Power –Low

Nordstrom has the luxuary of a wide array of potential textile manufactures. These manufactures have little to no leverage over Nordstrom or its competition. With such a large pool to choose from, switching suppliers is of little cost and time due to higher levels of technology and advanced methods of manufacturing.

Buyer Power – Very High

Consumers have easy access to a wide array of substitues within the industry. There is no cost to switch brands and with no urgancy to buy apparel, consumers have the power to wait for better prices.

Intensity of Competition – Very High

Nordstrom operates in a highly competive environment with both national and international established brands that conduct business near or in the same retail space. As online shopping continues to grow, Nordstrom will face more competion in the digital world while trying to maintain a strong foothold from in store sales.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High brand recognition Prime store locations Continued expansion	Low same store sales Over expansion Increased online competition
Opportunities	**Threats**
International expansion Continued off price retail expansion Continued e-commerce growth	Cannibalization of sales Loss of brand status Economic downturn

Appendix 3: Income Statement

Income Statement	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Sales	$13,110	$14,095	$14,498	$15,137	$15,654	$16,409	$16,838
Direct costs	8,406	9,168	9,440	9,890	10,394	10,863	11,113
Gross Margin	4,704	4,927	5,058	5,247	5,260	5,546	5,725
SG&A and other	3,381	3,826	4,253	4,321	4,185	4,463	4,630
EBIT	1,323	1,101	805	926	1,075	1,083	1,094
Interest	138	125	121	136	130	131	134
EBT	1,185	976	684	790	945	952	960
Taxes	465	376	330	353	350	353	356
Net income	720	600	354	437	595	599	605
Dividends	251	253	256	247	250	252.5	255.025
Basic Shares	190.0	186.3	173.2	166.8	165.0	159.1	150.5
EPS	$3.79	$3.22	$2.04	$2.62	$3.61	$3.77	$4.02
DPS	$1.32	$1.36	$1.48	$1.48	$1.52	$1.59	$1.69

Appendix 4: Balance Sheet

Balance Sheet	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Assets							
Cash	827	595	1,007	1,181	1,287	1,289	1,309
Operating assets ex cash	4,397	2,419	2,235	2,322	2,360	2,473	2,538
Operating assets	5,224	3,014	3,242	3,503	3,647	3,762	3,846
Operating liabilities	2,792	2,901	3,018	3,233	3,277	3,434	3,524
NOWC	2,432	113	224	270	370	327	322
NOWC ex cash (NWC)	1,605	(482)	(783)	(911)	(917)	(961)	(986)
NFA	4,021	4,684	4,616	4,612	4,551	4,770	4,895
Invested capital	*$6,453*	*$4,797*	*$4,840*	*$4,882*	*$4,921*	*$5,098*	*$5,217*
Total assets	*$9,245*	*$7,698*	*$7,858*	*$8,115*	*$8,197*	*$8,532*	*$8,741*
Liabilities and Shareholder Equity							
Short-term and long-term debt	$3,131	$2,805	$2,774	$2,737	$2,736	$2,786	$2,866
Other liabilities	882	1,121	1,196	1,168	1,120	1,160	1,220
Debt/equity-like securities						30	80
Equity	2,440	871	870	977	1,065	1,122	1,051
Total supplied capital	*$6,453*	*$4,797*	*$4,840*	*$4,882*	*$4,921*	*$5,097*	*$5,217*
Total liabilities and equity	*$9,245*	*$7,698*	*$7,858*	*$8,115*	*$8,197*	*$8,532*	*$8,741*

Appendix 5: Sales forecast

						Base Case		Bull Case		Bear Case	
	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2020	FY 2021	FY 2020	FY 2021
Sales	13,110	14,095	14,498	15,137	15,654	16,409	16,838	16,749	17,994	15,194	14,848
Growth		*7.5%*	*2.9%*	*4.4%*	*3.4%*	*4.8%*	*2.6%*	*2.1%*	*7.4%*	*-7.4%*	*-2.3%*
Full price	9,678	9,933	9,705	9,838	10,002	10,352	10,476	10,502	11,027	9,702	9,314
Growth		*2.6%*	*-2.3%*	*1.4%*	*1.7%*	*3.5%*	*1.2%*	*5.0%*	*5.0%*	*-3.0%*	*-4.0%*
% of sales	*73.8%*	*70.5%*	*66.9%*	*65.0%*	*63.9%*	*63.1%*	*62.2%*	*62.7%*	*61.3%*	*63.9%*	*62.7%*
Off-price	3,575	4,065	4,509	4,956	5,352	5,727	6,013	5,887	6,535	5,432	5,487
Growth		*13.7%*	*10.9%*	*9.9%*	*8.0%*	*7.0%*	*5.0%*	*10.0%*	*11.0%*	*1.5%*	*1.0%*
% of sales	*27.3%*	*28.8%*	*31.1%*	*32.7%*	*34.2%*	*2.0%*	*35.7%*	*35.1%*	*36.3%*	*35.8%*	*37.0%*
Other Retail and credit	(143)	97	284	343	300	330	348	360	432	60	48
Growth		*-167.8%*	*192.8%*	*20.8%*	*-12.5%*	*10.0%*	*5.6%*	*20.0%*	*20.0%*	*-80.0%*	*-20.0%*
% of sales	*-1.1%*	*0.7%*	*2.0%*	*2.3%*	*1.9%*	*2.0%*	*6.0%*	*2.1%*	*2.4%*	*0.4%*	*0.3%*

Appendix 6: Ratios

Ratios	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Profitability							
Gross margin	35.9%	35.0%	34.9%	34.7%	33.6%	33.8%	34.0%
Operating (EBIT) margin	10.1%	7.8%	5.6%	6.1%	6.9%	6.6%	6.5%
Net profit margin	5.5%	4.3%	2.4%	2.9%	3.8%	3.7%	3.6%
Activity							
NFA (gross) turnover		3.24	3.12	3.28	3.42	3.52	3.48
Total asset turnover		1.66	1.86	1.90	1.92	1.96	1.95
Liquidity							
Op asset / op liab	1.87	1.04	1.07	1.08	1.11	1.10	1.09
NOWC Percent of sales		9.0%	1.2%	1.6%	2.0%	2.1%	1.9%
Solvency							
Debt to assets	33.9%	36.4%	35.3%	33.7%	33.4%	32.6%	32.8%
Debt to equity	128.3%	322.0%	318.9%	280.1%	256.9%	248.3%	272.6%
Other liab to assets	9.5%	14.6%	15.2%	14.4%	13.7%	13.6%	14.0%
Total debt to assets	43.4%	51.0%	50.5%	48.1%	47.0%	46.2%	46.7%
Total liabilities to assets	73.6%	88.7%	88.9%	88.0%	87.0%	86.5%	87.1%
Debt to EBIT	2.37	2.55	3.45	2.96	2.54	2.57	2.62
EBIT/interest	9.59	8.81	6.65	6.81	8.27	8.26	8.15
Debt to total net op capital	48.5%	58.5%	57.3%	56.1%	55.6%	54.6%	54.9%
ROIC							
NOPAT to sales	6.1%	4.8%	2.9%	3.4%	4.3%	4.2%	4.1%
Sales to NWC		25.10	(22.92)	(17.87)	(17.13)	(17.47)	(17.29)
Sales to NFA		3.24	3.12	3.28	3.42	3.52	3.48
Sales to IC ex cash		2.87	3.61	4.02	4.27	4.41	4.36
Total ROIC ex cash		13.8%	10.4%	13.6%	18.5%	18.3%	17.9%
NOPAT to sales	6.1%	4.8%	2.9%	3.4%	4.3%	4.2%	4.1%
Sales to NOWC		11.08	86.04	61.28	48.92	47.06	51.84
Sales to NFA		3.24	3.12	3.28	3.42	3.52	3.48
Sales to IC		2.51	3.01	3.11	3.19	3.28	3.26
Total ROIC		12.0%	8.6%	10.5%	13.8%	13.6%	13.4%
NOPAT to sales	6.1%	4.8%	2.9%	3.4%	4.3%	4.2%	4.1%
Sales to EOY NWC	8.17	(29.24)	(18.52)	(16.62)	(17.07)	(17.07)	(17.07)
Sales to EOY NFA	3.26	3.01	3.14	3.28	3.44	3.44	3.44
Sales to EOY IC ex cash	2.33	3.35	3.78	4.09	4.31	4.31	4.31
Total ROIC using EOY IC ex cash	14.3%	16.1%	10.9%	13.8%	18.6%	17.9%	17.6%
NOPAT to sales	6.1%	4.8%	2.9%	3.4%	4.3%	4.2%	4.1%
Sales to EOY NOWC	5.39	124.73	64.72	56.06	42.31	50.12	52.25
Sales to EOY NFA	3.26	3.01	3.14	3.28	3.44	3.44	3.44
Sales to EOY IC	2.03	2.94	3.00	3.10	3.18	3.22	3.23
Total ROIC using EOY IC	12.5%	14.1%	8.6%	10.5%	13.8%	13.4%	13.2%

Appendix 7: Ratios

Ratios Continued	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
ROE							
5-stage							
EBIT / sales		7.8%	5.6%	6.1%	6.9%	6.6%	6.5%
Sales / avg assets		1.66	1.86	1.90	1.92	1.96	1.95
EBT / EBIT		88.6%	85.0%	85.3%	87.9%	87.9%	87.7%
Net income /EBT		61.5%	51.8%	55.3%	63.0%	63.0%	63.0%
ROA		7.1%	4.6%	5.5%	7.3%	7.2%	7.0%
Avg assets / avg equity		5.12	8.94	8.65	7.99	7.65	7.95
ROE		36.2%	40.7%	47.3%	58.3%	54.8%	55.6%
3-stage							
Net income / sales		4.3%	2.4%	2.9%	3.8%	3.7%	3.6%
Sales / avg assets		1.66	1.86	1.90	1.92	1.96	1.95
ROA		7.1%	4.6%	5.5%	7.3%	7.2%	7.0%
Avg assets / avg equity		5.12	8.94	8.65	7.99	7.65	7.95
ROE		36.2%	40.7%	47.3%	58.3%	54.8%	55.6%
Payout Ratio		42.2%	72.3%	56.5%	42.0%	42.1%	42.2%
Retention Ratio		57.8%	27.7%	43.5%	58.0%	57.9%	57.8%
Sustainable Growth Rate		21.0%	11.3%	20.6%	33.8%	31.7%	32.2%

Appendix 8: JWN's Comps

Ticker	Name	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
JWN	NORDSTROM INC	$49.04	$8,239	0.0	(25.1)	(25.3)	(6.2)	7.0	3.5	8.4	35.3%	-5.4%	-7.6%	24.5%	4.7%	-6.2%	0.41	222.6%	A-	2.80%	53.9%
TJX	TJX COMPANIES INC	$45.73	$56,592	(1.0)	(17.8)	(17.1)	(3.7)	24.8	19.6	11.6	4.5%	8.6%	12.4%	23.1%	6.1%	9.6%	0.56	42.5%	A+	1.52%	30.4%
JCP	PENNEY (J C) CO	$1.38	$435	1.5	3.0	(25.0)	(53.2)	(56.9)	(56.3)		299.4%	-92.2%	-375.0%	-531.8%	-23.2%		0.67	406.6%	C	0.00%	
M	MACY'S INC	$31.84	$9,790	(0.2)	(15.7)	(12.5)	(19.9)	23.0	26.4	-1.6	-26.2%	-17.5%	15.4%	17.5%	-14.0%	8.9%	0.08	96.5%	B+	4.41%	27.5%
KSS	KOHL'S CORP	$62.95	$10,395	(1.4)	(23.2)	(21.9)	(19.5)	24.8	16.1	16.1	-5.0%	-6.2%	11.4%	0.0%	31.5%	4.1%	0.72	69.7%	B+	3.54%	39.8%
DDS	DILLARDS INC -CL A	$65.77	$1,746	1.5	(17.3)	(14.3)	(30.8)	13.4	9.5	7.6	-29.5%	-24.6%	-5.0%	22.9%	-0.5%	2.0%	0.30	34.9%	B+	0.58%	4.7%
Average			$14,533	0.1	(16.0)	(19.4)	(22.2)	6.0	3.1	8.4	46.4%	-22.9%	-58.0%	-74.0%	0.8%	3.7%	0.46	145.5%		2.14%	31.3%
Median			$9,014	(0.1)	(17.6)	(19.5)	(19.7)	18.2	12.8	8.4	-0.2%	-11.9%	3.2%	20.2%	2.1%	4.1%	0.48	83.1%		2.16%	30.4%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			3.2%	20.0%	7.7%	10.1%						

Ticker	Website	2019 ROE	P/B	P/E 2017	2018	2019	TTM	NTM	2020	2021	2019 NPM	2019 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
JWN	http://shop.nordstrom.com	40.7%	6.89	14.4	15.1	16.9	17.9	13.2	13.6	13.0	3.1%	0.53	5.3%	12.0%	10.7	6.6	8.6	1.3%	1.7%	5.0%	$7.12
TJX	http://www.tjx.com	46.7%	10.73	23.0	21.6	23.0	18.8	18.0	18.7	17.6	6.9%	1.58	10.9%	35.9%	12.4	14.5	16.0	4.1%	6.1%	6.7%	$4.26
JCP	http://www.jcpenney.com	6.5%	0.41	-8.1	-39.5	6.3	-6.1	-1.5	-1.5	-1.9	0.6%	0.03	1.0%	-2.1%	18.1	1.1	-31.4	-4.7%	-2.8%	-0.7%	$3.41
M	http://www.macysinc.com	19.5%	1.73	9.5	8.1	8.9	5.8	7.8	7.5	8.8	4.4%	0.39	6.4%	13.8%	7.7	4.7	6.3	-1.5%		-2.1%	$18.43
KSS	http://www.kohls.com	12.7%	1.90	12.3	14.4	15.0	10.5	11.1	15.0	11.4	4.5%	0.67	7.4%	8.8%	9.8	5.0	5.7	-2.8%	-1.4%	-0.2%	$33.05
DDS	http://www.dillards.com	7.8%	1.07	9.4	11.9	13.7	7.8	11.0	11.1	11.2	2.0%	0.27	4.3%	9.4%	8.9	4.8	6.8	-1.4%		-1.0%	$61.23
Average		22.3%	3.79	10.1	5.3	14.0	9.1	9.9	10.8	10.0	3.6%	0.58	5.9%	13.0%	11.3	6.1	2.0	-0.8%	0.9%	1.3%	
Median		16.1%	1.82	10.9	13.2	14.4	9.2	11.1	12.4	11.3	3.8%	0.46	5.9%	10.7%	10.2	4.9	6.5	-1.5%	0.1%	-0.5%	
spx	S&P 500 INDEX			17.8	20.6	16.9			15.7	14.3											

Appendix 9: 3-stage DCF

	Year						
	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2020	2021	2022	2023	2024	2024	2026
Sales Growth	*4.8%*	*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*4.2%*	*4.1%*	*4.3%*	*4.5%*	*4.6%*	*4.8%*	*5.0%*
S / NWC	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*	*(17.07)*
S / NFA (EOY)	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*	*3.44*
S / IC (EOY)	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*	*4.31*
ROIC (EOY)	*17.9%*	*17.6%*	*18.4%*	*19.2%*	*20.0%*	*20.8%*	*21.5%*
ROIC (BOY)		*18.1%*	*18.8%*	*19.6%*	*20.4%*	*21.2%*	*22.0%*
Share Growth		*-5.4%*	*-7.0%*	*-5.2%*	*-4.0%*	*1.0%*	*1.0%*
Sales	$16,409	$16,838	$17,175	$17,518	$17,868	$18,226	$18,590
NOPAT	$682	$689	$734	$781	$829	$878	$930
Growth		*1.1%*	*6.5%*	*6.3%*	*6.2%*	*6.0%*	*5.8%*
- Change in NWC	-44	-25	-20	-20	-21	-21	-21
NWC EOY	*-961*	*-986*	*-1006*	*-1026*	*-1047*	*-1068*	*-1089*
Growth NWC		*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
- Chg NFA	219	125	98	100	102	104	106
NFA EOY	*4,770*	*4,895*	*4,993*	*5,093*	*5,194*	*5,298*	*5,404*
Growth NFA		*2.6%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
Total inv in op cap	175	100	78	80	81	83	85
Total net op cap	3809	3909	3987	4066	4148	4231	4315
FCFF	$507	$590	$656	$701	$747	$795	$845
% of sales	*3.1%*	*3.5%*	*3.8%*	*4.0%*	*4.2%*	*4.4%*	*4.5%*
Growth		*16.3%*	*11.3%*	*6.8%*	*6.6%*	*6.4%*	*6.2%*
- Interest (1-tax rate)	83	85	86	88	90	91	93
Growth		*2.4%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
FCFE w/o debt	$424	$505	$570	$613	$658	$704	$752
% of sales	*2.6%*	*3.0%*	*3.3%*	*3.5%*	*3.7%*	*3.9%*	*4.0%*
Growth		*19.1%*	*12.8%*	*7.6%*	*7.3%*	*7.0%*	*6.8%*
/ No Shares	159.1	150.5	140.0	132.7	127.4	128.7	129.9
FCFE	$2.67	$3.36	$4.07	$4.62	$5.16	$5.47	$5.78
Growth		*25.9%*	*21.3%*	*13.5%*	*11.8%*	*6.0%*	*5.7%*
* Discount factor	0.90	0.81	0.72	0.65	0.58	0.52	0.47
Discounted FCFE	$2.39	$2.70	$2.94	$2.99	$3.00	$2.85	$2.71
Third Stage							
Terminal value P/E							
Net income	$599	$605	$648	$693	$739	$787	$836
% of sales	*3.7%*	*3.6%*	*3.8%*	*4.0%*	*4.1%*	*4.3%*	*4.5%*
EPS	$3.77	$4.02	$4.63	$5.22	$5.80	$6.11	$6.43
Growth		*6.6%*	*15.2%*	*12.8%*	*11.1%*	*5.4%*	*5.2%*
Terminal P/E							16.91
* Terminal EPS							$6.43
Terminal value							$108.81
* Discount factor							0.47
Discounted terminal value							$50.95

Summary

First stage	$5.09	Present value of first 2 year cash flow
Second stage	$14.50	Present value of year 3-7 cash flow
Third stage	$50.95	Present value of terminal value P/E
Value (P/E)	**$70.54**	= value at beg of fiscal yr 2020

Industrials

United Parcel Services

Recommendation	Neutral
Target (today's value)	$107
Current Price	$101.60
52 week range	$89.89 - $133.56

Share Data	
Ticker:	UPS
Market Cap. (Billion):	$89.3
Inside Ownership	0.5%
Inst. Ownership	51.8%
Beta	0.86
Dividend Yield	3.5%
Payout Ratio	56.9%
Cons. Long-Term Growth Rate	6.3%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$60.9	$65.9	$72.1	$77.6	$82.1
Gr %	-	8.2%	9.4%	7.6%	5.8%
Cons	-	-	-	$76.5	$80.7
EPS					
Year	$3.89	$5.64	$6.80	$7.45	$8.44
Gr %	-	45.1%	20.4%	9.6%	13.3%
Cons	-	-	$7.23	$7.82	$8.50

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	210%	238%	698%	131%	88%
Industry	61.1%	54.1%	121%	40.3%	34%
NPM (%)	8.3%	5.7%	7.5%	8.8%	9.1%
Industry	5.9%	4.7%	5.3%	5.8%	6.1%
A. T/O	1.57	1.54	1.54	1.41	1.37
ROA (%)	13.1%	8.7%	11.4%	12.5%	12%
Industry	9.7%	8.3%	9.1%	10.2%	10.7%
D/A	39.8%	53.5%	50.2%	46.7%	43.1%

Valuation	'17	'18	'19E	'20E
P/E	29.5	16.5	13.3	12.2
Industry	28.3	15.8	13.7	12.3
P/S	1.65	1.27	1.17	1.11
P/B	68.7	28.7	13.7	8.8
P/CF	19.0	13.9	8.4	7.7
EV/EBIT	22.3	16.6	13.3	12.3

Performance	Stock	Industry
1 Month	-5.4%	-16.9%
3 Month	-15.8%	-19.3%
YTD	-13.1%	2.8%
52-week	-12.3%	5.9%
3-year	6.3%	-10.2%

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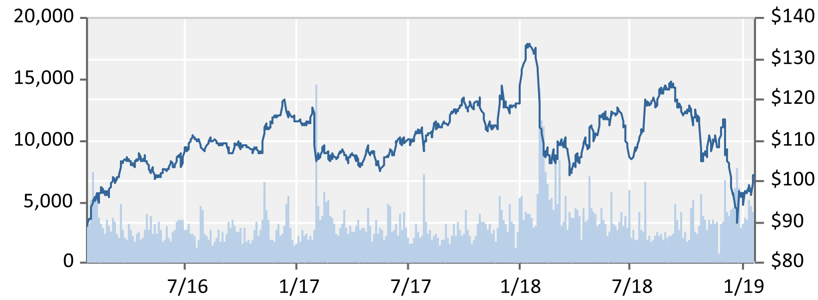


Source: FactSet Prices

Summary: I recommend a neutral rating with a target of $107. Although UPS has an opportunity to improve efficiency and increase margins, there are a few major headwinds that UPS needs to navigate through. These headwinds offset my optimism that the core business can greatly improve. The stock is fairly valued based on relative and DCF analysis.

Key Drivers:

- International expansion: The expansion of UPS' operations overseas received a boost in 2017 when it acquired two European companies; the top small package company in Ireland and a U.K. based LTL delivery company. International sales have the potential to rise sharply in the coming years.

- Fuel Costs: Although fuel only represented 4% of total expenses in 2017 for UPS, it plays a crucial role in margins and ultimately has a large impact on the bottom line.

- Competition: UPS has faced competition from longtime rivals such as FedEx, but the emergence of Amazon as a delivery service needs to be monitored.

- Macroeconomic Trends: UPS tends to perform better when the economy is doing well due to the growth of commerce.

Valuation: Using a relative valuation approach, United Parcel Services appears to be overvalued in comparison to the transportation industry. A combination of the approaches suggests that UPS is fairly valued, as the stock's value is about $109 and the shares trade at $101.60.

Risks: Threats to the business include a slowing economy, foreign currency risks, fuel costs, and declining international sales.

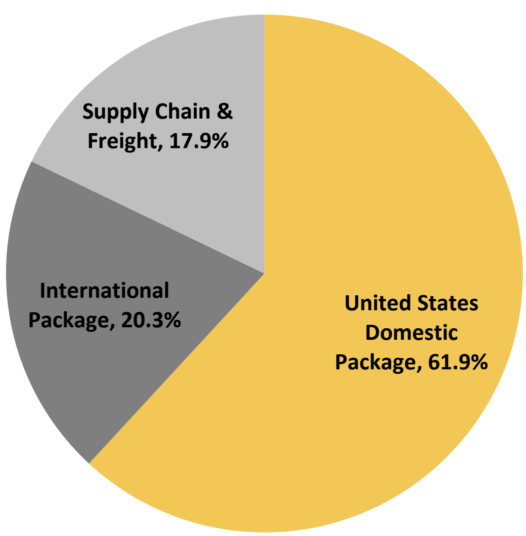
Company Overview

United Parcel Service, Inc. (UPS) provides letter and package delivery, specialized transportation, logistics, and financial services. UPS has three segments in which it operates: U.S. Domestic Package, International Package, and Supply Chain & Freight. The U.S. Domestic Package segment offers transportation of letters, small packages, and palletized freight via air and ground services in the United States. The International Package segment provides small package transportation services in Europe, Asia-Pacific, Canada and Latin America, Indian sub-continent, the Middle East and Africa. The Supply Chain and Freight segment offers international air and ocean freight forwarding and international trade and brokerage services in approximately 220 countries. UPS was founded in 1907 and is headquartered in Atlanta, Georgia.

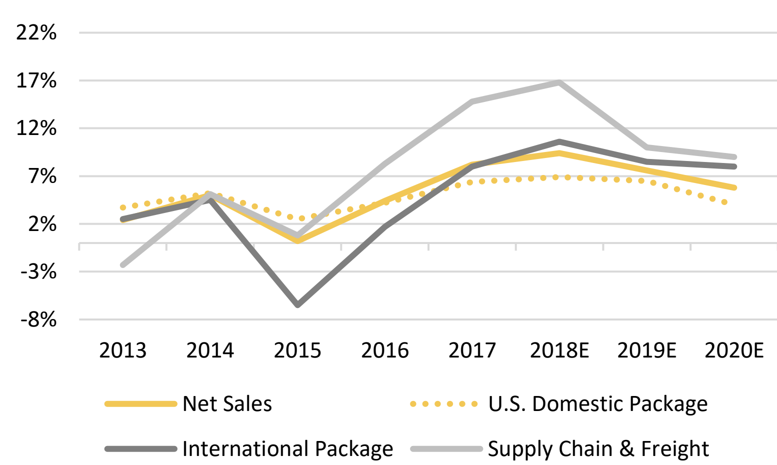
UPS generates 61.9% of its revenue from the U.S. Domestic Package segment, 20.2% from the International Package segment, and 17.9% from the Supply Chain & Freight segment.

- U.S. Domestic Package: In the nine months ended 2018, ground products saw a rise in revenue of 7.4%, Next Day Air revenue was up 6.2%, and Deferred Air products revenue rose 7.5%. Operating margin for this segment as a whole came was 9.3% through three quarters.
- International Package: Export shipments rose more than 10% in the first nine months of 2018, helping to increase revenue by 10.3% for the segment. Operating margin was 17.2% for the first three quarters, the highest of all three segments for UPS.
- Supply Chain & Freight: Forwarding saw a 22.0% rise in revenue while UPS' Freight revenue rose 11.5% in the first three quarters of 2018.

Figures 1 and 2: Revenue by segment for UPS, year-end 2017 (left) and Revenue Segment Growth Since 2011



Source: FactSet



Source: FactSet

Business/Industry Drivers

Though several factors may contribute to United Parcel Services, Inc. future success, the following are the most important business drivers:

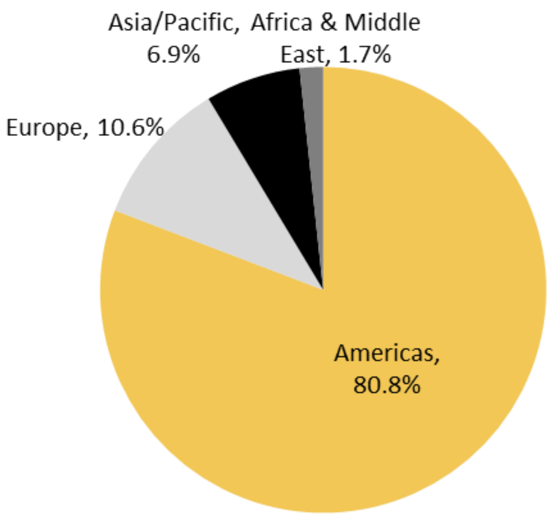
1) International and Overall Expansion
2) Fuel Costs
3) Competition
4) Macroeconomic Trends

International and Overall Expansion

The international package segment for UPS has been inconsistent over the past five years in delivering sales growth. From 2012 through 2016, UPS' International Package segment averaged yearly sales growth of just 0.24%. That all changed in 2017 when management decided to penetrate this market further with acquisitions, acquiring Nightline Logistics, a top small package company in Ireland. The firm not stop there, and also purchased Freightex, a U.K. based asset light provider of truckload and LTL. Both of these acquisitions contributed to the International Package segment growing 8.0% in 2017. These acquisitions should help position UPS to capture more market share in Europe, as well as open up more delivery lanes between Europe and Asia.

It is my opinion that the international market presents the largest opportunity going forward for UPS as America is already a saturated market, making up over 80% of UPS' total revenue. To put into perspective how important the international market can be for UPS, COO Jim Barber said that he expects UPS international earnings to eclipse U.S. earnings over time. However, looking at Figure 4 one can see that the International Package segment has averaged roughly 20% of total sales dating back to 2008, presenting no large changes as of yet.

Figure 3: Revenue Breakdown by Super Region



Source: FactSet

Figure 4: Segment Breakdown % of Total Sales

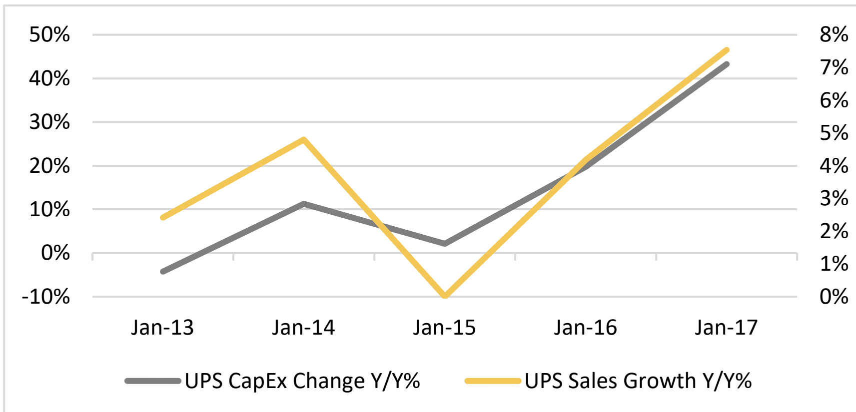
Source: FactSet

UPS will be adding seven new buildings, totaling five million square feet of new space.

UPS is not stopping at international expansion, as it continues to expand domestically as well. The U.S. Domestic Package segment slightly underperformed last year due to volume growth being stronger than UPS could handle. Realizing that it is critical to correct this quickly to not allow competitors to take market share, UPS announced it is adding seven new buildings that will total more than five million square feet. This would add to the already 34 million square feet that UPS uses for operations. In the near term this will negatively affect free cash flow as capital expenditures will be approximately 7.94% of sales, which is up from their prior five year average of 4.13%. These additions as well as the continual trend towards automated process facilities should not only allow UPS to handle more volume but also keep costs down, helping the firm win any potential bidding wars with competitors. Additionally, this is not a one-time expenditure for UPS as they plan to keep their capital expenditures in the range of 8.5% to 10.0% of sales through 2020. Figure 5 indicates how increasing capital expenditures has translated to sales growth for UPS over the past five years and how lack of capital expenditures contributed to a decrease in sales. UPS believes that an additional $1.00-$1.20 of EPS should be added to long- term guidance figures due to cost savings from these capital expenditures.

Sales growth has risen with capital expenditures.

Figure 5: UPS CapEx Change Y/Y% (Right), UPS Sales Growth Y/Y% (Left)

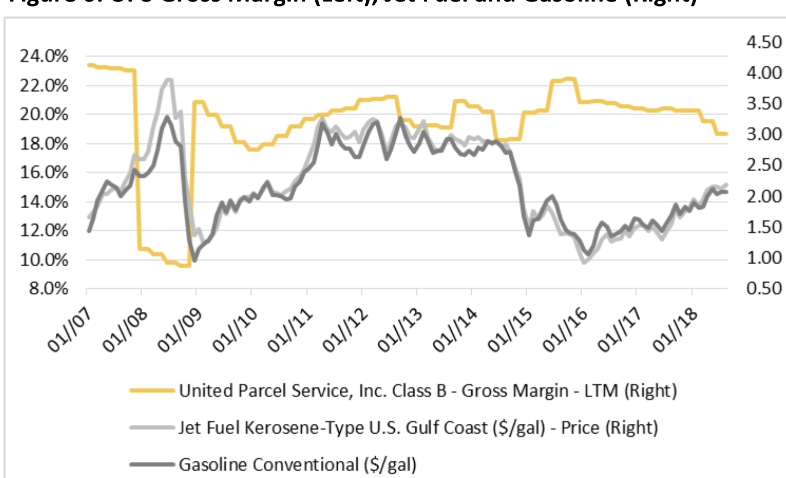


Source: FactSet

Fuel Costs

One of the largest expenses for companies involved with the transportation of products comes from fuel costs. With a fleet of roughly 119,000 vehicles and approximately 580 aircrafts, fuel is a large cost. In 2017, UPS spent nearly $2.7 billion on fuel, which is up $572 million from 2016, or a 27.0% increase. Whether it be from gasoline, diesel, or jet fuel, the costs associated with these inputs greatly affect the bottom line. UPS attempts to pass on the added expense to the customer with a fuel surcharge. However, at a certain point, customers may not be willing to pay for high fuel costs and that could dampen sales or the firm may have to bite the bullet and take on that added expense. Also, if UPS charges too high of a surcharge, the product mix may shift to products with lower yields such as ground deliveries instead of higher yielding air delivery. Figure 6 addresses how the change in fuel costs affect gross margin. As fuel prices rise, gross margin tends to decrease and as fuel prices decline gross margin tends to rise.

Figure 6: UPS Gross Margin (Left), Jet Fuel and Gasoline (Right)



Source: FactSet

Previously, UPS stated that in times of volatility it may attempt to enter hedging transactions to offset losses by rising fuel prices. Although, from management's tone in its 2017 annual report, it sounded as if the company would much rather use consistent fuel surcharges than attempt to hedge. This makes sense because in 2017 fuel surcharge added $347 million to revenue; however, the 2016 fuel surcharge revenue declined by $219 million with lower fuel prices. Nonetheless, this proves that UPS is able to cover some portion of fuel costs regardless of whether they are going up or down.

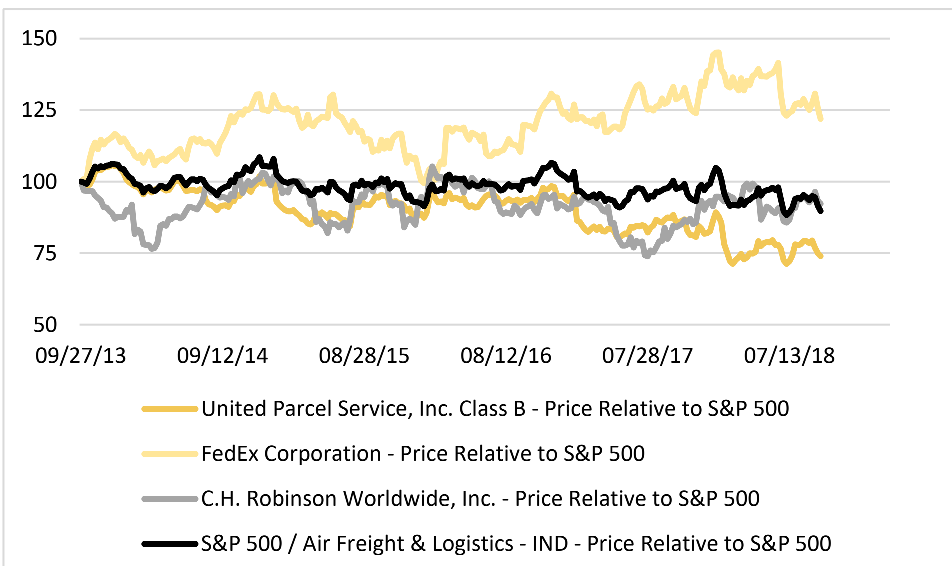
Additionally, UPS is attempting to combat fuel costs by adding alternative fuel vehicles, which now stands at a total of 9,100, or approximately 7.6% of the total fleet. The addition of alternative fuel vehicles may be an interesting and valuable long-term play for UPS, but in the near term I do not see it having a noticeable impact on the stock.

Competition

UPS' main publicly traded competitors are FedEx and C.H. Robinson Worldwide Inc. As you can see from Figure 7, FedEx has not only outperformed the competition but is also the only one to outperform the S&P 500. From an existing competitor's position, FedEx controls the greatest market share aside from UPS. In the nine months ended in 2018, UPS received approximately 72% of domestic revenue from ground operations and 28% through the air, while FedEx saw 59% revenue from the ground and 41% in the air. FedEx has much more control in air delivery, especially internationally. However, UPS may be trying to penetrate air services further as the firm has contracts to order 32 new aircraft from Boeing, which would add to the 248 that UPS owns and 320 currently being leased.

FedEx has outpaced UPS and the competition over the past five years in terms of stock returns.

Figure 7: UPS, Competitors, and Industry Returns Relative to the S&P 500



Source: FactSet

Aside from these competitors, there are a few more that should be noted. The United States Postal Service (USPS) delivers the most e-commerce packages to households of all of the major shippers previously mentioned. Even though the USPS has seen total pieces of mail delivered decline every year since 2006, it still presents a large threat to UPS and consistently takes away potential packages from the firm. Even if the USPS continues to be unprofitable, it will most likely continue to be funded by the government because it is such a large employer and delivers post mail, a necessity, and it would shake up the economy if it went under. The United States Postal Service is a competitor that will likely stand up to any threat UPS can generate.

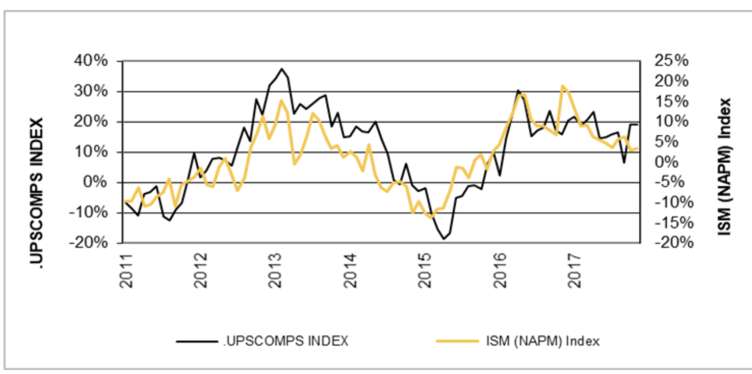
Another potential competitor that has yet to gain much attention but deserves a great deal of consideration is Amazon. Amazon initially put in an order for 4,500 Mercedes Benz Sprinter Vans, but early in September it increased its order to 20,000 vans. This increase was due to higher than expected demand for people signing up for its program called "Amazon's Delivery Service Partners" in which individuals can start up their own small business using Amazon branded vans to deliver packages. With a $10,000 investment and a fleet of at least five vans, individuals can start delivering packages for Amazon, but must increase their fleet size to 20 vans over an undisclosed period of time. These vans have already begun delivering packages and more should be operational by the end of the year. With Amazon accounting for such a large majority of total online sales, it is my opinion that it is the biggest future threat to UPS. By Amazon delivering more of its own packages, UPS will lose substantial sales, and if this is successful for Amazon, odds are that it will quickly grow this delivery service because the firm has plenty of capital to do it.

Macroeconomic Trends

One of the main drivers for UPS and the industry as a whole is the state of the economy. When the economy is doing well people are likely to increase spending, which means more goods are shipped. Furthermore, volume growth can be attributed to ecommerce, which should only keep growing as well.

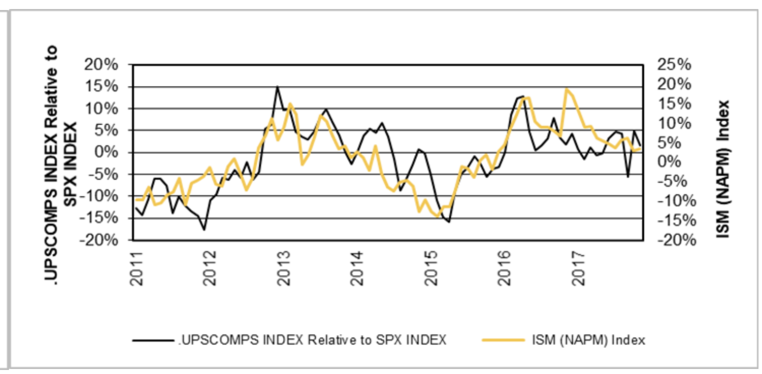
Figure 8 shows just how important the state of the economy is to how the transportation industry performs. There is a relatively strong relationship between the ISM Index and the transportation index; if the ISM Index is moving up, most of the time the transportation index is as well, and vice versa. This is no surprise as the ISM Index tracks business activities such as production, supplier deliveries, imports and exports. Figure 9 is a similar chart to Figure 8 except that it is plotting the transportation index relative to the S&P 500. From here you can conclude that when the ISM Index is declining the transportation index usually underperforms the S&P 500 and outperforms the S&P 500 when the ISM Index rises. This further stresses the importance of monitoring the economy when following a transportation company or transportation index.

Figure 8: UPSCOMPS and ISM Index



Source: Bloomberg, IMCP

Figure 9: UPSCOMPS Relative to S&P 500 and ISM Index

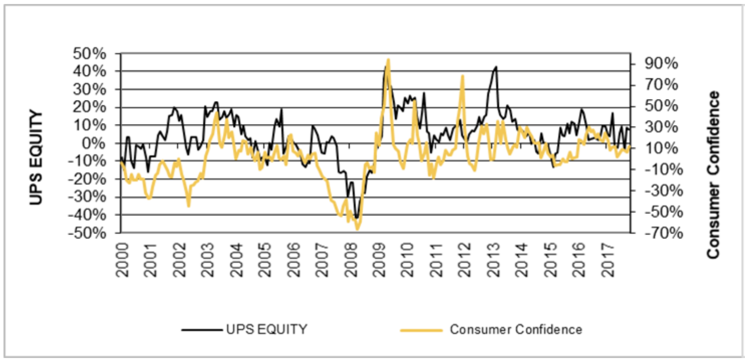


Source: Bloomberg, IMCP

The ISM Index is highly correlated with the transportation industry.

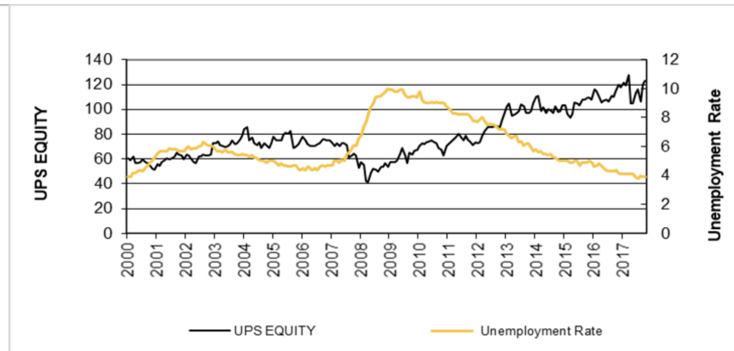
Two other main macroeconomic statistics with strong correlations to UPS include consumer confidence and the unemployment rate. Consumer confidence is positively correlated while the unemployment rate is negatively correlated, as you can see from figures 10 and 11 on the next page. The direction of both is up so there is no immediate sign that UPS will underperform.

Figure 10: UPS Price Change vs. Change in Consumer Confidence



Source: Bloomberg, IMCP

Figure 11: UPS Stock Price vs. Unemployment Rate



Source: Bloomberg, IMCP

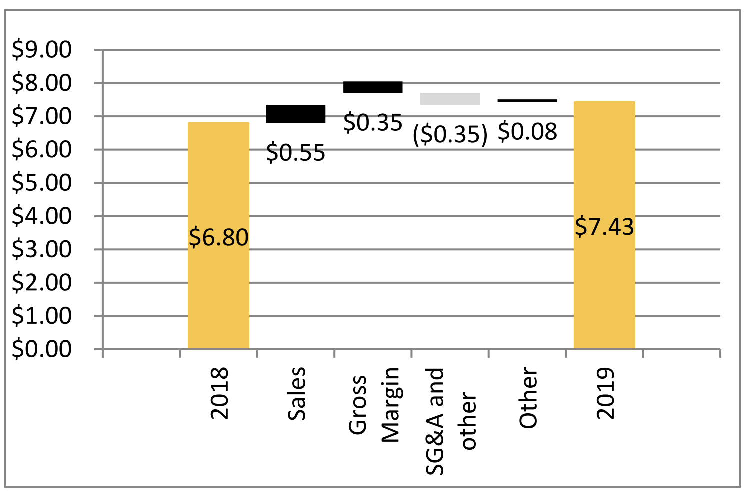
Financial Analysis

<u>Quantification of Drivers</u>

Figures 12 and 13 quantify what I believe to be the major 2019 and 2020 financial drivers for UPS. I expect EPS to increase from $6.80 to $7.43 a share in FY2019. An increase in sales from volume growth and price increases will account for a $0.55 increase in EPS. Additionally, gross margin will add $0.35 to EPS due to UPS becoming more efficient in the handling of product from infrastructure improvements from increased capital expenditures. This increase from gross margin will be offset from a $0.35 decrease in EPS attributed to an increase in SG&A and other. SG&A is projected to increase as a percentage of sales due to the increased staffing at new facilities. Finally, share buybacks will add another $0.08 to EPS in 2019.

EPS is expected to rise 9.3% in 2019

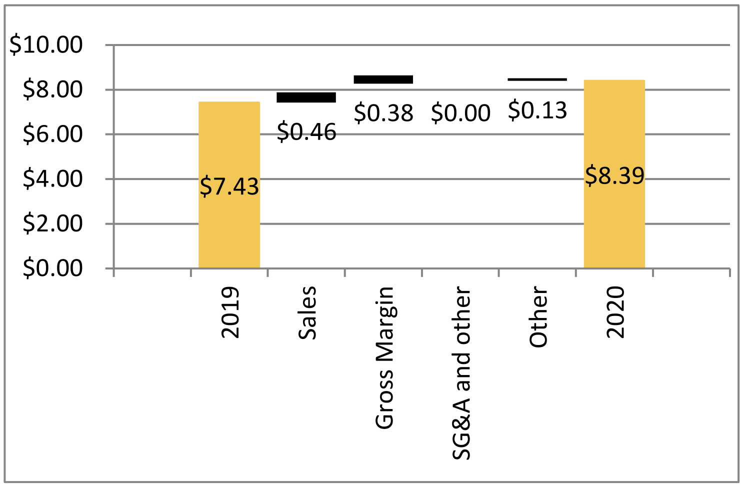
Figure 12: Quantification of 2019 EPS Drivers



Source: Company Reports, IMCP

In 2020, I expect EPS to increase from $7.43 to $8.39 a share. Much like 2019, an increase in sales due to volume growth and price increases is the main contributor, adding $0.46. This increase is lower than 2019 due to lower overall sales growth. Once again gross margin is expected to add $0.38 to 2020 EPS from UPS becoming more efficient in its operations. SG&A and other will neither increase nor decrease EPS, however share buybacks are expected to increase EPS by $0.13. Both of my EPS estimates are slightly more bearish than consensus estimates, forecasting a 4.98% and 1.29% lower return for 2019 and 2020, respectively.

Figure 13: Quantification of 2020 EPS Drivers



Source: Company Reports, IMCP

Revenues

Figure 14: EPS and YoY Growth Estimates

	2019E	2020E
Revenue - Estimate	$77,556	$82,055
YoY Growth	7.6%	5.8%
Revenue - Consensus	$76,531	$80,677
YoY Growth	6.1%	5.4%
EPS - Estimate	$7.43	$8.39
YoY Growth	2.8%	12.9%
EPS - Consensus	$7.82	$8.50
YoY Growth	8.2%	8.7%

Sources: FactSet, IMCP

Over the past five years UPS has always reported positive growth, in a range from less than 1% to greater than 9%. I believe there is an opportunity for UPS to achieve a higher and consistent growth rate. Figure 14 shows my revenue estimates are slightly more optimistic than consensus, and I believe that is due to three reasons:

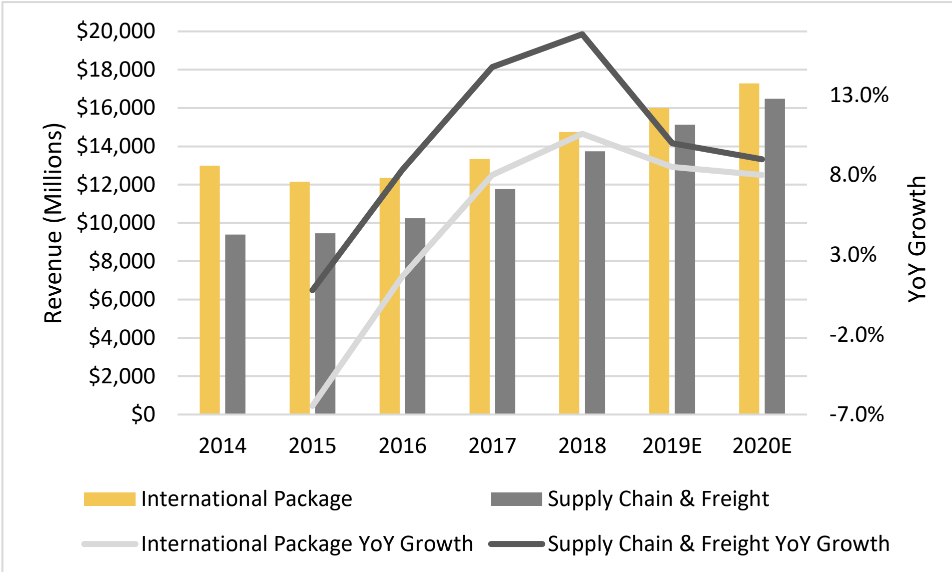
- I expect higher international sales in the international package segment as well as the freight and supply segment. I also expect higher average revenue per piece. In the nine months ended September 2018 compared to the nine months ended September 2017, the average revenue per piece for the international segment is up 6.6%. This should be a sustainable growth rate going forward as Deutsche Post's CFO said in November to expect rate increases in 2019 as well.

- I also believe higher sales can be achieved in these two segments due to the acquisitions that were made, Freightex and Nightline Logistics, in 2017. Figure 15 shows how these acquisitions have helped push sales in the international package segment as well as the freight and supply segment to all-time highs. It should be noted that even though my growth estimates for these two segments are decreasing in 2019 and 2020, I am still higher than consensus.

- Additionally, I believe that the U.S. Domestic Package segment will also see growth in sales in 2019 and 2020, however, it will be slowing due to a slowing economy.

Higher revenue per piece will drive international sales higher.

Figure 15: Segment Revenue and YoY Growth



Sources: FactSet, IMCP

Return on Equity

Compared to all of its peers, UPS has by far and away the highest ROE and it is not close. (See figure 20) Historically, UPS has had an ROE that is quite high, but over the past three years it has skyrocketed after it began to take on much more debt, $8 billion in 2017, as it bought back shares. This ultimately reduced equity and produced an ROE of over 465% that you see today. Looking forward, I project UPS' ROE to begin to move lower due to equity levels rising faster than asset levels.

Figure 16: ROE Breakdown, 2015-2020E

5-Stage DuPont ROE	2015	2016	2017	2018	2019E	2020E
EBIT / sales	12.6%	8.3%	11.4%	11.0%	11.0%	11.5%
Sales / Avg assets	1.58	1.55	1.54	1.53	1.56	1.59
EBT / EBIT	100.0%	101.3%	95.4%	93.7%	94.2%	95.0%
Net income /EBT	66.0%	66.8%	68.7%	79.2%	79.0%	79.0%
ROA	13.1%	8.7%	11.4%	12.5%	12.8%	13.7%
Avg assets / Avg equity	15.87	26.95	58.79	37.27	20.09	11.02
ROE	208.4%	235.0%	673.1%	465.2%	256.2%	150.7%

Source: IMCP

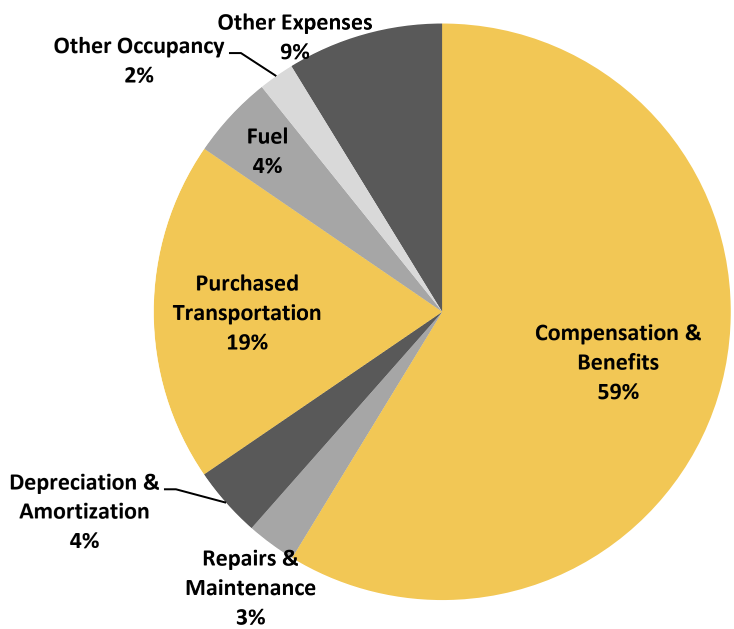
Given distorted leverage, the better ratio to evaluate success is ROA. You can see that it feel in 2016 as margins declined, rose in 2017 as margins recovered, and rose further in 2018 as the tax rate declined. I expect ROA to rise another percent by 2020 because of higher margins and asset turns.

Operating Margin and Expenses

UPS' largest expense, as noted in figure 17, is compensation and benefits. Making up nearly 59% of total expenses, it is something that needs to be continually monitored. Compensation and benefits have been declining in recent years as a percent of total expenses, accounting for 61.1%, 60.8%, and 58.7% in 2015, 2016, and 2017, respectively. I believe this will continue to slowly fall due to investments made by UPS in infrastructure, which should allow more work to be done in less time, ultimately leading to higher margins. However, as this is decreasing, purchased transportation has taken on a higher total of expenses. Most of this can be attributed to the purchase of airplanes, which also causes fuel inputs to rise since jet fuel is more costly than the fuel for UPS' ground units. Additionally, pilots cost more money than truck drivers on an individual basis, so the purchases of aircraft can cut into some of the efficiencies that are being achieved through improved infrastructure.

Purchased transportation as a percent of total expenses is rising.

Figure 17: 2017 Operating Expenses



Source: FactSet

Free Cash Flow

Free cash flow has been rather unsteady in the past few years, especially from 2017 to 2018. One of the main reasons for the drastic changes is due to increased capital expenditures. Capital expenditures as a percent of sales rose to 7.94% from a previous five year average of 4.13%, and 2017 was especially high. UPS also plans to keep this level between 8.5% and 10% through 2020. Share buybacks should continue, however at a slower pace because UPS has approximately $3.5 billion left of a $10 billion share buyback plan. Although, even after cap ex growth plans, the firm has over $5 billion in free cash flow that can be used to pay down debt, buy back shares, and pay its dividend.

Figure 18: Free Cash Flows 2014-2020E

Free Cash Flow With Cash and Debt							
	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$3,968	$4,846	$3,388	$5,148	$6,281	$6,740	$7,455
Growth		*22.1%*	*-30.1%*	*52.0%*	*22.0%*	*7.3%*	*10.6%*
NOWC	4092	5530	5800	6851	7158	5969	5552
Net fixed assets	$23,663	$25,103	$26,528	$29,855	$32,224	$34,469	$36,469
Total net operating capital	$27,755	$30,633	$32,328	$36,706	$39,383	$40,439	$42,021
Growth		*10.4%*	*5.5%*	*13.5%*	*7.3%*	*2.7%*	*3.9%*
- Change in NOWC		$1,438	$270	$1,051	$308	-$1,189	-$417
- Change in NFA		$1,440	$1,425	$3,327	$2,369	$2,245	$1,999
FCFF		$1,968	$1,693	$770	$3,604	$5,683	$5,873
Growth			*-14.0%*	*-54.5%*	*368.2%*	*57.7%*	*3.3%*
- After-tax interest expense		$2	-$43	$238	$396	$390	$375
+ Net new short-term and long-term debt		$3,547	$1,741	$8,214	$272	-$900	-$900
FCFE		$5,513	$3,477	$8,746	$3,480	$4,393	$4,597
Growth			*-36.9%*	*151.5%*	*-60.2%*	*26.2%*	*4.7%*

Source: IMCP

Valuation

UPS was valued using multiples and a 3-stage discounted cash flow model. Based on earnings multiples, the stock is expensive relative to other firms and is worth $99.10. Other relative valuation approaches show that UPS is slightly overvalued based on its fundamentals versus those of its peers in the transportation industry. Price to sales yielded a price of $105, and a detailed DCF analysis values UPS at $109. As a result of these valuations, I value the stock at $107.00

<u>Trading History</u>

UPS is currently trading near its five year low relative to the S&P 500. Part of this can be attributed to the recent sell off in the transportation industry with UPS falling nearly 16% in the last three months while the industry is down more than 19%. The current NTM P/E for UPS is 13.4, well below its historical five year average of 25.1 and its current TTM P/E of 16.2.

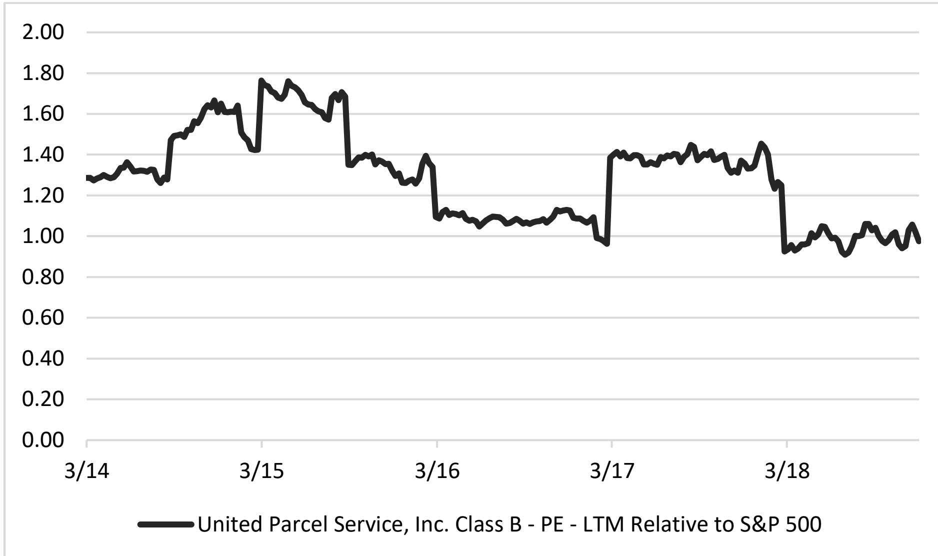
Assuming the firm maintains a 13.8 NTM P/E at the end of 2019, it should trade at $102.53 by the end of the year.

- Price = P/E x EPS = 13.4 x $8.39 = $112.43

UPS' P/E is currently near a five year low, relative to the S&P 500.

Discounting $112.43 back to today at an 11.86% cost of equity (explained in Discounted Cash Flow section) yields a price of $99.10. Given UPS' potential for earnings growth and continued profitability, this seems to be a rather low valuation.

Figure 19: UPS LTM P/E Relative to S&P 500



Source: FactSet

Relative Valuation

UPS is currently trading at a P/E only slightly higher than that of its peer group, with a TTM P/E of 16.2 compared to an average of 15.6. In the past UPS, traded at a P/E that was near 25% higher than its peer group, so this leads me to believe that investors are starting to believe less in the overall growth story of UPS and treating it more like a mature company. UPS also has P/B and P/S ratios that are much higher than the industry average, especially P/B due to an extremely high ROE. UPS has a higher net margin than most of its competitors, contributing to the higher P/S ratio.

Figure 20: 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	2016	2017	2018	2019	Pst 5yr	Beta	Equity	Rating	Yield	Payout
UPS	UNITED PARCEL SERVICE INC	$101.21	$87,264	(2.3)	(6.0)	(17.9)	(14.5)	(14.3)	(15.1)	11.2	20.8%	-25.0%	39.3%	29.8%	8.3%	47.7%	1.29	648.8%	B+	3.16%	56.9%
FDX	FEDEX CORP	$188.27	$49,612	(0.7)	(14.3)	(25.6)	(29.1)	(21.4)	(24.6)	13.2	3.0%	59.3%	57.8%	26.6%	13.7%		1.52	79.5%	A-	1.00%	12.1%
XPO	XPO LOGISTICS INC	$60.27	$7,651	(9.6)	(22.9)	(45.6)	(47.2)	(21.0)	(34.2)	34.3	7.4%	-152.8%	264.7%	7.7%	28.7%		2.47	96.7%	B-	0.00%	0.0%
DPSGY	DEUTSCHE POST AG	$28.67	$35,341	0.2	(9.7)	(20.3)	(17.3)	(39.0)	(39.8)	7.5	28.6%	58.7%	16.0%	-26.8%	30.2%	7.6%	1.43	106.0%		4.37%	
EXPD	EXPEDITORS INTL WASH INC	$72.26	$12,471	1.3	2.3	(3.8)	(7.4)	12.3	11.7	12.4	-1.1%	-1.7%	5.1%	31.9%	4.3%	11.3%	0.88	0.0%	A	1.18%	25.7%
CHRW	C H ROBINSON WORLDWIDE INC	$88.12	$12,117	0.1	(0.0)	(11.1)	(3.0)	0.1	(1.1)	12.0	8.4%	2.3%	-7.0%	36.8%	9.0%	-0.5%	0.76	85.6%	A	1.99%	41.1%
UAL	UNITED CONTINENTAL HLDGS INC	$89.63	$24,421	1.7	(1.7)	2.1	23.8	41.5	33.0	18.8	27.3%	-57.2%	-21.8%	26.3%	18.1%		1.22	140.8%	B-	0.00%	0.0%
Average			$32,697	(1.4)	(7.5)	(17.5)	(13.5)	(6.0)	(10.0)	15.6	13.5%	-16.6%	50.6%	18.9%	16.1%	16.5%	1.37	165.4%		1.67%	22.6%
Median			$24,421	0.1	(6.0)	(17.9)	(14.5)	(14.3)	(15.1)	12.4	8.4%	-1.7%	16.0%	26.6%	13.7%	9.5%	1.29	96.7%		1.18%	18.9%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			1.3%	11.7%	20.5%	9.8%						

		2017		P/E							2017	2017			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2015	2016	2017	TTM	NTM	2018	2019	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
UPS	http://www.ups.com	154.4%	28.06	18.1	28.7	21.4	16.2	13.4	14.0	12.9	7.3%	1.32	9.3%	28.8%	16.6	15.8	16.2	6.0%	5.7%	4.0%	$3.61
FDX	http://www.fedex.com	16.6%	2.59	31.0	24.3	20.6	10.6	10.3	12.3	10.8	5.3%	0.82	8.5%	13.9%	14.2	6.5		7.7%	5.6%	8.1%	$72.76
XPO	http://www.xpo.com	9.5%	1.85	-16.9	50.8	29.5	16.2	15.1	18.0	14.0	2.6%	0.50	4.3%	4.1%	24.8	7.1	15.4	7.8%	5.7%	123.1%	$32.63
DPSGY	http://www.deutschepost.de	23.2%	2.41	18.5	13.8	17.2	14.1	11.0	14.2	10.9	4.5%	0.47	4.2%	16.4%	16.4	6.6	12.5	1.7%		-0.8%	$11.90
EXPD	http://www.expeditors.com	21.9%	6.38	18.8	22.4	26.1	21.4	21.6	22.1	21.2	6.2%	1.80	10.0%	25.5%	15.3	18.8	18.9	7.7%		3.0%	$11.33
CHRW	http://www.chrobinson.com	29.4%	7.76	17.7	20.4	26.7	19.7	18.2	19.3	17.7	3.1%	0.81	5.3%	25.7%	17.7	15.6	17.5	6.1%	5.4%	5.5%	$11.35
UAL	http://www.unitedcontinentalholdings.com	19.5%	2.58	2.8	8.4	10.0	11.2	8.8	10.5	8.9	4.9%	0.65	12.4%	10.4%	8.7	4.7	4.5	7.3%	7.4%	0.3%	$34.75
Average		39.2%	7.37	12.8	24.1	21.6	15.6	14.1	15.8	13.8	4.8%	0.91	7.7%	17.8%	16.2	10.7	14.2	6.3%	6.0%	20.5%	
Median		21.9%	2.59	18.1	22.4	21.4	16.2	13.4	14.2	12.9	4.9%	0.81	8.5%	16.4%	16.4	7.1	15.8	7.3%	5.7%	4.0%	
spx	S&P 500 INDEX			17.5	18.9	20.2			16.6	15.1											

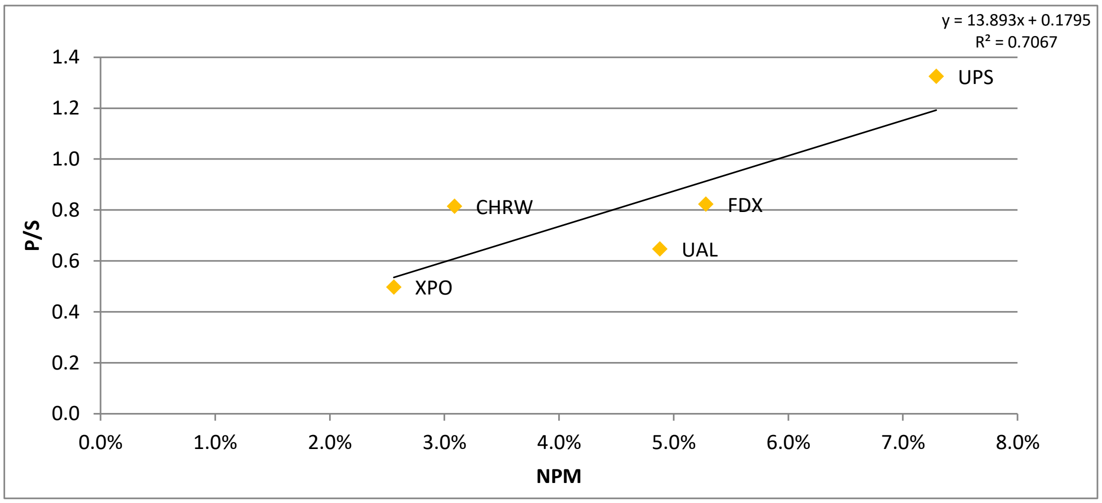
Source: FactSet

A more thorough analysis of P/S and NPM is shown in figure 20. The calculated R-squared of the regression indicates that over 70% of a sampled firm's P/S is explained by its NPM. Note that Deutsche Post and Expeditors Intl. have been excluded from this regression because they are outliers for the peer group.

- Estimated P/S = Estimated 2019 NPM (8.2%) x 13.893 + 0.1795 = 1.3
- Target Price = Estimated P/S (1.3) x 2019 SPS ($90.74) = $120

Discounting back to the present value at an 11.86% cost of equity leads to a target price of $105 using this metric.

Figure 21: P/S vs NPM



Source: IMCP

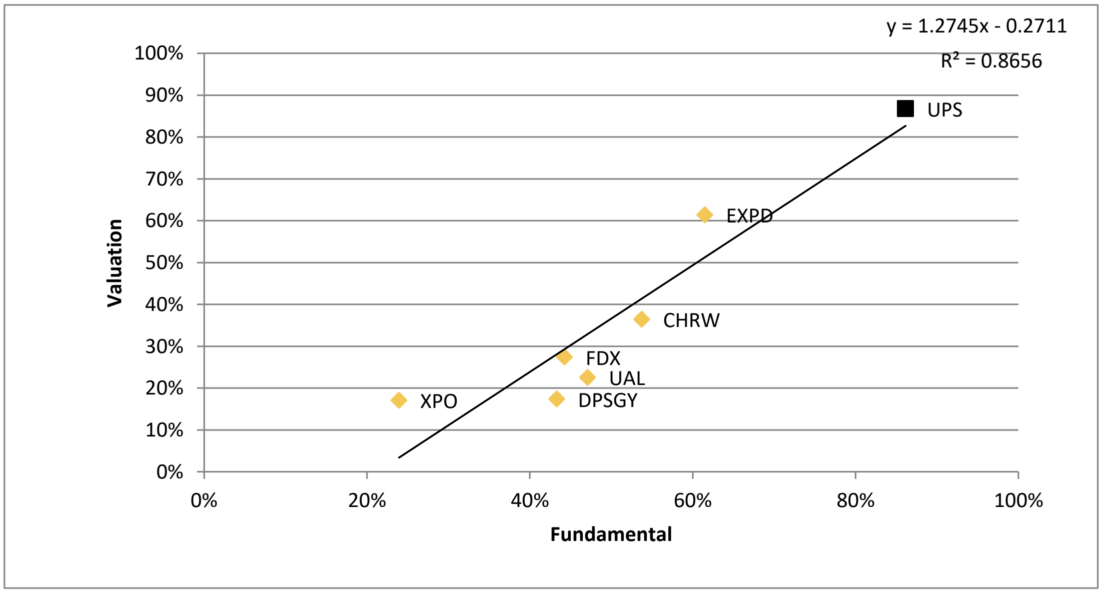
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. Equal fundamental weightings of 33.3% for beta, 2017 NPM, and 2017 ROE were compared to valuation weightings of 50% of both P/B and P/S. The regression line had an R-squared value of .8656 and included all seven industry comps. UPS is currently located slightly above the regression line, making it minimally more expensive based on fundamentals.

Figure 22: Composite Valuation, % of Range

		Fundamentals			Valuation			
	Weight	33.30%	33.30%	33.30%	50.00%	50.00%		
Ticker	Name	1/ Beta	2017 ROE	2017 NPM	P/B	P/S	Fund	Value
UPS	UNITED PARCEL SERVICE INC	59%	100%	100%	100%	74%	86%	87%
FDX	FEDEX CORP	50%	11%	72%	9%	46%	44%	27%
XPO	XPO LOGISTICS INC	31%	6%	35%	7%	28%	24%	17%
DPSGY	DEUTSCHE POST AG	53%	15%	62%	9%	26%	43%	17%
EXPD	EXPEDITORS INTL WASH INC	86%	14%	85%	23%	100%	61%	61%
CHRW	C H ROBINSON WORLDWIDE INC	100%	19%	42%	28%	45%	54%	36%
UAL	UNITED CONTINENTAL HLDGS INC	62%	13%	67%	9%	36%	47%	23%

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 UPS.

For the purpose of this analysis, the company's cost of equity was calculated to be 11.86% 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 3.10%.
- A ten year beta of 1.27 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 11.86% (3.10 + 1.27(10.0 – 3.10)).

Stage One – The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $5.14 and $5.45, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $8.95 per share. Thus, stage one of this discounted cash flow analysis contributes $8.95 to value.

Stage Two – Stage two of the model focuses on fiscal years 2021 to 2025. 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 11.86% cost of equity. I assume 3% sales growth each year from 2021 to 2025, which is lower than past years, mainly due to the likelihood of a slowing economy and a mature business for UPS. The ratio of NWC to sales will remain the same as well as the NFA turnover. The NOPAT margin is expected to rise slightly, ending at 9.5% in 2025, up from 9.15% in 2020.

Figure 24: FCFE and Discounted FCFE, 2019 - 2021

	2019	2020	2021	2022	2023	2024	2025
FCFE	$5.14	$5.45	$8.08	$8.45	$8.84	$9.24	$9.67
Discounted FCFE	$4.59	$4.36	$5.77	$5.40	$5.05	$4.72	$4.41

Added together, the second stage discounted cash flows total $25.35.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $7.43 in 2019 to $10.46 in 2025.

Figure 25: EPS Estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$7.43	$8.39	$8.77	$9.17	$9.58	$10.01	$10.46

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this model, the terminal P/E is assumed to be 15.6. The transportation industry has historically had a higher P/E than 15.6, but has recently began to fall and should remain in a lower range going forward due to many companies in the industry maturing. This multiple is higher than today, but the market is currently enduring a severe correction.

Given the assumed terminal earnings per share of $10.46 and a price to earnings ratio of 15.6, a terminal value of $163.43 per share is calculated. Using the 11.86% cost of equity, this number is discounted back to a present value of $74.56.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $108.86 is calculated (8.95 + 25.35 + 74.56). Given UPS' current price of $101.33, this model indicates that the stock is slightly undervalued.

Scenario Analysis

When valuing a company it is important to take into account other factors that may cause a stock to perform either more bearish or bullish than expected. With the most recent downturn in the market there is more uncertainty as to which direction it will trade next. For instance, I have projected 3% sales growth for years 2021 through 2025 with the expectation of a full business cycle normalizing sales growth. However, if the economy continues to grow at a quick pace, my forecasted sales numbers can turn out to be very low, and vice versa.

In the first scenario, I illustrate a bullish case and what can change if 6% sales growth is achieved by UPS. Using the 3-stage DCF model, you can see that the price target for UPS will rise from $108 to $120, or about 11%. In the second scenario, the bearish case with a more than expected slowing economy, the price target changes from $108 to $102 a share. This represents a decrease of about 5.5% in share price.

Figure 26: Bull Case Scenario

First stage	$8.95	Present value of first 2 year cash flow
Second stage	$25.37	Present value of year 3-7 cash flow
Third stage	$86.07	Present value of terminal value P/E
Value (P/E)	**$120.40**	= value at beg of fiscal yr 2019

Source: IMCP

Figure 27: Bear Case Scenario

First stage	$8.95	Present value of first 2 year cash flow
Second stage	$25.30	Present value of year 3-7 cash flow
Third stage	$67.50	Present value of terminal value P/E
Value (P/E)	**$101.85**	= value at beg of fiscal yr 2019

Source: IMCP

Business Risks

Competition: UPS faces competition from many other companies, but Amazon may have the largest future impact on UPS. Amazon is projected to take away a small percent of market share from UPS and its competitors, but if Amazon ramps up its delivery service it could be detrimental to the firm.

Foreign Currency Risks: UPS has approximately 20% of its sales coming from the international segment, representing about $15 billion. Although UPS has currency hedges, if the Euro or Canadian Dollar rise drastically UPS will be negatively impacted.

Data Breach: Although unlikely, it has happened to major firms in the past. A data breach at UPS could be catastrophic because information technology is so heavily relied upon to run the business efficiently.

Economic downturn: An economic downturn in the U.S. or other countries can adversely affect UPS.

Appendix

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

To compete on a global or even domestic scale in this industry requires an immense amount of capital. Companies attempting to enter the industry would also struggle to match the operating efficiencies of UPS, FedEx, and the United States Postal Service. However, Amazon has the ability to enter.

Threat of Substitutes – Low

There is virtually no substitute for the service that this industry provides.

Supplier Power – Medium

Although UPS owns many vehicles and aircraft, it also rents equipment. Rental companies can raise prices as they please. UPS is also a large user of fuel, and they have no say in the price of that input.

Buyer Power – Relatively Low

Although the buyer can shop around for lower prices, odds are they will not find substantial discounts from the big name players in the industry. UPS, FedEx, and the USPS will charge prices near one another and therefore can continue to control most of the market.

Intensity of Competition – Medium

While there are few competitors in this industry, they still compete at a fairly high level. If one of the major companies has issues handling packages, a competitor will be right there waiting to take those sales.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Global Network Cutting Edge Technology Cash Generation	Poor Traffic Control Low Revenue Per Piece Growth Labor Union
Opportunities	**Threats**
International Expansion Emerging Markets Increased Air Deliveries	Peaking Economy Amazon Fuel Costs

Appendix 3: Sales Forecast

Sales							
Items	**Dec-14**	**Dec-15**	**Dec-16**	**Dec-17**	**Dec-18**	**Dec-19**	**Dec-20**
Sales	**58,232**	**58,363**	**60,906**	**65,872**	**72094**	**77556**	**82,055**
Growth		*0.2%*	*4.4%*	*8.2%*	*9.4%*	*7.6%*	*5.8%*
United States Domestic Package	**35,851**	**36,747**	**38,301**	**40,764**	**43,594**	**46,428**	**48,285**
Growth		*2.5%*	*4.2%*	*6.4%*	*6.9%*	*6.5%*	*4.0%*
% of sales	*61.6%*	*63.0%*	*62.9%*	*61.9%*	*60.5%*	*59.9%*	*58.8%*
International Package	**12,988**	**12,149**	**12,350**	**13,338**	**14,750**	**16,004**	**17,284**
Growth		*-6.5%*	*1.7%*	*8.0%*	*10.6%*	*8.5%*	*8.0%*
% of sales	*22.3%*	*20.8%*	*20.3%*	*20.2%*	*20.5%*	*20.6%*	*21.1%*
Supply Chain & Freight	**9,393**	**9,467**	**10,255**	**11,770**	**13,750**	**15,125**	**16,486**
Growth		*0.8%*	*8.3%*	*14.8%*	*16.8%*	*10.0%*	*9.0%*
% of sales	*16.1%*	*16.2%*	*16.8%*	*17.9%*	*19.1%*	*19.5%*	*20.1%*

Appendix 4: Income Statement

Income Statement	2014	2015	2016	2017	2018	2019E	2020E
Sales	$58,232	$58,363	$60,906	$65,872	$72,094	$77,556	$82,055
Direct costs	46,523	46,252	48,569	52,539	57,675	61,657	64,823
Gross Margin	11,709	12,111	12,337	13,333	14,419	15,899	17,232
SG&A, and other	5,641	4,766	7,266	5,839	6,489	7,368	7,795
EBIT	6,068	7,345	5,071	7,494	7,930	8,531	9,436
Interest and Other	1,431	3	(65)	346	500	494	475
EBT	4,637	7,342	5,136	7,148	7,430	8,038	8,961
Taxes	1,605	2,498	1,705	2,238	1,545	1,688	1,882
Income	3,032	4,844	3,431	4,910	5,885	6,350	7,079
Other	-	-	-	-	-	-	-
Net income	3,032	4,844	3,431	4,910	5,885	6,350	7,079
Basic Shares	916.0	900.0	882.0	870.0	866.0	854.8	843.5
EPS	$3.31	$5.38	$3.89	$5.64	$6.80	$7.43	$8.39
DPS	$2.58	$2.81	$3.00	$3.19	$3.41	$3.68	$3.97

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Appendix 5: Balance Sheet

Balance Sheet	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19E	Dec-20E
Capital							
Cash	3,283	4,726	4,567	4,069	4,675	3,023	2,434
Operating assets ex cash	8,525	8,482	9,282	11,479	12,000	13,185	13,949
Operating assets	11,808	13,208	13,849	15,548	16,675	16,207	16,384
Operating liabilities	7,716	7,678	8,049	8,697	9,516	10,237	10,831
NOWC	4,092	5,530	5,800	6,851	7,159	5,970	5,553
NOWC ex cash (NWC)	809	804	1,233	2,782	2,484	2,947	3,118
NFA	23,663	25,103	26,528	29,855	32,224	34,469	36,469
Invested capital	*$27,755*	*$30,633*	*$32,328*	*$36,706*	*$39,383*	*$40,439*	*$42,021*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$35,471*	*$38,311*	*$40,377*	*$45,403*	*$48,899*	*$50,677*	*$52,853*
Short-term and long-term debt	$10,787	$14,334	$16,075	$24,289	$24,561	$23,661	$22,761
Other liabilities	14,810	13,808	15,824	11,387	13,562	13,562	13,562
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	2,158	2,491	429	1,030	1,500	3,457	5,939
Total supplied capital	*$27,755*	*$30,633*	*$32,328*	*$36,706*	*$39,623*	*$40,680*	*$42,262*
Total liabilities and equity	*$35,471*	*$38,311*	*$40,377*	*$45,403*	*$49,139*	*$50,917*	*$53,093*

Appendix 6: Ratios

Ratios	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20
Profitability							
Gross margin	20.1%	20.8%	20.3%	20.2%	20.0%	20.5%	21.0%
Operating (EBIT) margin	10.4%	12.6%	8.3%	11.4%	11.0%	11.0%	11.5%
Net profit margin	5.2%	8.3%	5.6%	7.5%	8.2%	8.2%	8.6%
Activity							
NFA (gross) turnover		2.39	2.36	2.34	2.32	2.33	2.31
Total asset turnover		1.58	1.55	1.54	1.53	1.56	1.59
Liquidity							
Op asset / op liab	1.53	1.72	1.72	1.79	1.75	1.58	1.51
NOWC Percent of sales		8.2%	9.3%	9.6%	9.7%	8.5%	7.0%
Solvency							
Debt to assets	30.4%	37.4%	39.8%	53.5%	50.2%	46.7%	43.1%
Debt to equity	499.9%	575.4%	3747.1%	2358.2%	1637.4%	684.5%	383.3%
Other liab to assets	41.8%	36.0%	39.2%	25.1%	27.7%	26.8%	25.7%
Total debt to assets	72.2%	73.5%	79.0%	78.6%	78.0%	73.5%	68.7%
Total liabilities to assets	93.9%	93.5%	98.9%	97.7%	97.4%	93.7%	89.2%
Debt to EBIT	1.78	1.95	3.17	3.24	3.10	2.77	2.41
EBIT/interest	4.24	2,448.33	(78.02)	21.66	15.86	17.28	19.86
Debt to total net op capital	38.9%	46.8%	49.7%	66.2%	62.4%	58.5%	54.2%
ROIC							
NOPAT to sales	6.8%	8.3%	5.6%	7.8%	8.7%	8.7%	9.1%
Sales to NWC		72.37	59.80	32.81	27.38	28.56	27.06
Sales to NFA		2.39	2.36	2.34	2.32	2.33	2.31
Sales to IC ex cash		2.32	2.27	2.18	2.14	2.15	2.13
Total ROIC ex cash		19.2%	12.6%	17.0%	18.7%	18.7%	19.4%
NOPAT to sales	6.8%	8.3%	5.6%	7.8%	8.7%	8.7%	9.1%
Sales to NOWC		12.13	10.75	10.41	10.29	11.81	14.24
Sales to NFA		2.39	2.36	2.34	2.32	2.33	2.31
Sales to IC		2.00	1.93	1.91	1.90	1.94	1.99
Total ROIC		16.6%	10.8%	14.9%	16.5%	16.9%	18.1%
NOPAT to sales	6.8%	8.3%	5.6%	7.8%	8.7%	8.7%	9.1%
Sales to EOY NWC	71.98	72.59	49.40	23.68	29.03	26.32	26.32
Sales to EOY NFA	2.46	2.32	2.30	2.21	2.24	2.25	2.25
Sales to EOY IC ex cash	2.38	2.25	2.19	2.02	2.08	2.07	2.07
Total ROIC using EOY IC ex cash	16.2%	18.7%	12.2%	15.8%	18.1%	18.0%	18.8%
NOPAT to sales	6.8%	8.3%	5.6%	7.8%	8.7%	8.7%	9.1%
Sales to EOY NOWC	14.23	10.55	10.50	9.61	10.07	12.99	14.78
Sales to EOY NFA	2.46	2.32	2.30	2.21	2.24	2.25	2.25
Sales to EOY IC	2.10	1.91	1.88	1.79	1.83	1.92	1.95
Total ROIC using EOY IC	14.3%	15.8%	10.5%	14.0%	15.9%	16.7%	17.7%
ROE							
5-stage							
EBIT / sales		12.6%	8.3%	11.4%	11.0%	11.0%	11.5%
Sales / avg assets		1.58	1.55	1.54	1.53	1.56	1.59
EBT / EBIT		100.0%	101.3%	95.4%	93.7%	94.2%	95.0%
Net income /EBT		66.0%	66.8%	68.7%	79.2%	79.0%	79.0%
ROA		13.1%	8.7%	11.4%	12.5%	12.8%	13.7%
Avg assets / avg equity		15.87	26.95	58.79	37.27	20.09	11.02
ROE		208.4%	235.0%	673.1%	465.2%	256.2%	150.7%
3-stage							
Net income / sales		8.3%	5.6%	7.5%	8.2%	8.2%	8.6%
Sales / avg assets		1.58	1.55	1.54	1.53	1.56	1.59
ROA		13.1%	8.7%	11.4%	12.5%	12.8%	13.7%
Avg assets / avg equity		15.87	26.95	58.79	37.27	20.09	11.02
ROE		208.4%	235.0%	673.1%	465.2%	256.2%	150.7%
Payout Ratio		52.1%	77.0%	56.4%	50.2%	49.5%	47.3%
Retention Ratio		47.9%	23.0%	43.6%	49.8%	50.5%	52.7%
Sustainable Growth Rate		99.8%	54.0%	293.2%	231.9%	129.4%	79.4%

Appendix 7: 3-Stage DCF Model

	Year						
3 Stage Discounted Cash Flow	1	2	3	4	5	6	7
First Stage			**Second Stage**				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*7.6%*	*5.8%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
NOPAT / S	*8.7%*	*9.1%*	*9.2%*	*9.3%*	*9.3%*	*9.4%*	*9.5%*
S / NOWC	*12.99*	*14.78*	*14.78*	*14.78*	*14.78*	*14.78*	*14.78*
S / NFA (EOY)	*2.25*	*2.25*	*2.25*	*2.25*	*2.25*	*2.25*	*2.25*
S / IC (EOY)	*1.92*	*1.95*	*1.95*	*1.95*	*1.95*	*1.95*	*1.95*
ROIC (EOY)	*16.7%*	*17.7%*	*17.9%*	*18.1%*	*18.2%*	*18.4%*	*18.6%*
ROIC (BOY)		*18.4%*	*18.4%*	*18.6%*	*18.8%*	*18.9%*	*19.1%*
Share Growth		*-1.3%*	*-0.5%*	*-0.5%*	*-0.5%*	*-0.5%*	*-0.5%*
Sales	$77,556	$82,055	$84,517	$87,052	$89,664	$92,354	$95,124
NOPAT	$6,740	$7,455	$7,748	$8,053	$8,369	$8,697	$9,037
Growth		*10.6%*	*3.9%*	*3.9%*	*3.9%*	*3.9%*	*3.9%*
- Change in NOWC	-1189	-417	167	172	177	182	187
NOWC EOY	*5970*	*5553*	*5719*	*5891*	*6067*	*6249*	*6437*
Growth NOWC		*-7.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
- Chg NFA	2245	1999	1094	1127	1161	1196	1231
NFA EOY	*34,469*	*36,469*	*37,563*	*38,690*	*39,851*	*41,046*	*42,277*
Growth NFA		*5.8%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
Total inv in op cap	1057	1582	1261	1298	1337	1378	1419
Total net op cap	40439	42021	43282	44581	45918	47296	48714
FCFF	$5,683	$5,873	$6,488	$6,755	$7,032	$7,319	$7,618
% of sales	*7.3%*	*7.2%*	*7.7%*	*7.8%*	*7.8%*	*7.9%*	*8.0%*
Growth		*3.3%*	*10.5%*	*4.1%*	*4.1%*	*4.1%*	*4.1%*
- Interest (1-tax rate)	390	375	387	398	410	422	435
Growth		*-3.7%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
+ Net new debt	-900	-900	683	703	724	746	769
Debt	23661	22761	23444	24147	24872	25618	26386
Debt / tot net op capital	*58.5%*	*54.2%*	*54.2%*	*54.2%*	*54.2%*	*54.2%*	*54.2%*
FCFE w debt	$4,393	$4,597	$6,784	$7,060	$7,346	$7,643	$7,951
% of sales	*5.7%*	*5.6%*	*8.0%*	*8.1%*	*8.2%*	*8.3%*	*8.4%*
Growth		*4.7%*	*47.6%*	*4.1%*	*4.1%*	*4.0%*	*4.0%*
/ No Shares	854.8	843.5	839.3	835.1	830.9	826.8	822.6
FCFE	$5.14	$5.45	$8.08	$8.45	$8.84	$9.24	$9.67
Growth		*6.0%*	*48.3%*	*4.6%*	*4.6%*	*4.6%*	*4.6%*
* Discount factor	0.89	0.80	0.71	0.64	0.57	0.51	0.46
Discounted FCFE	$4.59	$4.36	$5.77	$5.40	$5.05	$4.72	$4.41

Third Stage							
Terminal value P/E							
Net income	$6,350	$7,079	$7,362	$7,655	$7,959	$8,274	$8,602
% of sales	*8.2%*	*8.6%*	*8.7%*	*8.8%*	*8.9%*	*9.0%*	*9.0%*
EPS	$7.43	$8.39	$8.77	$9.17	$9.58	$10.01	$10.46
Growth		*13.0%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*	*4.5%*
Terminal P/E							15.63
* Terminal EPS							$10.46
Terminal value							$163.43
* Discount factor							0.46
Discounted terminal value							$74.56

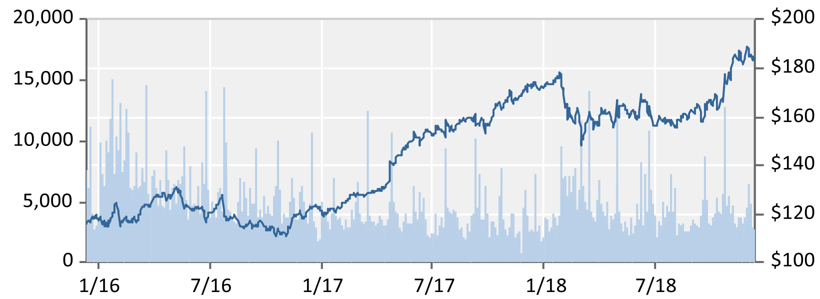
Summary			
First stage	$8.95	Present value of first 2 year cash flow	
Second stage	$25.35	Present value of year 3-7 cash flow	
Third stage	$74.56	Present value of terminal value P/E	
Value (P/E)	**$108.86**	= value at beg of fiscal yr	2019

Recommendation	**NEUTRAL**
Target (today's value)	$180
Current Price	$183.59
52 week range	$146.84 - $190.88

Restaurants

McDonald's Corporation

Share Data	
Ticker:	MCD
Market Cap. (Billion):	$141.5
Inside Ownership	0.1%
Inst. Ownership	69.8%
Beta	0.62
Dividend Yield	2.5%
Payout Ratio	61.3%
Cons. Long-Term Growth Rate	8.8%



Source: FactSet Prices

	'16	**'17**	**'18E**	**'19E**	**'20E**
Sales (billions)					
Year	$24.6	$22.8	$21.0	$20.6	$20.9
Gr %	-3.1%	-7.3%	-7.9%	-2.1%	1.4%
Cons	-	-	$21.0	$21.4	$20.8
EPS					
Year	$5.49	$6.43	$7.72	$8.19	$8.72
Gr %	13.8%	17.2%	20.1%	6.1%	6.4%
Cons	-	-	$7.73	$8.23	$8.88

Summary: I recommend a neutral rating with a target of $180. Despite declining revenue, MCD has greatly increased its profitability through customer-centric initiatives and refranchising. However, much of the projected growth in earnings and free cash flow is factored into the current price. Therefore, I do not believe the stock presents enough upside to advocate for a buy rating.

Ratio	**'16**	**'17**	**'18E**	**'19E**	**'20E**
ROE (%)	191%	NA	NA	NA	NA
Industry	24.0%	82.3%	39.0%	44.6%	32.0%
NPM (%)	19.0%	22.8%	28.5%	29.8%	30.2%
Industry	12.6%	13.6%	13.6%	16.7%	14.2%
A. T/O	0.70	0.70	0.70	0.63	0.61
ROA (%)	13.6%	16.0%	17.5%	17.8%	18.5%
Industry	10.9%	14.4%	11.6%	14.6%	13.8%
A/E	14.12	NA	NA	NA	NA

__Key Drivers__:

- Experience of the Future initiative: McDonald's plan to raise guest count and same store sales growth involves modernization of restaurants to improve the customer experience. Recent data shows a 2% rise in guest count growth, which coincides with the launch of this initiative.

- Mobile application and delivery: MCD is the clear leader in fast food's recent entry into the delivery market. The firm was early in recognizing consumers' shift in demand for convenience with 40% of restaurants now offering the service.

- Refranchising and cost-cutting: An aggressive refranchising policy has resulted in a dramatic increase in gross and operating margins. This is expected to continue until 2020, and should drive margins higher until then.

- Competition: McDonald's faces a highly competitive market. The firm must ensure it remains ahead of its peers in terms of food quality, value, and convenience so customers continue to visit its restaurants.

Valuation	**'17**	**'18E**	**'19E**	**'20E**
P/E	24.8	27.9	23.7	22.3
Industry	35.3	27.5	27.0	23.6
P/S	6.0	6.8	6.7	6.8
P/B	NA	NA	NA	NA
P/CF	26.6	21.8	19.0	17.7
EV/EBITDA	20.0	20.0	18.9	18.1

__Valuation:__ Using a relative valuation approach, MCD appears to be slightly overvalued in comparison to the fast food restaurant industry. DCF analysis implies a value of $180. A combination of the approaches suggests that McDonald's is fairly valued, as the stock's value is about $180 and the shares trade at $183.59.

__Risks:__ Threats to the business include ongoing refranchising, competition, pricing and marketing, supply chain interruptions, and loss of brand identity.

Performance	**Stock**	**Industry**
1 Month	-1.3%	-2.7%
3 Month	11.5%	9.0%
YTD	6.7%	9.6%
52-week	6.0%	8.7%
3-year	58.2%	33.4%

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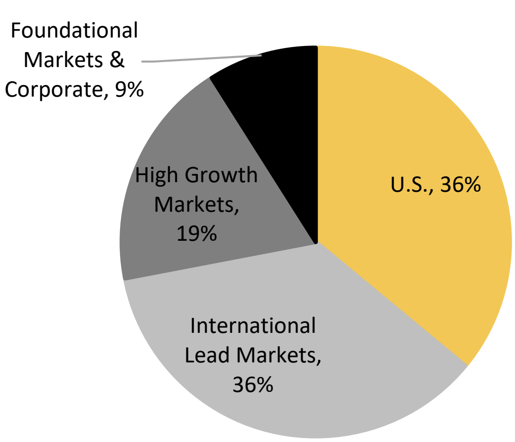
Company Overview

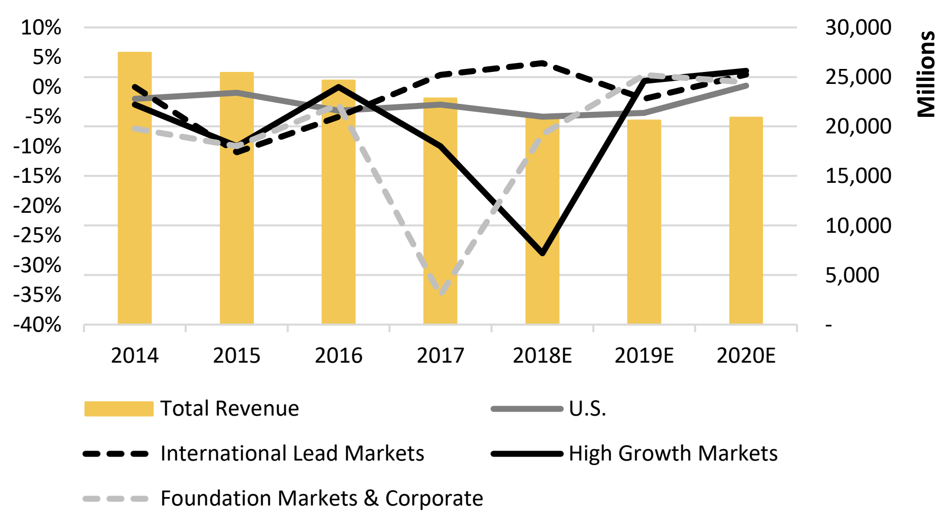
McDonald's Corporation (MCD) is a franchisor and operator of McDonald's fast food restaurants. MCD and its independent franchisees primarily sell hamburgers and cheeseburgers, breakfast sandwiches, chicken sandwiches, fries, soft drinks, coffee, and desserts. Signature menu items include the Big Mac, Quarter Pounder with Cheese, Chicken McNuggets, Egg McMuffin, McFlurry, and the McCafé. The company's business relationship with its franchisees requires that it meets specific quality guidelines, ensuring limited variation in menu items across regions. This has led to MCD having one of the strongest and most recognizable brands in the U.S. for well over 40 years. MCD has a wide-ranging customer base, but primarily targets value-oriented customers with frequent promotional deals. McDonald's franchises and operates 37,557 restaurants in 120 countries across six continents, and is headquartered in Oak Brook, Illinois.

McDonald's currently produces 53% of its revenue from franchises, and 47% from company-operated sales. In 2015, MCD began reducing its number of company-operated restaurants by refranchising them, which earns much less revenue. This distorts the revenue growth figures but has led to higher profitability. MCD franchises and operates restaurants in the following four segments:

- U.S.: The largest and most established segment. Revenue has declined at a -2.9% 3-yr CAGR despite store renovations and refranchising; however, operating income has grown at a 6.1% 3-yr CAGR. I expect revenue to continue declining at a -3.1% 2-yr CAGR.
- International Lead Markets: Consists of established markets in Australia, Canada, France, and similar countries. Revenues have a 3-yr CAGR of -0.6%, while operating income has a 7.6% CAGR. Revenue is expected to continue declining at a -0.2%.
- High Growth Markets: Markets where MCD believes it has more franchising and expansion opportunity, such as China, Russia, Italy and others. Revenue has a -13.6% 3-yr CAGR, largely due to significant refranchising efforts in China and Hong Kong. Operating income for the same period has a 12.1% CAGR. I expect revenue to grow at a 1.4% 2-yr CAGR.
- Foundational Markets & Corporate: Comprised of various markets in Japan, Brazil, Taiwan, and includes corporate activities. Revenues have a -17.4% 3-yr CAGR, mostly due to a significant reduction in company-operated restaurants. Meanwhile, the 3-yr CAGR for operating income is 55%. I expect this segment to grow at a 2-yr CAGR of 2.3%.

Figures 1 and 2: Revenue Sources for MCD, Q3 2018 (left) and Revenue history with segment growth since 2014





Source: Company reports

Business/Industry Drivers

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

1) Experience of the Future (EOTF)
2) Mobile application and delivery
3) Refranchising and cost-cutting initiatives
4) Competition
5) Macroeconomic trends

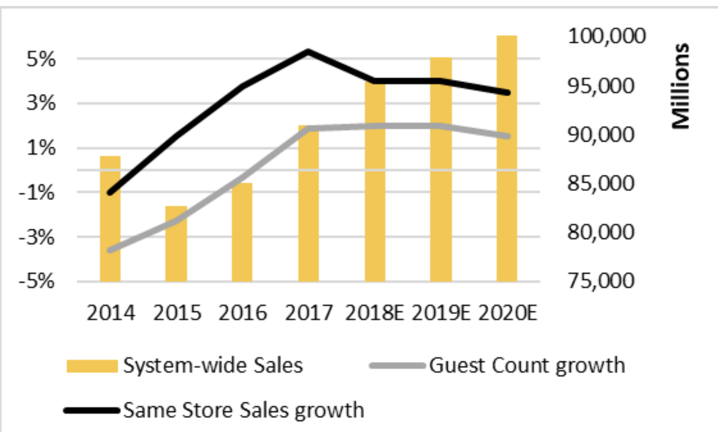
<u>Experience of the Future (EOTF)</u>

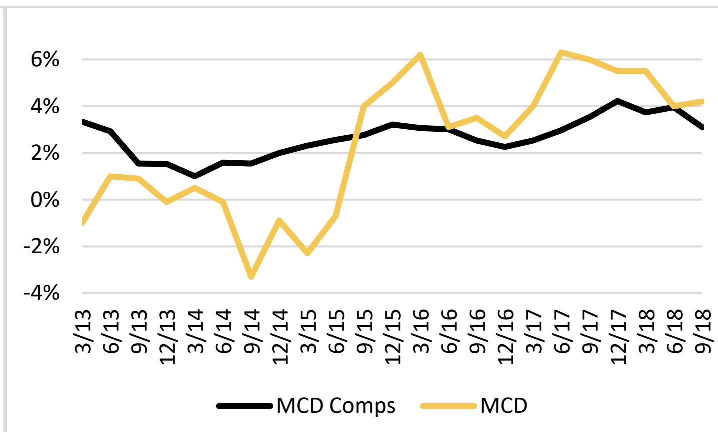
MCD anticipates having 50% of U.S. locations converted to the "Experience of the Future" by year-end 2018.

In Q1 2015, MCD's new CEO Steve Easterbrook announced a business turnaround plan in response to a 2.1% decline in the U.S. segment's same store sales (SSS), largely due to a 4.1% drop in guest counts. The plan to restore guest count growth revolved around MCD's "Experience of the Future" (EOTF) initiative. EOTF focuses on modernizing locations with updated décor, self-order kiosks, and technology integration to improve the customer experience and drive higher guest counts.

In March 2017, MCD announced a more defined plan called the "Velocity Growth Plan." Its primary focus is to propel guest count growth by improving the customer's overall fast food experience with greater convenience and value. The plan combines the EOTF initiative with its existing mobile application (app). MCD intends to bring curbside pickup and delivery through third parties to U.S. and select international locations, and has begun doing so through its partnership with Uber Eats.

Figures 3 and 4: System-wide sales compared to guest count and SSS growth (left) and SSS compared to competitors





Source: Company reports, Bloomberg, FactSet, MCD Comps: CMG, DRI, JACK, LOCO, QSR, SBUX, SONC, WEN, & YUM

MCD has consistently experienced 3-6% YoY growth in SSS since Q3 2015

Figure 3 illustrates the corresponding growth in system-wide sales, guest counts, and SSS since 2015. Figure 4 displays how MCD has outpaced its competitors in SSS growth since Q3 2015. Both figures show a clear turnaround in system-wide sales and SSS that coincides with the announcement of the EOTF initiatives in 2015. Figure 3 also displays my expectations for growth rates to remain positive, but to become more in-line with the fast food industry, which is supported by the downward trend in SSS growth observed in Figure 4.

Although it is not the same as revenue, MCD tracks total system-wide sales to monitor the health of the franchise. The idea that successful franchisees lead to a successful franchisor has been central to McDonald's philosophy and historical success since Ray Kroc founded the company. New restaurant expansion and SSS growth generates growth in system-wide sales. The 2-yr CAGR for system-wide sales since the turnaround is 4.9%.

MCD defines SSS as sales in restaurants that have been in operation for a minimum of 13 months. SSS growth is driven by guest count growth and the average sale price, or "average check." Average check is influenced by pricing and product mix, with pricing having a greater effect.

System-wide sales grew 3% in 2016 and 7% in 2017.

Guest count growth is the primary goal of the company's EOTF, digital, and delivery initiatives. In Q2 2018, MCD announced an additional $6 billion of capital expenditures through 2020 to accelerate EOTF conversions in the U.S. For reference, MCD's net income is about $6 billion. The Wall Street Journal reported in May 2017 that a commitment letter from McDonald's to franchisees indicated the company would cover 55% of costs associated with the EOTF initiative[1]; meaning the company and its franchisees will inject a total of $10.9 billion in capital into the project. As of year-end 2017, MCD has converted approximately 33% of all restaurants. It is currently converting 2.5% restaurants per quarter, and expects to have 39%, 45%, and 53% of all locations converted to EOTF by the end of 2018, 2019, and 2020, respectively.

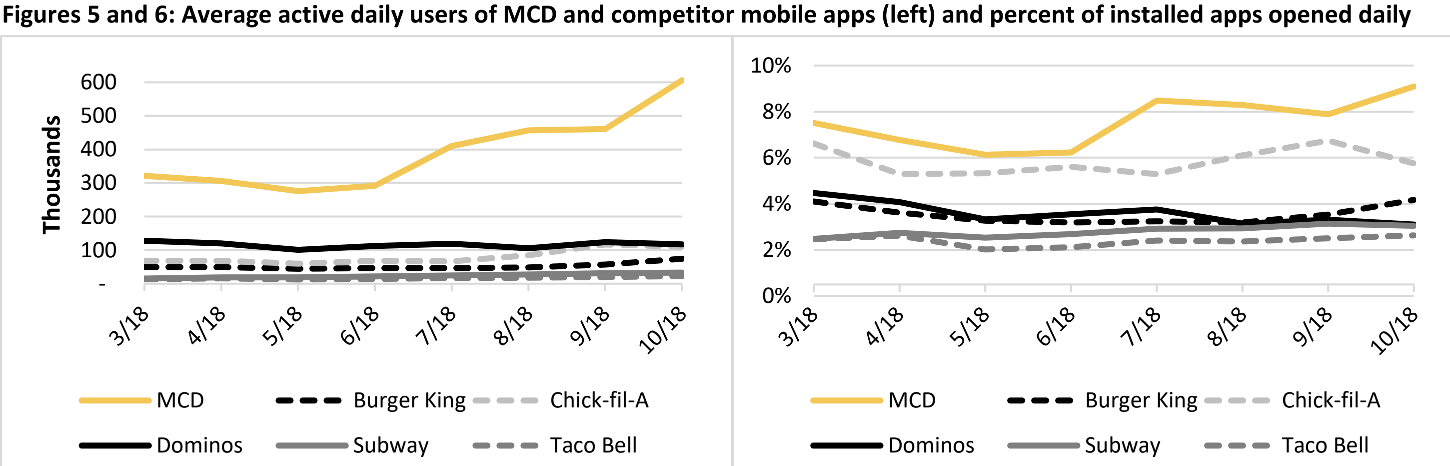
A conversion to EOTF typically takes 5-10 days to complete, and restaurants are not operational during this period. MCD admits this has had more short-term negative effects on SSS and margins than anticipated; however, figures 3 and 4 show these updates have had a positive overall impact on SSS. The data related to EOTF leads me to agree with management's assessment that the promising long-term effects greatly outweigh the short-term sales impacts. The stock has responded positively with a 3-yr CAGR of 22.6% since the turnaround.

MCD estimated its mobile app had been downloaded 20 million times at year-end 2017.

<u>Mobile application and delivery</u>

Another important aspect of MCD's "Velocity Growth Plan" is further leveraging its mobile application to increase convenience for customers. Mobile app data suggests MCD has a sizeable competitive advantage in the digital space among fast food restaurants. Figure 5 demonstrates MCD's incredibly large and growing lead in number of daily users of its mobile app. To emphasize this advantage, McDonald's has roughly 13,000 fewer locations than Subway in the U.S., but its mobile app generates 573,000 more average daily users.

Figures 5 and 6: Average active daily users of MCD and competitor mobile apps (left) and percent of installed apps opened daily



Source: SimilarWeb

Additionally, figure 6 shows the average daily percentage of total installed applications opened each day. MCD also leads its competitors in this category at 6-8.5%. Furthermore, the data shows a 56% surge in growth between June and August, which coincides with MCD's efforts to increase awareness of its delivery service during the 2018 FIFA World cup. The company has a strong and growing relationship with Uber Eats, and as of Q3 2018, offers delivery in 40% of its locations

[1] Julie Jargon, "McDonald's Boosts Its Payout for Franchise Upgrades," *The Wall Street Journal* (New York City, NY), May 11, 2017.

According to SimilarWeb, MCD's mobile app is downloaded an average of 1.3 million times each month.

globally. MCD claims delivery comprises 10% of sales in many of these locations, and typically doubles the average check. With no additional invested capital required, free cash flow should rise.

I believe MCD's mobile app is currently its greatest competitive advantage. Evidence suggests the fast food industry is moving further towards convenience and delivery. The app provides an easy transition into this market. It also provides customers with exclusive deals and coupons, thus incentivizing its continued used. While the company's optimism surrounding delivery is very high, I believe many of these customers are already committed to MCD, so the guest counts will not grow to the extent management anticipates. Overall, the high daily use relative to its competitors suggests the deals are working, and are behind much of the recent growth in guest count and SSS.

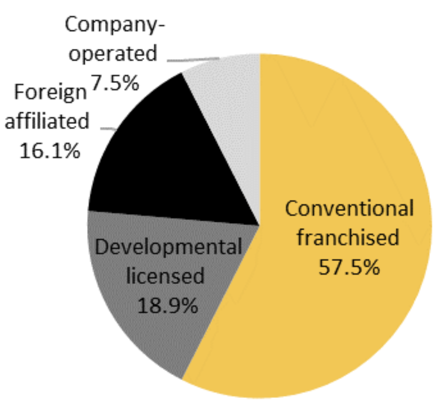
Refranchising and cost cutting initiatives

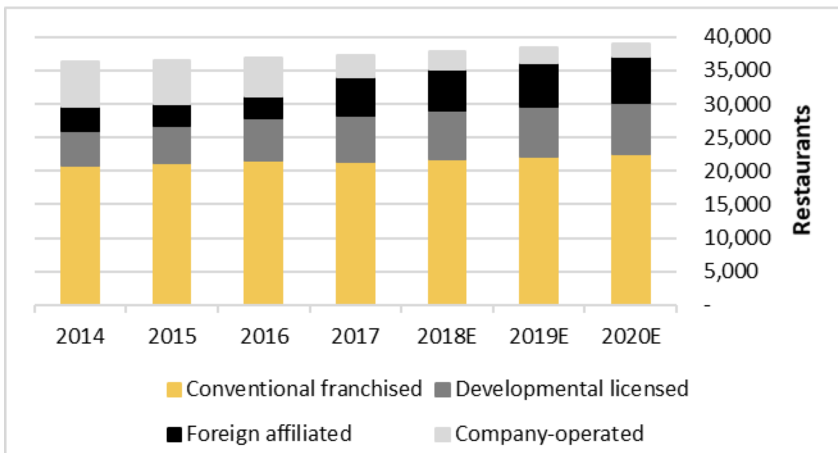
Growth in deliveries is promising. According to MCD, approximately 1 billion people in the world live within 10 minutes of a McDonald's.

Two additional aspects of MCD's turnaround plan were to refranchise an additional 10% of restaurants and reduce annual SG&A expenses by 19% through 2018. In 2015, 82% of restaurants were franchises. MCD's long-term goal is to be 95% franchised, and it is at 92.5% as of Q3 2018, shown in figure 7. Figure 8 displays both historical and projected changes in restaurant ownership types. A sharp increase in foreign affiliated restaurants in 2017 was the result of the company's sale of its China and Hong Kong businesses. I expect McDonald's to reach this goal by Q1 2020, based on current company guidance of 1.6% net restaurant expansions and an average 3% reduction in company-operated restaurants per quarter.

Refranchising lowers MCD's total revenue but expands the firm's gross and operating margins. Despite the greater profitability, refranchising has far less effect on ROA than one might expect, because it still owns the land and building assets of conventional franchises. The ongoing refranchising of company-operated stores has been the primary driver of MCD's expanding margins.

Figures 7 and 8: Restaurants by ownership type at Q3 2018 (left), and restaurant expansion by ownership type (right)





Source: Company reports, FactSet

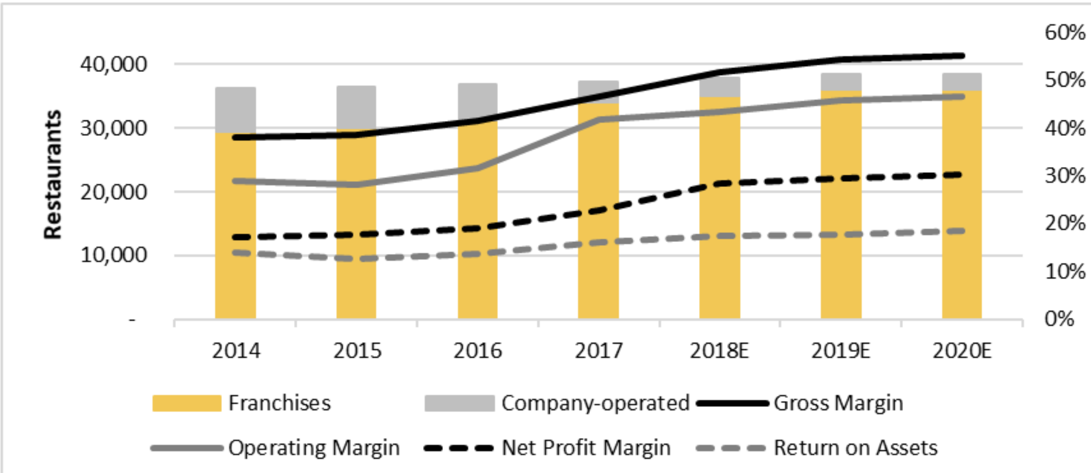
Combined gross margins are a blend of company-operated gross profit margins and franchise margins, which is unique to franchisors. For the past five years, MCD has maintained company-operated gross margins of 15-18%, and 82% for franchised margins. So, as MCD refranchises company-operated restaurants, total revenue decreases, but the combined gross margin increases.

MCD's high margins in franchises are a result of relatively passive revenue streams with low costs of revenue. Conventional franchises are the largest generator of franchised revenue, consisting of rent, royalties on 4% of sales, and initial franchise fees. Since MCD does not own the land and buildings of developmental licenses, this ownership type only provides royalties on 4% of sales and initial fees. Meanwhile, foreign affiliates do not produce revenue. Instead, MCD maintains a 20% equity investment in these restaurants, and records royalties on sales in equity from unconsolidated affiliates. Foreign affiliates currently only exist in China and Japan, where the firm has had issues adapting its menu. The recent increase in developmental licenses and foreign affiliates relative to conventional franchises is slightly concerning, because the company loses control of quality standards in these locations. McDonald's has built a highly successful brand by enforcing strict quality standards, ensuring all locations are effectively the same. Having very limited control may be detrimental to the brand's reputation in China and Japan. However, the advantage to developmental licenses and foreign affiliates is that MCD has no invested capital in these restaurants, because franchisees purchase the land and buildings. Thus, the expanding margins observed in these regions should result in additional free cash flow.

In 2017, revenue decreased 7%, but combined gross margin and EPS increased 4% and 17%, respectively.

Figure 9 illustrates how the increasing proportion of franchised restaurants has accelerated MCD's growth in gross, operating, and net profit margins. A 6% decrease in SG&A expense can also be observed during 2017, which is a result of the cost-cutting initiatives. I expect a continued improvement in margins over the next two years, but at a slightly reduced rate as MCD nears its goal of being 95% franchised.

Figure 9: Profitability metrics compared to refranchising



Source: Company Reports

3-year CAGR for total return is 22.6% versus 17.1% for the S&P 500.

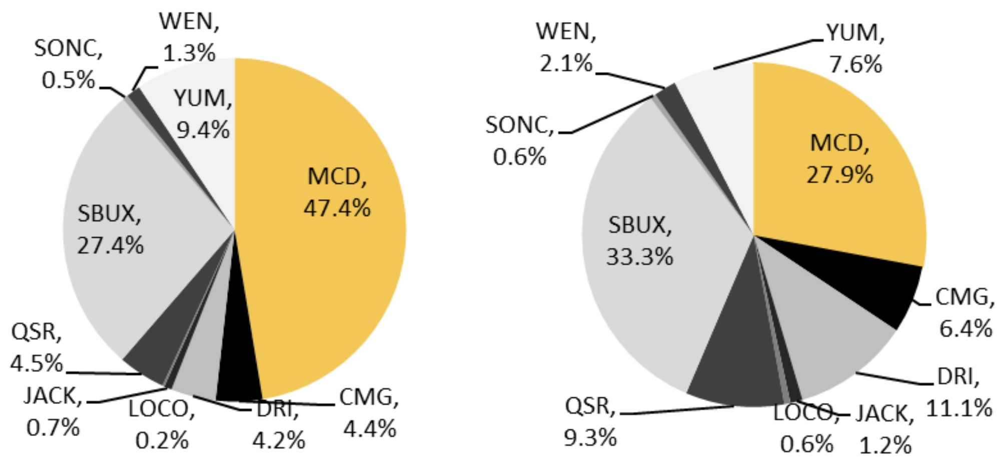
<u>Competition</u>

The fast food industry is extremely competitive. Barriers to entry are relatively low due to small capital requirements, little dependence on technology, and a well-established supply chain infrastructure. Successful fast food restaurants focus on a specific cuisine, so consumers have many substitutes with no switching costs. Fast food restaurants must prove to consumers that they can conveniently receive high quality food at a low cost. Restaurants primarily use promotional and seasonal deals to accomplish this goal. Restaurants also depend on brand and product recognition to create sustained competitive advantages. Competitive advantages for fast food brands include reputations for having discounted prices, unique menu items, and convenience.

MCD's number of delivery locations grew from 7,800 to 13,000 between July 2016 & 2017.

MCD has a wide range of competitors. Other large international and regional franchises, coffee shops, and small local restaurants qualify as MCD's competition. Figures 11 & 12 are not fully representative of the overall industry, because many of MCD's largest competitors, including Subway and Chick-fil-A, are privately held. However, MCD clearly has the largest market share in terms of market cap and total revenues among publicly traded restaurant firms. Market cap share is higher than revenue share which reflects a higher P/S ratio, perhaps due to MCD's higher profit margins.

Figures 10 & 11: Comparison of MCD comps by market cap (left), and total revenues



Source: FactSet, IMCP

MCD tends to outperform the S&P 500 during economic downturns, but trails during booms.

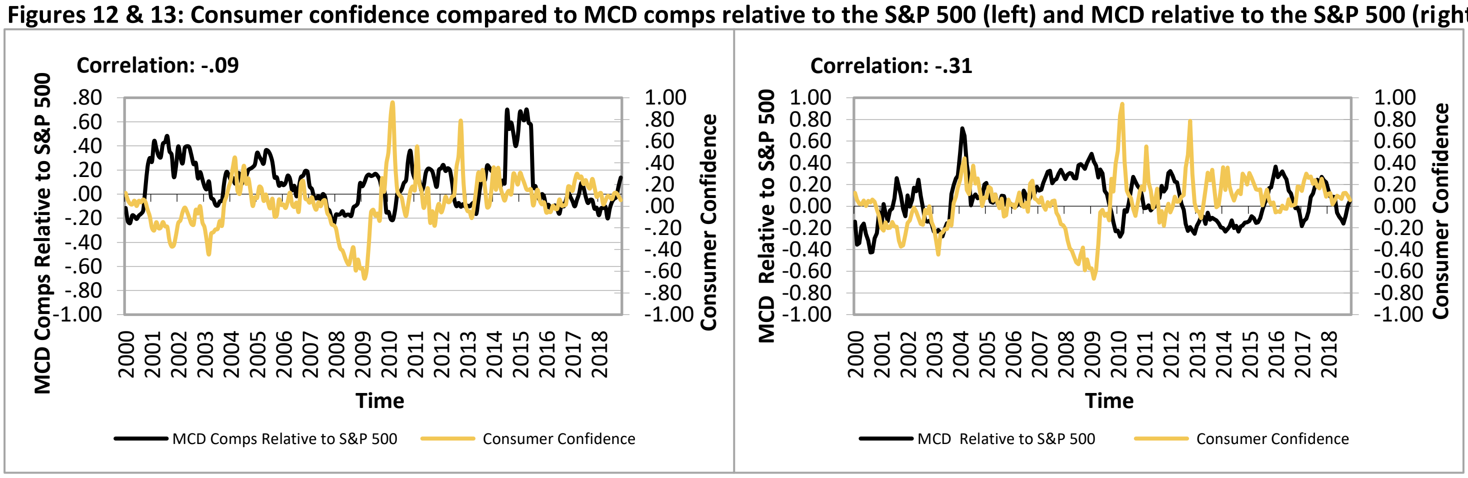
MCD spent several years attempting to appease the tastes of an increasingly health-conscious consumer; however, the company's turnaround marked a significant shift in strategy. Largely abandoning healthy alternatives, MCD has spent the past three years building large competitive advantages through its mobile app, delivery partnerships, and the $1 $2 $3 Dollar Menu. These changes have resulted in a 3-year CAGR for total return of 22.6% versus the S&P 500's 17.1%.

MCD was early in recognizing consumers' shift in demand for greater convenience. YUM, the parent company of Taco Bell, KFC, and Pizza Hut, is MCD's closest competitor in fast food delivery. Both companies have established delivery partnerships, but MCD's app data has average daily users of 606,000 versus Taco Bell's 23,000. I also believe YUM will see offsetting effects for delivery sales, since fast food will likely steal market share from pizza delivery.

Macroeconomic trends

The consumer discretionary sector is cyclical and has a 10.2% weight in the S&P 500. MCD has a 5.13% weight in the sector. The sector's performance largely depends on consumer confidence. While the fast food industry does follow this trend on an absolute basis, it shows a slight tendency to outperform the S&P 500 on a relative basis during times of low confidence. Figures 13 and 14 display this trend, with MCD showing a stronger negative correlation compared to its peers. MCD behaves more like a consumer staple, likely due to its low cost, and can be a good defensive play during an economic downturn.

Figures 12 & 13: Consumer confidence compared to MCD comps relative to the S&P 500 (left) and MCD relative to the S&P 500 (right)



Source: Bloomberg, IMCP

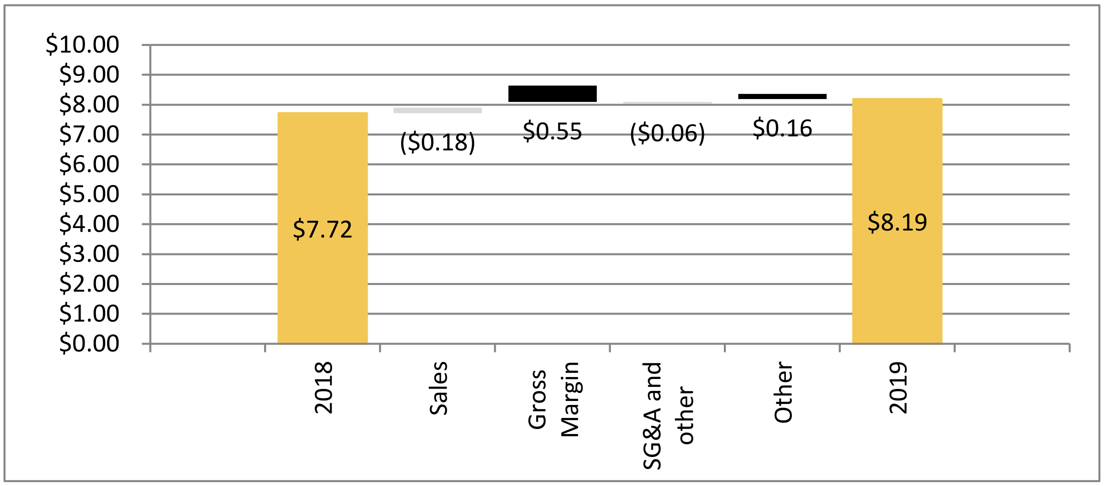
Financial Analysis

Quantification of Drivers

I anticipate EPS to grow 6.1% from $7.72 to $8.19 in FY 2019. Revenues should decrease earnings by $0.18; however, I expect the ongoing gross margin expansion to offset this by $0.55 per share. MCD's cost cutting initiatives should end in 2018, thus SG&A expenses should stabilize as a percent of sales in 2019 and have a marginally negative impact of $0.06 per share on earnings. Finally, I forecast a slight increase in interest expense and the tax rate, while the repurchase of 750.2 million shares will have a net EPS increase of $0.16.

Gross Margins should add $0.55 to 2019 EPS, which is projected to grow by 6.1%.

Figure 14: Quantification of 2019 EPS drivers

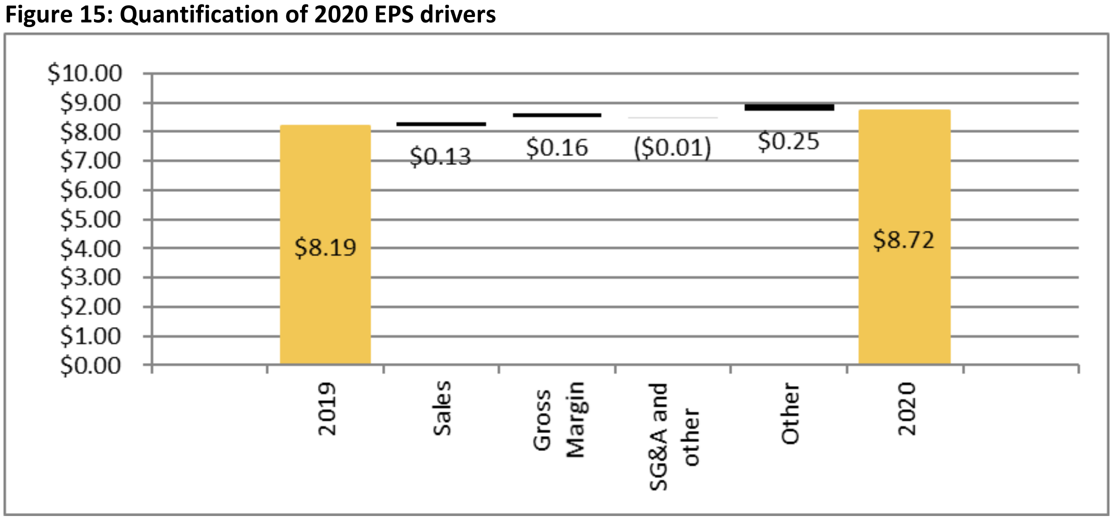


Source: Company Reports, IMCP

I expect 2020 EPS to increase by 6.5% from $8.19 to $8.72. I anticipate revenue and gross margins to increase earnings by $0.13 and $0.16, respectively. I believe MCD will complete its goal of having 95% franchised restaurants by Q1 2020, so revenue and gross margin growth should begin normalizing in 2020 to 1.4% and 2.9%, respectively. SG&A expenses should also remain relatively constant as a percent of sales and will only lose $0.01 of earnings for the company. An increase in share buybacks of 732.9 million shares will offset the increased interest expense to provide a net increase of $0.25 in EPS.

Figure 15: Quantification of 2020 EPS drivers

Share buybacks, net of interest and tax, contribute $0.25 to projected 2020 earnings, which should grow 6.5%.



Source: Company Reports, IMCP

Estimate vs. Consensus Analysis

I am slightly more pessimistic than consensus estimates for both 2019 and 2020. As previously stated, I predict MCD will reach its goal of being 95% franchised during Q1 of 2020. Based on 2020 revenue consensus, this appears to be later than the market expects. Furthermore, while the potential SSS growth is promising, I do not believe it will offset the decline in company-operated sales to the extent the market does. As such, my prediction of greater margin expansion does not outweigh the negative growth in sales, so my predicted EPS falls short of consensus.

For 2019, revenue is projected to fall 2.1%, compared to consensus estimates of -1.1%.

Figure 16: Revenue, Gross Margin, and EPS projections

	2018E	2019E	2020E
Revenue - Estimate	$21,028	$20,596	$20,891
YoY Growth	*-7.9%*	*-2.1%*	*1.4%*
Revenue - Consensus	$21,044	$20,806	$21,248
YoY Growth	*-7.8%*	*-1.1%*	*2.1%*
Gross Margin - Estimate	$10,849	$11,199	$11,520
Gross Margin %	*51.6%*	*54.4%*	*55.1%*
Gross Margin - Consensus	$10,831	$11,292	$11,621
Gross Margin %	*51.5%*	*54.3%*	*54.7%*
EPS - Estimate	$7.72	$8.19	$8.72
YoY Growth	*20.1%*	*6.1%*	*6.4%*
EPS - Consensus	$7.73	$8.23	$8.84
YoY Growth	*20.2%*	*6.5%*	*7.4%*

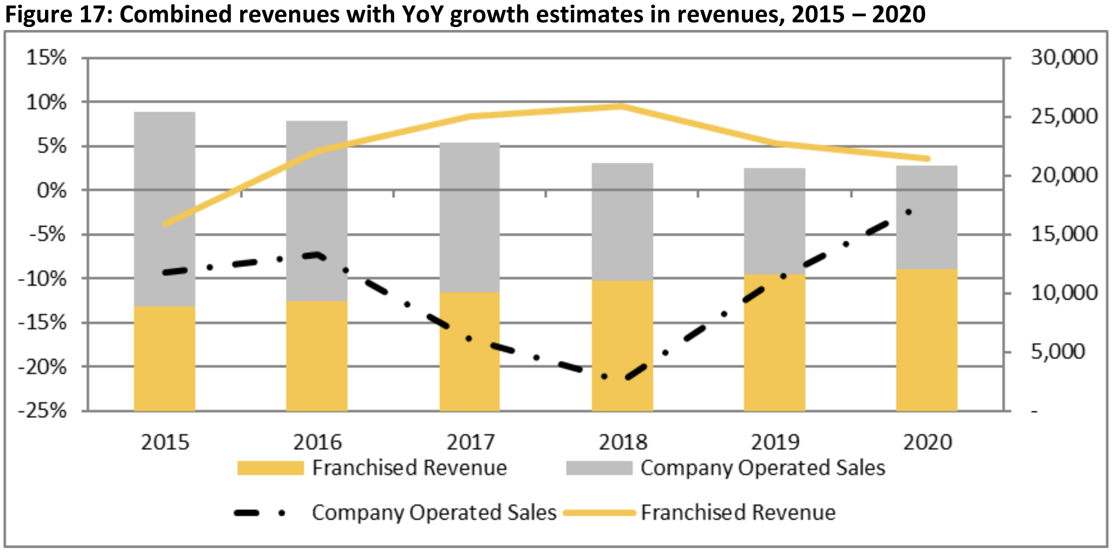
Source: FactSet, IMCP

Revenue Forecast

McDonald's revenue has declined each year since 2013. The initial decline was due to negative guest count and SSS growth; however, the decline observed since 2015 is the result of MCD's EOTF initiative and "Velocity Growth Plan." As previously described, the refranchising involved in this plan reduces the total number of company-operated restaurants while increasing the total number of franchised restaurants. Since MCD records all sales from company-operated restaurants as revenue, this significantly decreases the total dollar amount of revenue recognized.

Due to refranchising, company-operated sales and franchised revenue show an inverse relationship, as shown in figure 17.

Figure 17: Combined revenues with YoY growth estimates in revenues, 2015 – 2020



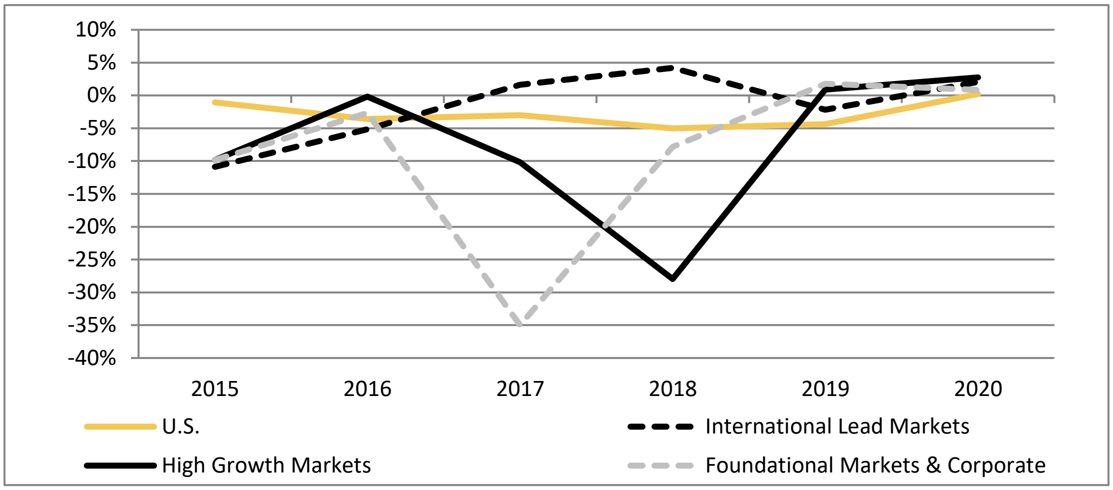
Source: Company Reports, IMCP

Figure 18 displays the trend in which the negative growth in company-operated sales outweighs the growth in franchised revenue to drive total revenue down. Since I expect the company to be 95% franchised in 2020, I predict revenue will continue declining by 2.1% in 2019, but increase 1.4% in 2020.

Figure 19 shows both the past and projected growth rates of MCD's four operating segments. The large drop in revenues for the High Growth and Foundational Markets is not expected to continue, since these were primarily due to the sale of businesses to developmental licensees and foreign affiliates in China and Japan. Negative growth rates observed in the U.S. and International Lead Markets were due to aforementioned refranchising efforts. Overall, I expect revenue growth in all segments to begin normalizing at the end of 2019 and grow between 0.5 – 2.5% in 2020.

Dramatic drops in revenue depicted in figure 18 were a result of large sales of businesses to developmental licensees and foreign affiliates in China and Japan.

Figure 18: McDonald's segment revenues YoY growth estimates, 2015 – 2020



Source: Company Reports, IMCP

Operating Income and Margins

Cost of revenue for company-operated restaurants consists of standard restaurant costs such as food and ingredients. Meanwhile, cost of revenue for franchised restaurants is comprised of occupancy costs, which include property taxes, lease payments, and depreciation. Historically, the gross margins for company-operated sales have remained around 17-18%, while the gross margins for franchised revenue has generally been around 82%. As MCD continues to refranchise, I expect gross and operating margins to expand through 2020 to 55.1% and 46.5%, respectively.

Figure 19: MCD Operating Margins, 2017 – 2020E

	2017	2018E	2019E	2020E
Revenue	$22,820	$21,028	$20,596	$20,891
Cost of revenue	$12,200	$10,179	$9,397	$9,371
Gross income	$10,621	$10,849	$11,199	$11,520
Gross Margin	*46.5%*	*51.6%*	*54.4%*	*55.1%*
Growth	*4.1%*	*2.1%*	*3.2%*	*2.9%*
SG&A	$2,231	$2,152	$1,771	$1,811
Growth	*-9.1%*	*-3.6%*	*-17.7%*	*2.2%*
Other operating (Income) Loss	($1,163)	($409)	$0	$0
Operating income	$9,495	$9,106	$9,427	$9,709
Operating margin	*41.6%*	*43.3%*	*45.8%*	*46.5%*

Source: Company Reports, IMCP

Refranchising continues to accelerate MCD's total gross margin, which is expected to reach 55% in 2020.

Figure 19 demonstrates the expenses affecting MCD's operating margin. SG&A expense primarily relates to company-operated restaurants. It contains expenses for paper, employees, and the same occupancy costs associated with franchised revenue, and these costs remain relatively constant. Conversely, other operating income consists of gains and losses on the sales and purchases of restaurants, causing it to vary widely from year-to-year. This makes it extremely difficult to forecast. Proceeds from this activity still fall under operating income because it is a normal part of MCD's operations that has continually occurred in nearly every quarter throughout its history.

Return on Assets

Along with the turnaround plan, MCD has gone through a recapitalization process in which it has increased debt while buying shares. The increase in treasury shares bought at recent market prices has driven book equity to a negative balance. In turn, return on equity has not been a meaningful metric since 2017. I analyzed return on assets (ROA) and return on invested capital (ROIC) instead.

Figure 20: ROA and ROIC breakdown, 2015 – 2020E

	2015	2016	2017	2018E	2019E	2020E
Net income / sales	17.8%	19.0%	22.8%	28.5%	29.8%	30.2%
Sales / avg assets	0.46	0.49	0.46	0.41	0.40	0.41
ROA	12.5%	13.6%	16.0%	17.5%	17.8%	18.5%
ROIC	14.9%	16.7%	19.4%	21.5%	21.9%	22.9%

Source: Company Reports, IMCP

MCD's ROIC is consistently greater than its WACC, thereby signaling economic value added.

I expect ROA and ROIC to grow steadily through 2020. Profitability has increased, but this has still required additional invested capital. Therefore, ROA has not increased as dramatically as MCD's other profitability ratios. However, ROIC is a promising metric for MCD, because although it is also growing slower, it has far exceeded the firm's weighted average cost of capital (WACC) of 7.33%. Whenever ROIC exceeds WACC, economic value is added. As increased leverage lowers the WACC and ROIC increases, there will be continued growth in economic value added.

Free Cash Flow

As shown in figure 21, MCD's free cash flow, excluding cash and debt changes, declined during the initial phase of its turnaround. Changes in net working capital excluding cash was negative in 2015 and 2017. The firm sold over 6% of its business in Hong Kong and China to an affiliate in 2017. In 2015-16 net long-term capital fell, which boosted FCF, but its growth initiatives in 2017 and 2018 are adding $1.6-2.3 billion in capital per year. Overall, I expect FCF to flatten in 2019-20 to a level of around $6 billion as capex growth slows. The firm has returned an average of $9 billion per year in the last four years, and I expect it to continue doing so in the future. MCD will need to grow its FCF to justify the aggressive repurchase program it currently has in place. However, its current FCF levels more than cover annual dividends of around $3 billion.

FCFE per share is forecasted to flatten to a level of around $6 billion per year.

Figure 21: Free cash flows 2014 – 2020E

Free Cash Flow	2014	2015	2016	2017	2018E	2019E	2020E
NOPAT	$5,130	$4,970	$5,290	$5,750	$6,762	$6,976	$7,185
Growth		*-3.1%*	*6.4%*	*8.7%*	*17.6%*	*3.2%*	*3.0%*
NWC*	(640)	(993)	929	(27)	(210)	(206)	(209)
Net fixed assets	30,096	28,296	26,175	28,477	30,039	29,422	29,845
Total net operating capital*	$29,456	$27,303	$27,104	$28,449	$29,829	$29,216	$29,636
Growth		*-7.3%*	*-0.7%*	*5.0%*	*4.8%*	*-2.1%*	*1.4%*
- Change in NWC*		(353)	1,922	(956)	(183)	4	(3)
- Change in NFA		(1,800)	(2,120)	2,301	1,563	(617)	423
FCFF*		$7,123	$5,489	$4,405	5,383	$7,589	$6,765
Growth			*-22.9%*	*-19.7%*	*22.2%*	*41.0%*	*-10.9%*
- After-tax interest expense	372	441	604	558	769	830	873
FCFE**		$6,682	$4,885	$3,847	$4,614	$6,759	$5,892
Growth			*-26.9%*	*-21.2%*	*19.9%*	*46.5%*	*-12.8%*

Source: Company Reports, IMCP

Valuation

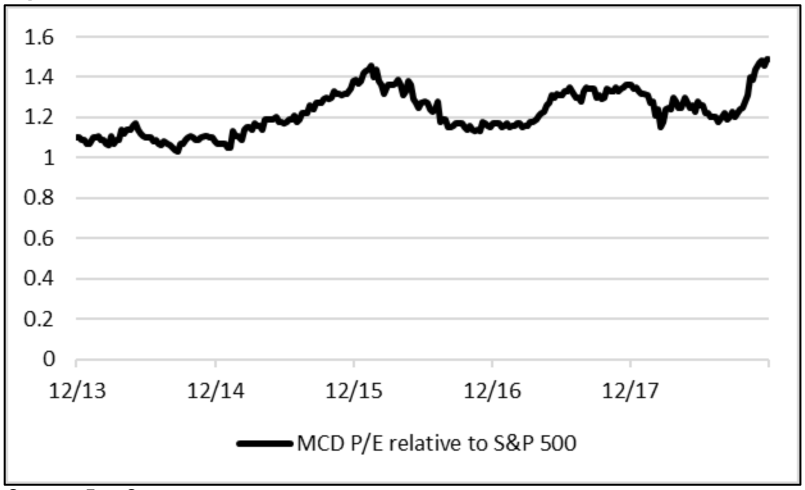
MCD was valued using multiples and a 3-stage discounted cash flow model. Based on earnings multiples, the stock is expensive relative to other firms and is worth $181. Relative valuation shows MCD to be undervalued based on its fundamentals versus those of its peers in the restaurant industry. Price to sales valuation yielded a price of $201. A detailed DCF analysis values MCD lower at $180. I give the DCF value more weight because it incorporates assumptions reflecting MCD's ongoing shift to a higher franchised model. As a result of these valuations, I value the stock at $180.

Trading History

MCD is currently trading near its five-year high P/E relative to the S&P 500. This is the result of recent earnings growth and the high optimism most analysts have for future sales and earnings. MCD's current NTM P/E is at 23.7 compared to its five-year average of 20.0. I expect some movement back to this number in the future, but not a significant amount in the coming year.

Given high and rising profitability, a high P/S relative to peers may be justified.

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



Source: FactSet

Assuming the firm maintains a 22.5 NTM P/E at the end of 2019, it should trade at $196.20 by the end of the year.

- Price = P/E x EPS = 22.5 x $8.72 = $196.20

Discounting $196.20 back to today at an 8.28% cost of equity (explained in Discounted Cash Flow section) yields a price of $181.20. Given MCD's potential for sales growth and continued profitability, this appears to be a fair value.

Relative Valuation

Given declining revenues and rising profitability, a high P/S relative to peers may be justified.

McDonald's is currently trading at a P/E near the average of its peers. With a P/E TTM of 27.9 compared to an average of 27.5, the stock is trading in-line with market expectations for its industry. This may reflect optimism the market has for fast food's entrance into the delivery market. MCD's P/S ratio is twice the average of its peers at 6.2. This is a reflection of MCD's high and increasing net profit margin.

A more thorough analysis of P/S and net profit margin (NPM) is shown in figure 24. The calculated R-squared of the regression indicates that over 85% of a sampled firm's P/S is explained by its NPM. It is important to note that Chipotle and El Pollo Loco were excluded from this sample because they are outliers with low NPMs but high valuation. MCD has one of the highest P/Ss and NPMs of this grouping, and I predict its NPM will continue to rise in 2019, resulting in the following valuation:

Estimated P/S = Estimated 2019 NPM (29.8%) x 28.659 - .6137 = 7.93

- Target Price = Estimated P/S (7.93) x 2019 SPS ($27.45) = $217.68.
- Discounting back to the present at an 8.28% cost of equity leads to a target price of $201.

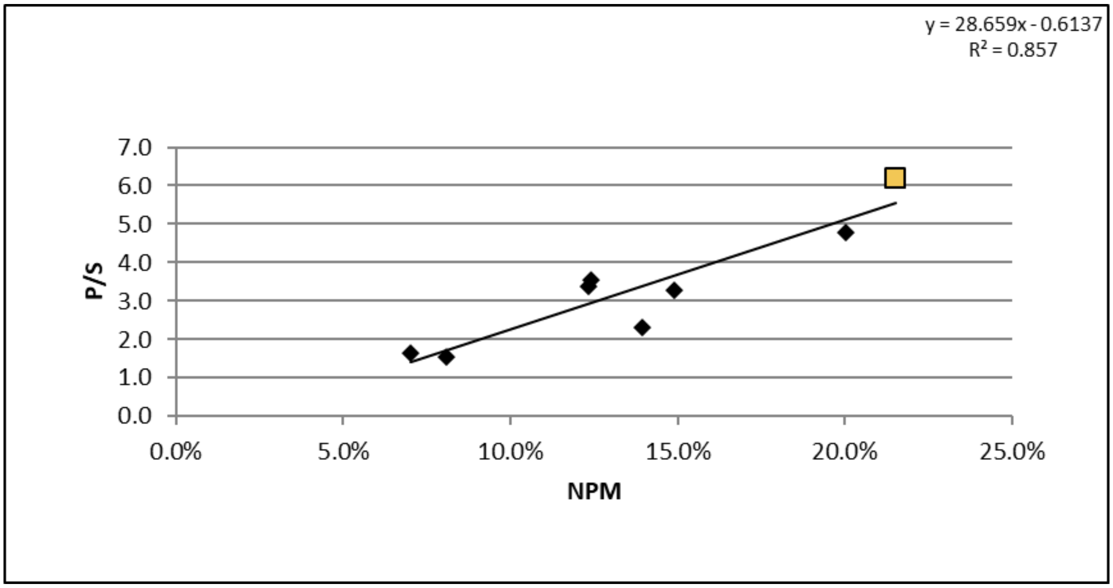
Figure 23: P/E vs LTM EPS Growth

		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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
MCD	MCDONALD'S CORP	$183.59	$141,531	(0.6)	(1.3)	11.5	10.3	6.0	6.7	8.8	21.7%	17.1%	17.1%	29.2%	7.4%	3.5%	0.20		A	2.22%	61.3%
CMG	CHIPOTLE MEXICAN GRILL INC	$472.35	$13,125	(0.6)	(3.8)	(3.3)	1.2	50.7	63.4	23.2	63.5%	701.3%	701.3%	92.2%	29.8%	-6.8%	0.69	0.0%	B+	0.00%	0.0%
DRI	DARDEN RESTAURANTS INC	$101.75	$12,628	(3.4)	(9.5)	(14.8)	10.2	17.6	6.0	9.7	10.8%	26.4%	26.4%	36.9%	9.4%		0.37	40.7%	A-	2.50%	51.6%
JACK	JACK IN THE BOX INC	$83.12	$2,140	(0.3)	3.6	(3.7)	(1.9)	(19.3)	(15.3)	11.9	33.9%	13.6%	13.6%	2.1%	9.5%		0.07		B	1.80%	50.1%
LOCO	EL POLLO LOCO HOLDINGS INC	$14.75	$576	(1.3)	(11.0)	9.3	37.9	41.8	49.0		115.2%	-53.2%	-53.2%	245.5%	17.1%		0.70		B+	1.47%	33.9%
QSR	RESTAURANT BRANDS INTL INC	$52.98	$13,315	(1.5)	(6.7)	(8.9)	(10.4)	(12.4)	(13.8)	12.7	7.4%	68.4%	68.4%	8.1%	12.4%	44.6%	0.58	352.3%	B	1.90%	13.3%
SBUX	STARBUCKS CORP	$65.92	$81,780	0.7	(3.9)	19.6	16.7	11.6	14.8	13.7	-17.5%	19.8%	19.8%	17.8%	14.4%		0.74		A+	1.56%	28.2%
SONC	SONIC CORP	$43.48	$1,552	0.0	0.4	12.8	32.4	55.9	58.2	17.0	-14.3%	18.7%	18.7%	6.9%	9.4%		0.70		B+	1.47%	33.9%
WEN	WENDY'S CO	$16.98	$4,020	(1.0)	(2.5)	(3.9)	(4.6)	11.1	3.4	21.6	-74.1%	57.1%	57.1%	-14.3%	25.8%	105.3%	0.58	352.3%	B	1.90%	13.3%
YUM	YUM BRANDS INC	$89.81	$28,048	(0.5)	(1.0)	1.8	8.1	8.9	10.0	13.0	-26.6%	52.0%	52.0%	2.4%	8.3%	2.4%	0.74		A+	1.56%	28.2%
Average			$29,872	(0.9)	(3.6)	2.0	10.0	17.2	18.2	14.6	12.0%	92.1%	92.1%	42.7%	14.4%	29.8%	0.54	186.3%		1.64%	31.4%
Median			$12,877	(0.6)	(3.1)	(0.7)	9.1	11.4	8.4	13.0	9.1%	23.1%	23.1%	13.0%	11.0%	3.5%	0.64	196.5%		1.68%	31.0%
SPX	S&P 500 INDEX	$2,637		(0.0)	(5.2)	(8.7)	(5.2)	(0.9)	(1.4)			11.9%	21.7%	8.7%	10.3%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
MCD	http://www.mcdonalds.com	-72.3%	-20.84	22.4	31.6	28.8	27.9	22.9	22.3	20.8	21.5%	6.20	40.3%	20.8%	20.0	19.8	16.9	-2.2%	2.4%	-3.7%	-$8.81
CMG	http://www.chipotle.com	11.9%	9.14	490.0	375.4	76.4	70.3	43.0	39.8	30.7	3.8%	2.93	7.4%	12.7%	24.8	25.4	31.2	7.5%	9.4%	10.4%	$51.66
DRI	http://www.darden.com	23.8%	5.55	21.1	27.8	24.2	19.9	17.9	17.0	15.6	7.0%	1.64	9.5%	18.6%	15.3	12.8		4.9%		-1.1%	$18.33
JACK	http://www.jackinthebox.com	-18.9%	-3.62	29.2	25.7	19.0	26.0	19.4	18.8	17.1	8.1%	1.55	23.4%	18.3%	17.1	15.2		-0.5%	6.2%	-10.2%	-$22.99
LOCO	http://www.elpolloloco.com	3.0%	1.99	26.2	21.1	68.4	40.6	18.9	19.4	16.6	2.1%	1.43	5.7%	2.3%	12.4	11.8		6.3%		6.5%	$7.40
QSR	http://www.rbi.com	36.8%	6.09	25.1	32.4	16.9	21.5	20.0	15.3	13.6	13.9%	2.31	38.0%	4.7%	22.2	14.8		6.1%	6.7%	24.7%	$8.70
SBUX	http://www.starbucks.com	257.5%	73.79	28.9	29.9	28.8	20.5	24.9	24.3	21.3	12.4%	3.56	15.6%	45.8%	20.7	18.2		5.4%	8.6%	10.7%	$0.89
SONC	http://www.sonicdrivein.com	-19.6%	-5.35	19.8	20.5	27.3	23.0	26.9	25.6	23.4	12.4%	3.38	24.1%	16.4%	19.9	16.9		-4.2%	4.2%	-4.8%	-$8.12
WEN	http://www.wendys.com	23.4%	5.17	27.6	33.5	22.1	7.0	26.9	25.7	20.5	14.9%	3.29	18.7%	6.1%	23.0	22.0	13.1	9.1%	3.4%	-13.4%	$3.29
YUM	http://www.yum.com	-15.8%	-3.77	25.5	32.9	24.0	18.3	25.0	23.3	21.5	20.0%	4.77	30.8%	41.2%	21.7	25.8	18.5	-2.8%	4.0%	-15.5%	-$23.83
Average		23.0%	6.82	71.6	63.1	33.6	27.5	24.6	23.2	20.1	11.6%	3.11	21.4%	18.7%	19.7	18.3	19.9	3.0%	5.6%	0.4%	
Median		7.5%	3.58	25.9	30.8	25.7	22.2	23.9	22.8	20.6	12.4%	3.11	21.1%	17.4%	20.3	17.6	17.7	5.2%	5.2%	-2.4%	

Source: FactSet, IMCP

Figure 24: P/S vs NPM



Source: FactSet, IMCP

Figure 24 shows MCD's (yellow) slight overvaluation relative to peers based on P/S and NPM.

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 higher weighting of NPM with equal weights of LTG and STM sales growth was compared to an equal weight composite of P/E, P/S, and P/CF. The fundamentals were selected to reflect MCD's current profitability and possible long-term growth rates, since these are the metrics that appear to be driving the stock. After eliminating Chipotle, an extreme outlier, the regression line had an R-squared of .75. Figure 26 shows that MCD is above the line, so it is expensive based on its fundamentals. This makes sense given MCD's strong fundamentals in the last few quarters.

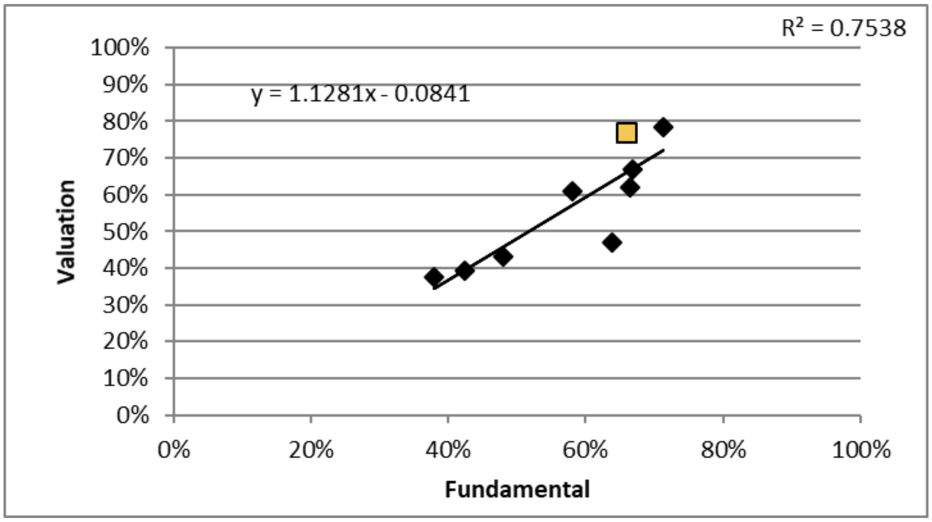
Figure 25: Composite valuation, percent of max

		Fundamentals			Valuation				
	Weight	25.0%	50.0%	25.0%	33.3%	33.3%	33.3%		
Ticker	**Name**	**LTG**	**NPM**	**STM**	**P/E**	**P/S**	**P/CF**	**Fund**	**Value**
MCD	MCDONALD'S CORP	38%	100%	26%	53%	100%	77%	66%	77%
DRI	DARDEN RESTAURANTS INC	42%	33%	63%	42%	26%	50%	42%	39%
JACK	JACK IN THE BOX INC	51%	38%	66%	45%	25%	59%	48%	43%
LOCO	EL POLLO LOCO HOLDINGS INC	69%	10%	63%	44%	23%	46%	38%	38%
QSR	RESTAURANT BRANDS INTL INC	55%	65%	71%	46%	37%	57%	64%	47%
SBUX	STARBUCKS CORP	59%	58%	91%	58%	57%	71%	66%	62%
SONC	SONIC CORP	73%	57%	44%	62%	54%	66%	58%	61%
WEN	WENDY'S CO	93%	69%	36%	63%	53%	85%	67%	67%
YUM	YUM BRANDS INC	56%	93%	43%	58%	77%	100%	71%	78%

Source: FactSet, IMCP

Figure 26 displays a composite relative valuation. MCD (yellow) shows a slight overvaluation relative to its peers.

Figure 26: Composite relative valuation



Source: FactSet, IMCP

Discounted Cash Flow Analysis

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

For the purpose of this analysis, the company's cost of equity was calculated to be 8.28% 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 3.1%.
- A beta of 0.75 was utilized, which indicates the company has less risk relative 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 8.28% (3.1 + 0.75 (10.0 – 3.1)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $11.00 and $11.95, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $20.35 per share. Thus, stage one of this discounted cash flow analysis contributes $20.35 to value.

Stage Two - Stage two of the model focuses on fiscal years 2017 to 2021. 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 8.28% cost of equity. I assume 2% revenue growth in 2021, rising to 3% through 2023, and falling to 2% by 2025. The ratio of NOWC to sales will first rise as sales outpace change in operating assets, but fall back to normal levels as sales growth matures. NFA turnover will remain relatively constant at 0.7 upon MCD realizing its 95% franchised goal. Also, the NOPAT margin is expected to continue rising to 35% in 2021 and fall back to 31% through 2025. Share buybacks are expected to continue at 3% per year. Finally, after-tax interest is expected to rise 2% per year as the result of modest increases in borrowing.

Figure 27: FCFE and discounted FCFE, 2019 - 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$11.00	$11.95	$9.31	$9.06	$9.20	$9.70	$9.62
Discounted FCFE	$10.16	$10.19	$7.34	$6.59	$6.18	$6.02	$5.51

Terminal P/E of 22 chosen for DCF is based on assumption that investors will continue to pay a slight premium for MCD's lower risk and strong fundamentals.

Added together, the second stage discounted cash flows total $31.65.

Stage Three – Net income for the years 2021 – 2025 is calculated based on the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $8.19 in 2019 to $10.18 in 2025.

Figure 28: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$8.19	$8.72	$9.35	$9.62	$9.89	$10.04	$10.18

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 the historical average of the S&P 500. However, based on historical P/E, along with the strong cash flows and relatively low risk of McDonald's, I believe investors will continue to pay a slight premium over the market in the future. Therefore, a P/E ratio of 22 is assumed at the end of MCD's terminal year. While this may be a high multiple at the end of 2025, one must consider what the market will price in today.

Given the assumed terminal earnings per share of $10.18 and a price to earnings ratio of 22, a terminal value of $223.93 per share is calculated. Using the 8.28% cost of equity, this number is discounted back to a present value of $128.35.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $180.35 is calculated (20.35 + 31.65 + 128.35). Given MCD's current price of $183.59, this model indicates that the stock is slightly overvalued.

<u>Scenario Analysis</u>

It is difficult to value McDonald's with certainty since it is impossible to predict every variable involved in the company's future operations. Additionally, it is difficult to forecast economic factors that may have either positive or negative impacts on future results. Given this, it is necessary to project alternate scenarios based on possible differences in assumptions.

Bull Case – In this scenario, I forecast sales to increase at a favorable rate of 2% and 4% in 2019 and 2020, respectively. This assumes the "Velocity Growth Plan" grows guest counts and SSS better than expected. Holding other variables constant, this scenario yields an EPS growth of 12.9% in 2019, and 11.4% in 2020. This nearly doubles the projected growth in both years, and it is representative of the strong residual impact MCD's revenues have on the bottom line. This makes intuitive sense, given that the firm is currently increasing its profitability while revenue declines. Any positive surprise in revenue should have a large impact on the stock.

Since the stock is currently trading near my target price, it is implied that the market is pricing in many of my assumptions. If the market expects higher sales than me, it could be more bullish on NFA turnover as well. If the sales increase as they do in the bullish scenario, both the NFA turnover and P/E will likely increase as well. If the NFA turnover increases from my level of 0.7 to 1.0 and the terminal P/E is 24, the value per share today becomes $212.

Bear Case – In this scenario, I assume gross and operating margins do not expand in 2019 or 2020. If MCD is unable to find enough capable franchisees, this could have an adverse effect on the firm's refranchising plans. Instead, holding all else constant, I assume margins stay at 45% and 42% for gross and operating margins, respectively through 2020. It is important to note that these numbers are just below expected 2018 values. This would reduce NOPAT by 5.3% in 2019, along with a 4.8% decrease in EPS. This clearly shows that the market expects margins to expand, and much of the current valuation likely hinges on this.

If the gross and operating margins flatten and the NOPAT decreases, the P/E should fall as MCD will not meet investor expectations. I applied a P/E of 19 to this scenario, which is just below MCD's five-year average. This bear case would make the value per share today become $151.

Business Risks

I have many reasons to be optimistic about McDonald's future performance; however, there are several risk factors that cause me to remain more neutral on my outlook of the stock:

Ongoing refranchising:

MCD's growth in FCF depends on the success of refranchising, which depends on the selection and integration of capable third-parties. If these efforts are not successful, financial results could be adversely affected.

Competitive marketplace:

The fast food industry is highly competitive and includes many non-traditional market participants such as convenience stores, grocery stores, and coffee shops. It can be expected to remain highly competitive, and results may be impacted by new or continuing actions of competitors, which may have short- or long-term effects.

Pricing and marketing:

McDonald's results depend on the impact of pricing, promotional and marketing plans across MCD's system, and the ability to adjust these plans to respond quickly and effectively to evolving customer preferences. Existing or future pricing strategies are expected to continue to be important components of MCD's business strategy; however, they may not be successful and could negatively impact sales and margins.

Supply chain interruptions:

Supply chain management is key to ensuring reliable and sufficient product supply. Supply chain interruptions, including shortages and transportation issues, and price increases can adversely affect MCD, its suppliers, and its franchisees.

Loss of brand identity:

Brand value is based in part on consumer perceptions. Those perceptions are affected by a variety of factors, including the nutritional content and preparation of MCD's food, the ingredients used, and business practices. Consumer acceptance of MCD's offerings is subject to change for a variety of reasons, and some changes can occur rapidly. For example, nutritional, health and other scientific studies and conclusions, which constantly evolve and may have contradictory implications, drive popular opinion, litigation, and regulation in ways that affect the fast food industry.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – High

Relatively few barriers exist to enter the fast food industry. Capital requirements are low and advanced technology is not necessary for entrance. Shifts in consumer tastes also allow for new market participants.

Threat of Substitutes – Very High

Fast food and fast casual restaurants are a prevalent fixture in every community throughout the developed world. Today's consumers have a wide variety of choices between a myriad of different cuisines with no switching costs.

Supplier Power – Moderate

Suppliers have greater leverage over restaurants at the beginning of their life-cycles. However, supplier power decreases as restaurants grow and mature due to being able to tap a greater diversification of suppliers, which allows restaurants to switch at low costs.

Buyer Power – Very High

Consumers have a great amount of power over restaurants. Countless substitutes exist with no cost of switching between brands. There is little incentive for consumers to be loyal to specific brands, because differences in value-oriented deals are marginal.

Intensity of Competition – Very High

Many large franchises compete for market share throughout the world. They are often located in direct proximity to each other, and aggressively discount prices to draw in higher guest counts. Other firms react accordingly, and margins narrow as a result.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High operating margins High brand recognition Large global network	Over expansion Lack of control in affiliates Lack of new locations
Opportunities	**Threats**
Mobile app expansion Delivery expansion Broaden consumer appeal	Loss of brand identity Changing consumer tastes Rising minimum wage

Appendix 3: Income Statement

Income Statement (in millions)							
Items	2014	2015	2016	2017	2018E	2019E	2020E
Company-Operated Sales	18,169	16,488	15,295	12,719	9,968	8,955	8,833
Franchised Revenues	9,272	8,925	9,327	10,102	11,060	11,640	12,059
Net Revenue	**$27,441**	**$25,413**	**$24,622**	**$22,820**	**$21,028**	**$20,596**	**$20,891**
Company-Operated Costs	15,288	13,977	12,699	10,410	8,210	7,319	7,218
Franchised Occupancy Expenses	1,697	1,647	1,718	1,790	1,968	2,078	2,153
Total Direct Costs	**16,986**	**15,624**	**14,417**	**12,200**	**10,179**	**9,397**	**9,371**
Company-Operated Gross Margin	2,881	2,511	2,596	2,309	1,757	1,637	1,614
Franchised Gross Margin	7,575	7,278	7,609	8,312	9,091	9,562	9,906
Gross Profit	**10,456**	**9,789**	**10,205**	**10,621**	**10,849**	**11,199**	**11,520**
Operating Expenses:							
SG&A and other	2,507	2,595	2,454	1,126	1,742	1,771	1,811
Earnings before interest & tax	7,948	7,194	7,751	9,495	9,106	9,427	9,709
Interest expense	576	638	885	921	1,035	1,122	1,180
Earnings before tax	7,372	6,556	6,866	8,574	8,071	8,306	8,529
Taxes	2,614	2,026	2,180	3,381	2,078	2,159	2,218
Net operating profit after tax	4,758	4,529	4,687	5,192	5,993	6,146	6,312
Net Income	**$4,758**	**$4,529**	**$4,687**	**$5,192**	**$5,993**	**$6,146**	**$6,312**
Basic Shares	981	939	854	807	776	750	724
Earnings per share	$4.85	$4.82	$5.49	$6.43	$7.72	$8.19	$8.72
Dividends per share	$3.28	$3.44	$3.58	$3.83	$4.19	$4.73	$5.18

Appendix 4: Balance Sheet

Balance Sheet (in millions)							
Items	2014	2015	2016	2017	2018	2019	2020
Assets							
Cash	2,078	7,686	1,223	2,464	2,128	2,636	1,378
Operating assets ex cash	2,108	1,958	3,625	2,863	2,523	2,471	2,507
Total current assets	4,186	9,643	4,849	5,327	4,651	5,108	3,885
Net Fixed Assets	30,096	28,296	26,175	28,477	30,039	29,422	29,845
Total assets	*$34,281*	*$37,939*	*$31,024*	*$33,804*	*$34,690*	*$34,530*	*$33,730*
Liabilities and Stockholders' Equity							
Current Liabilities	2,748	2,950	2,696	2,891	2,734	2,677	2,716
Short-term and long-term debt	$14,990	$24,122	$25,879	$29,536	$32,736	$34,736	$36,236
Other liabilities	3,690	3,778	4,653	4,645	4,745	4,845	4,945
Equity	12,853	7,088	(2,204)	(3,268)	(5,525)	(7,728)	(10,167)
Total liabilities and equity	*$34,281*	*$37,939*	*$31,024*	*$33,804*	*$34,690*	*$34,530*	*$33,730*

Appendix 5: Sales Forecast

Sales (in millions)							
Items	2014	2015	2016	2017	2018E	2019E	2020E
Sales	**27,441**	**25,413**	**24,622**	**22,820**	**21,028**	**20,596**	**20,891**
Growth		*-7.4%*	*-3.1%*	*-7.3%*	*-7.9%*	*-2.1%*	*1.4%*
Company-Operated	$18,169	$16,488	$15,295	$12,719	$9,968	$8,955	$8,833
Growth		*-9.3%*	*-7.2%*	*-16.8%*	*-21.6%*	*-10.2%*	*-1.4%*
Franchised Revenues	9,272	8,925	9,327	10,102	11,060	11,640	12,059
Growth		*-3.7%*	*4.5%*	*8.3%*	*9.5%*	*5.3%*	*3.6%*
U.S.	**8,651**	**8,559**	**8,253**	**8,006**	**7,604**	**7,272**	**7,288**
Growth		*-1.1%*	*-3.6%*	*-3.0%*	*-5.0%*	*-4.4%*	*0.2%*
% of sales	*31.5%*	*33.7%*	*33.5%*	*35.1%*	*36.2%*	*35.3%*	*34.9%*
Company Operated Sales	4,351	4,198	3,743	3,260	2,625	2,074	2,012
Growth		*-3.5%*	*-10.9%*	*-12.9%*	*-19.5%*	*-21.0%*	*-3.0%*
Franchised Revenues	4,300	4,361	4,510	4,746	4,979	5,198	5,276
Growth		*1.4%*	*3.4%*	*5.2%*	*4.9%*	*4.4%*	*1.5%*
International Lead Markets	**8,545**	**7,615**	**7,223**	**7,340**	**7,648**	**7,482**	**7,637**
Growth		*-10.9%*	*-5.1%*	*1.6%*	*4.2%*	*-2.2%*	*2.1%*
% of sales	*31.1%*	*30.0%*	*29.3%*	*32.2%*	*36.4%*	*2.0%*	*36.6%*
Company Operated Sales	5,443	4,798	4,279	4,080	3,980	3,662	3,625
Growth		*-11.8%*	*-10.8%*	*-4.6%*	*-2.5%*	*-8.0%*	*-1.0%*
Franchised Revenues	3,102	2,817	2,945	3,260	3,669	3,821	4,012
Growth		*-9.2%*	*4.6%*	*10.7%*	*12.5%*	*4.1%*	*5.0%*
High Growth Markets	**6,845**	**6,173**	**6,161**	**5,533**	**3,986**	**4,020**	**4,131**
Growth		*-9.8%*	*-0.2%*	*-10.2%*	*-28.0%*	*0.9%*	*2.7%*
% of sales	*24.9%*	*24.3%*	*25.0%*	*24.2%*	*19.0%*	*19.5%*	*19.8%*
Company Operated Sales	6,072	5,442	5,378	4,592	2,815	2,652	2,626
Growth		*-10.4%*	*-1.2%*	*-14.6%*	*-38.7%*	*-5.8%*	*-1.0%*
Franchised Revenues	774	731	783	942	1,171	1,368	1,505
Growth		*-5.5%*	*7.0%*	*20.3%*	*24.3%*	*16.8%*	*10.0%*
Foundational Markets & Corporate	**3,401**	**3,066**	**2,985**	**1,941**	**1,789**	**1,821**	**1,836**
Growth		*-9.8%*	*-2.7%*	*-35.0%*	*-7.8%*	*1.8%*	*0.8%*
% of sales	*12.4%*	*12.1%*	*12.1%*	*8.5%*	*8.5%*	*8.8%*	*8.8%*
Company Operated Sales	2,304	2,050	1,896	787	548	567	570
Growth		*-11.0%*	*-7.5%*	*-58.5%*	*-30.4%*	*3.5%*	*0.5%*
Franchised Revenues	1,097	1,016	1,089	1,154	1,241	1,253	1,266
Growth		*-7.4%*	*7.2%*	*5.9%*	*7.6%*	*1.0%*	*1.0%*

Appendix 6: Ratios

Ratios	2014	2015	2016	2017	2018E	2019E	2020E
Profitability							
Gross margin	38.1%	38.5%	41.4%	46.5%	51.6%	54.4%	55.1%
Operating (EBIT) margin	29.0%	28.3%	31.5%	41.6%	43.3%	45.8%	46.5%
Net profit margin	17.3%	17.8%	19.0%	22.8%	28.5%	29.8%	30.2%
Activity							
NFA (gross) turnover		0.87	0.90	0.84	0.72	0.69	0.70
Total asset turnover		0.70	0.71	0.70	0.61	0.60	0.61
Liquidity							
Op asset / op liab	1.52	3.27	1.80	1.84	1.70	1.91	1.43
NOWC Percent of sales		16.0%	18.0%	10.1%	10.4%	10.6%	8.6%
Solvency							
Debt to assets	43.7%	63.6%	83.4%	87.4%	94.4%	100.6%	107.4%
Debt to equity	116.6%	340.3%	-1174.2%	-903.8%	-592.6%	-449.5%	-356.4%
Other liab to assets	10.8%	10.0%	15.0%	13.7%	13.7%	14.0%	14.7%
Total debt to assets	54.5%	73.5%	98.4%	101.1%	108.0%	114.6%	122.1%
Total liabilities to assets	62.5%	81.3%	107.1%	109.7%	115.9%	122.4%	130.1%
Debt to EBIT	1.89	3.35	3.34	3.11	3.59	3.68	3.73
EBIT/interest	13.79	11.27	8.76	10.31	8.80	8.40	8.23
Debt to total net op capital	47.5%	68.9%	91.4%	95.5%	102.4%	109.1%	116.8%
ROIC							
NOPAT to sales	18.7%	19.6%	21.5%	25.2%	32.2%	33.9%	34.4%
Sales to NWC		(31.12)	(769.43)	50.62	(177.09)	(98.96)	(100.71)
Sales to NFA		0.87	0.90	0.84	0.72	0.69	0.70
Sales to IC ex cash		0.90	0.91	0.82	0.72	0.70	0.71
Total ROIC ex cash		17.5%	19.4%	20.7%	23.2%	23.6%	24.4%
NOPAT to sales	18.7%	19.6%	21.5%	25.2%	32.2%	33.9%	34.4%
Sales to NOWC		6.25	5.57	9.95	9.66	9.47	11.61
Sales to NFA		0.87	0.90	0.84	0.72	0.69	0.70
Sales to IC		0.76	0.78	0.77	0.67	0.65	0.66
Total ROIC		14.9%	16.7%	19.4%	21.5%	21.9%	22.9%
NOPAT to sales	18.7%	19.6%	21.5%	25.2%	32.2%	33.9%	34.4%
Sales to EOY NWC	(42.86)	(25.59)	26.51	(838.99)	(100.00)	(100.00)	(100.00)
Sales to EOY NFA	0.91	0.90	0.94	0.80	0.70	0.70	0.70
Sales to EOY IC ex cash	0.93	0.93	0.91	0.80	0.70	0.70	0.70
Total ROIC using EOY IC ex cash	17.4%	18.2%	19.5%	20.2%	22.7%	23.9%	24.2%
NOPAT to sales	18.7%	19.6%	21.5%	25.2%	32.2%	33.9%	34.4%
Sales to EOY NOWC	19.09	3.80	11.44	9.37	10.97	8.47	17.86
Sales to EOY NFA	0.91	0.90	0.94	0.80	0.70	0.70	0.70
Sales to EOY IC	0.87	0.73	0.87	0.74	0.66	0.65	0.67
Total ROIC using EOY IC	16.3%	14.2%	18.7%	18.6%	21.2%	21.9%	23.2%
EBIT / sales		28.3%	31.5%	41.6%	43.3%	45.8%	46.5%
Sales / avg assets		0.70	0.71	0.70	0.61	0.60	0.61
EBT / EBIT		91.1%	88.6%	90.3%	88.6%	88.1%	87.8%
Net income /EBT		69.1%	68.3%	60.6%	74.3%	74.0%	74.0%
ROA		12.5%	13.6%	16.0%	17.5%	17.8%	18.5%
Payout Ratio		71.3%	65.3%	59.5%	54.2%	57.8%	59.4%
Retention Ratio		28.7%	34.7%	40.5%	45.8%	42.2%	40.6%
Sustainable Growth Rate		13.0%	66.7%	-76.9%	-62.4%	-39.2%	-28.6%

Appendix 7: 3-stage DCF Model

	First Stage		Second Stage				
	2019	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Sales Growth	*-2.1%*	*1.4%*	*2.0%*	*3.0%*	*3.0%*	*2.0%*	*2.0%*
NOPAT / S	*33.9%*	*34.4%*	*35.0%*	*34.0%*	*33.0%*	*32.0%*	*31.0%*
S / NOWC	*8.47*	*17.86*	*16.09*	*14.32*	*12.55*	*10.77*	*9.00*
S / NFA (EOY)	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*	*0.70*
S / IC (EOY)	*0.65*	*0.67*	*0.67*	*0.67*	*0.66*	*0.66*	*0.65*
ROIC (EOY)	*21.9%*	*23.2%*	*23.5%*	*22.7%*	*21.9%*	*21.0%*	*20.1%*
ROIC (BOY)		*22.6%*	*24.0%*	*23.5%*	*22.7%*	*21.6%*	*20.8%*
Share Growth		*-3.5%*	*-3.0%*	*-3.0%*	*-3.0%*	*-3.0%*	*-3.0%*
Sales	$20,596	$20,891	$21,309	$21,948	$22,607	$23,059	$23,520
NOPAT	$6,976	$7,185	$7,458	$7,462	$7,460	$7,379	$7,291
Growth		*3.0%*	*3.8%*	*0.1%*	*0.0%*	*-1.1%*	*-1.2%*
- Change in NOWC	513	-1261	155	209	269	339	473
NOWC EOY	*2431*	*1169*	*1324*	*1533*	*1802*	*2140*	*2613*
Growth NOWC		*-51.9%*	*13.2%*	*15.8%*	*17.6%*	*18.8%*	*22.1%*
- Chg NFA	-617	423	597	913	941	646	659
NFA EOY	*29,422*	*29,845*	*30,442*	*31,355*	*32,296*	*32,941*	*33,600*
Growth NFA		*1.4%*	*2.0%*	*3.0%*	*3.0%*	*2.0%*	*2.0%*
Total inv in op cap	-104	-838	752	1122	1210	984	1132
Total net op cap	31853	31014	31766	32888	34098	35082	36214
FCFF	$7,080	$8,023	$6,707	$6,341	$6,251	$6,394	$6,160
% of sales	*34.4%*	*38.4%*	*31.5%*	*28.9%*	*27.6%*	*27.7%*	*26.2%*
Growth		*13.3%*	*-16.4%*	*-5.5%*	*-1.4%*	*2.3%*	*-3.7%*
- Interest (1-tax rate)	830	873	891	908	927	945	964
Growth		*5.2%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
+ Net new debt	2000	1500	725	739	754	769	784
Debt	34736	36236	36961	37700	38454	39223	40008
Debt / tot net op capital	*109.1%*	*116.8%*	*116.4%*	*114.6%*	*112.8%*	*111.8%*	*110.5%*
FCFE w debt	$8,250	$8,650	$6,541	$6,171	$6,078	$6,218	$5,980
% of sales	*40.1%*	*41.4%*	*30.7%*	*28.1%*	*26.9%*	*27.0%*	*25.4%*
Growth		*4.8%*	*-24.4%*	*-5.6%*	*-1.5%*	*2.3%*	*-3.8%*
/ No Shares	750.2	723.9	702.2	681.1	660.7	640.9	621.6
FCFE	$11.00	$11.95	$9.31	$9.06	$9.20	$9.70	$9.62
Growth		*8.7%*	*-22.0%*	*-2.7%*	*1.5%*	*5.5%*	*-0.9%*
* Discount factor	0.92	0.85	0.79	0.73	0.67	0.62	0.57
Discounted FCFE	$10.16	$10.19	$7.34	$6.59	$6.18	$6.02	$5.51
Third Stage							
Terminal value P/E							
Net income	$6,146	$6,312	$6,568	$6,554	$6,534	$6,434	$6,327
% of sales	*29.8%*	*30.2%*	*30.8%*	*29.9%*	*28.9%*	*27.9%*	*26.9%*
EPS	$8.19	$8.72	$9.35	$9.62	$9.89	$10.04	$10.18
Growth		*6.4%*	*7.3%*	*2.9%*	*2.8%*	*1.5%*	*1.4%*
Terminal P/E							22.00
* Terminal EPS							$10.18
Terminal value							$223.93
* Discount factor							0.57
Discounted terminal value							$128.35

Summary

First stage	$20.35	Present value of first 2 year cash flow	
Second stage	$31.65	Present value of year 3-7 cash flow	
Third stage	$128.35	Present value of terminal value P/E	
Value (P/E)	**$180.35**	= value at beg of fiscal yr	2019

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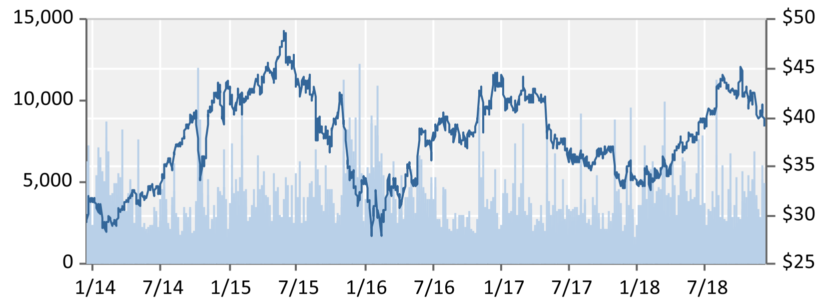
Analyst: Lucas Volpe

Food Processing and Commodities Trading

Archer Daniels Midland

Recommendation	BUY
Target (today's value)	$53
Current Price	$44.55
52 week range	$39.28 - $52.06



Source: FactSet Prices

Share Data	
Ticker:	ADM
Market Cap. (Billion):	$24.98
Inside Ownership	0.4%
Inst. Ownership	78.8%
Beta	0.93
Dividend Yield	3.01%
Payout Ratio	33.0%
Cons. Long-Term Growth Rate	3.3%

Summary: I recommend a "Buy" rating with a target price of $53. ADM has an opportunity to dramatically improve efficiencies, increase margins through acquisitions in international markets, and commodity prices are expected to raise. The stock is undervalued based on a three-stage DCF model and undervalued based on a relative valuation approach.

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$62.35	$60.83	$65.19	$69.23	$71.99
Gr %	-9.1%	-2.4%	7.2%	6.2%	4.0%
Cons	-	-	$65.14	$67.31	$67.69
EPS					
Year	$2.09	$2.24	$3.54	$3.73	$3.87
Gr %	-15.8%	7.2%	58.4%	5.4%	3.8%
Cons	-	-	$3.53	$3.68	$3.79

Key Drivers:

- Population Growth: The current growth rate of the population is nearly 1%, with an estimated 10 billion people by 2050. With a rise in wealth and fewer people living in poverty, the demand for food will continue to increase.
- Supply/Demand: With nearly 20% of revenue derived from soybeans, ADM will operates with a tight margin. As this is directly correlated with the yearly yield of commodities, ADM strategically hedges uncertainty.
- Mergers & Acquisitions: An estimated 10% of revenue has been obtained through acquisitions. The firm has made 32 acquisitions since 2014, and ADM sees this as a driver for future growth.
- Competition: ADM is under serious pressure from both private and public food processing competitors. With every company seeking the same raw material, ADM is working to improve efficiency in operations to increase profitability.

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	7.3%	9.0%	11.4%	10.4%	10.2%
Industry	8.4%	8.6%	9.6%	9.3%	9.4%
NPM (%)	2.0%	2.6%	3.3%	3.1%	3.1%
Industry	3.0%	3.3%	2.9%	3.5%	4.0%
A. T/O	1.56	1.53	1.64	1.65	1.63
ROA (%)	3.2%	4.0%	5.3%	5.1%	5.2%
Industry	3.6%	3.7%	3.9%	4.1%	4.4%
A/E	2.31	2.18	2.09	2.12	2.04

Valuation	'16	'17	'18E	'19E
P/E	13.8	20.5	11.3	12.6
Industry	39.7	13.9	12.5	14.5
P/S	0.43	0.38	0.38	0.37
P/B	1.52	1.22	1.38	1.2
P/CF	18.3	10.4	12.1	10.5
EV/EBITDA	11.2	10.0	8.9	8.7

Valuation: Using a relative valuation approach, Archer Daniels Midland appears to be undervalued in comparison to the food processing and commodities processing industry. Due to greater precision of inputs, the DCF analysis implies the stock is worth $53. A combination of the approaches suggests that Archer Daniels Midland is valued at $53 and offers great upside to current trading levels.

Performance	Stock	Industry
1 Month	-7.7%	-16.9%
3 Month	-10.5%	-19.3%
YTD	11.2%	2.8%
52-week	6.3%	5.9%
3-year	30.2%	-10.2%

Risks: Threats to the business include the regulatory environment and the competitive marketplace. Foreign currency fluctuations, supply and demand mandates, and a large age distribution in farming all may create adverse conditions for sales.

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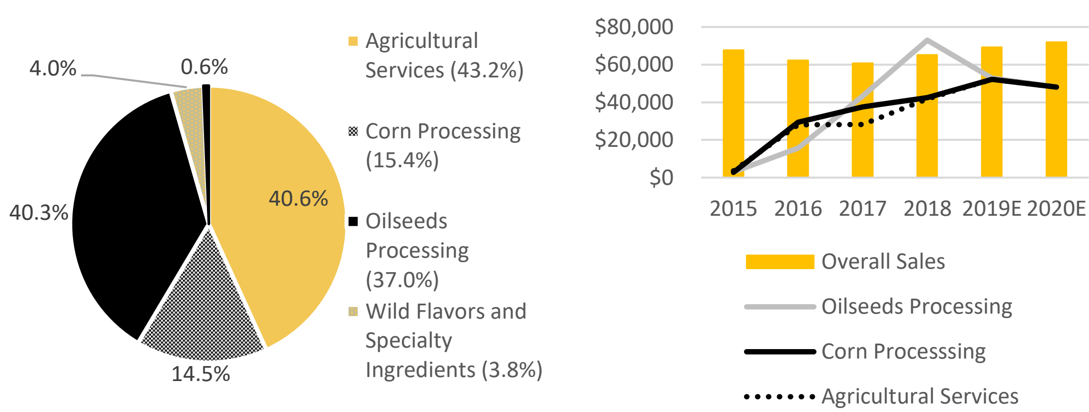
Company Overview

Archer-Daniels-Midland Co. (ADM) processes oilseeds, corn, wheat, cocoa, and other agricultural commodities. The company operates through the following segments: Corn Processing, Oilseeds Processing, Wild Flavors & Specialty Ingredients, and Agricultural Services. The company resells commodities primarily as food and feed ingredients and as raw materials for the agricultural processing industry. Archer-Daniels-Midland was founded in 1902 and is headquartered in Chicago, IL.

- The Oilseeds Processing segment includes activities related to the origination, merchandising, crushing, and further processing of oilseeds such as soybeans and soft seeds (e.g. cottonseed, sunflower seed, canola, rapeseed, and flaxseed) into vegetable oils and protein meals. Revenue was $22.5 billion, or 37% of sales in 2017, and grew 16.5% in 2018 with sales of $26.3 billion.
- The Corn Processing segment engages in corn-wet milling and dry milling activities, and converts corn into sweeteners, starches, and bio-products. Corn processing was responsible for 15.4%, or $9.3 billion, of total sales in 2017 and fell 1.2%. 2018 sales grew 1.2% to $9.4 billion of total sales.
- The Wild Flavors and Specialty Ingredients segment manufactures, sells, and distributes specialty products including natural flavor ingredients, flavor systems, natural colors, proteins, emulsifiers, soluble fiber, polyols, hydrocolloids, natural health and nutrition products, other specialty food, and feed ingredients. This segment was added in 2015 and is the smallest of the four. In 2017, sales totaled $2.3 billion or 3.8% of total revenue and declined 4.7%. In 2018, sales totaled $2.6 billion, growing 12.9%.
- The Agricultural Services segment utilizes its extensive United States grain elevator and global transportation network to buy, store, clean, and transport agricultural commodities, such as oilseeds, corn, wheat, milo, oats, rice, and barley. This segment services is the largest with $26.2 billion of sales (43.2% of total sales), and declined 6% in 2017. In 2018, sales remained stagnate, with minimal sales growth of 0.9% to $26.4 billion.

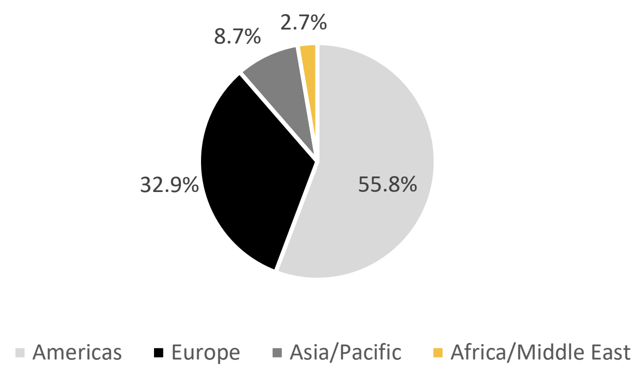
Figure 1 below shows the relationship of total sales to each segment. Figure 2 provides the growth rate in sales per segment. To note, the Wild Flavors and Specialty Ingredients segmented was added in 2015, where it has seen 0.82% and -4.93% growth in 2016 and 2017, respectively.

Figures 1 and 2: 2017 ADM Revenue Allocation (left) and 2015-2020E Total Sales/Segment Growth Rate (right)



Source: Company Report, FactSet

Figure 3: ADM 2017 Regional Revenue Exposure



Source: Company Report, FactSet

2017 generated $60,828 million in revenue and 2018 is expected to be up 7.2%. The Americas were 55.8% of sales with 45.9% originating from the United States. Europe was the second largest. Within Europe, Switzerland and Germany were the largest source of revenue accounting for 23.2% and 7.5% of total revenue, while Asia/Pacific and Africa/Middle East booked a combined 11.4%.

Business/Industry Drivers

Archer Daniels Midland is integrated in many facets of the global economy; however, the most important drivers for the firm are:

1) Population Growth and Life Expectancy
2) Supply/Demand
3) Mergers & Acquisitions
4) Project Readiness

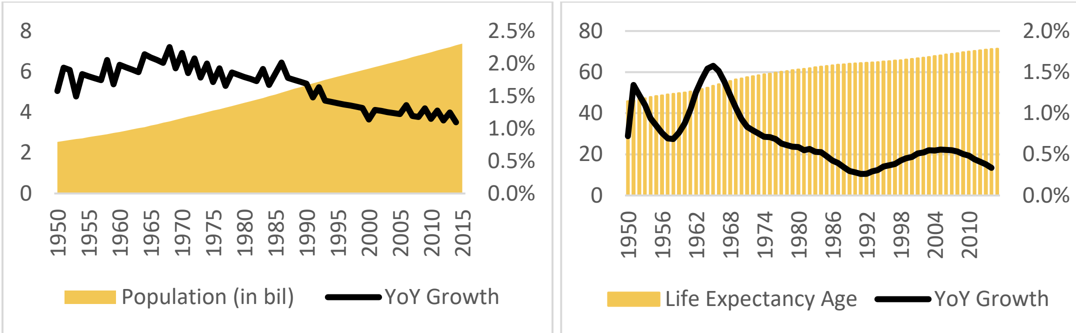
<u>Population Growth and Life Expectancy</u>

ADM seeks to monetize from the growing population.

ADM operates in 170 countries across the world and facilitates aiding and feeding the 7.4 billion people living on it. The 20th century saw the largest increase in population growth, spiking nearly 300% from 1950 to 2000. By year 2050, the world's population is projected to be approximately just under 10 billion people.

Figure 4 shows that the population growth rate has been trending downward for decades. The current growth rate is about 1%, which we could assume is the long-term demand for food. Part of the reason for positive growth is that people are living longer (Figure 5), which suggests rising wealth and fewer people are living in poverty. This may be related to people having fewer children.

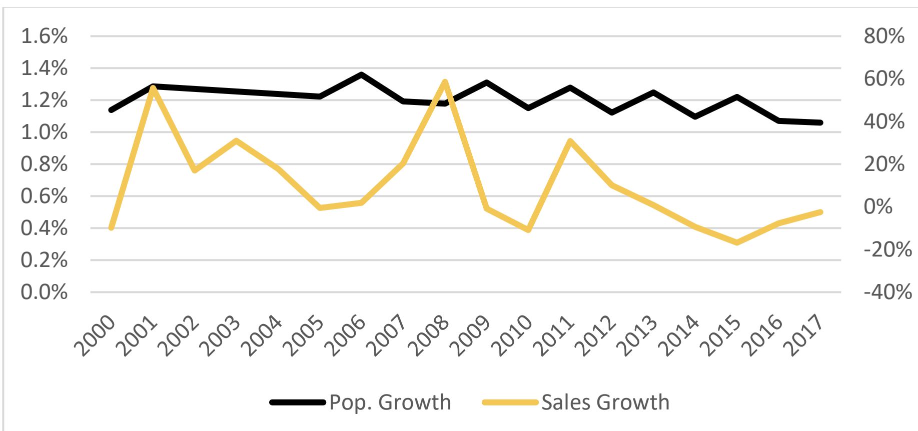
Figure 4 and 5: World Population (left) and Population Growth Rate (right) / World Age Expectancy (left) and Expectancy Growth Rate (right)



Source: Our World In Data.Org

ADM prides itself as the "supermarket to the world." In the 1980s through the 1990s, ADM's sales rose 16.7% annually compared to a 3.2% annual population growth rate. In the 2000s, the relationship changed in large part from a corporate-wide expansion into ethanol production which coincided with large swings in the ethanol trading price.

Figure 6: World Population growth (left) and ADM Sales growth (right)



Source: Our World In Date.Org/Company Report, FactSet

Supply and Demand

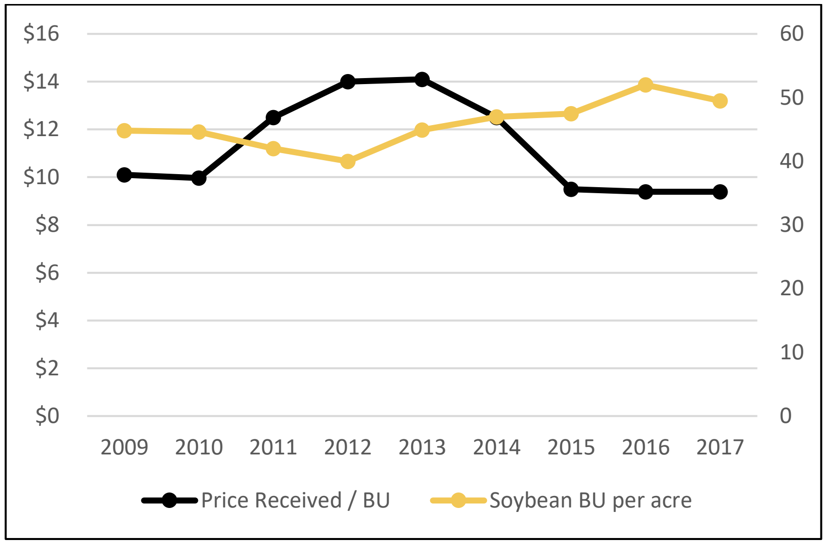
As ADM is one of the world's leading producers of food and beverages ingredients, the company is price sensitive to commodity prices. The Oilseed Processing segment was 43.7% of total gross revenue for ADM in the fiscal year 2017. By product level, soybean and soybean meal alone represented around 20% of ADM's revenue. Moreover, soybean origination, merchandising, crushing, and further processing accounted for 17% of revenue in fiscal year 2017. Thus, ADM's gross margin is tied to the price per bushel of soybean.

The price per bushel is highly dependent on the yield of the crop. According to the USDA, soybeans have maintained a constant 273 billion acres since 2012. Over this same period, the soybean yield, or the seed generation per acre by planted acre, has averaged just 17.2%. With the expected average of 17 plants from every 100 planted growing successfully, ADM operates with tight margins.

In a year when the yield, or supply, decreases, the price of soybeans rises. Figure 8 shows that this has a negative impact on the company's total gross margins. Most notably, from 2011 to 2014, ADM's gross margin fell as the price per bushel of soybean rose.

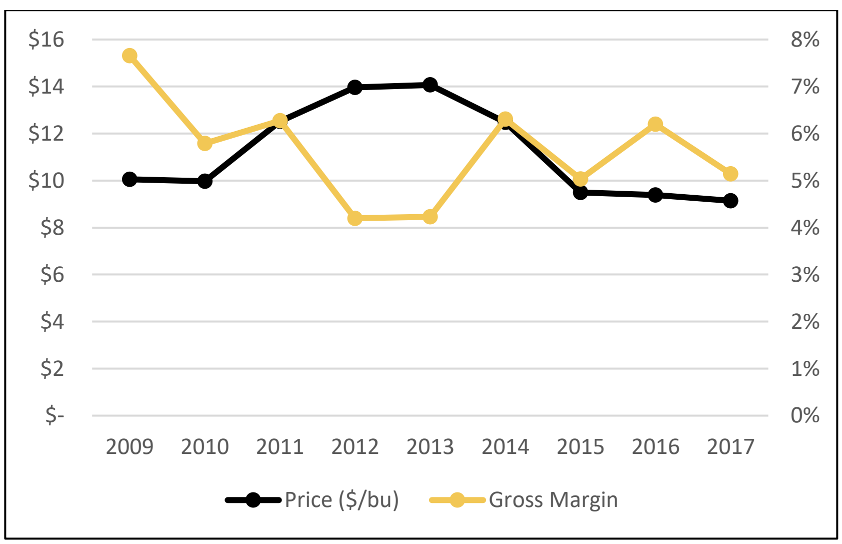
There is an inverse relationship between price received and yield.

Figure 7: 2009-2017 Price Received per Bushel (left) vs Soybean Origination Bushel per acre (right)



Source: United States Department of Agriculture

Figure 8: 2009-2017 ADM Gross Margin (right) vs Soybean Prices per Bushel (left)



Source: United States Department of Agriculture, Company Report, FactSet

Likewise, when ADM pays less per bushel of soybean, the gross margin increases. For instance, in 2016 to 2017 when the price per bushel fell from 2013 levels, gross margin rose about 1%. The relationship shows that ADM cannot fully pass along cost increases to customers; however, the increases that are implemented may be kept when prices decline.

Mergers & Acquisitions

As a mature company, ADM has recently undergone strategic initiatives to grow. Since new CEO Juan Luciano took office in 2014, ADM has seen the greatest number of acquisitions since the founding of the company (Figure 10). ADM engaged in 40 acquisitions from 1990 to 2010; while from 2014 through today, ADM has completed 32 acquisitions.

In 2019, ADM acquires Florida Chemical Company for $175 million to expand the Specialty Ingredients segment.

Most notably, in 2017, ADM acquired Crosswind Industries Inc. to aide in the development of the specialty ingredients and private label foods to grow this segment and adapt to consumer tastes and preferences. Next, ADM acquired an 89% controlling interest in Biopolis SL, a leading provider of microbial technology, and formed a partnership in conjunction with Mayo Clinic to research digestive health to procure natural ingredients and reposition toward this new consumer preference. Further, to expand regional sales in Africa/Middle East, ADM acquired a 51% stake in Industries Centers to create ADM Israel to specialize in the import and distribution of agricultural feed products. Further, in early 2018, ADM targeted Bunge as a potential merger. Bunge is the second largest per market share in the industry, facing antitrust laws as a form of monopoly. However, with no merger deal confirmed, ADM has a forward-looking strategy to digitize and standardize the entire industry. This focus would be on execution and supply chain processes by optimizing resources to better suit the farmer and the customer.

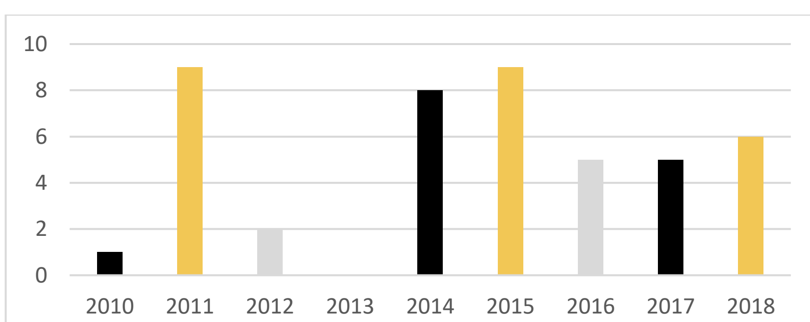
ADM's existing customer base contributed to 89.6% of all sales since 2014. The remaining 10.4% of revenue has been engineered through acquisitions (Figure 9). ADM's growth strategy is concentrated on geographic areas and segments where it has minimal exposure. With this at hand, I expect acquired sales through acquisitions to continue to be a main growth driver for revenue. Free cash flows, discussed later, is still positive and growing even after acquisitions and without debt.

Figure 9: ADM organic vs acquisition sales

Year	2014A	2015A	2016A	2017A	2018E
Sales	81,201	67,702	62,346	60,828	65,188
Sales growth rate		-17%	-8%	-2%	7%
Acquired sales	2,556	5,165	20,583	342	1,923
Acquired sales prior year where show up in next year		2,407	677	493	555
Cumulative acquired growth	2,556	10,128	31,388	32,223	34,701
Sales without acquistion	78,645	57,574	30,958	28,605	30,035
Cumulative organic growth		(21,071)	(47,687)	(50,040)	(46,893)
Organic growth rate		-27%	46%	80%	5%
% of sales growth from acquisitions		-93%	-193%	-181%	-249%
% of sales growth from organic growth		193%	293%	281%	349%

Source: Company Reports, IMCP

Figure 10: ADM Acquisitions as Buyer per year 2010-2018



Source: Company Reports, FactSet

Further, management is expected to continue to seek additions in its portfolio to reduce volatility of earnings and drive long-term returns. Through expansion into foreign markets, ADM may see pressure on delivering products logistically. However, ADM has an existing infrastructure to sustain this growth. The firm has a globally interconnected transportation network of 1,800 barges, 12,300 rail cars, 290 trucks, 1,300 trailers, 100 boats, and 10 oceangoing vessels.

Project Readiness

Increased efficiencies will seek to positively impact the bottom line.

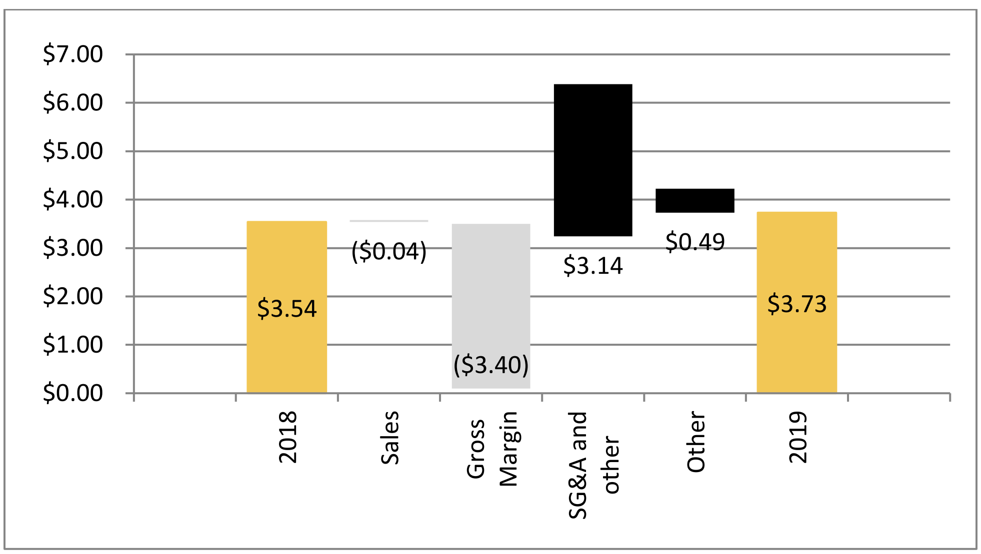
ADM has undergone a massive internal investigation to seek and identify opportunities for improvements throughout the organization. As executive management has made Project Readiness a key driver for efficiency growth in earnings calls, the information gathered may be more insightful than previously thought. For any organization, employee feedback is crucial for day to day activity. Recognizing this, Readiness asked for the employee participation in surveys to offer feedback that would create a long-term sustainable and successful work environment.

To distinguish operational improvements, Readiness observed the data gathered from employees on a variety of technological, practical, and even human characteristic traits. With this positive feedback and ongoing testing, ADM has illustrated operational flaws in capabilities, work environment, coordination, innovation, and a company-wide vision. Knowing this, ADM will be able to invest in areas the feedback said it was lacking, both operationally and personally. With these implementations, ADM will look to cut costs, stream-line duties, and offer external customers and partnerships a competitive edge.

Financial Analysis

I anticipate EPS to grow to $3.73 in FY 2019. A slower expected revenue growth rate should decrease earnings by $0.04. A decline in gross margin of $3.40 will negatively affect EPS. I anticipate that SG&A as a percent of sales will fall and boost EPS by $3.14 driven by lower costs to sell and deliver products. Finally, I forecast an increase in EPS of $0.49 that is driven by a more favorable tax rate.

Figure 11: Quantification of 2019 EPS drivers

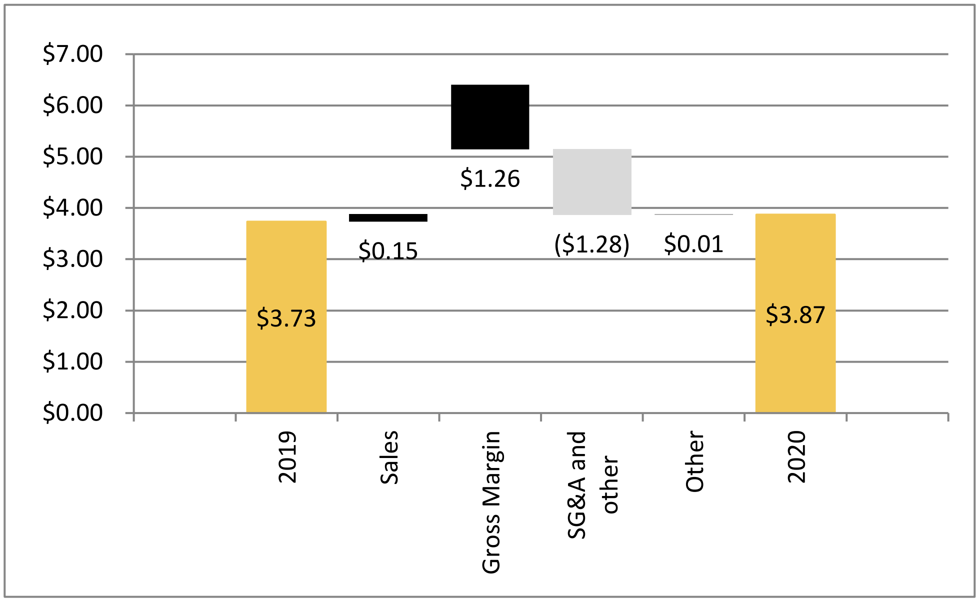


My EPS is $0.04 more optimistic in 2019 compared to consensus.

Source: Company Reports, IMCP

I expect 2020 EPS to increase $0.14 to $3.87. ADM will gain $0.15 in EPS from increased sales in the US and International markets. I anticipate an expansion of $1.26 in gross margin driven by higher commodity prices and demand. SG&A will rise as a percent of sales and cause EPS to fall. This is driven by higher costs from logistical transportation. A $0.01 gain from derivative and hedging contracts against expected higher commodity prices should help earnings as well.

Figure 12: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

Per FactSet, I am slightly more optimistic than consensus estimates for 2019 with EPS of $3.73 vs $3.69, and revenue of $69,230 vs. $67,310. In 2020, I anticipate stronger results will be driven by current acquisitions producing significant sales growth, hedges against higher commodity prices paying off, and increased efficiencies from capital investment in current facilities. The 2020 consensus for EPS and sales stands at $3.80 and $67,688, respectively; versus. my EPS and sales projections of $3.87 and $71,999, respectively.

Revenues

ADM's revenue has sharply decreased from 2014 levels. However, I expect a revenue increase in Fiscal Year (FY) 2019 and FY2020 mainly driven by strong crop yields and an expanding geographic outreach. Higher exports volumes for US commodities, improving transportation infrastructure domestically and internationally, and a relief from the rising dollar could help revenues.

Figure 13: Growth statistics 2015-2020E

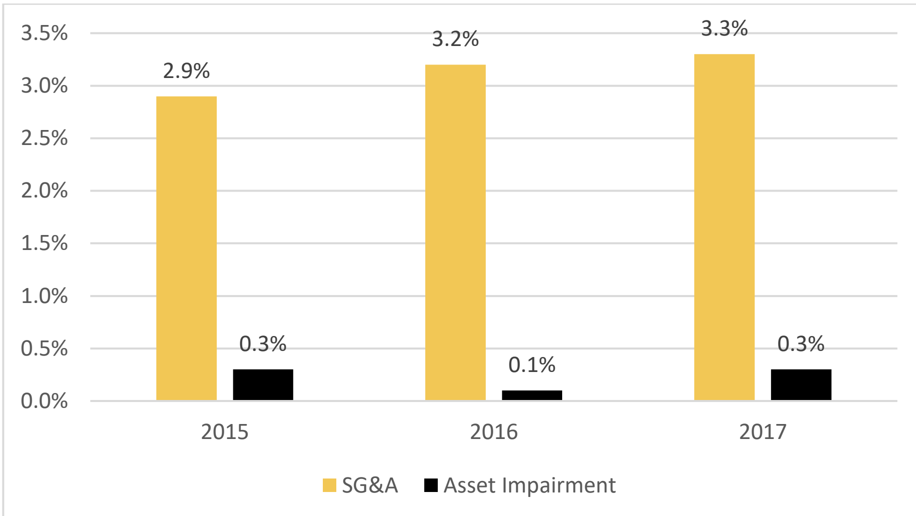
Growth Statistics	2015	2016	2017	2018	2019E	2020E
Sales	-16.6%	-7.9%	-2.4%	7.2%	6.2%	4.0%
Direct Costs	-15.9%	-9.1%	-1.3%	6.0%	6.5%	4.1%
Gross Margin	-28.6%	13.7%	-19.1%	28.2%	1.8%	2.2%
SG&A and other	-31.7%	83.0%	-25.7%	-19.5%	-15.1%	-16.8%
EBIT	-27.0%	-20.2%	-11.7%	73.3%	9.2%	8.7%

Source: Company Reports

Operating Income and Margins

Operating expenses are composed primarily of cost of products sold, SG&A expense and other expenses such as asset impairment. I believe ADM will materialize savings from Project Readiness where operating facilities are being improved and a shift from a normal employment base to contracted employees in factories. Further, a potential acquisition of Bunge, which is second in market share behind ADM's 52.3% market share in 2017, should ease margin risk headed into the future.

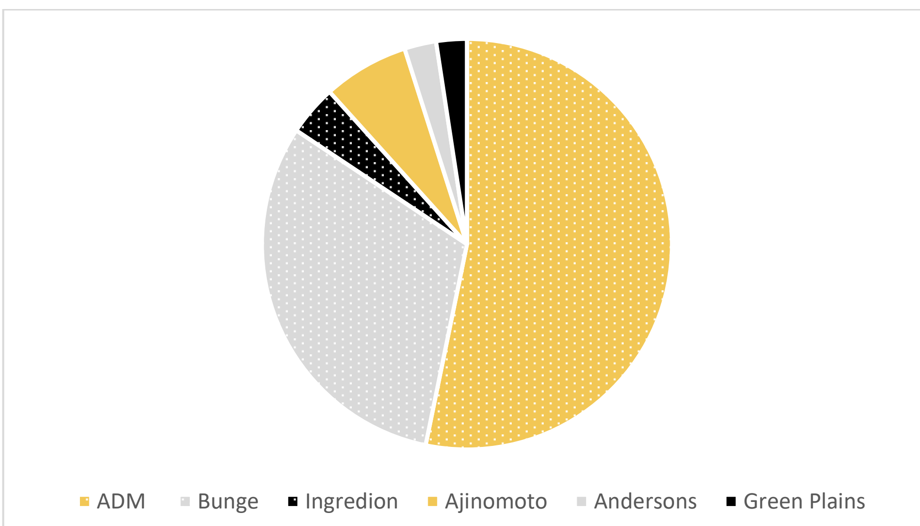
Figure 14: Composition of 2015-2017 operating expenses as a percent of sales



Source: Company Reports

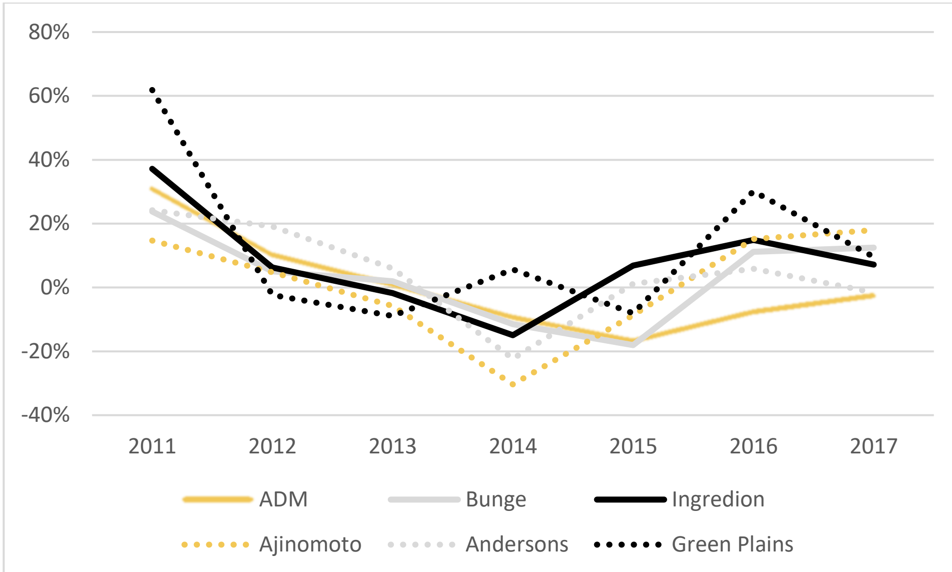
Figure 15: ADM market share vs Comps, 2017

ADM had a 52% market share in 2017.



Source: Company Reports, FactSet

Figure 16: ADM Market Share growth vs. Comps, 2011-2017



Source: Company Reports, FactSet

Figure 17: ADM Selected financial data, 2015-2020E

Operating margin is expected to rise and then stay consistent.

Selected Financial Data	2015	2016	2017	2018	2019E	2020E
Sales	$67,702	$62,346	$60,828	$65,188	$69,230	$71,999
Direct Costs	64,300	58,478	57,699	61,176	65,145	67,823
Gross Income	3,402	3,868	3,129	4,012	4,085	4,176
Gross Margin	5.0%	6.2%	5.1%	6.2%	5.9%	5.8%
Operating Expenses	1,118	2,046	1,520	1,223	1,038	864
EBIT	2,284	1,822	1,609	2,789	3,046	3,312
Operating Margin	3.4%	2.9%	2.6%	4.3%	4.4%	4.6%

Source: Company Reports, IMCP

Return on Equity

ADM has had a consistent return on equity (ROE) from 2015-2017, with a rise in 2018 due to an increase in margins and asset utilization. Changes in return on asset (ROA) and ROE have been greatly impacted by changes in the earnings before interest and taxes (EBIT) margin which bottomed in 2016. In 2019, margins, asset turns, and the interest burden will improve, but the tax situation worsens, so ROA falls modestly. 2020 is similar to 2019. Leverage is expected to decline; although, ADM recently announced a share repurchase program.

Figure 18: ROE breakdown, 2015 – 2020E

5-stage Du Pont	2015	2016	2017	2018	2019E	2020E
EBIT / Sales	3.4%	2.9%	2.6%	4.3%	4.4%	4.6%
Sales / avg assets	1.61	1.56	1.53	1.64	1.68	1.65
EBT / EBIT	86.5%	97.0%	79.5%	87.1%	88.6%	88.8%
Net income / EBT	77.8%	69.8%	99.5%	87.4%	76.0%	76.0%
ROA	3.7%	3.1%	3.2%	5.3%	5.0%	5.1%
Avg assets / avg equity	2.24	2.28	2.25	2.13	2.11	2.08
ROE	8.2%	7.0%	7.2%	11.4%	10.5%	10.7%

Source: Company Reports, IMCP

Free Cash Flow

ADM's free cash flow greatly decreased in 2015 due to a big drop in working capital, and has remained relatively consistent since. M&A activity has kept net fixed assets (NFA) rising, but net operating profit after taxes (NOPAT) more than covers the cost and free cash flow to equity (FCFE) is about $1 billion. $1.3 billion in debt comes due in the next five years, but this should be not be an issue. Share buybacks are about $0.7 billion per annum with 13.8 million shares remaining that may be repurchased under the program and dividends are $0.8 billion per year, or 33% of earnings.

Figure 19: ADM Free Cash Flow without Cash and Debt, 2014-2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$2,147	$1,778	$1,271	$1,600	$2,120	$2,315	$2,517
Growth		*-17.2%*	*-28.5%*	*25.9%*	*32.5%*	*9.2%*	*8.7%*
NWC*	9,327	7,414	7,253	6,551	6,902	7,892	7,488
Net fixed assets	17,969	18,328	18,724	20,038	20,199	21,451	22,500
Total net operating capital*	$27,296	$25,742	$25,977	$26,589	$27,101	$29,344	$29,988
Growth		*-5.7%*	*0.9%*	*2.4%*	*1.9%*	*8.3%*	*2.2%*
- Change in NWC*		(1,913)	(161)	(702)	351	990	(404)
- Change in NFA		359	396	1,314	161	1,252	1,048
FCFF*		$3,332	$1,036	$988	$ 1,608	$1,058	$1,873
Growth			*-68.9%*	*-4.6%*	*62.7%*	*-34.2%*	*77.0%*
- After-tax interest expense	231	240	38	328	274	264	282
FCFE**		$3,092	$998	$660	$1,334	$794	$1,592
Growth			*-67.7%*	*-33.9%*	*102.1%*	*-40.5%*	*100.5%*
FCFF per share		$5.37	$1.75	$1.74	$2.85	$1.61	$3.36
Growth			-67.3%	-1.0%	65.3%	-43.9%	108.5%
FCFE per share		$ 4.98	$ 1.69	$ 1.16	$ 2.38	$ 1.42	$ 2.85
Growth			-66.1%	-31.3%	105.4%	-40.4%	100.8%

Source: Company Reports, IMCP

Valuation

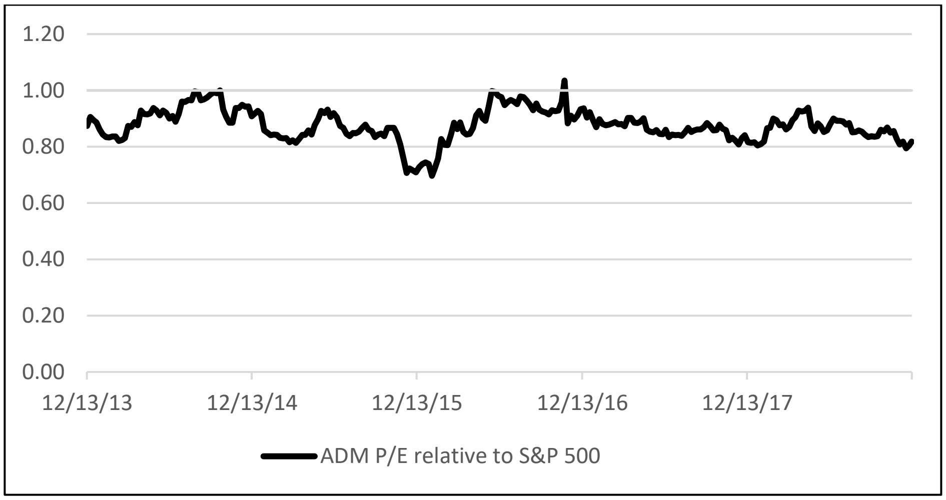
ADM was valued using multiples and a 3-stage discounting cash flow (DCF) model. Based on earnings multiples and the DCF model, the stock is worth $53. Relative valuation shows ADM to be slightly undervalued based on its fundamentals versus those of its peers in the food processing and commodities trading industry. With a scenario analysis I value the stock at $53.

Trading History

ADM has maintained a below average P/E relative to the S&P 500.

ADM is currently trading at a five year price to earnings (P/E) low relative to the S&P 500. This is the result of recent sales and earnings depression and the fact that most analysts believe that growth will be slow. ADM's current next twelve month (NTM) P/E is at 11.2 compared to its five year average of 16.9. While I expect a rebound following FY 2018, ADM should remain at a discount to the broader market and its peers.

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



Source: FactSet

Assuming the firm maintains a 12 NTM P/E at the end of 2019, it should trade at $46.44 by the end of the year.

- Price = P/E x EPS = 12 x $3.87 = $46.44

Discounting $46.44 back to today at a 8.3% cost of equity (explained in Discounted Cash Flow section) yields a price of $42.58. Given ADM's potential for earnings growth, increasing market share and continued profitability, this valuation prices in these future expectations but still seems to be an unusually low valuation.

Relative Valuation

ADM is currently trading at a P/E much lower than its peers, with a P/E TTM of 17.9 compared to an average of 32.9. This may be due to the fact that ADM held up better than others as commodity prices fell and has less room to recover. Although, the average is driven by two outliers as the median P/E TTM is 18.5. ADM's EV/EBIT trades at 25.7 compared to the peer median of 13.8. However, ADM's price to book (P/B) and price to sales (P/S) trading multiples of 1.38 and 0.43, respectively, are at a discount compared to the peer average of 1.52 and 0.53, respectively, even though the firm has above average ROE and profit margin.

Figure 21: ADM comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
ADM	Archer Dainels Midland	$46.84	$26,261	1.8	(2.4)	(7.1)	6.9	14.7	16.9		38.5%	-16.2%	58.7%	5.4%	3.8%		0.63	35.4%	B+	2.91%	33.0%
BG	Bunge	$59.33	$8,370	4.0	(5.1)	(8.7)	(15.1)	(11.6)	(11.6)	50.2	224.1%	-58.5%	137.6%	12.6%	2.9%		1.72	87.9%		3.36%	114.6%
INGR	Ingredion	$105.14	$7,434	0.7	1.6	4.0	(5.3)	(24.7)	(24.8)	5.1	21.4%	8.0%	-9.4%	9.3%	5.6%	5.2%	0.23	55.0%	A-	2.32%	39.5%
AJINY	Ajinomoto	$17.12	$8,993	(1.0)	6.5	0.6	(8.5)	(6.6)	(9.1)	4.6		7.8%	31.9%	-3.3%	17.0%	1.5%	0.02	48.9%		1.36%	26.4%
ANDE	Andersons	$33.56	$950	1.5	(8.5)	(17.8)	0.0	6.7	7.7		-35.4%	-382.9%	-232.8%	42.9%	9.1%	-12.5%	1.25	54.1%	B+	2.00%	21.4%
GPRE	Green Plains	$16.98	$703	4.5	(5.7)	(4.3)	(18.4)	0.8	0.8		-476.4%	425.0%	-196.6%	-102.1%	2100.0%	35.4%	1.22	85.3%	B	2.95%	274.4%
Average			$8,785	1.9	(2.3)	(5.5)	(6.7)	(3.5)	(3.3)	20.0	-45.6%	-2.8%	-35.1%	-5.9%	356.4%	7.4%	0.84	61.1%		2.49%	84.9%
Median			$7,902	1.6	(3.7)	(5.7)	(6.9)	(2.9)	(4.2)	5.1	21.4%	-4.2%	11.3%	7.3%	7.4%	3.3%	0.93	54.5%		2.62%	36.2%
SPX	S&P 500 INDEX	$2,790		1.1	2.5	(3.8)	2.0	5.6	4.4			3.2%	20.5%	7.3%	10.1%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
ADM	http://www.adm.com	10.4%	1.38	13.8	20.5	11.3	17.9	12.9	12.6	12.1	3.3%	0.43	3.2%	6.6%	25.7	11.8	12.1	3.9%	1.4%	-7.3%	$33.91
BG	http://www.bunge.com	11.6%	1.50	14.6	37.2	14.6	35.4	10.9	11.4	11.1	1.4%	0.18	1.8%	1.5%	-64.3	6.7	9.7	2.9%	3.1%	-5.6%	$39.62
INGR	http://www.ingredion.com	17.4%	2.62	13.4	16.2	20.0	17.1	14.1	13.8	13.0	8.4%	1.27	13.5%	11.5%	13.2	8.8	10.4	0.6%	4.5%	-2.2%	$40.10
AJINY	http://www.ajinomoto.co.jp	8.9%	1.67	37.4	29.3	20.7	19.2		19.5	16.6	4.6%	0.86	7.8%	6.4%	14.5	9.2				-6.0%	$10.28
ANDE	http://www.andersonsinc.com	5.4%	1.18	77.1	-38.5	20.2	10.9	16.9	15.3	14.0	1.2%	0.26	1.4%	3.5%	52.8	8.5	8.4	2.9%		-6.8%	$28.48
GPRE	http://www.gpreinc.com	-6.5%	0.78	81.8	18.9	-11.9	97.1	-25.8	566.0	25.7	-1.5%	0.18	-1.1%	3.6%	-139.5	8.1	6.3	-5.2%		0.5%	$21.70
Average		7.9%	1.52	39.7	13.9	12.5	32.9	5.8	106.4	15.4	2.9%	0.53	4.4%	5.5%	-16.3	8.9	9.4	1.0%	3.0%	-4.6%	
Median		9.6%	1.44	26.0	19.7	17.3	18.5	12.9	14.5	13.5	2.3%	0.34	2.5%	5.0%	13.8	8.6	9.7	2.9%	3.1%	-5.8%	
spx	S&P 500 INDEX			16.2	17.2	17.1			16.6	15.1											

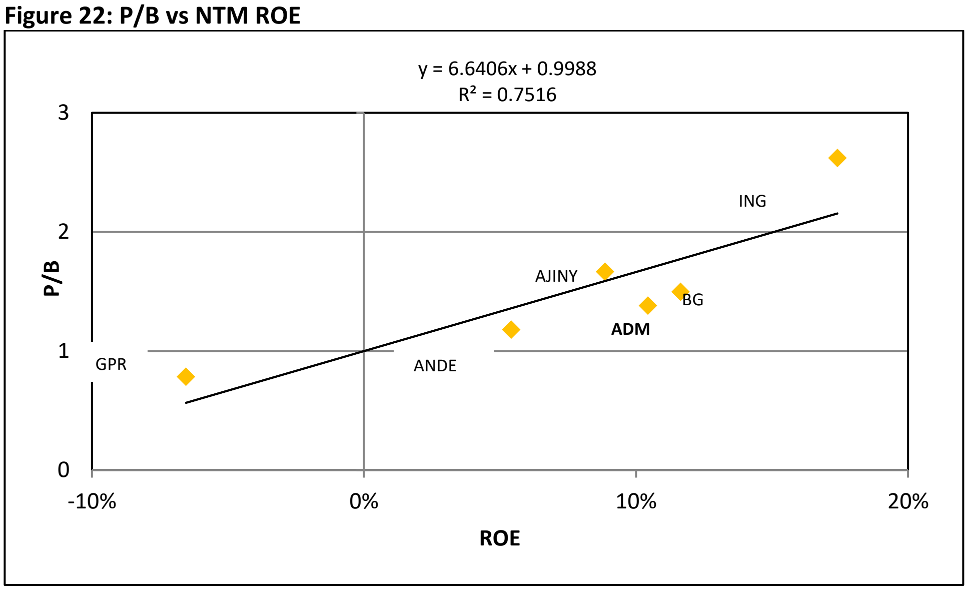
Source: FactSet, IMCP

A more thorough analysis of P/B and ROE is shown in figure 22. The calculated R-squared of the regression indicates that just over 75% of ADM and sampled firm's P/B is explained by its NTM ROE. To note, all comparable companies are included on this regression. According to this measure, ADM is slightly undervalued with below average P/B and ROE ratios.

- Estimated P/B = Estimated 2020 ROE (10.7%) x 6.64 + .9988 = 1.7
- Target Price = Estimated P/B (1.7) x 2019E BVPS (36.2) = $61.8

Discounting back to the present at an 8.3% cost of equity leads to a target price of $56.6 using this metric. This valuation seems slightly above my thesis of Archer Daniels Midland.

Figure 22: P/B vs NTM ROE



Source: FactSet, IMCP

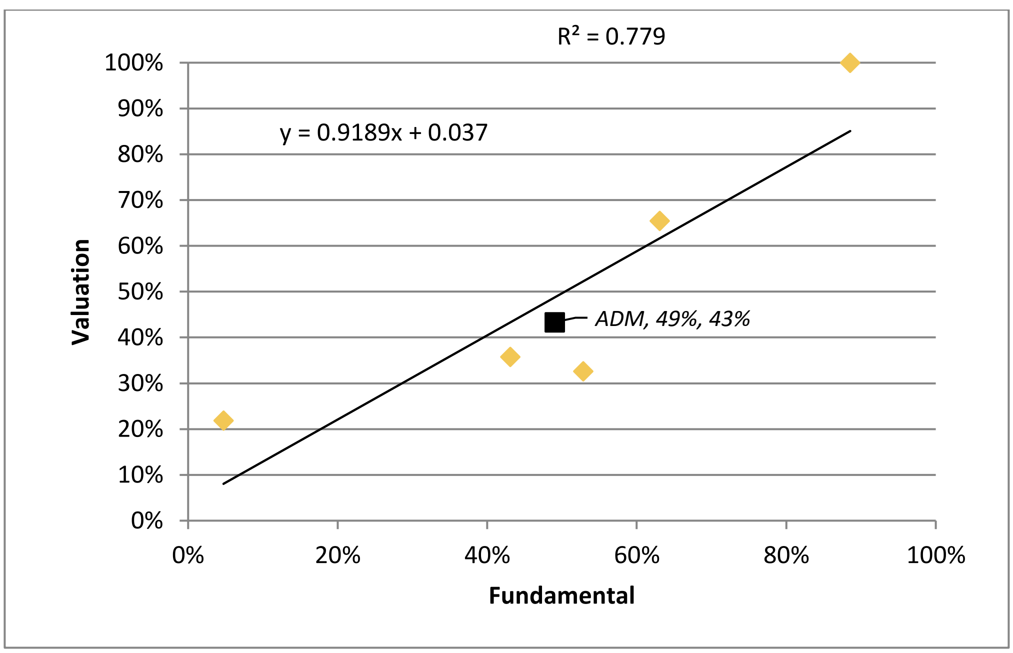
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. A 25% equal weighting of 1/Payout, 2018 ROE, 2018 Net Profit Margin (NPM), and STM sales growth were compared to a 50% equal weight composite or P/B and P/S valuation. The regression line had an R-squared of 0.78. Given that ADM is slightly below the line, it shows that it is inexpensive compared to peers based on fundamentals.

Figure 23: Composite valuation, % of max

				Fundamentals				Valuation	
			Weight	25%	25%	25%	25%	50%	50%
				1/	2018	2018	Sales Growth		
Ticker	Name	Fund	Value	Payout	ROE	NPM	STM	P/B	P/S
ADM	Archer Daniels Midland	49%	43%	65%	60%	39%	33%	53%	34%
BG	Bunge	43%	36%	19%	67%	17%	70%	57%	14%
INGR	Ingredion	89%	100%	54%	100%	100%	100%	100%	100%
AJINY	Ajinomoto	63%	65%	81%	51%	54%	66%	64%	67%
ANDE	Andersons	53%	33%	100%	31%	14%	66%	45%	20%
GPRE	Green Plains	5%	22%	8%	-38%	-18%	66%	30%	14%

Source: FactSet, IMCP

Figure 24: Composite valuation, % of range



Source: FactSet, IMCP

<u>Discounted Cash Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 8.3% 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 3.1%.
- A ten year beta of 0.85 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 8.3% (3.10 + 0.85 (10.0 – 3.10)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be -$0.34 and $2.85, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $2.26 per share. Thus, stage one of this discounted cash flow analysis contributes $2.09 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 8.3% cost of equity. I assume 2.0% sales growth from 2021-2025 to account for inflation. The ratio of NWC to sales will remain at 2020 levels, but NFA turnover will rise from 3.2 in 2020 to 3.4 in 2025 as a result of improvements in operations. Also, the NOPAT margin is expected to rise to 4.5% in 2025 from 3.5% in 2020 due to infrastructure efficiencies.

Figure 25: FCFE and discounted FCFE, 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$ (0.34)	$ 2.85	$ 3.54	$ 3.89	$ 4.25	$ 4.63	$ 5.02
Disconted FCFE	$ (0.31)	$ 2.39	$ 2.72	$ 2.76	$ 2.76	$ 2.77	$ 2.76

Added together, these discounted cash flows total $23.85, with the second stage equaling $13.79.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $3.76 in 2019 to $5.65 in 2025.

Figure 26: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$ 3.76	$ 3.87	$ 4.11	$ 4.47	$ 4.85	$ 5.24	$ 5.65

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. ADM historically trades at a discount to the market P/E given the mature state of the company and relatively stable industry. The stock normally trades at 15% below the S&P 500. If we assume the market reverts to normal (15-16) by 2025, ADM should trade at a P/E of about 13. Therefore, a P/E ratio of 12 is assumed at the end of ADM's terminal year. I believe this measurement is reasonable; however, given that ADM has recently had a systematic pullback in its stock price and recent acquisitions have not materialized, the stock could likely trade below this multiple in the future.

Given the assumed terminal earnings per share of $5.65 and a price to earnings ratio of 12, a terminal value of $53.06 per share is calculated. Using the 8.3% cost of equity, this number is discounted back to a present value of $48.65.

Total Present Value – Given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $53.06 is calculated (2.09 + 13.79 + 37.19). Given ADM's current price of $44.55, this model indicates that the stock is undervalued.

Scenario Analysis

Considering two different scenarios for my DCF model, I calculated an intrinsic value representing an outlook for a bull and bear case.

For my bull case, I assumed a 3.0% average sales growth for FY 2019-2025, a 4.1% average NOPAT margin, a beta of 0.70, and a terminal P/E of 14.0. With these increases, the DCF model calculates an intrinsic value of $64.85. As this is a bull case, assumptions would be made that ADM gains regulatory approval to acquire its current target of Bunge, it expands in the human health and nutrition portfolio to satisfy consumer trends, and energy costs such as oil remain at reduced levels.

For my bear case, I assumed a 1.0% average sales growth for FY 2019-2025, as well as a 3.7% average NOPAT margin, a beta of 0.9, and a terminal P/E of 10. These assumptions would decrease my intrinsic value to $43.30. These inputs would imply competition within the industry accelerates where target acquisitions fail, a production shortage due to processing interruptions, and potential commodity market prices weakening.

Figure 27: Scenario analysis

(2019 - 2025)	Base Case	Bull Case	Bear Case
7yr. avg. sales growth	2%	3%	1%
7 yr. avg. NOPAT margin	3.9%	4.1%	3.7%
Beta	0.85	0.8	0.9
Terminal P/E	12	14	10
DCF Value	$53.06	$64.85	$43.30

Business Risks

Although I have many reasons to be bullish about Archer Daniels Midland, there are several reasons why the outlook may not be as positive.

Exposure to currency fluctuations:

As sourced in the company 10-K, ADM has consolidated subsidiaries in more than 80 countries. ADM has entered into foreign currency contracts to hedge against exchange risks with the greatest contracts concentrated in the euro, British pound, Canadian dollar, and the Brazilian real. Historically, currency translations into dollars have been worth $9.4 billion yearly. Continued strength of the dollar against these currencies may impact imports and exports of goods and contribute to potential losses.

Competitive marketplace:

ADM's marketplace is highly competitive. Many of the products ADM produces are sensitive to competitive pricing since they produce similar products. Any decrease in a price that ADM does not match or counter could threaten sales and negatively impact margins.

Exposure to commodity fluctuations:

The pricing of commodities is highly dependent on the farmer's crop yield. Factors such as weather conditions, governmental programs, disease, and technology advancements could all influence yields positively or negatively. With this unpredictability, ADM faces continued uncertainty to supply and demand of commodities which ultimately hits its bottom-line.

Regulatory Environment:

Government regulation and trade agreements that impact ADM vary in their taxation, tariffs, duties, and import and export restrictions. Also, ADM's raw material products are all subject to volume restrictions, energy consumption mandates, and product safety rules which can adversely affect the company.

Beginning Farmers and Age Distribution:

The United States Department of Agriculture states more than 31% of farm operators are age 65 or older. Only 17% of beginning farms are operated by a person aged 35 or younger with most farm sizes considered small. This is a dramatic risk to ADM as experience and acreage is leaving the industry.

Appendix 1: SWOT Analysis

Strengths	Weaknesses
Global Outreach Economies of scale Acquistion power	Unpredictable commodity prices Low profit margin Low R&D and staffing cuts
Opportunities	**Threats**
International Expansion Sceince and analytics Alternative products	GMO vs Non-GMO crop Tarriffs on exports Regulation

Appendix 2: Porter's 5 Forces

Threat of New Entrants – Very Low

While the barriers to entry into the agriculture and food processing industry are not extensive, it would require significant capital, R&D, and infrastructure to produce large volumes. Expansive regulatory requirements also deter new entrants.

Threat of Substitutes – Relatively Low

ADM relies on its extensive transportation system to deliver raw materials around the globe. The firm's products are commodities that people need so the threat of substitution is low.

Supplier Power - Low

The supplier to ADM is the farmer. While commodity prices can be volatile due to supply and demand factors, farmers depend on ADM to purchase, store, and procure the crops year after year. With this mutual dependence, supplier power is low.

Buyer Power – Moderate

ADM's products are integrated into nearly every product on grocery shelves. With numerous purchasers of its products, ADM streamlines its sales and production process over super-regions across the world. Although, buyers have many choices and can easily switch.

Intensity of Competition – High

ADM operates in a very competitive industry, where competition is seeking the same raw material. Once the commodity is attained, profitability is realized by the processing efficiency of the business. ADM has seen drastic cuts in this operating lines, and has goals to continue increasing operational efficiency. Further, ADM is seeking to collaborate and even acquire competitors. Until this is complete, ADM will continue to face significant competition.

Appendix 3: Sales Forecast

Sales (in mil)	2014	2015	2016	2017	2018	2019E	2020E
Sales	$81,201	$67,702	$62,346	$60,828	$65,188	$69,230	$71,999
Growth		-16.6%	-7.9%	-2.4%	7.2%	6.2%	4.0%
Agricultural Services	$36,288	$29,682	$27,893	$26,246	$26,482	$28,097	$29,221
Growth		-18.2%	-6.0%	-5.9%	0.9%	6.1%	4.0%
% of sales	44.7%	43.8%	44.7%	43.1%	40.6%	40.6%	40.6%
Corn Processing	$12,282	$9,995	$9,466	$9,352	$9,462	$10,039	$10,441
Growth		-18.6%	-5.3%	-1.2%	1.2%	6.1%	4.0%
% of sales	15.1%	14.8%	15.2%	15.4%	14.5%	2.0%	14.5%
Oilseeds Processing	$30,933	$25,217	$22,152	$22,530	$26,258	$27,928	$29,045
Growth		-18.5%	-12.2%	1.7%	16.5%	6.4%	4.0%
% of sales	38.1%	37.2%	35.5%	37.0%	40.3%	40.3%	6.0%
Wild Flavors & Specialty	$1,368	$2,407	$2,427	$2,313	$2,611	$2,768	$2,878
Growth		76.0%	0.8%	-4.7%	12.9%	6.0%	4.0%
% of sales	1.7%	3.6%	3.9%	3.8%	4.0%	4.0%	4.0%
Other	$330	$401	$408	$387	$375	$398	$413
Growth		21.5%	1.7%	-5.1%	-3.1%	6.0%	4.0%
% of sales	0.4%	0.6%	0.7%	0.6%	0.6%	0.6%	0.6%

Appendix 4: Income Statement

Income Statement (in mil)	2014	2015	2016	2017	2018	2019E	2020E
Sales	$81,201	$67,702	$62,346	$60,828	$65,188	$69,230	$71,999
Direct costs	76,433	64,300	58,478	57,699	61,176	65,145	67,823
Gross Margin	4,768	3,402	3,868	3,129	4,012	4,085	4,176
SG&A and other	1,638	1,118	2,046	1,520	1,223	1,038	864
EBIT	3,130	2,284	1,822	1,609	2,789	3,046	3,312
Interest	337	308	55	330	360	347	70
EBT	2,793	1,976	1,767	1,279	2,429	2,677	2,941
Taxes	877	438	534	7	306	648	706
Income	1,916	1,538	1,233	1,272	2,123	2,051	2,236
Other	-	-	-	-	-	-	-
Net income	1,916	1,538	1,233	1,272	2,123	2,051	2,236
Dividends	624	687	701	730	755	770	780
Basic Shares	656	621	591	569	560	559	558
EPS	$2.92	$2.48	$2.09	$2.24	$3.54	$3.73	$3.87
DPS	$0.95	$1.11	$1.19	$1.28	$1.35	$1.38	$1.40

Appendix 5: Balance Sheets

Balance Sheet (in millions)	2014	2015	2016	2017	2018	2019E	2020E
ASSETS							
Cash	1,099	910	619	804	915	970	890
Operating assets ex cash	24,929	20,919	20,426	19,121	18,550	20,561	20,808
Operating assets	26,028	21,829	21,045	19,925	19,465	21,531	21,698
Operating liabilities	15,602	13,505	13,173	12,570	11,648	12,669	13,320
NOWC	10,426	8,324	7,872	7,355	7,817	8,862	8,378
NOWC ex cash (NWC)	9,327	7,414	7,253	6,551	6,902	7,892	7,488
NFA	17,969	18,328	18,724	20,038	20,199	21,451	22,500
Invested capital	$28,395	$26,652	$26,596	$27,393	$28,016	$30,314	$30,878
Marketable securities		-	-	-	-	-	-
Total Assets	$43,997	$40,157	$39,769	$39,963	$39,664	$42,983	$44,197
LIABILITIES AND SHAREHOLDER EQUITY							
Short-term and long-term debt	$5,636	$5,865	$6,658	$7,480	$7,262	$7,522	$7,297
Other libabilities	3,129	2,872	2,757	1,591	1,754	2,561	1,944
Debt/equity- like securities	-	-	-	-	-	-	-
Equity	19,630	17,915	17,181	18,322	19,000	20,231	21,637
Total supplied capital	28,395	26,652	26,596	27,393	28,016	30,314	30,878
Total liabilities and equity	$43,997	$40,157	$39,769	$39,963	$39,664	$42,983	$44,197

Appendix 6: Ratios

Ratios	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	5.9%	5.0%	6.2%	5.1%	6.2%	5.9%	5.8%
Operating (EBIT) margin	3.9%	3.4%	2.9%	2.6%	4.3%	4.4%	4.6%
Net profit margin	2.4%	2.3%	2.0%	2.1%	3.3%	3.0%	3.1%
Activity							
NFA (gross) turnover		3.73	3.37	3.14	3.24	3.32	3.28
Total asset turnover		1.61	1.56	1.53	1.64	1.68	1.65
Liquidity							
Op asset / op liab	1.67	1.62	1.60	1.59	1.67	1.70	1.63
NOWC Percent of sales		13.8%	13.0%	12.5%	11.6%	12.0%	12.0%
Solvency							
Debt to assets	12.8%	14.6%	16.7%	18.7%	18.3%	17.5%	16.5%
Debt to equity	28.7%	32.7%	38.8%	40.8%	38.2%	37.2%	33.7%
Other liab to assets	7.1%	7.2%	6.9%	4.0%	4.4%	6.0%	4.4%
Total debt to assets	19.9%	21.8%	23.7%	22.7%	22.7%	23.5%	20.9%
Total liabilities to assets	55.4%	55.4%	56.8%	54.2%	52.1%	52.9%	51.0%
Debt to EBIT	1.80	2.57	3.65	4.65	2.60	2.47	2.20
EBIT/interest	9.29	7.42	33.13	4.88	7.75	8.77	8.94
Debt to total net op capital	19.8%	22.0%	25.0%	27.3%	25.9%	24.8%	23.6%
ROIC							
NOPAT to sales	2.6%	2.6%	2.0%	2.6%	3.3%	3.3%	3.5%
Sales to NWC		8.09	8.50	8.81	9.69	9.36	9.36
Sales to NFA		3.73	3.37	3.14	3.24	3.32	3.28
Sales to IC ex cash		2.55	2.41	2.31	2.43	2.45	2.43
Total ROIC ex cash		6.7%	4.9%	6.1%	7.9%	8.2%	8.5%
NOPAT to sales	2.6%	2.6%	2.0%	2.6%	3.3%	3.3%	3.5%
Sales to NOWC		7.22	7.70	7.99	8.59	8.30	8.35
Sales to NFA		3.73	3.37	3.14	3.24	3.32	3.28
Sales to IC		2.46	2.34	2.25	2.35	2.37	2.35
Total ROIC		6.5%	4.8%	5.9%	7.7%	7.9%	8.2%
NOPAT to sales	2.6%	2.6%	2.0%	2.6%	3.3%	3.3%	3.5%
Sales to EOY NWC	8.71	9.13	8.60	9.29	9.44	8.77	9.62
Sales to EOY NFA	4.52	3.69	3.33	3.04	3.23	3.23	3.20
Sales to EOY IC ex cash	2.97	2.63	2.40	2.29	2.41	2.36	2.40
Total ROIC using EOY IC ex cash	7.9%	6.9%	4.9%	6.0%	7.8%	7.9%	8.4%
NOPAT to sales	2.6%	2.6%	2.0%	2.6%	3.3%	3.3%	3.5%
Sales to EOY NOWC	7.79	8.13	7.92	8.27	8.34	7.81	8.59
Sales to EOY NFA	4.52	3.69	3.33	3.04	3.23	3.23	3.20
Sales to EOY IC	2.86	2.54	2.34	2.22	2.33	2.28	2.33
Total ROIC using EOY IC	7.6%	6.7%	4.8%	5.8%	7.6%	7.6%	8.2%
ROE							
5-stage							
EBIT / sales		3.4%	2.9%	2.6%	4.3%	4.4%	4.6%
Sales / avg assets		1.61	1.56	1.53	1.64	1.68	1.65
EBT / EBIT		86.5%	97.0%	79.5%	87.1%	88.6%	88.8%
Net income /EBT		77.8%	69.8%	99.5%	87.4%	76.0%	76.0%
ROA		3.7%	3.1%	3.2%	5.3%	5.0%	5.1%
Avg assets / avg equity		2.24	2.28	2.25	2.13	2.11	2.08
ROE		8.2%	7.0%	7.2%	11.4%	10.5%	10.7%
3-stage							
Net income / sales		2.3%	2.0%	2.1%	3.3%	3.0%	3.1%
Sales / avg assets		1.61	1.56	1.53	1.64	1.68	1.65
ROA		3.7%	3.1%	3.2%	5.3%	5.0%	5.1%
Avg assets / avg equity		2.24	2.28	2.25	2.13	2.11	2.08
ROE		8.2%	7.0%	7.2%	11.4%	10.5%	10.7%
Payout Ratio		44.7%	56.9%	57.4%	35.6%	37.5%	34.9%
Retention Ratio		55.3%	43.1%	42.6%	64.4%	62.5%	65.1%
Sustainable Growth Rate		4.5%	3.0%	3.1%	7.3%	6.5%	7.0%

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	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
ADM	Archer Dainels Midland	$46.84	$26,261	1.8	(2.4)	(7.1)	6.9	14.7	16.9		38.5%	-16.2%	58.7%	5.4%	3.8%		0.63	35.4%	B+	2.91%	33.0%
BG	Bunge	$59.33	$8,370	4.0	(5.1)	(8.7)	(15.1)	(11.6)	(11.6)	50.2	224.1%	-58.5%	137.6%	12.6%	2.9%		1.72	87.9%		3.36%	114.6%
INGR	Ingredion	$105.14	$7,434	0.7	1.6	4.0	(5.3)	(24.7)	(24.8)	5.1	21.4%	8.0%	-9.4%	9.3%	5.6%	5.2%	0.23	55.0%	A-	2.32%	39.5%
AJINY	Ajinomoto	$17.12	$8,993	(1.0)	6.5	0.6	(8.5)	(6.6)	(9.1)	4.6		7.8%	31.9%	-3.3%	17.0%	1.5%	0.02	48.9%		1.36%	26.4%
ANDE	Andersons	$33.56	$950	1.5	(8.5)	(17.8)	0.0	6.7	7.7		-35.4%	-382.9%	-232.8%	42.9%	9.1%	-12.5%	1.25	54.1%	B+	2.00%	21.4%
GPRE	Green Plains	$16.98	$703	4.5	(5.7)	(4.3)	(18.4)	0.8	0.8		-476.4%	425.0%	-196.6%	-102.1%	2100.0%	35.4%	1.22	85.3%	B	2.95%	274.4%
Average			$8,785	1.9	(2.3)	(5.5)	(6.7)	(3.5)	(3.3)	20.0	-45.6%	-2.8%	-35.1%	-5.9%	356.4%	7.4%	0.84	61.1%		2.49%	84.9%
Median			$7,902	1.6	(3.7)	(5.7)	(6.9)	(2.9)	(4.2)	5.1	21.4%	-4.2%	11.3%	7.3%	7.4%	3.3%	0.93	54.5%		2.62%	36.2%
SPX	S&P 500 INDEX	$2,790		1.1	2.5	(3.8)	2.0	5.6	4.4			3.2%	20.5%	7.3%	10.1%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
ADM	http://www.adm.com	10.4%	1.38	13.8	20.5	11.3	17.9	12.9	12.6	12.1	3.3%	0.43	3.2%	6.6%	25.7	11.8	12.1	3.9%	1.4%	-7.3%	$33.91
BG	http://www.bunge.com	11.6%	1.50	14.6	37.2	14.6	35.4	10.9	11.4	11.1	1.4%	0.18	1.8%	1.5%	-64.3	6.7	9.7	2.9%	3.1%	-5.6%	$39.62
INGR	http://www.ingredion.com	17.4%	2.62	13.4	16.2	20.0	17.1	14.1	13.8	13.0	8.4%	1.27	13.5%	11.5%	13.2	8.8	10.4	0.6%	4.5%	-2.2%	$40.10
AJINY	http://www.ajinomoto.co.jp	8.9%	1.67	37.4	29.3	20.7	19.2		19.5	16.6	4.6%	0.86	7.8%	6.4%	14.5	9.2				-6.0%	$10.28
ANDE	http://www.andersonsinc.com	5.4%	1.18	77.1	-38.5	20.2	10.9	16.9	15.3	14.0	1.2%	0.26	1.4%	3.5%	52.8	8.5	8.4	2.9%		-6.8%	$28.48
GPRE	http://www.gpreinc.com	-6.5%	0.78	81.8	18.9	-11.9	97.1	-25.8	566.0	25.7	-1.5%	0.18	-1.1%	3.6%	-139.5	8.1	6.3	-5.2%		0.5%	$21.70
Average		7.9%	1.52	39.7	13.9	12.5	32.9	5.8	106.4	15.4	2.9%	0.53	4.4%	5.5%	-16.3	8.9	9.4	1.0%	3.0%	-4.6%	
Median		9.6%	1.44	26.0	19.7	17.3	18.5	12.9	14.5	13.5	2.3%	0.34	2.5%	5.0%	13.8	8.6	9.7	2.9%	3.1%	-5.8%	
spx	S&P 500 INDEX			16.2	17.2	17.1			16.6	15.1											

Appendix 8: 3-stage DCF Model

First Stage			Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*6.2%*	*4.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
NOPAT / S	*3.3%*	*3.5%*	*3.5%*	*3.7%*	*3.9%*	*4.1%*	*4.3%*
S / NWC	*8.77*	*9.62*	*9.62*	*9.62*	*9.62*	*9.62*	*9.62*
S / NFA (EOY)	*3.23*	*3.20*	*3.24*	*3.28*	*3.32*	*3.36*	*3.40*
S / IC (EOY)	*2.36*	*2.40*	*2.42*	*2.45*	*2.47*	*2.49*	*2.51*
ROIC (EOY)	*7.9%*	*8.4%*	*8.5%*	*9.1%*	*9.6%*	*10.2%*	*10.8%*
ROIC (BOY)		*8.6%*	*8.6%*	*9.1%*	*9.7%*	*10.3%*	*10.9%*
Share Growth		*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*	*-0.2%*
Sales	$69,230	$71,999	$73,439	$74,908	$76,406	$77,934	$79,493
NOPAT	$2,315	$2,517	$2,570	$2,772	$2,980	$3,195	$3,418
Growth		*8.7%*	*2.1%*	*7.8%*	*7.5%*	*7.2%*	*7.0%*
- Change in NWC	990	-404	146	152	155	158	164
NWC EOY	*7892*	*7488*	*7634*	*7786*	*7941*	*8099*	*8263*
Growth NWC		*-5.1%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*	*2.0%*
- Chg NFA	1252	1048	167	171	176	181	186
NFA EOY	*21,451*	*22,500*	*22,666*	*22,838*	*23,014*	*23,195*	*23,380*
Growth NFA		*4.9%*	*0.7%*	*0.8%*	*0.8%*	*0.8%*	*0.8%*
Total inv in op cap	2243	644	313	323	331	339	350
Total net op cap	29344	29988	30300	30624	30955	31294	31643
FCFF	$72	$1,873	$2,258	$2,448	$2,649	$2,856	$3,068
% of sales	*0.1%*	*2.6%*	*3.1%*	*3.3%*	*3.5%*	*3.7%*	*3.9%*
Growth		*2487.7%*	*20.5%*	*8.4%*	*8.2%*	*7.8%*	*7.4%*
- Interest (1-tax rate)	264	282	284	287	290	293	296
Growth		*6.6%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*	*1.0%*
FCFE w/o debt	($192)	$1,592	$1,973	$2,161	$2,359	$2,563	$2,772
% of sales	*-0.3%*	*2.2%*	*2.7%*	*2.9%*	*3.1%*	*3.3%*	*3.5%*
Growth		*-930.5%*	*24.0%*	*9.5%*	*9.1%*	*8.7%*	*8.1%*
/ No Shares	559.0	557.9	556.8	555.7	554.6	553.5	552.4
FCFE	($0.34)	$2.85	$3.54	$3.89	$4.25	$4.63	$5.02
Growth		*-932.0%*	*24.2%*	*9.7%*	*9.4%*	*8.9%*	*8.4%*
* Discount factor	0.92	0.84	0.77	0.71	0.65	0.60	0.55
Discounted FCFE	($0.31)	$2.40	$2.74	$2.76	$2.77	$2.77	$2.75
Third Stage							
Terminal value P/E							
Net income	$2,051	$2,236	$2,286	$2,484	$2,690	$2,902	$3,122
% of sales	*3.0%*	*3.1%*	*3.1%*	*3.3%*	*3.5%*	*3.7%*	*3.9%*
EPS	$3.76	$3.87	$4.11	$4.47	$4.85	$5.24	$5.65
Growth		*2.9%*	*6.1%*	*8.9%*	*8.5%*	*8.1%*	*7.8%*
Terminal P/E							12.00
* Terminal EPS							$5.65
Terminal value							$67.83
* Discount factor							0.55
Discounted terminal value							$37.19

Summary		
First stage	$2.09	Present value of first 2 year cash flow
Second stage	$13.79	Present value of year 3-7 cash flow
Third stage	$37.19	Present value of terminal value P/E
Value (P/E)	**$53.06**	= value at beg of fiscal yr

Air Freight and Logistics

FedEx Corporation

Recommendation	BUY
Target (today's value)	$294
Current Price	$188.27
52 week range	$184.05 - $274.66

Share Data	
Ticker:	FDX
Market Cap. (Billion):	$59.6
Inside Ownership	7.7%
Inst. Ownership	73.8%
Beta	1.13
Dividend Yield	1.37%
Payout Ratio	12.2%
Cons. Long-Term Growth Rate	5.5%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$50.4	$60.3	$65.5	$71.0	$75.7
Gr %	6.1%	19.8%	8.5%	8.5%	6.6%
Cons	-	-	$65.4	$71.3	$75.2
EPS					
Year	$6.59	$11.25	$17.10	$16.02	$18.46
Gr %	77.9%	70.8%	52.0%	-6.4%	15.3%
Cons	-	-	$17.54	$16.31	$19.77

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	12.6%	20.0%	25.7%	22.4%	21.3%
Industry	45.4%	49.4%	119.6%	37.7%	31.3%
NPM (%)	3.6%	5.0%	7.0%	7.1%	7.4%
Industry	4.4%	4.1%	6.6%	6.2%	6.3%
A. T/O	1.21	1.28	1.30	1.30	1.29
ROA (%)	4.4%	6.3%	9.1%	9.2%	9.5%
Industry	9.2%	8.0%	10.8%	11.1%	11.6%
D/A	30.1%	30.8%	32.6%	32.6%	32.6%

Valuation	'17	'18	'19E	'20E
P/E	27.5	10.7	9.4	8.4
Industry	28.6	14.3	14.0	12.9
P/S	0.9	0.8	0.7	0.6
P/B	3.4	2.6	2.0	1.7
P/CF	11.5	10.7	6.0	5.2
EV/EBIT	11.7	14.2	8.8	7.8

Performance	Stock	Industry
1 Month	-14.3%	-8.0%
3 Month	-25.6%	-19.2%
YTD	-24.6%	-15.8%
52-week	-21.4%	-14.0%
3-year	30.5%	18.4%

Contact: Jonathan Walther
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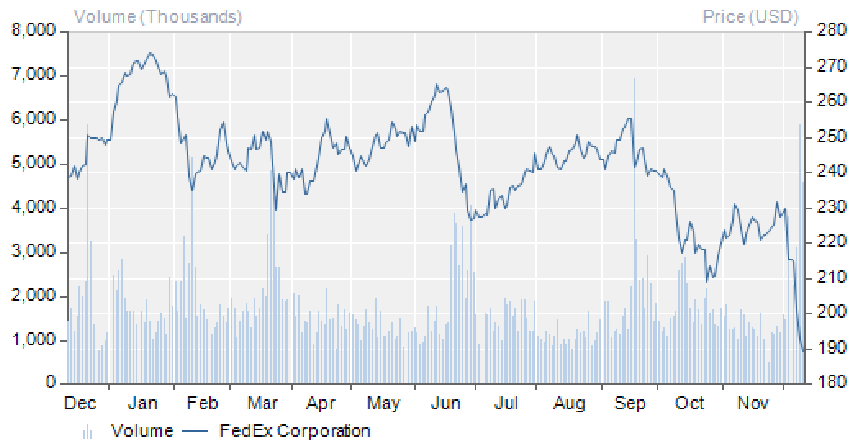


Source: FactSet Prices

Summary: I recommend a buy rating with a target of $294. FDX has an opportunity to improve efficiency and increase margins. I believe FDX is in position to lead the industry in global growth. Additionally, FDX is growing domestic ground and freight services. The stock is undervalued based on relative valuation and DCF analysis.

Key Drivers:

- Global Trade: Over 33% of FDX's revenues comes from international sales. Greater international demand will allow FDX to streamline its supply chain. Global trade will play a huge role in the future growth potential of FDX.
- Jet Fuel and Crude Prices: FDX operates a large-scale supply chain network, connected by a massive fleet of vehicles. It operates one of the largest air fleets in the world.
- Macroeconomic Trends: With global operations, FDX is dependent on overall macroeconomic trends. Consumer confidence, the ISM index, and global GDP growth are drivers of relative performance.
- Government Regulation: FDX is exposed to international laws and regulations. Making sure they are in accordance with all of the regulations is important. Additionally, changes in regulation could prove to be costly.

Valuation: Using a relative valuation approach, FDX appears to be undervalued in comparison to the air freight and logistics industry. DCF analysis suggests the stock is worth $294. A combination of the approaches indicates that FedEx is undervalued, as shares currently trade at $188.

Risks: Threats to the business include the economy, competitive markets, cyber security, acquisition integration risk, and a mature domestic market.

Company Overview

FedEx Corporation (NYSE:FDX) is an American multinational air freight and logistics courier that operates in 220 countries worldwide. FDX employs over 425,000 employees and has been operating since 1971. Headquartered in Memphis, Tennessee, FDX is one of the world's largest air freight and logistics couriers. FedEx Corporation conducts business through the following five main business segments:

FedEx Express – (55.3% of revenue)

FedEx Express segment consists of:

- Domestic and international express shipping and freight delivery,
- International small-packaging ground delivery, and
- International freight delivery.

FedEx Express is the world's largest express transportation company offering time-definite delivery options to more than 220 countries, connecting 99% of the world's GDP producing countries and territories. FDX Express revenues increased 10% in the first quarter of 2019. This segment had a 32.4% growth rate in FY 2017 due to its acqusition of TNT Express. FY 2018 grew at 6.9% and is positioned to grow in the 7% range in FY 2019.

FedEx Ground – (28.1% of revenue)

FedEx Ground segment consists of:

- Small-package delivery services with-in the U.S. and Canada, and
- Day-certain delivery service to any business address in the U.S. and Canada.

FedEx Ground is a leading North American provider of small-package delivery services and has capabilities to deliver to any business or household with in North America. FDX ground service grew 13% in the first quarter of 2019 and its operating income increased 10%. Over the past four years, this segment has grown between 10% and 16%. It is posioned to grow 10% in FY 2019.

FedEx Freight – (10.4% of revenue)

FedEx Freight segment consists of:

- Less-than-truckload (LTL) freight services across all lengths of haul.

FedEx Freight is a leading U.S. provider of LTL freight services. FedEx Freight Priority offers time sensitive shipping when speed is critical to meet customers supply chain needs. FedEx Freight Economy is for when customers can trade time for cost. FedEx Freight also operates in Canada, Mexico, Puerto Rico and the U.S. Virgin Islands. Revenues and operating income rose by 18% and 7% respectively in the first quarter of 2019; primarily due to higher revenue per shipment and average daily shipments. This segment has grown over 10% over the past four years and is positioned to grow in the 10% range for FY 2019 and 2020.

FedEx Services – (2.5% of revenue)

FedEx Services segment consists of:

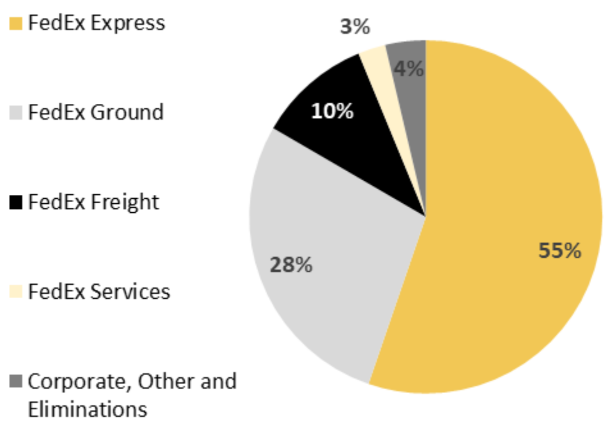
- Sales, marketing, information technology, communications, customer service, technical support, billing and collections services, and
- Certain back-office functions that support the transportation segments.

FedEx Services includes FedEx Office and Print Services, Inc., which provide document and business services and retail access to the package transportation businesses. This segment has grown 2.5% to 3.5% over the past four years. It is positioned to grow in the 3.5% range for FY 2019 and 2020.

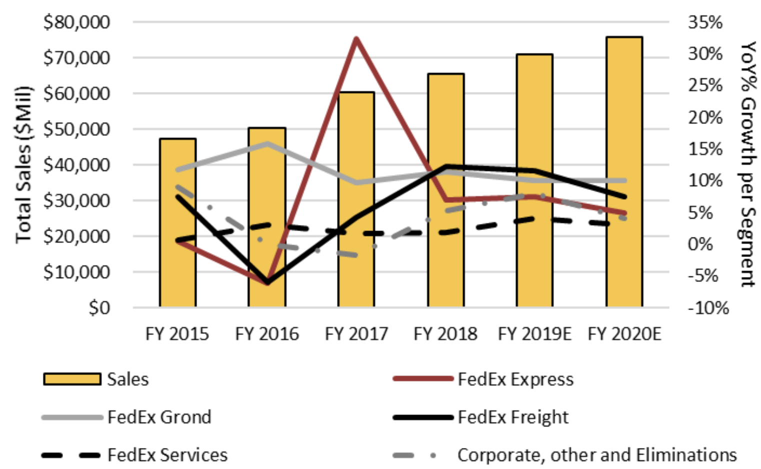
Corporate, Other and Eliminations – (3.7% of revenue)

This segment consists of corporate headquarters, costs for corporate officers, other legal and financial functions and other costs not attributed to our core business. Also included in this segment are the five other smaller segments: FedEx Forward Depots, FedEx Custom Critical, FedEx Supply Chain, FedEx Cross Border, and FedEx Trade Networks Transport & Brokerage. It also includes goodwill and impairment charges. In FY 2018, this segment grew at 5.2% and is positioned to grow more going into the future.

Figures 1 and 2: Revenue Sources for FDX, FY (left) and Revenue history since 2015 (right)



Source: Company reports



Source: Company reports, Factset

FDX is a multinational company with operations worldwide, thus exposing it to vast amount of competition. FDX's lead focus is on the air freight and express shipping segment.

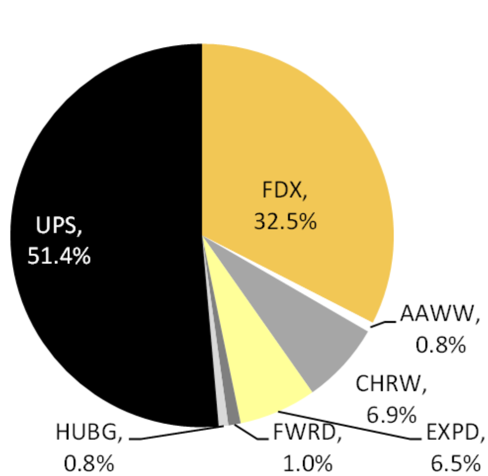
The acquisition of TNT Express has given FDX an opportunity to expand its international business.

FDX is the largest express carrier and largest cargo airline in the world, offering 48 hour express services to more than 90% of the world's GDP. The express couriers total market size is $254 billion per year, of which FDX currently accounts for 22.5%, which is the highest share of the market. This segment is also the highest revenue yielding segment in its portfolio. FDX holds a competitive advantage by its owning 670 aircrafts, and with the recent acquisition of TNT Express, which is Europe's largest express courier. This is a very capital-intensive industry, so the threat of new entrance is low. However, some international competition is controlled or subsidized by foreign governments, giving them easy access to raising capital.

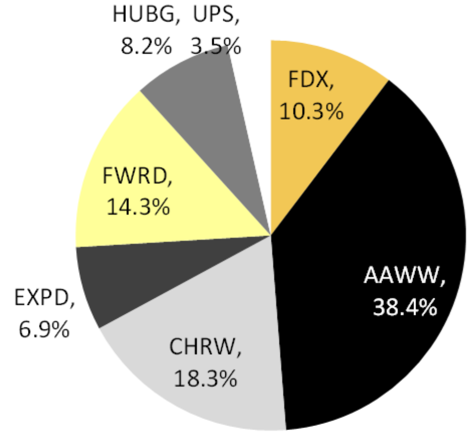
Also, FDX ground is positioned well to compete in the ground industry. This segment has the highest operating margin for FDX at 12%. FDX holds 24% of the $65 billion market share of domestic ground shipping; just behind UPS at 42% and just in front of USPS at 18%. This segment has been growing the fastest due to the rise of ecommerce over the past five years. In addition, some high-volume package shippers, such as Amazon, are developing and implementing their own delivery capabilities and utilizing independent contractors, thus challanging FDX's market share.

FDX has very stable and competitive prices due to a streamlined and well connected supply chain. The transportation business is highly competitive and sensitive to prices and service quality, especially in periods of little or no macroeconomic growth. Figures 3 and 4 show the break down of the industry.

Figures 3 and 4: Industry market cap (left) and industry by sales (right)



Source: IMCP, Factset



Source: IMCP, Factset

Business/Industry Drivers

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

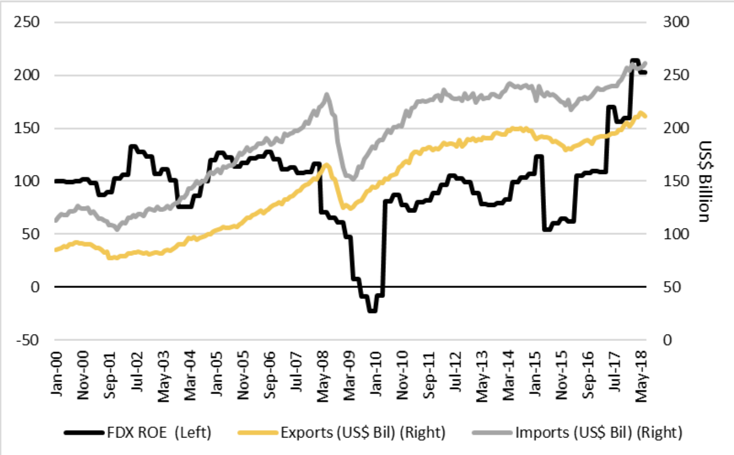
1) Global Trade
2) Jet Fuel and Crude Prices
3) Macroeconomic Trends
4) Government Regulation

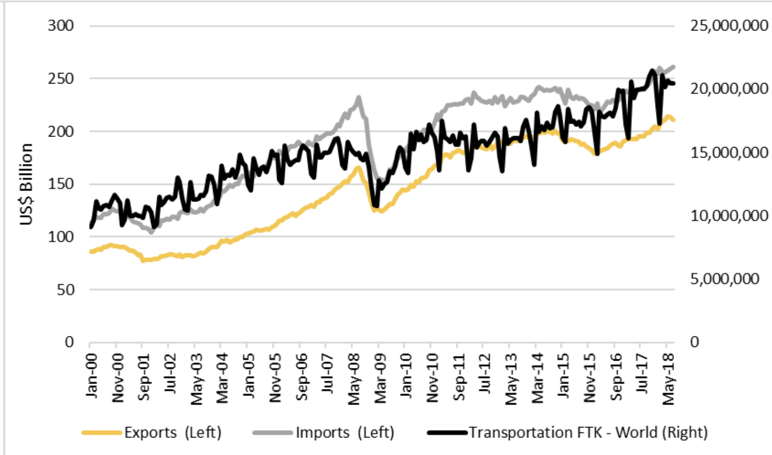
Global Trade

US trade talks have added uncertainty to global trade; however, the end goal should benefit global trade flows.

The global trade enviornment has a large affect on the volumes of goods FDX transports. Being a multinational company, trade directly impacts FDX by increaing and decreasing demand for goods between countries. New or amended trade agreements could boost global trade flows and subsequently boost air freight demand. Freight Tonne Kilometers (FTK) is a measure of how much freight business an airline receives. As figures 5 and 6 show, FDX's ROE has a strong relationship between US imports, US exports, and Global FTK.

Figures 5 and 6: Comparing total US imports and exports to: FDX ROE relative to SPX (Left), Transportation FTK (Right)





Source: International Air Transportation Association (IATA), Factset

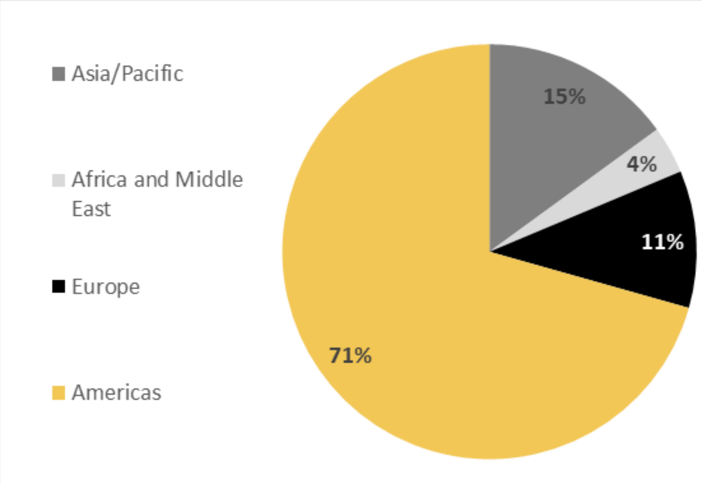
The acquisition of TNT Express is expected to rapidly expand growth in European and global markets.

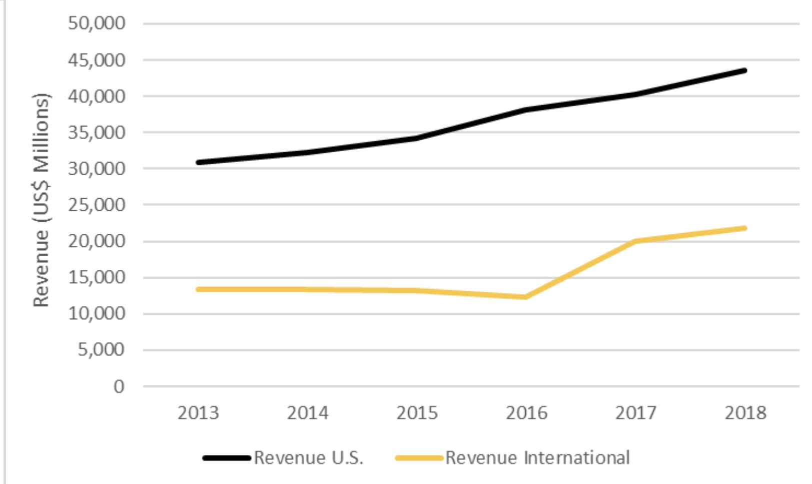
FDX expanded globally by acquiring TNT Express in January 2016. This marked FDX's largest M&A transaction in history at roughly $4.8 billion. This cost as a percent of assets was 1.04 and as a percent of sales was .72, or roughly 45% lower than the 2016 P/S multiple for FDX which was 1.05. This means that FDX got a good deal, if it can turn the business around and integrate it with its own business. TNT's operating margin was -2.92%, which drove its profit margin to negative. Since the acquisition, FDX's net margin has grown 46% y/y. This deal was financed with cash as well as new and existing debt agreements.

TNT is one of Europe's largest air and freight couriers with over 1,000 facilities worldwide, including road hubs, air hubs, and office facilities. As of April 2017, FedEx Express began operating flights linking TNT's main air hub in Liege, Belgium to the FDX world hub in Memphis, Tennessee. This gives TNT's customers direct access to services offered by FDX in the U.S. and Canada, linking the two largest trading partners in the world, the European Union and the United States. Full integration of FDX and TNT is expected to be completed by the end of 2020.

The success of this international expansion will depend heavily on the global trade environment being conducive to the free and fair flow of goods. FDX has established itself as the largest presence in the international express shipping segment. The tariff uncertainty between the United States and China does bring questions to the table regarding the future of trade with China. Mainland China accounts for 6.7% of FDX's revenue, up 3.9% from last year. This represents the second largest revenue share to FDX by any single country as well as the second highest growth rate. This will be an important factor to keep an eye on. Figures 7 and 8 show FDX's revenue by region and the growth trends of its domestic and international revenue.

Figures 7 and 8: FY2017 revenue by region (left) and domestic and international Revenue (right)





Source: Factset

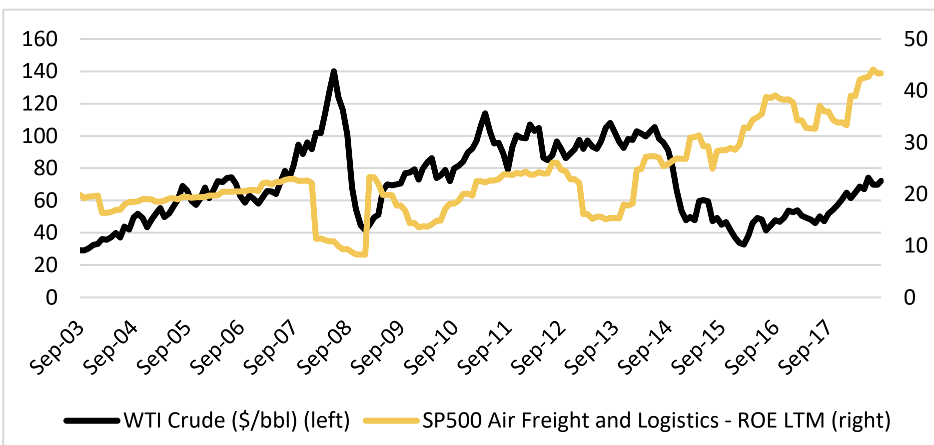
Source: Company reports

Jet Fuel and Crude Prices

FDX operates a large-scale supply chain network, connected by over-the-road vehicles and airplanes. FedEx Express is currently the world's largest airline by the measurement of freight tonne-kilometers (FTK). With 670 airplanes and over 100,000 over-the-road vehicles supporting FDX's daily operations, it is quite logical to assume that the firm is highly exposed to the risks of fuel prices. Figure 9 displays the relationship between the S&P 500 Air Freight and Logistics subsector's ROE versus the WTI crude price per barrel.

High fuel prices cause ROE to fall.

Figure 9: Relationship between WTI Crude ($bbl) & SP&500 Air Freight and Logistics Index -ROE

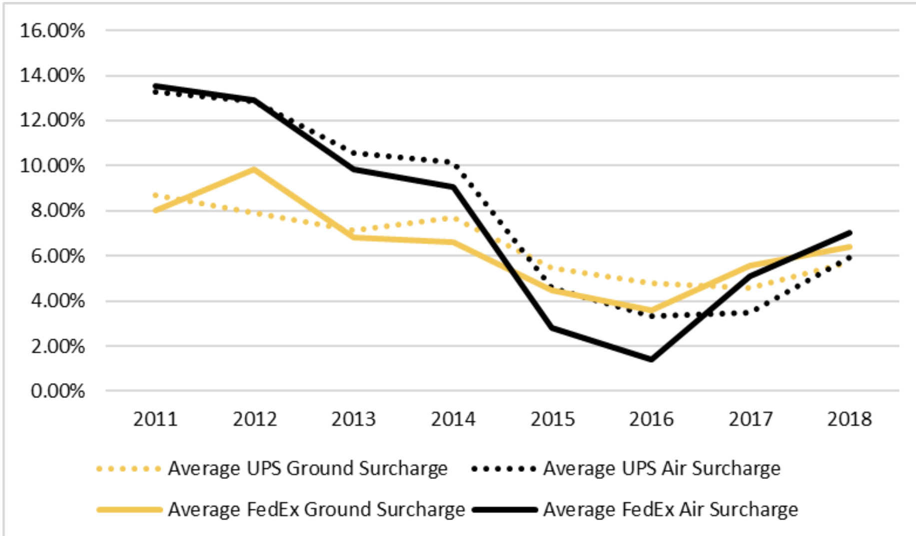


Source: Factset

As of May 31, 2018, FDX holds no derivative positions to hedge against fuel price volatility and has no plans to use derivative instruments in the near future. To offset rising prices, FDX and most other large shipping couriers have switched to using a fuel index surcharge. FDX's fuel index surcharge is updated on a weekly basis and is based off the U.S. Department of Energy's weekly-published data. This is essentially a tariff that FDX charges directly to customers and is reflected in the price paid based on customers' shipping requests. Figure 10 is an example FDX's and UPS's fuel index surcharges and how they differ.

Fuel index surcharges and calculations vary between companies, creating competitive advantages or disadvantages.

Figure 10: FDX fuel index surcharge vs. UPS fuel index surcharge

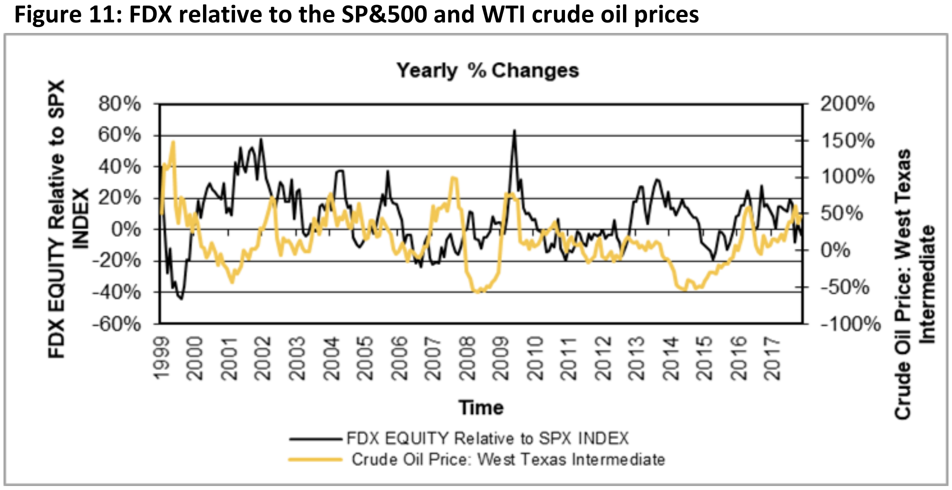


Source: Company reports

Overall, FDX is exposed to risks involving fuel prices and availability and here is why. First, on a competitive level, if competitor uses derivative instruments or other forms of hedging this could result in its prices being lower than FDX's at some point in time. Second, if a competitor uses a different method for projecting its surcharge it could result in its prices being lower than FDX's. Lastly, if fuel prices rise too high then consumers may not choose expedited and more expensive express shipping that FDX provides and opt for less expensive economy shipping. Express shipping has by far the largest profit margins among FDX's overall portfolio for shipping options. Figure 11 shows the sometimes negative relationship between FDX relative to the S&P 500 and WTI crude prices.

There is a negative correlation between WTI crude oil and FDX relative to the S&P500.

Figure 11: FDX relative to the SP&500 and WTI crude oil prices



Source: IMCP, Bloomberg

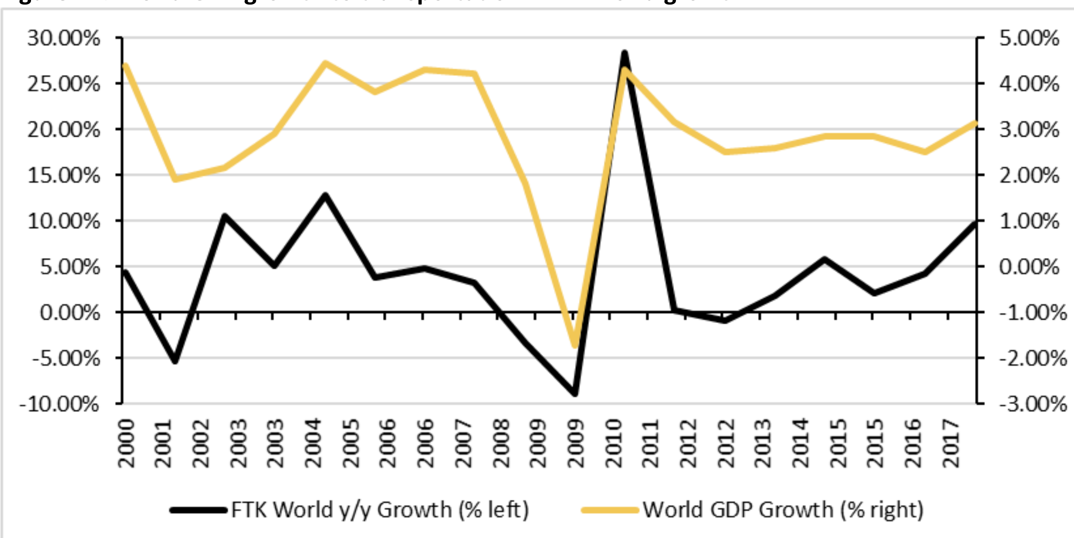
Macroeconomic Trends

With these indicators being at all-time highs, we must take into consideration that high numbers eventually come down.

FDX is a multinational company with operations in various countries and regions worldwide. This leaves it exposed to various international risks and opportunities. The recent trade disputes present a hiccup in overall global growth for the industry. However, with the acquisition of TNT Express, the global growth outlook for FDX looks optimistic. Domestically, with consumer confidence, business confidence and employment numbers at all-time highs, this paints an optimistic picture for the future of global shipping couriers, for at least the short term.

World GDP is also a very important indicator to the relative performance of the air freight and logistics industry. World GDP growth ties closely with the volumes of global trade. As stated earlier, global trade is an important driver for this industry. Earlier I graphed the strong relationship between trade and freight tonne kilometers and FDX's ROE. Figures 12 shows the relationship between world GDP growth and freight tonne kilometers.

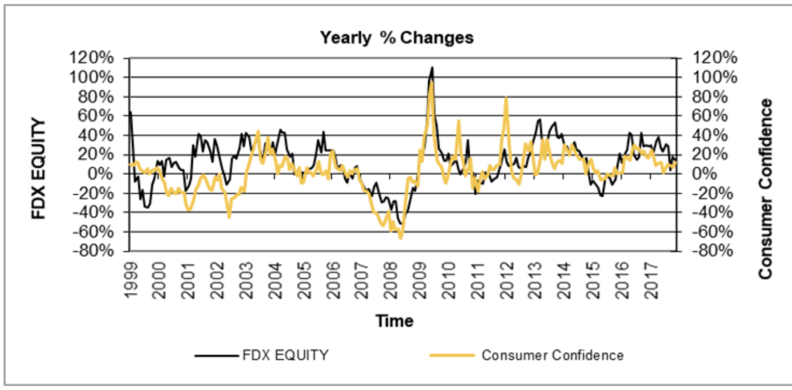
Figure 12: World GDP growth to transportation FTK – world growth

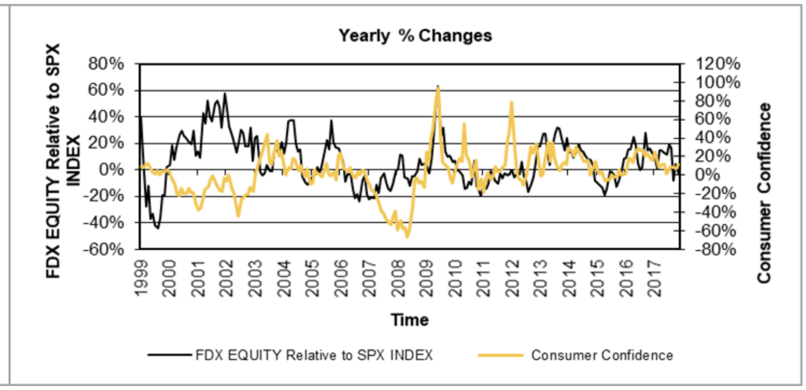


Source: Factset

FDX also is highly correlated with consumer confidence and the ISM (NAPM) index. When manufactures and consumers have optimistic outlooks, they increase spending (i.e. ,trade). Consumer confidence in the U.S. hit an 18-year high as of September 2018. The ISM index is also at a high. The Institute of Supply Chain Management surveys more than 300 manufacturing firms to generate the ISM (NAPM) index. The survey monitors employment, production, inventories, new orders, and supplier deliveries. This is a very good measure to evaluate how a company is performing and the overall state of the economy. Figures 13 and 14 show the relationship between FDX and FDX relative to the S&P500 to consumer confidence. Figures 15 and 16 show the relationship between FDX and FDX relative to the S&P500 to the ISM (NAPM) index.

Figures 13 and 14: FDX (left) and FDX relative to the S&P500 (right) to consumer confidence

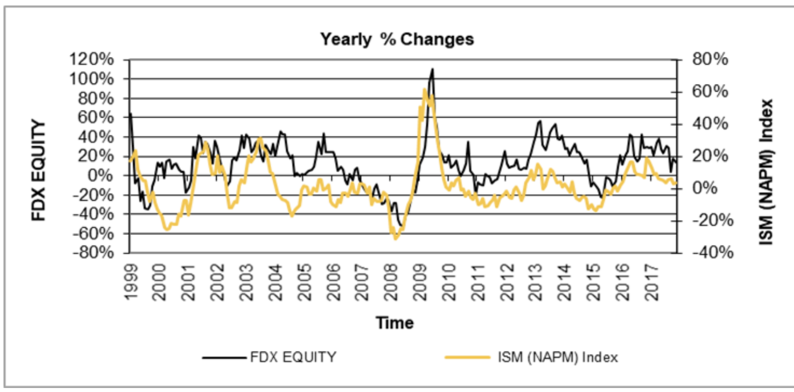


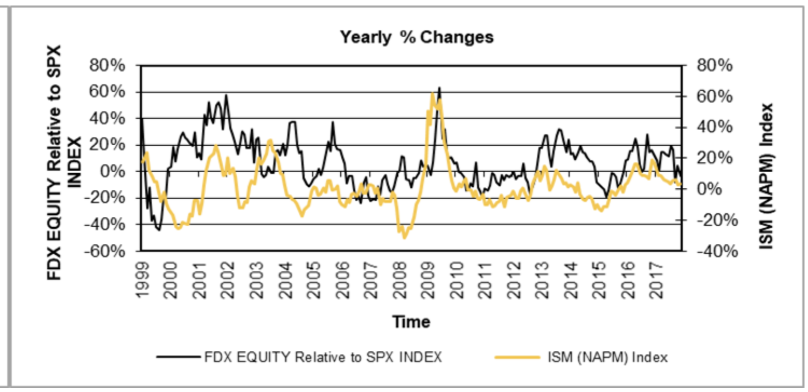


Source: IMCP, Bloomberg

Source: IMCP, Bloomberg

Figures 15 and 16: FDX (left) and FDX relative to the S&P500 (right) to the ISM (NAPM) index





Source: IMCP, Bloomberg

Source: IMCP, Bloomberg

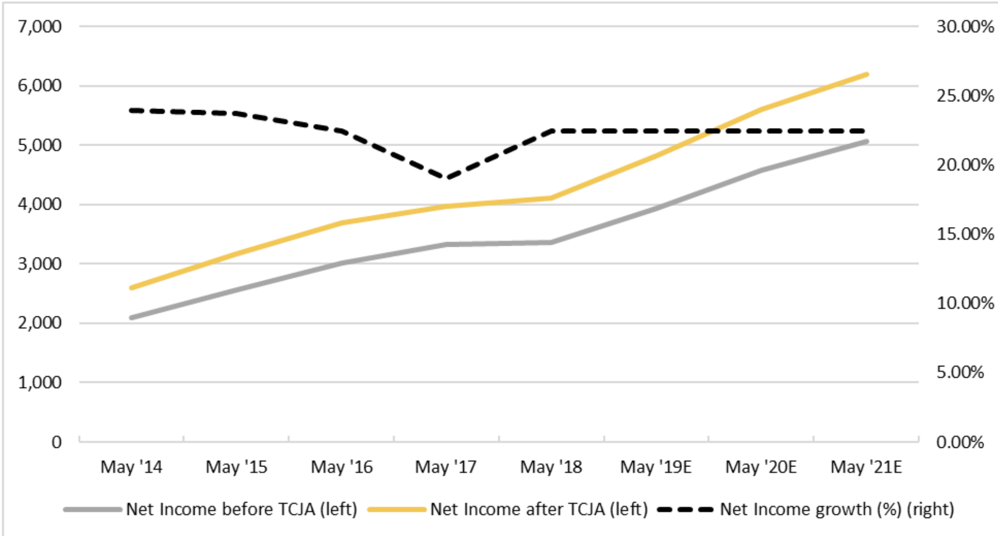
<u>Government Regulation</u>

Stricter government regulation almost always leads to higher operating costs.

FDX operates internationally and is exposed to regulation from many domestic and international government agencies. This includes abiding and adhering to laws passed by all countries in which FDX operates. More exposure to laws and regulation raises costs for business; however, the Tax Cuts and Jobs Act (TCJA) has had a great positive effect on the business.

First, the TCJA favorably impacted FDX's bottom line, reducing its effective tax rate from 34.6% the year prior to -5% for 2018. FDX recognized a benefit of $265 million related to the lower income tax rate on 2018 earnings. The company also recorded a benefit of $1.15 billion related to the re-measurement of its U.S. deferred tax liability and a one-time transition tax on previously deferred foreign earnings. Additionally, FDX received a $204 million benefit from a $1.5 billion contribution to pension plans, a $255 million benefit from corporate restructuring and integration of TNT Express, and a $225 million benefit from foreign tax credits. Much of this benefit is a one-time benefit; however, long term FDX will benefit from lower corporate tax rates and the repatriation of foreign earnings. The TCJA required significant judgments, estimates, and calculations to be made when determining the firm's overall tax liability. The IRS will ultimately review and judge if the company's interpretations were correct. Figure 17 shows the net effect the TCJA has on the bottom line. The data represents if the TCJA did not happen and if the TCJA took place in 2014 and the respective percent change in FDX's net income.

Figure 17: Net impact the TCJA has on FDX's net income



Source: FactSet

Additionally, FDX faces regulation from foreign and domestic emissions agencies. The EPA and the EU ETS have made regulations stricter regarding aircraft and diesel emissions due to health concerns. Given the stricter regulation, FDX announced a plan to improve fuel efficiency by 50% by 2025. This includes purchasing newer and more fuel-efficient vehicles. This is costly; however, over time it will positively impact FDX by reducing the amount of fuel needed to transport items.

The firm also faces regulation from foreign and domestic agencies regarding security. This ranges from data protection to package delivery safety. Recently, there have been a few cases where bombs have been shipped and delivered. If regulations were to be enforced regarding this risk, it could directly impact the cost of operations. Also, data protection is a growing concern amount foreign and domestic agencies. The EU's General Data Protection Regulation (GDPR) recently tightened up regulation, and violations of GDPR can result in up to 4% of a company's annual revenue. This is something FDX is taking seriously to adhere to these regulations and guidelines to avoid fines.

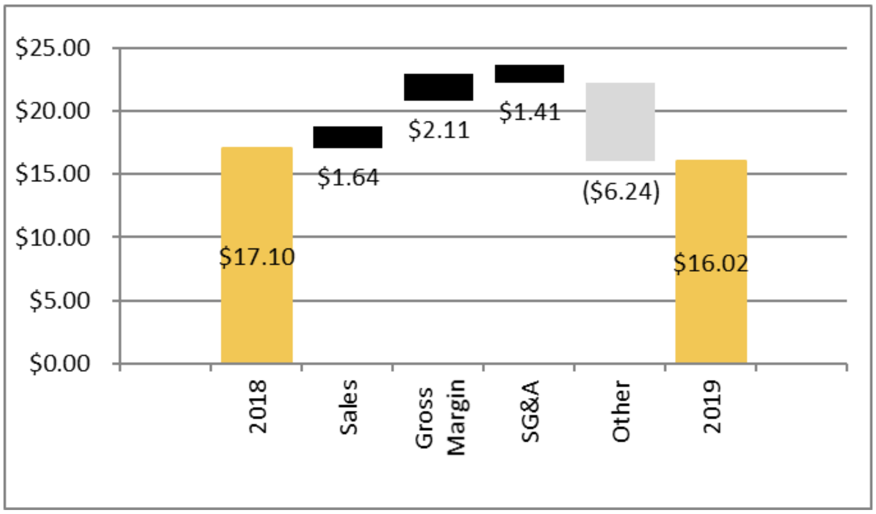
Lastly, FDX and the U.S. government have two major agreements that affect overall operations. The United States Postal Service (USPS) and FDX entered into a deal in 2013 where FDX will provide all air-to-air transportation of first class express, priority, and international mail. This agreement has been extended until 2024. USPS currently accounts for 2.45% of FDX's total revenue making USPS its largest customer by revenue. Changes in USPS's business model or financial stability could have an impact on FDX. Additionally, the Department of Defense (DOD) has an agreement with FDX through the Civil Reserve Air Fleet Program (CRAF). Under this program, the DOD may requisition for military use certain models of FedEx Express's wide body aircraft in the event of declared need. FDX would be compensated for the operation of any aircraft requisitioned at standard contract rates.

Financial Analysis

I anticipate EPS to shrink to $16.02 in FY 2019. This decrease in EPS can largely be attributed to the fact that FDX's effective tax rate was -5% for FY 2018. Its tax rate should stabilize to 25% going forward. Increasing international and domestic revenues should boost EPS $1.64. Gross margin increase should raise EPS $2.11. SG&A to sales decrease should help EPS by $1.41. Then other, which includes interest, taxes, and share issuances (repurchases), should decrease EPS by $6.24. I derived these numbers by forecasting sales revenue increasing 8.5%, gross margin increasing by 0.8% to 23.2%, operating margin increasing by 1.3% to 8.7%, a tax rate of 25%, and share repurchases of 2% of overall shares.

While EPS drops in 2019 to $16.02, using a 3-year CAGR, EPS has grown at 35%.

Figure 18: Quantification of 2019 EPS drivers

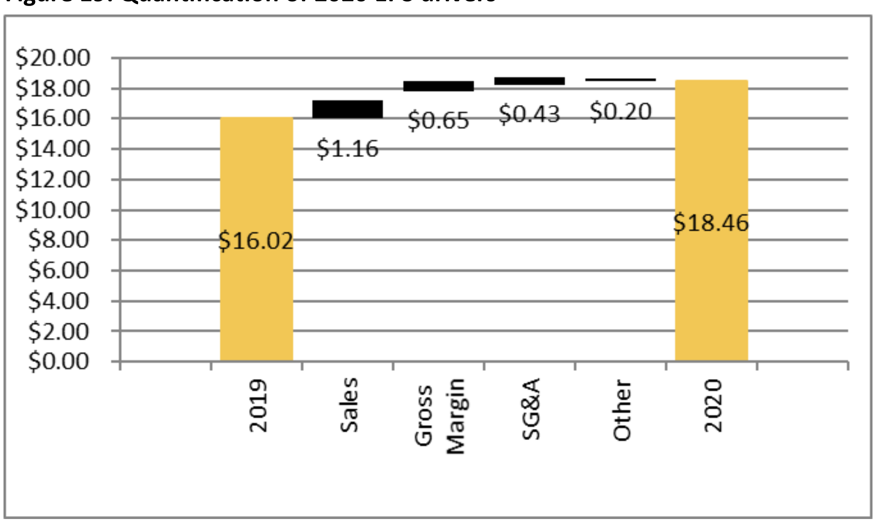


Source: Company Reports, IMCP

I expect 2020 EPS to increase to $18.46. This rise can be attributed to sales revenue continuing to grow at a 6.6% rate, adding $1.16 to EPS. In addition, gross margin rises 0.3% to 23.5%, which increases EPS by $0.65. Operating margin is expected to grow 0.5% to 9.2%, adding $0.43 to EPS. Lastly, share repurchases remain at a 2% of overall shares, adding $0.20 to EPS.

My 2020 EPS estimate is lower than consensus as I am more pessimistic about the rate at which FDX can increase margins.

Figure 19: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

I am slightly more pessimistic than consensus revenue estimates for 2019. I wanted to keep YoY revenue growth similar to FY 2018. I thought this would be a more accurate representation of the volatile climate we are currently facing. However, in 2020, I anticipate stronger than consensus revenue growth driven primarily by FDX's global growth and its continuing market share growth in domestic shipping segments. My EPS estimates for 2019 and 2020 are slightly lower than consensus. This is mainly because I have FDX's operating margin growing slower than consensus. Long term, I believe operating margins have room to continue to improve. Short term, I wanted to use a more realistic target of operating margin growth to ensure accurate valuation. Figure 20 shows FY 2018 and my FY 2019 and FY 2020 estimates vs. consensus. FY 2018 was already reported, but I included it to show a baseline of performance.

Figure 20: Revenue and EPS estimates vs. consensus

	FY 2018	FY 2019E	FY 2020E
Revenue Estimate ($M)	$65,450	$71,045	$75,739
YoY Growth	8.5%	8.5%	6.6%
Revenue Consensus ($M)	$65,357	$71,331	$75,294
YoY Growth	8.6%	9.1%	5.6%
EPS - Estimate	$17.10	$16.02	$18.46
YoY Growth	52.0%	-6.4%	15.3%
EPS - Consensus	$17.54	$16.31	$19.77
YoY Growth	58.4%	-7.0%	21.2%

Source: Factset, IMCP

Revenues

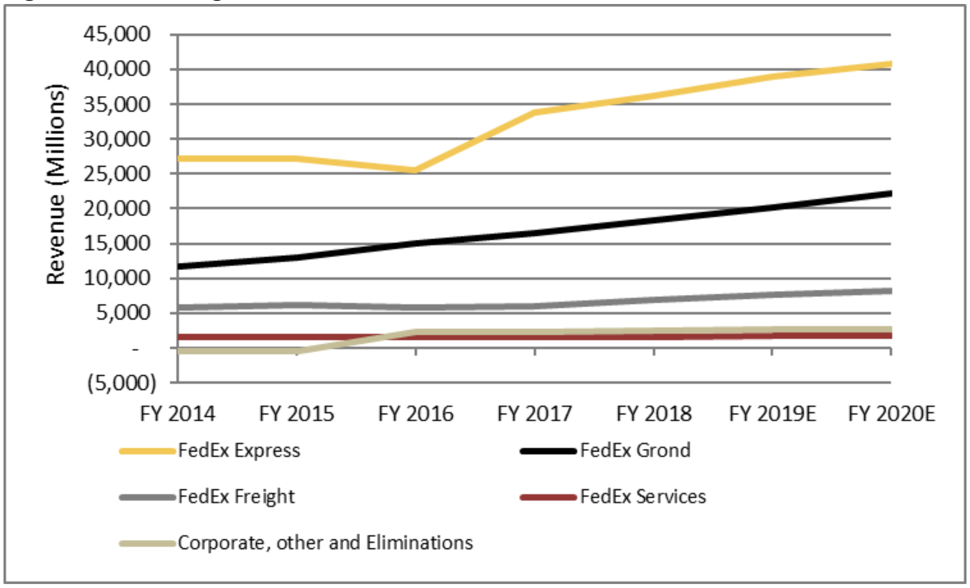
FDX's revenue has steadily increased over the past decade. It is safe to assume that long-term sales will continue to grow at a minimum the rate of GDP. I expect that sales in the express segment will continue to grow steadily into the future. Global express package volume is expected to exceed GDP growth, as the parcel market becomes a greater share of transportation spending in Asia, Europe and the US. International growth is key to maintaining the competitive advantage they have. The TNT Express acquisition added a significant increase to the overall revenue FY 2017. Specifically, the express segment grew at a rate of 32.4% that year, boosting FDX's international revenue to 33.4% of its overall sales. Strategically, this move lines FDX up for strong growth internationally.

Shipping lanes refers to the route routinely served by the carrier. FDX being equal to or faster than 96.9% of shipping lanes it shares with UPS.

FDX Ground should also continue to deliver above-market growth rates as the company further leverages its domestic and global capabilities. FDX Ground service is the second largest domestic ground shipping provider; UPS being first. However, FDX is faster to more locations than UPS ground. 67.8% of shipping lanes are equal to UPS, 29.1% of shipping lanes are faster than UPS, and 3.1% of shipping lanes are slower than UPS. Due to a high level of investment and commitment to growth, FDX is positioned well to increase market share against UPS domestically in the ground segment.

FDX Freight has been investing in technology and automation to improve the reliability and speed of its services. It currently has the highest market share in the domestic freight industry at 17.4%. Freight profitability continues to benefit from ongoing productivity incentives. FDX is positioned to further leverage its service sensitive, low cost freight model. This success should further diversify its business model and improve overall capital returns.

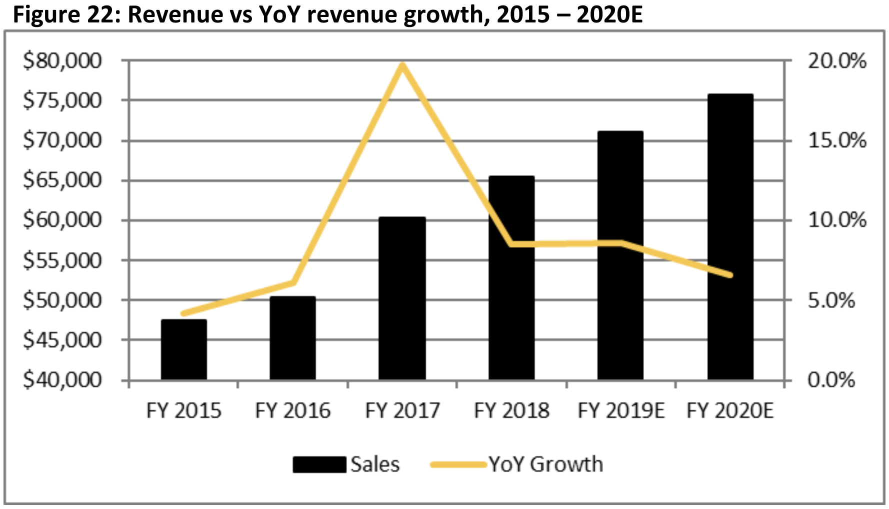
Figure 21: FDX's segment revenues, 2015 – 2020E



Source: Company Reports, IMCP

These charts display the marginal growth in express revenue around the time of the TNT Express acquisition.

Figure 22: Revenue vs YoY revenue growth, 2015 – 2020E



Source: Company Reports

Return on Equity

FDX has maintained near industry median ROE over the past five years. UPS has skewed the industry average due to its 200%-700% ROE, related to its capital structure. I predict ROE to maintain low 20% levels through 2019 and 2020. DuPont analysis for FDX reveals that ROE rose from 2015 to 2017 due to rising margins and leverage. 2018 is distorted by taxes; In 2019, ROE will be stable at 2017 levels as rising margins are offset by declining leverage.

FDX's ROE and ROA are lower than the industry as I believe they are investing much more than competitors are.

Figure 23: ROE breakdown, 2015 – 2020E

5-stage DuPont ROE	2015	2016	2017	2018	2019E	2020E
EBIT / sales	3.9%	6.1%	8.4%	7.4%	8.7%	9.2%
Sales / avg assets	1.36	1.22	1.28	1.30	1.30	1.28
EBT / EBIT	87.1%	89.0%	90.9%	89.4%	90.9%	91.5%
Net income /EBT	64.4%	66.4%	65.4%	104.9%	75.0%	75.0%
ROA	3.0%	4.4%	6.3%	9.1%	7.7%	8.1%
Avg assets / avg equity	2.30	2.87	3.17	2.84	2.63	2.50
ROE	6.9%	12.6%	20.0%	25.7%	20.3%	20.3%

Source: Company Reports, IMCP

If FDX can increase sales at a rate that outpaces its fixed asset growth this will contribute to a rising ROE; however, I assume stable asset turnover. The leverage ratio will decline despite the share buybacks.

Free Cash Flow

Figure 24: Free cash flows 2014 – 2020E

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$2,424	$1,205	$2,044	$3,297	$5,115	$4,636	$5,226
Growth		*-50.3%*	*69.6%*	*61.3%*	*55.2%*	*-9.4%*	*12.7%*
NOWC	4,372	4,398	4,010	4,732	5,056	5,396	6,611
Net fixed assets	23,387	26,196	33,970	35,924	38,989	42,322	45,118
Total net operating capital	$27,759	$30,594	$37,980	$40,656	$44,045	$47,718	$51,729
Growth		*10.2%*	*24.1%*	*7.0%*	*8.3%*	*8.3%*	*8.4%*
- Change in NOWC		26	(388)	722	324	340	1,215
- Change in NFA		2,809	7,774	1,954	3,065	3,333	2,796
FCFF		-$1,630	-$5,342	$621	$1,726	$962	$1,215
Growth			*227.7%*	*-111.6%*	*178.0%*	*-44.2%*	*26.3%*
- After-tax interest expense		155	224	300	543	420	445
+ Net new short-term and long-term debt		2,531	6,494	1,169	1,654	1,000	1,000
FCFE		$746	$928	$1,490	$2,837	$1,542	$1,770
Growth			*24.4%*	*60.6%*	*90.4%*	*-45.6%*	*14.8%*
FCFF per share		($5.76)	($19.36)	$2.33	$6.46	$3.66	$4.69
Growth			*236.0%*	*-112.1%*	*177.0%*	*-43.4%*	*28.3%*
FCFE per share		$2.64	$3.36	$5.60	$10.63	$5.86	$6.84
Growth			*27.6%*	*66.6%*	*89.7%*	*-44.9%*	*16.7%*

Source: Company Reports, IMCP

FDX's free cash flow has historically been relatively strong. For being a very capital intensive business, FDX does a very good job at producing and retaining cash. FCF was artificially inflated during 2018 due to the -5% effective tax rate. The 45% decrease in FCFE growth I am forecasting for 2019 is really a 3.5% growth from the 2017 FCFE. Additionally, in 2016, the sharp decrease in FCFF can be attributed to the acquisition of TNT Express; which was a $4.8 billion cash and debt deal. FCF per share will partially be used for stock buybacks. The firm's board of directors approved a share repurchase program of up to 25 million shares in early 2016. As of FY 2018 end, FDX has repurchased 12 million, or about $2 billion. Given the firm's $1.5 billion+ FCFE, this rate of purchases is sustainable. I expect both FCFF and FCFE to increase in 2020 as FDX improves operating margins and NOPAT increases.

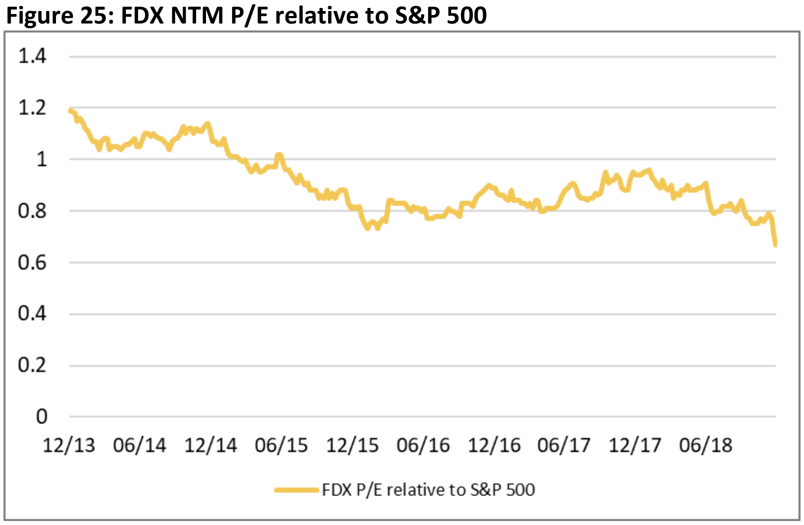
Valuation

FDX was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is inexpensive relative to other firms and is worth $245 according to my price to earnings valuation. Another relative valuation approach shows FDX to be undervalued based on its fundamentals versus those of its peers in the air freight and logistics industry. Price to book valuation yielded a price of $326. A detailed DCF analysis using a combination of P/E and P/B valuation multiples gave me a $294 target. I give P/B a bit more weight because it incorporates assumptions that reflect changes in FDX's capital structure.

Trading History

FDX is currently trading near its 52 week low. This is due to a high level of market volatility in the past three months. The air freight and logistics sector has taken a beating recently, with FDX shaving roughly 15% of its share price in the last two weeks. FDX's current NTM P/E is at 10.0 compared to its five year average of 14.9. I expect some movement towards or even exceeding that average in the near future as margins increase and segment revenues grow.

Figure 25: FDX NTM P/E relative to S&P 500



Source: Factset

Assuming the firm can increase to an average of 14.9 NTM P/E at the end of 2019, it should trade at $275 by the end of the year.

- Price = P/E x EPS = 14.9 x $18.46 = $275

Discounting $275 back to today at a 10.91% cost of equity (explained in Discounted Cash Flow section) yields a price of $248. Given FDX's potential for earnings growth and continued profitability, this seems to be a fair valuation.

Relative Valuation

FDX is currently trading at a P/E much lower than its peers, with a P/E TTM of 10.6 compared to an average of 14.3. The market could be taking into account that last FY 2018 earnings were inflated by the negative effective tax rate. Also, FDX's P/B and P/S ratios are significantly lower than those of its peers. This is a reflection of FDX's relatively low ROIC and ROE compared to its peers; however, it has a higher net margin.

Figure 26: FDX comparable companies

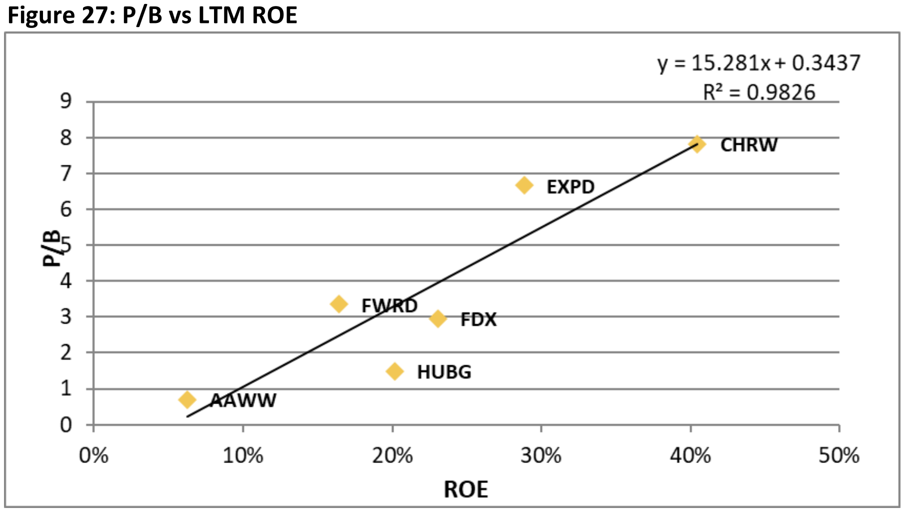
		Current	Market	Price Change						Earnings Growth								LT Debt/	S&P	LTM Dividend	
Ticker	Name	Price	Value	1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	Equity	Rating	Yield	Payout
FDX	FEDEX CORP	$188.27	$49,612	(0.7)	(14.3)	(25.6)	(29.1)	(21.4)	(24.6)	13.2	3.0%	70.1%	51.4%	-2.9%	21.2%		1.52	79.5%	A-	1.00%	12.1%
AAWW	ATLAS AIR WORLDWIDE HLDG INC	$48.58	$1,243	1.6	(8.8)	(24.6)	(34.4)	(14.8)	(17.2)	4.9	-35.1%	423.6%	-47.7%	46.7%	8.6%	9.2%	1.22	123.2%	B-	0.00%	0.0%
CHRW	C H ROBINSON WORLDWIDE INC	$88.12	$12,117	0.1	(0.0)	(11.1)	(3.0)	0.1	(1.1)	12.0	8.4%	-0.6%	28.6%	8.9%	7.6%	-0.5%	0.76	85.6%	A	1.99%	41.1%
EXPD	EXPEDITORS INTL WASH INC	$72.26	$12,471	1.3	2.3	(3.8)	(7.4)	12.3	11.7	12.4	-1.1%	14.0%	21.6%	4.0%	8.5%		0.88	0.0%	A	1.18%	25.7%
FWRD	FORWARD AIR CORP	$58.90	$1,720	0.3	(2.7)	(11.0)	(3.8)	2.5	2.5	20.6	-2.9%	221.1%	4.5%	13.2%	12.0%	10.2%	1.74	7.4%	A-	0.97%	17.9%
HUBG	HUB GROUP INC -CL A	$40.19	$1,377	(1.3)	(12.4)	(17.4)	(21.5)	(13.7)	(16.1)	14.8	-24.6%	84.1%	34.8%	-43.2%	7.1%	17.1%	1.41	23.0%	B+	0.00%	0.0%
UPS	UNITED PARCEL SERVICE INC	$101.21	$87,264	(2.3)	(6.0)	(17.9)	(14.5)	(14.3)	(15.1)	11.2	20.8%	45.0%	24.2%	12.1%	9.0%	47.7%	1.29	648.8%	B+	3.16%	56.9%
Average			$23,686	(0.2)	(6.0)	(15.9)	(16.2)	(7.0)	(8.5)	12.7	-4.5%	122.5%	16.8%	5.5%	10.6%	16.7%	1.26	138.2%		1.19%	22.0%
Median			$12,117	0.1	(6.0)	(17.4)	(14.5)	(13.7)	(15.1)	12.4	-1.1%	70.1%	24.2%	8.9%	8.6%	10.2%	1.29	79.5%		1.00%	17.9%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			3.2%	20.5%	7.3%	10.1%						

		2018		P/E							2018	2018			EV/	P/CF	P/CF	Sales Growth			Book
Ticker	Website	ROE	P/B	2016	2017	2018	TTM	NTM	2019	2020	NPM	P/S	OM	ROIC	EBIT	Current	5-yr	NTM	STM	Pst 5yr	Equity
FDX	http://www.fedex.com	23.1%	2.59	22.9	16.8	14.9	10.6	10.3	11.5	9.5	6.8%	0.76	8.5%	13.9%	14.2	6.5		7.7%	5.6%	8.1%	$72.76
AAWW	http://www.atlasair.com	6.2%	0.67	25.1	6.0	13.0	4.7	7.2	7.3	6.7	4.3%	0.47	10.8%	6.4%	13.9	2.9	4.5	12.8%		5.6%	$72.36
CHRW	http://www.chrobinson.com	40.4%	7.76	17.3	20.5	19.4	19.7	18.2	17.6	16.4	3.8%	0.72	5.3%	25.7%	17.7	15.6	17.5	6.1%	5.4%	5.5%	$11.35
EXPD	http://www.expeditors.com	28.9%	6.38	19.1	19.7	19.8	21.4	21.6	21.3	19.6	7.0%	1.55	10.0%	25.5%	15.3	18.8		7.7%			$11.33
FWRD	http://www.forwardair.com	16.4%	3.21	47.8	16.4	19.0	17.5	18.1	17.2	15.4	6.7%	1.31	9.1%	16.1%	16.2	11.7	13.5	8.5%	6.4%	13.5%	$18.36
HUBG	http://www.hubgroup.com	20.2%	1.48	15.0	10.8	8.8	9.7	12.8	13.0	12.1	4.6%	0.34	3.0%	15.5%	19.1	6.9		2.9%	4.4%	5.2%	$27.07
UPS	http://www.ups.com	193.3%	28.06	24.9	20.4	17.1	16.2	13.4	13.0	11.9	8.3%	1.21	9.3%	28.8%	16.6	15.8	16.2	6.0%	5.7%	4.0%	$3.61
Average		46.9%	7.16	24.6	15.8	16.0	14.3	14.5	14.4	13.1	5.9%	0.91	8.0%	18.8%	16.1	11.2	12.9	7.4%	5.5%	7.0%	
Median		23.1%	3.21	22.9	16.8	17.1	16.2	13.4	13.0	12.1	6.7%	0.76	9.1%	16.1%	16.2	11.7	14.8	7.7%	5.6%	5.5%	

Source: Factset

A more thorough analysis of P/B and ROE is shown in figure 27. The calculated R-squared of the regression indicates that over 98% of a sampled firm's P/B is explained by its NTM ROE. Note that that UPS is excluded from this regression, because it has posted near 700% ROE given its extremely high debt load. FDX has the second lowest P/B and ROE of this grouping and according to this measure is undervalued. However, given the recent headwinds the air freight and logistics industry is dealing with, I believe that ROE will be more highly valued by investors in the coming months as conditions improve.

Figure 27: P/B vs LTM ROE



Source: Factset

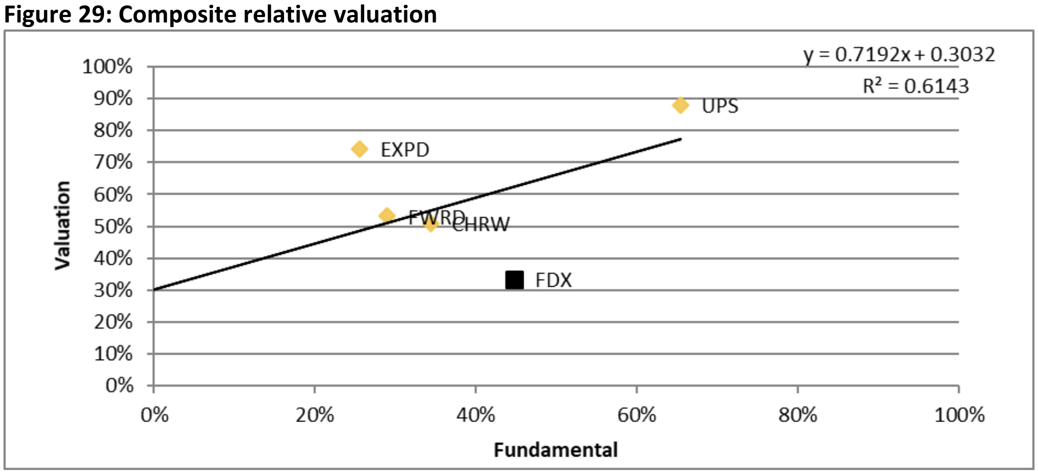
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. An equal weighting of long-term, 2018, 2019E NTM, and past five year earnings growth was compared to an equal weight composite of P/S, P/CF and P/B. One can see that FDX is below the line, so that indicates it is inexpensive based on its fundamentals.

Figure 28: Composite valuation, % of range

Ticker	Name	Fundamental						Valuation			Weighted	
		20.0%	20.0%	0.0%	20.0%	20.0%	20.0%	33.3%	33.3%	33.3%		
		Earnings Growth										
		LTG	NTM	2017	2018	2019	Pst 5yr	P/B	P/S	P/CF	Fund	Value
FDX	FEDEX CORP	64%	17%	17%	100%	-6%	49%	10%	54%	37%	45%	33%
AAWW	ATLAS AIR WORLDWIDE HLDG INC	24%	-145%	100%	-93%	100%	19%	2%	30%	15%	-19%	16%
CHRW	C H ROBINSON WORLDWIDE INC	58%	40%	0%	56%	19%	-1%	26%	45%	81%	34%	51%
EXPD	EXPEDITORS INTL WASH INC	60%	-7%	3%	42%	9%	24%	23%	100%	100%	26%	74%
FWRD	FORWARD AIR CORP	100%	-14%	52%	9%	28%	21%	11%	85%	63%	29%	53%
HUBG	HUB GROUP INC -CL A	72%	-118%	20%	68%	-93%	36%	5%	21%	38%	-7%	21%
UPS	UNITED PARCEL SERVICE INC	54%	100%	11%	47%	26%	100%	100%	79%	85%	65%	88%

Source: IMCP

Figure 29: Composite relative valuation



Source: IMCP

<u>Discounted Cash Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 10.91% 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 3.0%.
- A one-year beta of 1.13 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 10.91% (3.0 + 1.13 (10.0 – 3.0)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $1.86 and $2.42, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $4.27 per share. Thus, stage one of this discounted cash flow analysis contributes $4.27 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 10.91% cost of equity. I assume 5.5% sales growth rate in 2021 through 2025. The ratio of sales to NOWC and sales to NFA will remain at 2020 levels. In addition, the NOPAT to sales margin is projected to incrementally rise to 7.5% in 2025 from 6.9% in 2020 due to an increase in operational efficiency. Finally, share growth is expected to remain constant at -1.5% as FDX continues to repurchase shares.

Figure 30: FCFE and discounted FCFE, 2019 – 2025

	FY 2019E	FY 2020E	FY 2021E	FY 2022E	FY 2023E	FY 2024E	FY 2025E
FCFE	$2.06	$2.97	$8.99	$10.04	$11.18	$12.44	$13.82
Discounted FCFE	$1.86	$2.42	$6.59	$6.63	$6.66	$6.68	$6.69

Added together, these discounted cash flows total $37.54 (second stage is $33.26).

Stage Three – Net income for the years 2019 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $17.10 in 2018 to $28.49 in 2025.

Figure 31: EPS estimates 2019 – 2025

	FY 2019E	FY 2020E	FY 2021E	FY 2022E	FY 2023E	FY 2024E	FY 2025E
EPS	$16.02	$18.46	$20.15	$21.98	$23.97	$26.14	$28.49

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. For the purpose of this analysis, the P/E ratio will converge near to the historical average relative to the S&P 500. I assume the firm should have about the same risk and growth profile as the market by 2025. Therefore, a P/E ratio of 15 is assumed at the end of FDX's terminal year. Historically FDX has had a lower P/E than its industry. An average multiple should be better to calculate a fair value, and the stock could very easily trade above this value as the potential for growth is changing with economic conditions and M&A transactions.

Given the assumed terminal earnings per share of $28.49 and a price to earnings ratio of 15, a terminal value of $427.39 per share is calculated. Using the 10.91% cost of equity, this number is discounted back to a present value of $207.03.

I have also used a terminal price-to-book ratio to analyze the fair value of the stock. Using P/B value of 3.25 and a terminal BVPS of $183.36 this gives us a terminal value of $595.93, discounted to a value of $288.67. P/B and ROE have a strong correlation in the air freight and logistics industry, as noted earlier in the valuation section. I use a 3.25 P/B multiple based on the regression results in figure 27.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value using P/E of $244.57 is calculated (4.27 + 33.26 + 207.03). Using P/B intrinsic value of $326.21 is calculated (4.27 + 33.26 + 288.67). Given FDX's current price of $188.27, this model indicates that the stock is undervalued. For my valuation I weighted the P/B at 60% and P/E at 40%.

Scenario Analysis

FDX is difficult to value with certainty as there is a lot of uncertainty regarding the solution for the global trade climate we are currently facing. Additionally, it is nearly impossible to predict with certainty the outcomes of some of the strategic moves FDX has made. With bold strategy there are always trade off risks.

Sales Growth – Sales growth is dependent on GDP growth as well as international expansion. These variables are very dynamic and difficult to predict. In my model, I predicted a fairly modest estimate for sales growth, so I do not believe FDX will have any trouble hitting my estimates. However, any variability will most definitely lead to a movement in target price. Under a lower than predicted sales growth scenario, FDX still grows at a faster rate than GDP. International growth is very important to FDX increasing its return on capital. It has spent heavily in Europe to increase its global presence. The European and Asian markets are very important as they are not as matured as the US market when it comes to global express shipping couriers.

Operating Margin – In my forecast, I predicted operating margins to increase. I believe this is realistic as FDX has invested heavily in certain segments and regions. Once those operations get further developed I believe they will become more efficient. In a scenario where FDX's operating margin stays flat, this would reduce EPS dramatically. Its operating margins are heavily tied to its overall profitability and additionally to ROIC.

In a bear case scenario, I decrease sales by 1% and keep operating margins consistent with 2018. Additionally, I decrease the terminal P/E multiple to 13 and increase cost of capital by 0.5%. This results in net income decreasing by nearly $1 billion and EPS estimated falling to $13.24 and $14.19 in 2019 and 2020, respectively. This bear case scenario results in a target price of $242, which is a 28% upside from the current price of $188.

In a bull case scenario, I increase sales revenue by 0.5% and operating margin by 0.3%. Additionally, I raise terminal P/E to 16 and lower cost of capital by 0.5%. This results in net income increasing by nearly $200 million. EPS estimates rise to $16.70 and $19.30 in 2019 and 2020, respectively. This bull case scenario results in a target price of $316, which is a 68% upside from the current price of $188.

This bull case more accurately represents the consensus EPS numbers. While I am optimistic on the overall industry, my estimates come in slightly under consensus. I believe that my estimates more accurately represent a realistic case.

Business Risks

Although I have many reasons to be optimistic about FDX, there are several business risks it faces including:

Economic Sensitivity:

Economic growth and trade are large factors that affect growth and profitability. Any impediments to these factors can significantly change operating profit, as FDX is an asset intensive business.

Competes in highly competitive markets:

Many logistics providers provide the same service as FDX. This is a very price and time sensitive business. Customers are most concerned with how quickly and efficiently they can receive their goods.

Domestic express market:

Growth potential is constrained in FDX's largest segment. Due to efficient and competitive time sensitive ground services, the domestic express market is slowing. Rising jet fuel prices make this segment less price competitive.

Cyber security:

In 2017, TNT Express faced a data breach. This poses a threat as management deals with a lot of sensitive customer information. Additionally, data breaches can disrupt operational technology infrastructure.

Acquisition integration risk:

FDX has made multiple small-scale acquisitions and a few large ones, including the largest with TNT Express. Integrations of these segments remain a potential operational and cost risk. TNT Express is on target to be a fully integrated part of FDX by 2020.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

While barriers into the shipping industry are relatively high, there are many government regulations to adhere to and it is a very capital-intensive industry to enter. Entry into the express courier industry is extremely high because of not only the capital intensiveness, but also the established supply chain.

Threat of Substitutes - High

There are many competitors in the shipping courier industry. This means that FDX needs to maintain competitive prices and fast shipping to protect its market share.

Supplier Power - Relatively High

The two largest suppliers for FDX are Boeing and Airbus. Thus, a production lag or increase in prices would directly impact FDX because there aren't many substitute suppliers for wide body aircrafts. FDX and Boeing have a long-standing relationship and FDX is Boeing's fourth largest customer.

Buyer Power – Medium

While there are many substitutes, few can offer the competitive pricing and shipping lead times that FDX offers. FDX has a vast air freight supply chain making it easier for it to get packages cross country and internationally at faster rates. USPS is FDX's largest customer, so a change in who USPS's uses for air freight would impact FDX.

Intensity of Competition – Medium

There are numerous national and international shipping couriers; however, few have the supply chain capabilities of FDX. FDX is the largest express courier in the world, giving it an advantage in speed and volume. With the acquisition of TNT Express, FDX has strengthened its overall international supply chain capabilities.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
High brand recognition	Volitile market demand
Established supply chain	Dependance on U.S. markets
Reliability of service	Overall market growth limited
Opportunities	**Threats**
International expansion	International regulation
Global economic growth	Irrational prices
E-commerce	Company independent shipping

Appendix 3: Income Statement

Income Statement	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019E	FY 2020E
Sales	$45,567	$47,453	$50,365	$60,319	$65,450	$71,045	$75,739
Direct costs	36,825	36,705	38,539	46,554	50,760	54,563	57,940
Gross Margin	8,742	10,748	11,826	13,765	14,690	16,483	17,799
SG&A and other	4,927	8,881	8,749	8,728	9,820	10,302	10,831
EBIT	3,815	1,867	3,077	5,037	4,870	6,181	6,968
Interest	157	240	337	458	517	561	593
EBT	3,658	1,627	2,740	4,579	4,353	5,620	6,375
Taxes	1,334	577	920	1,582	(219)	1,405	1,594
Income	2,324	1,050	1,820	2,997	4,572	4,215	4,781
Other	4	2	2	4	6	-	-
Net income	2,320	1,048	1,818	2,993	4,566	4,215	4,781
Basic Shares	307.0	283.0	276.0	266.0	267.0	263.2	259.0
EPS	$7.56	$3.70	$6.59	$11.25	$17.10	$16.02	$18.46
DPS	$0.61	$0.80	$1.00	$1.60	$2.00	$2.44	$2.97

Income Statement	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019E	FY 2020E
Sales Growth		4.1%	6.1%	19.8%	8.5%	8.5%	6.6%
Gross margin	19.2%	22.6%	23.5%	22.8%	22.4%	23.2%	23.5%
SG&A % of Sales	10.8%	18.7%	17.4%	14.5%	15.0%	14.5%	14.3%
EBIT margin	8.4%	3.9%	6.1%	8.4%	7.4%	8.7%	9.2%
Rate on debt		4.0%	3.2%	3.2%	3.3%	3.3%	3.3%
Tax rate	36.5%	35.5%	33.6%	34.5%	-5.0%	25.0%	25.0%

Appendix 4: Balance Sheets

Balance Sheet	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019E	FY 2020E
Cash	2,908	3,763	3,534	3,969	3,265	3,478	4,566
Operating assets ex cash	6,775	6,572	8,455	8,659	10,076	10,941	11,664
Operating assets	9,683	10,335	11,989	12,628	13,341	14,419	16,230
Operating liabilities	5,311	5,937	7,979	7,896	8,285	9,023	9,619
NOWC	4,372	4,398	4,010	4,732	5,056	5,396	6,611
NOWC ex cash (NWC)	1,464	635	476	763	1,791	1,918	2,045
NFA	23,387	26,196	33,970	35,924	38,989	42,322	45,118
Invested capital	*$27,759*	*$30,594*	*$37,980*	*$40,656*	*$44,045*	*$47,718*	*$51,729*
Marketable securities	-	-	-	-	-	-	-
Total assets	*$33,070*	*$36,531*	*$45,959*	*$48,552*	*$52,330*	*$56,741*	*$61,348*
Short-term and long-term debt	$4,737	$7,268	$13,762	$14,931	$16,585	$17,585	$18,585
Other liabilities	7,745	8,333	10,434	9,652	8,044	8,044	8,044
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	15,277	14,993	13,784	16,073	19,416	22,089	25,100
Total supplied capital	*$27,759*	*$30,594*	*$37,980*	*$40,656*	*$44,045*	*$47,718*	*$51,729*
Total liabilities and equity	*$33,070*	*$36,531*	*$45,959*	*$48,552*	*$52,330*	*$56,741*	*$61,348*

Appendix 5: Sales Forecast

Items	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019E	FY 2020E
Sales	$45,567	$47,453	$50,365	$60,319	$65,450	71,045	$75,739
Growth		*4.1%*	*6.1%*	*19.8%*	*8.5%*	*8.5%*	*6.6%*
Segments							
FedEx Express	27,121	27,239	25,553	33,824	36,172	38,885	40,829
Growth		*0.4%*	*-6.2%*	*32.4%*	*6.9%*	*7.5%*	*5.0%*
% of sales	*59.5%*	*57.4%*	*50.7%*	*56.1%*	*55.3%*	*54.7%*	*53.9%*
FedEx Grond	11,617	12,984	15,051	16,503	18,395	20,235	22,258
Growth		*11.8%*	*15.9%*	*9.6%*	*11.5%*	*10.0%*	*10.0%*
% of sales	*25.5%*	*27.4%*	*29.9%*	*27.4%*	*28.1%*	*28.5%*	*29.4%*
FedEx Freight	5,757	6,191	5,825	6,070	6,812	7,595	8,165
Growth		*7.5%*	*-5.9%*	*4.2%*	*12.2%*	*11.5%*	*7.5%*
% of sales	*12.6%*	*13.0%*	*11.6%*	*10.1%*	*10.4%*	*10.7%*	*10.8%*
FedEx Services	1,536	1,545	1,593	1,621	1,650	1,716	1,767
Growth		*0.6%*	*3.1%*	*1.8%*	*1.8%*	*4.0%*	*3.0%*
% of sales	*3.4%*	*3.3%*	*3.2%*	*2.7%*	*2.5%*	*2.4%*	*2.3%*
Corporate, other an	(464)	(506)	2,343	2,301	2,421	2,615	2,719
Growth		*9.1%*	*-563.0%*	*-1.8%*	*5.2%*	*8.0%*	*4.0%*
% of sales	*-1.0%*	*-1.1%*	*4.7%*	*3.8%*	*3.7%*	*3.7%*	*3.6%*
Regions							
United States	32,259	34,216	38,070	40,269	43,581	47,307	50,432
Growth		*6.1%*	*11.3%*	*5.8%*	*8.2%*	*8.5%*	*6.6%*
% of sales	*70.8%*	*72.1%*	*75.6%*	*66.8%*	*66.6%*	*66.6%*	*66.6%*
International	13,308	13,237	12,295	20,050	21,869	23,739	25,307
Growth		*-0.5%*	*-7.1%*	*63.1%*	*9.1%*	*8.5%*	*6.6%*
% of sales	*29.2%*	*27.9%*	*24.4%*	*33.2%*	*33.4%*	*33.4%*	*33.4%*

Appendix 6: Ratios

Ratios	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019E	FY 2020E
Profitability							
Gross margin	19.2%	22.6%	23.5%	22.8%	22.4%	23.2%	23.5%
Operating (EBIT) margin	8.4%	3.9%	6.1%	8.4%	7.4%	8.7%	9.2%
Net profit margin	5.1%	2.2%	3.6%	5.0%	7.0%	5.9%	6.3%
Activity							
NFA (gross) turnover		1.91	1.67	1.73	1.75	1.75	1.73
Total asset turnover		1.36	1.22	1.28	1.30	1.30	1.28
Liquidity							
Op asset / op liab	1.82	1.74	1.50	1.60	1.61	1.60	1.69
NOWC Percent of sales		9.2%	8.3%	7.2%	7.5%	7.4%	7.9%
Solvency							
Debt to assets	14.3%	19.9%	29.9%	30.8%	31.7%	31.0%	30.3%
Debt to equity	31.0%	48.5%	99.8%	92.9%	85.4%	79.6%	74.0%
Other liab to assets	23.4%	22.8%	22.7%	19.9%	15.4%	14.2%	13.1%
Total debt to assets	37.7%	42.7%	52.6%	50.6%	47.1%	45.2%	43.4%
Total liabilities to assets	53.8%	59.0%	70.0%	66.9%	62.9%	61.1%	59.1%
Debt to EBIT	1.24	3.89	4.47	2.96	3.41	2.85	2.67
EBIT/interest	24.30	7.78	9.13	11.00	9.42	11.03	11.74
Debt to total net op capital	17.1%	23.8%	36.2%	36.7%	37.7%	36.9%	35.9%
ROIC							
NOPAT to sales	5.3%	2.5%	4.1%	5.5%	7.8%	6.5%	6.9%
Sales to EOY NOWC	10.42	10.79	12.56	12.75	12.95	13.17	11.46
Sales to EOY NFA	1.95	1.81	1.48	1.68	1.68	1.68	1.68
Sales to EOY IC	1.64	1.55	1.33	1.48	1.49	1.49	1.46
Total ROIC using EOY IC	8.7%	3.9%	5.4%	8.1%	11.6%	9.7%	10.1%
ROE							
5-stage							
EBIT / sales		3.9%	6.1%	8.4%	7.4%	8.7%	9.2%
Sales / avg assets		1.36	1.22	1.28	1.30	1.30	1.28
EBT / EBIT		87.1%	89.0%	90.9%	89.4%	90.9%	91.5%
Net income /EBT		64.4%	66.4%	65.4%	104.9%	75.0%	75.0%
ROA		3.0%	4.4%	6.3%	9.1%	7.7%	8.1%
Avg assets / avg equity		2.30	2.87	3.17	2.84	2.63	2.50
ROE		6.9%	12.6%	20.0%	25.7%	20.3%	20.3%
3-stage							
Net income / sales		2.2%	3.6%	5.0%	7.0%	5.9%	6.3%
Sales / avg assets		1.36	1.22	1.28	1.30	1.30	1.28
ROA		3.0%	4.4%	6.3%	9.1%	7.7%	8.1%
Avg assets / avg equity		2.30	2.87	3.17	2.84	2.63	2.50
ROE		6.9%	12.6%	20.0%	25.7%	20.3%	20.3%
Payout Ratio		21.7%	15.2%	14.2%	11.7%	15.2%	16.1%
Retention Ratio		78.3%	84.8%	85.8%	88.3%	84.8%	83.9%

Appendix 7: 3-stage DCF Model

	Year						
	1	2	3	4	5	6	7
	First Stage		Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*8.5%*	*6.6%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*
NOPAT / S	*6.5%*	*6.9%*	*7.0%*	*7.1%*	*7.3%*	*7.4%*	*7.5%*
S / NOWC	*13.17*	*11.46*	*11.46*	*11.46*	*11.46*	*11.46*	*11.46*
S / NFA (EOY)	*1.68*	*1.68*	*1.68*	*1.68*	*1.68*	*1.68*	*1.68*
S / IC (EOY)	*1.49*	*1.46*	*1.46*	*1.46*	*1.46*	*1.46*	*1.46*
ROIC (EOY)	*9.7%*	*10.1%*	*10.3%*	*10.5%*	*10.6%*	*10.8%*	*11.0%*
ROIC (BOY)		*11.0%*	*10.8%*	*11.0%*	*11.2%*	*11.4%*	*11.6%*
Share Growth		*-1.6%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*	*-1.5%*
Sales	$71,045	$75,739	$79,905	$84,299	$88,936	$93,827	$98,988
NOPAT	$4,636	$5,226	$5,609	$6,019	$6,457	$6,924	$7,424
Growth		*12.7%*	*7.3%*	*7.3%*	*7.3%*	*7.2%*	*7.2%*
- Change in NOWC	340	1215	364	384	405	427	450
NOWC EOY	*5396*	*6611*	*6974*	*7358*	*7763*	*8190*	*8640*
Growth NOWC		*22.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*
- Chg NFA	3333	2796	2481	2618	2762	2914	3074
NFA EOY	*42,322*	*45,118*	*47,600*	*50,218*	*52,980*	*55,893*	*58,968*
Growth NFA		*6.6%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*
Total inv in op cap	3673	4011	2845	3002	3167	3341	3525
Total net op cap	47718	51729	54574	57576	60742	64083	67608
FCFF	$962	$1,215	$2,764	$3,017	$3,290	$3,584	$3,900
% of sales	*1.4%*	*1.6%*	*3.5%*	*3.6%*	*3.7%*	*3.8%*	*3.9%*
Growth		*26.3%*	*127.4%*	*9.2%*	*9.0%*	*8.9%*	*8.8%*
- Interest (1-tax rate)	420	445	469	495	523	551	582
Growth		*5.9%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*
FCFE w/o debt	$542	$770	$2,295	$2,522	$2,768	$3,032	$3,318
% of sales	*0.8%*	*1.0%*	*2.9%*	*3.0%*	*3.1%*	*3.2%*	*3.4%*
Growth		*42.1%*	*197.9%*	*9.9%*	*9.7%*	*9.6%*	*9.4%*
/ No Shares	263.2	259.0	255.1	251.3	247.5	243.8	240.1
FCFE	$2.06	$2.97	$8.99	$10.04	$11.18	$12.44	$13.82
Growth		*44.5%*	*202.4%*	*11.6%*	*11.4%*	*11.2%*	*11.1%*
* Discount factor	0.90	0.81	0.73	0.66	0.60	0.54	0.48
Discounted FCFE	$1.86	$2.42	$6.59	$6.63	$6.66	$6.68	$6.69

Appendix 7 (continued): 3-stage DCF Model

Third Stage								
Terminal value P/B								
	Book value	$22,089	$25,100	$28,392	$31,916	$35,687	$39,721	$44,034
	Growth		*13.6%*	*13.1%*	*12.4%*	*11.8%*	*11.3%*	*10.9%*
	ROE (EOY book)	*19.1%*	*19.0%*	*18.1%*	*17.3%*	*16.6%*	*16.0%*	*15.5%*
	Net income	$4,215	$4,781	$5,140	$5,524	$5,934	$6,373	$6,842
	Dividends	$642	$770	$841	$917	$1,001	$1,091	$1,189
	Growth		*20.0%*	*9.1%*	*9.1%*	*9.1%*	*9.0%*	*9.0%*
	Shares	263.2	259.0	255.1	251.3	247.5	243.8	240.1
	Price		$237.45	$259.16	$282.76	$308.40	$336.25	$366.51
	Growth			*9.1%*	*9.1%*	*9.1%*	*9.0%*	*9.0%*
	Net issuance		-$1,000	-$1,007	-$1,082	-$1,162	-$1,248	-$1,340
	Terminal P/B							3.25
	* Terminal BPS							$183.36
	Terminal value							$595.93
	* Discount factor							0.48
	Discounted terminal value							$288.67
Terminal value P/E								
	Net income	$4,215	$4,781	$5,140	$5,524	$5,934	$6,373	$6,842
	% of sales	*5.9%*	*6.3%*	*6.4%*	*6.6%*	*6.7%*	*6.8%*	*6.9%*
	EPS	$16.02	$18.46	$20.15	$21.98	$23.97	$26.14	$28.49
	Growth		*15.3%*	*9.1%*	*9.1%*	*9.1%*	*9.0%*	*9.0%*
	Terminal P/E							15.00
	* Terminal EPS							$28.49
	Terminal value							$427.39
	* Discount factor							0.48
	Discounted terminal value							$207.03

Summary			
First stage	$4.27	Present value of first 2 year cash flow	
Second stage	$33.26	Present value of year 3-7 cash flow	
Third stage	$288.67	Present value of terminal value P/B	
Third stage	$207.03	Present value of terminal value P/E	
Value (P/B)	**$326.21**	= value at beg of fiscal yr	2019
Value (P/E)	**$244.57**	= value at beg of fiscal yr	2019

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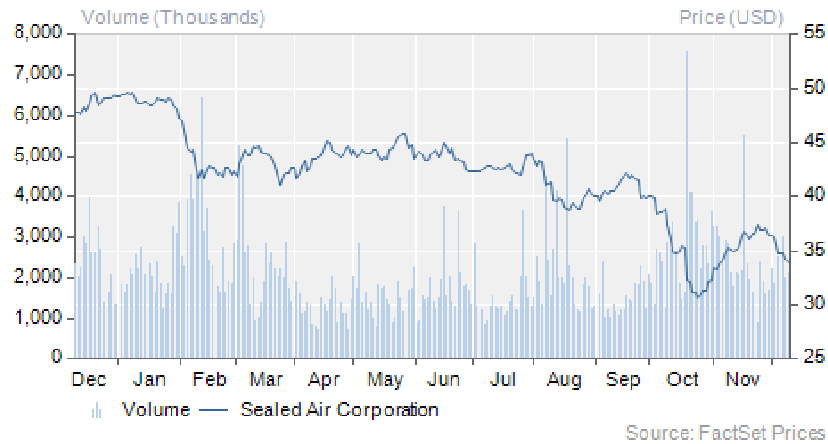
Analyst: Thomas Wendler

December 12, 2018

Packaging

Sealed Air Corporation

Recommendation	BUY
Target (today's value)	$41
Current Price	$34.05
52 week range	$30.22 - $49.94



Share Data	
Ticker:	SEE
Market Cap. (Billion):	$5.34
Inside Ownership	1.4%
Beta	1.02
Dividend Yield	1.88%
Payout Ratio	26.3%
Cons. Long-Term Growth Rate	3.4%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$4.21	$4.46	$4.79	$5.00	$5.21
Gr %		5.9%	7.3%	4.4%	4.3%
Cons				$47.2	$48.4
EPS					
Year	$1.73	$0.34	$0.45	$2.37	$2.55
Gr %		-80.3%	31.6%	429%	7.5%
Cons			$0.46	$2.69	$2.97

Ratio	'16	'17	'18	'19E	'20E
NPM (%)	8.0%	1.4%	1.5%	7.3%	7.3%
Industry	4.7%	4.8%	5.0%	6.4%	6.7%
EBIT/interest	3.17	2.95	3.44	3.79	3.79
ROA (%)	6.52%	0.91%	7.6%	8.0%	8.7%
Industry	4.5%	5.9%	6.3%	6.0%	6.4%
A. T/O	0.57	0.70	0.93	0.98	0.97

Valuation	'17	'18	'19E	'20E
P/E	32.0	17.3	14.0	12.7
Industry	24.0	22.2	15.6	14.1
P/S	1.87	1.14	1.13	1.10
P/CF	12.1	22.1	10.7	8.8
EV/EBIT	19.3	19.3	12.5	11.7

Performance	Stock	Industry
1 Month	-3.0%	-1.4%
3 Month	-16.1%	-7.5%
YTD	-30.9%	-11.4%
52-week	-28.8%	-11.9%
3-year	-21.7%	1.6%

Summary: Sealed Air Corporation is currently under-valued. Therefore, I recommend a buy rating with a target of $41. SEE has stable sales in its food care segment, which covers its heavy leverage, and growing sales in product care. My estimations differ from consensus through more stable food care sales, higher product care sales, and a higher effective tax rate.

Key Drivers:

- Beef production rates: although the firm packages a variety of food products, it has its highest correlation with beef at 0.63. Beef production is seasonal and grows at an average annual rate of 0.43%. The stable revenue from the food care segment has allowed the firm to carry large amounts of debt.

- Acquisitions and divestures: with flat sales in mature markets, Sealed Air has been expanding its business through acquisitions. In 2017, the firm's acquisition of Falgerdala accounted for 59% of sales growth in the product care segment. In 2018, the firm's acquisition of AFP accounts for 66% of product cares sales growth so far. Product care sales growth is expected to fall to the industry average of 3.5%.

Valuation: Sealed Air is under-valued based on a relative valuation model, probability-weighted scenario analysis, and discounted cash flow analysis. A weighted average of these approaches suggests that the firm's stock value is about $41 and the shares trade at $34.05.

Risks: Threats to the business include debt, livestock viruses, government instability, sole suppliers, the green movement, and customer preference.

Contact: Thomas Wendler
Email: twendler@uwm.edu
Phone: 262-343-3406

Company Overview

Sealed Air Corporation (SEE) is a global leader in food safety, security, and product protection. The firm produces automated packaging lines and supplies the packaging. SEE utilizes its market position, global reach, and patented innovations to maintain its growth. The food care segment targets new and existing food processing companies allowing them to be more efficient. The product protection segment targets companies searching for safer, more efficient, and more cost-effective packaging solutions. Sealed Air Corporation operates in 58 countries with a sales distribution network reaching 122 countries. Sealed Air Corporation is organized under the laws of Delaware.

Food care segment:

- Supplies food processors, retailers, and food service operators with high efficiency food packaging lines and packaging.
- Sealed Air Corporation's product care segment aims to reduce shipping and fulfilment costs, increase operational efficiency, reduce damage, and enhance customer and brand experience.
- The food care packaging is used in the red meat, poultry, seafood, produce, dairy, bakery, and convenience food industries.

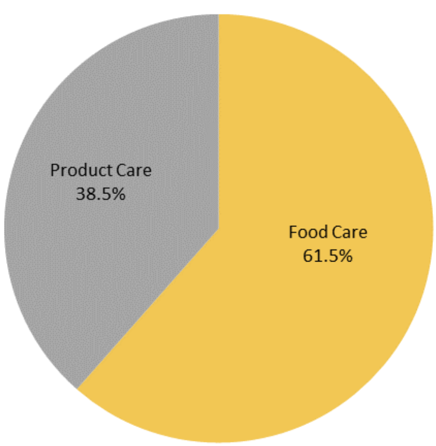
Product Care segment:

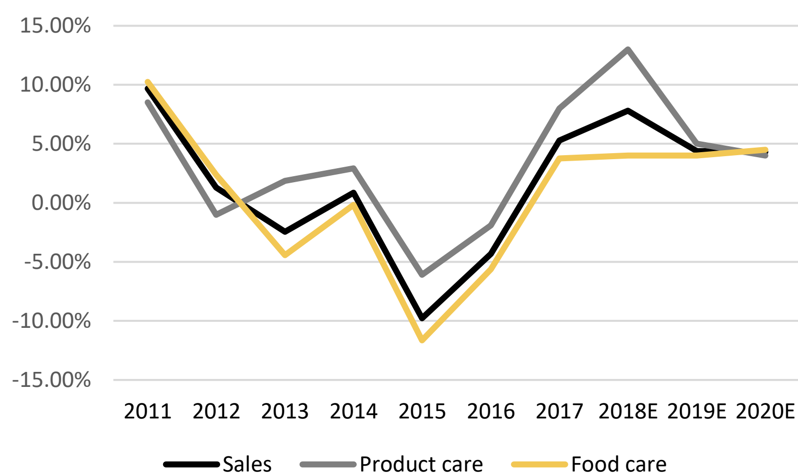
- Provides sustainable packaging solutions to a broad range of industries and market sectors including e-commerce fulfillment, general manufacturing, electronics, and transportation.
- Sealed Air Corporation's product care segment aims to reduce shipping and fulfilment costs, increase operational efficiency, reduce damage, and enhance customer and brand experience through its packaging and packaging lines.
- Sealed Air Corporation's product care includes padded envelopes, inflatable packaging, foam packaging, shrink films, paper packaging, and temperature-controlled packaging solutions.

Sealed Air Corporation generates 61.5% of its sales through its food care segment and 38.5% through its product care segment:

- Sealed Air Corporation's food care segment had 4% sales growth in 2017 and has 4% estimated sales growth in 2018.
- The product care segment had 8% sales growth in 2017 and as 13% estimated sales growth in 2018.

Figures 1 and 2: Revenue sources for SEE, year-end 2017 (left) and revenue growth by segment (right)





Source: Company reports

Business/Industry Drivers

Although there are many influences affecting Sealed Air Corporation's operations, the main business drivers are:

1) Beef production rates
2) Acquisitions & divestitures

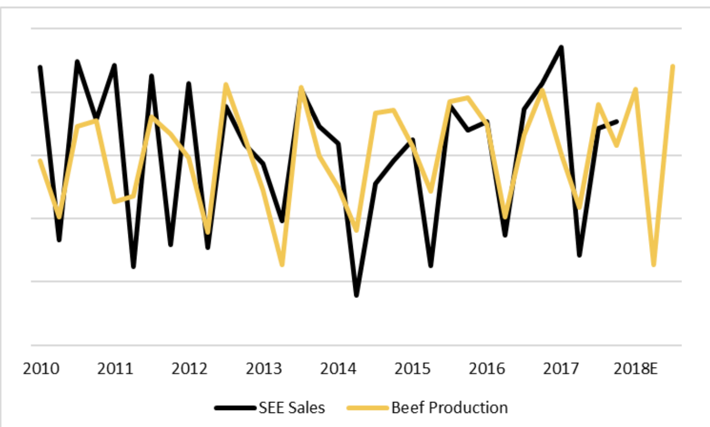
Beef production is estimated to have 2% growth in 2018.

Beef Production Rates

Beef production is a main business driver for SEE's sales. Sales are seasonal, yet stable on an annual bases with an average annual growth rate of 0.43% since 2011. Total beef production rose from 26.2 million tons to 27.1 million tons during that time. Beef production is negativly correlated with beef prices. When less beef is produced the prices increase to lower demand.

Cryovac, a subsidiary of Sealed Air Corporation released its whole bird automation system in February 2018. This system allows food packaging companies to move from four operators on a line to one. It also allows 45 birds/minute to be packaged, 12.5% more than the industry average. This will allow SEE to gain exposure to the broiler meat industry, which has compound growth 25% more than beef production over the past 6 years.

Figures 3 and 4: Quarterly beef production and sales (left), and beef prices and production (right)



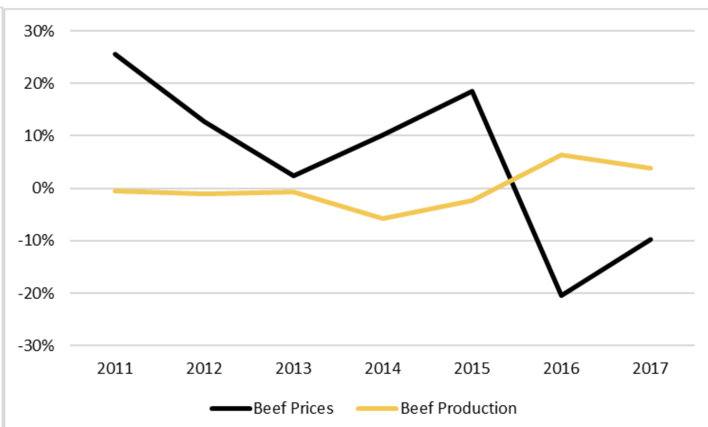
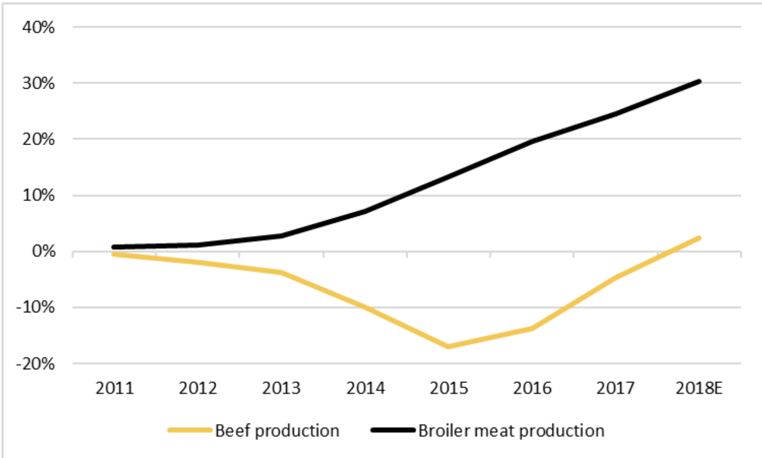


Figure 5: broiler meat and beef production compounded growth



Source: USDA, and Company reports

The meat packaging industry has an ageing workforce and outdated machinery. This provides Sealed Air Corporation with an opportunity to introduce labor saving equipment to boost growth in this reliable, yet slow growth, industry.

Meat production is also dependent on viruses affecting livestock population trade restrictions. In 2015, China stopped all imports of U.S. poultry due to the avian influenza. Denmark is planning to shut down all pork exports if the African swine fever reaches its pork industry. In 1986, mad cow disease devastated farming communities. Widespread animal viruses can significantly decrease meat production and negatively affect SEE's sales.

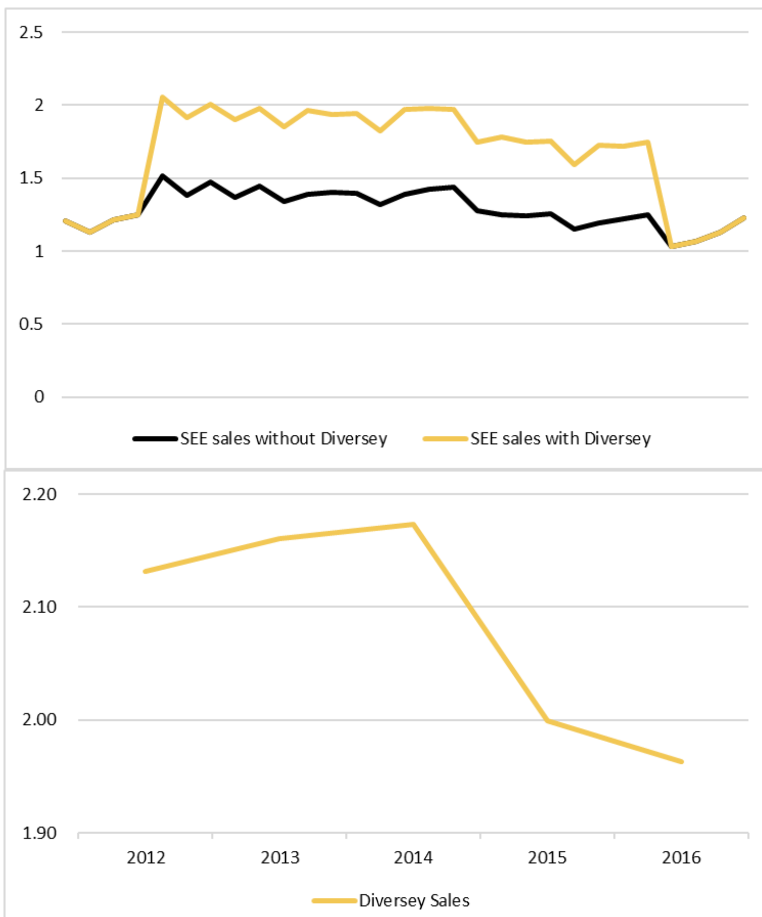
Acquisitions & Divestitures

Diversey generated $500 million in sales quarterly and sold for a $640 million gain.

The firm has utilized its acquisitions to position itself in new industries as well as expand its current business.

During the fourth quarter of 2011, Sealed Air Corporation purchased Diversey, an industrial laundry and cleaning product company. During the 5-year holding period, Diversey generated $11 billion in sales and was sold for $3.2 billion, with a gain of $640.7 million, at the end of 2016.

Figure 6 and 7: SEE quarterly sales, in billions, with and without Diversey (top), and Diversey's annual sales, in billions (bottom)

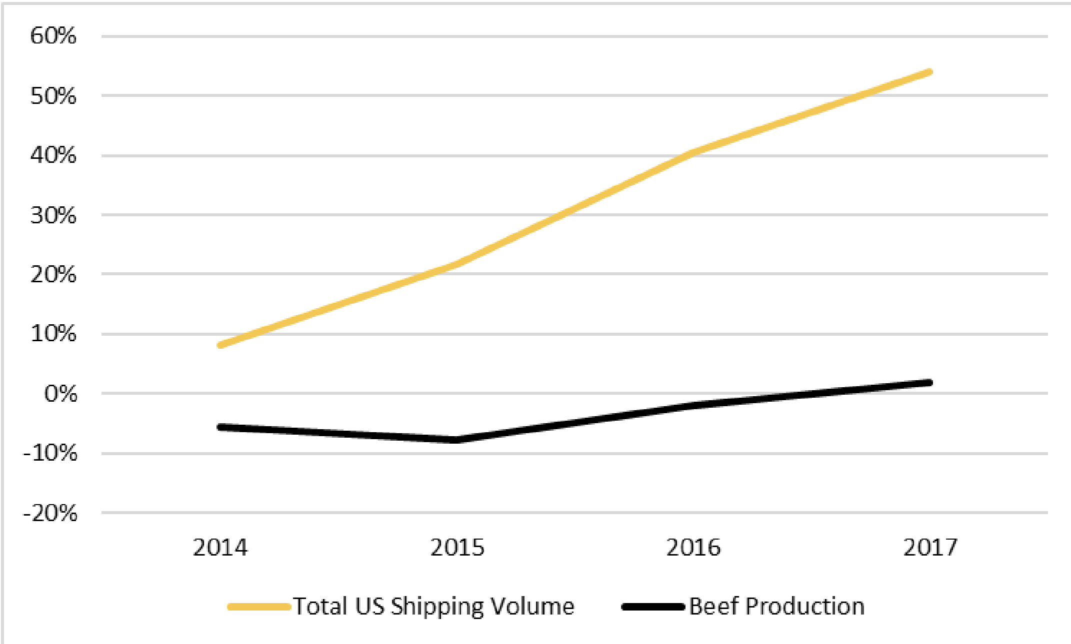


Source: Company reports

SEE is selling its food tray businesses and shifting its focus towards product care, a much quicker growing product market. This has allowed it to become one of 30 APASS (Amazon packaging support and supplier network) members. The firm can now test and certify packaging without additional testing or documentation from Amazon.

Growth in beef production has underperformed relative to shipping volume by 54% over the past 4 years

Figure 8: Growth in shippig volume and beef production

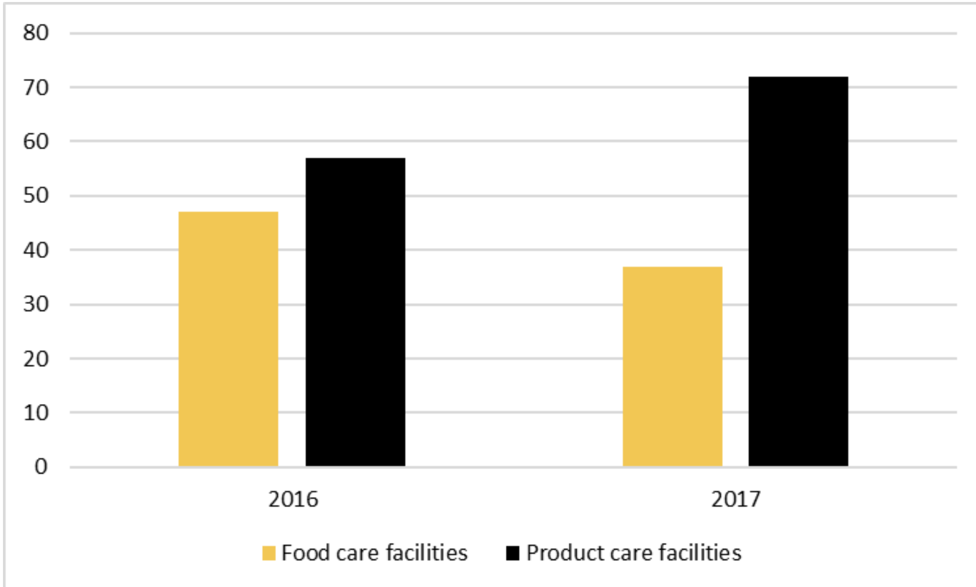


Source: USPS & USDA

Acquisitions and divestitures:

- 2015:
    - SEE sold its North American foam trays and absorbent pads business as well as its European food trays business.
    - Acquisition of B+ Equipment, headquartered in France. B+ Equipment is a manufacturer and servicer of automated packaging equipment.
- 2017:
    - The company sold its Latin American foam trays and absorbent pads business allowing it to acquire the flexible food tray business Deltaplam.
    - Acquisition of Fagerdala Singapore Pte Ltd. to grow sales in the consumer electronics, medical equipment and devices, automotive, temperature assurance, and e-commerce fulfillment sectors. Also, SEE plans to leverage Fagerdala's manufacturing footprint in Asia to increase sales.
- 2018:
    - The firm acquired AFP, a leading fabricator of foam, corrugated, molded pulp, and wood packaging solutions. AFP specializes in custom-engineered protective packaging for retail, e-commerce and direct shipping applications.

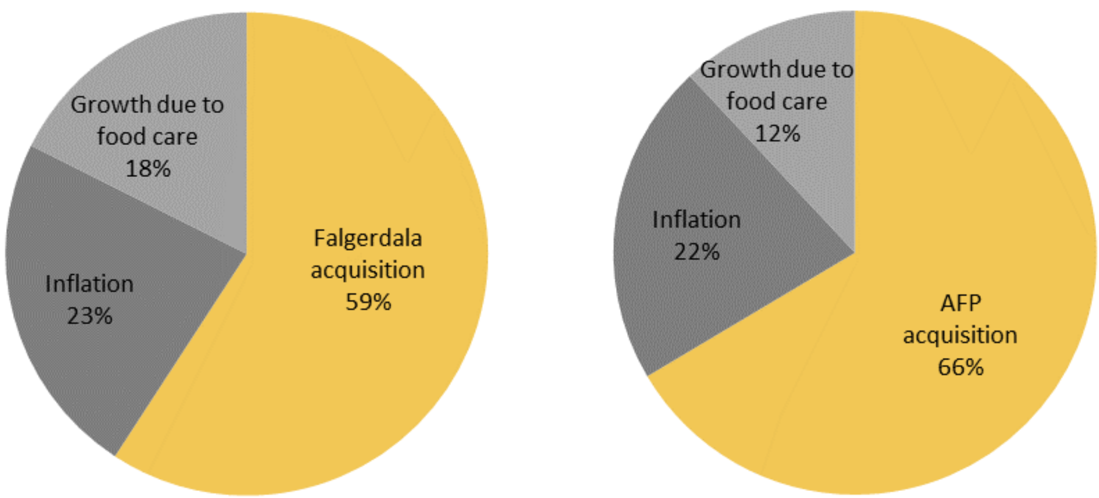
Figure 9: Facilities by segment



Source: Company reports

The product care segment has grown rapidly over the past two years, 8% in 2017 and an estimated 13% in 2018. This growth, however, is being drawn mainly through acquisitions, inflation, and modest growth that is tied to its food care business.

Figure 10 and 11: Product care sales growth in 2017 (left), and estimated product care sales growth in 2018 (right)

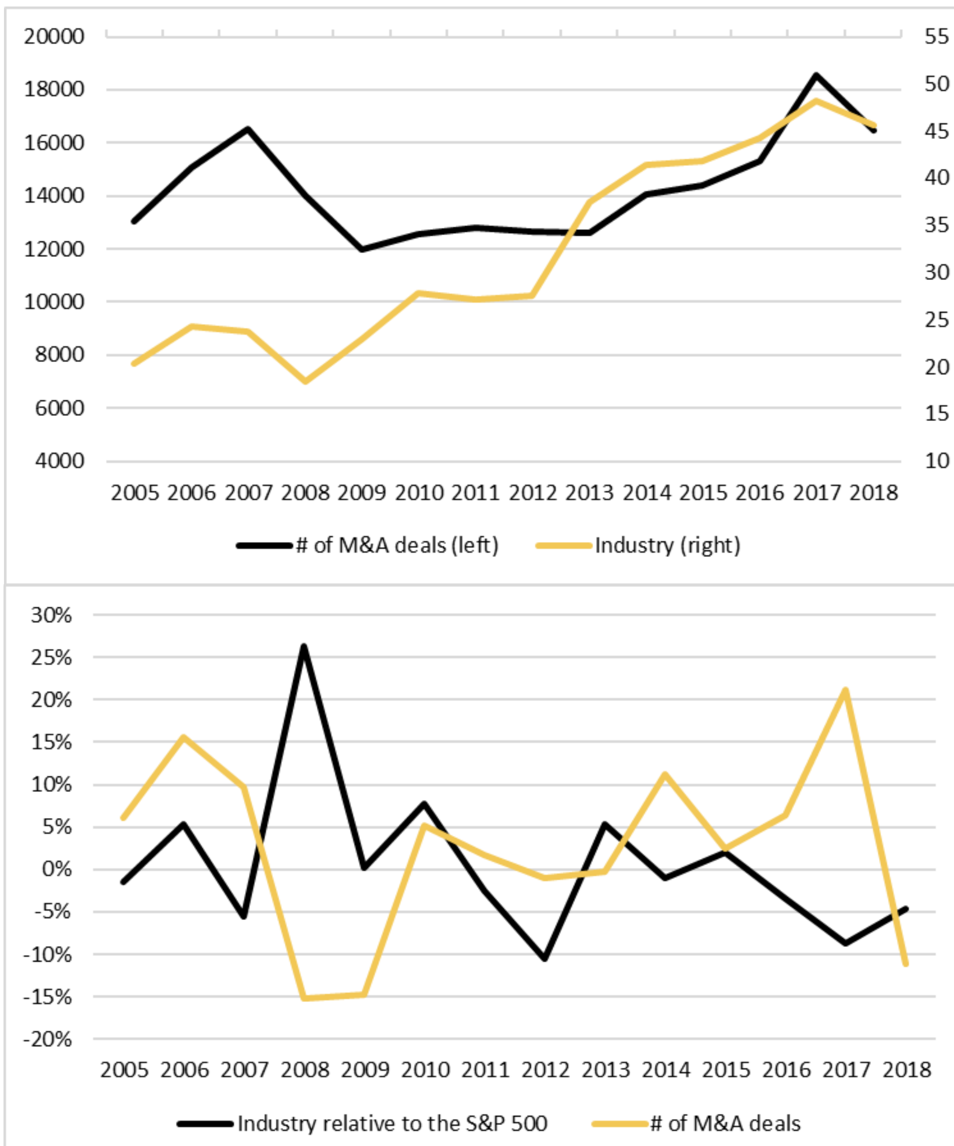


Source: Company reports, US Inflation Calculator

Mergers and acquisitions are a large part of the growth in packaging companies and more mergers and acquisitions occur when the S&P 500 is near a cycle peak. This amplifies the otherwise stable nature of the industry because growth expectations rise as firms make acquisitions. Product packaging may be growing due to more online sales, but sales will likely be more cyclical than the food business.

On a macro scale, if you compare the number of mergers and acquisitions to an index of equally weighted packaging equities, you find a correlation of 0.53. Once a regression is done, it was found that the R squared of the data set is 0.31. Relative to the S&P 500, the industry has a correlation to the number of mergers and acquisitions of -0.41. This is because times of lower acquisitions are during times of economic distress. This industry is able to maintain food care sales during these times and are less affected by market down turns.

Figure 12 and 13: Number of U.S. mergers and acquisitions and industry index price (top) and number of U.S. mergers and acquisitions and industry index price change relative to the S&P 500 (bottom)



Source: FactSet, imaa-institute

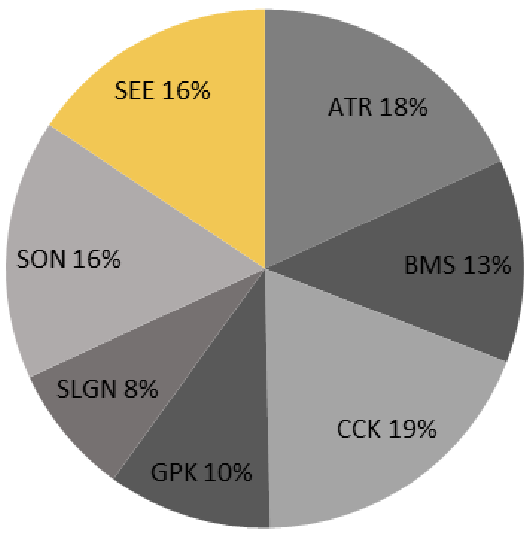
Sealed Air Corporation sets itself above the competition with its biodegradable plastic alternatives.

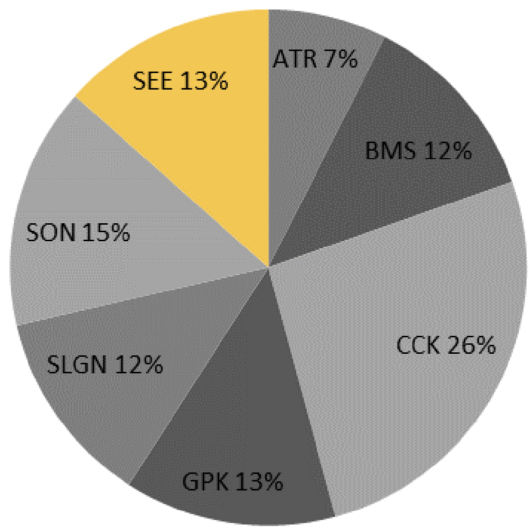
Competitor Analysis:

Sealed Air Corporation's main competitors are AptarGroup, Bemis Company, Crown Holdings, Graphic Packaging Holding Company, Silgan Holdings, and Sonoco Products Company. Packaging solutions is a highly competitive industry. Entering in this industry requires a company to be capable of designing, installing, and supplying automated packaging lines. This process is very capital intensive and creates a moat around existing packing solution providers. Companies in the packaging industry are loyal to their line producers and purchase packaging supplies for the life span of their lines. They usually wait until equipment is in dire need of replacement before purchasing new lines. Competition is fierce, however, for companies needing to automate their packaging systems and those in need of packaging solutions when entering contracts with companies such as Amazon. The number of new companies in need of packaging solutions grows every year as e-commerce grows as a purchasing platform.

Sealed Air separates itself from its competitors through innovation. SEE began their drive towards sustainability in 2012 with its Paknatural biodegradable loose fill. Since then, it has created a plant-based resin plastic substitute which the firm implements in its food care segment. This year they won an innovation award for the StealthWrap product line which lowers packaging size and shipping costs.

Figures 14 and 15: Comparison of SEE comps by market cap (left) and sales (right)





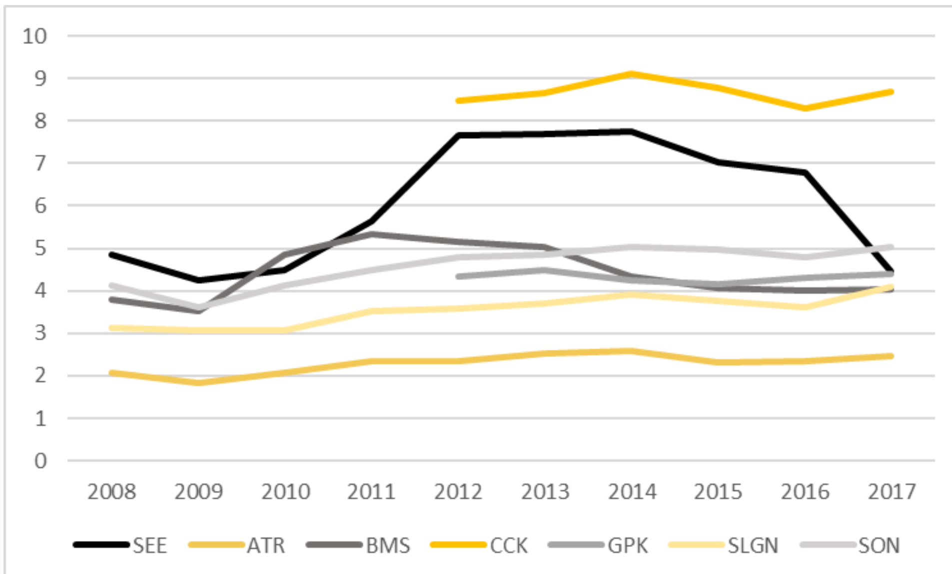
Source: Company Reports, FactSet

Sealed Air Corporation and comps:

- Sealed Air Corporation
  - 61.5% of sales from food care products and 38.5% from product care.
- AptarGroup
  - 14.5% of sales from food and beverage packaging, 34% from pharmaceutical packaging, and 51.5% from beauty and home product packaging.
- Bemis Company
  - 100% of sales from product care.

- Crown Holdings
  - 45.7% of sales from beverage packaging, 22.2% from food care packaging, and 32.1% from product care.
- Graphic Packaging Holding Company
  - 100% of sales from product care.
- Silgan Holdings
  - 100% of sales from product care.
- Sonoco Products Company
  - 100% of sales from product care.

Figures 16: Competitor revenue by firm

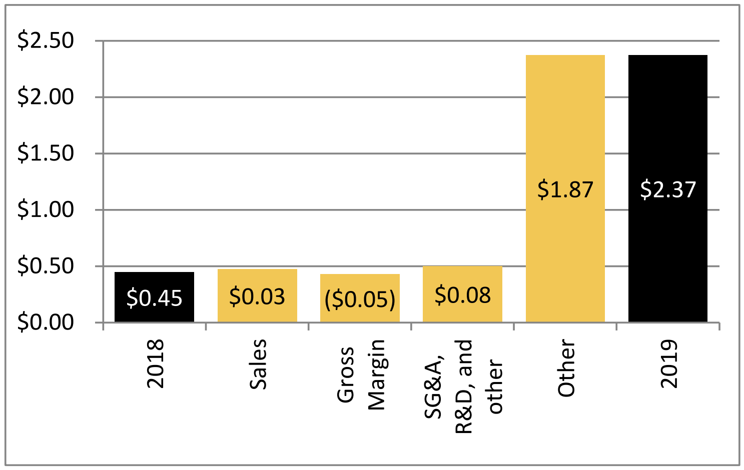


Source: Company Reports, FactSet

Financial Analysis

I anticipate EPS to grow to $2.37 in FY 2019. Modest sales growth and a slight increase in EBIT margins will boost $0.03 each. Gross margins are down slightly as the firm moves from food to product care. After the repatriation of funds this year, the change in the effective tax rate will boost EPS by $1.80. Finally, the repurchase of shares will grow eps by $0.07.

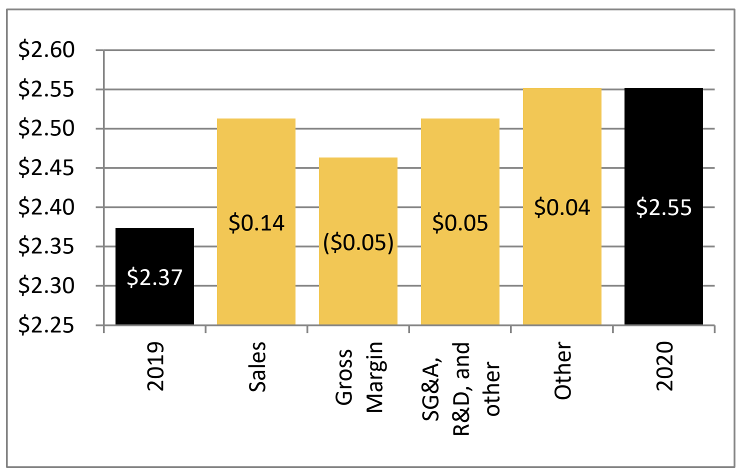
Figure 17: Quantification of 2019 EPS drivers



Source: Company Reports, IMCP

I expect 2020 EPS to increase $0.18 to $2.55. Sealed Air's sales will increase through acquisitions in its product care segment and a stable growth in meat packaging. Sales growth will account for $0.14 change in EPS. This shift to product care is forecasted to further hurt the company's gross margin and lower EPS by $0.05. This drop in EPS will be counteracted through further gains in lowering SG&A as a percent of sales. Finally, the companies share buyback plan will account for a $0.04 growth in EPS.

Figure 18: Quantification of 2020 EPS drivers



Source: Company Reports, IMCP

I am pessimistic versus consensus estimates for 2019 and 2020. I assume higher sales growth, but lower margins and a higher tax rate than consensus.

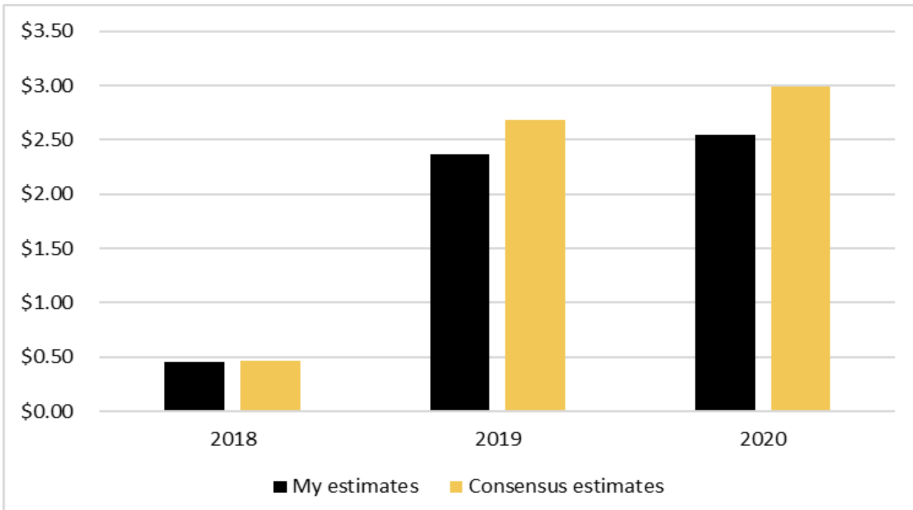
Food care sales growth is expected to have 4% sales growth in 2019 and 4.5% growth in 2020 based of beef production estimates from the USDA. Consensus estimates are 2% and 6% for food care sales growth.

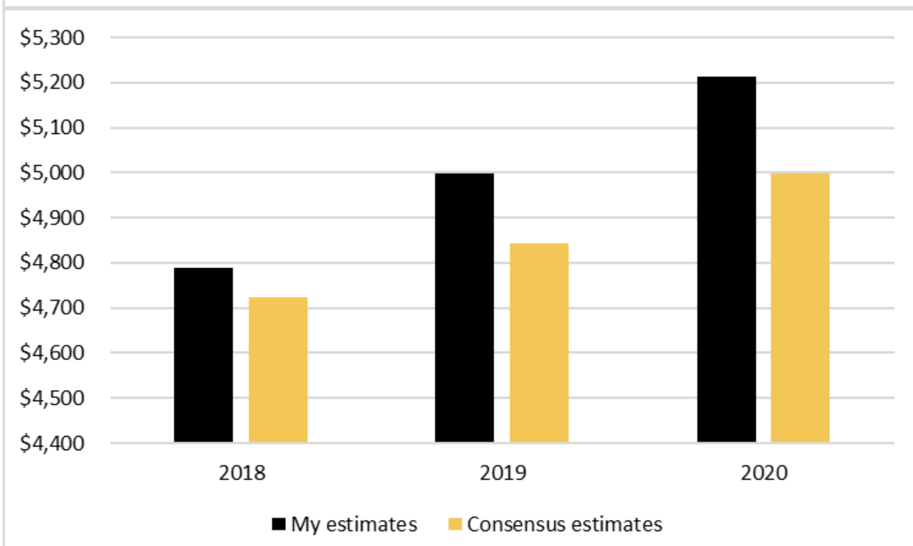
Product care sales growth estimates are higher than consensus and growth is attributed to acquisitions, inflation, and growth in the firm's food care segment. As firms buy more food packaging, more corrugate is needed for the final products. As seen in figures 10 and 11 growth in food care accounts for over 10% of the product care segment's growth. Last year the acquisition of AFP accounted for 66% of the firm's product care sales growth. Without acquisitions in 2019 and 2020, the firm's product care segment's growth will depend more on inflation and volume growth growth in food care sales. Inflation is expected to drop to 2.44% in 2019 and 2.13% in 2020 (statista.com). Food care sales are projected to grow by 4% in 2019 and 4.5% in 2020. This will lead to a projected 4% growth in 2019 and 4.5% growth in 2020, above consensus which is at 4% in 2019 and -3% in 2020.

As the company shifts more of its total sales to product care, its margins will fall lowering the firms EPS. In the Q3 transcripts, the firm again promises to increase its EBITDA margin. Historically, it has not been able to live up to its own expectations. Also, as the company shifts more of its sales to product care, a lower margin segment, its gross margin will fall.

My projected effective tax rate is higher than consensus. The Tax Cut and Jobs Act (TCJA) lowered the corporate tax rate to 21%. Sealed Air's most current effective tax rate was 30% compared to 84% last year. Consensus believes is that the rate will drop to 27%. However, I estimate 30% which reflects the company's effective tax rate since TCJA's implementation.

Figure 19 and 20: EPS estimates vs. consensus (top) Revenue estimates vs. consensus in millions (bottom)





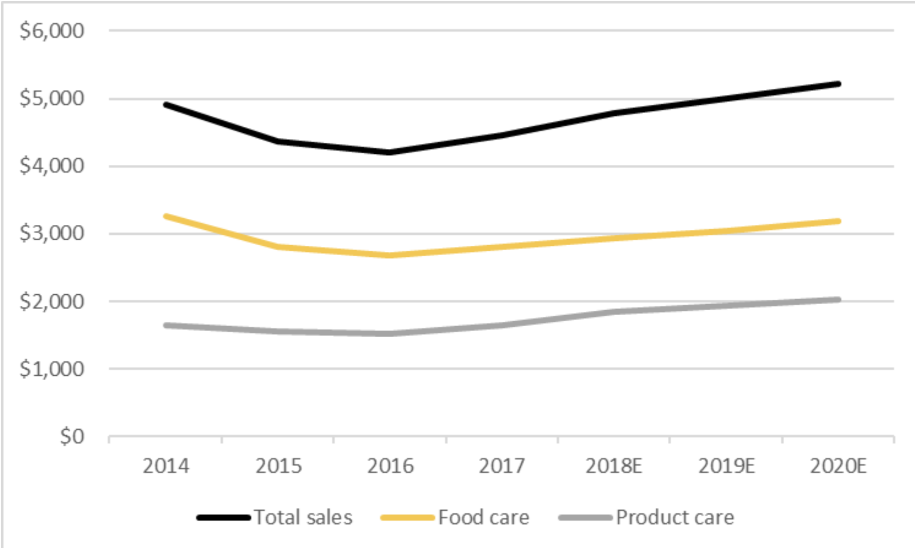
Source: FactSet, IMCP

Revenues

Sealed Air Corporation's sales have rebounded, since the sale of Diversey, as it has shifted its focus back to its core packaging businesses. With the purchase of Falgerdala and AFP, the company is expanding its industrial packaging to supplying e-commerce companies with custom packaging.

SEE has also experienced sales growth in the firm's food care segment. This is attributable to growth in beef production.

Figure 21: Sealed Air Corporation segment revenues, 2014 – 2020E



Source: Company Reports, IMCP

Operating Income and Margins

Sealed Air Corporations operating income fell to $596 million in 2017 from $631.4 million in 2016. Sales during the same period rose to $4,461.6 million in 2017 from $4,211.3 million in 2016. This caused an overall change of operating margin of -2%.

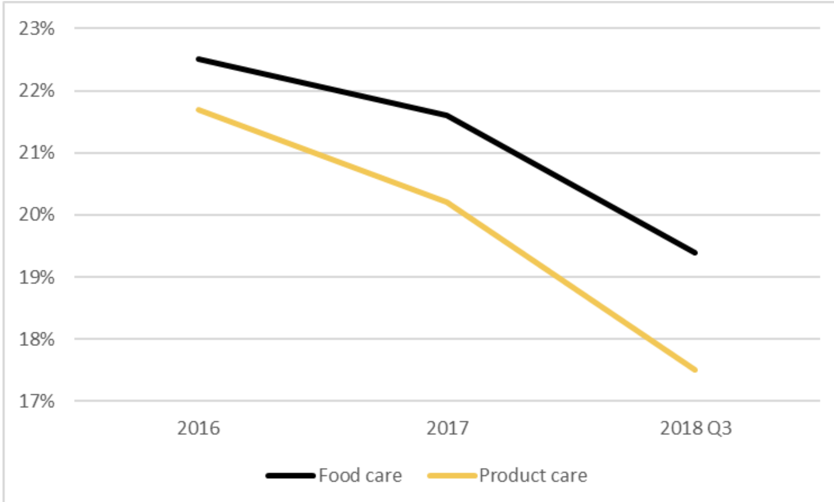
SEE's EBITDA margins have been decreasing but are projected to stabilize.

The firm's food care segment saw a decrease in EBITDA margin over the past three years. Margins dropped to 19.4% currently from 22.5% in 2016.

The firm's product care segment also saw a decrease in EBITDA margin over the past three years. Margins dropped to 16.6% from 21.7% in 2016.

Sealed air corporation stated, during its 3rd quarter 2018 earnings call, that it is focusing on increasing EBITDA margins in both the food care and product care segments. The firm's focus will be on lowering input costs. However, polyethylene prices are already low, and the firm's plastic substitutes are all made through products from sole suppliers. This creates little opportunity to increase margins. Still, I give management some benefit and expect EBIT margins to rise to 13.6 in 2020 from 13.1 in 2018.

Figures 22 and 23: EBITDA margin by segment (top) operating margins, 2014 – 2018E (bottom)



	2014	2015	2016	2017	2018E
Sales	4908	4369	4211	4462	4788
Direct costs	3288	2914	2806	3044	3256
Gross income	1620	1455	1405	1417	1532
Gross Margin	33.0%	33.3%	33.4%	31.8%	32.0%
SG&A, R&D, and other	933	838	774	821	905
Growth		-10%	-8%	6%	10%
Operating income	687	617	631	596	627
Operating margin	14.0%	14.1%	15.0%	13.4%	13.1%

Source: Company Reports

SEE's margins have been decreasing due to high corporate costs.

EBITDA/Assets

Sealed Air Corporation's EBITDA/assets has been increasing despite declining EBITDA margins. The firm's decreasing asset base has been able to cover the falling margins and drive up the EBITDA/assets ratio. SEE's EBITDA margin has been decreasing due to high corporate costs that are not allocated to food care or product care.

Figure 24: Company EBITDA/assets breakdown by segment

SEE	2014	2015	2016	2017
Average assets	1017.95	849.65	731.7	786
Asset growth	-5.6%	-16.5%	-13.9%	7.4%
EBITDA	963.9	965.8	936.5	940.6
EBITDA margin	17.5%	19.3%	19.2%	18.7%
EBITDA / assets	94.7%	113.7%	128.0%	119.7%
Food care	2014	2015	2016	2017
Average assets	723.35	600.3	491.15	485.7
Asset growth	-5.9%	-17.0%	-18.2%	-1.1%
EBITDA	670.2	643.7	605.4	608.3
EBITDA margin	17.7%	20.7%	21.7%	20.2%
EBITDA / assets	92.7%	107.2%	123.3%	125.2%
Product care	2014	2015	2016	2017
Average assets	294.6	249.35	240.55	300.3
Asset growth	-5.0%	-15.4%	-3.5%	24.8%
EBITDA	293.7	322.1	331.1	332.3
EBITDA margin	17.5%	22.5%	22.5%	21.6%
EBITDA / assets	99.7%	129.2%	137.6%	110.7%

Source: Company Reports

Over the next two years, I expect the firm's EBITDA/asset ratio to decrease. The food care segment has already lowered its asset base as much as possible, without hurting sales, closing 21% of its facilities in 2017. The EBITDA margin has plateaued creating little possibility for the food care segments EBITDA/assets ratio to grow further.

The product care segment is still growing its asset base as it tries to expand. The segment's EBITDA margin is decreasing in 2018, however, it has an opportunity to rise as the firm's acquisitions are integrated into the firm.

Free Cash Flow

Figure 25: Free cash flows 2015 – 2020E

Free Cash Flow	2015	2016	2017	2018E	2019E	2020E
NOPAT	$416	$492	$96	$100	$496	$518
Growth	*12.1%*	*18.2%*	*-80.4%*	*4.3%*	*394.0%*	*4.3%*
NOWC	1,426	1,792	1,304	909	1,062	1,148
Net fixed assets	5,210	5,200	3,414	3,491	3,570	3,724
Total net operating capital	$6,636	$6,992	$4,719	$4,400	$4,632	$4,872
Growth	*-6.0%*	*5.4%*	*-32.5%*	*-6.8%*	*5.3%*	*5.2%*
- Change in NOWC	(303)	366	(488)	(395)	152	86
- Change in NFA	(124)	(10)	(1,786)	76	80	154
FCFF	$843	$136	$2,370	$419	$264	$278
Growth		*-83.9%*	*1644.1%*	*-82.3%*	*-36.9%*	*5.0%*
- After-tax interest expense	142	155	33	29	131	137
+ Net new short-term and long-term debt	198	586	(1,905)	308	200	200
FCFE	$899	$567	$432	$698	$333	$341
Growth		*-37.0%*	*-23.8%*	*61.5%*	*-52.2%*	*2.2%*

Source: Company Reports, IMCP

SEE’s free cash flows have been extremely volatile. In 2017, the firm sold Diversey care lowering its net fixed assets and its debt. This caused a 1644.1% increase in FCFF in 2017. The firm’s 2017 FCFE, dropped 23.8% due to the decline in debt.

In 2018, the firm’s FCFE is expected to grow by 61.5%. In 2017, the firm closed 10 of its food care facilities and opened 15 product care facilities. Product care facilities require less working capital and this shift caused the drop in 2017 and another expected drop in 2018 and the shift continues.

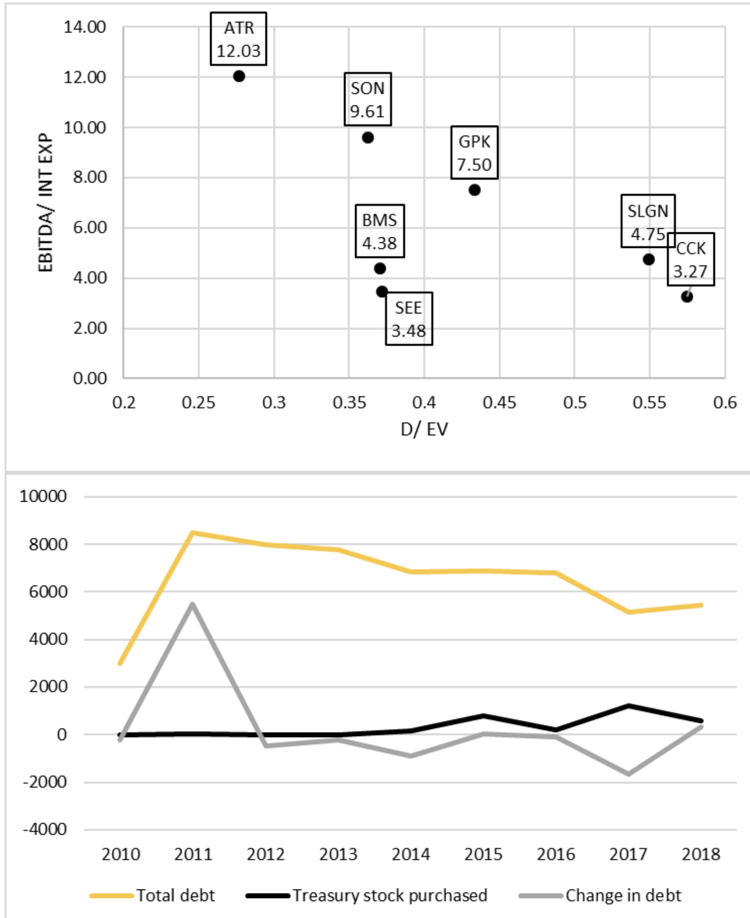
The firm’s FCFE in 2019 is expected to drop by 52.2%. As the firm can no longer close food care facilities, and as it opens more product care facilities its NOWC will increase. Although SEE is expected to have a large increase in NOPAT, from the tax reform, the increase in NOWC has a greater impact.

I expect the firm’s 2020 FCFE growth to be 2.2%. It’s expected its FCFE will be used to repurchase shares. NOPAT will grow with sales. Also, NFA will increase as the company grows its product care segment.

Debt

The firm operates with a debt to assets ratio of 1.09. If its extensive goodwill is removed from assets, the debt to assets ratio skyrockets to 1.78. Interest expense is one third of operating income and an unexpected drop in sales could present great risk. The firm’s steady income from its food care segment has been able to fund this significant debt. Additional leverage from acquisitions in its product care segment could cause financial distress. The firm has been paying down debt, which has been a factor in its rising coverage ratio. However, the firm’s EBITDA/interest expense is the lowest of similarly levered firms.

Figure 26 and 27: Industry coverage ratio to leverage (top) SEE's total debt, change in debt, and change in treasury stock (bottom)



Source: Company Reports

Valuation

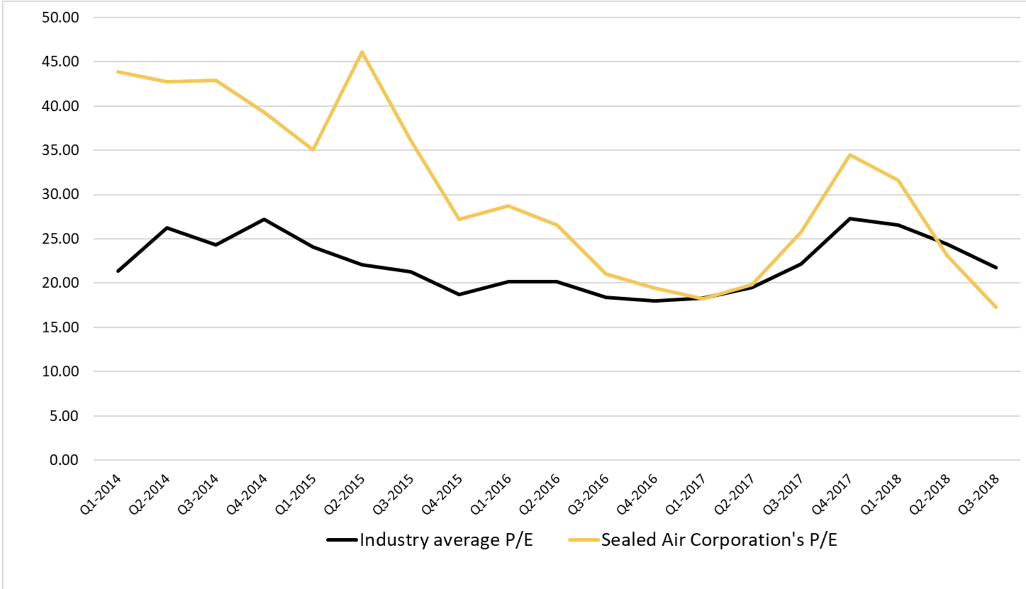
SEE was valued using multiples and a 3-stage discounting cash flow model. Based on earnings multiples, the stock is undervalued relative and is worth $37. Relative valuation shows SEE to be undervalued based on its fundamentals versus those of its peers in the packaging industry with a value of $42. A detailed DCF analysis values SEE higher, at $44; I give this value a bit more weight because it incorporates assumptions that reflect SEE's ongoing changes and items the effect the whole industry. Finally, a probability-weighted scenario analysis yields a price of $40. As a result of these valuations, I value the stock at $41.

Due to the repatriation of funds, LTM P/E is negative. Once negated, the firm's P/E is 17.3.

<u>Trading History</u>

SEE is currently trading at its five-year low P/E. This is the result of the sale of Diversey lowering earnings and slow growth in food care. SEE's NTM P/E is 14.3 based on my estimates in comparison to a LTM P/E of 17.3 currently, once effects of repatriation are removed. The industry's historical average P/E is 22.2. I predict that SEE's P/E will trend towards the mean as expectations for its product care division grow.

Figure 28: SEE LTM P/E and industry average P/E



Source: FactSet, Company Reports

Assuming the firm maintains a 17.3 P/E at the end of 2019, it should trade at $44.

- Price = P/E x EPS = 17.3 x $2.55 = $44

Discounting $44 back to today at a 10.35% cost of equity (explained in Discounted Cash Flow section) yields a price of $36. If SEE's P/E trends towards the industry average of 22.2, the stock is worth $46 after discounting.

This industry's P/E is above the market average due to the lower risk associated to food packaging.

<u>Relative Valuation</u>

Sealed Air Corporation is currently trading at a P/E lower than its peers, with a P/E TTM of 17.3 compared to an average of 22.2. Investors prefer firms with better positioning for growth from e-commerce. SEE's P/S is higher than the industry average. This is because of the relative stability of the firm's food care sales and a shallow moat created with customers who are tied to them for packaging products with its automated lines.

Figure 29: SEE comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Divi Yield
SEE	SEALED AIR CORP	$35.35	$5,547	0.8	1.6	(11.3)	(19.5)	(21.6)	(28.3)	3.4	-1742.3%	92.6%	-69.3%	482.6%	11.6%		1.05		B	1.98%
ATR	APTARGROUP INC	$102.08	$6,412	(0.3)	0.4	0.1	9.3	19.2	18.3	11.0	33.9%	2.6%	8.5%	26.5%	13.6%	7.4%	0.51	81.3%	A	1.29%
BMS	BEMIS CO INC	$47.95	$4,364	(0.6)	6.8	(3.7)	9.8	9.1	0.3	7.4	146.4%	0.4%	0.4%	18.9%	8.1%	-9.3%	0.50	120.6%	B+	2.69%
CCK	CROWN HOLDINGS INC	$48.07	$6,499	0.6	4.3	17.5	7.0	(18.4)	(14.5)	8.8	150.8%	26.2%	3.4%	55.2%	-3.2%	-8.8%	0.96	948.8%	B	0.00%
GPK	GRAPHIC PACKAGING HOLDING CO	$11.27	$3,498	(1.0)	(11.0)	(21.2)	(20.7)	(27.8)	(27.1)	14.4	-23.9%	1.4%	4.2%	18.9%	3.4%	25.6%	1.60	161.1%	B-	2.72%
SLGN	SILGAN HOLDINGS INC	$24.65	$2,727	(1.2)	(5.0)	(8.7)	(9.9)	(13.8)	(16.1)	11.1	-27.7%	-9.9%	56.7%	11.1%	6.8%	17.4%	0.68	239.7%	A-	1.62%
SON	SONOCO PRODUCTS CO	$56.02	$5,591	0.2	8.1	0.0	8.7	9.5	5.4	5.6	45.2%	15.2%	12.8%	9.8%	6.3%	-1.8%	0.84	72.5%	A-	2.93%
Average			$4,948	(0.2)	0.8	(3.9)	(2.2)	(6.3)	(8.9)	8.8	-202.5%	18.4%	2.4%	89.0%	6.7%	5.1%	0.88	270.7%		1.89%
Median			$5,547	(0.3)	1.6	(3.7)	7.0	(13.8)	(14.5)	8.8	33.9%	2.6%	4.2%	18.9%	6.8%	2.8%	0.84	140.8%		1.98%
SPX	S&P 500 INDEX	$2,702		(0.8)	(2.4)	(4.9)	(1.0)	4.8	1.0			11.9%	21.8%	9.0%	10.1%					

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr
SEE	http://www.sealedair.com	-20.4%	-15.66	19.4	34.5	17.3	17.3	13.7	13.2	11.8	1.5%	1.17		1.5%	19.3	26.5	13.1	0.5%		-10.2%
ATR	http://www.aptar.com	15.5%	4.60	23.5	23.2	25.1	32.4	24.2	23.5	20.7	7.9%	2.33	13.6%	9.9%	18.9	16.6	12.7	8.1%		1.2%
BMS	http://www.bemis.com	19.1%	3.68	18.1	19.3	19.2	39.3	16.0	16.2	15.0	5.6%	1.07	9.3%	3.4%	16.3	11.8	10.9	-0.7%	0.8%	-4.7%
CCK	http://www.crowncork.com	52.9%	6.91	18.0	14.8	15.3	21.5	8.6	8.4	8.7	4.4%	0.58	11.0%	5.9%	11.7	7.2	9.5	12.7%	3.4%	0.5%
GPK	http://www.graphicpkg.com	12.8%	1.96	18.3	17.6	20.9	10.1	13.2	12.8	12.4	3.8%	0.58	8.3%	9.0%	18.7	5.6	7.8	10.4%		0.3%
SLGN	http://www.silganholdings.com	24.1%	2.99	19.0	20.1	14.8	8.3	11.5	11.2	10.4	5.0%	0.62	9.1%	10.7%	14.8	6.4	8.8	1.8%	0.3%	2.7%
SON	http://www.sonoco.com	17.4%	3.08	16.8	18.8	16.8	23.3	16.1	16.1	15.1	5.9%	1.03	9.1%	6.3%	16.1	12.4	10.3	5.4%	1.5%	1.0%
Average		17.4%	1.08	19.0	21.2	18.5	21.7	14.7	14.5	13.4	4.9%	1.06	10.1%	6.7%	16.5	12.3	10.4	5.5%	1.5%	-1.3%
Median		17.4%	3.08	18.3	19.3	17.3	21.5	13.7	13.2	12.4	5.0%	1.03	9.2%	6.3%	16.3	11.8	10.3	5.4%	1.1%	0.5%
spx	S&P 500 INDEX			17.1	16.8	16.4			15.3	13.9										

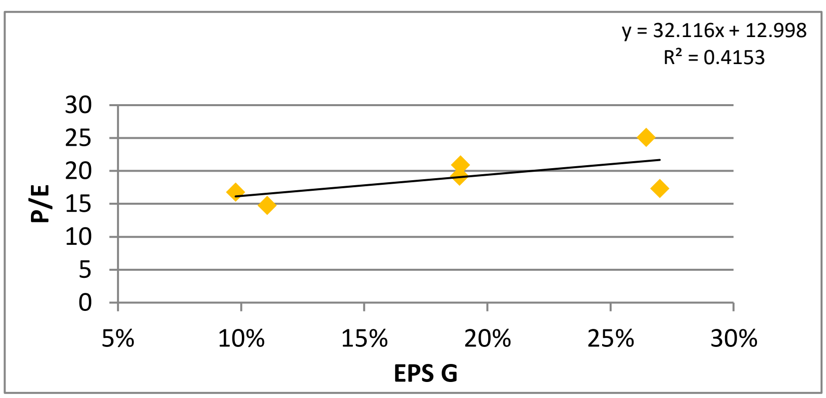
Source: IMCP

When one-time repatriation taxes are removed, LTM EPS growth is 27%.

A more thorough analysis of P/E and LTM EPS growth is shown in figure 26. The calculated R-squared of the regression indicates that over 41% of a sampled firm's P/E is explained by its LTM EPS growth. SEE has the highest EPS growth and a mid-range P/E of this grouping, and according to this measure is slightly undervalued.

- Estimated P/E = Estimated 2018 EPS growth (27%) x 32.12 + 13 = 21.7
- Target Price = Estimated P/E appreciation (21.7/17.3) x 2018 current price (34.05) = $42.65

Figure 30: P/E vs LTM EPS growth

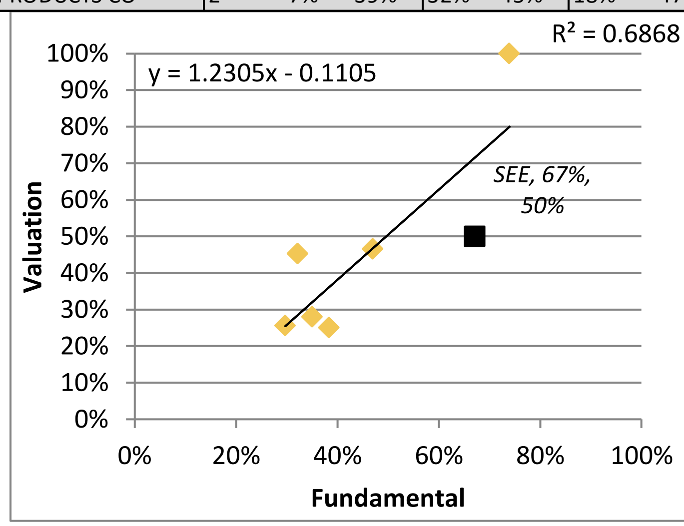


Source: FactSet, IMCP

For a final comparison, I created a composite ranking of 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 2019 and 2020 EPS growth was compared to P/S. The regression line had an R-squared of .69. SEE is below the line, so it is inexpensive based on its fundamentals.

Figure 31 and 32: Composite valuation, % of max (top) and composite relative valuation (bottom)

							Fundamental		Valuation
						Weight	50.0%	50.0%	100.0%
		Rank		Target	Weighted		Earnings Growth		P/S
Ticker	Name	Diff	Diff	Value	Fund	Value	2019	2020	2018E
SEE	SEALED AIR CORP	4	8%	58%	67%	50%	49%	85%	50%
ATR	APTARGROUP INC	1	-38%	62%	74%	100%	48%	100%	100%
BMS	BEMIS CO INC	3	0%	47%	47%	47%	34%	60%	47%
CCK	CROWN HOLDINGS INC	7	17%	42%	38%	25%	100%	-23%	25%
GPK	GRAPHIC PACKAGING HOLDING	5	12%	37%	30%	26%	34%	25%	26%
SLGN	SILGAN HOLDINGS INC	6	12%	40%	35%	28%	20%	50%	28%
SON	SONOCO PRODUCTS CO	2	-7%	39%	32%	45%	18%	47%	45%



Source: FactSet, IMCP

<u>Discounted Cash Flow Analysis</u>

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

For the purpose of this analysis, the company's cost of equity was calculated to be 10.35% 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 3.10%.
- A ten-year beta of 1.05 was utilized since the company has higher risk than the market. While its food care business is stable, the firm has undergone many changes which present some risk as does its above leverage.
- 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 10.35% (3.10 + 1.05 (10.0 – 3.10)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $2.17 and $2.28, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $3.84 per share. Thus, stage one of this discounted cash flow analysis contributes $3.84 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 10.35% cost of equity. I assume 3.5% annual sales growth during this period. The ratio of sales to NOWC, sales to NFA, and NOPAT to sales will remain at 2020 levels.

Figure 33: FCFE and discounted FCFE, 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$2.17	$2.28	$2.70	$2.88	$3.08	$3.28	$3.50
Discounted FCFE	$1.96	$1.88	$2.01	$1.94	$1.88	$1.82	$1.76

Source: FactSet, IMCP

Added together, these discounted cash flows total $9.41.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $2.37 in 2019 to $3.53 in 2025.

Figure 34: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$2.37	$2.55	$2.72	$2.90	$3.10	$3.31	$3.53

Source: FactSet, IMCP

Stage three of the model requires an assumption regarding the company's terminal price-to-earnings ratio. This industry's P/E is declining as the pace of e-commerce growth slows. SEE is expected to have slower growth than the industry, so a discounted P/E of 14.61 is warranted.

Given the assumed terminal earnings per share of $3.53 and a price to earnings ratio of 14.61, a terminal value of $52.94 per share is calculated. Using the 10.35% cost of equity, this number is discounted back to a present value of $26.58.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $39.13 is calculated (3.84 + 9.41 + 26.58). Given SEE's current price of $34.05, this model indicates that the stock is undervalued.

<u>Scenario Analysis</u>

Sealed Air Corporation's base case valuation is $39.13/share. For the bear case, consensus sales growth was applied to 2019 and 2020.

The second stage sales growth was lowered to 2%, the lower end of long-term industry sales growth. The terminal P/E had been lowered to the 2020 consensus estimate and a higher beta was applied. The stock's value drops to $32.63/share.

The bull case has a higher second stage sales growth. Growth rates for established packaging companies has trended between 3% and 4%. The terminal P/E has been raised from the base case to the industry five-year average. The beta is lowered to 0.9. Although the company is heavily levered in comparison to its peers, its sales in food care is stable and can cover the firm's interest expense. After these values are applied, the stock's value is rises to $56.73.

Figure 35: SEE base, bear, and bull case

Base	2019	2020	2021-2025
Sales Growth	4.39%	4.31%	3.50%
Terminal P/E	14.61		
Beta	1.05		
Cost of Equity	10.35%		
Value	**$39.13**		
Bear	2019	2020	2021-2025
Sales Growth	2%	6%	3%
Terminal P/E	11.4		
Beta	1.1		
Cost of Equity	10.69%		
Value	**$32.63**		
Bull	2019	2020	2021-2025
Sales Growth	4.39%	4.31%	4%
Terminal P/E	22.22		
Beta	0.9		
Cost of Equity	9.31%		
Value	**$56.73**		

Source: FactSet, IMCP

Business Risks

Sealed Air Corporation operates in two industries and has exposure to internal and external forces that could negatively affect the business.

Debt heavy operations:

The firm has a debt to assets ratio of 1.09. Once goodwill is removed from the firm's assets it has a debt to assets ratio of 1.78. SEE's coverage ratio is 3.48. An unexpected drop in sales could cause financial distress.

Livestock viruses:

61.5% of Sealed Air Corporation's sales is from food care products. A substantial loss to livestock would not only hurt SEE's food packaging sales, but also its automated food packaging line sales.

Government instability:

The firm operates in 58 countries and is exposed to their economic conditions. Last year they were forced to cease Venezuelan operations at a total cost of $49 million. This was due to the country's poor economic condition which created an atmosphere where it could not obtain supplies and maintain production.

Suppliers:

Although there are a broad range of suppliers for SEE's polyolefin raw materials, the firm still has some sole suppliers. If these suppliers are unable to fulfill SEE's orders, it would have a material effect on its ability to produce and sell products.

Green movement:

Although the firm is shifting to more biodegradable plastic alternatives, most of its sales are from products made from petrochemical based raw materials. A plastic ban would adversely affect SEE's ability to sell its products.

Customer preference:

Within the well-established packaging industry, new customers are gained through innovative products. Sealed Air Corporation offers Plantic, a biodegradable plant resin plastic alternative. Also, the firm's StealthWrap won a packaging innovation award this year. However, if these products are not accepted by consumers, SEE will not meet its sales estimates.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Low

The packaging industry is well defined, and the risk of new entrants is low due to the low prices established companies can offer and high capital requirements to enter the industry.

Threat of Substitutes – Relatively Low

Companies utilize the packaging from the firms that provided their equipment. Few substitutes will run on the same line and the costs to purchase a new automated system is substantial.

Supplier Power -- Low and Very High

There are various suppliers of polyolefin raw materials, so suppliers have very little market power. However, raw material suppliers for plant-based resin products are sole providers and SEE relies heavily on them.

Buyer Power – High

No buyer constitutes more than 10% of net sales. Buyers must buy packaging from the company which produced its automated packaging line. Buyers wait until old lines need replacement to upgrade and must buy quickly to keep up production. Also, businesses tend to stay with the companies they have been working with for new equipment. This leaves Sealed Air Corporations only exposed to buyer power with new automated line sales. Various companies can offer similar packaging solutions.

Intensity of Competition – High

There are multiple packaging solution companies in each region that Sealed Air Corporation operates that offer similar products. The company attempts to set itself above the competition with its biodegradable products and innovative packaging solutions.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Innovation Extensive global reach Diverse consumer base	Sole suppliers High debt Overpaying for acquisitions
Opportunities	**Threats**
Growth in beef production Growth in product care Economic conditions	Customer response Exchange rates Economic instability

Appendix 3 and 4: Income Statement (top), balance sheets (bottom)

Income statement (in millions)	2014	2015	2016	2017	2018	2019E	2020E
Sales	4,908	4,369	4,211	4,462	4,788	4,999	5,214
Direct costs	3,288	2,914	2,806	3,044	3,256	3,449	3,608
Gross Margin	1,620	1,455	1,405	1,417	1,532	1,550	1,606
SG&A, R&D, and other	933	838	774	821	905	870	897
EBIT	687	617	631	596	627	680	709
Interest	228	211	199	202	183	179	187
EBT	459	406	432	394	445	500	522
Taxes	211	133	96	331	373	135	141
Net income	248	274	336	64	71	365	381
Basic Shares	210	204	194	187	159	154	149
EPS	1.18	1.34	1.73	0.34	0.45	2.37	2.55
DPS	0.53	0.52	0.63	0.64	0.80	0.87	0.94

Balance sheet (in millions)	2014	2015	2016	2017	2018E	2019E	2020E
Cash	286	358	334	594	191	312	366
Operating assets ex cash	2,332	1,857	1,882	1,272	1,308	1,365	1,424
Operating assets	2,619	2,216	2,215	1,866	1,499	1,678	1,790
Operating liabilities	890	790	423	562	590	616	642
NOWC	1,729	1,426	1,792	1,304	909	1,062	1,148
NOWC ex cash (NWC)	1,442	1,068	1,458	710	718	750	782
NFA	5,335	5,210	5,200	3,414	3,491	3,570	3,724
Invested capital	*$7,063*	*$6,636*	*$6,992*	*$4,719*	*$4,400*	*$4,632*	*$4,872*
Total assets	*$7,953*	*$7,426*	*$7,416*	*$5,281*	*$4,990*	*$5,248*	*$5,515*
Short-term and long-term debt	$5,196	$5,395	$5,981	$4,075	$4,383	$4,583	$4,783
Other liabilities	704	714	402	491	517	517	517
Debt/equity-like securities	-	-	-	-	-	-	-
Equity	1,163	527	610	152	(500)	(468)	(428)
Total supplied capital	*$7,063*	*$6,636*	*$6,993*	*$4,719*	*$4,400*	*$4,632*	*$4,872*
Total liabilities and equity	*$7,953*	*$7,426*	*$7,416*	*$5,281*	*$4,990*	*$5,248*	*$5,515*

Appendix 5: Sales Forecast

Sales (in millions)	2014	2015	2016	2017	2018E	2019E	2020E
Sales	$4,908	$4,369	$4,211	$4,462	$4,788	$4,999	$5,214
Growth		*-11.0%*	*-3.6%*	*5.9%*	*7.3%*	*4.4%*	*4.3%*
Food Care	3,253	2,815	2,687	2,815	2,933	3,051	3,188
Growth		*-13.5%*	*-4.6%*	*4.8%*	*4.2%*	*4.0%*	*4.5%*
% of sales	*66.3%*	*64.4%*	*63.8%*	*63.1%*	*61.3%*	*61.0%*	*61.1%*
Product Care	1,655	1,554	1,525	1,646	1,855	1,948	2,026
Growth		*-6.1%*	*-1.9%*	*8.0%*	*12.7%*	*5.0%*	*4.0%*
% of sales	*33.7%*	*35.6%*	*36.2%*	*36.9%*	*38.7%*	*2.0%*	*38.9%*
Total	100.0%	100.9%	100.0%	100.0%	100.0%	100.0%	100.0%
Americas	3,092	2,739	2,635	2,824	2,969	3,099	3,233
Growth		*-11.4%*	*-3.8%*	*7.2%*	*5.1%*	*4.4%*	*4.3%*
% of sales	*63.0%*	*62.7%*	*62.6%*	*63.3%*	*62.0%*	*62.0%*	*62.0%*
EMEA	1,178	1,033	963	985	1,101	1,150	1,199
Growth		*-12.3%*	*-6.8%*	*2.3%*	*11.8%*	*4.4%*	*4.3%*
% of sales	*24.0%*	*23.6%*	*22.9%*	*22.1%*	*23.0%*	*23.0%*	*23.0%*
APAC	638	639	614	653	718	750	782
Growth		*0.1%*	*-3.9%*	*6.3%*	*10.1%*	*4.4%*	*4.3%*
% of sales	*13.0%*	*14.6%*	*14.6%*	*14.6%*	*15.0%*	*15.0%*	*15.0%*

Appendix 6: Ratios

Ratios	2014	2015	2016	2017	2018E	2019E	2020E
Profitability							
Gross margin	33.0%	33.3%	33.4%	31.8%	32.0%	31.0%	30.8%
Operating (EBIT) margin	14.0%	14.1%	15.0%	13.4%	13.1%	13.6%	13.6%
Net profit margin	5.1%	6.3%	8.0%	1.4%	1.5%	7.3%	7.3%
Activity							
NFA (gross) turnover		0.83	0.81	1.04	1.39	1.42	1.43
Total asset turnover		0.57	0.57	0.70	0.93	0.98	0.97
Liquidity							
Op asset / op liab	2.94	2.81	5.23	3.32	2.54	2.72	2.79
NOWC Percent of sales		36.1%	38.2%	34.7%	23.1%	19.7%	21.2%
Solvency							
Debt to assets	65.3%	72.6%	80.7%	77.2%	87.8%	87.3%	86.7%
Debt to equity	446.9%	1023.5%	980.9%	2675.9%	-876.6%	-979.2%	-1117.7%
Other liab to assets	8.9%	9.6%	5.4%	9.3%	10.4%	9.9%	9.4%
Total debt to assets	74.2%	82.3%	86.1%	86.5%	98.2%	97.2%	96.1%
Total liabilities to assets	85.4%	92.9%	91.8%	97.1%	110.0%	108.9%	107.8%
Debt to EBIT	7.56	8.74	9.47	6.84	6.99	6.74	6.75
EBIT/interest	3.02	2.93	3.17	2.95	3.44	3.79	3.79
Debt to total net op capital	73.6%	81.3%	85.5%	86.4%	99.6%	98.9%	98.2%

Ratios	2014	2015	2016	2017	2018E	2019E	2020E
ROIC							
NOPAT to sales	7.6%	9.5%	11.7%	2.2%	2.1%	9.9%	9.9%
Sales to NWC		3.48	3.33	4.11	6.70	6.81	6.81
Sales to NFA		0.83	0.81	1.04	1.39	1.42	1.43
Sales to IC ex cash		0.67	0.65	0.83	1.15	1.17	1.18
Total ROIC ex cash		6.4%	7.6%	1.8%	2.4%	11.6%	11.7%
NOPAT to sales	7.6%	9.5%	11.7%	2.2%	2.1%	9.9%	9.9%
Sales to NOWC		2.77	2.62	2.88	4.33	5.07	4.72
Sales to NFA		0.83	0.81	1.04	1.39	1.42	1.43
Sales to IC		0.64	0.62	0.76	1.05	1.11	1.10
Total ROIC		6.1%	7.2%	1.6%	2.2%	11.0%	10.9%
NOPAT to sales	7.6%	9.5%	11.7%	2.2%	2.1%	9.9%	9.9%
Sales to EOY NWC	3.40	4.09	2.89	6.28	6.67	6.67	6.67
Sales to EOY NFA	0.92	0.84	0.81	1.31	1.37	1.40	1.40
Sales to EOY IC ex cash	0.72	0.70	0.63	1.08	1.14	1.16	1.16
Total ROIC using EOY IC ex cash	5.5%	6.6%	7.4%	2.3%	2.4%	11.5%	11.5%
NOPAT to sales	7.6%	9.5%	11.7%	2.2%	2.1%	9.9%	9.9%
Sales to EOY NOWC	2.84	3.06	2.35	3.42	5.27	4.71	4.54
Sales to EOY NFA	0.92	0.84	0.81	1.31	1.37	1.40	1.40
Sales to EOY IC	0.69	0.66	0.60	0.95	1.09	1.08	1.07
Total ROIC using EOY IC	5.3%	6.3%	7.0%	2.0%	2.3%	10.7%	10.6%
ROE							
5-stage							
EBIT / sales		14.1%	15.0%	13.4%	13.1%	13.6%	13.6%
Sales / avg assets		0.57	0.57	0.70	0.93	0.98	0.97
EBT / EBIT		65.8%	68.4%	66.1%	70.9%	73.6%	73.6%
Net income /EBT		67.4%	77.9%	16.2%	16.0%	73.0%	73.0%
ROA		3.6%	4.5%	1.0%	1.4%	7.1%	7.1%
Avg assets / avg equity		9.10	13.06	16.66	(29.54)	(10.58)	(12.01)
ROE		32.4%	59.2%	16.7%	-41.0%	-75.5%	-85.0%
3-stage							
Net income / sales		6.3%	8.0%	1.4%	1.5%	7.3%	7.3%
Sales / avg assets		0.57	0.57	0.70	0.93	0.98	0.97
ROA		3.6%	4.5%	1.0%	1.4%	7.1%	7.1%
Avg assets / avg equity		9.10	13.06	16.66	(29.54)	(10.58)	(12.01)
ROE		32.4%	59.2%	16.7%	-41.0%	-75.5%	-85.0%
Payout Ratio		39.0%	36.1%	187.9%	177.4%	36.5%	37.0%
Retention Ratio		61.0%	63.9%	-87.9%	-77.4%	63.5%	63.0%
Sustainable Growth Rate		19.8%	37.8%	-14.7%	31.7%	-47.9%	-53.6%

Appendix 7: 3-stage DCF model

First Stage			Second Stage				
Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*4.4%*	*4.3%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
NOPAT / S	*9.9%*	*9.9%*	*9.9%*	*9.9%*	*9.9%*	*9.9%*	*9.9%*
S / NOWC	*4.71*	*4.54*	*4.54*	*4.54*	*4.54*	*4.54*	*4.54*
S / NFA (EOY)	*1.40*	*1.40*	*1.40*	*1.40*	*1.40*	*1.40*	*1.40*
S / IC (EOY)	*1.08*	*1.07*	*1.07*	*1.07*	*1.07*	*1.07*	*1.07*
ROIC (EOY)	*10.7%*	*10.6%*	*10.6%*	*10.6%*	*10.6%*	*10.6%*	*10.6%*
ROIC (BOY)		*11.2%*	*11.0%*	*11.0%*	*11.0%*	*11.0%*	*11.0%*
Share Growth		*-3.0%*	*-3.0%*	*-3.0%*	*-3.0%*	*-3.0%*	*-3.0%*
Sales	$4,999	$5,214	$5,396	$5,585	$5,781	$5,983	$6,192
NOPAT	$496	$518	$536	$554	$574	$594	$615
Growth		*4.3%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
- Change in NOWC	152	86	40	42	43	45	46
NOWC EOY	*1062*	*1148*	*1188*	*1230*	*1273*	*1317*	*1364*
Growth NOWC		*8.1%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
- Chg NFA	80	154	130	135	140	145	150
NFA EOY	*3,570*	*3,724*	*3,854*	*3,989*	*4,129*	*4,273*	*4,423*
Growth NFA		*4.3%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
Total inv in op cap	232	240	171	176	183	189	196
Total net op cap	4632	4872	5043	5219	5402	5591	5787
FCFF	$264	$278	$365	$378	$391	$405	$419
% of sales	*5.3%*	*5.3%*	*6.8%*	*6.8%*	*6.8%*	*6.8%*	*6.8%*
Growth		*5.0%*	*31.6%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
- Interest (1-tax rate)	131	137	142	146	152	157	162
Growth		*4.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
+ Net new debt	200	200	167	173	179	186	192
Debt	4583	4783	4950	5124	5303	5489	5681
Debt / tot net op capital	*98.9%*	*98.2%*	*98.2%*	*98.2%*	*98.2%*	*98.2%*	*98.2%*
FCFE w debt	$333	$341	$391	$405	$419	$434	$449
% of sales	*6.7%*	*6.5%*	*7.2%*	*7.2%*	*7.2%*	*7.2%*	*7.2%*
Growth		*2.2%*	*14.8%*	*3.5%*	*3.5%*	*3.5%*	*3.5%*
/ No Shares	153.9	149.3	144.8	140.4	136.2	132.1	128.2
FCFE	$2.17	$2.28	$2.70	$2.88	$3.08	$3.28	$3.50
Growth		*5.4%*	*18.3%*	*6.7%*	*6.7%*	*6.7%*	*6.7%*
* Discount factor	0.91	0.82	0.74	0.67	0.61	0.55	0.50
Discounted FCFE	$1.96	$1.88	$2.01	$1.94	$1.88	$1.82	$1.76
Third Stage							
Terminal value P/E							
Net income	$365	$381	$394	$408	$422	$437	$452
% of sales	*7.3%*	*7.3%*	*7.3%*	*7.3%*	*7.3%*	*7.3%*	*7.3%*
EPS	$2.37	$2.55	$2.72	$2.90	$3.10	$3.31	$3.53
Growth		*7.5%*	*6.7%*	*6.7%*	*6.7%*	*6.7%*	*6.7%*
Terminal P/E							17.30
* Terminal EPS							$3.53
Terminal value							$61.05
* Discount factor							0.50
Discounted terminal value							$30.65

Summary		
First stage	$3.84	Present value of first 2 year cash flow
Second stage	$9.41	Present value of year 3-7 cash flow
Third stage	$30.65	Present value of terminal value P/E
Value (P/E)	**$43.90**	= value at beg of fiscal yr 2019

Analyst: Asher Wiskow

INVESTMENT MANAGEMENT CERTIFICATE PROGRAM

December 13, 2018

Apparel Retail

Boeing Company

Recommendation	BUY
Target (today's value)	$390
Current Price	$325.75
52 week range	$287.72 - $394.28

Share Data	
Ticker:	BA
Market Cap. (Billion):	$185.5
Inside Ownership	0.1%
Inst. Ownership	70.3%
Beta	1.15
Dividend Yield	2.1%
Payout Ratio	38.8%
Cons. Long-Term Growth Rate	15.1%

	'16	'17	'18	'19E	'20E
Sales (billions)					
Year	$94.5	$93.4	$99.6	$103.7	$110.1
Gr %	-2.0%	-2.2%	7.3%	4.3%	6.2%
Cons	-	-	-	-	-
EPS					
Year	$7.17	$13.02	$16.59	$18.45	$20.94
Gr %	0.2%	81.5%	27.5%	11.2%	16.5%
Cons	-	-	-	-	-

Ratio	'16	'17	'18	'19E	'20E
ROE (%)	136.8	1397	NA	NA	NA
Industry	34.4%	36.3%	54.0%	53.3%	61%
NPM (%)	5.2%	8.8%	9.5%	9.8%	10%
Industry	7.0%	7.9%	8.1%	8.0%	7.8%
A. T/O	1.02	1.02	1.01	1.02	1.04
ROA (%)	5.3%	9.0%	9.5%	10.6%	12%
Industry	6.4%	7.0%	7.3%	7.1%	7.4%
D/A	-	-	-	-	-

Valuation	'17	'18	'19E	'20E
P/E	22.0	19.1	17.9	15.5
Industry	24.8	18.1	16.2	14.0
P/S	1.9	1.9	1.7	1.6
P/B	491.0	NA	NA	NA
P/CF	13.5	13.8	11.9	10.3
EV/EBITDA	14.5	14.0	12.0	11.1

Performance	Stock	Industry
1 Month	-6.88%	-3.9%
3 Month	-7.5%	-10.0%
YTD	1.0%	1.9%
52-week	1.0%	2.8%
3-year	40.1%	21.1%

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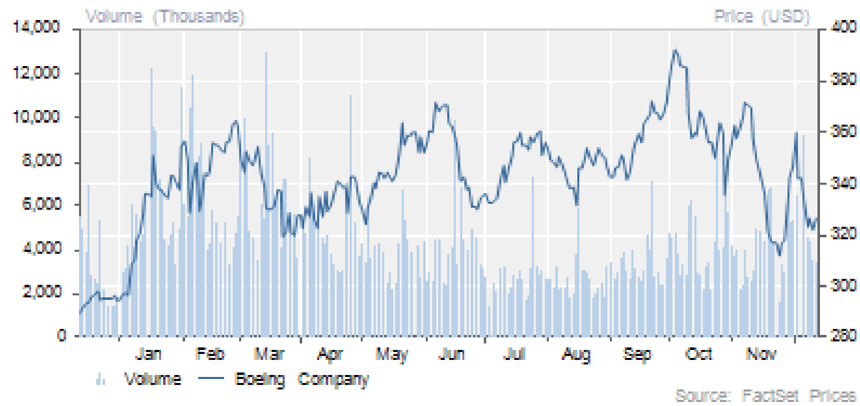


Summary: I recommend a buy rating with a target of $390. Boeing is currently trading at a discount to the industry and has shown promising growth. The firm has an opportunity to capture additional market share. The business is undervalued based on relative valuation and DCF analysis.

Key Drivers:

- 737 MAX 10: Boeing forecasts global demand for 28,000 narrow-body planes by 2035. This figure projects 95% higher than demand of 14,372. The 737 MAX 10 saves 15% on 30% of airlines fuel cost. This could improve an airline's profit margins by up to 40%.

- Competitor analysis: Boeing is currently outpacing Airbus in orders in 2018. Boeing and Airbus are competing for market share in the potential $2 trillion industry of narrow-body aircraft industry at 28,000 units.

- Boeing Global Services: BGS is Boeing's newest business segment that provides support and services to Boeing's aviation and defense customers. The implementation of this business segment drove growth from 2015 through 2017 and grew the firm's ROA by 70%.

- Macroeconomic trends: Boeing's business is cyclical and trends with consumer confidence as well as fuel prices. This driver can cause losses as much as it can cause gains. If an airline isn't making a profit due to a spike in fuel price or a slowed economy, Boeing will take a hit.

Valuation: Using a relative valuation approach, Boeing appears to be undervalued in comparison to the aerospace and defense industry. Due to the variability of inputs, 3-step DCF analysis provides the most precise way to fairly value the firm, and indicates a value of $409. A combination of the approaches suggest that Boeing is valued at $390 and is currently trading at $325.75.

Risks: Threats to the business include cyclical demand, a competitive marketplace, labor issues, and operational risk.

Company Overview

The Boeing Co. (BA) is an aerospace and defense company that manufactures commercial airliners, defense aircraft for the military, space systems, and security systems and services. Boeing operates through the segments of Commercial Airlines, Defense, Space and Security, Global Services, and its own asset-backed lending and leasing firm Boeing Capital.

Commercial Airplanes accounts for **61.2% of revenue**
This includes:

- Narrow-body, short- to medium-range: 737 and 737 MAX
- Widebody, medium- to long-range: 747, 767, 777, and 787 Dreamliner
- Widebody, ultra-range: 777 200LR
- Products in development (expected EIS):
    - 777X (2019), Boeing NMA (2025-2027), 737RS (+2030)

Commercial Airplanes saw steady growth from **2012-2015 with an average growth of 16.7%** when taking into consideration the impressive year of **2012 which saw 35.8% growth**. This was followed by **growth of -1.6% in 2016 and a larger dip of -12.8% in 2017**, due to an order backlog stretching 10 years and losing a large amount of sales to the A320neo

Defense, Space & Security (BDS) accounts for **22.7% of revenue**

- BDS is a division of Boeing that oversees the design and development of military aircraft. The main consumers of this division are the United States Department of Defense and NASA. The BDS portfolio focuses on **six key market areas**: **commercial derivatives, military rotorcraft, human space exploration, satellites, autonomous systems and services.** From 2015-2017, BDS has declined with an average growth of -5,850.

Boeing Global Services (BGS) accounts for **15.8% of revenue**

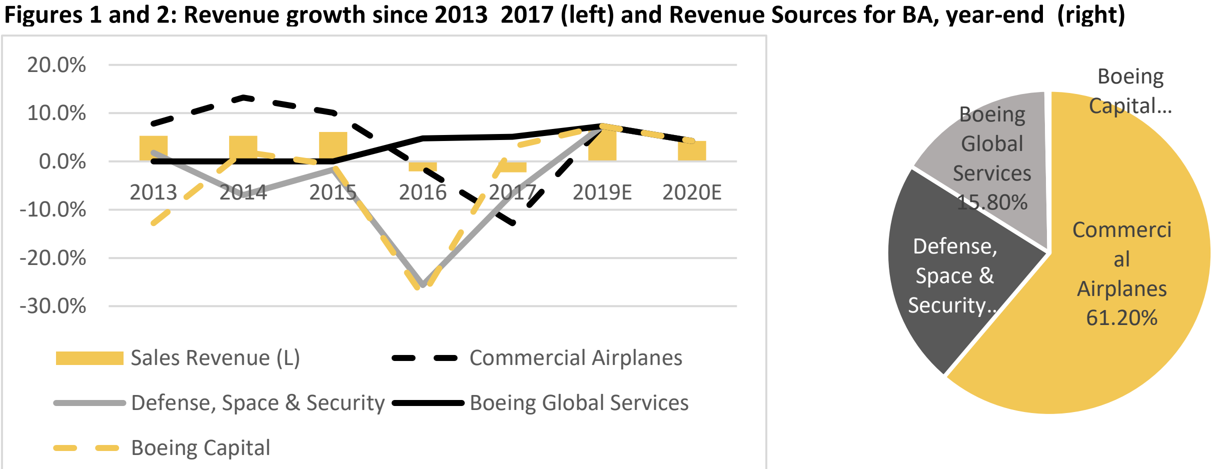
- BGS provides services to Boeing's commercial and defense customers by offering aviation services support, aircraft modifications, spare parts, training, maintenance documents, data analytics and information-based services, and technical advice to commercial and government customers.

Boeing's increased focus on this sector drove growth of 9,250 **from 2015-2017**

Boeing Capital (BCC) accounts for **0.3% of revenue**

- BCC is there to ensure that Boeing customers have the financing necessary to purchase and take delivery of their product. 41% of the firm's aircraft are leased through BGS.

Figures 1 and 2: Revenue growth since 2013 2017 (left) and Revenue Sources for BA, year-end (right)



Source: Company reports

Business/Industry Drivers

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

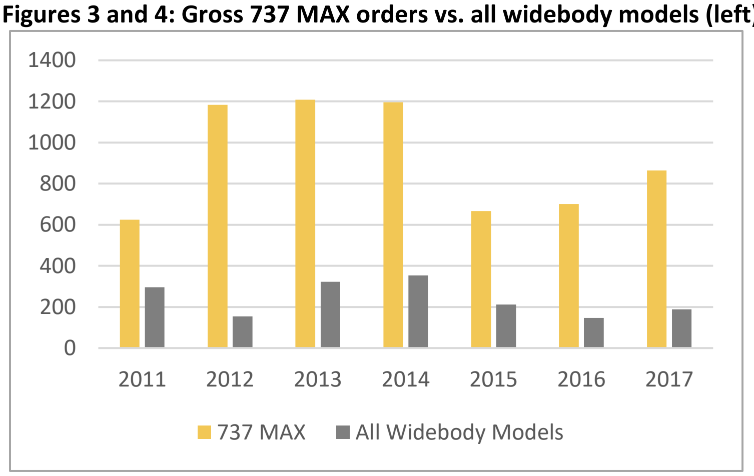
1) 737 MAX 10
2) Competitor analysis
3) Boeing Global Services
4) Macroeconomic trends

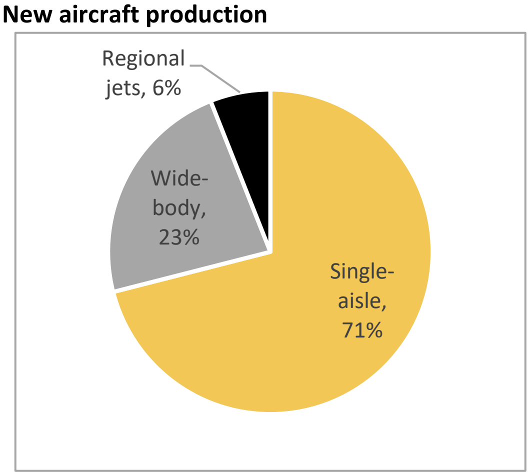
737 MAX 10 reduces fuel cost by 15% compared to old 737s

<u>737 MAX 10</u>

The Boeing 737 MAX 10 is a narrow-body aircraft and the newest addition to the 737 MAX series. Set to enter commercial service in 2020, It is projected to be the lowest cost single-aisle plane to date. The MAX 10 uses the newest model of the LEAP-1B engine which reduces fuel cost by 15% and noise footprint by 40%. The plane features the largest seat count of all MAX models with 230 2-class seats. The purpose of the MAX series is to create efficiency and an extended range of travel while lowering the cost for the consumer. The MAX 10 extends past the range of the modern day 737 by 400 nmi, while lowering the trip cost and operating cost per seat by 5% each. The world is moving toward more narrow-body planes for cost efficient travel, and I believe that Boeing will be able to capture a large piece of that market once the MAX 10 hits the tarmac in 2020.

Figures 3 and 4: Gross 737 MAX orders vs. all widebody models (left) New aircraft production





Source: Company reports

Narrow-body market worth an estimated $2 trillion by 2035

I believe the rolling-out of the 737 MAX 10 will promote growth within the narrow-body market and allow Boeing to close the gap with Airbus in said sector by releasing an airliner to better compete with the A321neo. Boeing forecasts global demand for 28,000 narrow-body planes by 2035. This figure **projects 95% growth on top of the 2018 demand of 14,372**. This is possible due to lower operating costs and increased range on the narrow-body planes putting them up to speed with wide-bodies. The market space has a predicted worth of $2 trillion. The MAX 10's improvements on previous models will allow Boeing to compete with the A321neo due to better cost efficiency and an overall better consumer experience.

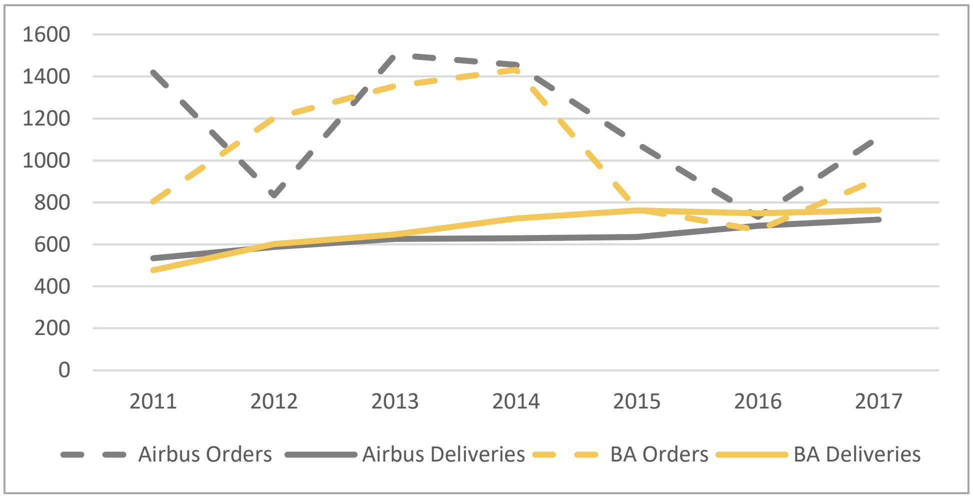
However, the success of the 737 MAX 10 depends on Boeing being able to increase their asset turnover. The firm is currently sitting on 4,695 backlogged orders for the 737s and BA is working on upping the build rate from 52 jets per month to the target of 59 jets per month by mid-2019. I am skeptical of Boeing being able to pull this off, and this poses a threat to their chance at taking market space from Airbus.

Competitor Analysis

Being that Boeing's main revenue streams from commercial aircraft sales, it is beneficial to have one major competitor in Airbus. Boeing and Airbus are established in their positions, but still compete intensely. Airbus's recent dominance in orders is due to its A321neo model which is favored by many low-cost airlines over Boeing's 737 MAX 8 and 9. This prompted Boeing's customers to push it to create the MAX 10.

Airbus recent dominance attributed to A321neo

Figure 5: Boeing orders and deliveries vs. Airbus orders and deliveries

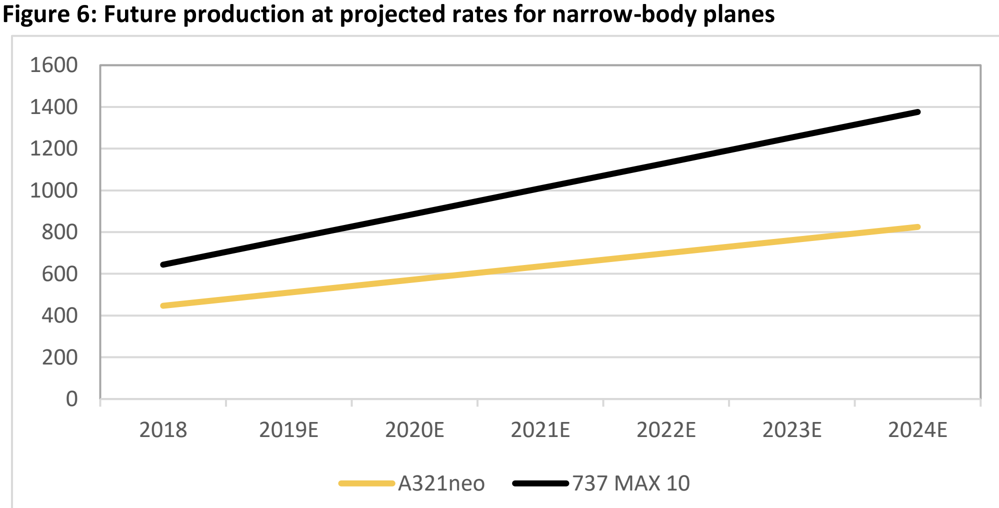


Source: Company reports

Through Airbus had a better 2017 in terms of orders, Boeing is currently outpacing it in 2018 with 487 orders to Airbus's 214. Airbus is expected to outpace Boeing in production at a rate of 63 narrow-bodies per month versus Boeing's 59 plane target for mid-2019. Boeing is currently sitting on 197 737 MAX 10s produced. Airbus has the upper hand with 447 A321neo planes. Boeing will need to up its production to steal some of the $2 trillion future industry. 28,000 units priced at $86M per unit (737 MAX 7) comes out to roughly $2.7 trillion. The 737 MAX 10 is listed at $130M.

28000*$86M per unit = $2.7 trillion of estimated attainable market share

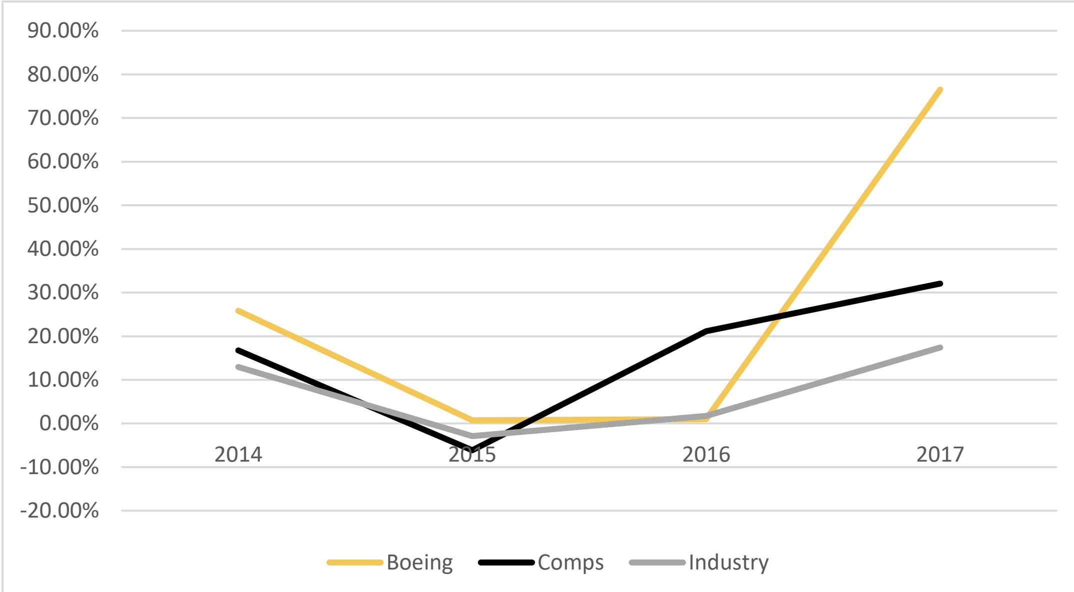
Figure 6: Future production at projected rates for narrow-body planes



Source: Company reports

Figure 7: Boeing EPS growth vs Comps vs Aerospace Defense industry

In 2017, Boeing experienced EPS growth of 76.51% compared to the industry's 17.4% and comps 32.0%



Source: FactSet

Boeing Global Services

BGS was launched on June 30, 2017. It helps better support Boeing's customers and move the company forward. It helps speed along the supply chain portion of the business and increases asset turnover on smaller parts produced by Boeing. After making BSG one of its major businesses, Boeing has seen a significant jump in several profitability ratios, creating growth and stability.

Boeing has been steadily outpacing the industry in terms of EPS growth in the past four years. In terms of the competition, Boeing lost ground from mid-2015 through 2016 but quickly bounced back and is the outright top performer in the industry. This trend continued into 2018 and I expect Boeing will outperform the comps and industry.

Figure 8: Significant ratio and financials increases

All major growth factors increased significantly with the implementation of BGS

Variables	2015	2016	2017 (BGS First Recorded)	%Chg 2016-2017
Net Income (MM)	5172	4892	8191	167.4%
EPS	7.44	7.61	13.43	176.5%
Net Op CF (MM)	9363	10499	13344	127.1%
FCF (MM)	6913	7886	11605	147.2%
Net Margin	5.4%	5.2%	8.8%	169.2%
ROA	5.3%	5.3%	9.0%	169.8%
ROE	69.0%	136.8%	1397.8%	1021.8%
Sustainable Growth Rate	65.6%	58.4%	806.7%	1380.6%

Source: FactSet

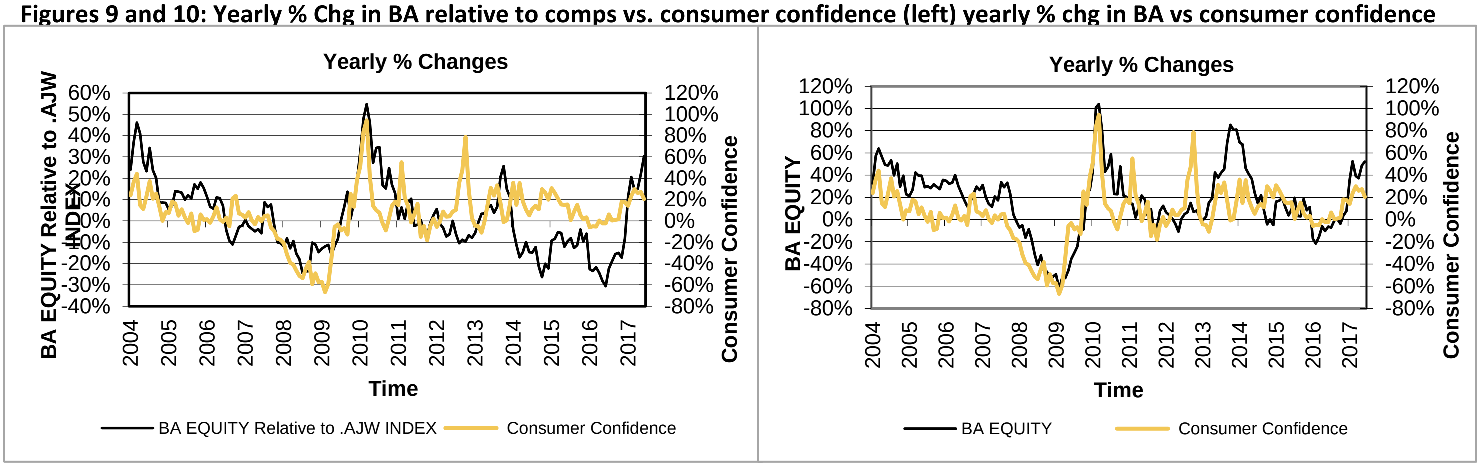
2017 SGR is a staggering figure and drove 807% growth. I believe Boeing Global Services will continue to benefit the firm going forward.

Boeing Global Services is responsible for the analytical component of the business. BGS uses its data management software to minimize risk, costs, and time by applying scientific processes to the data to move forward with more certainty.

Boeing's recent acquisition of Millennium Space Systems is huge for BGS as this gives Millennium's tech to Boeing. This tech includes 70 of Millennium's reaction wheels, 44 of which are already in orbit. These reaction wheels support commercial imaging satellites to better track flight paths for both military and commercial airliners.

Macroeconomic trends

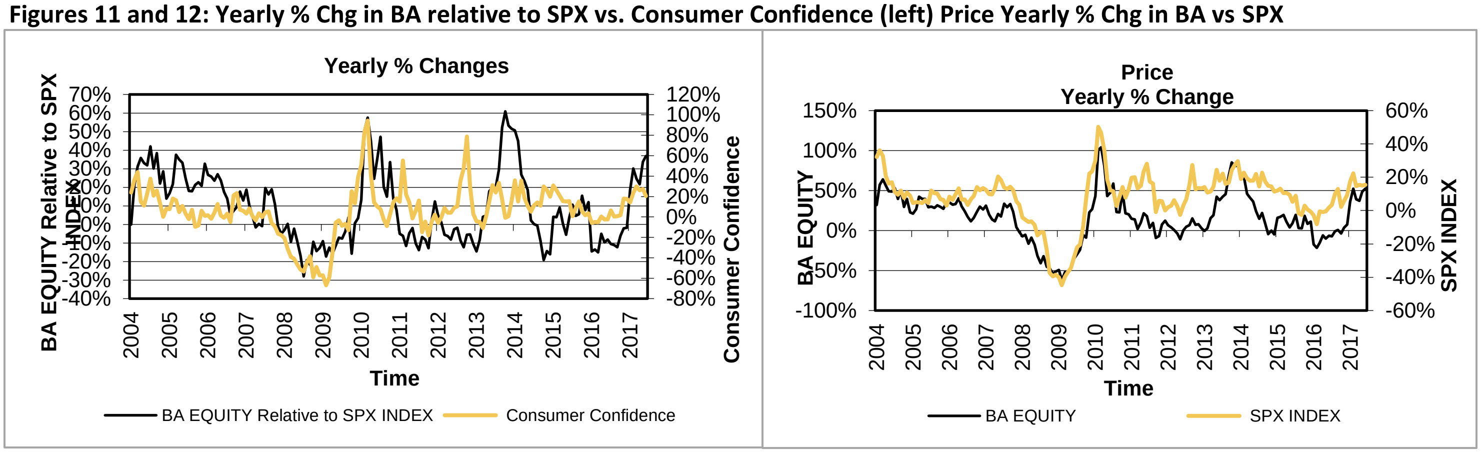
Figures 9 and 10: Yearly % Chg in BA relative to comps vs. consumer confidence (left) yearly % chg in BA vs consumer confidence



Source: Bloomberg, IMCP

BA stock relative to the comp index *(AIR-FR, LMT, NOC, BA-GB*) tracks consumer confidence trends rather closely until around 2014 when the stock underperformed due to slowing sales relative to the industry. Although, figure 10 shows that BA stil tracked consumer confidence by itself.

Figures 11 and 12: Yearly % Chg in BA relative to SPX vs. Consumer Confidence (left) Price Yearly % Chg in BA vs SPX



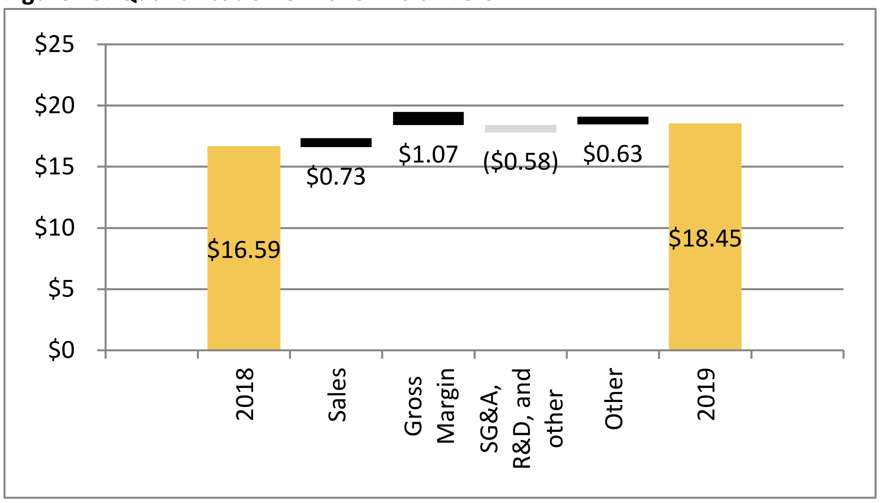
Source: Bloomberg, IMCP

Figure 11 shows that Boeing relative to the S&P 500 tracks consumer confidence with a relatively strong correlation. In 2014, Boeing outperformed the S&P 500 by a considerable amount and this is the only year that the trend breaks. Figure 12 shows that the S&P 500 grew around 20% and Boeing spiked due to its 30% EPS growth to meet it.

Financial Analysis

I anticipate EPS to grow to $18.45 in FY 2019. Improving revenues should increase earnings by $0.73. This is primarily driven by sales of commercial aircraft, specifically narrow-body models. I anticipate another $1.07 growth in EPS due to BA increasing its gross margin. I expect SG&A, R&D, and other expenses as a percent of sales to rise along with business and sales expansion, so I anticipate a growth offset of $0.58. Boeing has a buyback plan set in place to purchase $18 billion worth of shares over the next 24 to 30 months, adding another $0.63 to its EPS

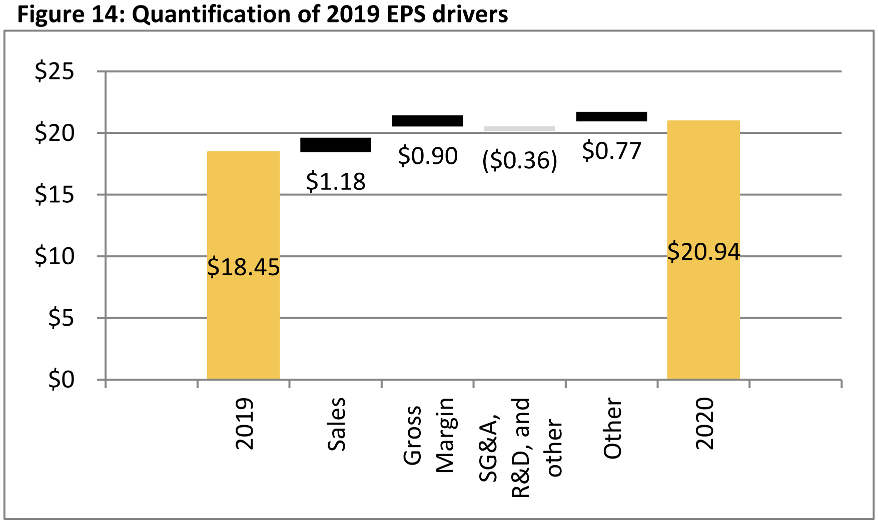
Figure 13: Quantification of 2018 EPS drivers



Source: Company Reports, Factset

I expect 2019 EPS to increase $2.39 to $20.94 in FY 2020. I anticipate Boeing will gain $1.18 in EPS from accelerated sales growth due to the rolling out of the 737 MAX10. I expect another slight 0.5% growth of gross margin to boost EPS by another $0.90. Again, I project SG&A, R&D, and other expenses to rise as a percent of sales with the sales expansion, so I anticipate this to cause a $0.36 contraction to EPS. Boeing's $18 billion buyback plan will be wrapping up near the end of 2020, which I expect to drive EPS growth by another $0.77.

Figure 14: Quantification of 2019 EPS drivers



Source: Company Reports, Factset

I have estimated 2019 EPS a bit higher than consensus, and a little lower for 2020; although, my estimates are close to consensus. I believe Airbus will take a larger amount of market share than estimated. However, I could be underestimating the market appeal for the 737 MAX10 during its unveiling.

Figure 15: EPS and YoY growth estimates vs. Consensus

	Sales	EPS
2019 Estimate	$ 103,745	$ 18.45
2019 Consensus	$ 106,704	$ 18.24
2020 Estimate	$ 110,142	$ 20.94
2020 Consensus	$ 114,481	$ 21.08

Source: Factset, IMCP

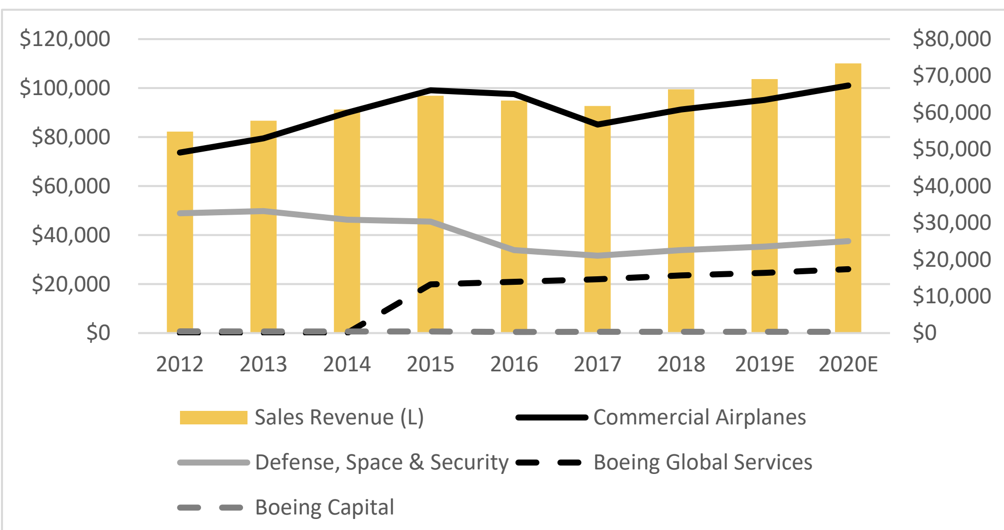
Revenues

MQ-25A extends the unrefueled range of the F35 Super Hornet from 450nmi to 700nmi

Boeing's revenue has generally been steadily increasing with only a slight decrease from 2015 to 2017. Due to an uptick in deliveries in 2017 and sales growth in 2018, and I anticipate constant growth through 2020. Boeing's main source of revenue is its commercial airplanes segment at around 65% of total sales. BA has had consistent sales from the wide-body models and new growth generated from the MAX line of narrow-body planes. New sales of the 737 MAX10 will be the primary driver of growth in 2019 and 2020. With the implementation of Boeing Global Services, this segment has experienced167.4% net income growth for the firm on 5.1% revenue growth.

Boeing's defense segment will see essentially no growth. BA has been losing large defense contracts to competitors like Lockheed Martin as Boeing shifts its focus toward BGS and new aircraft. However, in Q4 of 2018 Boeing secured a sizeable defense contract for $805.3M with the US Navy with its new MQ-25A UAV. The US Navy could potentially buy 75 units worth a total of $13 billion.

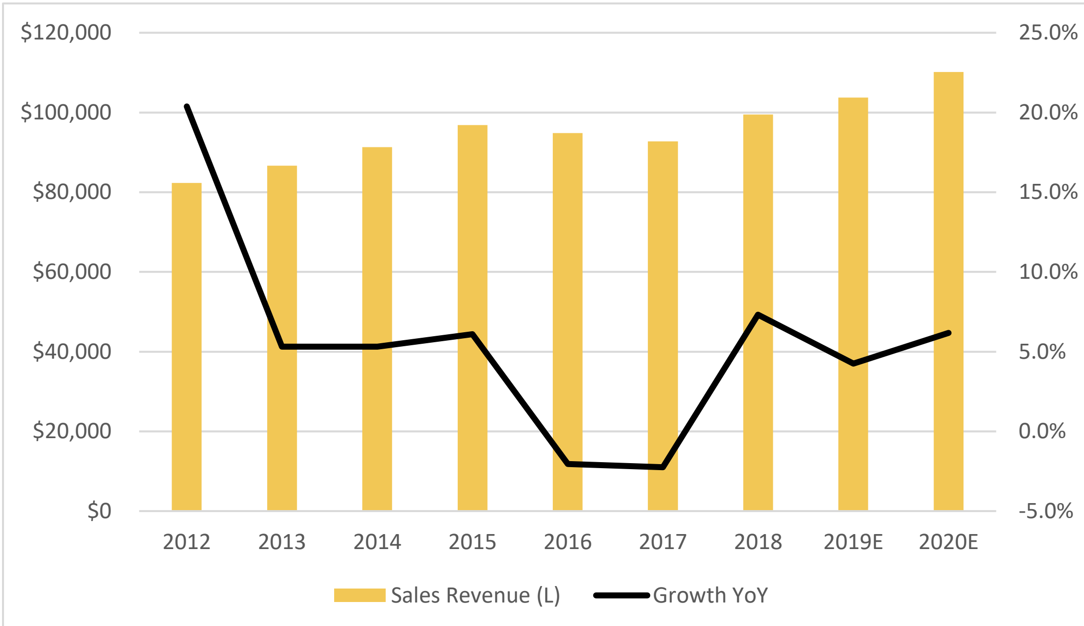
Figure 16: Boeing sales and segment revenues



Source: Company Reports, Factset

Boeing Capital has contributed to a small portion of its revenue, as the capital division's main function is to make sure Boeing's customers have the appropriate financing to purchase and take delivery of its products.

Figure 17: Boeing sales revenue vs. YoY growth



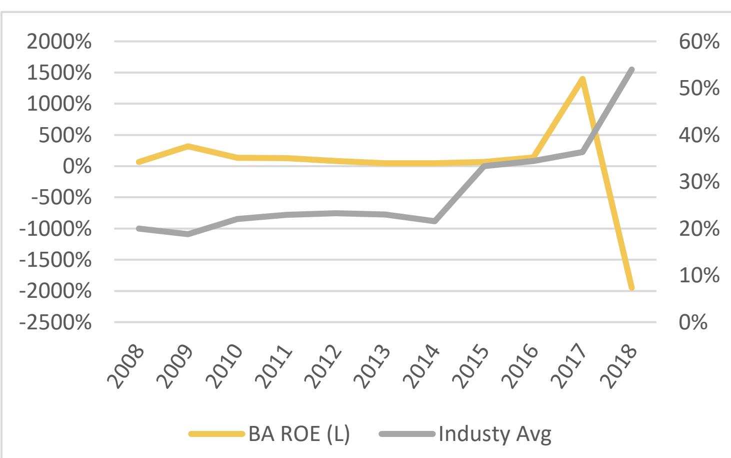
Source: Company Reports, Factset

BA's ROE is negative because of share buybacks while EPS has been rising

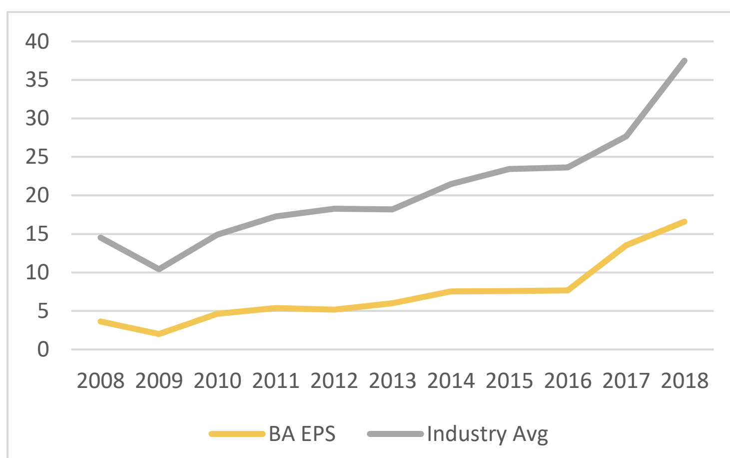
Return Analysis

Boeing's ROE is difficult to analyze as the firm posted a negative equity balance in 2018, and I anticipate this trend will continue. Share buybacks have distorted the ROE and makes this an unreliable metric to use when measuring BA's return on capital. Figure 18 and Figure 19 show Boeing's ROE and EPS from 2008 to 2018 compared to the industry average to demonstrate this skewed metric.

Figure 18 and 19: Boeing ROE vs. Industry average (left) and Boeing EPS vs. Industry average (right)



Source: Company Reports, Factset

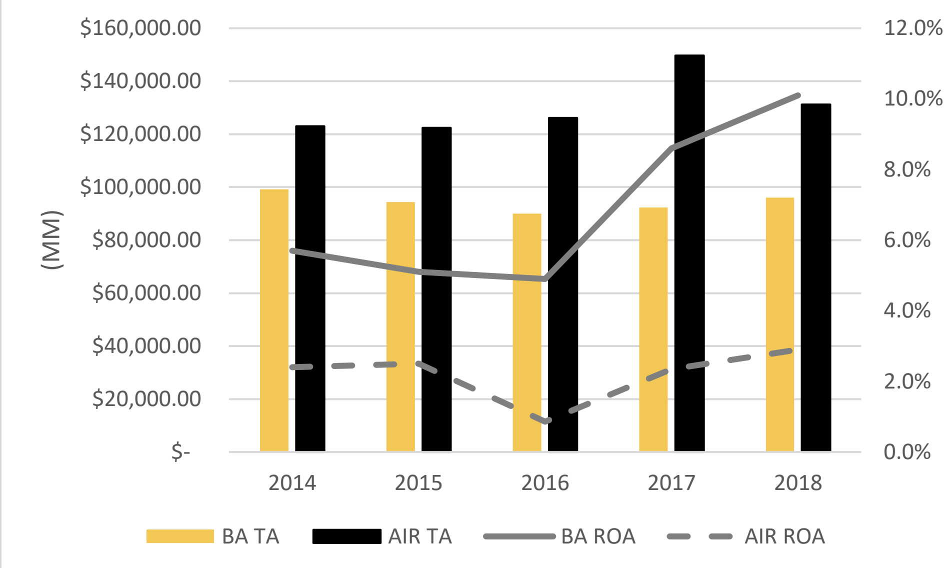


Source: Company Reports, Factset

Boeing's return on assets is a better measure than ROE as they report consistently report a negative figure. BA's ROA is superior to competitors.

Boeing's ROA is triple that of Airbus while holding roughly 35% less assets

Figure 20: Boeing total assets and ROA vs. Airbus



Source: Company Reports, Factset

Free Cash Flow

Figure 21: Boeing's free cash flow

Free Cash Flow	2014	2015	2016	2017	2018	2019E	2020E
NOPAT	$5,423	$5,112	$4,826	$8,134	$9,853	$10,553	$11,501
Growth		*-5.7%*	*-5.6%*	*68.6%*	*21.1%*	*7.1%*	*9.0%*
NOWC	11,068	17,822	12,354	8,892	9,248	5,030	764
Net fixed assets	31,413	26,174	27,509	27,172	28,259	29,461	31,278
Total net operating capital	$42,481	$43,996	$39,863	$36,064	$37,507	$34,491	$32,042
Growth		*3.6%*	*-9.4%*	*-9.5%*	*4.0%*	*-8.0%*	*-7.1%*
- Change in NOWC		6,754	(5,468)	(3,462)	356	(4,218)	(4,266)
- Change in NFA		(5,239)	1,335	(337)	1,087	1,202	1,817
FCFF		$3,597	$8,959	$11,933	$8,411	$13,568	$13,950
Growth			*149.1%*	*33.2%*	*-29.5%*	*61.3%*	*2.8%*
- After-tax interest expense		196	267	291	369	407	413
+ Net new short-term and long-term debt		589	838	214	1,965	250	125
FCFE		$3,990	$9,530	$11,856	$10,006	$13,411	$13,662
Growth			*138.8%*	*24.4%*	*-15.6%*	*34.0%*	*1.9%*
Sources of cash (FCFE)		$3,990	$9,530	$11,856	$10,006	$13,411	$13,662

Source: Company Reports, IMCP

Boeing's NOPAT has shown consistent growth since 2016. The commercial airline segment took the largest relative hit at $979 million as the firm saw cancellations on backlogged orders. In 2017, Boeing saw its NOPAT grow 68.6% as the firm brought Boeing Global Service into its business model.

I expect NOPAT to continue to grow in 2019 and 2020 as the firm tries to capture a broader section of the narrow-body market with the unveiling of the 737 MAX 10. I believe this will contribute to FCFF and FCFE growth going forward. I expect Boeing to use the newly generated free cash flow of over $13 billion per year to cap off its $18 billion repurchase plan and pay off debts to suppliers.

Boeing saw its NOPAT grow 68.6% as the firm instituted the BGS segment into its business model

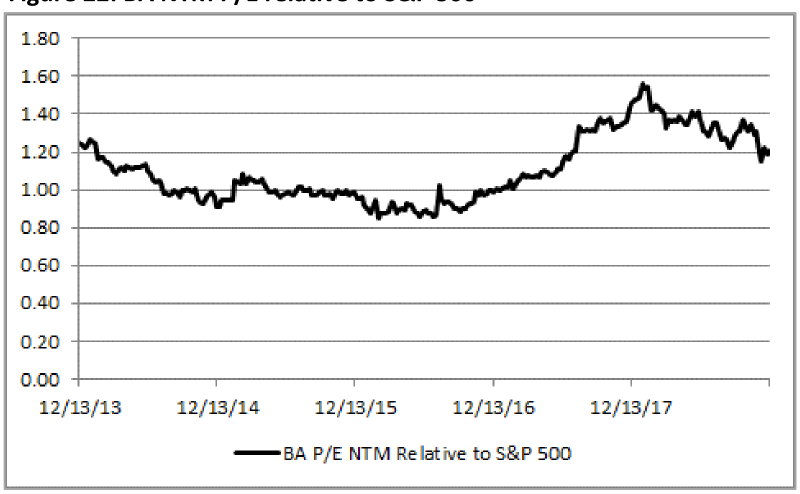
Valuation

BA 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 $419. Another relative valuation approach shows BA to be slightly undervalued based on its fundamentals versus those of its peers in the aerospace and defense industry. Price to sales valuation yielded a price of $353. A detailed DCF analysis values BA significantly higher, at $409; I give this value more weight because it incorporates assumptions that more clearly reflect BA's business model. Overall, I value the stock at $390.

Trading History

BA is currently trading around 20% below its five-year high relative to the S&P 500. This is the result of recent earnings growth outpacing the sales growth of the firm and perhaps the market not believing it is repeatable. The current NTM P/E of the S&P 500 is 15. BA's current NTM P/E is at 18.1 which is on par with the firm's five-year average of 18.1. I expect the NTM P/E to remain at 18.1 with a possible decrease in the future.

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



Source: Factset

Assuming the firm maintains an 18.1 NTM P/E at the end of 2019, it should trade at $379 by the end of the year.

- Price = P/E x EPS = 18.1 x $20.94 = $379

Discounting $379 back to today at a 11.06% cost of equity (explained in Discounted Cash Flow section) yields a price of $341. Given BA's potential for earnings growth and continued profitability, this seems to be an unusually low valuation.

Relative Valuation

Boeing's ROE metric is negative but still correlates with P/B with an R^2 of .9.

Boeing is currently trading at a TTM P/E relatively lower than its peers, with a P/E TTM of 19.1 compared to an average of 22.6. Boeing's ROIC of 79.8% is far superior to the industry average of 26.4%. This can also be attributed to Boeing's business model as its suppliers contribute to the firm's ROA handsomely.

Figure 23: BA comparable companies

Ticker	Name	Current Price	Market Value	Price Change 1 day	1 Mo	3 Mo	6 Mo	52 Wk	YTD	Earnings Growth LTG	NTM	2017	2018	2019	2020	Pst 5yr	Beta	LT Debt/ Equity	S&P Rating	LTM Dividend Yield	Payout
BA	BOEING CO	$326.69	$185,522	1.4	(8.5)	(7.6)	(11.9)	12.7	10.8	15.9	2.9%	76.5%	22.5%	9.9%	15.6%	21.4%	1.54		A+	1.97%	38.3%
AIR-FR	AIRBUS SE	$103.98	$80,653	3.3	(3.1)	(14.3)	(9.0)	4.9	10.2	23.1	68.9%	240.4%	6.5%	28.0%	22.0%	19.9%	1.16	78.7%		1.59%	
LMT	LOCKHEED MARTIN CORP	$292.50	$83,195	0.1	(4.1)	(10.1)	(7.2)	(7.4)	(8.9)	20.7	71.8%	7.7%	31.8%	11.8%	25.8%	-3.9%	1.11	1430.1%	A	2.73%	72.6%
NOC	NORTHROP GRUMMAN CORP	$270.11	$46,896	0.8	(2.7)	(11.0)	(18.0)	(12.1)	(12.0)	17.9	13.5%	8.9%	43.4%	-4.4%	14.4%	8.0%	0.89	152.6%	A+	1.81%	28.7%
BA-GB	BAE SYSTEMS	$5.80	$18,520	0.8	(13.5)	(25.9)	(29.2)	(17.5)	(20.1)	7.2		22.0%	-11.5%	7.4%	8.6%	-4.1%	0.99			4.48%	
Average			$82,957	1.3	(6.4)	(13.8)	(15.0)	(3.9)	(4.0)	17.0	39.3%	71.1%	18.6%	10.6%	17.3%	8.2%	1.14	553.8%		2.51%	46.5%
Median			$80,653	0.8	(4.1)	(11.0)	(11.9)	(7.4)	(8.9)	17.9	41.2%	22.0%	22.5%	9.9%	15.6%	8.0%	1.11	152.6%		1.97%	38.3%
SPX	S&P 500 INDEX	$2,651		0.5	(2.8)	(8.2)	(4.9)	(0.5)	(0.8)			11.9%	21.6%	8.6%	10.5%						

Ticker	Website	2018 ROE	P/B	P/E 2016	2017	2018	TTM	NTM	2019	2020	2018 NPM	2018 P/S	OM	ROIC	EV/ EBIT	P/CF Current	P/CF 5-yr	Sales Growth NTM	STM	Pst 5yr	Book Equity
BA	http://www.boeing.com	-732.3%	-144.21	20.3	21.8	19.1	19.1	18.1	17.9	15.5	9.5%	1.86	10.8%	79.8%	18.0	15.1	14.3	7.9%	8.1%	2.7%	-$2.27
AIR-FR	http://www.airbusgroup.com	35.4%	7.47	48.7	21.5	21.1	27.5	16.3	16.5	13.5	4.6%	0.97	5.5%	16.5%	26.1	20.4	11.2	5.1%	3.6%	3.4%	$13.92
LMT	http://www.lockheedmartin.com	529.9%	88.22	20.2	24.1	16.6	26.5	15.5	14.9	11.8	9.8%	1.63	12.6%	13.5%	19.4	10.6	13.2	0.8%	7.6%	1.6%	$3.32
NOC	http://www.northropgrumman.com	36.4%	5.15	19.1	23.1	14.2	17.2	15.2	14.8	13.0	12.7%	1.80	12.7%	11.9%	17.6	10.6	13.4	18.6%	7.4%	0.5%	$52.40
BA-GB	http://baesystems.com	23.2%	2.49	14.6	12.7	10.7			10.0	9.2	7.4%	0.80		10.2%	11.7	8.9	11.5			2.0%	$2.33
Average		-21.5%	-8.17	24.6	20.6	16.4	22.6	16.3	14.8	12.6	8.8%	1.41	10.4%	26.4%	18.6	13.1	12.7	8.1%	6.7%	2.0%	
Median		35.4%	5.15	20.2	21.8	16.6	22.8	15.9	14.9	13.0	9.5%	1.63	11.7%	13.5%	18.0	10.6	13.2	6.5%	7.5%	2.0%	
spx	S&P 500 INDEX			18.8	20.0	16.3			15.0	13.6											

Source: Factset, IMCP

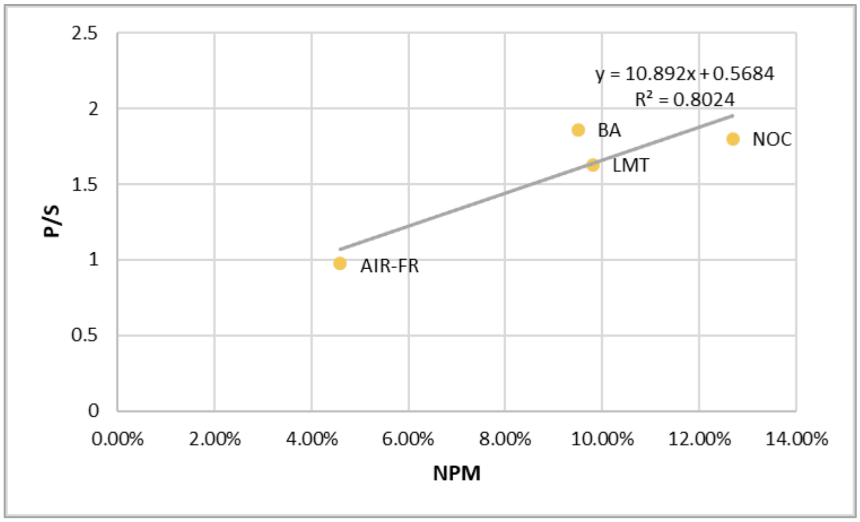
A more thorough analysis of P/S and NPM is shown in figure 23. The calculated R-squared of the regression indicates that over 80% of a sampled firm's P/S is explained by its NPM. Note that that BAE Systems is excluded from this regression, because it is an outlier.

ANF's BVPS was $20.04 last quarter, by far the highest of any of its competitors.

- Estimated P/S = Estimated 2019 NPM (9.8%) x 10.892 + .5684 = 1.636
- Target Price = Estimated P/S (1.636) x 2019E SPS (187.9) = $307

Discounting back to the present at a 11.06% cost of equity leads to a target price of $276. This figure seems unusually low; however, my estimation for 2019 NPM was only a 0.3% from 2018.

Figure 24: BA P/S vs. NPM



Source: Factset, IMCP

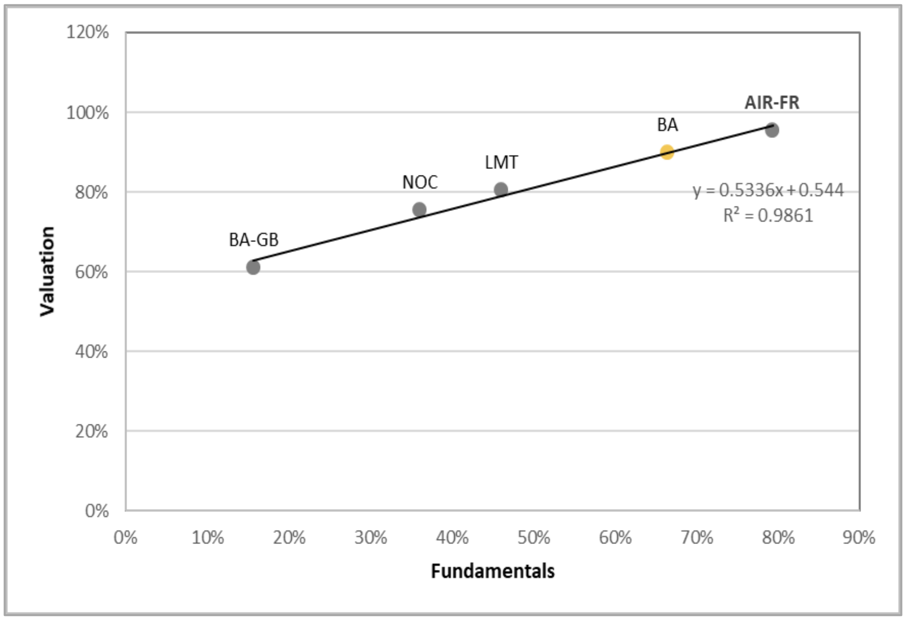
For a final comparison, I created a composite ranking of several valuation and fundamental metrics. Since the variables have different scales, each was converted to a percentile before calculating the composite score. For the fundamental metrics, 20% weighting was applied to earnings growth for 2018, 2019, and the past five years. 15% for earnings growth for 2020, and the remaining 25% to sales growth over the past five years. These were compared to four equal-weighted valuation metrics for NTM, 2018, and 2019 P/E, as well as EV/EBIT. The regression line had an R-squared value of .9861 and BA is on the line so it is fairly valued

Figure 25: Composite valuation, % of max

		Fundamentals					Valuation					
		20%	20%	15%	20%	25%	25.0%	25.0%	25.0%	25.0%		
		Earnings Growth				Sales Growth	P/E			EV/		
Ticker	Name	2018	2019	2020	Pst 5yr	Pst 5yr	NTM	2018	2019	EBIT	Fund	Value
BA	BOEING CO	52%	36%	60%	100%	80%	100%	91%	100%	69%	66%	90%
AIR-FR	AIRBUS SE	15%	100%	85%	93%	100%	90%	100%	92%	100%	79%	95%
LMT	LOCKHEED MARTIN CORP	73%	42%	100%	-18%	47%	85%	79%	83%	74%	46%	80%
NOC	NORTHROP GRUMMAN CORP	100%	-16%	56%	37%	14%	84%	67%	83%	67%	36%	75%
BA-GB	BAE SYSTEMS	-26%	26%	33%	-19%	58%	92%	51%	56%	45%	16%	61%

Source: Factset, IMCP

Figure 26: Composite relative valuation



Source: Factset, IMCP

Discounted Cash Flow Analysis

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

For the purpose of this analysis, the company's cost of equity was calculated to be 11.06% 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 2.91%.
- A ten year beta of 1.15 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 11.06% (2.91 + 1.15 (10.0 – 2.91)).

Stage One - The model's first stage simply discounts fiscal years 2019 and 2020 free cash flow to equity (FCFE). These per share cash flows are forecasted to be $24.39 and $25.81, respectively. Discounting these cash flows, using the cost of equity calculated above, results in a value of $42.88 per share. Thus, stage one of this discounted cash flow analysis contributes $42.88 to value.

Stage Two - Stage two of the model focuses on fiscal years 2021 to 2025. 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 11.06% cost of equity. I assume 6% sales growth in 2021 and 2022, declining to 3% growth by 2025. The ratio of NWC to sales will remain at 2020 levels, but NFA turnover will rise from 3.52 in 2020 to 4 in 2021 as a result of improvements in operations. Also, the NOPAT margin is expected to rise from 10.4% in 2020 to 12.4% in 2025. Finally, after-tax interest is expected to rise 3% per year as the result of modest increases in borrowing.

Figure 27: FCFE and discounted FCFE, 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
FCFE	$24.39	$25.81	$27.56	$22.66	$25.34	$27.98	$21.55
Disc. FCFE	$21.96	$20.92	$20.12	$14.89	$15.00	$14.91	$10.34

Source: Factset, IMCP

Added together, these discounted cash flows total $118.14, with the second stage contributing $75.25.

Stage Three – Net income for the years 2021 – 2025 is calculated based upon the same margin and growth assumptions used to determine FCFE in stage two. EPS is expected to grow from $18.45 in 2019 to $31.70 in 2025.

Figure 28: EPS estimates for 2019 – 2025

	2019	2020	2021	2022	2023	2024	2025
EPS	$18.45	$20.94	$23.01	$25.35	$27.62	$29.75	$31.70

Source: Factset, IMCP

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 current P/E ratio of 19 is assumed at the end of BA's terminal year. While this may be a high multiple at the end of 2025, 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 BA's slowing growth.

Given the assumed terminal earnings per share of $31.70 and a price to earnings ratio of 19.1, a terminal value of $650.45 per share is calculated. Using the 11.06% cost of equity, this number is discounted back to a present value of $290.45.

Total Present Value – given the above assumptions and utilizing a three stage discounted cash flow model, an intrinsic value of $409 is calculated (42.88 + 75.25 + 290.45). Given BA's current price of $327, this model indicates that the stock is 20% undervalued.

<u>Scenario Analysis</u>

Boeing is a stable company that I consider to be almost mature. The firm is in the process of a massive share repurchase plan. I say almost mature because Boeing is still in the state where the firm can expand by purchasing and merging with other businesses to extend its market share as well as reach new markets. Despite the firm being on the cusp of maturity, it is still relatively difficult to value. With intense pressure on its defense segment from Lockheed Martin as well as heated competition with Airbus in the commercial airliner market, there is no certainty that the firm will meet consensus estimates.

Figure 29 displays my assumptions for a bear and bull case for Boeing. BA is a strong company with a great business model that posts good returns and strong sales year after year. For the bull case, I assume the firm has a 21 P/E along with a beta of 1.05 as it boasts strong earnings and sales growth. In the bull scenario, I assume Boeing captures a larger share of the narrow-body market, raising its NOPAT/S as the 737 MAX 10 pushes margins higher due to lower production costs.

For the bear case, I assume a P/E of 17 and a beta of 1.25 due to an earnings drought and poor market performance. I also will assume that Boeing's sales growth slows from 6% to 1% due to Airbus capturing the majority market share, causing margins to thin and the value of the stock to fall.

Figure 26: Boeing bull and bear case

	2021	2022	2023	2024	2025
Base Case					
Beta	1.15				
Sales Growth	6.00%	6.00%	5.00%	4.00%	3.00%
NOPAT/S	10.80%	11.20%	11.60%	12.00%	12.40%
S/NFA	4	4	4	4	3.52
Terminal P/E	19.1				
Bull Case					
Beta	1.05				
Sales Growth	10.00%	10.00%	10.00%	10.00%	10.00%
NOPAT/S	15.00%	15.50%	16.00%	16.50%	17.00%
S/NFA	5	5	5	5	5
Terminal P/E	21				
Bear Case					
Beta	1.25				
Sales Growth	1.00%	1.00%	1.00%	1.00%	1.00%
NOPAT/S	5.00%	5.50%	6.00%	6.50%	7.00%
S/NFA	3	3	3	3	3
Terminal P/E	17				

Source: Factset, IMCP

Business Risks

Although I have many reasons to be optimistic about Boeing, there are several good reasons why the stock may not meet expectations and remain stagnant.

Cyclical Demand:

Boeing's commercial airliners may be its most profitable business segment, but the firm is not immune to demand swings. There will be economic rough patches ahead, and the first industry to take a hit is the commercial flying business. If fuel prices rise and BA’s customers lose profits, Boeing will take a significant hit.

Competitive marketplace:

Competition is fierce for Boeing. Airbus has been at the top of the rapidly growing narrow-body industry and Boeing needs to make the right decisions at the right times to take away a chunk of that business. The firm also must compete with Lockheed Martin for defense contracts. Boeing caught a break this year and was awarded its largest contract in a decade, but BA is by no means the market leader.

Labor issues:

BA has been struggling to manufacture and deliver planes to its customers due to a supplier bottleneck. The firm also is dealing with unionization among its employees as the workers believe they have been overworked trying to pick up for management’s slack.

Operational risk:

Boeing recently came under duress due to one of its 737 MAX 8s suffering a mechanical malfunction during a passenger flight on Lion Air. The mechanical malfunction resulted in a catastrophic crash that killed all 189 passengers on board. This is a huge blow to Boeing’s credibility and future market share for new 737 models.

Appendix 1: Porter's 5 Forces

Threat of New Entrants – Very Low

The Aerospace and Defense industry is one of the most difficult industries to gain traction in as a new business. Boeing holds the largest market cap in the industry at $211B and is highly unlikely to lose any business to a new firm.

Threat of Substitutes - Low

Many of Boeing's established customers will stick with Boeing not only because of the professional relationship, but also because switching airliner providers will cost them a fair amount of capital with few benefits to justify the cost.

Supplier Power - Moderate

Boeing heavily relies on its suppliers to provide it with the raw materials and goods necessary for producing aircraft. Many of its suppliers are large technology firms such as GE and Honeywell. However, Boeing is also a large firm and only chooses the suppliers it deems accountable for getting the firm what it needs in a timely fashion.

Buyer Power – Moderate

As with any consumer driven market, the buyer power is high. The consumer wants the most innovative and technologically advanced project on the market. However, the cost for switching suppliers in the commercial airline industry is high and Boeing can use its massive backlog as bargaining leverage to show consumers that its product is of utmost quality.

Intensity of Competition – High

The intensity of competition is high due to aerospace and defense firms always pushing the envelopes of innovation and technology. Boeing and Airbus are the leaders and this moderates the competition slightly due to the firms being well established and financially stable.

Appendix 2: SWOT Analysis

Strengths	Weaknesses
Industry leader World-wide recognition Financially sound	Operational risk Labor issues (Union) BDS
Opportunities	**Threats**
Boeing Global Services Future narrow-body demand Acquisition of Millennium	Airbus Lockheed Martin (DCs) 737 production issues

Appendix 3: Income Statement

Income Statement (MM)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Sales	$91,287	$96,849	$94,865	$92,732	$99,512	$103,745	$110,142
Direct costs	77,277	82,823	81,084	75,406	80,264	82,996	87,563
Gross Margin	14,010	14,026	13,781	17,326	19,248	20,749	22,579
SG&A, R&D, and other	6,814	6,856	8,243	7,273	8,302	9,026	9,803
EBIT	7,196	7,170	5,538	10,053	10,946	11,723	12,776
Interest	333	275	306	360	410	452	459
EBT	6,863	6,895	5,232	9,693	10,536	11,271	12,317
Taxes	1,691	1,979	673	1,850	1,052	1,125	1,230
Income	5,172	4,916	4,559	7,843	9,484	10,146	11,087
Other		-	-	-	-	-	-
Net income	5,172	4,916	4,559	7,843	9,484	10,146	11,087
Basic Shares	727.6	686.9	635.5	602.5	571.5	550.0	529.4
EPS	$7.11	$7.16	$7.17	$13.02	$16.59	$18.45	$20.94
DPS	$2.91	$3.62	$4.34	$5.67	$8.35	$9.11	$9.94

Appendix 4: Balance Sheets

Balance Sheet (MM)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Cash	11,733	11,302	8,801	8,813	8,672	8,979	8,261
Operating assets ex cash	56,052	56,932	53,687	56,348	59,095	57,060	57,274
Operating assets	67,785	68,234	62,488	65,161	67,767	66,039	65,535
Operating liabilities	56,717	50,412	50,134	56,269	58,520	61,009	64,771
NOWC	11,068	17,822	12,354	8,892	9,248	5,030	764
NOWC ex cash (NWC)	(665)	6,520	3,553	79	576	(3,949)	(7,497)
NFA	31,413	26,174	27,509	27,172	28,259	29,461	31,278
Invested capital	*$42,481*	*$43,996*	*$39,863*	*$36,064*	*$37,507*	*$34,491*	*$32,042*
Marketable securities							
Total assets	***$99,198***	***$94,408***	***$89,997***	***$92,333***	***$96,026***	***$95,500***	***$96,813***
Short-term and long-term	$8,141	$8,730	$9,568	$9,782	$11,747	$11,997	$12,122
Other liabilities	25,550	28,869	29,418	25,870	$27,144	27,794	28,444
Debt/equity-like securitie	-	-	-	-	-	-	-
Equity	8,790	6,397	877	412	(1,385)	(5,301)	(8,525)
Total supplied capital	*$42,481*	*$43,996*	*$39,863*	*$36,064*	*$37,506*	*$34,490*	*$32,041*
Total liabilities and equit	***$99,198***	***$94,408***	***$89,997***	***$92,333***	***$96,026***	***$95,500***	***$96,812***

Appendix 5: Sales Forecast

Sales (MM)							
Items	2014	2015	2016	2017	2018	2019E	2020E
Sales	91,287	96,849	94,865	92,732	99,512	103,745	110,142
Growth		*6.1%*	*-2.0%*	*-2.2%*	*7.3%*	*4.3%*	*6.2%*
Commercial Airplanes	59,990	66,048	65,069	56,729	60,338	63,053	67,467
Growth		*10.1%*	*-1.5%*	*-12.8%*	*6.4%*	*4.5%*	*7.0%*
% of sales	*65.7%*	*68.2%*	*68.6%*	*61.2%*	*60.6%*	*60.8%*	*61.3%*
Defense, Space & Secur	21,514	21,233	19,561	21,057	22,658	22,885	23,113
Growth		*-1.3%*	*-7.9%*	*7.6%*	*7.6%*	*1.0%*	*1.0%*
% of sales	*23.6%*	*21.9%*	*20.6%*	*22.7%*	*22.8%*	*2.0%*	*21.0%*
Global Services	9,367	9,155	9,937	14,639	16,216	17,513	19,265
Growth		*-2.3%*	*8.5%*	*47.3%*	*10.8%*	*8.0%*	*10.0%*
% of sales	*10.3%*	*9.5%*	*10.5%*	*15.8%*	*16.3%*	*16.9%*	*6.0%*
Boeing Capital	416	413	298	307	300	294	297
Growth		*-0.7%*	*-27.8%*	*3.0%*	*-2.3%*	*-2.0%*	*1.0%*
% of sales	*0.5%*	*0.4%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*	*0.3%*
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
United States	37,842	39,287	38,765	42,331	45,377	44,610	47,361
Growth		*3.8%*	*-1.3%*	*9.2%*	*7.2%*	*-1.7%*	*6.2%*
% of sales	*41.5%*	*40.6%*	*40.9%*	*45.6%*	*45.6%*	*43.0%*	*43.0%*
Middle East	9,243	10,846	13,297	12,287	13,235	13,798	14,649
Growth		*17.3%*	*22.6%*	*-7.6%*	*7.7%*	*4.3%*	*6.2%*
% of sales	*10.1%*	*11.2%*	*14.0%*	*13.3%*	*13.3%*	*13.3%*	*13.3%*
China	11,029	12,556	10,312	11,911	12,738	17,637	18,724
Growth		*13.8%*	*-17.9%*	*15.5%*	*6.9%*	*38.5%*	*6.2%*
% of sales	*12.1%*	*13.0%*	*10.9%*	*12.8%*	*12.8%*	*17.0%*	*17.0%*
Europe	11,898	12,248	13,790	11,457	12,339	10,375	11,014
Growth		*2.9%*	*12.6%*	*-16.9%*	*7.7%*	*-15.9%*	*6.2%*
% of sales	*13.0%*	*12.6%*	*14.5%*	*12.4%*	*12.4%*	*10.0%*	*10.0%*
All Other	21,275	21,912	18,701	14,746	15,822	17,325	18,394
Growth		*3.0%*	*-14.7%*	*-21.1%*	*7.3%*	*9.5%*	*6.2%*
% of sales	*23.3%*	*22.6%*	*19.7%*	*15.9%*	*15.9%*	*16.7%*	*16.7%*

Appendix 6: Ratios

Ratios							
Items	2014	2015	2016	2017	2018	2019E	2020E
Profitability							
Gross margin	15.3%	14.5%	14.5%	18.7%	19.3%	20.0%	20.5%
Operating (EBIT) margin	7.9%	7.4%	5.8%	10.8%	11.0%	11.3%	11.6%
Net profit margin	5.7%	5.1%	4.8%	8.5%	9.5%	9.8%	10.1%
Activity							
NFA (gross) turnover		3.36	3.53	3.39	3.59	3.59	3.63
Total asset turnover		1.00	1.03	1.02	1.06	1.08	1.15
Liquidity							
Op asset / op liab	1.20	1.35	1.25	1.16	1.16	1.08	1.01
NOWC Percent of sales		14.9%	15.9%	11.5%	9.1%	6.9%	2.6%
Solvency							
Debt to assets	8.2%	9.2%	10.6%	10.6%	12.2%	12.6%	12.5%
Debt to equity	92.6%	136.5%	1091.0%	2374.3%	-848.2%	-226.3%	-142.2%
Other liab to assets	25.8%	30.6%	32.7%	28.0%	28.3%	29.1%	29.4%
Total debt to assets	34.0%	39.8%	43.3%	38.6%	40.5%	41.7%	41.9%
Total liabilities to assets	91.1%	93.2%	99.0%	99.6%	101.4%	105.5%	108.8%
Debt to EBIT	1.13	1.22	1.73	0.97	1.07	1.02	0.95
EBIT/interest	21.61	26.07	18.10	27.93	26.70	25.93	27.82
Debt to total net op capital	19.2%	19.8%	24.0%	27.1%	31.3%	34.8%	37.8%
ROIC							
NOPAT to sales	5.9%	5.3%	5.1%	8.8%	9.9%	10.2%	10.4%
Sales to NFA		3.36	3.53	3.39	3.59	3.59	3.63
Sales to IC ex cash		3.05	2.98	3.18	3.55	3.82	4.47
Total ROIC ex cash		16.1%	15.1%	27.9%	35.1%	38.8%	46.7%
NOPAT to sales	5.9%	5.3%	5.1%	8.8%	9.9%	10.2%	10.4%
Sales to EOY NOWC	8.25	5.43	7.68	10.43	10.76	20.62	144.13
Sales to EOY NFA	2.91	3.70	3.45	3.41	3.52	3.52	3.52
Sales to EOY IC	2.15	2.20	2.38	2.57	2.65	3.01	3.44
Total ROIC using EOY IC	12.8%	11.6%	12.1%	22.6%	26.3%	30.6%	35.9%
3-stage							
Net income / sales		5.1%	4.8%	8.5%	9.5%	9.8%	10.1%
Sales / avg assets		1.00	1.03	1.02	1.06	1.08	1.15
ROA		5.1%	4.9%	8.6%	10.1%	10.6%	11.5%
Avg assets / avg equity		12.75	25.35	141.45	(193.59)	(28.65)	(13.91)
ROE		64.7%	125.4%	1216.9%	NA	NA	NA
Payout Ratio		50.7%	60.5%	43.6%	50.3%	49.4%	47.5%
Retention Ratio		49.3%	39.5%	56.4%	49.7%	50.6%	52.5%
Sustainable Growth Rate		31.9%	49.6%	686.7%	NA	NA	NA

Appendix 7: 3-stage discounted cash flow

Cash flows	2019	2020	2021	2022	2023	2024	2025
Sales Growth	*4.3%*	*6.2%*	*6.0%*	*6.0%*	*5.0%*	*4.0%*	*3.0%*
NOPAT / S	*10.2%*	*10.4%*	*10.8%*	*11.2%*	*11.6%*	*12.0%*	*12.4%*
S / NOWC	*20.62*	*144.13*	*144.13*	*144.13*	*144.13*	*144.13*	*144.13*
S / NFA (EOY)	*3.52*	*3.52*	*4.00*	*4.00*	*4.00*	*4.00*	*3.52*
S / IC (EOY)	*3.01*	*3.44*	*3.89*	*3.89*	*3.89*	*3.89*	*3.44*
ROIC (EOY)	*30.6%*	*35.9%*	*42.0%*	*43.6%*	*45.1%*	*46.7%*	*42.6%*
ROIC (BOY)		*33.3%*	*39.4%*	*46.2%*	*47.4%*	*48.6%*	*49.7%*
Share Growth		*-3.7%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
Sales	$103,745	$110,142	$116,750	$123,755	$129,943	$135,141	$139,195
NOPAT	$10,553	$11,501	$12,609	$13,861	$15,073	$16,217	$17,260
Growth		*9.0%*	*9.6%*	*9.9%*	*8.8%*	*7.6%*	*6.4%*
- Change in NOWC	-4218	-4266	46	49	43	36	28
NOWC EOY	*5030*	*764*	*810*	*859*	*902*	*938*	*966*
Growth NOWC		*-84.8%*	*6.0%*	*6.0%*	*5.0%*	*4.0%*	*3.0%*
- Chg NFA	1202	1817	-2090	1751	1547	1299	5759
NFA EOY	*29,461*	*31,278*	*29,188*	*30,939*	*32,486*	*33,785*	*39,544*
Growth NFA		*6.2%*	*-6.7%*	*6.0%*	*5.0%*	*4.0%*	*17.0%*
Total inv in op cap	-3016	-2449	-2044	1800	1590	1335	5787
Total net op cap	34491	32042	29998	31797	33387	34723	40510
FCFF	$13,568	$13,950	$14,653	$12,061	$13,484	$14,881	$11,473
% of sales	*13.1%*	*12.7%*	*12.6%*	*9.7%*	*10.4%*	*11.0%*	*8.2%*
Growth		*2.8%*	*5.0%*	*-17.7%*	*11.8%*	*10.4%*	*-22.9%*
- Interest (1-tax rate)	407	413	426	439	452	465	479
Growth		*1.6%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
+ Net new debt	250	125	364	375	386	397	409
Debt	11997	12122	12486	12860	13246	13643	14053
Debt / tot net op capital	*34.8%*	*37.8%*	*41.6%*	*40.4%*	*39.7%*	*39.3%*	*34.7%*
FCFE w debt	$13,411	$13,662	$14,591	$11,997	$13,418	$14,813	$11,403
% of sales	*12.9%*	*12.4%*	*12.5%*	*9.7%*	*10.3%*	*11.0%*	*8.2%*
Growth		*1.9%*	*6.8%*	*-17.8%*	*11.8%*	*10.4%*	*-23.0%*
/ No Shares	550.0	529.4	529.4	529.4	529.4	529.4	529.4
FCFE	$24.39	$25.81	$27.56	$22.66	$25.35	$27.98	$21.54
Growth		*5.8%*	*6.8%*	*-17.8%*	*11.8%*	*10.4%*	*-23.0%*
* Discount factor	0.90	0.81	0.73	0.66	0.59	0.53	0.48
Discounted FCFE	$21.96	$20.92	$20.12	$14.89	$15.00	$14.91	$10.33
Terminal value P/E							
Net income	$10,146	$11,087	$12,183	$13,422	$14,622	$15,752	$16,781
% of sales	*9.8%*	*10.1%*	*10.4%*	*10.8%*	*11.3%*	*11.7%*	*12.1%*
EPS	$18.45	$20.94	$23.01	$25.35	$27.62	$29.75	$31.70
Growth		*13.5%*	*9.9%*	*10.2%*	*8.9%*	*7.7%*	*6.5%*
Terminal P/E							19.10
* Terminal EPS							$31.70
Terminal value							$605.45
* Discount factor							0.48
Discounted terminal value							$290.45

First stage	$42.88	Present value of first 2 year cash flow
Second stage	$75.25	Present value of year 3-7 cash flow
Third stage	$290.45	Present value of terminal value P/E
Value (P/E)	$408.59	= value at beg of fiscal yr 2019

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